Dialogic®

Dialogic® Global Call Country Dependent Parameters (CDP) for PDK Protocols

Configuration Guide

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Revision History

This revision history summarizes the changes made in each published version of this document.

Document No.	Publication Date	Description of Revisions
05-1965-008	February 2008	Global changes: Made global changes to reflect Dialogic brand. Deleted references to ICAPI protocols. Configuration Overview chapter: Updated the Protocol Summary table to show support for supervised transfer on the North American Analog Bidirectional protocol. Configuration Procedures chapter: Added note that the procedure for Downloading the Protocol and CDP File on a Windows® System is not applicable when using Dialogic® System Release 6.0 PCI for Windows®. Added information about *pdk.cfg* file options for Dialogic® DNI310TEPEHMP, DNI610TEPEHMP, DNI1210TEPEHMP, and DNI2410TEPEHMP Digital Network Interface Boards. North American Analog Bidirectional Protocol Parameter Configuration chapter: Added new parameters, CDP_BlindXferTime and CDP_BtStartTimer.
05-1965-007	April 2006	Configuration Overview chapter: Updated the Protocol Summary table for the new protocols. Configuration Procedures chapter: Added note that the procedure for Downloading the Protocol and CDP File on a Windows® System is not applicable when using Dialogic® System Release 6.1 CompactPCI for Windows®. Added note about running pdkmanagerregsetup if the pdk.cfg file is not present. (PTR 36373) Updated the information about the *pdk.cfg* file mlmfile options that are applicable when using the Global Call Protocols with Dialogic® Host Media Processing (HMP) Software. (PTR 36868) Added procedure for Downloading Different Variations of the Same Protocol on DM3 Boards. Tone and Tone Mask Parameters chapter: Changed parameter name used with Mexico R2 protocol to CDP_Generic_Variant_ID, and added reference to using this parameter with Kuwait R2 protocol as well. Bulgaria R2 Bidirectional Protocol Parameter Configuration chapter: New chapter. Croatia R2 Bidirectional Protocol Parameter Configuration chapter: New chapter. Kuwait R2 Bidirectional Protocol Parameter Configuration chapter: New chapter. Lithuania R2 Bidirectional Protocol Parameter Configuration chapter: New chapter. Nortel Meridian Lineside E1 Bidirectional Protocol Parameter Configuration chapter: Changed the protocol module file names. Added new parameters, CDP_WaitForIdle, CDP_WaitForReleaseGuard, CDP_WaitForSeizeAck, CDP_WaitForIdle_Timeout, CDP_ReleaseGuardTimeout, CDP_SeizeAck_Timeout. Uzbekistan R2 Bidirectional Protocol Parameter Configuration chapter: New chapter.
05-1965-006	December 2005	Global change: Added new parameter, CDP_In_ANIBeforeDNIS, to chapters for countries/protocols that use the pdk_r2_io protocol module. Configuration Procedures chapter: Added configuration information that is applicable when using the Global Call Protocols with Dialogic® Host Media Processing (HMP) Software.

Document No.	Publication Date	Description of Revisions
05-1965-005	June 2005	Global changes: Revised the description of the CDP_Drop_Using_ProgressTones_After_AcceptCall parameter. Configuration Overview chapter: Updated the Protocol Summary table for the new protocols. Updated the Protocol Summary table to show supervised transfer supported on MELCAS Lineside protocol. Configuration Procedures chapter: Added note that the procedure for Downloading the Protocol and CDP File on DM3 Boards is not applicable when using Dialogic® System Release 6.1 for Linux. Alcatel 4400 Lineside E1 Bidirectional Protocol Parameter Configuration chapter: Added new parameters, CDP_BlockOnLOOS and CDP_ReconnectDelay. Alcatel VPS 4x00 Lineside Bidirectional Protocol Parameter Configuration chapter: Added new parameter, CDP_BlockOnLOOS. E1 CAS Bidirectional Protocol Parameter Configuration chapter: Changed default value of CDP_IN_GetDigitTime parameter. Ericsson MD110 PBX Lineside E1 Bidirectional Protocol Parameter Configuration chapter: Added new parameters, CDP_BlockOnLOOS and CDP_ReconnectDelay. Korea GDS Lineside E1 Bidirectional Protocol Parameter Configuration chapter: Added new parameters, CDP_BlockOnLOOS and CDP_RemoteBlockingTimeout. Korea T1/R2 Bidirectional Protocol Parameter Configuration chapter: New chapter. Lebanon R2 Bidirectional Protocol Parameter Configuration chapter: New chapter. Lucent Lineside E1 Bidirectional Protocol Parameter Configuration chapter: Added new parameters, CDP_BlockOnLOOS and CDP_ReconnectDelay. MELCAS Lineside Bidirectional Protocol Parameter Configuration chapter: Added new parameters for call transfer functionality. NEC Lineside E1 Bidirectional Protocol Parameter Configuration chapter: Added new parameters, CDP_BlockOnLOOS and CDP_ReconnectDelay. Nortel Meridian Lineside E1 Bidirectional Protocol Parameter Configuration chapter: Added new parameters, CDP_BlockOnLOOS and CDP_ReconnectDelay. North American Analog Bidirectional Protocol Parameter Configuration chapter: Added new parameter, CDP_DisconnectToneSup. Poland R2 Bidirectional Protocol Parameter Configuration chapter: New chapter. Samsung PBX Lineside E1 Bidirectional Protocol Parameter Configuration chapter: New chapter. T1 FXS Ground Start Bidirectional Protocol Parameter Configuration chapter: Added new parameters, CDP_BlockOnLOOS and CDP_RemoteBlockingTimeout. United States T1 Bidirectional Protocol Parameter Configuration chapter: Changed default value of CDP_IN_GetDigitTime parameter. United States T1 FXS/LS Bidirectional Protocol Parameter Configuration: Added new parameters, CDP_BlockOnLOOS and CDP_ReconnectDelay.

Document No.	Publication Date	Description of Revisions
05-1965-004	December 2004	Global changes: Changed name of document to *Global Call Country Dependent Parameters (CDP)* ***for PDK Protocols*** *Configuration Guide*. Added new parameters for MF/DTMF support and metering to chapters for countries/protocols that use the pdk_r2_io protocol module. Added new parameters for Belgium Lineside, Belgium Network, Ecuador R2, and Korea R2, which now use the pdk_r2_io protocol module. Added information about tone and tone mask parameters to chapters for countries/protocols that use the pdk_r2_io protocol module, plus China R2 and Mexico R2. Configuration Overview chapter: Added Protocol Summary table. Configuration Procedures chapter: Added note about system releases where the Global Call Protocols package is installed as part of the system release software (as opposed to a separately installed package). Added note about not adding parameters to a CDP file. (Also deleted chapter about call progress analysis parameters, which erroneously stated that these parameters could be added to a CDP file.) Tone and Tone Mask Parameters chapter: New chapter. Australia R2 Bidirectional Protocol Parameter Configuration chapter: New chapter. Direct Signaling Protocol Parameter Configuration chapter: Revised note about system release requirements for this protocol. E1 CAS Bidirectional Protocol Parameter Configuration chapter: Added new parameters, **CDP_IN_RemoteBlockingTimeout** and **CDP_IN_ResumeCallTimeout**. Mexico R2 Bidirectional Protocol Parameter Configuration chapter: Added new parameter, **CDP_Drop_Using_ProgressTones_After_AcceptCall**. South Africa R2 Bidirectional Protocol Parameter Configuration chapter: New chapter.
05-1965-003	June 2004	CCITT R2 Asymmetric Bidirectional Protocol Parameter Configuration chapter: New chapter. Direct Signaling Protocol Parameter Configuration chapter: Added information about retrieving the ABCD signaling bit values. Ecuador R2 Bidirectional Protocol Parameter Configuration chapter: New chapter. Korea R2 Bidirectional Protocol Parameter Configuration chapter: Changed the protocol modules used with this protocol. Added new parameter, **cdp_CATInsertType**. Added new parameter, **CDP_MAX_DIGITS** (replaces **CDP_ANI_MaxDigits** and **CDP_DNIS_MaxDigits**). Mexico R2 Bidirectional Protocol Parameter Configuration chapter: Changed default value for the **CDP_SEND_ALERTING_ON_R2MF_COMPLETION** parameter. Added new parameters, **CDP_ConnectType**, **CDP_FLAG_APPEND_F**, and **CDP_OVERLAP_SENDING_ENABLED**. NEC Lineside E1 Bidirectional Protocol Parameter Configuration chapter: New chapter. North American Analog Bidirectional Protocol Parameter Configuration chapter: Added new parameter, **CDP_Detect_DialTone**. T1 FXS Ground Start Bidirectional Protocol Parameter Configuration chapter: New chapter. Taiwan Modified R1 Bidirectional Protocol Parameter Configuration chapter: Added new parameter, **CDP_ANI_Timeout**.

Document No.	Publication Date	Description of Revisions
05-1965-003 (continued)		United States T1 Bidirectional Protocol Parameter Configuration chapter: Added new parameters, **CDP_IN_RemoteBlockingTimeout** and **CDP_IN_ResumeCallTimeout**. United States T1 FXS/LS Bidirectional Protocol Parameter Configuration chapter: Added new parameter, **CDP_AllowDblHookflashOnConsultationDrop**.
05-1965-002	December 2003	Global changes: Added two new parameters, **CDP_FLAG_APPEND_F** and **CDP_SEND_ALERTING_ON_R2MF_COMPLETION**, for the countries/protocols that use the pdk_r2_io protocol module. Also revised the description of the **CDP_OVERLAP_SENDING_ENABLED** parameter. These changes affect the following chapters: Argentina R2, Brazil R2, CCITT R2, Colombia R2, Finland R2, India R2, Israel R2, Korea R2, Malaysia R2, Morocco R2, Pakistan R2, Philippines R2, Singapore R2, Thailand R2, Venezuela R2, and Vietnam R2. Added a protocol limitation regarding the use of **gc_DropCall( )** after **gc_SetUpTransfer( )**. This change affects the following chapters: Alcatel 4400 Lineside E1, E1 CAS, Ericsson MD110 PBX Lineside, Lucent Lineside E1, Nortel Meridian Lineside E1, United States T1, and United States T1 FXS/LS. (PTR 30365) Belgium Lineside Bidirectional Protocol Parameter Configuration and Belgium Network Bidirectional Protocol Parameter Configuration chapters: New chapters Brazil R2 Bidirectional Protocol Parameter Configuration chapter: Changed the default value for **CAS_PULSE_DOUBLE_ANSWER** parameter. Chile R2 Bidirectional Protocol Parameter Configuration chapter: New chapter. China R2 Bidirectional Protocol Parameter Configuration chapter: Revised the description of the **CDP_DNIS_DIGITS_BEFORE_ANI** parameter. E1 CAS Bidirectional Protocol Parameter Configuration and United States T1 Bidirectional Protocol Parameter Configuration chapters: Added new parameter, **CDP_BlockOnLOOS**. Added guideline for setting the **CDP_IN_GetDigitTime** parameter. (PTR 29357) MELCAS Network Bidirectional Protocol Parameter Configuration chapter: Changed the default value for **CDP_DTMF_DIALING** parameter. Saudi Arabia R2 Bidirectional Protocol Parameter Configuration chapter: New chapter. Sweden P7 Bidirectional Protocol Parameter Configuration and Sweden P7 PBX Bidirectional Protocol Parameter Configuration chapters: Changed the default value for **CDP_Dial_Using_DTMF** and **CDP_DialToneEnabled** parameters. United States T1 FXS/LS Bidirectional Protocol Parameter Configuration chapter: Added new parameter, **CDP_DisconnectToneSup**.
05-1965-001	June 2003	Initial version of document. Much of the information contained in this document was previously published in the *Global Call Country Dependent Parameters (CDP) Reference*, document number 05-0870-006. **Note:** Information about ICAPI protocols is not included in this document. Although still supported, no further development of ICAPI protocols is planned.

About This Publication

The following topics provide information about this publication:

Purpose

This guide provides information about configuring the country dependent parameter (CDP) files included in the Dialogic® Global Call Protocols package. Configuration procedures are given, as well as descriptions of configuration files and configuration parameters. This guide is only for protocols that were developed using the Dialogic® Protocol Development Kit (PDK).

Applicability

This document version (05-1965-008) is published for Dialogic® Host Media Processing Software Release 3.1LIN.

This document may also be applicable to other software releases (including service updates) on Linux or Windows® operating systems. Check the Release Guide for your software release to determine whether this document is supported.

Intended Audience

This information is intended for those who use the Dialogic® Global Call Application Programming Interface (API) to develop applications using Analog, E1 CAS, or T1 robbed bit technologies.

How to Use This Publication

Refer to this publication after you have installed the Dialogic® system release software and the Global Call Protocols package.

Chapter 1, "Configuration Overview" and Chapter 2, "Configuration Procedures" provide introductory information and procedures for using Global Call protocols on Dialogic® DM3 and Springware boards, on a Linux or Windows® system.

Note: *DM3 boards* is a collective name used in this publication to refer to products that are based on the Dialogic® DM3 mediastream architecture. For example, the Dialogic® DM/V and DMT160TEC boards are products that use the DM3 architecture. *Springware boards* is a collective name for boards based on a preceding architecture.

The remaining chapters provide reference information about the protocol parameters. Chapter 3, "Tone and Tone Mask Parameters" discusses the tone and tone mask parameters, which no longer appear in some CDP files, and explains how their default values can be modified. This chapter is applicable to several countries/protocols. Following this is a separate chapter for each protocol. The chapters are in alphabetical order by protocol name. The information in each chapter includes the protocol file set, any protocol limitations, and a description of each modifiable CDP parameter.

Note: Only the modifiable parameters in the CDP files are listed and described in this guide. The CDP files contain additional parameters that are set to the value required to meet the approval of the local PTT and should not be changed.

Related Information

See the following for additional information:

- *http://www.dialogic.com/manuals/* (for Dialogic® product documentation)
- *http://www.dialogic.com/support/* (for Dialogic technical support)
- *http://www.dialogic.com/* (for Dialogic® product information)

Configuration Overview 1

This chapter provides an overview of the configuration process and of the files associated with each protocol.

1.1 Major Configuration Steps

The major configuration steps when using the Dialogic® Global Call Protocols package are:

1. Configuring the country dependent parameters in the CDP file
2. Downloading the protocol and CDP file

Detailed information about these configuration steps is given in Chapter 2, "Configuration Procedures".

Each protocol is contained in a separate, modular binary file. This modular design simplifies adapting applications for use in numerous countries. The protocol and parameters used at the application's interface to the PTT must complement those used by the local CO.

User selectable options allow customization of the country dependent parameters to fit a particular application or configuration within a country, because switches within the same country may use the same protocol but may require different parameter values for local use. These parameters (for example, the number of DNIS digits, number of ANI digits, time-outs, and many others) are specified in the CDP file and may be modified at configuration time (that is, at any time before starting your application).

1.2 Protocol File Naming Conventions

When a protocol is installed on your system, several files are installed, including the protocol modules and country dependent parameter files. For most protocols, the files are named according to the conventions shown in Table 1.

Table 1. Protocol File Naming Conventions

File Name	Description
pdk_cc_tt_dd.cdp or pdk_cc_tt_fffff_dd.cdp	Country dependent parameter files
pdk_cc_tt_dd.qs or pdk_cc_tt_fffff_dd.qs pdk_cc_tt_dd.hot or pdk_cc_tt_fffff_dd.hot	Dialogic® DM3 protocol modules
pdk_cc_tt_dd.qs or pdk_cc_tt_fffff_dd.qs pdk_cc_tt_dd.arm.hot or pdk_cc_tt_fffff_dd.arm.hot	Dialogic® DM3 protocol modules for Dialogic® DMT160TEC boards
pdk_cc_tt_dd.psi or pdk_cc_tt_fffff_dd.psi	Dialogic® Springware protocol modules

In Table 1:

pdk
: indicates the PDKRT call control library, i.e., the call control library for which the protocol is written.

cc
: is a two-character ISO country code or regional code (for example, ar = Argentina, cn = China, na = North America, etc.), or sw for a switch-specific protocol. (cc is not always included in the protocol module name, for example, when the generic R2 protocol is used.)

tt
: is a two-character protocol type. Examples of valid types are:
- e1 – a pulse, MF SOCOTEL, or other E1 protocol
- em – a T1 protocol using E&M signaling with support for DTMF digits only
- ls – a loop start protocol
- mf – a T1 protocol using E&M signaling with support for MF digits
- r2 – a protocol using R2MFC signaling

fffff
: is optional and defines a special software or hardware feature supported by the protocol. For switch-specific protocols, this field provides additional information about the switch.

dd
: is a direction indicator, normally io for inbound/outbound.

.cdp
: is the file extension for country dependent parameter files.

.qs, .hot, and .arm.hot
: are the file extensions for Dialogic® DM3 protocol modules.

.psi
: is the file extension for Dialogic® Springware protocol modules.

1.3 Protocol File Directory Locations

The protocol files are located under the installation directories listed in Table 2. (The directory location environment variables shown in Table 2 are for Dialogic® System Release Software 6.x and later software.)

Table 2. Protocol File Directory Locations

File Type	Directory Location	
	Linux	Windows®
Country dependent parameters (.cdp)	$INTEL_DIALOGIC_CFG	%INTEL_DIALOGIC_CFG%
Dialogic® DM3 protocol modules (.qs, .hot, .arm.hot)	$INTEL_DIALOGIC_CFG	%INTEL_DIALOGIC_CFG%
Dialogic® Springware protocol modules (.psi)	$INTEL_DIALOGIC_FWL	%INTEL_DIALOGIC_FWL%

1.4 Protocol Summary

Table 3 lists the PDK protocols in the Dialogic® Global Call Protocols package and indicates which protocols support key features such as busy tone, DTMF/MF, overlap send/receive, and supervised transfer.

Table 3. Protocol Summary

Protocol Name or Switch Type	Features			
	Busy Tone	DTMF/MF	Overlap Send/ Receive	Supervised Transfer
Alcatel 4400 Lineside E1 Bidirectional	Supported	—	—	Supported
Alcatel VPS 4x00 Lineside Bidirectional	—	Supported	—	Supported
Argentina R2 Bidirectional	Supported	Supported	Supported	—
Australia R2 Bidirectional	Supported	Supported	Supported	—
Belgium Lineside Bidirectional	Supported	Supported	Supported	—
Belgium Network Bidirectional	Supported	Supported	Supported	—
Brazil R2 Bidirectional	Supported	Supported	Supported	—
Bulgaria R2 Bidirectional	Supported	Supported	Supported	—
CCITT R2 Asymmetric Bidirectional	Supported	—	—	—
CCITT R2 Bidirectional	Supported	Supported	Supported	—
Chile R2 Bidirectional	Supported	Supported	Supported	—
China R2 Bidirectional	—	—	—	—
Colombia R2 Bidirectional	Supported	Supported	Supported	—
Croatia R2 Bidirectional	Supported	Supported	Supported	—

Table 3. Protocol Summary (Continued)

Protocol Name or Switch Type	Features			
	Busy Tone	DTMF/MF	Overlap Send/ Receive	Supervised Transfer
Direct Signaling	—	—	—	—
E1 CAS Bidirectional	—	Supported	—	Supported
Ecuador R2 Bidirectional	Supported	Supported	Supported	—
Ericsson MD110 PBX Bidirectional	Supported	—	—	Supported
Finland R2 Bidirectional	Supported	Supported	Supported	—
Hong Kong DTMF Bidirectional	—	Supported	—	—
India R2 Bidirectional	Supported	Supported	Supported	—
Indonesia E&M Bidirectional	—	—	—	—
Israel R2 Bidirectional	Supported	Supported	Supported	—
Italy E1 Bidirectional	—	—	—	—
Korea GDS Lineside	Supported	—	—	Supported
Korea GDS Network Emulation	Supported	—	—	—
Korea R2 Bidirectional	Supported	Supported	Supported	—
Korea T1/R2 Bidirectional	Supported	Supported	Supported	—
Kuwait R2 Bidirectional	Supported	—	—	—
Lebanon R2 Bidirectional	Supported	Supported	Supported	—
Lithuania R2 Bidirectional	Supported	Supported	Supported	—
Lucent Lineside E1 Bidirectional	Supported	—	—	Supported
Malaysia R2 Bidirectional	Supported	Supported	Supported	—
MELCAS Lineside	Supported	Supported	—	Supported
MELCAS Network Emulation	Supported	Supported	—	—
Mexico R2 Bidirectional	Supported	—	—	—
Morocco R2 Bidirectional	Supported	Supported	Supported	—
NEC Lineside Bidirectional	Supported	—	—	Supported
Nortel Meridian Lineside E1 Bidirectional	Supported	—	—	Supported
North America Analog Bidirectional	—	—	—	Supported
Pakistan R2 Bidirectional	Supported	Supported	Supported	—
Philippines R2 Bidirectional	Supported	Supported	Supported	—
Poland R2 Bidirectional	Supported	Supported	Supported	—
Samsung PBX Lineside E1 Bidirectional	Supported	DTMF only	—	Supported
Saudi Arabia R2 Bidirectional	Supported	Supported	Supported	—
Singapore R2 Bidirectional	Supported	Supported	Supported	—
South Africa R2 Bidirectional	Supported	Supported	Supported	—

Table 3. Protocol Summary (Continued)

Protocol Name or Switch Type	Features			
	Busy Tone	DTMF/MF	Overlap Send/ Receive	Supervised Transfer
Sweden P7 Bidirectional	—	Supported	—	—
Sweden P7 PBX Bidirectional	—	Supported	—	—
T1 FXS Ground Start Bidirectional	Supported	—	—	Supported
Taiwan Modified R1 Bidirectional	—	—	—	—
Taiwan T1 E&M Bidirectional	—	Supported	—	—
Thailand R2 Bidirectional	Supported	Supported	Supported	—
United States T1 FGA/FGB/FGD/FXO/FXS/LS Bidirectional	Supported	Supported	—	Supported
United States T1 FXS/LS Bidirectional	Supported	Supported	—	Supported
Uzbekistan R2 Bidirectional	Supported	Supported	Supported	—
Venezuela R2 Bidirectional	Supported	Supported	Supported	—
Vietnam R2 Bidirectional	Supported	Supported	Supported	—

Configuration Procedures 2

This chapter describes the configuration procedures needed when using the Global Call Protocols package.

2.1 Assumptions and Prerequisites

The following assumptions and prerequisites apply to the Global Call Protocols configuration procedures:

- The Dialogic® system release software has been installed and configured. See the Software Installation Guide for your system release and the Configuration Guide for your boards for applicable procedures.
- The Global Call Protocols package has been installed.

  Note: When used with Dialogic® System Release 5.x software, the Global Call Protocols package is installed separately (i.e., not with the system release software). Check the Release Notes for your Global Call Protocols package to determine the Dialogic system releases that it can be used with.

  With Dialogic® System Release 6.x software, the Global Call Protocols package is installed as part of the system release software or with a Service Update for the system release.

  With Dialogic® Host Media Processing (HMP) Software 2.0WIN (and later versions of Dialogic® HMP Software), the Global Call Protocols package is installed as part of the system release software or with a Service Update for the system release.
- The .fcd and .pcd configuration files selected for Dialogic® DM3 boards support the use of DM3 PDK protocols. With Dialogic® System Release 5.x software, some of the .fcd/.pcd files have an embedded protocol. When these .fcd/.pcd files have been assigned to a board, the PDK protocols cannot be used with that board.

  Make sure that the .fcd/.pcd file names are the *mlx_qsx_**cas*** variety on T1 and *mlx_qsx_**r2mf*** variety on E1. For example, *ml2_qsa_**cas**.fcd* and *ml2_qsa_**cas**.pcd* support the use of DM3 PDK protocols, but *ml2_qsa_**t1**.fcd* and *ml2_qsa_**t1**.pcd* do not support the use of DM3 PDK protocols.

- The .fcd/.pcd files that support T1 CAS and E1 R2MF PDK protocols on HMP are different from the .fcd/.pcd files used with Dialogic® System Release software, With Dialogic® HMP Software Release 2.0 (and later versions of Dialogic® HMP Software), T1 CAS PDK protocols can be run on the Dialogic® DNI300TEPHMP and DNI1200TEPHMP interface boards using the Dialogic® HMP Software host media resources. E1 R2MF PDK protocols can be run on the Dialogic® DNI601TEPHMP interface board using the tone resources on the board itself, since the dual span board contains DSP resources.

2.2 Order of Procedures

Configuring Country Dependent Parameters can be done at any time before starting your application.

Downloading the Protocol and CDP File on Dialogic® DM3 Boards and Downloading the Protocol and CDP File on Dialogic® Springware Boards should be done before starting the boards.

Downloading Different Variations of the Same Protocol on Dialogic® DM3 Boards is optional and should only be done if you need different variations of the same protocol to be used on different boards or on different trunks of the same board.

2.3 Configuring Country Dependent Parameters

The country dependent parameters (CDP) file can be modified from the command line using a text editor.

Note: If you want to preserve the default parameter values contained in the CDP file, make a backup copy of the file prior to editing it.

To edit a CDP file:

1. From the command prompt, go to the directory where the CDP files are located. (With Dialogic® System Release 6.x software, this is $INTEL_DIALOGIC_CFG on Linux and %INTEL_DIALOGIC_CFG% on Windows®.)

2. Using a text editor (for example, vi on Linux or WordPad on Windows®), open the CDP file you want to modify.

3. Edit the CDP file as necessary. See the Parameter Configuration chapters in this guide for a description of the CDP file parameters for each protocol.

   Note: Only the modifiable parameters in the CDP files are listed and described in this guide. The CDP files contain additional parameters that are set to the value required to meet the approval of the local PTT and should not be changed.

   Do not add any parameters to a CDP file, because the protocol may not support them. Only those parameters that are already included in the CDP file are supported. Adding parameters to a CDP file could result in errors.

4. Save and close the CDP file.

If you have Dialogic® DM3 boards, continue with Section 2.4, "Downloading the Protocol and CDP File on Dialogic® DM3 Boards", on page 25. If you have Dialogic® Springware boards, continue with Section 2.6, "Downloading the Protocol and CDP File on Dialogic® Springware Boards", on page 31.

2.4 Downloading the Protocol and CDP File on Dialogic® DM3 Boards

Note: This section is not applicable when using Dialogic® System Release 6.x software. See the appropriate Configuration Guide on the System Release bookshelf for the applicable procedure.

To download the Global Call protocol modules and country dependent parameters to Dialogic® DM3 boards, you must create a file called *pdk.cfg*. This file specifies the protocol and the parameter settings downloaded to each board. The information is downloaded when you start the boards.

Perform either of the following procedures, depending on your operating system:

- Downloading the Protocol and CDP File on a Linux System
- Downloading the Protocol and CDP File on a Windows® System

Note: On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility with Dialogic® Springware boards, the **gc_OpenEx( )** protocol name field may be specified for Dialogic® DM3 boards, but it is not used.

If you want to download different variations of the same protocol (for example, one for immediate start and one for wink start), see Section 2.5, "Downloading Different Variations of the Same Protocol on Dialogic® DM3 Boards", on page 29.

2.4.1 Downloading the Protocol and CDP File on a Linux System

Note: This section is not applicable when using Dialogic® System Release 6.1 for Linux. See the Configuration Guide on the System Release 6.1 Linux bookshelf for the applicable procedure.

On Linux, the dlstart utility will automatically download the protocol and country dependent parameters if the file *pdk.cfg* is present in the $INTEL_DIALOGIC_CFG directory.

Proceed as follows to set up the *pdk.cfg* file:

1. Stop the Dialogic® Service if it is running.
2. From the command prompt, go to the $INTEL_DIALOGIC_CFG directory.
3. Using a text editor (for example, vi), create a file called *pdk.cfg*.

4. For each Dialogic® DM3 board to be configured, add a line to *pdk.cfg* in the following format:

   ```
   board <n> [options] fcdfile <file> pcdfile <file> variant <file>
   ```

   The options can be abbreviated to their first letter, for example:

   ```
   b <n> [options] f <file> p <file> v <file>
   ```

   Note: For Dialogic® DMT160TEC boards, the `mlmfile` option must also be included.

   Note: For Dialogic® HMP Interface Boards, the `mlmfile` and `rocboard` options must also be included.

   See Table 4, "pdk.cfg File Options", on page 27 for a description of all options, and see the pdk.cfg File Examples for Dialogic® System Release Software and pdk.cfg File Examples for Dialogic® HMP Software following Table 4.

5. Save and close the *pdk.cfg* file.

The configuration settings take effect when the system is started.

Note: To stop the system from automatically downloading the protocol and country dependent parameters when you start the system, remove *pdk.cfg* from the $INTEL_DIALOGIC_CFG directory.

2.4.2 Downloading the Protocol and CDP File on a Windows® System

Note: This section is not applicable when using Dialogic® System Release 6.1 CompactPCI for Windows® or Dialogic® System Release 6.0 PCI for Windows®. See the Configuration Guide on the Dialogic® System Release 6.1 CompactPCI for Windows® bookshelf for the applicable procedure.

On Windows®, a tool called PDKManager is used to download the Global Call protocol modules and country dependent parameters to Dialogic® DM3 boards. Starting the Dialogic® Configuration Manager (DCM) will automatically invoke PDKManager if the file *pdk.cfg* is present in the %INTEL_DIALOGIC_CFG% directory.

Note: If the *pdk.cfg* file is not present in the %INTEL_DIALOGIC_CFG% directory and `pdkmanagerregsetup` is run, no indication is given that a problem exists. Subsequent attempts to start the Dialogic services will fail with no discernible error.

Proceed as follows to set up the *pdk.cfg* file and PDKManager:

1. Stop the Dialogic Service if it is running.

2. From the command prompt, go to the %INTEL_DIALOGIC_CFG% directory.

3. Using a text editor (for example, WordPad), create a file called *pdk.cfg*.

4. For each Dialogic® DM3 board to be configured, add a line to *pdk.cfg* in the following format:

   ```
   board <n> [options] fcdfile <file> pcdfile <file> variant <file>
   ```

   The options can be abbreviated to their first letter, for example:

   ```
   b <n> [options] f <file> p <file> v <file>
   ```

   Note: For Dialogic® DMT160TEC boards, the `mlmfile` option must also be included.

   Note: For Dialogic® HMP Interface Boards, the `mlmfile` and `rocboard` options must also be included.

   See Table 4, "pdk.cfg File Options", on page 27 for a description of all options, and see the pdk.cfg File Examples for Dialogic® System Release Software and pdk.cfg File Examples for Dialogic® HMP Software following Table 4.

5. Save and close the *pdk.cfg* file.

6. Type the following at the command line:

   ```
   pdkmanagerregsetup add
   ```

   The system responds with:

   ```
   PDKManager key insertion succeeded.
   ```

The configuration settings take effect when you run the DCM utility and start the boards.

Note: To stop PDKManager from automatically running whenever the DCM is started, type the following at the command prompt: `pdkmanagerregsetup remove`

Table 4. pdk.cfg File Options

Option	Description
board <n>	**Required.** Specifies the logical board ID for the board(s) to which the command applies. For multiple boards, n = {n1 n2 ... nx} For example, to download and assign the *pdk_ar_r2_io* protocol files to all lines on boards 1 and 3, type: `board {1 3} variant pdk_ar_r2_io.cdp`
line <n>	Specifies the E1 or T1 line(s) to which the command applies. If this parameter is not specified, then all lines defined by the FCD file are used. For multiple lines, n = {n1 n2 ... nx} For example, to download and assign the *pdk_ar_r2_io* protocol files to lines 1 and 2 on board 1, type: `board 1 line {1 2} variant pdk_ar_r2_io.cdp`
fcdfile <file>	**Required** if the default FCD file, *qs_r2mf.fcd*, is not used. Determines line and channel configurations by parsing the FCD file.
pcdfile <file>	**Required** if the default PCD file, *qs_r2mf.pcd*, is not used. Specifies the .mlm file by parsing the PCD file.
variant <file>	**Required**. Specifies the CDP file used. Downloads and configures the protocol on the board(s) specified, and then assigns the variant to the lines and channels.

Table 4. pdk.cfg File Options (Continued)

Option	Description
mlmfile <file>	**Required** for Dialogic® DMT160TEC boards, which must use `mlmfile dti16pdk.mlm.sym` **Required** for Dialogic® DNI300TEPHMP single span interface boards (used with Dialogic® HMP Software), which must use `mlmfile hmp_pdk.mlm.sym` **Required** for Dialogic® DNI601TEPHMP dual span interface boards (used with Dialogic® HMP Software), which must use either: • `mlmfile hmp_media_pdk.mlm.sym` if the board is using CAS or R2MF on all trunks • `mlmfile hmp_media_mixed.mlm.sym` if the board is mixing CAS/R2MF and ISDN protocols **Required** for Dialogic® DNI1200TEPHMP quad span interface boards (used with Dialogic® HMP Software), which must use either: • `mlmfile hmp_pdk.mlm.sym` if the board is using CAS or R2MF on all trunks • `mlmfile hmp_mixed.mlm.sym` if the board is mixing CAS/R2MF and ISDN protocols **Required** for Dialogic® DNI310TEPEHMP, DNI610TEPEHMP, DNI1210TEPEHMP, and DNI2410TEPEHMP Digital Network Interface Boards (used with Dialogic® HMP Software), which must use either: • `mlmfile hmp_pdk_octal.mlm.sym` if the board is using CAS on all trunks • `mlmfile hmp_mixed_octal.mlm.sym` if the board is mixing CAS and ISDN protocols Overrides the firmware file (.mlm) specified in the PCD file.
rocboard <n>	**Required** for Dialogic® HMP Software applications only. Indicates where to get the tone signaling resources. (See examples below.)

pdk.cfg File Examples for Dialogic® System Release Software

For all lines on board 1, use the specified .fcd/.pcd files and Argentina R2 protocol:

```
b 1 f ml1b_qs2_r2mf.fcd p ml1b_qs2_r2mf.pcd v pdk_ar_r2_io.cdp
```

For lines 1 and 2 on board 2, use the specified .fcd/.pcd files and Brazil R2 protocol:

```
b 2 l {1 2} f ml2_qs_r2mf.fcd p ml2_qs_r2mf.pcd v pdk_br_r2_io.cdp
```

For all lines on board 3 (a Dialogic® DMT160TEC board), use the specified .fcd/pcd files and United States T1 protocol:

```
b 3 f 16xt_cas.fcd p 16xt_cas.pcd v pdk_us_mf_io.cdp
m dti16pdk.mlm.sym
```

pdk.cfg File Examples for Dialogic® HMP Software

If T1 CAS PDK is being used with a Dialogic® DNI300TEPHMP (single span) board with logical board ID 0 and Dialogic® HMP Software host with logical board ID 1:

```
b 0 v pdk_us_mf_io.cdp p gnetworkonly_hmpssb_1_cas.pcd
f gnetworkonly_hmpssb_1_cas.fcd m hmp_pdk.mlm.sym r 1
```

If T1 CAS PDK is being used with a Dialogic® DNI601TEPHMP (dual span) board with logical board ID 0 and Dialogic® HMP Software host with logical board ID 1 (Dialogic® HMP Software host will not be used):

```
b 0 v pdk_us_mf_io.cdp p ghmpl1_hmpdsb_2_cas.pcd
f ghmpl1_hmpdsb_2_cas.fcd m hmp_media_pdk.mlm.sym r 0
```

If E1 R2MF PDK is being used with a Dialogic® DNI601TEPHMP (dual span) board with logical board ID 0 and Dialogic® HMP Software host with logical board ID 1 (Dialogic® HMP Software host will not be used):

```
b 0 v pdk_ar_r2_io.cdp p ghmpl1_hmpdsb_2_r2mf.pcd
f ghmpl1_hmpdsb_2_r2mf.fcd m hmp_media_pdk.mlm.sym r 0
```

If T1 CAS PDK is being used with a Dialogic® DNI1200TEPHMP (quad span) board with logical ID 0 and Dialogic® HMP Software host with logical ID 1:

```
b 0 v pdk_us_mf_io.cdp p gnetworkonly_hmpqsb_4_cas.pcd
f gnetworkonly_hmpqsb_4_cas.fcd m hmp_pdk.mlm.sym r 1
```

If a board is mixing CAS/R2MF and ISDN protocols, the *pdk.cfg* file should indicate the trunks that are configured for CAS/R2MF. For example, if a Dialogic® DNI1200TEPHMP (quad span) board is configured to have two 4ESS trunks and two CAS trunks, then the *pdk.cfg* file should contain:

```
b 0 line 3 v pdk_us_mf_io.cdp p gnetworkonly_hmpqsb_2_4ess_2_cas.pcd
f gnetworkonly_hmpqsb_2_4ess_2_cas.fcd m hmp_mixed.mlm.sym r 1
b 0 line 4 v pdk_us_mf_io.cdp p gnetworkonly_hmpqsb_2_4ess_2_cas.pcd
f gnetworkonly_hmpqsb_2_4ess_2_cas.fcd m hmp_mixed.mlm.sym r 1
```

Note: The variant (v) value will differ depending on the CDP file you are using.

2.5 Downloading Different Variations of the Same Protocol on Dialogic® DM3 Boards

Some applications may need different variations of the same protocol to be used on different boards or on different trunks of the same board. For example, the pdk_us_mf_io protocol has a parameter that sets either wink start or immediate start. You may want wink start for some trunks and immediate start for other trunks.

Each CDP file has a **SYS_VariantName** parameter. For example, in the *pdk_us_mf_io.cdp* file, the **SYS_VariantName** parameter is:

```
/* sys_VariantName (OPTIONAL) Differentiates between variants using the
same base protocol. */
DM3 CHARSTRING_t SYS_VariantName = us_mf_io
```

You can create different variations of a CDP file by using a different value of the **SYS_VariantName** parameter in each file.

To create different variations of a CDP file, perform the following procedure:

Note: If you want to preserve the default parameter values contained in the CDP file, make a backup copy of the file before performing this procedure.

1. From the command prompt, go to the directory where the CDP files are located. (With Dialogic® System Release 6.x software, this is $INTEL_DIALOGIC_CFG on Linux and %INTEL_DIALOGIC_CFG% on Windows®.)

2. Make a separate copy of the CDP file for each variation that you want. For example, for two variations of the *pdk_us_mf_io.cdp* file, one for wink start and one for immediate start, the file names could be *pdk_us_mf_io_WK.cdp* and *pdk_us_mf_io_IM.cdp*.

3. Using a text editor (for example, vi on Linux or WordPad on Windows®), open one of the CDP files you want to modify.

4. Edit the CDP file as necessary, for example, for wink start or immediate start.

5. Change the value of the **SYS_VariantName** parameter so that each CDP file has a different variant name. The **SYS_VariantName** parameter appears towards the end of the CDP file. It must be **unique in each file**, and it is **limited to 8 characters**.

   For example, one variation of the *pdk_us_mf_io.cdp* file could have:

   ```
   DM3 CHARSTRING_t SYS_VariantName = us_mf_WK
   ```

   and the other variation of the *pdk_us_mf_io.cdp* file could have:

   ```
   DM3 CHARSTRING_t SYS_VariantName = us_mf_IM
   ```

   The **SYS_VariantName** can be set to anything, as long as it is unique for that specific CDP file and is 8 characters or less.

6. Save and close the CDP file.

7. Repeat Step 3. through Step 6. for the next CDP file to be modified.

To download the protocols:

- If you are using a system release where downloading the protocols is done as part of the overall system configuration procedure (for example, Dialogic® System Release 6.1 Linux or Dialogic® System Release 6.1 CompactPCI Windows), the names of the newly created CDP files will be included in the list of protocols when configuring trunks. So you can select the appropriate protocol accordingly for each trunk.
- If you are using a system release where you must create and edit the *pdk.cfg* file to download protocols, refer to the instructions in Section 2.4.1, "Downloading the Protocol and CDP File on a Linux System", on page 25 or Section 2.4.2, "Downloading the Protocol and CDP File on a Windows® System", on page 26. Specify the names of the newly created CDP files with the v (variant) option in *pdk.cfg*, for example:

  ```
  board 0 line 1 f gul1_dsb_2_cas.fcd p gul1_dsb_2_cas.pcd v pdk_us_mf_io_WK.cdp
  board 0 line 2 f gul1_dsb_2_cas.fcd p gul1_dsb_2_cas.pcd v pdk_us_mf_io_IM.cdp
  ```

  In this example, lines (trunks) 1 and 2 of the same board use the different variations of the *pdk_us_mf_io.cdp* file that were created.

Note: Even though the file *names* are different, if the value of the **SYS_VariantName** parameter is not unique in the different variations of the CDP file, then the download will not work as expected. All protocols based on that PDK protocol defined in the *pdk.cfg* file will use only the changes in the first file found with that specific **SYS_VariantName**.

2.6 Downloading the Protocol and CDP File on Dialogic® Springware Boards

With Dialogic® Springware boards, the protocol is determined when a Global Call device is opened with the **gc_OpenEx( )** function. For information about using this function, see the *Dialogic® Global Call API Library Reference*. The protocol name to use in the **gc_OpenEx( )** function is the root file name of the CDP file without the .cdp extension. See the Parameter Configuration chapters in this guide for the **gc_OpenEx( )** protocol name for each protocol.

Tone and Tone Mask Parameters 3

This chapter discusses the tone and tone mask parameters, which no longer appear in some CDP files, and explains how their default values can be modified.

Note: The information in this chapter applies to all countries/protocols that use the pdk_r2_io protocol module, plus China R2, Kuwait R2, and Mexico R2.

3.1 Introduction and Background

For improved usability when editing CDP files, a number of parameters that are rarely modified have been removed from the CDP files for some countries/protocols. The parameters that were removed are tone and tone mask parameters, whose values are defined by the protocol specification and are generally not customized by users. For a list of the parameters that have been removed and their default values, see the individual protocol chapters.

Even though these parameters have been removed from the CDP files, it is still possible to override their default values as explained in the following section.

3.2 Overriding Default Values of Tone and Tone Mask Parameters

In place of the tone and tone mask parameters, the CDP files now contain three parameters:

```
All Integer_t CDP_Generic_R2_Variant_ID = 1
All CHARSTRING_t CDP_override_mask_parms = "None"
All CHARSTRING_t CDP_override_tone_parms = "None"
```

The default values for the tone and tone mask parameters have been hard coded in the protocol binary. Since the different protocol variants (i.e., for different countries) have different defaults, the **CDP_Generic_R2_Variant_ID** parameter initializes the appropriate default values of these parameters at the time of opening the device. (In the example shown above, 1 is the value of the **CDP_Generic_R2_Variant_ID** parameter for the Argentina R2 protocol.) Each protocol/country has a different value for the **CDP_Generic_R2_Variant_ID** parameter, and this value should **not** be changed.

Note: In place of the **CDP_Generic_R2_Variant_ID** parameter, the China CDP file has a parameter named **CDP_Generic_CN_Variant_ID**, and the Kuwait and Mexico CDP files have a parameter named **CDP_Generic_Variant_ID**. The parameters have different names since China, Kuwait, and Mexico do not use the generic R2 protocol. The parameter values should not be changed.

In order to override the default values of the tone and tone mask parameters that have been removed from the CDP file, two new parameters have been introduced: **CDP_override_mask_parms** and **CDP_override_tone_parms**.

3.2.1 Overriding Tone Mask Parameters

To keep the default values for tone mask parameters, leave **CDP_override_mask_parms** with the value:

```
All CHARSTRING_t CDP_override_mask_parms="None"
```

To override certain parameters, it can be set as shown in the following example:

```
All CHARSTRING_t CDP_override_mask_parms = "02,52=26625,58=01665"
```

The format for setting the **CDP_override_mask_parms** parameter is:

"NN,XX=YYYYY,XX=YYYYY, ..."

where:

NN
: The number of mask parameters to be overridden. (Should be exactly 2 digits, e.g., if you want to override 4 mask parameters, enter 04.)

XX
: Parameter ID for the parameter to be overridden. (2 digits, e.g., 3 should be entered as 03.)

YYYYY
: The parameter value in decimal. (5 digits, e.g., 308 should be entered as 00308.)

In the example above, two mask parameters are overridden: parameter ID 52 (**CDP_Grp1_RecvErrMask1**) is set to 26625 and parameter ID 58 (**CDP_Grp2_RecvErrMask**) is set to 1665. For a list of the parameter names, parameter IDs, and the default parameter values, see the individual protocol chapters.

3.2.2 Overriding Tone Parameters

To keep the default values for tone parameters, leave **CDP_override_tone_parms** with the value:

```
All CHARSTRING_t CDP_override_tone_parms="None"
```

To override certain parameters, it can be set as shown in the following example:

```
All CHARSTRING_t CDP_override_tone_parms = "03,04='7',05='7',25='b'"
```

The format for setting the **CDP_override_tone_parms** parameter is:

"NN,XX='C',XX='C', ..."

where:

NN
: The number of tone parameters to be overridden. (Should be exactly 2 digits, e.g., if you want to override 4 tone parameters, enter 04.)

XX
: Parameter ID for the parameter to be overridden. (2 digits, e.g., 3 should be set as 03.)

C
: The parameter value in hexadecimal. (0-9, A-F in single quotes, e.g., '1', 'C'.)

In the example above, three tone parameters are overridden: parameter ID 4 (**CDP_GrpA_SendOnErr**) is set to '7', parameter ID 5 (**CDP_GrpB_SendOnErr**) is set to '7', and parameter ID 25 (**CDP_Grp1_tone_requestdenied**) is set to 'b'. For a list of the parameter names, parameter IDs, and the default parameter values, see the individual protocol chapters.

Alcatel 4400 Lineside E1 Bidirectional Protocol Parameter Configuration

4

This chapter discusses the capabilities and parameters of the Alcatel 4400 Lineside E1 Bidirectional protocol in the following topics:

4.1 General Protocol Information

The Alcatel 4400 Lineside E1 protocol is an OPS_FX protocol.

Protocol File Set

The files used with the Alcatel 4400 Lineside E1 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_sw_e1_fxs_io.qs and pdk_sw_e1_fxs_io.hot (or pdk_sw_e1_fxs_io.arm.hot for DMT160TEC boards)	pdk_sw_e1_fxs_io.psi
Country Dependent Parameters	pdk_sw_e1_ac4400_io.cdp	pdk_sw_e1_ac4400_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_sw_e1_ac4400_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

After a call is transferred with **gc_SetUpTransfer( )**, you cannot issue a **gc_DropCall( )** on the original call. You must drop the consultation call before the original call can be dropped. The behavior of the protocol is undefined if you try to drop the original call without dropping the consultation call first.

4.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_e1_ac4400_io.cdp* file are:

- CDP_BlindXferTime
- CDP_BlockOnLOOS
- CDP_ConnectOnNoDialTone (Outbound)
- CDP_ConnectOnNoRingBack (Outbound)
- CDP_DelayInDialling (Outbound)
- CDP_DialToneWaitTime (Outbound)
- CDP_MinPBXHangupTime (Inbound)
- CDP_PBXDiscEnabled
- CDP_ProtocolStopsOffhook
- CDP_ReconnectDelay
- CDP_WaitDialToneEnabled (Outbound)

CDP_BlindXferTime

Description: After sending the address digits on a BlindTransfer request, the protocol waits for the time specified by this parameter before sending CAS_ONHOOK and switching back to IDLE state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_BlockOnLOOS

Description: Allows the protocol to send out CAS_OFFHOOK to block the line whenever a channel is set out-of-service (by the application calling the **gc_SetChanState( )** function).

Note: The ability to block the line is not supported on all switches, so this parameter is disabled by default.

Values:

- 0 [default]: Do not send CAS_OFFHOOK when a channel is set out-of-service.
- 1: Send CAS_OFFHOOK when a channel is set out-of-service.

CDP_ConnectOnNoDialTone (Outbound)

Description: Determines how the protocol should proceed when dial tone is not detected. If the parameter is enabled (set to 1), and no dial tone is detected, a local collision with an inbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0: Do not assume local collision and disconnect the call if no dial tone is detected.
- 1 [default]: Assume local collision and connect the perceived inbound call if no dial tone is detected.

CDP_ConnectOnNoRingBack (Outbound)

Description: Determines how the protocol should proceed when no ringback tone is detected. If the parameter is enabled (set to 1), and no ringback is detected, a remote collision with a remote outbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0: Do not assume remote collision and disconnect the call if no ringback is detected.
- 1 [default]: Assume remote collision and connect the call if no ringback is detected.

CDP_DelayInDialling (Outbound)

Description: Specifies the delay time in dialing when the parameter **CDP_WaitDialToneEnabled** is not enabled.

Values: Default is 40.

CDP_DialToneWaitTime (Outbound)

Description: Defines the time that the protocol waits for a dial tone before an outbound call can be made.

Values: Time in milliseconds. Default is 10000 (10 seconds).

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1. If the time defined by this parameter is exceeded before dial tone is detected, the action taken depends on the value of the **CDP_ConnectOnNoDialTone** parameter as follows:

- If the **CDP_ConnectOnNoDialTone** parameter is set to 1, a local collision is assumed and the incoming call is connected.
- If the **CDP_ConnectOnNoDialTone** parameter is set to 0, the call attempt fails and a disconnect event is forwarded with a reason of no dial tone.

CDP_MinPBXHangupTime (Inbound)

Description: Specifies the length of the ring cycle and is used to determine if the remote end (that is, the PBX) has dropped an incoming call. The timer is reset at the start of each ring cycle. If the timer expires without resetting, ringing has been acknowledged to stop indicating the PBX has dropped the call, as the caller has abandoned the call before it was answered.

Values: Time in milliseconds. Default is 5000 (5 seconds).

Guidelines: The value of this parameter is typically set to 6 seconds, which corresponds to the complete ring cycle (2 seconds on and 4 seconds of silence).

CDP_PBXDiscEnabled

Description: Determines if the remote PBX can initiate call disconnection via CAS line signaling.

Values:

- 0: Disable call disconnect supervision, since it is not supported by the PBX.
- 1 [default]: Enable call disconnect supervision provided by the PBX.

CDP_ProtocolStopsOffhook

Description: Determines the state of the hook switch signaling (on-hook or off-hook) when the protocol stops after **gc_Close( )**.

Note: This parameter has no effect on DM3 boards, because the protocol is not stopped until the board is stopped.

Values:

- 0 [default]: Set the hook switch state to on-hook.
- 1: Set the hook switch state to off-hook.

CDP_ReconnectDelay

Description: Specifies the intentional delay before the primary call is back to the connected state after the consultation call is released.

Values: Time in milliseconds. Default is 0.

Guidelines: A 2-second delay is recommended for some switches.

CDP_WaitDialToneEnabled (Outbound)

Description: Determines if the protocol should wait for a dial tone before dialing. Note that this parameter does **not** apply to supervised transfers (consultation calls), in which case the dial tone is not verified.

Values:

- 0 [default]: Do not wait for dial tone before dialing.
- 1: Have the FXS wait for dial tone before dialing.

Alcatel VPS 4x00 Lineside Bidirectional Protocol Parameter Configuration

5

This chapter discusses the capabilities and parameters of the Alcatel VPS 4x00 Lineside Bidirectional protocol in the following topics:

5.1 General Protocol Information

Protocol File Set

The files used with the Alcatel VPS 4x00 Lineside protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_sw_vps_4x00_io.qs and pdk_sw_vps_4x00_io.hot (or pdk_sw_vps_4x00_io.arm.hot for DMT160TEC boards)	pdk_sw_vps_4x00_io.psi
Country Dependent Parameters	pdk_sw_vps_4x00_io.cdp	pdk_sw_vps_4x00_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_sw_vps_4x00_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

None.

5.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_vps_4x00_io.cdp* file are:

- CDP_BlindXferTime
- CDP_BlockOnLOOS
- CDP_MinPBXHangupTime (Inbound)
- CDP_OnhookTime (Outbound)
- CDP_PBXDiscEnabled
- CDP_PreDialingWaitMode
- CDP_PreDialingWaitTime
- CDP_ProtocolStartsOnHook
- CDP_ProtocolStopsOffhook

CDP_BlindXferTime

Description: After sending the address digits on a BlindTransfer request, the protocol waits for the time specified by this parameter before sending CAS_ONHOOK and switching back to IDLE state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_BlockOnLOOS

Description: Allows the protocol to send out CAS_OFFHOOK to block the line whenever a channel is set out-of-service (by the application calling the **gc_SetChanState( )** function).

Note: The ability to block the line is not supported on all switches, so this parameter is disabled by default.

Values:

- 0 [default]: Do not send CAS_OFFHOOK when a channel is set out-of-service.
- 1: Send CAS_OFFHOOK when a channel is set out-of-service.

CDP_MinPBXHangupTime (Inbound)

Description: Specifies the length of the ring cycle and is used to determine if the remote end (that is, the PBX) has dropped an incoming call. The timer is reset at the start of each ring cycle. If the timer expires without resetting, ringing has been acknowledged to stop indicating the PBX has dropped the call, as the caller has abandoned the call before it was answered.

Values: Time in milliseconds. Default is 5000 (5 seconds).

Guidelines: The value of this parameter is typically set to 6 seconds, which corresponds to the complete ring cycle (2 seconds on and 4 seconds of silence).

CDP_OnhookTime (Outbound)

Description: If FXS is outbound only and starts in the off-hook state, it remains in the off-hook state until it receives a MakeCall. This parameter specifies the time during which FXS should remain on-hook before processing the MakeCall.

Values: Time in milliseconds. Default is 500 (0.5 seconds).

CDP_PBXDiscEnabled

Description: Determines if the remote PBX can initiate call disconnection via CAS line signaling.

Values:

- 0: Disable call disconnect supervision, since it is not supported by the PBX.
- 1 [default]: Enable call disconnect supervision provided by the PBX.

CDP_PreDialingWaitMode

Description: Specifies the behavior of the FXS prior to dialing.

Values:

- 0: Wait for **CDP_PreDialingWaitTime** specified timer.
- 1 [default]: Wait for start dialing DTMF code from PBX.

CDP_PreDialingWaitTime

Description: If **CDP_PreDialingWaitMode** is set to 0, the FXS will wait this specified time prior to dialing.

Values: Time in milliseconds. Default is 500 (0.5 seconds).

CDP_ProtocolStartsOnHook

Description: Specifies the signal sent on the line in following two conditions:

- When the protocol starts in the in-service outbound channel state
- When alarm is released and channel state requested is in-service outbound

Values:

- 0: Send CAS_OFFHOOK signal on the line.
- 1 [default]: Send CAS_ONHOOK signal on the line.

CDP_ProtocolStopsOffhook

Description: Determines the state of the hook switch signaling (on-hook or off-hook) when the protocol stops after **gc_Close( )**.

Note: This parameter has no effect on DM3 boards, because the protocol is not stopped until the board is stopped.

Values:

- 0 [default]: Set the hook switch state to on-hook.
- 1: Set the hook switch state to off-hook.

Argentina R2 Bidirectional Protocol Parameter Configuration 6

This chapter discusses the capabilities and parameters of the Argentina R2 Bidirectional protocol in the following topics:

6.1 General Protocol Information

Protocol File Set

The files used with the Argentina R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_ar_r2_io.cdp	pdk_ar_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_ar_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

6.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_ar_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Coin box or subscriber with charge metering
- 5: Telephone operator
- 6: Data transmission
- 11: C. P. T. P.
- 12: Special line
- 13: Mobile user
- 14: Virtual private network line
- 15: Special line

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the

result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.

- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Chargeable (B-6)
- 7: Not chargeable (B-7)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/
```

```
/*
-----------------------------
Metering AS pulsed clear-back
-----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0 [default]: GCEV_ALERTING is sent after receiving a ringback tone.
- 1: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

6.3 Tone and Tone Mask Parameters

Table 5 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 5. Tone and Tone Mask Parameters for Argentina R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'5'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'9'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	
CDP_GrpA_SendANIAvailability	10	'5'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'A'	Restart sending DNIS digits.

Table 5. Tone and Tone Mask Parameters for Argentina R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_SIT	15	'2'	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'8'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'0'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'7'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	As per specifications the digit I-15 (end of dialing) represents the end of dialing so this parameter is set to 32768 decimal (8000 Hex).
CDP_Grp1_RecvErrMask1	52	30721	As per specifications I-0, I-11 to I-14 are treated as errors so the value of this parameter is 30721 decimal (7801 Hex).
CDP_Grp1_TermToneMask2	53	36864	I-15 (end of Dialing) or I-12 (the requested information is not available) can terminate the compelled cycle, value is 36864 decimal (9000 Hex).
CDP_Grp1_RecvErrMask2	54	24577	As per specifications I-0, I-13 and I-14 are treated as errors so the value of this parameter is 24577 decimal (6001 Hex).
CDP_Grp1_TermToneMask3	55	01026	As per specs I-1 or I-10 can terminate the compelled signaling cycle so the value of this parameter is 1026 decimal (0402 Hex).
CDP_Grp1_RecvErrMask3	56	64509	Any tone other than I-0, I-10 is treated as error so the value of this parameter is 64509 decimal (FBFD Hex).
CDP_Grp2_TermToneMask	57	63614	As per specifications the tones II-1 to II-6 and II-11 to II-15 are valid category tones so the value is 63614 decimal (F87E Hex).
CDP_Grp2_RecvErrMask	58	01921	As per specifications II-0, II-7 to II-10 are treated as errors so the value of this parameter is 1921 decimal (0781 Hex).

Table 5. Tone and Tone Mask Parameters for Argentina R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_TermToneMask1	59	00042	As per specifications, A-1, A-3, A-5, and A-9 can terminate the compelled signaling cycles of sending DNIS digits. So the value is 42 decimal (002A Hex).
CDP_GrpA_TermToneMask2	60	00042	After Outgoing register shall send category digit, this compelled signaling sequence can be terminated either by A-5, in which case the incoming register would be requesting the calling party's number (ANI digits), or it may ask for the remaining DNIS digits by sending A-1 tone, or it can ask the category and change the meaning of next tones to groupB by sending A-3. So this parameter will be set to 42 decimal (002A Hex).
CDP_GrpA_TermToneMask3	61	00010	As per specifications, A-1, A-3 can terminate the compelled signaling cycles of sending ANI digits. This parameter will be set to 10 decimal (000A Hex).
CDP_GrpA_TermToneMask4	62	00010	
CDP_GrpA_RecvErrMask1	63	63505	Tones A-1 to A-3 and A-5 to A-10 are considered OK. Any tone other than this will be error (see Specs). So this parameter will be equal to 63505 decimal (F811 Hex).
CDP_GrpA_RecvErrMask2	64	65493	Any tone other than A-1, A-3, or A-5 will be treated as error. Only A-1, A-3, or A-5 is expected. Any other tone will be an error. So this parameter is set as 65493 decimal (FFD5 Hex).
CDP_GrpA_RecvErrMask3	65	65493	
CDP_GrpA_RecvErrMask4	66	65495	Any tone other than A-3 or A-5 will indicate an error. So this parameter is set as 65495 decimal (FFD7 Hex).
CDP_GrpA_RecvErrMask5	67	65493	Any tone other than A-1, A-3, or A-5 will indicate an error. So this parameter is set as 65493 decimal (FFD5 Hex).
CDP_GrpB_TermToneMask	68	00508	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: B-2 (Send << number changed >> recorded announcement) B-3 (Subscriber's Line Busy) B-4 (Congestion) B-5 (Unallocated National Number) B-6 (Subscriber's Line Free, Charge) B-7 (Subscriber's Line Free, No Charge) B-8 (Subscriber's Line Out of Service) So this parameter will be set to 508 decimal (01FC Hex).

Table 5. Tone and Tone Mask Parameters for Argentina R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_CallAnsweredTermToneMask	69	00192	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-6 or B-7 (Line Free Charge/NoCharge)
CDP_GrpB_RecvErrMask	70	65027	Any tone out of B-0, B-1, B-9 to B-15 shall be considered as error. So this parameter is set as 65027 decimal (FE03 Hex).

Australia R2 Bidirectional Protocol Parameter Configuration

7

This chapter discusses the capabilities and parameters of the Australia R2 Bidirectional protocol in the following topics:

7.1 General Protocol Information

Protocol File Set

The files used with the Australia R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_au_r2_io.cdp	pdk_au_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_au_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

7.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_au_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0 [default]: Disable the reception of ANI digits.
- 1: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Operator
- 2: Customer or pay phone (partial or no CLI)
- 4: Transmission test position
- 5: Public pay phone with CLI
- 6: Telex CUG
- 7: International customer
- 8: International operator
- 9: Customer with CLI
- 10: Non-public pay phone with CLI

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1 [default]: Chargeable (B-1)
- 5: Not chargeable (B-5)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/

/*
----------------------------
Metering AS pulsed clear-back
----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0 [default]: GCEV_ALERTING is sent after receiving a ringback tone.
- 1: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

7.3 Tone and Tone Mask Parameters

Table 6 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 6. Tone and Tone Mask Parameters for Australia R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit. (No distinction for DNIS/ANI digit.)
CDP_GrpA_SendANI	02	'1'	Group A backward signal requesting next ANI digit. (No distinction for DNIS/ANI digit.)
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'A'	These tones are sent to forward register in case of error during exchange of tones. No explicit mention of General Error Signal in Grp A and B. Mapped the Previous Digit Signal A-10 for GrpA-SendOnErr.
CDP_GrpB_SendOnErr	05	'8'	
CDP_GrpA_SendCat	06	'1'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'3'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (No such Group A tone clear from AUSTEL specs.)
CDP_GrpA_SendANIWithAC	08	'1'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number". (Mapped to Next Digit Request as there is no mention of such request asking with Area Code and Trunk Number.)

Table 6. Tone and Tone Mask Parameters for Australia R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_A_10	09	'0'	Not used for Australia protocol.
CDP_GrpA_SendANIAvailability	10	'0'	Not used for Australia protocol.
CDP_GrpA_N_1	11	'0'	Send N-1 tone. (Not used for Australia protocol.)
CDP_GrpA_N_2	12	'0'	Send N-2 tone. (Not used for Australia protocol.)
CDP_GrpA_N_3	13	'0'	Send N-3 tone. (Not used for Australia protocol.)
CDP_GrpA_Restart	14	'2'	Restart sending DNIS digits.
CDP_GrpB_SIT	15	'0'	
CDP_GrpB_UserBusy	16	'2'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'0'	
CDP_GrpB_Rejected	19	'0'	
CDP_GrpB_NormalClearing	20	'3'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'6'	
CDP_GrpB_linefree_charge	22	'1'	
CDP_GrpB_linefree_nocharge	23	'5'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	As per specification I-15 ("F") would come appended signifying end of dialing. So this parameter is set to 0x8000, i.e., 32768.
CDP_Grp1_RecvErrMask1	52	30721	I-0 and I-11 to I-14 are treated as error. So the value of this parameter is 0x7801, i.e., 30721.
CDP_Grp1_TermToneMask2	53	36864	I-15 (end of dialing) or I-12 (requested info not available) is valid terminating tone. So the value of this parameter is 0x9000, i.e., 36864.
CDP_Grp1_RecvErrMask2	54	26625	As per specs I-0, I-11, I-13, and I-14 are treated error.So value of this parameter is 0x6801, i.e., 26625.
CDP_Grp1_TermToneMask3	55	32768	

Table 6. Tone and Tone Mask Parameters for Australia R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp1_RecvErrMask3	56	26625	As per specs, I-0, I-11, I-13, and I-14 are treated errors, so the value of this parameter is 0x6801, i.e., 26625.
CDP_Grp2_TermToneMask	57	63478	II-1, II-2, II-4 to II-15 are valid signals, so the value of this parameter is 0xF7F6, i.e., 63478.
CDP_Grp2_RecvErrMask	58	00009	As per specs II-0 and II-3 are invalid tones so the value of this parameter is 0x0009, i.e., 00009.
CDP_GrpA_TermToneMask1	59	00010	As per specs A-1 and A-3 can terminate the DNIS compelled signaling, so this parameter value is 0x000A, i.e., 00010.
CDP_GrpA_TermToneMask2	60	01038	For category there is no group A tone to terminate the signaling, but A-1 could mean this. 0x040E, i.e., 1038.
CDP_GrpA_TermToneMask3	61	01038	A-1, A-3 can terminate the ANI compelled signaling.
CDP_GrpA_TermToneMask4	62	01038	
CDP_GrpA_RecvErrMask1	63	64497	Tones other than A-1, A-2, A-3, and A-10 are error tones. 0xFBF1, i.e,. 64497.
CDP_GrpA_RecvErrMask2	64	64497	Tones other than A-1, A-2, A-3, and A-10 are error tones. 0xFBF1, i.e., 64497.
CDP_GrpA_RecvErrMask3	65	64497	Tones other than A-1, A-2, A-3, and A-10 are error tones. 0xFBF1, i.e,. 64497.
CDP_GrpA_RecvErrMask4	66	64497	Tones other than A-1, A-2, A-3, and A-10 are error tones. 0xFBF1, i.e., 64497.
CDP_GrpA_RecvErrMask5	67	64497	Tones other than A-1, A-2, A-3, and A-10 are error tones. 0xFBF1, i.e., 64497.
CDP_GrpB_TermToneMask	68	00254	Valid B-series tones are B-1 to B-7. So the parameter value is 0x00FE, i.e., 254.
CDP_GrpB_CallAnsweredTermToneMask	69	00706	Line Free Charge/No Charge are B-1, B-5, or B-7. So the parameter value is 0x02C2, i.e., 00706.
CDP_GrpB_RecvErrMask	70	65281	Tones B-0 and B-8 to B-15 are invalid tones. 0xFF01, i.e., 65281.

Belgium Lineside Bidirectional Protocol Parameter Configuration 8

This chapter discusses the capabilities and parameters of the Belgium Lineside Bidirectional protocol in the following topics:

8.1 General Protocol Information

Protocol File Set

The files used with the Belgium Lineside protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_be_ls_io.cdp	pdk_be_ls_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_be_ls_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

8.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_be_ls_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0 [default]: Disable the reception of ANI digits.
- 1: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Coin box
- 5: National operator
- 6: Data transmission
- 7: International subscriber without priority
- 8: International data transmission
- 9: International subscriber with priority
- 10: International forward transfer

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1 [default]: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0: The protocol exchanges address information using R2MF tones.
- 1 [default]: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1: Subscriber line free, charge, called party release control
- 6: Subscriber line free, charge
- 7 [default]: Subscriber line free, no charge

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0 [default]: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/

/*
----------------------------
Metering AS pulsed clear-back
----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0 [default]: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )**, indicating the end of information.
- 1: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will cause 'f' to be sent to the remote end, indicating that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0 [default]: GCEV_ALERTING is sent after receiving a ringback tone.
- 1: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1 [default]: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

8.3 Tone and Tone Mask Parameters

Table 7 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 7. Tone and Tone Mask Parameters for Belgium Lineside Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'9'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'9'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'5'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	
CDP_GrpA_SendANIAvailability	10	'5'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.

Table 7. Tone and Tone Mask Parameters for Belgium Lineside Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'A'	Restart sending DNIS digits.
CDP_GrpB_SIT	15	'4'	After any one of B-1 and B-6 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'4'	
CDP_GrpB_Rejected	19	'4'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'1'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'7'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	As per specifications the digit I-15 (end of dialing) represents the end of dialing so this parameter is set to 32768 decimal (8000 Hex).
CDP_Grp1_RecvErrMask1	52	18433	As per specifications I-0, I-11, and I-14 are treated as errors so the value of this parameter is 18433 decimal (4801 Hex).
CDP_Grp1_TermToneMask2	53	36864	I-15 (end of Dialing) or I-12 (the requested information is not available) can terminate the compelled cycle, value is 36864 decimal (9000 Hex).
CDP_Grp1_RecvErrMask2	54	18433	As per specifications I-0, I-11, and I-14 are treated as errors so the value of this parameter is 18433 decimal (4801 Hex).
CDP_Grp1_TermToneMask3	55	36864	As per specs I-12 or I-15 can terminate the compelled signaling cycle so the value of this parameter is 36864 decimal (9000 Hex).
CDP_Grp1_RecvErrMask3	56	28671	Any tone other than I-12, I-15 is treated as error so the value of this parameter is 28671 decimal (6FFF Hex).
CDP_Grp2_TermToneMask	57	02406	As per specifications the tones II-1 to II-10 are valid category tones so the value is 2046 decimal (7FE Hex).

Table 7. Tone and Tone Mask Parameters for Belgium Lineside Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp2_RecvErrMask	58	63489	As per specifications II-0, II-11 to II-15 are treated as errors so the value of this parameter is 63489 decimal (F801 Hex).
CDP_GrpA_TermToneMask1	59	00618	As per specifications, A-1, A-3, A-5, A-6, and A-9 can terminate the compelled signaling cycles of sending DNIS digits. So the value is 618 decimal (026A Hex).
CDP_GrpA_TermToneMask2	60	00618	After Outgoing register shall send category digit, this compelled signaling sequence can be terminated either by A-9, in which case the incoming register would be requesting the calling party's number (ANI digits), or it may ask for the remaining DNIS digits by sending A-1 tone, or it can ask the category and change the meaning of next tones to groupB by sending A-3 or A-6. So this parameter will be set to 618 decimal (026A Hex).
CDP_GrpA_TermToneMask3	61	00618	As per specifications, A-1, A-3, A-5, A-6, or A-9 can terminate the compelled signaling cycles of sending ANI digits. This parameter will be set to 618 decimal (026A Hex).
CDP_GrpA_TermToneMask4	62	00618	As per specifications, A-1, A-3, A-5, A-6, or A-9 can terminate the compelled signaling cycles of asking ANI availability and sending request denied signals. This parameter will be set to 618 decimal (026A Hex).
CDP_GrpA_RecvErrMask1	63	64529	Tones A-1 to A-3 and A-5 to A-9 are considered OK. Any tone other than this will be error (see Specs). So this parameter will be equal to 64529 decimal (FC11 Hex).
CDP_GrpA_RecvErrMask2	64	64529	
CDP_GrpA_RecvErrMask3	65	64529	
CDP_GrpA_RecvErrMask4	66	64529	
CDP_GrpA_RecvErrMask5	67	64529	

Table 7. Tone and Tone Mask Parameters for Belgium Lineside Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_TermToneMask	68	00218	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: CDP_GrpB_SIT = '4' (number changed) CDP_GrpB_UserBusy = '3' (line engaged) CDP_GrpB_NetworkCongestion = '4' (congestion) CDP_GrpB_UnAssignedNumber = '4' (number indistinct) CDP_GrpB_Rejected = '4' (jamming) CDP_GrpB_NormalClearing = '4' CDP_GrpB_linefree_charge_ClearingFromInboundOnly = '1' (call clearing under called subscriber) CDP_GrpB_linefree_charge = '6' (line free charge) CDP_GrpB_linefree_nocharge = '7' So this parameter will be set to 218 decimal (00DA Hex.).
CDP_GrpB_CallAnsweredTermToneMask	69	00194	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-1, B-6, or B-7 (Line Free Charge/NoCharge/Charge and call clearing is under the control of called subscriber)
CDP_GrpB_RecvErrMask	70	65317	Any tone out of B-0, B-2, B-5, B-8 to B-15 shall be considered as error. So this parameter is set as 65317 decimal (FF25 Hex).

Belgium Network Bidirectional Protocol Parameter Configuration 9

This chapter discusses the capabilities and parameters of the Belgium Network Bidirectional protocol in the following topics:

9.1 General Protocol Information

Protocol File Set

The files used with the Belgium Network protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_be_co_io.cdp	pdk_be_co_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_be_co_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

9.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_be_co_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0 [default]: Disable the reception of ANI digits.
- 1: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Coin box
- 5: National operator
- 6: Data transmission
- 7: International subscriber without priority
- 8: International data transmission
- 9: International subscriber with priority
- 10: International forward transfer

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1 [default]: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0: The protocol exchanges address information using R2MF tones.
- 1 [default]: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1: Subscriber line free, charge, called party release control
- 6: Subscriber line free, charge
- 7 [default]: Subscriber line free, no charge

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0 [default]: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/

/*
----------------------------
Metering AS pulsed clear-back
----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0 [default]: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )**, indicating the end of information.
- 1: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will cause 'f' to be sent to the remote end, indicating that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0 [default]: GCEV_ALERTING is sent after receiving a ringback tone.
- 1: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1 [default]: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

9.3 Tone and Tone Mask Parameters

Table 8 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 8. Tone and Tone Mask Parameters for Belgium Network Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'9'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'9'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'5'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	
CDP_GrpA_SendANIAvailability	10	'5'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.

Table 8. Tone and Tone Mask Parameters for Belgium Network Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'A'	Restart sending DNIS digits.
CDP_GrpB_SIT	15	'4'	After any one of B-1 and B-6 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'4'	
CDP_GrpB_Rejected	19	'4'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'1'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'7'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	As per specifications the digit I-15 (end of dialing) represents the end of dialing so this parameter is set to 32768 decimal (8000 Hex).
CDP_Grp1_RecvErrMask1	52	18433	As per specifications I-0, I-11, and I-14 are treated as errors so the value of this parameter is 18433 decimal (4801 Hex).
CDP_Grp1_TermToneMask2	53	36864	I-15 (end of Dialing) or I-12 (the requested information is not available) can terminate the compelled cycle, value is 36864 decimal (9000 Hex).
CDP_Grp1_RecvErrMask2	54	18433	As per specifications I-0, I-11, and I-14 are treated as errors so the value of this parameter is 18433 decimal (4801 Hex).
CDP_Grp1_TermToneMask3	55	36864	As per specs I-12 or I-15 can terminate the compelled signaling cycle so the value of this parameter is 36864 decimal (9000 Hex).
CDP_Grp1_RecvErrMask3	56	28671	Any tone other than I-12, I-15 is treated as error so the value of this parameter is 28671 decimal (6FFF Hex).
CDP_Grp2_TermToneMask	57	02406	As per specifications the tones II-1 to II-10 are valid category tones so the value is 2046 decimal (7FE Hex).

Table 8. Tone and Tone Mask Parameters for Belgium Network Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp2_RecvErrMask	58	63489	As per specifications II-0, II-11 to II-15 are treated as errors so the value of this parameter is 63489 decimal (F801 Hex).
CDP_GrpA_TermToneMask1	59	00618	As per specifications, A-1, A-3, A-5, A-6, and A-9 can terminate the compelled signaling cycles of sending DNIS digits. So the value is 618 decimal (026A Hex).
CDP_GrpA_TermToneMask2	60	00618	After Outgoing register shall send category digit, this compelled signaling sequence can be terminated either by A-9, in which case the incoming register would be requesting the calling party's number (ANI digits), or it may ask for the remaining DNIS digits by sending A-1 tone, or it can ask the category and change the meaning of next tones to groupB by sending A-3 or A-6. So this parameter will be set to 618 decimal (026A Hex).
CDP_GrpA_TermToneMask3	61	00618	As per specifications, A-1, A-3, A-5, A-6, or A-9 can terminate the compelled signaling cycles of sending ANI digits. This parameter will be set to 618 decimal (026A Hex).
CDP_GrpA_TermToneMask4	62	00618	As per specifications, A-1, A-3, A-5, A-6, or A-9 can terminate the compelled signaling cycles of asking ANI availability and sending request denied signals. This parameter will be set to 618 decimal (026A Hex).
CDP_GrpA_RecvErrMask1	63	64529	Tones A-1 to A-3 and A-5 to A-9 are considered OK. Any tone other than this will be error (see Specs). So this parameter will be equal to 64529 decimal (FC11 Hex).
CDP_GrpA_RecvErrMask2	64	64529	
CDP_GrpA_RecvErrMask3	65	64529	
CDP_GrpA_RecvErrMask4	66	64529	
CDP_GrpA_RecvErrMask5	67	64529	

Table 8. Tone and Tone Mask Parameters for Belgium Network Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_TermToneMask	68	00218	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: CDP_GrpB_SIT = '4' (number changed) CDP_GrpB_UserBusy = '3' (line engaged) CDP_GrpB_NetworkCongestion = '4' (congestion) CDP_GrpB_UnAssignedNumber = '4' (number indistinct) CDP_GrpB_Rejected = '4' (jamming) CDP_GrpB_NormalClearing = '4' CDP_GrpB_linefree_charge_ClearingFromInboundOnly = '1' (call clearing under called subscriber) CDP_GrpB_linefree_charge = '6' (line free charge) CDP_GrpB_linefree_nocharge = '7' So this parameter will be set to 218 decimal (00DA Hex.).
CDP_GrpB_CallAnsweredTermToneMask	69	00194	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-1, B-6, or B-7 (Line Free Charge/NoCharge/Charge and call clearing is under the control of called subscriber)
CDP_GrpB_RecvErrMask	70	65317	Any tone out of B-0, B-2, B-5, B-8 to B-15 shall be considered as error. So this parameter is set as 65317 decimal (FF25 Hex).

Brazil R2 Bidirectional Protocol Parameter Configuration 10

This chapter discusses the capabilities and parameters of the Brazil R2 Bidirectional protocol in the following topics:

10.1 General Protocol Information

Protocol File Set

The files used with the Brazil R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_br_r2_io.cdp	pdk_br_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_br_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

10.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_br_r2_io.cdp* file are:

- CAS_PULSE_DOUBLE_ANSWER (Inbound)
- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_DOUBLE_ANSWER_FLAG (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REANSWER_TIMEOUT (Outbound)
- CDP_RECV_CALL_EVENT_SENT_WITH_FIRST_ANSWER (Inbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)

- CDP_TrunkPrefixNumber

CAS_PULSE_DOUBLE_ANSWER (Inbound)

Description: Specifies the double answer signal. When answering a call, the double answer signal is sent to the CO to block collect calls. This parameter is valid is only if **CDP_DOUBLE_ANSWER_FLAG** is set to 1.

Values: Default is 0101, 1101, 0, 0, 0, 0, 1800, 2000, 2200.

Guidelines: The default double answer signal comprises the following:

- An initial answer signal with signaling bits AB = 01 for 1000 msec (signaling bits ABCD = 0101).
- A backward clear signal (signaling bits AB = 11) for 2000 msec (signaling bits ABCD = 1101).
- A return to answer state with signaling bits AB = 01 (signaling bits ABCD = 0101).

The eighth argument of this parameter is the time between the two answers. The seventh and ninth arguments should be set to approximately 90% and 110%, respectively, of argument number 8.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: General subscriber
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Local public telephone
- 5: Telephone operator
- 6: Equipment of data transmission
- 7: Intercity public telephone
- 11: Subscriber with transference facility

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the

cdp_CATInsertType parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_DOUBLE_ANSWER_FLAG (Inbound)

Description: Specifies whether to enable the double answer feature that is used to block collect calls.

Values:

- 0 [default]: Disable double answer feature.
- 1: Enable double answer feature.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the

description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1 [default]: Chargeable (B-1)
- 5: Not chargeable (B-5)
- 6: Chargeable, but the clearing of the call is under called party control

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)

- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/

/*
----------------------------
Metering AS pulsed clear-back
----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0: ANI collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 2]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REANSWER_TIMEOUT (Outbound)

Description: Defines the amount of time the protocol should wait before sending a DISCONNECTED event to the application. This prevents the outbound side from getting disconnected when a double answer signal is received from the remote end in the connected

state. For information about the double answer signal, see the **CAS_PULSE_DOUBLE_ANSWER** parameter.

Values:

- 0 [default]: Do not wait to report a DISCONNECTED event to the application when a remote DISCONNECT signal (CAS_CLEARBWD) line signal is received.
- Non-zero: Wait for the specified amount of time when receiving a DISCONNECT signal (CAS_CLEARBWD) before sending the DISCONNECTED event to the application. In the Connected state, receiving a DISCONNECT signal (CAS_CLEARBWD) from the remote end does not cause a transition to the Disconnected state immediately. If, during this period, the Answer (CAS_ANSWER) signal is received, no DISCONNECTED event is reported to the application and the protocol remains in the Connected state only.

Guidelines: A typical value should be slightly more than 2000 milliseconds, for example, 2500 milliseconds.

CDP_RECV_CALL_EVENT_SENT_WITH_FIRST_ANSWER (Inbound)

Description: Specifies if the call state is changed to CONNECTED after first or second answer. This parameter is valid only if **CDP_DOUBLE_ANSWER_FLAG** is set to 1.

Values:

- 0: Change the call state to the CONNECTED state after the second answer.
- 1 [default]: Change the call state to the CONNECTED state after the first answer.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

10.3 Tone and Tone Mask Parameters

Table 9 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 9. Tone and Tone Mask Parameters for Brazil R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'9'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'9'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'5'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	
CDP_GrpA_SendANIAvailability	10	'5'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'A'	Restart sending DNIS digits.

Table 9. Tone and Tone Mask Parameters for Brazil R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_SIT	15	'4'	After any one of B-1 and B-6 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'4'	
CDP_GrpB_Rejected	19	'4'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'1'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'7'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	As per specifications the digit I-15 (end of dialing) represents the end of dialing so this parameter is set to 32768 decimal (8000 Hex).
CDP_Grp1_RecvErrMask1	52	18433	As per specifications I-0, I-11, and I-14 are treated as errors so the value of this parameter is 18433 decimal (4801 Hex).
CDP_Grp1_TermToneMask2	53	36864	I-15 (end of Dialing) or I-12 (the requested information is not available) can terminate the compelled cycle, value is 36864 decimal (9000 Hex).
CDP_Grp1_RecvErrMask2	54	18433	As per specifications I-0, I-11 and I-14 are treated as errors so the value of this parameter is 18433 decimal (4801 Hex).
CDP_Grp1_TermToneMask3	55	36864	As per specs I-12 or I-15 can terminate the compelled signaling cycle so the value of this parameter is 36864 decimal (9000 Hex).
CDP_Grp1_RecvErrMask3	56	28671	Any tone other than I-12, I-15 is treated as error so the value of this parameter is 28671 decimal (6FFF Hex).
CDP_Grp2_TermToneMask	57	02406	As per specifications the tones II-1 to II-10 are valid category tones so the value is 2406 decimal (7FE Hex).
CDP_Grp2_RecvErrMask	58	63489	As per specifications II-0, II-11 to II-15 are treated as errors so the value of this parameter is 63489 decimal (F801 Hex).

Table 9. Tone and Tone Mask Parameters for Brazil R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_TermToneMask1	59	00618	As per specifications, A-1, A-3, A-5, A-6, and A-9 can terminate the compelled signaling cycles of sending DNIS digits. So the value is 618 decimal (0026A Hex).
CDP_GrpA_TermToneMask2	60	00618	
CDP_GrpA_TermToneMask3	61	00618	As per specifications, A-1, A-3, A-5, A-6, or A-9 can terminate the compelled signaling cycles of sending ANI digits.
CDP_GrpA_TermToneMask4	62	00618	As per specifications, A-1, A-3, A-5, A-6, or A-9 can terminate the compelled signaling cycles of asking ANI availability and sending request denied signals.
CDP_GrpA_RecvErrMask1	63	65429	Tones A-1 to A-3 and A-5 to A-9 are considered OK. Any tone other than this will be error (see Specs).
CDP_GrpA_RecvErrMask2	64	65429	
CDP_GrpA_RecvErrMask3	65	65429	
CDP_GrpA_RecvErrMask4	66	65429	
CDP_GrpA_RecvErrMask5	67	65429	
CDP_GrpB_TermToneMask	68	00218	
CDP_GrpB_CallAnsweredTermToneMask	69	00194	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-1, B-6, or B-7 (Line Free Charge/NoCharge/Charge and call clearing is under the control of called subscriber)
CDP_GrpB_RecvErrMask	70	65317	Any tone out of B-0, B-2, B-5, B-8 to B-15 shall be considered as error.

Bulgaria R2 Bidirectional Protocol Parameter Configuration 11

This chapter discusses the capabilities and parameters of the Bulgaria R2 Bidirectional protocol in the following topics:

11.1 General Protocol Information

Protocol File Set

The files used with the Bulgaria R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_bg_r2_io.cdp	pdk_bg_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_bg_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

11.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_bg_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 5: Telephone operator
- 6: Data subscriber
- 11: Subscriber with CNDB
- 12: VIS subscriber

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the

result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.

- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as “pulsed answer” and the first answer pulse should be treated as first metering pulse as well. (See the

description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Chargeable (B-6)
- 7: Not chargeable (B-7)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/

/*
----------------------------
Metering AS pulsed clear-back
----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

11.3 Tone and Tone Mask Parameters

Table 10 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 10. Tone and Tone Mask Parameters for Bulgaria R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'9'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.

Table 10. Tone and Tone Mask Parameters for Bulgaria R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'0'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	
CDP_GrpA_SendANIAvailability	10	'0'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'0'	Restart sending DNIS digits.
CDP_GrpB_SIT	15	'2'	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'8'	
CDP_GrpB_NormalClearing	20	'0'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'0'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'7'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	As per specifications the digit I-15 (end of dialing) represents the end of dialing so this parameter is set to 32768 decimal (8000 Hex).
CDP_Grp1_RecvErrMask1	52	30721	As per specifications I-0, I-11 to I-14 are treated as errors so the value of this parameter is 30721 decimal (7801 Hex).
CDP_Grp1_TermToneMask2	53	36864	I-15 (end of dialing) or I-12 (the requested information is not available) can terminate the compelled cycle, value is 36864 decimal (9000 Hex).

Table 10. Tone and Tone Mask Parameters for Bulgaria R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp1_RecvErrMask2	54	26625	As per specifications I-0, I-11, I-13 and I-14 are treated as errors so the value of this parameter is 26625 decimal (6801 Hex).
CDP_Grp1_TermToneMask3	55	01026	As per specs I-1 or I-10 can terminate the compelled signaling cycle so the value of this parameter is 1026 decimal (0402 Hex).
CDP_Grp1_RecvErrMask3	56	64509	Any tone other than I-0, I-10 is treated as error so the value of this parameter is 64509 decimal (FBFD Hex).
CDP_Grp2_TermToneMask	57	02302	As per specifications the tones II-1 to II-3, II-4, II-7, and II-11 are valid category tones so the value is 2302 decimal (8FE Hex).
CDP_Grp2_RecvErrMask	58	59281	As per specifications II-0, II-4, II-7 to II-10, and II-13 to II-15 are treated as errors so the value of this parameter is 59281 decimal (E791 Hex).
CDP_GrpA_TermToneMask1	59	01642	As per specifications, A-1, A-3, A-5, A-6, A-9, and A-10 can terminate the compelled signaling cycles of sending DNIS digits. So the value is 1642 decimal (066A Hex).
CDP_GrpA_TermToneMask2	60	01642	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by A-9, in which case the incoming register would be requesting the calling party's number (ANI digits), or it may ask for the remaining DNIS digits by sending A-1 tone, or it can ask the category and change the meaning of next tones to groupB by sending A-3 or by A-6 address complete change groupB signal. So this parameter will be set to 1642 decimal (066A Hex).
CDP_GrpA_TermToneMask3	61	00010	As per specifications, A-1, A-3 can terminate the compelled signaling cycles of sending ANI digits. This parameter will be set to 10 decimal (000A Hex).
CDP_GrpA_TermToneMask4	62	00010	
CDP_GrpA_RecvErrMask1	63	63505	Tones A-1 to A-3 and A-5 to A-10 are considered OK. Any tone other than this will be error (see Specs). So this parameter will be equal to 63505 decimal (F811 Hex).
CDP_GrpA_RecvErrMask2	64	63925	Any tone other than A-1, A-3, A-6, A-9, or A-10 will be treated as error. So this parameter is set as 63925 decimal (F9B5 Hex).
CDP_GrpA_RecvErrMask3	65	64981	Only A-1, A-3, A-5, or A-9 is expected. Any other tone will be an error. So this parameter is set as 64981 decimal (FDD5 Hex).

Table 10. Tone and Tone Mask Parameters for Bulgaria R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_RecvErrMask4	66	65495	Any tone other than A-3 or A-5 will indicate an error. So this parameter is set as 65495 decimal (FFD7 Hex).
CDP_GrpA_RecvErrMask5	67	65493	Any tone other than A-1, A-3, or A-5 will indicate an error. So this parameter is set as 65493 decimal (FFD5 Hex).
CDP_GrpB_TermToneMask	68	00508	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: CDP_GrpB_SIT = ‘2’ (called number changed) CDP_GrpB_UserBusy = '3' (subscriber line busy) CDP_GrpB_NetworkCongestion = '4' (congestion) CDP_GrpB_UnAssignedNumber = '5' (unassigned number) CDP_GrpB_Rejected = '8' (subscriber line out of order) CDP_GrpB_NormalClearing = '0' CDP_GrpB_linefree_charge_ClearingFromInboundOnly = '0' CDP_GrpB_linefree_charge = '6' (line free, charge) CDP_GrpB_linefree_nocharge = '7' (line free, do not charge) So this parameter will be set to 508 decimal (01FC Hex).
CDP_GrpB_CallAnsweredTermToneMask	69	00192	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-6 or B-7 (Line Free Charge/NoCharge)
CDP_GrpB_RecvErrMask	70	65027	Any tone out of B-0, B-1, B-9 to B-15 shall be considered as error. So this parameter is set as 65027 decimal (FE03 Hex).

CCITT R2 Asymmetric Bidirectional Protocol Parameter Configuration

12

This chapter discusses the capabilities and parameters of the CCITT R2 Asymmetric Bidirectional protocol in the following topics:

12.1 General Protocol Information

The CCITT R2 Asymmetric protocol supports asymmetric inbound and outbound CAS line signals. The seize, clear forward, answer, and clear backward signals can have different values for incoming and outgoing calls. These signals are identified as follows in the *pdk_ccitt_r2_asym_io.cdp* file:

- CAS_INBOUND_SEIZE, CAS_OUTBOUND_SEIZE
- CAS_INBOUND_CLEARFWD, CAS_OUTBOUND_CLEARFWD
- CAS_INBOUND_ANSWER, CAS_OUTBOUND_ANSWER
- CAS_INBOUND_CLEARBWD, CAS_OUTBOUND_CLEARBWD

Protocol File Set

The files used with the CCITT R2 Asymmetric protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_asym_io.qs and pdk_r2_asym_io.hot (or pdk_r2_asym_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_asym_io.psi
Country Dependent Parameters	pdk_ccitt_r2_asym_io.cdp	pdk_ccitt_r2_asym_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_ccitt_r2_asym_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

12.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_ccitt_r2_asym_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- CDP_ConnectType (Outbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: II-1, subscriber without priority
- 2: II-2, subscriber with priority
- 3: II-3, maintenance equipment
- 4: II-4, spare
- 5: II-5, operator
- 6: II-6, data transmission
- 7: II-7, subscriber (or operator without forward transfer facility)
- 8: II-8, data transmission
- 9: II-9, subscriber with priority
- A: II-10, operator with forward transfer facility

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_outbound_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_outbound_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_outbound_answer is received. If cas_outbound_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_outbound_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_outbound_answer or call analysis) is received. If cas_outbound_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_outbound_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_outbound_answer or call analysis) is received. If cas_outbound_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_outbound_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_outbound_answer is ignored. If cas_outbound_answer is received first, it is ignored.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Subscriber’s line free, charge
- 7: Subscriber’s line free, no charge

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 0.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

CCITT R2 Bidirectional Protocol Parameter Configuration 13

This chapter discusses the capabilities and parameters of the CCITT R2 Bidirectional protocol in the following topics:

13.1 General Protocol Information

Protocol File Set

The files used with the CCITT R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_ccitt_r2_io.cdp	pdk_ccitt_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_ccitt_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

13.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_ccitt_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: II-1, subscriber without priority
- 2: II-2, subscriber with priority
- 3: II-3, maintenance equipment
- 4: II-4, spare
- 5: II-5, operator
- 6: II-6, data transmission
- 7: II-7, subscriber (or operator without forward transfer facility)
- 8: II-8, data transmission
- 9: II-9, subscriber with priority
- A: II-10, operator with forward transfer facility

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the

result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.

- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Subscriber's line free, charge
- 7: Subscriber's line free, no charge

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/
```

```
/*
-----------------------------
Metering AS pulsed clear-back
-----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 0.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is “#*”

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

13.3 Tone and Tone Mask Parameters

Table 11 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 11. Tone and Tone Mask Parameters for CCITT R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'5'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'0'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'0'	
CDP_GrpA_SendANIAvailability	10	'0'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'A'	Restart sending DNIS digits.

Table 11. Tone and Tone Mask Parameters for CCITT R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_SIT	15	'2'	After Group B tone is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'4'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'0'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'7'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	fedc ba98 7654 3210 Binary: 1000 0000 0000 0000 Hex: 8000 Decimal: 32768
CDP_Grp1_RecvErrMask1	52	30720	fedc ba98 7654 3210 Binary: 0111 1000 0000 0000 Hex: 7800 Decimal: 30720
CDP_Grp1_TermToneMask2	53	32768	fedc ba98 7654 3210 Binary: 1000 0000 0000 0000 Hex: 8000 Decimal: 32768
CDP_Grp1_RecvErrMask2	54	30720	fedc ba98 7654 3210 Binary: 0111 1000 0000 0000 Hex: 7800 Decimal: 30720
CDP_Grp1_TermToneMask3	55	32768	fedc ba98 7654 3210 Binary: 1000 0000 0000 0000 Hex: 8000 Decimal: 32768
CDP_Grp1_RecvErrMask3	56	30720	fedc ba98 7654 3210 Binary: 0111 1000 0000 0000 Hex: 7800 Decimal: 30720

Table 11. Tone and Tone Mask Parameters for CCITT R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp2_TermToneMask	57	02030	fedc ba98 7654 3210 Binary: 0000 0111 1110 1110 Hex: 07EE Decimal: 2030
CDP_Grp2_RecvErrMask	58	63504	fedc ba98 7654 3210 Binary: 1111 1000 0001 0000 Hex: F810 Decimal: 63504
CDP_GrpA_TermToneMask1	59	00120	fedc ba98 7654 3210 Binary: 0000 0000 0111 1000 Hex: 0078 Decimal: 120
CDP_GrpA_TermToneMask2	60	00106	fedc ba98 7654 3210 Binary: 0000 0000 0110 1010 Hex: 006A Decimal: 106
CDP_GrpA_TermToneMask3	61	00090	fedc ba98 7654 3210 Binary: 0000 0000 0001 1010 Hex: 005A Decimal: 90
CDP_GrpA_TermToneMask4	62	00088	fedc ba98 7654 3210 Binary: 0000 0000 0100 1010 Hex: 0058 Decimal: 88
CDP_GrpA_RecvErrMask1	63	01536	fedc ba98 7654 3210 Binary: 0000 0110 0000 0000 Hex: 0600 Decimal: 1536
CDP_GrpA_RecvErrMask2	64	01940	fedc ba98 7654 3210 Binary: 0000 0111 1001 0100 Hex: 0794 Decimal: 1940
CDP_GrpA_RecvErrMask3	65	01924	fedc ba98 7654 3210 Binary: 0000 0111 1000 0100 Hex: 784 Decimal: 1924
CDP_GrpA_RecvErrMask4	66	01956	fedc ba98 7654 3210 Binary: 0000 0111 1010 0100 Hex: 07A4 Decimal: 1956

Table 11. Tone and Tone Mask Parameters for CCITT R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_RecvErrMask5	67	01940	fedc ba98 7654 3210 Binary: 0000 0111 1001 0100 Hex: 0794 Decimal: 1940
CDP_GrpB_TermToneMask	68	00508	f
CDP_GrpB_CallAnsweredTermToneMask	69	00192	fedc ba98 7654 3210 Binary: 0000 0000 1100 0000 Hex: 00C0 Decimal: 192
CDP_GrpB_RecvErrMask	70	65026	fedc ba98 7654 3210 Binary: 1111 1110 0000 0010 Hex: FE02 Decimal: 65026

Chile R2 Bidirectional Protocol Parameter Configuration 14

This chapter discusses the capabilities and parameters of the Chile R2 Bidirectional protocol in the following topics:

14.1 General Protocol Information

Protocol File Set

The files used with the Chile R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_cl_r2_io.cdp	pdk_cl_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_cl_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

14.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_cl_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Subscriber with long distance
- 5: Telephone operator
- 6: Data transmission
- 11: Non-identifiable subscriber

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the

result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.

- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Line free, chargeable
- 7: Line free, not chargeable

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/

/*
----------------------------
Metering AS pulsed clear-back
----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0: ANI collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0 [default]: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

14.3 Tone and Tone Mask Parameters

Table 12 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 12. Tone and Tone Mask Parameters for Chile R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'5'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'5'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'0'	
CDP_GrpA_SendANIAvailability	10	'0'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.

Table 12. Tone and Tone Mask Parameters for Chile R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'A'	Restart sending DNIS digits.
CDP_GrpB_SIT	15	'2'	After any one of B-1 and B-6 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'8'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'4'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'7'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	As per specifications the digit I-15 (end of dialing) represents the end of dialing so this parameter is set to 32768 decimal (8000 Hex).
CDP_Grp1_RecvErrMask1	52	30721	As per specifications I-0, I-11 to I-14 are treated as errors so the value of this parameter is 30721 decimal (7801 Hex).
CDP_Grp1_TermToneMask2	53	36864	I-15 (end of Dialing) or I-12 (the requested information is not available) can terminate the compelled cycle, value is 36864 decimal (9000 Hex).
CDP_Grp1_RecvErrMask2	54	26625	As per specifications I-0, I-11, I-13, and I-14 are treated as errors.
CDP_Grp1_TermToneMask3	55	0	This parameter is not used for Chile R2, as CDP_IS_ANIAVAILABILITY_CHECK_NEEDED is 0.
CDP_Grp1_RecvErrMask3	56	0	
CDP_Grp2_TermToneMask	57	02174	As per specifications the tones II-1 to II-6 and II-11 are valid category tones.
CDP_Grp2_RecvErrMask	58	63361	As per specifications II-0, II-7 to II-10, and II-12 to II-15 are treated as errors.
CDP_GrpA_TermToneMask1	59	00104	As per specifications, A-3, A-5, and A-6 can terminate the compelled signaling cycles of sending DNIS digits.

Table 12. Tone and Tone Mask Parameters for Chile R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_TermToneMask2	60	00106	After Outgoing register shall send category digit, this compelled signaling sequence can be terminated either by A-5, in which case the incoming register would be requesting the calling party's number (ANI digits), or it may ask for the remaining DNIS digits by sending A-1 tone, or it can ask the category and change the meaning of next tones to groupB by sending A-3 or A-6 address complete to move to conversion state.
CDP_GrpA_TermToneMask3	61	00074	As per specifications, A-1, A-3, or A-6 can terminate the compelled signaling cycles of sending ANI digits.
CDP_GrpA_TermToneMask4	62	00074	
CDP_GrpA_RecvErrMask1	63	65041	Tones A-0, A-4, and A-9 to A-15 are treated as error tones.
CDP_GrpA_RecvErrMask2	64	65429	Any tone other than A-1, A-3, A-5, or A-6 is treated as error.
CDP_GrpA_RecvErrMask3	65	65429	
CDP_GrpA_RecvErrMask4	66	0	This parameter is not used for Chile R2, as CDP_IS_ANIAVAILABILITY_CHECK_NEEDED is 0.
CDP_GrpA_RecvErrMask5	67	65429	Any tone other than A-1, A-3, A-5, or A-6 is treated as error.
CDP_GrpB_TermToneMask	68	00508	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: ‘2’ Send SIT ‘3’ Subscriber's line busy ‘4’ Congestion ‘5’ Number not assigned ‘6’ Subscriber's line free, charge ‘7’ Subscriber's line free, no charge ‘8’ Subscriber's line out of service
CDP_GrpB_CallAnsweredTermToneMask	69	00192	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-6 or B-7 (Line Free Charge/NoCharge/Charge and call clearing is under the control of called subscriber)
CDP_GrpB_RecvErrMask	70	65025	Any tone out of B-0, B-9 to B-15 is treated as error tone.

China R2 Bidirectional Protocol Parameter Configuration 15

This chapter discusses the capabilities and parameters of the China R2 Bidirectional protocol in the following topics:

15.1 General Protocol Information

Protocol File Set

The files used with the China R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_cn_r2_io.qs and pdk_cn_r2_io.hot (or pdk_cn_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_cn_r2_io.psi
Country Dependent Parameters	pdk_cn_r2_io.cdp	pdk_cn_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_cn_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

From the Accepted state, the protocol used in this country does not support a forced release of the line; that is, issuing a **gc_DropCall( )** function after a **gc_AcceptCall( )** function. If a forced release is attempted, the function will fail and an error is returned. To recover, the application should issue a **gc_AnswerCall( )** function followed by **gc_DropCall( )** and **gc_ReleaseCall( )** functions. However, anytime a GCEV_DISCONNECTED event is received in the Accepted state, the **gc_DropCall( )** function can be issued.

15.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_cn_r2_io.cdp* file are:

- CDP_ANI_ENABLED
- CDP_ANI_MaxDigits
- CDP_CallingPartyCategory_KA
- CDP_CallingPartyCategory_KD
- CDP_DNIS_DIGITS_BEFORE_ANI
- CDP_DNIS_ENABLED
- CDP_DNIS_MaxDigits
- CDP_GrpB_Tone
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_NO_ANI_CAT_KA_ENABLED
- CDP_NUM_OF_DNIS_DIGITS
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

CDP_ANI_ENABLED

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_CallingPartyCategory_KA

Description: Specifies the category of the calling subscriber.

Values: Table 13 shows some typical values. Default is 3.

Table 13. CDP_CallingPartyCategory_KA Values for China

Value	KA (Switch Step by Step)	KA (Switch Crossbar/Electronic)
1	Regular, fixed delay	Voice/fax/data fixed delay
2	Regular, immediate	Voice/fax/data immediate
3 [default]	Regular, business	Voice/fax/data business
4	Priority 1	Voice/fax/data priority 1
5	Free	Free
6	Small PBX	Small PBX
7	Priority 1, fixed delay	Voice/fax/data priority 1, fixed delay
8	Priority 2, fixed delay	Voice/fax/data priority 2, fixed delay
9	Privileged local	Voice/fax/data priority 1, business
10	Non-privileged local	Free

CDP_CallingPartyCategory_KD

Description: Specifies the category of the calling subscriber.

Values: Some typical values are:

- 1 [default]: Long distance operator, semi-automatic
- 2: Long distance, automatic switching
- 3: Local exchange, voice
- 4: Local exchange, fax and data
- 5: Semi-automatic, verify calling ID
- 6: Test

CDP_DNIS_DIGITS_BEFORE_ANI

Description: Determines the number of dialed number identification service (DNIS) digits that are to be received before any ANI digits are received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digit(s) are received.
3. ANI digits are received.
4. The remaining DNIS digits are received.
5. Category digits are received again.

Values:

- 0 [default]: Indicates that ANI digits must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before ANI digits.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_DNIS_ENABLED

Description: Enables or disables the reception of DNIS digits.

Values:

- 0: Disable the reception of DNIS digits.
- 1 [default]: Enable the reception of DNIS digits.

Guidelines: Even if this parameter is set to 0, the first forward tone received will be the first DNIS digit only.

For Dialogic® DM3 boards, if DNIS is disabled, you also have to remove **feature_DNIS** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_DNIS_MaxDigits

Description: Specifies the maximum number of DNIS digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_GrpB_Tone

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 0: Not chargeable
- 1 [default]: Chargeable

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_NO_ANI_CAT_KA_ENABLED

Description: If there are no ANI digits (that is, **CDP_ANI_ENABLED** = 0), then Cat_KA can be requested by sending an A-6 tone before Cat_KD is sent in response to an A-3 tone (change over to Group B).

Values:

- 0 [default]: If ANI is enabled.
- 1: If ANI is not enabled.

Guidelines: The behavior of the protocol is not predictable if this parameter is set to a value other than 0 or 1.

CDP_NUM_OF_DNIS_DIGITS

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

15.3 Tone and Tone Mask Parameters

Table 14 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 14. Tone and Tone Mask Parameters for China R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
a_GrpA_SendDNIS	01	'1'	A-1 (see specs). Group A backward signal requesting next digit. If A-6 was not received before this signal, this tone shall be requesting the forward register to send DNIS digits.
a_GrpA_SendANI	02	'1'	A-1 (see specs). Group A backward signal requesting next digit. When received A-6 before this signal, this tone shall be requesting the forward register to send ANI digits.
a_GrpA_N_1	03	'2'	A-2 (see specs). Send first digit.
a_GrpA_AddrCmpltChgGpB	04	'3'	A-3 (see specs). This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
a_GrpA_SendOnErr	05	'4'	A-4 and B-4 (see specs). These tones are sent to forward register in case of error during exchange of tones : congestion.
a_GrpB_SendOnErr	06	'4'	
a_GrpA_SendCAT_KA	07	'6'	A-6 (see specs). Group A backward signal requesting category of calling subscriber.

Table 14. Tone and Tone Mask Parameters for China R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
a_GrpB_linefree_charge	08	'1'	B-1 to 6 (see specs), This tone is sent on receipt of category for Group II. After this tone, sequence of R2MF tone exchange is over and call is through. This is the last R2MF tone in establishment of a call.
a_GrpB_LocalTrunkBusy	09	'2'	
a_GrpB_LongDistanceBusy	10	'3'	
a_GrpB_Congestion	11	'4'	
a_GrpB_CongestionOrLineBusy	12	'4'	
a_GrpB_UnallocatedNumber	13	'5'	
a_GrpB_PBXfree_charge	14	'6'	Subscriber's/PBX line free, chargeable. After any one of these two tones is received, category tone from Group II is sent to Incoming register after which sequence of R2MF tone exchange is over and call is through.
Mask Parameters			
a_Grp1_TermToneMask	51	32768	As per specifications the digit I-15 (end of dialing) represents the end of dialing so this parameter is set to 32768 decimal (8000 Hex).
a_Grp1_RecvErrMask	52	30721	As per specifications I-0, I-11 to I-14 are treated as errors so the value of this parameter is 30721 decimal (7801 Hex).
a_Grp2KA_TermToneMask	53	32766	For KA: As per specifications the tones1 to 14 are valid category tones so this parameter is equal to 32766 decimal (7FFE Hex). Note that this value varies with regard to switch type (CrossBar/Electronic or Step-By-Step). For KD: As per specifications the tones 1 to 6 are valid category tones so this parameter is equal to 126 decimal (007E Hex).
a_Grp2KD_TermToneMask	54	00126	
a_Grp2KA_RecvErrMask	55	32768	For KA: As per specifications tone 15 is treated as error so the value of this parameter is 32768 decimal (8000 Hex.). Note that this value varies with regard to switch type (CrossBar/Electronic or Step-By-Step). For KD: As per specifications tones 7 to 15 are treated as errors so the value of this parameter is 65408 decimal (FF80 Hex.). It varies with KD = 1, 2, 6 and 3, 4.
a_Grp2KD_RecvErrMask	56	65408	
a_GrpA_TermToneMask1	57	00072	For DNIS: As per specifications, A-3 and A-6 can terminate the compelled signaling cycles of sending DNIS digits.

Table 14. Tone and Tone Mask Parameters for China R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
a_GrpA_TermToneMask2	58	00010	For CAT_KA: After Outgoing register shall send category digit, this compelled signaling sequence can be terminated by A-1, in which case the incoming register would be requesting the calling party's number (ANI digits) or A-3. If it does not have ANI it will just send I-15. So this parameter will be set to 10 decimal (000A Hex.).
a_GrpA_TermToneMask3	59	00008	For ANI: As per specifications, A-3 can terminate the compelled signaling cycles of sending ANI digits.
a_GrpA_TermToneMask4	60	00008	For partial DNIS: As per specifications, A-3 can terminate the compelled signaling cycles of sending partial DNIS digits. So this parameter will be set to 8 decimal (0008 Hex.).
a_GrpA_RecvErrMask1	61	65457	For DNIS: Tones A-1 to A-3, and A-6 are considered OK. Any tone other than this will be error, i.e,. A-4, A-5, and A-7 to A-15 are erroneous (see specs). So this parameter will be equal to 65457 decimal (FFB1 Hex).
a_GrpA_RecvErrMask2	62	65525	For CAT_KA: Any tone other than A-1 or A-3 will be treated as error. So this parameter is set as 65525 decimal (FFF5 Hex).
a_GrpA_RecvErrMask3	63	65525	For ANI: A-1 or A-3 are OK. Any other tone will be an error. So this parameter is set as 65525 decimal (FFF5 Hex).
a_GrpA_RecvErrMask4	64	65525	For partial DNIS: A-1 or A-3 are OK. Any other tone will be an error. So this parameter is set as 65525 decimal (FFF5 Hex).
a_GrpB_TermToneMask_3_4	65	00114	After Outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: [FOR KD(GrpII) = 3, 4] [FOR KD(GrpII) = 1, 2, 6] B-1 (Subscriber's Line Free, Charge) (Subscriber's Line Free, Charge) B-2 (Spare) (Local Trunk Busy) B-3 (Spare) (Long Distance Exchange Busy) B-4 (Congestion or Line Busy) (Congestion) B-5 (Unallocated Number) (Unallocated Number) B-6 (PBX line free, Charge) - B1,B4,B5,B6 B1,B2,B3,B4,B5 = 0072 (Hex) = 003E (Hex) = 114 (decimal) = 62 (decimal) So this parameter will be determined corresponding to Grp-II signals in the SDL.
a_GrpB_TermToneMask_1_2_6	66	00062	

Table 14. Tone and Tone Mask Parameters for China R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
a_GrpB_RecvErrMask_3_4	67	65421	For KD = 3, 4: Tones B-0, B-2, B-3, B-7 to B-15 shall be considered as error. So this parameter is set as FF8D (hex), 65421(decimal). For KD = 1, 2, 6: Tone B-0, B-6 to B-15 shall be considered as error. So this parameter is set as FF41 (hex), 65345 (decimal).
a_GrpB_RecvErrMask_1_2_6	68	65345	
a_GrpB_CallAnsweredTermToneMask	69	00066	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-1 or B-6 (Line/PBX Free Charge). Value = 0042 (hex), 66 (decimal).

Colombia R2 Bidirectional Protocol Parameter Configuration 16

This chapter discusses the capabilities and parameters of the Colombia R2 Bidirectional protocol in the following topics:

16.1 General Protocol Information

Protocol File Set

The files used with the Colombia R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_co_r2_io.cdp	pdk_co_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_co_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

16.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_co_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber (one of the Group II forward signals).

Values:

- 1: National long distance
- 2 [default]: Subscriber without priority
- 3: Pay phone or kiosk
- 4: Immediate billing information (kiosk)
- 5: Available
- 6: Available
- 7: Available
- 8: Available
- 9: Available
- 10: Available

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the

result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.

- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1 [default]: Chargeable (B-1)
- 5: Not chargeable (B-5)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/
```

```
/*
-----------------------------
Metering AS pulsed clear-back
-----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0: ANI collection is terminated by I-15 (end of dialing).
- Non-zero [default is 7]: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 7]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

16.3 Tone and Tone Mask Parameters

Table 15 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 15. Tone and Tone Mask Parameters for Colombia R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'1'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'6'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change. After receiving the category, we can request the ANI by sending A-1. Note: A-6 is the first signal in ANI request sequence. After A-6 the meaning of A-1 is send next ANI digit rather than send next DNIS digit.
CDP_GrpA_AddrCmpltCharge	07	'0'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.) Note: Not used with Colombia.
CDP_GrpA_SendANIWithAC	08	'1'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number". Note: Not used with Colombia.

Table 15. Tone and Tone Mask Parameters for Colombia R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_A_10	09	'0'	Not used with Colombia.
CDP_GrpA_SendANIAvailability	10	'1'	
CDP_GrpA_N_1	11	'0'	Send N-1 tone. Note: Not used with Colombia.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'2'	Restart sending DNIS digits.
CDP_GrpB_SIT	15	'3'	After any one of B-1 and B-5 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'2'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'0'	
CDP_GrpB_Rejected	19	'6'	
CDP_GrpB_NormalClearing	20	'0'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'0'	
CDP_GrpB_linefree_charge	22	'1'	
CDP_GrpB_linefree_nocharge	23	'5'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability. Note: Not used with Colombia.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability. Note: Not used with Colombia.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	As per specifications the digit I-15 (end of dialing) represents the end of dialing so this parameter is set to 32768 decimal (8000 Hex).
CDP_Grp1_RecvErrMask1	52	30721	As per specifications I-0, I-11 to I-14 are treated as errors so the value of this parameter is 30721 decimal (7801 Hex).
CDP_Grp1_TermToneMask2	53	36864	I-15 (end of Dialing) or I-12 (the requested information is not available) can terminate the compelled cycle, value is 36864 decimal (9000 Hex).
CDP_Grp1_RecvErrMask2	54	24577	As per specifications I-0, I-13 and I-14 are treated as errors so the value of this parameter is 24577 decimal (6001 Hex).

Table 15. Tone and Tone Mask Parameters for Colombia R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp1_TermToneMask3	55	01026	As per specs I-1 or I-10 can terminate the compelled signaling cycle so the value of this parameter is 1026 decimal (0402 Hex).
CDP_Grp1_RecvErrMask3	56	64509	Any tone other than I-0, I-10 is treated as error so the value of this parameter is 64509 decimal (FBFD Hex).
CDP_Grp2_TermToneMask	57	02046	As per specifications the tones II-1 to II-10 are valid category tones so the value is 2046 decimal (07FE Hex).
CDP_Grp2_RecvErrMask	58	63489	As per specifications II-0, II-11 to II-15 are treated as errors so the value of this parameter is 63489 decimal (F801 Hex).
CDP_GrpA_TermToneMask1	59	00072	As per specifications, A-3 and A-6 can terminate the compelled signaling cycles of sending DNIS digits. So the value is 72 decimal (0048 Hex).
CDP_GrpA_TermToneMask2	60	00074	After Outgoing register shall send category digit, this compelled signaling sequence can be terminated either by A-6, in which case the incoming register would be requesting the calling party's number (ANI digits), or it can ask the category and change the meaning of next tones to groupB by sending A-3. So this parameter will be set to 74 decimal (004A Hex).
CDP_GrpA_TermToneMask3	61	00010	As per specifications, A-1, A-3 can terminate the compelled signaling cycles of sending ANI digits. This parameter will be set to 10 decimal (000A Hex).
CDP_GrpA_TermToneMask4	62	00010	
CDP_GrpA_RecvErrMask1	63	63505	Tones A-1 to A-3 and A-5 to A-10 are considered OK. Any tone other than this will be error (see Specs). So this parameter will be equal to 63505 decimal (F811 Hex).
CDP_GrpA_RecvErrMask2	64	65493	Any tone other than A-1, A-3, or A-6 will be treated as error. So this parameter is set as 65493 decimal (FFD5 Hex).
CDP_GrpA_RecvErrMask3	65	65461	Only A-1, A-3, or A-6 is expected. Any other tone will be an error. So this parameter is set as 65461 decimal (FFB5 Hex).
CDP_GrpA_RecvErrMask4	66	65495	Any tone other than A-3 or A-5 will indicate an error. So this parameter is set as 65495 decimal (FFD7 Hex).
CDP_GrpA_RecvErrMask5	67	65495	

Table 15. Tone and Tone Mask Parameters for Colombia R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_TermToneMask	68	00062	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: B-1 (Subscriber's Line Free, Charge) B-2 (Subscriber's Line Busy) B-3 (Intercepted Subscriber Line) B-4 (Congestion) B-5 (Subscriber's Line Free, No Charge) B-6 (Double Disconnection) So this parameter will be set to 62 decimal (003E Hex).
CDP_GrpB_CallAnsweredTermToneMask	69	00034	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-1 or B-5 (Line Free Charge/NoCharge)
CDP_GrpB_RecvErrMask	70	65473	Any tone out of B-1 to B-9 shall be considered as error. So this parameter is set as 65473 decimal (FFC1 Hex).

Croatia R2 Bidirectional Protocol Parameter Configuration 17

This chapter discusses the capabilities and parameters of the Croatia R2 Bidirectional protocol in the following topics:

17.1 General Protocol Information

Protocol File Set

The files used with the Croatia R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_hr_r2_io.cdp	pdk_hr_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_hr_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

17.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_hr_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Coin box or subscriber with charge metering
- 5: Telephone operator
- 6: Data transmission
- 11: C. P. T. P.
- 12: Special line
- 13: Mobile user
- 14: Virtual private network line
- 15: Special line

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the

result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.

- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Chargeable (B-6)
- 7: Not chargeable (B-7)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/

/*
----------------------------
Metering AS pulsed clear-back
----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. ‘f’ will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause ‘f’ to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0 [default]: GCEV_ALERTING is sent after receiving a ringback tone.
- 1: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

17.3 Tone and Tone Mask Parameters

Table 16 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 16. Tone and Tone Mask Parameters for Croatia R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'5'	Group A backward signal requesting next ANI digit.

Table 16. Tone and Tone Mask Parameters for Croatia R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'9'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	
CDP_GrpA_SendANIAvailability	10	'5'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'A'	Restart sending DNIS digits.
CDP_GrpB_SIT	15	'2'	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register, after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'8'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'0'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'7'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			

Table 16. Tone and Tone Mask Parameters for Croatia R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp1_TermToneMask1	51	32768	As per specifications the digit I-15 (end of dialing) represents the end of dialing so this parameter is set to 32768 decimal (8000 Hex).
CDP_Grp1_RecvErrMask1	52	30721	As per specifications I-0, I-11 to I-14 are treated as errors so the value of this parameter is 30721 decimal (7801 Hex).
CDP_Grp1_TermToneMask2	53	36864	I-15 (end of dialing) or I-12 (the requested information is not available) can terminate the compelled cycle, value is 36864 decimal (9000 Hex).
CDP_Grp1_RecvErrMask2	54	24577	As per specifications I-0, I-13 and I-14 are treated as errors so the value of this parameter is 24577 decimal (6001 Hex).
CDP_Grp1_TermToneMask3	55	01026	As per specs I-1 or I-10 can terminate the compelled signaling cycle so the value of this parameter is 1026 decimal (0402 Hex).
CDP_Grp1_RecvErrMask3	56	64509	Any tone other than I-0, I-10 is treated as error so the value of this parameter is 64509 decimal (FBFD Hex).
CDP_Grp2_TermToneMask	57	63614	As per specifications the tones II-1 to II-6 and II-11 to II-15 are valid category tones so the value is 63614 decimal (F87E Hex).
CDP_Grp2_RecvErrMask	58	01921	As per specifications II-0, II-7 to II-10 are treated as errors so the value of this parameter is 1921 decimal (0781 Hex).
CDP_GrpA_TermToneMask1	59	00042	As per specifications, A-1, A-3, A-5, and A-9 can terminate the compelled signaling cycles of sending DNIS digits. So the value is 42 decimal (002A Hex).
CDP_GrpA_TermToneMask2	60	00042	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by A-5, in which case the incoming register would be requesting the calling party's number (ANI digits), or it may ask for the remaining DNIS digits by sending A-1 tone, or it can ask the category and change the meaning of next tones to groupB by sending A-3. So this parameter will be set to 42 decimal (002A Hex).
CDP_GrpA_TermToneMask3	61	00010	As per specifications, A-1, A-3 can terminate the compelled signaling cycles of sending ANI digits. This parameter will be set to 10 decimal (000A Hex).
CDP_GrpA_TermToneMask4	62	00010	
CDP_GrpA_RecvErrMask1	63	63505	Tones A-1 to A-3 and A-5 to A-10 are considered OK. Any tone other than this will be error (see Specs). So this parameter will be equal to 63505 decimal (F811 Hex).

Table 16. Tone and Tone Mask Parameters for Croatia R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_RecvErrMask2	64	65493	Any tone other than A-1, A-3, or A-5 will be treated as error. Only A-1, A-3, or A-5 is expected. Any other tone will be an error. So this parameter is set as 65493 decimal (FFD5 Hex).
CDP_GrpA_RecvErrMask3	65	65493	
CDP_GrpA_RecvErrMask4	66	65495	Any tone other than A-3 or A-5 will indicate an error. So this parameter is set as 65495 decimal (FFD7 Hex).
CDP_GrpA_RecvErrMask5	67	65493	Any tone other than A-1, A-3, or A-5 will indicate an error. So this parameter is set as 65493 decimal (FFD5 Hex).
CDP_GrpB_TermToneMask	68	00508	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: B-2 (Send << number changed >> recorded announcement) B-3 (Subscriber's line busy) B-4 (Congestion) B-5 (Unallocated national number) B-6 (Subscriber's line free, charge) B-7 (Subscriber's line free, no charge) B-8 (Subscriber's line out of service) So this parameter will be set to 508 decimal (01FC Hex).
CDP_GrpB_CallAnsweredTermToneMask	69	00192	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-6 or B-7 (line free charge/no charge)
CDP_GrpB_RecvErrMask	70	65027	Any tone out of B-0, B-1, B-9 to B-15 shall be considered as error. So this parameter is set as 65027 decimal (FE03 Hex).

Direct Signaling Protocol Parameter Configuration 18

This chapter discusses the capabilities and parameters of the Direct Signaling protocol in the following topics:

18.1 General Protocol Information

The Direct Signaling protocol is not a call control protocol; it is used strictly to give applications access to the signaling patterns on the line, as a means to allow the application to implement its own protocols. The protocol allows the application to generate and detect signaling patterns, as defined in the CDP file, giving the application direct control over the signaling patterns on the line.

Applications can call the **gc_Extension( )** function to generate up to eight distinct transition CAS patterns and three distinct pulse CAS patterns. The application can be notified, through the GCEV_EXTENSION event, when one of the patterns is detected by the protocol. The detection of each pattern can be enabled or disabled through the CDP parameters in the *pdk_dir_sig.cdp* file. The **gc_Extension( )** function can also be used to retrieve the current transmit/receive ABCD signaling bits on a particular channel.

Note: The ability to query the ABCD bits requires one of the following Dialogic® System Releases: System Release 6.1 for Linux, System Release 6.0 CompactPCI for Windows® (with Feature Pack 1), and System Release 6.0 PCI for Windows® (with Service Update).

The protocol is fully capable of handling alarm conditions, and when an alarm is received, the protocol will stop generating and detecting patterns. Applications can also stop generation and detection of patterns through the use of the **gc_SetChanState( )** function; by setting the channel out of service, the protocol will cease to generate or detect patterns.

Protocol File Set

The files used with the Direct Signaling protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards†	Dialogic® Springware Boards
Protocol Module	pdk_dir_sig.qs and pdk_dir_sig.hot (or pdk_dir_sig.arm.hot for Dialogic® DMT160TEC boards)	
Country Dependent Parameters	pdk_dir_sig.cdp	
	gc_OpenEx( ) Protocol Name	
	Not applicable‡	

NOTE: This protocol is supported on Dialogic® DM3 boards only.
†Support on Dialogic® DM3 boards requires Dialogic System Release 6.0 for PCI or later.
‡On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.

Protocol Limitations

You cannot use the standard Global Call API call control functions with this protocol; the protocol does not provide call control capabilities. Any command besides **gc_ResetLineDev( )**, **gc_SetChanState( )**, and **gc_Extension( )** will be ignored. **gc_ResetLineDev( )** has no effect with the protocol and is provided only for application compatibility. **gc_SetChanState( )** will stop (OutOfService) and resume (InService) the capabilities of this protocol (generation/detection of patterns). **gc_Extension( )** is what the application uses to access the functionality of this protocol. For additional information about these and other Global Call API functions and events, see the *Dialogic® Global Call API Library Reference*.

Additional Protocol Information

The application should include *dm3cc_parm.h* when using this protocol.

18.2 Country Dependent Parameter Descriptions

The modifiable parameters in the *pdk_dir_sig.cdp* file are:

- CDP_DETECT_PAT1 through CDP_DETECT_PAT11
- SYS_LineTypeT1

CDP_DETECT_PAT1 through CDP_DETECT_PAT11

Description: The protocol provides eight TRANS (transition) CAS patterns and three PULSE CAS patterns. TRANS patterns range from ID 1 to 8, and PULSE patterns range from ID 9 to 11. The **CDP_DETECT_PAT1** through **CDP_DETECT_PAT11** patterns enable or disable detection of each pattern.

Values:

- 0: Disable detection of the pattern.
- 1 [default] : Enable detection of the pattern.

SYS_LineTypeT1

Description: Specifies whether the protocol is to be used on a T1 trunk.

Values: By default, the **SYS_LineTypeT1** parameter is commented out in the *pdk_dir_sig.cdp* file as follows:

```
/* DM3 INTEGER_t SYS_LineTypeT1 = 1 */
```

Uncomment the line if the protocol is to be used on a T1 trunk.

18.3 Using Global Call Functions with Direct Signaling Protocol

This section provides code examples that illustrate how to use this protocol.

Generating a Signaling Pattern

The **gc_Extension( )** function is called to generate a signaling pattern. For this feature, the **gc_Extension( )** function should use GCTGT_GCLIB_CHAN as target type, the Global Call device handle for the line device as the target ID, and DM3CC_EXID_BIT_PATTERN as the extension ID. Inside the GC_PARM_BLK, the application specifies the pattern ID that the protocol should generate, with setID = CCSET_BIT_PATTERN, parmID = CCPARM_INTPARM1, size = sizeof(int), and value = <pattern ID, as defined in the CDP file, 1 - 11>.

The following example shows how to generate pattern #1:

```
#include "gclib.h"
#include "dm3cc_parm.h"

void main( void ) {
  LINEDEV devh;
  GC_PARM_BLKP pblkp = NULL;

  gc_Start( NULL );
  gc_OpenEx( &devh, ":N_dtiB1T1:V_dxxxB1C1:P_dm3", 0, NULL );

  /* Wait for GCEV_UNBLOCKED event */

  gc_util_insert_parm_val( &pblkp, CCSET_BIT_PATTERN, CCPARM_INTPARM1,
    sizeof( int ), 1 );
  gc_Extension( GCTGT_GCLIB_CHAN, devh, DM3CC_EXID_BIT_PATTERN, pblkp, NULL,
    EV_ASYNC );

  /* Wait for GCEV_EXTENSIONCMPLT event */

  gc_Close( devh );
  gc_Stop( );
}
```

Enabling the GCEV_EXTENSION Event for Pattern Detection

To enable detection of a pattern, you must first enable the detection in the CDP file by setting the appropriate **CDP_DETECT_PAT** parameter to 1. Within the application, the GCEV_EXTENSION event, used to inform the application whenever a pattern is detected, should

also be enabled. The **gc_SetConfigData( )** function is used to do this. The target type should be GCTGT_CCLIB_CHAN, the target ID the Global Call device handle, and the update condition should always be set to GCUPDATE_IMMEDIATE. Inside the GC_PARM_BLK, the application should indicate that the GCEV_EXTENSION event should be enabled, with setID = CCSET_EXTENSIONEVT_MSK, parmID = GCACT_ADDMSK, size = sizeof(long), and value = EXTENSIONEVT_BIT_PATTERN.

The following example shows how to enable the GCEV_EXTENSION event:

```
#include "gclib.h"
#include "dm3cc_parm.h"

void main( void ) {
  LINEDEV devh;
  GC_PARM_BLKP pblkp = NULL;

  gc_Start( NULL );
  gc_OpenEx( &devh, ":N_dtiB1T1:V_dxxxB1C1:P_dm3", 0, NULL );

  /* Wait for GCEV_UNBLOCKED event */

  gc_util_insert_parm_val( &pblkp, CCSET_EXTENSIONEVT_MSK, GCACT_ADDMSK,
    sizeof( long ), EXTENSIONEVT_BIT_PATTERN );
  gc_SetConfigData( GCTGT_CCLIB_CHAN, devh, pblkp, 0, GCUPDATE_IMMEDIATE,
    &req_id, EV_ASYNC );

  /* Wait for GCEV_EXTENSION event */

  gc_Close( devh );
  gc_Stop( );
}
```

Retrieving the Event Data

Whenever a pattern is detected, a GCEV_EXTENSION event will be sent to the application. The extevtdatap of the METAEVENT structure contains the data associated with the event, which will inform the application which pattern was detected by the protocol.

The following example shows how to retrieve this information:

```
#include <iostream.h>
#include "gclib.h"
#include "dm3cc_parm.h"

void main( void ) {
  LINEDEV devh;
  GC_PARM_BLKP pblkp = NULL;
  METAEVENT gc_event;
  GC_PARM_DATAP parmp = NULL;

  gc_Start( NULL );
  gc_OpenEx( &devh, ":N_dtiB1T1:V_dxxxB1C1:P_dm3", 0, NULL );

  /* Wait for GCEV_UNBLOCKED event */

  gc_util_insert_parm_val( &pblkp, CCSET_EXTENSIONEVT_MSK, GCACT_ADDMSK,
    sizeof( long ), EXTENSIONEVT_BIT_PATTERN );
  gc_SetConfigData( GCTGT_CCLIB_CHAN, devh, pblkp, 0, GCUPDATE_IMMEDIATE,
    &req_id, EV_ASYNC );

  /* Wait for GCEV_EXTENSION event */
```

```
  gc_GetMetaEvent( &gc_event );

  parmp = gc_util_next_parm(
    &( ( ( EXTENSIONEVTBLK * ) gc_event.extevtdatap )->parmblk ), NULL );
  cout << "Pattern Detected.  Pattern ID = " <<
    *( ( int * ) parmp->value_buf ) << endl;

  gc_Close( devh );
  gc_Stop( );
}
```

Retrieving the Bit Values

The **gc_Extension( )** function can be used to retrieve the current transmit/receive ABCD signaling bits on a particular channel. For this feature, the **gc_Extension( )** function should use GCTGT_GCLIB_CHAN as target type, the Global Call device handle for the line device as the target ID, and DM3CC_EXID_TXRX_SIGBITS_GET as the extension ID.

The following example shows how to retrieve the signaling bits. The format of the response is explained below.

```
#include <iostream.h>
#include "srllib.h"
#include "gclib.h"
#include "gcerr.h"
#include "dm3cc_parm.h"

/* Some macros to get the signaling bits */
#define GET_TX_BITS(x)        (( x & 0xF0 ) >> 4 )
#define GET_RX_BITS(x)        (( x & 0xF ))

LINEDEV       g_channel;
GC_PARM_BLKP  g_pblkp = NULL;
GC_PARM_DATAP g_parmp = NULL;
METAEVENT     g_EvtData;
int           g_TxABCDbits;
int           g_RxABCDbits;
int           g_SignalingBits;

void main( void )
{
    gc_Start( NULL );
    if( gc_OpenEx( &g_channel, ":N_dtiB1T1:V_dxxxB1C1:P_dm3", 0, NULL ) != GC_SUCCESS )
    {
        gc_Stop();
        return;
    }

     /* Wait for GCEV_UNBLOCKED event */

    gc_Extension( GCTGT_GCLIB_CHAN, g_channel, DM3CC_EXID_TXRX_SIGBITS_GET, g_pblkp,
                  NULL, EV_ASYNC );

    /* Wait for GCEV_EXTENSIONCMPLT event */

    g_parmp = gc_util_next_parm( &(((EXTENSIONEVTBLK *)g_EvtData.extevtdatap)->parmblk ),
                                 NULL );
```

```
    if( g_parmp == NULL )
    {
        cout << "No parameters in event GC_PARM_BLK." << endl;
    }
    else
    {
        g_SignalingBits = *((int *)parmp->value_buf );
        g_TxABCDbits    = GET_TX_ BITS( g_SignalingBits );
        g_RxABCDbits    = GET_RX_BITS( g_SignalingBits );

        cout << "Signaling Bits:" << endl;
        cout << "    Transmit ABCD Bits = " << g_TxABCDbits << "." << endl;
        cout << "    Receive ABCD Bits  = " << g_RxABCDbits << "." << endl;
    }

    gc_ResetLineDev( g_channel, EV_SYNC );
    gc_Close( g_channel );
    gc_Stop();
}
```

The response is the GCEV_EXTENSIONCMPLT event, which will contain a GC_PARM_DATA pointer that is structured as follows:

```
typedef struct
{
    unsigned short      set_ID;           /* Set ID (two bytes long)*/
    unsigned short      parm_ID;          /* Parameter ID (two bytes long) */
    unsigned char       value_size;       /* Size of value_buf in bytes */
    unsigned char       value_buf[1];     /* Address to the parm value buffer */
}GC_PARM_DATA, *GC_PARM_DATAP;
```

The fields of GC_PARM_DATA will be set to the following parameters:

- set_ID = CCSET_SIG_BITS
- parm_ID = CCPARM_CURRENT_STATE
- value_size = 0x1
- value_buf[1] = see Table 17

Table 17. Bit Positioning in GC_PARM_DATA value_buf Element

Bit No.	7	6	5	4	3	2	1	0
Value	A_{TX}	B_{TX}	C_{TX}	D_{TX}	A_{RX}	B_{RX}	C_{RX}	D_{RX}

Setting the Initial Bit Pattern

In addition to using Global Call functions with the Direct Signaling protocol to generate and detect signaling patterns and retrieve the bit values, you can set the initial bit pattern that is sent on the line when the board is downloaded. To do this, add or change the following parameter in the CHP section in the .config file for the firmware:

```
[CHP]
SetParm=0x1316,0xfd    ! Initial Bit Pattern on the line - should be 0xF<pattern>, where
<pattern> is the ABCD bit values. The default is 0xfd -> ABCD=1101 (blocking pattern for E1)
```

This allows the application to know what the initial bit pattern is whenever the board is downloaded.

E1 CAS Bidirectional Protocol Parameter Configuration 19

This chapter discusses the capabilities and parameters of the E1 CAS Bidirectional protocol in the following topics:

19.1 General Protocol Information

Protocol File Set

The files used with the E1 CAS protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_us_mf_io.qs and pdk_us_mf_io.hot (or pdk_us_mf_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_us_mf_io.psi
Country Dependent Parameters	pdk_e1_cas_io.cdp	pdk_e1_cas_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_e1_cas_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

After a call is transferred with **gc_SetUpTransfer( )**, you cannot issue a **gc_DropCall( )** on the original call. You must drop the consultation call before the original call can be dropped. The behavior of the protocol is undefined if you try to drop the original call without dropping the consultation call first.

19.2 Country Dependent Parameter Descriptions

The modifiable parameters in the *pdk_e1_cas_io.cdp* file are:

- CDP_BLIND_XFER_DIALTONE_TIMEOUT
- CDP_BLIND_XFER_POST_TIME

- CDP_BLIND_XFER_PRE_TIME
- CDP_BlockOnLOOS
- CDP_FORCED_RELEASE_ENABLED
- CDP_HOOKFLASH_ON_XFER
- CDP_HOOKFLASH_ON_XFER_DROP
- CDP_IN_ACCEPTBEFORERING
- CDP_IN_ANI_DigitType
- CDP_IN_ANI_Enabled
- CDP_IN_ANI_KP_Needed
- CDP_IN_ANI_MaxDigits
- CDP_IN_ANI_ST_Needed
- CDP_IN_ANI_Type_Pre
- CDP_IN_ANI_WINK_Needed
- CDP_IN_ANIKPDigit
- CDP_IN_ANISTDigit
- CDP_IN_DialTone_Needed
- CDP_IN_DNIS_BeforeANI
- CDP_IN_DNIS_DigitType
- CDP_IN_DNIS_Enabled
- CDP_IN_DNIS_KP_Needed
- CDP_IN_DNIS_MaxDigits
- CDP_IN_DNIS_ST_Needed
- CDP_IN_DNIS_WINK_Needed
- CDP_IN_DNISKPDigit
- CDP_IN_DNISSTDigit
- CDP_IN_EnableRingBack
- CDP_IN_GetDigitTime
- CDP_IN_RemoteBlockingTimeout
- CDP_IN_ResumeCallTimeout
- CDP_IN_WinkStart
- CDP_MIN_CallLength
- CDP_Min_HangupTime
- CDP_OUT_ANI_DigitType
- CDP_OUT_ANI_Enabled
- CDP_OUT_ANI_KP_Needed
- CDP_OUT_ANI_ST_Needed
- CDP_OUT_ANI_Type_Pre
- CDP_OUT_ANI_WINK_Needed

- CDP_OUT_ANIKPDigit
- CDP_OUT_ANISTDigit
- CDP_OUT_ANIString
- CDP_OUT_ConnectType
- CDP_OUT_DialTone_Needed
- CDP_OUT_DialTone_Timeout
- CDP_OUT_DNIS_BeforeANI
- CDP_OUT_DNIS_DigitType
- CDP_OUT_DNIS_Enabled
- CDP_OUT_DNIS_KP_Needed
- CDP_OUT_DNIS_ST_Needed
- CDP_OUT_DNIS_WINK_Needed
- CDP_OUT_DNISKPDigit
- CDP_OUT_DNISSTDigit
- CDP_OUT_EnableRingBack
- CDP_OUT_SeizeAck_Timeout
- CDP_OUT_SeizeDelay
- CDP_OUT_Send_Alerting_After_Dialing
- CDP_OUT_WinkStart
- CDP_SETUP_XFER_CPA
- CDP_SETUP_XFER_DIALTONE_TIMEOUT
- CDP_USE_DEFAULTANI
- CDP_Xfer_DigitType

CDP_BLIND_XFER_DIALTONE_TIMEOUT

Description: Defines the maximum time-out to wait for dial tone during a blind transfer.

Values:

- Time in milliseconds. Default is 5000 (5 seconds).
- 0: Disables waiting for dial tone during a blind transfer.

CDP_BLIND_XFER_POST_TIME

Description: Specifies the time between blind transfer dialing and hangup.

Values: Time in milliseconds. Default is 1000 (1 second).

CDP_BLIND_XFER_PRE_TIME

Description: Specifies the time between blind transfer hookflash and dialing.

Values: Time in milliseconds. Default is 0.

CDP_BlockOnLOOS

Description: Allows the protocol to send out CAS_BLOCKING to block the line whenever a channel is set out-of-service (by the application calling the **gc_SetChanState( )** function).

Note: The ability to block the line is not supported on all switches, so this parameter is disabled by default.

Values:

- 0 [default]: Do not send blocking pattern when a channel is set out-of-service.
- 1: Send blocking pattern when a channel is set out-of-service.

CDP_FORCED_RELEASE_ENABLED

Description: Enables the protocol to support "forced release" of incoming calls from the Accepted state. The protocol specification does not support forced release of incoming calls from the Accepted state. However, support for forcing release of incoming calls is supported in this implementation for flexibility with Global Call applications, which are permitted to call **gc_DropCall( )** from the Accepted state. In this scenario, the call will be answered transparently without notification of the application and then immediately disconnected, i.e., a "forced release" of the line. Note that in doing this, additional implications exist and must be considered, i.e., billing, etc.

Values:

- 0: Does not support forced release. No implicit answer will be performed transparently in this scenario, and only a CAS hangup (idle) signal will be generated.
- 1 [default]: Supports forced release.

CDP_HOOKFLASH_ON_XFER

Description: Determines if a hookflash is sent by the protocol when a supervised and blind transfer is requested.

Values:

- 0: Do not send hookflash.
- 1 [default]: Send the hookflash.

CDP_HOOKFLASH_ON_XFER_DROP

Description: Determines if a hookflash is sent by the protocol if a supervised transfer request is aborted via a **gc_DropCall( )** function.

Values:

- 0: Do not send hookflash.
- 1 [default]: Send the hookflash.

CDP_IN_ACCEPTBEFORERING

Description: Determines if an accept event should be sent before sending ringback tones.

Values:

- 0: Send the accept event after sending ringback tones.
- 1 [default]: Send the accept event before sending ringback tones.

CDP_IN_ANI_DigitType

Description: Determines the digit type for inbound automatic number identification (ANI) digits.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

CDP_IN_ANI_Enabled

Description: Enables ANI collection. The ANI digits are terminated either by **CDP_IN_ANISTDigit** if **CDP_IN_ANI_ST_Needed** is set to 1, or by the maximum number of digits set by **CDP_IN_ANI_MaxDigits**.

Values:

- 0: ANI collection not enabled.
- 1 [default]: ANI collection enabled.

Guidelines: For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_ANI,feature_transfer"
```

CDP_IN_ANI_KP_Needed

Description: Specifies whether the ANI prefix digit is used.

Values:

- 0: ANI prefix digit is not needed.
- 1 [default]: ANI prefix digit is needed.

CDP_IN_ANI_MaxDigits

Description: Specifies the maximum number of ANI digits expected. ANI collection terminates if this value is reached.

Values: Default is 12 ANI digits.

CDP_IN_ANI_ST_Needed

Description: Specifies whether ANI digits are terminated by **CDP_IN_ANISTDigit**.

Values:

- 0: No termination digit added; ANI digits are terminated by the maximum number of digits set by **CDP_IN_ANI_MaxDigits**.
- 1 [default]: Termination digit added; ANI digits are terminated by the value set by **CDP_IN_ANISTDigit**.

CDP_IN_ANI_Type_Pre

Description: Specifies whether ANI digits are expected before generating the answer signal.

Values:

- 0: Do not expect ANI digits before the answer signal.
- 1 [default]: Expect ANI digits before the answer signal.

CDP_IN_ANI_WINK_Needed

Description: Specifies if a CAS_WINK signaling pattern should be generated immediately after the reception of the ANI digits.

Values:

- 0 [default]: Do not generate the CAS_WINK signaling pattern after ANI.
- 1: Generate the CAS_WINK signaling pattern after ANI.

CDP_IN_ANIKPDigit

Description: Specifies the ANI prefix digit. This parameter has no effect if **CDP_IN_ANI_KP_Needed** is set to 0.

Values: Default is *.

CDP_IN_ANISTDigit

Description: Specifies the ANI ST digit. This parameter has no effect if **CDP_IN_ANI_ST_Needed** is set to 0.

Values: Default is *.

CDP_IN_DialTone_Needed

Description: Specifies whether a dial tone should be generated after receiving a CAS_SEIZE to notify the CO that it can begin dialing.

Values:

- 0 [default]: Do not generate a dial tone.
- 1: Generate a dial tone.

CDP_IN_DNIS_BeforeANI

Description: Specifies whether dialed number identification service (DNIS) digits are received before ANI digits. This parameter is applicable only if **CDP_IN_DNIS_Enabled** is set to 1.

Values:

- 0 [default]: Receive the ANI digits before the DNIS digits.
- 1: Receive the DNIS digits before the ANI digits.

CDP_IN_DNIS_DigitType

Description: Determines the digit type for inbound DNIS digits.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

CDP_IN_DNIS_Enabled

Description: Enables DNIS collection. The DNIS digits are terminated either by **CDP_IN_DNISSTDigit** if **CDP_IN_DNIS_ST_Needed** is set to 1, or by the maximum number of digits set by **CDP_IN_DNIS_MaxDigits**.

Values:

- 0: DNIS collection not enabled.
- 1 [default]: DNIS collection enabled.

Guidelines: For Dialogic® DM3 boards, if DNIS is disabled, you also have to remove **feature_DNIS** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_ANI,feature_transfer"
```

CDP_IN_DNIS_KP_Needed

Description: Specifies whether the DNIS prefix digit is used.

Values:

- 0 [default]: DNIS prefix digit is not needed.
- 1: DNIS prefix digit is needed.

CDP_IN_DNIS_MaxDigits

Description: Defines the maximum number of DNIS digits.

Values: Default is 12 DNIS digits.

CDP_IN_DNIS_ST_Needed

Description: Specifies whether DNIS digits are terminated by **CDP_IN_DNISSTDigit**.

Values:

- 0: No termination digit added; DNIS digits are terminated by the maximum number of digits set by **CDP_IN_DNIS_MaxDigits**.
- 1 [default]: Termination digit added; DNIS digits are terminated by the value set by **CDP_IN_DNISSTDigit**.

CDP_IN_DNIS_WINK_Needed

Description: Specifies whether a CAS_WINK signaling pattern should be generated immediately after the reception of the DNIS digits.

Values:

- 0 [default]: Do not generate the CAS_WINK signaling pattern after DNIS.
- 1: Generate the CAS_WINK signaling pattern after DNIS.

CDP_IN_DNISKPDigit

Description: Specifies the DNIS prefix digit. This parameter has no effect if **CDP_IN_DNIS_KP_Needed** is set to 0.

Values: Default is *.

CDP_IN_DNISSTDigit

Description: Specifies the DNIS ST digit. This parameter has no effect if **CDP_IN_DNIS_ST_Needed** is set to 0.

Values: Default is *.

CDP_IN_EnableRingBack

Description: Specifies whether a ringback should be generated before answering a call. The number of rings generated is determined by the value passed by the **gc_AcceptCall( )** or **gc_AnswerCall( )** function.

Values:

- 0 [default]: Do not generate a ringback.
- 1: Generate a ringback.

CDP_IN_GetDigitTime

Description: Specifies the total time the protocol will wait for the digit collection process to complete (for both DNIS and ANI).

Values: Time in milliseconds. Default is 30000 (30 seconds).

Guidelines: The value of **CDP_IN_GetDigitTime** must be greater than the values of the **PSL_TONE_RECEIVEDIGITS_FIRSTDIGIT_TO** and **PSL_TONE_RECEIVEDIGITS_INTERDIGIT_TO** parameters.

CDP_IN_RemoteBlockingTimeout

Description: Provides the ability to detect remote blocking and specifies the time to wait before sending a GCEV_BLOCKED event indicating the remote end is out of service. This can be used in the case of call clearing from the local end, if the protocol does not receive the expected CAS idle signal from the remote end within the specified time

Values:

- 0 [default]: Disables detection of remote blocking.
- Time in milliseconds: Enables detection of remote blocking and sets the time-out period.

CDP_IN_ResumeCallTimeout

Note: The suspend/resume calls feature is supported on Dialogic DM3 boards only and requires one of the following Dialogic® System Releases: System Release 6.1 for Linux, System Release 6.0 CompactPCI for Windows® (with Feature Pack 1), and System Release 6.0 PCI for Windows® (with Service Update).

Note: The application should include *dm3cc_parm.h* when using this feature.

Description: Provides the ability to suspend and resume calls. When this parameter is enabled, a caller can hang up and then pick up again without having the call terminated. After receiving a disconnect from the remote end, the protocol must receive a CAS_RESUME within the specified time-out period to resume the call. (See Guidelines below for information about the CAS_RESUME signal.)

If **CDP_IN_ResumeCallTimeout** is enabled and the protocol receives a disconnect line signal from the remote end, the disconnect is not reported immediately. Instead, the protocol reports that the remote end has suspended the call, and starts the timer. The application receives a GCEV_EXTENSION event with an associated value PDKVAL_SUSPEND (0x50000). If the protocol receives the CAS_RESUME signal before the timer expires, the application is notified that the remote end has resumed the call through another GCEV_EXTENSION event with an associated value PDKVAL_RESUME (0x50001).

During this suspend and resume period, the call is still in the Connected state. If the timer expires before receiving the CAS_RESUME signal, the call will be disconnected and the application receives a GCEV_DISCONNECTED event.

Values:

- 0 [default]: Disables the suspend/resume feature.
- Time in milliseconds: Enables the suspend/resume feature and sets the time-out period in which the call can be resumed.

Guidelines: The signal pattern for resuming the call (that is, when the user picks up the phone again) can be defined by modifying the CAS_RESUME signal definition in the CDP file. By default, it is the same as CAS_SEIZE.

Within the application, the GCEV_EXTENSION event must be enabled. The **gc_SetConfigData( )** function is used to do this. For example:

```
LINEDEV linedev;
GC_PARM_BLK * t_parm_data_blkp = NULL;  /* must be initialized to 0 */
long t_requestID;

     gc_util_insert_parm_val(&t_parm_data_blkp, CCSET_EXTENSIONEVT_MSK, GCACT_ADDMSK,
sizeof(long), EXTENSIONEVT_SUSPEND_RESUME);
     if ( gc_SetConfigData(GCTGT_CCLIB_CHAN, linedev, t_parm_data_blkp, 0,
GCUPDATE_IMMEDIATE, &t_requestID, EV_ASYNC)  )
     {
          /* Error process */
     }
     gc_util_delete_parm_blk(t_parm_data_blkp);  /* Must be called to free the memory */
```

For more detailed information about Global Call functions and events, see the *Dialogic® Global Call API Programming Guide* and *Dialogic® Global Call API Library Reference*.

CDP_IN_WinkStart

Description: Specifies whether to generate a seizure acknowledgment CAS_WINK after receiving a CAS_SEIZE.

Values:

- 0: Immediate start.
- 1 [default]: Wink start.

CDP_MIN_CallLength

Description: Specifies the minimum length of time that an inbound or outbound call can be connected.

Values: Time in milliseconds. Default is 300 milliseconds.

CDP_Min_HangupTime

Description: Controls the amount of time after hangup during which the protocol will ignore any signaling transitions. It is primarily used to prevent a race condition where, after an outbound channel hangs up after the call has been delivered but before a call is connected, the remote inbound channel might answer anyway, and the ensuing transition can be interpreted as a CAS_SEIZE.

Values: Time in milliseconds. Default is 0.

Guidelines: This parameter is needed only if CAS_ANSWER and CAS_SEIZE transitions are the same, and usually only useful when running the protocol back to back, as most live switches would not attempt to answer a call that has been disconnected.

CDP_OUT_ANI_DigitType

Description: Determines the digit type for outbound ANI digits.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

CDP_OUT_ANI_Enabled

Description: Enables ANI generation.

Values:

- 0: ANI collection not enabled.
- 1 [default]: ANI collection enabled.

CDP_OUT_ANI_KP_Needed

Description: Specifies whether the ANI prefix digit is used.

Values:

- 0: ANI prefix digit is not needed.
- 1 [default]: ANI prefix digit is needed.

CDP_OUT_ANI_ST_Needed

Description: Specifies whether ANI digits are terminated by **CDP_OUT_ANISTDigit**.

Values:

- 0: No termination digit added.
- 1 [default]: Termination digit added.

CDP_OUT_ANI_Type_Pre

Description: Specifies whether ANI digits will be generated before the reception of an answer signal.

Values:

- 0: Do not generate ANI digits before the answer signal.
- 1 [default]: Generate ANI digits before the answer signal.

CDP_OUT_ANI_WINK_Needed

Description: Specifies whether a CAS_WINK signaling pattern should be received immediately after the generation of the ANI digits.

Values:

- 0 [default]: A CAS_WINK signaling pattern does not have to be received.
- 1: A CAS_WINK signaling pattern must be received.

CDP_OUT_ANIKPDigit

Description: Specifies the ANI prefix digit. This parameter has no effect if **CDP_OUT_ANI_KP_Needed** is set to 0.

Values: Default is *.

CDP_OUT_ANISTDigit

Description: Specifies the ANI ST digit. This parameter has no effect if **CDP_OUT_ANI_ST_Needed** is set to 0.

Values: Default is *.

CDP_OUT_ANIString

Description: Specifies the string used as the ANI digits if **CDP_OUT_ANI_Enabled** is set to 1.

Values: Default is 5678.

CDP_OUT_ConnectType

Description: Specifies the mode for outbound connection detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_OUT_DialTone_Needed

Description: Specifies whether a dial tone must be received after generating a CAS_SEIZE.

Values:

- 0 [default]: Do not receive a dial tone.
- 1: Receive a dial tone.

CDP_OUT_DialTone_Timeout

Description: Defines the time-out while waiting for a dial tone after a line seizure. This parameter is not used if **CDP_OUT_WinkStart** is set to 0.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_OUT_DNIS_BeforeANI

Description: Specifies whether DNIS digits are sent before ANI digits. This parameter is applicable only if **CDP_OUT_DNIS_Enabled** is set to 1.

Values:

- 0 [default]: Send the ANI digits before the DNIS digits.
- 1: Send the DNIS digits before the ANI digits.

CDP_OUT_DNIS_DigitType

Description: Determines the digit type for outbound DNIS digits.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

CDP_OUT_DNIS_Enabled

Description: Enables DNIS.

Values:

- 0: DNIS not enabled.
- 1 [default]: DNIS enabled.

CDP_OUT_DNIS_KP_Needed

Description: Specifies whether the DNIS prefix digit is used.

Values:

- 0 [default]: DNIS prefix digit is not needed.
- 1: DNIS prefix digit is needed.

CDP_OUT_DNIS_ST_Needed

Description: Specifies whether DNIS digits are terminated by **CDP_OUT_DNISSTDigit**.

Values:

- 0: No termination digit added.
- 1 [default]: Termination digit added.

CDP_OUT_DNIS_WINK_Needed

Description: Specifies whether a CAS_WINK signaling pattern should be received immediately after sending the DNIS digits.

Values:

- 0 [default]: The reception of a CAS_WINK signaling pattern is not required.
- 1: The reception of a CAS_WINK signaling pattern is required.

CDP_OUT_DNISKPDigit

Description: Specifies the DNIS prefix digit. This parameter has no effect if **CDP_OUT_DNIS_KP_Needed** is set to 0.

Values: Default is *.

CDP_OUT_DNISSTDigit

Description: Specifies the DNIS ST digit. This parameter has no effect if **CDP_OUT_DNIS_ST_Needed** is set to 0.

Values: Default is *.

CDP_OUT_EnableRingBack

Description: Specifies whether a ringback must be received before a call is answered. The number of rings is determined by the value passed by the **gc_AcceptCall( )** or **gc_AnswerCall( )** function.

Values:

- 0 [default]: Do not receive a ringback.
- 1: Receive a ringback.

CDP_OUT_SeizeAck_Timeout

Description: Specifies the time-out while waiting for a CAS_WINK after a line seizure.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_OUT_SeizeDelay

Description: Specifies the desired delay between a makecall and a line seize attempt.

Values: Time in milliseconds. Default is 1000 (1 second).

CDP_OUT_Send_Alerting_After_Dialing

Description: Determines when the protocol sends a GCEV_ALERTING event to the application.

Values:

- 0 [default]: GCEV_ALERTING is sent when ringback is detected.
- 1: If call progress analysis is disabled, GCEV_ALERTING is sent after dialing is completed. If call progress analysis is enabled, GCEV_ALERTING is sent after dialing is initiated.

CDP_OUT_WinkStart

Description: Specifies whether a CAS_WINK seizure acknowledgment must be received following the generation of a seize request.

Values:

- 0: Immediate start, that is, no wink required.
- 1 [default]: Wink start, that is, wink required.

CDP_SETUP_XFER_CPA

Description: Enables call progress analysis during supervised transfer.

Values:

- 0: Call progress analysis disabled during supervised transfer.
- 1 [default]: Call progress analysis enabled during supervised transfer.

CDP_SETUP_XFER_DIALTONE_TIMEOUT

Description: Defines the maximum time-out to wait for dial tone during a supervised transfer.

Values:

- Time in milliseconds. Default is 5000 (5 seconds).
- 0: Disables waiting for dial tone during a supervised transfer.

CDP_USE_DEFAULTANI

Description: Once **CDP_OUT_ANI_Enabled** is set, specifies whether to use **CDP_OUT_ANIString** for the ANI. Otherwise, the number set by the application is used.

Values:

- 0 [default]: The number set by the application is used for ANI.
- 1: Use **CDP_OUT_ANIString** for the ANI.

CDP_Xfer_DigitType

Description: Determines the digit type for transfers.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

Ecuador R2 Bidirectional Protocol Parameter Configuration 20

This chapter discusses the capabilities and parameters of the Ecuador R2 Bidirectional protocol in the following topics:

20.1 General Protocol Information

Protocol File Set

The files used with the Ecuador R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_ec_r2_io.cdp	pdk_ec_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_ec_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

20.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_ec_r2_io.cdp* file are:

- CAS_PULSE_DOUBLE_ANSWER (Inbound)
- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_DOUBLE_ANSWER_FLAG (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REANSWER_TIMEOUT (Outbound)
- CDP_RECV_CALL_EVENT_SENT_WITH_FIRST_ANSWER (Inbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)

- CDP_TrunkPrefixNumber

CAS_PULSE_DOUBLE_ANSWER (Inbound)

Description: Specifies the double answer signal. When answering a call, the double answer signal is sent to the CO to block collect calls. This parameter is valid is only if **CDP_DOUBLE_ANSWER_FLAG** is set to 1.

Values: Default is 0101, 1101, 900, 50, 900, 80, 1800, 2000, 2200.

Guidelines: The default double answer signal comprises the following:

- An initial answer signal with signaling bits AB = 01 for 1000 msec (signaling bits ABCD = 0101).
- A backward clear signal (signaling bits AB = 11) for 2000 msec (signaling bits ABCD = 1101).
- A return to answer state with signaling bits AB = 01 (signaling bits ABCD = 0101).

The eighth argument of this parameter is the time between the two answers. The seventh and ninth arguments should be set to approximately 90% and 110%, respectively, of argument number 8.

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Coin box or subscriber with charge metering
- 5: Telephone operator
- 6: Data transmission
- 11: C. P. T. P.
- 12: Special line
- 13: Mobile user
- 14: Virtual private network line
- 15: Special line

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_DOUBLE_ANSWER_FLAG (Inbound)

Description: Specifies whether to enable the double answer feature that is used to block collect calls.

Values:

- 0 [default]: Disable double answer feature.
- 1: Enable double answer feature.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1 [default]: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Chargeable (B-6)
- 7: Not chargeable (B-7)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/

/*
-----------------------------
Metering AS pulsed clear-back
-----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0: ANI collection is terminated by I-15 (end of dialing).
- Non-zero [default is 15]: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 7]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REANSWER_TIMEOUT (Outbound)

Description: Defines the amount of time the protocol should wait before sending a DISCONNECTED event to the application. This prevents the outbound side from getting disconnected when a double answer signal is received from the remote end in the connected state. For information about the double answer signal, see the **CAS_PULSE_DOUBLE_ANSWER** parameter.

Values:

- 0 [default]: Do not wait to report a DISCONNECTED event to the application when a remote DISCONNECT signal (CAS_CLEARBWD) line signal is received.
- Non-zero: Wait for the specified amount of time when receiving a DISCONNECT signal (CAS_CLEARBWD) before sending the DISCONNECTED event to the application. In the Connected state, receiving a DISCONNECT signal (CAS_CLEARBWD) from the remote end does not cause a transition to the Disconnected state immediately. If, during this period, the Answer (CAS_ANSWER) signal is received, no DISCONNECTED event is reported to the application and the protocol remains in the Connected state only.

Guidelines: A typical value should be slightly more than 2000 milliseconds, for example, 2500 milliseconds.

CDP_RECV_CALL_EVENT_SENT_WITH_FIRST_ANSWER (Inbound)

Description: Specifies if the call state is changed to CONNECTED after first or second answer. This parameter is valid only if **CDP_DOUBLE_ANSWER_FLAG** is set to 1.

Values:

- 0: Change the call state to the CONNECTED state after the second answer.
- 1 [default]: Change the call state to the CONNECTED state after the first answer.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

20.3 Tone and Tone Mask Parameters

Table 18 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 18. Tone and Tone Mask Parameters for Ecuador R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'5'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'9'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	
CDP_GrpA_SendANIAvailability	10	'5'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'A'	Restart sending DNIS digits.
CDP_GrpB_SIT	15	'2'	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'8'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'0'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'7'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.

Table 18. Tone and Tone Mask Parameters for Ecuador R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	As per specifications the digit I-15 (end of dialing) represents the end of dialing so this parameter is set to 32768 decimal (8000 Hex).
CDP_Grp1_RecvErrMask1	52	30721	As per specifications I-0, I-11 to I-14 are treated as errors so the value of this parameter is 30721 decimal (7801 Hex).
CDP_Grp1_TermToneMask2	53	36864	I-15 (end of Dialing) or I-12 (the requested information is not available) can terminate the compelled cycle, value is 36864 decimal (9000 Hex).
CDP_Grp1_RecvErrMask2	54	24577	As per specifications I-0, I-11, I-13, and I-14 are treated as errors.
CDP_Grp1_TermToneMask3	55	01026	As per specs I-1 or I-10 can terminate the compelled signaling cycle so the value of this parameter is 1026 decimal (0402 Hex).
CDP_Grp1_RecvErrMask3	56	64509	Any tone other than I-0, I-10 is treated as error so the value of this parameter is 64509 decimal (FBFD Hex).
CDP_Grp2_TermToneMask	57	63614	As per specifications the tones II-1 to II-6 and II-11 to II-15 are valid category tones so the value is 63614 decimal (F87E Hex).
CDP_Grp2_RecvErrMask	58	01921	As per specifications II-0, II-7 to II-10 are treated as errors so the value of this parameter is 1921 decimal (0781 Hex).
CDP_GrpA_TermToneMask1	59	00106	As per specifications, A-1, A-3, and A-5 can terminate the compelled signaling cycles of sending DNIS digits.
CDP_GrpA_TermToneMask2	60	00106	After Outgoing register shall send category digit, this compelled signaling sequence can be terminated either by A-5, in which case the incoming register would be requesting the calling party's number (ANI digits), or it may ask for the remaining DNIS digits by sending A-1 tone, or it can ask the category and change the meaning of next tones to groupB by sending A-3.
CDP_GrpA_TermToneMask3	61	00074	As per specifications, A-1, A-3, or A-6 can terminate the compelled signaling cycles of sending ANI digits.
CDP_GrpA_TermToneMask4	62	00074	

Table 18. Tone and Tone Mask Parameters for Ecuador R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_RecvErrMask1	63	63505	Tones A-1 to A-3 and A-5 to A-10 are considered OK. Any tone other than this will be error (see Specs). So this parameter will be equal to 63505 decimal (F811 Hex).
CDP_GrpA_RecvErrMask2	64	65429	Any tone other than A-1, A-3, A-5, or A-6 is treated as error.
CDP_GrpA_RecvErrMask3	65	65429	Only A-1, A-3, A-5, or A-6 is expected. Any other tone will be an error. So this parameter is set as 65429 decimal (FF95 Hex).
CDP_GrpA_RecvErrMask4	66	65431	Any tone other than A-3, A-5, or A-6 will indicate an error. So this parameter is set as 65431 decimal (FF97 Hex).
CDP_GrpA_RecvErrMask5	67	65429	Any tone other than A-1, A-3, A-5, or A-6 is treated as error.
CDP_GrpB_TermToneMask	68	00508	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: B-2 (Send << number changed >> recorded announcement) B-3 (Subscriber's Line Busy) B-4 (Congestion) B-5 (Unallocated National Number) B-6 (Subscriber's Line Free, Charge) B-7 (Subscriber's Line Free, No Charge) B-8 (Subscriber's Line Out of Service) So this parameter will be set to 508 decimal (01FC Hex).
CDP_GrpB_CallAnsweredTermToneMask	69	00192	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-6 or B-7 (Line Free Charge/NoCharge/Charge and call clearing is under the control of called subscriber)
CDP_GrpB_RecvErrMask	70	65027	Any tone out of B-0, B-1, B-9 to B-15 shall be considered as error. So this parameter is set as 65027 decimal (FE03 Hex).

Ericsson MD110 PBX Lineside E1 Bidirectional Protocol Parameter Configuration 21

This chapter discusses the capabilities and parameters of the Ericsson MD110 PBX Lineside E1 Bidirectional protocol in the following topics:

21.1 General Protocol Information

Protocol File Set

The files used with the Ericsson MD110 PBX Lineside E1 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_sw_e1_fxs_io.qs and pdk_sw_e1_fxs_io.hot (or pdk_sw_e1_fxs_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_sw_e1_fxs_io.psi
Country Dependent Parameters	pdk_sw_e1_ermx_io.cdp	pdk_sw_e1_ermx_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_sw_e1_ermx_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

After a call is transferred with **gc_SetUpTransfer( )**, you cannot issue a **gc_DropCall( )** on the original call. You must drop the consultation call before the original call can be dropped. The behavior of the protocol is undefined if you try to drop the original call without dropping the consultation call first.

21.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_e1_ermx_io.cdp* file are:

- CDP_BlindXferTime
- CDP_BlockOnLOOS
- CDP_ConnectOnNoDialTone (Outbound)
- CDP_ConnectOnNoRingBack (Outbound)
- CDP_DelayInDialling (Outbound)
- CDP_DialToneWaitTime (Outbound)
- CDP_MinPBXHangupTime (Inbound)
- CDP_PBXDiscEnabled
- CDP_ProtocolStopsOffhook
- CDP_ReconnectDelay
- CDP_WaitDialToneEnabled (Outbound)

CDP_BlindXferTime

Description: After sending the address digits on a BlindTransfer request, the protocol waits for the time specified by this parameter before sending CAS_ONHOOK and switching back to IDLE state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_BlockOnLOOS

Description: Allows the protocol to send out CAS_OFFHOOK to block the line whenever a channel is set out-of-service (by the application calling the **gc_SetChanState( )** function).

Note: The ability to block the line is not supported on all switches, so this parameter is disabled by default.

Values:

- 0 [default]: Do not send CAS_OFFHOOK when a channel is set out-of-service.
- 1: Send CAS_OFFHOOK when a channel is set out-of-service.

CDP_ConnectOnNoDialTone (Outbound)

Description: Determines how the protocol should proceed when dial tone is not detected. If the parameter is enabled (set to 1), and no dial tone is detected, a local collision with an inbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0: Do not assume local collision and disconnect the call if no dial tone is detected.
- 1 [default]: Assume local collision and connect the perceived inbound call if no dial tone is detected.

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1.

CDP_ConnectOnNoRingBack (Outbound)

Description: Determines how the protocol should proceed when no ringback tone is detected. If the parameter is enabled (set to 1), and no ringback is detected, a remote collision with a remote outbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0 [default]: Do not assume remote collision and disconnect the call if no ringback is detected.
- 1: Assume remote collision and connect the call if no ringback is detected.

CDP_DelayInDialling (Outbound)

Description: Specifies the delay time in dialing when the parameter **CDP_WaitDialToneEnabled** is not enabled.

Values: Default is 100.

CDP_DialToneWaitTime (Outbound)

Description: Defines the time that the protocol waits for a dial tone before an outbound call can be made.

Values: Time in milliseconds. Default is 5000 (5 seconds).

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1. If the time defined by this parameter is exceeded before dial tone is detected, the action taken depends on the value of the **CDP_ConnectOnNoDialTone** parameter as follows:

- If the **CDP_ConnectOnNoDialTone** parameter is set to 1, a local collision is assumed and the incoming call is connected.
- If the **CDP_ConnectOnNoDialTone** parameter is set to 0, the call attempt fails and a disconnect event is forwarded with a reason of no dial tone.

CDP_MinPBXHangupTime (Inbound)

Description: Specifies the length of the ring cycle and is used to determine if the remote end has dropped an incoming call. The timer is reset at the start of each ring cycle. If the timer expires

without resetting, ringing has been acknowledged to stop indicating the call was dropped, as the caller has abandoned the call before it was answered.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_PBXDiscEnabled

Description: Determines if the remote PBX can initiate call disconnection via CAS line signaling.

Values:

- 0: Disable call disconnect supervision, since it is not supported by the PBX.
- 1 [default]: Enable call disconnect supervision provided by the PBX.

CDP_ProtocolStopsOffhook

Description: Determines the state of the hook switch signaling (on-hook or off-hook) when the protocol stops after **gc_Close( )**.

Note: This parameter has no effect on Dialogic® DM3 boards, because the protocol is not stopped until the board is stopped.

Values:

- 0 [default]: Set the hook switch state to on-hook.
- 1: Set the hook switch state to off-hook.

CDP_ReconnectDelay

Description: Specifies the intentional delay before the primary call is back to the connected state after the consultation call is released.

Values: Time in milliseconds. Default is 0.

Guidelines: A 2-second delay is recommended for some switches.

CDP_WaitDialToneEnabled (Outbound)

Description: Determines if the protocol should wait for a dial tone before dialing. Note that this parameter does **not** apply to supervised transfers (consultation calls), in which case the dial tone is not verified.

Values:

- 0 [default]: Do not wait for dial tone before dialing.
- 1: Wait for dial tone before dialing.

Finland R2 Bidirectional Protocol Parameter Configuration 22

This chapter discusses the capabilities and parameters of the Finland R2 Bidirectional protocol in the following topics:

22.1 General Protocol Information

Protocol File Set

The files used with the Finland R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_fi_r2_io.cdp	pdk_fi_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_fi_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

22.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_fi_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0: Request (inbound) or send (outbound) ANI digits without area code.
- 1 [default]: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side (same as Calling Line Identification Rejected (CLIR)).
- 1: ANI digits with area code (ANIWITHAC) are sent to the inbound side (same as Calling Line Identification Permitted (CLIP)).

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Ordinary subscriber
- 2: Subscriber with priority
- 3: Test equipment
- 4: Pay phone
- 5: Telephone operator
- 6: Data subscriber
- 11: Redirect call
- 13: Digital connectivity required

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the

result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.

- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1: Line free, chargeable malicious call identification
- 6 [default]: Line free, chargeable (B-6)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/
```

```
/*
-----------------------------
Metering AS pulsed clear-back
-----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0: ANI collection is terminated by -15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 2]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is “#*”

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

22.3 Tone and Tone Mask Parameters

Table 19 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 19. Tone and Tone Mask Parameters for Finland R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'5'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'9'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	
CDP_GrpA_SendANIAvailability	10	'5'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'A'	Restart sending DNIS digits.

Table 19. Tone and Tone Mask Parameters for Finland R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_SIT	15	'2'	After any one of B-1 and B-6 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'8'	
CDP_GrpB_NormalClearing	20	'A'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'1'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'0'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	As per specifications the digit I-15 (end of dialing) represents the end of dialing so this parameter is set to 32768 decimal (8000 Hex).
CDP_Grp1_RecvErrMask1	52	30721	As per specifications I-0, I-11 to I-14 are treated as errors so the value of this parameter is 30721 decimal (7801 Hex).
CDP_Grp1_TermToneMask2	53	36864	I-15 (end of Dialing) or I-12 (the requested information is not available) can terminate the compelled cycle, value is 36864 decimal (9000 Hex).
CDP_Grp1_RecvErrMask2	54	24577	As per specifications I-0, I-13 and I-14 are treated as errors.
CDP_Grp1_TermToneMask3	55	01026	As per specs I-1 or I-10 can terminate the compelled signaling cycle so the value of this parameter is 1026 decimal (0402 Hex).
CDP_Grp1_RecvErrMask3	56	64509	Any tone other than I-0, I-10 is treated as error so the value of this parameter is 64509 decimal (FBFD Hex).
CDP_Grp2_TermToneMask	57	02302	As per specifications the tones II-1 to II-7 and II-11 are valid category tones so the value is 2302 decimal (8FE Hex).
CDP_Grp2_RecvErrMask	58	63233	As per specifications II-0, II-8 to II-10, and II-12 to II-15 are treated as errors so the value of this parameter is 63233 decimal (F701 Hex).

Table 19. Tone and Tone Mask Parameters for Finland R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_TermToneMask1	59	00042	As per specifications, A-1, A-3, and A-5 can terminate the compelled signaling cycles of sending DNIS digits. So the value is 42 decimal (002A Hex).
CDP_GrpA_TermToneMask2	60	00554	After Outgoing register shall send category digit, this compelled signaling sequence can be terminated either by A-5 or A-9, in which case the incoming register would be requesting the calling party's number (ANI digits), or it may ask for the remaining DNIS digits by sending A-1 tone, or it can ask the category and change the meaning of next tones to groupB by sending A-3. So this parameter will be set to 554 decimal (022A Hex).
CDP_GrpA_TermToneMask3	61	00010	As per specifications, A-1, A-3 can terminate the compelled signaling cycles of sending ANI digits.
CDP_GrpA_TermToneMask4	62	00010	
CDP_GrpA_RecvErrMask1	63	65043	Tones A-2 to A-3 and A-5 to A-8 are considered OK. Any tone other than this will be error (see Specs). So this parameter will be equal to 65043 decimal (FE13 Hex).
CDP_GrpA_RecvErrMask2	64	64981	Any tone other than A-1, A-3, A-5, or A-9 will be treated as error. So this parameter is set as 64981 decimal (FDD5 Hex).
CDP_GrpA_RecvErrMask3	65	64981	Only A-1, A-3, A-5, or A-9 is expected. Any other tone will be an error. So this parameter is set as 64981 decimal (FDD5 Hex).
CDP_GrpA_RecvErrMask4	66	64595	Any tone other than A-3 or A-5 will indicate an error.
CDP_GrpA_RecvErrMask5	67	64981	Any tone other than A-3, A-5, or A-9 will indicate an error. So this parameter is set as 64981 decimal (FDD5 Hex).

Table 19. Tone and Tone Mask Parameters for Finland R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_TermToneMask	68	01918	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: CDP_GrpB_SIT = '2' (send special information tone) CDP_GrpB_UserBusy = '3' (subscriber line busy) CDP_GrpB_NetworkCongestion = '4' (congestion) CDP_GrpB_UnAssignedNumber = '5' (unallocated number) CDP_GrpB_Rejected = '8' (subscriber line out of order) CDP_GrpB_NormalClearing = 'A' (subscriber number changed) CDP_GrpB_linefree_charge_ClearingFromInboundOnly = '1' (malicious call identification) CDP_GrpB_linefree_charge = '6' CDP_GrpB_linefree_nocharge = '0' So this parameter will be set to 1918 decimal (077E Hex).
CDP_GrpB_CallAnsweredTermToneMask	69	00066	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-1 or B-6 (Line Free Charge/NoCharge)
CDP_GrpB_RecvErrMask	70	63618	Any tone out of B-1, B-7, and B-11 to B-15 shall be considered as error. So this parameter is set as 63618 decimal (F882 Hex).

Hong Kong DTMF Bidirectional Protocol Parameter Configuration 23

This chapter discusses the capabilities and parameters of the Hong Kong DTMF Bidirectional protocol in the following topics:

23.1 General Protocol Information

Protocol File Set

The files used with the Hong Kong DTMF protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_hk_dtmf_io.qs and pdk_hk_dtmf_io.hot (or pdk_hk_dtmf_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_hk_dtmf_io.psi
Country Dependent Parameters	pdk_hk_dtmf_io.cdp	pdk_hk_dtmf_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_hk_dtmf_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

None.

23.2 Country Dependent Parameter Descriptions

The modifiable parameters in the *pdk_hk_dtmf_io.cdp* file are:

- CDP_ProtocolReset_Timeout
- CDP_R2CallScenario
- CDP_SEIZEACK_TIMEOUT

CDP_ProtocolReset_Timeout

Description: Defines the maximum time-out in milliseconds for input remotely or from the environment if a protocol reset is active. On expiration of this time-out, the application returns to the initial state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_R2CallScenario

Description: Specifies the R2 call scenario.

Values:

- 0: Line signaling without Delay Dial, DNIS, ANI
- 1: Delay Dial Method with DNIS (HKTA2017)
- 2 [default]: Delay Dial Method with DNIS, ANI (HKTA2018)

Guidelines: For Dialogic® DM3 boards, if ANI or DNIS is disabled, you also have to remove **feature_ANI** and/or **feature_DNIS** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_ANI,feature_CAT"
```

CDP_SEIZEACK_TIMEOUT

Description: Defines the maximum time-out in milliseconds for a CAS_ANSWER signal once the line is seized by sending a CAS_SEIZE. The remote end is expected to acknowledge the CAS_SEIZE event during this interval. If not, the outgoing call is considered to have failed.

Values: Time in milliseconds. Default is 10000 (10 seconds).

India R2 Bidirectional Protocol Parameter Configuration 24

This chapter discusses the capabilities and parameters of the India R2 Bidirectional protocol in the following topics:

24.1 General Protocol Information

Protocol File Set

The files used with the India R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_in_r2_io.cdp	pdk_in_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_in_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

24.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_in_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side (same as Calling Line Identification Rejected (CLIR)).
- 1: ANI digits with area code (ANIWITHAC) are sent to the inbound side (same as Calling Line Identification Permitted (CLIP)).

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Ordinary subscriber
- 2: Subscriber with priority
- 3: Maintenance equipment calls (may be used in the future)
- 4: STD (Subscriber's trunk dialing - equivalent to long distance call, may be used in the future)
- 5: Coin box (may be used in the future)
- 6: Telephone operator

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the

result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.

- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as “pulsed answer” and the first answer pulse should be treated as first metering pulse as well. (See the

description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in the establishment of a call.

Values:

- 6 [default]: Line free, chargeable (B-6)
- 7: Line free, not chargeable

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)

- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1 [default]: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/

/*
----------------------------
Metering AS pulsed clear-back
----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0: Indicates that category must be received after all DNIS digits are received.
- Non-zero [default is 1]: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0: ANI collection is terminated by I-15 (end of dialing).
- Non-zero [default is 7]: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 2]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. ‘f’ will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause ‘f’ to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

24.3 Tone and Tone Mask Parameters

Table 20 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 20. Tone and Tone Mask Parameters for India R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'4'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.

Table 20. Tone and Tone Mask Parameters for India R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_AddrCmpltCharge	07	‘6’	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	‘0’	Group A backward tone requesting the next ANI digit in case of “ANI has to be come with Area Code and Trunk Prefix Number”.
CDP_A_10	09	‘A’	A-10 (spare, reply with I-12).
CDP_GrpA_SendANIAvailability	10	‘4’	
CDP_GrpA_N_1	11	‘9’	Send N-1 tone.
CDP_GrpA_N_2	12	‘7’	Send N-2 tone.
CDP_GrpA_N_3	13	‘8’	Send N-3 tone.
CDP_GrpA_Restart	14	‘2’	Restart sending DNIS digits.
CDP_GrpB_SIT	15	‘2’	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	‘3’	
CDP_GrpB_NetworkCongestion	17	‘4’	
CDP_GrpB_UnAssignedNumber	18	‘5’	
CDP_GrpB_Rejected	19	‘0’	
CDP_GrpB_NormalClearing	20	‘0’	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	‘0’	
CDP_GrpB_linefree_charge	22	‘6’	
CDP_GrpB_linefree_nocharge	23	‘7’	
CDP_grp1_string_requestdenied	24	‘c’	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	‘c’	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	0	As per specifications, the inbound knows the number of digits to receive and the r2mfReq_receivetones is terminated by the maxtones parameter. So this parameter is set to 0.
CDP_Grp1_RecvErrMask1	52	63489	As per specifications, I-0, I-11 to I-15 are treated as errors so the value of this parameter is 63489 decimal (F801 Hex).

Table 20. Tone and Tone Mask Parameters for India R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp1_TermToneMask2	53	0	As per specifications, the inbound knows the number of digits to receive and the r2mfReq_receivetones is terminated by the maxtones parameter. So this parameter is set to 0.
CDP_Grp1_RecvErrMask2	54	0	As per specifications, the inbound knows the number of digits to receive and the r2mfReq_receivetones is terminated by the maxtones parameter. So this parameter is set to 0 (I-0,I-11 to I-15).
CDP_Grp1_TermToneMask3	55	01026	As per specs I-1 or I-10 can terminate the compelled signaling cycle so the value of this parameter is 1026 decimal (0402 Hex).
CDP_Grp1_RecvErrMask3	56	64509	Any tone other than I-0, I-10 is treated as error so the value of this parameter is 64509 decimal (FBFD Hex).
CDP_Grp2_TermToneMask	57	00038	As per specifications the tones II-1 to II-2 and II-5 are valid category tones so the value is 38 decimal (0026 Hex).
CDP_Grp2_RecvErrMask	58	65497	As per specifications except II-1, II-2, and II-5 other tones are treated as errors so the value of this parameter is 65497 decimal (FFD9 Hex).
CDP_GrpA_TermToneMask1	59	00058	As per specifications, A-1, A-3, A-4, and A-5 can terminate the compelled signaling cycles of sending DNIS digits. So the value is 58 decimal (003A Hex).
CDP_GrpA_TermToneMask2	60	00058	As per specifications, A-5, A-4, A-3, or A-1 can terminate the compelled signaling cycles of sending ANI availability digit. So this parameter will be set to 58 decimal (3A Hex).
CDP_GrpA_TermToneMask3	61	00026	This parameter will be set to 26 decimal (001A Hex).
CDP_GrpA_TermToneMask4	62	00026	
CDP_GrpA_RecvErrMask1	63	65089	Tones A-1 to A-5, A-7 and A-8 are considered OK. Any tone other than this will be error (see Specs). So this parameter will be equal to 65089 decimal (FE41 Hex).
CDP_GrpA_RecvErrMask2	64	65509	Any tone other than A-1, A-3, or A-4 will be treated as error. So this parameter is set as 65509 decimal (FFE5 Hex).
CDP_GrpA_RecvErrMask3	65	65477	Only A-1, A-3, A-4, or A-5 is expected. Any other tone will be an error. So this parameter is set as 65477 decimal (FFC5 Hex).
CDP_GrpA_RecvErrMask4	66	65509	Any tone other than A-1, A-3, or A-4 will indicate an error. So this parameter is set as 65509 decimal (FFE5 Hex).
CDP_GrpA_RecvErrMask5	67	65509	

Table 20. Tone and Tone Mask Parameters for India R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_TermToneMask	68	00252	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: CDP_GrpB_SIT = '2' (change number) CDP_GrpB_UserBusy = '3' (called line busy) CDP_GrpB_NetworkCongestion = '4' (congestion) CDP_GrpB_UnAssignedNumber = '5' (unallocated number) CDP_GrpB_Rejected = '0' CDP_GrpB_NormalClearing = '0' CDP_GrpB_linefree_charge_ClearingFromInboundOnly = '0' CDP_GrpB_linefree_charge = '6' (charge) CDP_GrpB_linefree_nocharge = '7' (no charge) So this parameter will be set to 252 decimal (00FC Hex).
CDP_GrpB_CallAnsweredTermToneMask	69	00192	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-6 or B-7 (Line Free Charge/NoCharge)
CDP_GrpB_RecvErrMask	70	65283	Any tone out of B-0, B-1, and B-8 to B-15 shall be considered as error. So this parameter is set as 65283 decimal (FF03 Hex).

Indonesia E&M Bidirectional Protocol Parameter Configuration 25

This chapter discusses the capabilities and parameters of the Indonesia E&M Bidirectional protocol in the following topics:

25.1 General Protocol Information

Protocol File Set

The files used with the Indonesia E&M protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_id_em_io.qs and pdk_id_em_io.hot (or pdk_id_em_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_id_em_io.psi
Country Dependent Parameters	pdk_id_em_io.cdp	pdk_id_em_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_id_em_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

None.

25.2 Country Dependent Parameter Descriptions

The modifiable parameters in the *pdk_id_em_io.cdp* file are:

- cdp_NANI
- cdp_NDNIS1
- cdp_NDNIS2
- CDP_ProtocolReset_Timeout
- CDP_R2CallScenario

- CDP_SEIZEACK_TIMEOUT

cdp_NANI

Description: Specifies the number of automatic number identification (ANI) digits.

Values: Default is 7 ANI digits.

cdp_NDNIS1

Description: Specifies the number of dialed number identification service (DNIS) digits received in the first of two sessions. The total number of DNIS (NDNIS) can possibly be received in two sessions, that is, NDNIS=NDNIS1+NDNIS2, where NDNIS1 is the number of DNIS received in the first session, and NDNIS2 is the number of DNIS received in the second session. Three R2 call scenarios are possible, depending on the value set for **CDP_R2CallScenario**:

- Call Scenario 1: DNIS and CAT (category) are received, where NDNIS=NDNIS1.
- Call Scenario 2: DNIS, CAT, ANI, and CAT are received, where NDNIS=NDNIS1.
- Call Scenario 3: DNIS1, CAT, ANI, DNIS2, and CAT are received, where NDNIS1 is a fixed number (such as 1, 2, ...).

Values: Default is 4 DNIS digits.

cdp_NDNIS2

Description: Specifies the number of DNIS digits received in the second of two sessions. The total number of DNIS (NDNIS) can possibly be received in two sessions, that is, NDNIS=NDNIS1+NDNIS2, where NDNIS1 is the number of DNIS received in the first session, and NDNIS2 is the number of DNIS received in the second session. Three R2 call scenarios are possible, depending on the value set for **CDP_R2CallScenario**:

- Call Scenario 1: DNIS and CAT (category) are received, NDNIS2 = 0.
- Call Scenario 2: DNIS, CAT, ANI, and CAT are received, NDNIS2 = 0.
- Call Scenario 3: DNIS1, CAT, ANI, DNIS2, and CAT are received, where NDNIS2 is a fixed known number or variable length.

Values: Default is 2 DNIS digits.

CDP_ProtocolReset_Timeout

Description: Defines the maximum time-out in milliseconds for input remotely or from the environment if a protocol reset is active. On expiration of this time-out, the application returns to the initial state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_R2CallScenario

Description: Specifies the R2 call scenario.

Values:

- 0: Line signaling only (that is, ITU-T Q.421 + Q.422)
- 1: DNIS+CAT
- 2 [default]: DNIS+CAT+ANI+CAT
- 3: DNIS1+CAT+ANI+DNIS2+CAT

Guidelines: For outbound only R2 protocol, call scenarios 1, 2, and 3 are automatically handled. So any value greater than or equal to 1 will enable R2 one signaling.

For Dialogic® DM3 boards, if ANI or DNIS is disabled, you also have to remove **feature_ANI** and/or **feature_DNIS** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_ANI,feature_CAT"
```

CDP_SEIZEACK_TIMEOUT

Description: Defines the maximum time-out in milliseconds for a CAS_SEIZEACK event once the line is seized by sending a CAS_SEIZE. The remote end is expected to acknowledge the CAS_SEIZE event during this interval. If not, the outgoing call is considered to have failed.

Values: Time in milliseconds. Default is 5000 (5 seconds).

Israel R2 Bidirectional Protocol Parameter Configuration 26

This chapter discusses the capabilities and parameters of the Israel R2 Bidirectional protocol in the following topics:

26.1 General Protocol Information

Protocol File Set

The files used with the Israel R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_il_r2_io.cdp	pdk_il_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_il_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

26.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_il_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side (same as Calling Line Identification Rejected (CLIR)).
- 1: ANI digits with area code (ANIWITHAC) are sent to the inbound side (same as Calling Line Identification Permitted (CLIP)).

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber (one of the Group II forward signals).

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 5: Telephone operator
- 6: Data subscriber
- 11: Subscriber with CNDB
- 12: VIS subscriber

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the

result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.

- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Line free, chargeable (B-6)
- 7: Line free, not chargeable

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/
```

```
/*
-----------------------------
Metering AS pulsed clear-back
-----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 2]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is “#*”

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

26.3 Tone and Tone Mask Parameters

Table 21 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 21. Tone and Tone Mask Parameters for Israel R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'9'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'0'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	A-10 (Spare, reply with I-12)
CDP_GrpA_SendANIAvailability	10	'0'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'0'	Restart sending DNIS digits.

Table 21. Tone and Tone Mask Parameters for Israel R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_SIT	15	'2'	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'8'	
CDP_GrpB_NormalClearing	20	'0'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'0'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'7'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	As per specifications the digit I-15 (end of dialing) represents the end of dialing so this parameter is set to 32768 decimal (8000 Hex).
CDP_Grp1_RecvErrMask1	52	30721	As per specifications I-0, I-11 to I-14 are treated as errors so the value of this parameter is 30721 decimal (7801 Hex).
CDP_Grp1_TermToneMask2	53	36864	I-15 (end of Dialing) or I-12 (the requested information is not available) can terminate the compelled cycle, value is 36864 decimal (9000 Hex).
CDP_Grp1_RecvErrMask2	54	26625	As per specifications I-0, I-11, I-13, and I-14 are treated as errors so the value of this parameter is 26625 decimal (6801 Hex).
CDP_Grp1_TermToneMask3	55	01026	As per specs I-1 or I-10 can terminate the compelled signaling cycle so the value of this parameter is 1026 decimal (0402 Hex).
CDP_Grp1_RecvErrMask3	56	64509	Any tone other than I-0, I-10 is treated as error so the value of this parameter is 64509 decimal (FBFD Hex).
CDP_Grp2_TermToneMask	57	02302	As per specifications the tones II-1 to II-3, II-4, II-7, and II-11 are valid category tones so the value is 2302 decimal (8FE Hex).
CDP_Grp2_RecvErrMask	58	59281	As per specifications II-0, II-4, II-7 to II-10, and II-13 to II-15 are treated as errors so the value of this parameter is 59281 decimal (E791 Hex).

Table 21. Tone and Tone Mask Parameters for Israel R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_TermToneMask1	59	01642	As per specifications, A-1, A-3, A-5, A-6, A-9, and A-10 can terminate the compelled signaling cycles of sending DNIS digits. So the value is 1642 decimal (066A Hex).
CDP_GrpA_TermToneMask2	60	01642	After Outgoing register shall send category digit, this compelled signaling sequence can be terminated either by A-9, in which case the incoming register would be requesting the calling party's number (ANI digits), or it may ask for the remaining DNIS digits by sending A-1 tone, or it can ask the category and change the meaning of next tones to groupB by sending A-3 or by A-6 address complete change groupB signal. So this parameter will be set to 1642 decimal (66A Hex).
CDP_GrpA_TermToneMask3	61	00010	As per specifications, A-1 or A-3 can terminate the compelled signaling cycles of sending ANI digits. This parameter will be set to 10 decimal (000A Hex).
CDP_GrpA_TermToneMask4	62	00010	
CDP_GrpA_RecvErrMask1	63	63505	Tones A-1 to A-3 and A-5 to A-10 are considered OK. Any tone other than this will be error (see Specs). So this parameter will be equal to 63505 decimal (F811 Hex).
CDP_GrpA_RecvErrMask2	64	63925	Any tone other than A-1, A-3, A-6, A-9, or A-10 will be treated as error. So this parameter is set as 63925 decimal (F9B5 Hex).
CDP_GrpA_RecvErrMask3	65	64981	Only A-1, A-3, A-5, or A-9 is expected. Any other tone will be an error. So this parameter is set as 64981 decimal (FDD5 Hex).
CDP_GrpA_RecvErrMask4	66	65495	Any tone other than A-3 or A-5 will indicate an error. So this parameter is set as 65495 decimal (FFD7 Hex).
CDP_GrpA_RecvErrMask5	67	65493	Any tone other than A-1, A-3, or A-5 will indicate an error. So this parameter is set as 65493 decimal (FFD5 Hex).

Table 21. Tone and Tone Mask Parameters for Israel R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_TermToneMask	68	00508	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: CDP_GrpB_SIT = '2' (Called number changed) CDP_GrpB_UserBusy = '3' (subscriber line busy) CDP_GrpB_NetworkCongestion = '4' (congestion) CDP_GrpB_UnAssignedNumber = '5' (unassigned number) CDP_GrpB_Rejected = '8' (subscriber line out of order) CDP_GrpB_NormalClearing = '0' CDP_GrpB_linefree_charge_ClearingFromInboundOnly = '0' CDP_GrpB_linefree_charge = '6' (line free charge) CDP_GrpB_linefree_nocharge = '7' (line free, do not charge) So this parameter will be set to 508 decimal (01FC Hex).
CDP_GrpB_CallAnsweredTermToneMask	69	00192	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-6 or B-7 (Line Free Charge/NoCharge)
CDP_GrpB_RecvErrMask	70	65027	Any tone out of B-0, B-1, B-9 to B-15 shall be considered as error. So this parameter is set as 65027 decimal (FE03 Hex).

Italy E1 Bidirectional Protocol Parameter Configuration 27

This chapter discusses the capabilities and parameters of the Italy E1 Bidirectional protocol in the following topics:

27.1 General Protocol Information

Protocol File Set

The files used with the Italy E1 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards†	Dialogic® Springware Boards
Protocol Module	pdk_it_e1_io.qs and pdk_it_e1_io.hot (or pdk_it_e1_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_it_e1_io.psi
Country Dependent Parameters	pdk_it_e1_io.cdp	pdk_it_e1_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable‡	pdk_it_e1_io

†Support on Dialogic® DM3 boards requires Dialogic® System Release Software 6.0 for PCI or later.
‡On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.

Protocol Limitations

From the Accepted state, the protocol used in this country does not support a forced release of the line; that is, issuing a **gc_DropCall( )** function after a **gc_AcceptCall( )** function. If a forced release is attempted, the function will fail and an error is returned. To recover, the application should issue a **gc_AnswerCall( )** function followed by **gc_DropCall( )** and **gc_ReleaseCall( )** functions. However, anytime a GCEV_DISCONNECTED event is received in the Accepted state, the **gc_DropCall( )** function can be issued.

27.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_it_e1_io.cdp* file are:

- CDP_ClearBwdTimeOut
- CDP_DNIS_ENABLED
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_NUM_OF_DNIS_DIGITS
- CDP_ProtocolReset_Timeout
- CDP_SeizeAck_Timeout
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

CDP_ClearBwdTimeOut

Description: Defines the maximum time in milliseconds for a backward signal to clear.

Values: Time in milliseconds. Default is 150 (0.150 seconds).

CDP_DNIS_ENABLED

Description: Enables or disables the reception of dialed number identification service (DNIS) digits.

Values:

- 0: Disable the reception of DNIS digits.

Note: Even if this parameter is set to 0, the first forward tone being received will be First DNIS digit only.

- 1 [default]: Enable the reception of DNIS digits.

Guidelines: The behavior of the protocol is not predictable if this parameter is set to a value other than 0 or 1.

For Dialogic® DM3 boards, if DNIS is disabled, you also have to remove **feature_DNIS** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS"
```

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_NUM_OF_DNIS_DIGITS

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected.

CDP_ProtocolReset_Timeout

Description: Defines the maximum time-out in milliseconds for input remotely or from the environment if a protocol reset is active. On expiration of this time-out, the application returns to the initial state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_SeizeAck_Timeout

Description: Defines the maximum time-out in milliseconds for a CAS_SEIZEACK event once the line is seized by sending a CAS_SEIZE. The remote end is expected to acknowledge the CAS_SEIZE event during this interval. If not, the outgoing call is considered to have failed.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is CPE on inbound only trunk or CO on outbound only trunk (that is, the protocol is acting as inbound only).

Korea GDS Lineside E1 Bidirectional Protocol Parameter Configuration

28

This chapter discusses the capabilities and parameters of the Korea GDS Lineside E1 Bidirectional protocol in the following topics:

28.1 General Protocol Information

Protocol File Set

The files used with the Korea GDS Lineside E1 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_sw_e1_gdsls_io.qs and pdk_sw_e1_gdsls_io.hot (or pdk_sw_e1_gdsls_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_sw_e1_gdsls_io.psi
Country Dependent Parameters	pdk_sw_e1_gdsls_io.cdp	pdk_sw_e1_gdsls_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_sw_e1_gdsls_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

None.

28.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_e1_gdsls_io.cdp* file are:

CAS Line Signals (FX or SA)

Description: The *pdk_sw_e1_gdsls_io.cdp* file includes two sets of CAS signal definitions, one for FX and the other for SA signals. Only one set should be enabled (uncommented). You need to comment out the other set.

Values: By default, the FX signals are enabled and the SA signals are commented out.

Guidelines: Look in the CDP file for **Definitions for FX** and **Definitions for SA**. Make sure that one set is uncommented and the other is commented.

CDP_BlindXferTime

Description: After sending the address digits on a BlindTransfer request, the protocol waits for the time specified by this parameter before sending CAS_ONHOOK and switching back to IDLE state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_BlockOnLOOS

Description: Allows the protocol to send out CAS_OFFHOOK to block the line whenever a channel is set out-of-service (by the application calling the **gc_SetChanState( )** function).

Note: The ability to block the line is not supported on all switches, so this parameter is disabled by default.

Values:

- 0 [default]: Do not send CAS_OFFHOOK when a channel is set out-of-service.
- 1: Send CAS_OFFHOOK when a channel is set out-of-service.

CDP_ConnectOnNoDialTone (Outbound)

Description: Determines how the protocol should proceed when dial tone is not detected. If the parameter is enabled (set to 1), and no dial tone is detected, a local collision with an inbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0: Do not assume local collision and disconnect the call if no dial tone is detected.
- 1 [default]: Assume local collision and connect the perceived inbound call if no dial tone is detected.

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1.

CDP_DelayInDialling (Outbound)

Description: Specifies the delay time in dialing when the parameter **CDP_WaitDialToneEnabled** is not enabled.

Values: Default is 100.

CDP_DialToneWaitTime (Outbound)

Description: Defines the time that the protocol waits for a dial tone before an outbound call can be made.

Values: Time in milliseconds. Default is 10000 (10 seconds).

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1. If the time defined by this parameter is exceeded before dial tone is detected, the action taken depends on the value of the **CDP_ConnectOnNoDialTone** parameter as follows:

- If the **CDP_ConnectOnNoDialTone** parameter is set to 1, a local collision is assumed and the incoming call is connected.
- If the **CDP_ConnectOnNoDialTone** parameter is set to 0, the call attempt fails and a disconnect event is forwarded with a reason of no dial tone.

CDP_MinPBXHangupTime (Inbound)

Description: Specifies the length of the ring cycle and is used to determine if the remote end has dropped an incoming call. The timer is reset at the start of each ring cycle. If the timer expires without resetting, ringing has been acknowledged to stop indicating the call was dropped, as the caller has abandoned the call before it was answered.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_RemoteBlockingTimeout

Description: Specifies the length of time to wait for before detecting if the remote side is out of service.

Values: Time in milliseconds. Default is 0, i.e., the feature is disabled.

CDP_SeizeAck_Timeout

Description: Defines the maximum time-out in milliseconds for a CAS_SEIZEACK event once the line is seized by sending a CAS_SEIZE. The remote end is expected to acknowledge the CAS_SEIZE event during this interval. If not, the outgoing call is considered to have failed.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_WaitDialToneEnabled (Outbound)

Description: Determines if the protocol should wait for a dial tone before dialing. Note that this parameter does **not** apply to supervised transfers (consultation calls), in which case the dial tone is not verified.

Values:

- 0 [default]: Do not wait for dial tone before dialing.
- 1: Wait for dial tone before dialing.

Korea GDS Network E1 Bidirectional Protocol Parameter Configuration

29

This chapter discusses the capabilities and parameters of the Korea GDS Network E1 Bidirectional protocol in the following topics:

29.1 General Protocol Information

Protocol File Set

The files used with the Korea GDS Network E1 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_sw_e1_gdssw_io.qs and pdk_sw_e1_gdssw_io.hot (or pdk_sw_e1_gdssw_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_sw_e1_gdssw_io.psi
Country Dependent Parameters	pdk_sw_e1_gdssw_io.cdp	pdk_sw_e1_gdssw_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_sw_e1_gdssw_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

This protocol is not guaranteed to conform to or be in compliance with any official switch specifications and should be used only for testing purposes.

29.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_e1_gdssw_io.cdp* file are:

- CAS Line Signals (FX or SA)
- CDP_DialToneEnabled (Inbound)
- CDP_NumDNISDigits (Inbound)
- CDP_OnHoldTime
- CDP_PBXDiscEnabled
- CDP_TERMINATINGMASK (Inbound)
- CDP_ToneGenStopTime (Inbound)

CAS Line Signals (FX or SA)

Description: The *pdk_sw_e1_gdssw_io.cdp* file includes two sets of CAS signal definitions, one for FX and the other for SA signals. Only one set should be enabled (uncommented). You need to comment out the other set.

Values: By default, the FX signals are enabled and the SA signals are commented out.

Guidelines: Look in the CDP file for **Definitions for FX** and **Definitions for SA**. Make sure that one set is uncommented and the other is commented.

CDP_DialToneEnabled (Inbound)

Description: Determines whether PBX sends dial tone before receiving the first dialed number identification service (DNIS) digit.

Values:

- 0 [default]: Do not send dial tone before receiving first DNIS.
- 1: Send dial tone before receiving first DNIS.

CDP_NumDNISDigits (Inbound)

Description: Specifies the number of DNIS digits to be received.

Values: Default is 4.

CDP_OnHoldTime

Description: Specifies the time a call can be kept in the ONHOLD state. If the call does not come to ACTIVE state during this time, it is dropped.

Values: Time in milliseconds. Default is 60000 (60 seconds).

CDP_PBXDiscEnabled

Description: Determines if the remote PBX can initiate call disconnection.

Values:

- 0: Disable call disconnect supervision, since it is not supported by the PBX.
- 1 [default]: Enable call disconnect supervision provided by the PBX.

CDP_TERMINATINGMASK (Inbound)

Description: Specifies the string of digits that can terminate the dialed string. On receiving a digit from this mask, the collection of address digits will stop.

Values: Default is "#"

CDP_ToneGenStopTime (Inbound)

Description: Specifies the time that the PBX should wait after stopping generation of ringback tone and before sending busy tone.

Values: Time in milliseconds. Default is 12000 (12 seconds).

Korea R2 Bidirectional Protocol Parameter Configuration 30

This chapter discusses the capabilities and parameters of the Korea R2 Bidirectional protocol in the following topics:

30.1 General Protocol Information

Protocol File Set

The files used with the Korea R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_kr_r2_io.cdp	pdk_kr_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_kr_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

30.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_kr_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Pay station (coin box)
- 5: Operator
- 6: Data transmission

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1 [default]: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the

result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.

- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as “pulsed answer” and the first answer pulse should be treated as first metering pulse as well. (See the

description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Line free, not chargeable
- 7: Line free, chargeable

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)

- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/

/*
----------------------------
Metering AS pulsed clear-back
----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. ‘f’ will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause ‘f’ to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

30.3 Tone and Tone Mask Parameters

Table 22 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 22. Tone and Tone Mask Parameters for Korea R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'5'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.

Table 22. Tone and Tone Mask Parameters for Korea R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'9'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	
CDP_GrpA_SendANIAvailability	10	'5'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'9'	Restart sending DNIS digits.
CDP_GrpB_SIT	15	'2'	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'8'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'0'	
CDP_GrpB_linefree_charge	22	'7'	
CDP_GrpB_linefree_nocharge	23	'6'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	36864	fedc ba98 7654 3210 Binary: 1001 0000 0000 0000 Hex: 9000 Decimal: 36864
CDP_Grp1_RecvErrMask1	52	26624	fedc ba98 7654 3210 Binary: 0110 1000 0000 0000 Hex: 6800 Decimal: 26624

Table 22. Tone and Tone Mask Parameters for Korea R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp1_TermToneMask2	53	36864	fedc ba98 7654 3210 Binary: 1001 0000 0000 0000 Hex: 9000 Decimal: 36864
CDP_Grp1_RecvErrMask2	54	26624	fedc ba98 7654 3210 Binary: 0110 1000 0000 0000 Hex: 6800 Decimal: 26624
CDP_Grp1_TermToneMask3	55	36864	fedc ba98 7654 3210 Binary: 1001 0000 0000 0000 Hex: 9000 Decimal: 36864
CDP_Grp1_RecvErrMask3	56	26624	fedc ba98 7654 3210 Binary: 0110 1000 0000 0000 Hex: 6800 Decimal: 26624
CDP_Grp2_TermToneMask	57	00126	fedc ba98 7654 3210 Binary: 0000 0000 0111 1110 Hex: 007E Decimal: 126
CDP_Grp2_RecvErrMask	58	65408	fedc ba98 7654 3210 Binary: 1111 1111 1000 0000 Hex: FF80 Decimal: 65408
CDP_GrpA_TermToneMask1	59	00120	fedc ba98 7654 3210 Binary: 0000 0000 0111 1000 Hex: 0078 Decimal: 120
CDP_GrpA_TermToneMask2	60	00106	fedc ba98 7654 3210 Binary: 0000 0000 0110 1010 Hex: 006A Decimal: 106
CDP_GrpA_TermToneMask3	61	00090	fedc ba98 7654 3210 Binary: 0000 0000 0101 1010 Hex: 005A Decimal: 90
CDP_GrpA_TermToneMask4	62	00090	fedc ba98 7654 3210 Binary: 0000 0000 0101 1010 Hex: 005A Decimal: 90

Table 22. Tone and Tone Mask Parameters for Korea R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_RecvErrMask1	63	64512	fedc ba98 7654 3210 Binary: 1111 1100 0000 0000 Hex: FC00 Decimal: 64512
CDP_GrpA_RecvErrMask2	64	65428	fedc ba98 7654 3210 Binary: 1111 1111 1001 0100 Hex: FF94 Decimal: 65428
CDP_GrpA_RecvErrMask3	65	65412	fedc ba98 7654 3210 Binary: 1111 1111 1000 0100 Hex: FF84 Decimal: 65412
CDP_GrpA_RecvErrMask4	66	65412	fedc ba98 7654 3210 Binary: 1111 1111 1000 0100 Hex: FF84 Decimal: 65412
CDP_GrpA_RecvErrMask5	67	65412	fedc ba98 7654 3210 Binary: 1111 1111 1000 0100 Hex: FF84 Decimal: 65412
CDP_GrpB_TermToneMask	68	00510	fedc ba98 7654 3210 Binary: 0000 0001 1111 1110 Hex: 01FE Decimal: 510
CDP_GrpB_CallAnsweredTermToneMask	69	00192	fedc ba98 7654 3210 Binary: 0000 0000 1100 0000 Hex: 00C0 Decimal: 192
CDP_GrpB_RecvErrMask	70	65024	fedc ba98 7654 3210 Binary: 1111 1110 0000 0000 Hex: FE00 Decimal: 65024

Korea T1/R2 Bidirectional Protocol Parameter Configuration 31

This chapter discusses the capabilities and parameters of the Korea T1/R2 Bidirectional protocol in the following topics:

31.1 General Protocol Information

Protocol File Set

The files used with the Korea T1/R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_kr_t1_r2_io.qs and pdk_kr_t1_r2_io.hot (or pdk_kr_t1_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_kr_t1_r2_io.psi
Country Dependent Parameters	pdk_kr_t1_r2_io.cdp	pdk_kr_t1_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_kr_t1_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

31.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_kr_t1_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Pay station (coin box)
- 5: Operator
- 6: Data transmission

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1 [default]: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the

result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.

- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Line free, not chargeable
- 7: Line free, chargeable

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 0xxx,1xxx,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 1xxx,0xxx,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0xxx,1xxx,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 0xxx,1xxx,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 1xxx,0xxx,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 11xx,01xx,50,150,0,250,190,200,210
*/
```

```
/*
-----------------------------
Metering AS pulsed clear-back
-----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 0xxx,1xxx,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 1xxx,0xxx,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 01xx,11xx,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

31.3 Tone and Tone Mask Parameters

Table 23 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 23. Tone and Tone Mask Parameters for Korea T1/R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'5'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'9'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	
CDP_GrpA_SendANIAvailability	10	'5'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'9'	Restart sending DNIS digits.

Table 23. Tone and Tone Mask Parameters for Korea T1/R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_SIT	15	'2'	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'8'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'0'	
CDP_GrpB_linefree_charge	22	'7'	
CDP_GrpB_linefree_nocharge	23	'6'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	36864	fedc ba98 7654 3210 Binary: 1001 0000 0000 0000 Hex: 9000 Decimal: 36864
CDP_Grp1_RecvErrMask1	52	26624	fedc ba98 7654 3210 Binary: 0110 1000 0000 0000 Hex: 6800 Decimal: 26624
CDP_Grp1_TermToneMask2	53	36864	fedc ba98 7654 3210 Binary: 1001 0000 0000 0000 Hex: 9000 Decimal: 36864
CDP_Grp1_RecvErrMask2	54	26624	fedc ba98 7654 3210 Binary: 0110 1000 0000 0000 Hex: 6800 Decimal: 26624
CDP_Grp1_TermToneMask3	55	36864	fedc ba98 7654 3210 Binary: 1001 0000 0000 0000 Hex: 9000 Decimal: 36864
CDP_Grp1_RecvErrMask3	56	26624	fedc ba98 7654 3210 Binary: 0110 1000 0000 0000 Hex: 6800 Decimal: 26624

Table 23. Tone and Tone Mask Parameters for Korea T1/R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp2_TermToneMask	57	00126	fedc ba98 7654 3210 Binary: 0000 0000 0111 1110 Hex: 007E Decimal: 126
CDP_Grp2_RecvErrMask	58	65408	fedc ba98 7654 3210 Binary: 1111 1111 1000 0000 Hex: FF80 Decimal: 65408
CDP_GrpA_TermToneMask1	59	00120	fedc ba98 7654 3210 Binary: 0000 0000 0111 1000 Hex: 0078 Decimal: 120
CDP_GrpA_TermToneMask2	60	00106	fedc ba98 7654 3210 Binary: 0000 0000 0110 1010 Hex: 006A Decimal: 106
CDP_GrpA_TermToneMask3	61	00090	fedc ba98 7654 3210 Binary: 0000 0000 0101 1010 Hex: 005A Decimal: 90
CDP_GrpA_TermToneMask4	62	00090	fedc ba98 7654 3210 Binary: 0000 0000 0101 1010 Hex: 005A Decimal: 90
CDP_GrpA_RecvErrMask1	63	64512	fedc ba98 7654 3210 Binary: 1111 1100 0000 0000 Hex: FC00 Decimal: 64512
CDP_GrpA_RecvErrMask2	64	65428	fedc ba98 7654 3210 Binary: 1111 1111 1001 0100 Hex: FF94 Decimal: 65428
CDP_GrpA_RecvErrMask3	65	65412	fedc ba98 7654 3210 Binary: 1111 1111 1000 0100 Hex: FF84 Decimal: 65412
CDP_GrpA_RecvErrMask4	66	65412	fedc ba98 7654 3210 Binary: 1111 1111 1000 0100 Hex: FF84 Decimal: 65412

Table 23. Tone and Tone Mask Parameters for Korea T1/R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_RecvErrMask5	67	65412	fedc ba98 7654 3210 Binary: 1111 1111 1000 0100 Hex: FF84 Decimal: 65412
CDP_GrpB_TermToneMask	68	00510	fedc ba98 7654 3210 Binary: 0000 0001 1111 1110 Hex: 01FE Decimal: 510
CDP_GrpB_CallAnsweredTermToneMask	69	00192	fedc ba98 7654 3210 Binary: 0000 0000 1100 0000 Hex: 00C0 Decimal: 192
CDP_GrpB_RecvErrMask	70	65024	fedc ba98 7654 3210 Binary: 1111 1110 0000 0000 Hex: FE00 Decimal: 65024

Kuwait R2 Bidirectional Protocol Parameter Configuration 32

This chapter discusses the capabilities and parameters of the Kuwait R2 Bidirectional protocol in the following topics:

32.1 General Protocol Information

Protocol File Set

The files used with the Kuwait R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_mx_r2_io.qs and pdk_mx_r2_io.hot (or pdk_mx_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_mx_r2_io.psi
Country Dependent Parameters	pdk_kw_r2_io.cdp	pdk_kw_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_kw_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

None.

32.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_kw_r2_io.cdp* file are:

- CDP_ANI_ENABLED
- CDP_ANI_MaxDigits
- CDP_CallingPartyCategory_3
- CDP_CallingPartyCategory_6
- CDP_ConnectType (Outbound)
- CDP_DNIS_DIGITS_BEFORE_ANI
- CDP_DNIS_ENABLED
- CDP_DNIS_MaxDigits
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_NUM_OF_ANI_DIGITS
- CDP_NUM_OF_DNIS_DIGITS
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

CDP_ANI_ENABLED

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_ANI,feature_CAT,feature_Billing,feature_MoreDNIS"
```

CDP_ANI_MaxDigits

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_CallingPartyCategory_3

Description: Specifies the category of the calling subscriber, II(3).

Values:

- 1 [default]: Operator with offering facility
- 2: Normal subscriber
- 3: Reserve
- 4: Reserve
- 5: ATME equipment
- 6: Maintenance equipment
- 7: Reserve
- 8: Reserve - interception operator
- 9-15: Reserve

CDP_CallingPartyCategory_6

Description: Specifies the category of the calling subscriber, II(6).

Values:

- 1: Reserve
- 2: Normal subscriber
- 3 [default]: Box
- 4: Time and cost
- 5: Reserve - equipment ATME
- 6: Maintenance equipment
- 7: Share - 2
- 8: Share - 3
- 9: Share - 1
- 10: Reserve - Operator without possibility of offer
- 11-15: Reserve

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the

result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.

- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DNIS_DIGITS_BEFORE_ANI

Description: Determines the number of dialed number identification service (DNIS) digits that are to be received before any ANI digits are received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digit(s) are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that ANI digits must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before ANI digits are received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_DNIS_ENABLED

Description: Enables or disables the reception of DNIS digits.

Values:

- 0: Disable the reception of DNIS digits.
- 1 [default]: Enable the reception of DNIS digits.

Guidelines: Even if this parameter is set to 0, the first forward tone received will be the first DNIS digit only.

The behavior of the protocol is not predictable if this parameter is set to a value other than 0 or 1.

For Dialogic® DM3 boards, if DNIS is disabled, you also have to remove **feature_DNIS** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_ANI,feature_CAT,feature_Billing,feature_MoreDNIS"
```

CDP_DNIS_MaxDigits

Description: Specifies the maximum number of DNIS digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1 [default]: Line free, chargeable
- 6: Line free, not chargeable

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_NUM_OF_ANI_DIGITS

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by III-15 tone.
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by III-15 tone.
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. ‘f’ will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause ‘f’ to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

32.3 Tone and Tone Mask Parameters

Table 24 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 24. Tone and Tone Mask Parameters for Kuwait R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	A-1 (see specs). Group A backward signal requesting next Group I DNIS digit.
CDP_GrpA_N_1	02	'2'	A-2 (see specs). Send Group I first digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	A-3 (see specs). This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendCAT_6	04	'6'	A-6 (see specs). Group A backward signal requesting Group II(6) and change to reception of Group C (ANI digits).
CDP_GrpA_SendOnErr	05	'4'	A-4 and B-4 (see specs). These tones are sent to forward register in case of error during exchange of tones: congestion.
CDP_GrpB_SendOnErr	06	'4'	
CDP_GrpC_SendOnErr	07	'4'	

Table 24. Tone and Tone Mask Parameters for Kuwait R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_grpB_linefree_charge	08	'1'	B-1 to 6 (see specs). This tone is sent on receipt of category for Group II. After this tone, sequence of R2MF tone exchange is over and call is through. This is the last R2MF tone in establishment of a call.
CDP_grpB_EngagedSubs	09	'2'	
CDP_grpB_InterruptedSubs	10	'3'	
CDP_grpB_Blockade	11	'4'	
CDP_grpB_linefree_nocharge	12	'5'	
CDP_grpB_ResFree	13	'6'	
CDP_GrpC_SendANI	14	'1'	C-1
CDP_GrpC_AddrCmpltChgGpB	15	'3'	C-3 (see specs). This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpC_SendNextDNIS	16	'5'	C-5 (see specs). This tone is sent on receipt of ANI, Group III signals.This signal is sent to receive the next partial DNIS digit and results in the changeover to Group A signals.
CDP_GrpC_SendFirstDNIS	17	'0'	This tone is sent on receipt of ANI, Group III signals.This signal is sent to receive the next partial DNIS digit and results in the changeover to Group A signals.
Mask Parameters			
CDP_Grp1_TermTonemask	51	32768	The incoming end needs to either know the number of DNIS digits, or I-15 will terminate the DNIS digits reception.
CDP_Grp1_RecvErrMask	52	30721	I-0, I-11 to I-14 tones are assumed as errors. In case of conflict, set this parameter accordingly. The default value of this parameter is (7801 Hex => 30721 decimal).
CDP_Grp2_6_TermTonemask	53	00988	For II (6): As per specifications, the tones 2 to 4 and 6 to 9 are valid category tones so this parameter is equal to 988 decimal (03DC Hex). For II (3): As per specifications, the tones 1 to 6 are valid category tones so this parameter is equal to 126 decimal (007E Hex).
CDP_Grp2_3_TermTonemask	54	00126	
CDP_Grp2_6_RecvErrMask	55	64547	For II (6): As per specifications, tones 0, 1, 5, and 10 to 15 are treated as error so the value of this parameter is 64547 decimal (FC23 Hex.). For II (3): As per specifications, tones 0 and 7 to 15 are treated as errors so the value of this parameter is 65409 decimal (FF81 Hex.).
CDP_Grp2_3_RecvErrMask	56	65409	
CDP_Grp3_TermToneMask	57	32768	The incoming would either know the number of ANI digits or will be terminated by III-15. So this parameter is set to 32768 decimal (8000 Hex).

Table 24. Tone and Tone Mask Parameters for Kuwait R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp3_RecvErrMask	58	30721	As per specifications I-0, I-11 to I-14 are treated as errors so the value of this parameter is 30721 decimal (7801 Hex.).
CDP_GrpA_TermToneMask1	59	00074	For DNIS (Group I): As per specifications, A-1, A-3, and A-6 can terminate the compelled signaling cycles of sending DNIS digits.
CDP_GrpA_TermToneMask2	60	00042	For CAT_6 (Group II-6): After outgoing register shall send category digit, this compelled signaling sequence can be terminated by C-1, A-3, or C-5, in which case the incoming register would be requesting the calling party's number (ANI digits). If it does not have ANI it will just send I-15.
CDP_GrpA_RecvErrMask1	61	65457	For DNIS (Group I): Tones A-1 to A-3, and A-6 are considered OK. Any tone other than this will be error, i.e., A-0, A-4, A-5, and A-7 to A-15 are erroneous. So this parameter will be equal to 65457 decimal (FFB1 Hex).
CDP_GrpA_RecvErrMask2	62	65493	For CAT_6 (Group II-6): Any tone other than C-1, A-3, and C5 will be treated as error.
CDP_GrpB_TermToneMask	63	00126	After Outgoing register shall send category digit, this compelled signaling sequence can be terminated by B-1 to B-6 signals = 007E (hex) = 126 (decimal).
CDP_GrpB_RecvErrMask	64	65409	Tones B-1 to B-6 shall be considered OK. The rest are considered error. = FF81 (hex) = 65409 (decimal).
CDP_GrpB_CallAnsweredTermToneMask	65	00034	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-1 or B-5 (Line Free Charge/No Charge) Value = 0022 (hex) = 34 (decimal).
CDP_GrpC_TermToneMask3	66	00108	For ANI (Group III): As per specifications, C-2 (Send FirstGpI ChangeTo GpA), C-3 (Send GpII ChangeTo GpB), C-5 (Send NextGpI ChangeTo GpA), or C-6 (Send SameGpIII ChangeTo GpA) can terminate the compelled signaling cycles of sending ANI digits. So this parameter will be set to 108 decimal (006C Hex.).
CDP_GrpC_TermToneMask4	67	00008	For partial DNIS (Group I): As per specifications, A-3 can terminate the compelled signaling cycles of sending partial DNIS digits. So this parameter will be set to 8 decimal (0008 Hex).

Table 24. Tone and Tone Mask Parameters for Kuwait R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpC_RecvErrMask3	68	65425	For ANI (Group III): C-1, C-2, C-3, C-5, or C-6 is OK. Any other tone will be an error. So this parameter is set as 65425 decimal (FF91 Hex).
CDP_GrpC_RecvErrMask4	69	65525	For partial DNIS (Group I): A-1 or A-3 is OK. Any other tone will be an error So this parameter is set as 65525 decimal (FFF5 Hex).

Lebanon R2 Bidirectional Protocol Parameter Configuration 33

This chapter discusses the capabilities and parameters of the Lebanon R2 Bidirectional protocol in the following topics:

33.1 General Protocol Information

Protocol File Set

The files used with the Lebanon R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_lb_r2_io.cdp	pdk_lb_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_lb_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

33.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_lb_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 10.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Coin box or subscriber with charge metering
- 5: Telephone operator
- 6: Data transmission
- 11: C. P. T. P.
- 12: Special line
- 13: Mobile user
- 14: Virtual private network line
- 15: Special line

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the

result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.

- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Chargeable (B-6)
- 7: Not chargeable (B-7)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)

- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/

/*
----------------------------
Metering AS pulsed clear-back
----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. ‘f’ will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause ‘f’ to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0 [default]: GCEV_ALERTING is sent after receiving a ringback tone.
- 1: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

33.3 Tone and Tone Mask Parameters

Table 25 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 25. Tone and Tone Mask Parameters for Lebanon R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'9'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.

Table 25. Tone and Tone Mask Parameters for Lebanon R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'5'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'0'	A-10 (spare, reply with I-12_.
CDP_GrpA_SendANIAvailability	10	'5'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'0'	Restart sending DNIS digits.
CDP_GrpB_SIT	15	'2'	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'0'	
CDP_GrpB_NormalClearing	20	'8'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'1'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'7'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	As per specifications the digit I-15 (end of dialing) represents the end of dialing so this parameter is set to 32768 decimal (8000 Hex).
CDP_Grp1_RecvErrMask1	52	30721	As per specifications I-0, I-11 to I-14 are treated as errors so the value of this parameter is 30721 decimal (7801 Hex).
CDP_Grp1_TermToneMask2	53	36864	I-15 (end of Dialing) or I-12 (the requested information is not available) can terminate the compelled cycle, value is 36864 decimal (9000 Hex).

Table 25. Tone and Tone Mask Parameters for Lebanon R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp1_RecvErrMask2	54	30721	As per specifications I-0, I-11 to I-14 are treated as errors so the value of this parameter is 30721.
CDP_Grp1_TermToneMask3	55	36864	I-15 (end of dialing) or I-12 (the requested information is not available) can terminate the compelled cycle, so the value of this parameter is 36864 decimal (9000 Hex).
CDP_Grp1_RecvErrMask3	56	28671	Any tone other than I-0 to I-11 and I-13, I-14 are treated as errors.
CDP_Grp2_TermToneMask	57	8190	As per specifications the tones II-1 to II-12 are valid category tones.
CDP_Grp2_RecvErrMask	58	57344	Any tone other than II-1 to II-12 are considered as error tones.
CDP_GrpA_TermToneMask1	59	616	As per specifications, A-3, A-5, A-6, and A-9 can terminate the compelled signaling cycles of sending DNIS digits. So this parameter will be set to 616 decimal.
CDP_GrpA_TermToneMask2	60	618	As per specifications, A-9, A-6, A-5, A-3, or A-1 can terminate the compelled signaling cycles of sending ANI availability digit. So this parameter will be set to 618 decimal.
CDP_GrpA_TermToneMask3	61	74	As per specifications, A-1, A-3, A-6 can terminate the compelled signaling cycles of sending ANI digits.
CDP_GrpA_TermToneMask4	62	74	
CDP_GrpA_RecvErrMask1	63	64528	Tones A-0 to A-3 and A-5 to A-9 are considered OK. Any tone other than this will be error (see Specs). So this parameter will be equal to 64528 decimal.
CDP_GrpA_RecvErrMask2	64	64512	Any tone other than A-10 to A-15 will be treated as error. So this parameter is set as 64512 decimal.
CDP_GrpA_RecvErrMask3	65	64512	
CDP_GrpA_RecvErrMask4	66	64512	
CDP_GrpA_RecvErrMask5	67	64512	
CDP_GrpB_TermToneMask	68	511	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: B-7 (Subscriber's Line Free, No Charge) B-1 (ClearingFromInboundOnly) B-3 (Subscriber's Line Busy) B-4 (Congestion) B-2 (SIT) B-6 (Subscriber's Line Free, Charge) B-0 (Subscriber's Line Out of Service) So this parameter will be set to 511 decimal.

Table 25. Tone and Tone Mask Parameters for Lebanon R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_CallAnsweredTermToneMask	69	192	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-6 or B-7 (Line Free Charge/NoCharge)
CDP_GrpB_RecvErrMask	70	65024	Any tone out of B-9 to B-15 shall be considered as error. So this parameter is set as 65024 decimal.

Lithuania R2 Bidirectional Protocol Parameter Configuration 34

This chapter discusses the capabilities and parameters of the Lithuania R2 Bidirectional protocol in the following topics:

34.1 General Protocol Information

Protocol File Set

The files used with the Lithuania R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_lt_r2_io.cdp	pdk_lt_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_lt_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

34.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_lt_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Coin box or subscriber with charge metering
- 5: Telephone operator
- 6: Data transmission
- 11: C. P. T. P.
- 12: Special line
- 13: Mobile user
- 14: Virtual private network line
- 15: Special line

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the

result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.

- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Chargeable (B-6)
- 7: Not chargeable (B-7)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/
```

```
/*
-----------------------------
Metering AS pulsed clear-back
-----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0 [default]: GCEV_ALERTING is sent after receiving a ringback tone.
- 1: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

34.3 Tone and Tone Mask Parameters

Table 26 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 26. Tone and Tone Mask Parameters for Lithuania R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'5'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'0'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'0'	
CDP_GrpA_SendANIAvailability	10	'0'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'0'	Restart sending DNIS digits.

Table 26. Tone and Tone Mask Parameters for Lithuania R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_SIT	15	'2'	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'8'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'0'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'7'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	
CDP_Grp1_RecvErrMask1	52	30720	
CDP_Grp1_TermToneMask2	53	32768	
CDP_Grp1_RecvErrMask2	54	30720	
CDP_Grp1_TermToneMask3	55	32768	
CDP_Grp1_RecvErrMask3	56	30720	
CDP_Grp2_TermToneMask	57	2030	
CDP_Grp2_RecvErrMask	58	63504	
CDP_GrpA_TermToneMask1	59	00042	As per specifications, A-1, A-3, A-5, and A-9 can terminate the compelled signaling cycles of sending DNIS digits. So the value is 42 decimal (002A Hex).
CDP_GrpA_TermToneMask2	60	00042	After Outgoing register shall send category digit, this compelled signaling sequence can be terminated either by A-5, in which case the incoming register would be requesting the calling party's number (ANI digits), or it may ask for the remaining DNIS digits by sending A-1 tone, or it can ask the category and change the meaning of next tones to groupB by sending A-3. So this parameter will be set to 42 decimal (002A Hex).

Table 26. Tone and Tone Mask Parameters for Lithuania R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_TermToneMask3	61	00010	As per specifications, A-1, A-3 can terminate the compelled signaling cycles of sending ANI digits. This parameter will be set to 10 decimal (000A Hex).
CDP_GrpA_TermToneMask4	62	00010	
CDP_GrpA_RecvErrMask1	63	65041	
CDP_GrpA_RecvErrMask2	64	65493	Any tone other than A-1, A-3, or A-5 will be treated as error. Only A-1, A-3, or A-5 is expected. Any other tone will be an error. So this parameter is set as 65493 decimal (FFD5 Hex).
CDP_GrpA_RecvErrMask3	65	65493	
CDP_GrpA_RecvErrMask4	66	65495	Any tone other than A-3 or A-5 will indicate an error. So this parameter is set as 65495 decimal (FFD7 Hex).
CDP_GrpA_RecvErrMask5	67	65493	Any tone other than A-1, A-3, or A-5 will indicate an error. So this parameter is set as 65493 decimal (FFD5 Hex).
CDP_GrpB_TermToneMask	68	00508	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: B-2 (Send << number changed >> recorded announcement) B-3 (Subscriber's Line Busy) B-4 (Congestion) B-5 (Unallocated National Number) B-6 (Subscriber's Line Free, Charge) B-7 (Subscriber's Line Free, No Charge) B-8 (Subscriber's Line Out of Service) So this parameter will be set to 508 decimal (01FC Hex).
CDP_GrpB_CallAnsweredTermToneMask	69	00192	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-6 or B-7 (Line Free Charge/NoCharge)
CDP_GrpB_RecvErrMask	70	65027	Any tone out of B-0, B-1, B-9 to B-15 shall be considered as error. So this parameter is set as 65027 decimal (FE03 Hex).

Lucent Lineside E1 Bidirectional Protocol Parameter Configuration 35

This chapter discusses the capabilities and parameters of the Lucent Lineside E1 Bidirectional protocol in the following topics:

35.1 General Protocol Information

Protocol File Set

The files used with the Lucent Lineside E1 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_sw_e1_fxs_io.qs and pdk_sw_e1_fxs_io.hot (or pdk_sw_e1_fxs_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_sw_e1_fxs_io.psi
Country Dependent Parameters	pdk_sw_e1_luls_io.cdp	pdk_sw_e1_luls_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_sw_e1_luls_io

†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.

Protocol Limitations

After a call is transferred with **gc_SetUpTransfer( )**, you cannot issue a **gc_DropCall( )** on the original call. You must drop the consultation call before the original call can be dropped. The behavior of the protocol is undefined if you try to drop the original call without dropping the consultation call first.

35.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_e1_luls_io.cdp* file are:

- CDP_BlindXferTime
- CDP_BlockOnLOOS
- CDP_ConnectOnNoDialTone (Outbound)
- CDP_ConnectOnNoRingBack (Outbound)
- CDP_DelayInDialling (Outbound)
- CDP_DialToneWaitTime (Outbound)
- CDP_MinPBXHangupTime (Inbound)
- CDP_OnhookTime (Outbound)
- CDP_PBXDiscEnabled
- CDP_ProtocolStopsOffhook
- CDP_ReconnectDelay
- CDP_WaitDialToneEnabled (Outbound)

CDP_BlindXferTime

Description: After sending the address digits on a BlindTransfer request, the protocol waits for the time specified by this parameter before sending CAS_ONHOOK and switching back to IDLE state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_BlockOnLOOS

Description: Allows the protocol to send out CAS_OFFHOOK to block the line whenever a channel is set out-of-service (by the application calling the **gc_SetChanState( )** function).

Note: The ability to block the line is not supported on all switches, so this parameter is disabled by default.

Values:

- 0 [default]: Do not send CAS_OFFHOOK when a channel is set out-of-service.
- 1: Send CAS_OFFHOOK when a channel is set out-of-service.

CDP_ConnectOnNoDialTone (Outbound)

Description: Determines how the protocol should proceed when dial tone is not detected. If the parameter is enabled (set to 1), and no dial tone is detected, a local collision with an inbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0: Do not assume local collision and disconnect the call if no dial tone is detected.
- 1 [default]: Assume local collision and connect the perceived inbound call if no dial tone is detected.

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1.

CDP_ConnectOnNoRingBack (Outbound)

Description: Determines how the protocol should proceed when no ringback tone is detected. If the parameter is enabled (set to 1), and no ringback is detected, a remote collision with a remote outbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0 [default]: Do not assume remote collision and disconnect the call if no ringback is detected.
- 1: Assume remote collision and connect the call if no ringback is detected.

CDP_DelayInDialling (Outbound)

Description: Specifies the delay time in dialing when the parameter **CDP_WaitDialToneEnabled** is not enabled.

Values: Default is 100.

CDP_DialToneWaitTime (Outbound)

Description: Defines the time that the protocol waits for a dial tone before an outbound call can be made.

Values: Time in milliseconds. Default is 10000 (10 seconds).

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1. If the time defined by this parameter is exceeded before dial tone is detected, the action taken depends on the value of the **CDP_ConnectOnNoDialTone** parameter as follows:

- If the **CDP_ConnectOnNoDialTone** parameter is set to 1, a local collision is assumed and the incoming call is connected.
- If the **CDP_ConnectOnNoDialTone** parameter is set to 0, the call attempt fails and a disconnect event is forwarded with a reason of no dial tone.

CDP_MinPBXHangupTime (Inbound)

Description: Specifies the length of the ring cycle and is used to determine if the remote end (that is, the PBX) has dropped an incoming call. The timer is reset at the start of each ring cycle. If the timer expires without resetting, ringing has been acknowledged to stop indicating the PBX has dropped the call, as the caller has abandoned the call before it was answered.

Values: Time in milliseconds. Default is 5000 (5 seconds).

Guidelines: The value of this parameter is typically set to 6 seconds, which corresponds to the complete ring cycle (2 seconds on and 4 seconds of silence).

CDP_OnhookTime (Outbound)

Description: If Lineside E1 is outbound only and starts in the off-hook state, it remains in the off-hook state until it receives a **gc_MakeCall( )**. This parameter specifies the time during which Lineside E1 should remain on-hook before processing the **gc_MakeCall( )**.

Values: Time in milliseconds. Default is 500 (0.5 seconds).

CDP_PBXDiscEnabled

Description: Determines if the remote PBX can initiate call disconnection via CAS line signaling.

Values:

- 0: Disable call disconnect supervision, since it is not supported by the PBX.
- 1 [default]: Enable call disconnect supervision provided by the PBX.

CDP_ProtocolStopsOffhook

Description: Determines the state of the hook switch signaling (on-hook or off-hook) when the protocol stops after **gc_Close( )**.

Note: This parameter has no effect on Dialogic® DM3 boards, because the protocol is not stopped until the board is stopped.

Values:

- 0 [default]: Set the hook switch state to on-hook.
- 1: Set the hook switch state to off-hook.

CDP_ReconnectDelay

Description: Specifies the intentional delay before the primary call is back to the connected state after the consultation call is released.

Values: Time in milliseconds. Default is 0.

Guidelines: A 2-second delay is recommended for some switches.

CDP_WaitDialToneEnabled (Outbound)

Description: Determines if the protocol should wait for a dial tone before dialing. Note that this parameter does **not** apply to supervised transfers (consultation calls), in which case the dial tone is not verified.

Values:

- 0 [default]: Do not wait for dial tone before dialing.
- 1: Wait for dial tone before dialing.

Malaysia R2 Bidirectional Protocol Parameter Configuration 36

This chapter discusses the capabilities and parameters of the Malaysia R2 Bidirectional protocol in the following topics:

36.1 General Protocol Information

Protocol File Set

The files used with the Malaysia R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_my_r2_io.cdp	pdk_my_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_my_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

36.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_my_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1: Operator with trunk offering
- 2 [default]: Ordinary subscriber
- 3: CCB unit free
- 4: Multicoin CCB
- 5: STD CCB
- 6: Test equipment
- 7: Subscriber with priority
- 8: Interception operator
- 9: Data transmission
- A: Reserved for operator initiated call with forward transfer facility (international)

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the

result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.

- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1 [default]: Called party free, with metering
- 5: Called party free, without metering

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/
```

```
/*
-----------------------------
Metering AS pulsed clear-back
-----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

36.3 Tone and Tone Mask Parameters

Table 27 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 27. Tone and Tone Mask Parameters for Malaysia R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'6'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'6'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'0'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'9'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	
CDP_GrpA_SendANIAvailability	10	'5'	
CDP_GrpA_N_1	11	'8'	Send N-1 tone.
CDP_GrpA_N_2	12	'9'	Send N-2 tone.
CDP_GrpA_N_3	13	'0'	Send N-3 tone.
CDP_GrpA_Restart	14	'2'	Restart sending DNIS digits.

Table 27. Tone and Tone Mask Parameters for Malaysia R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_SIT	15	'0'	After Group B tone is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through.
CDP_GrpB_UserBusy	16	'2'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'3'	
CDP_GrpB_Rejected	19	'4'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'6'	
CDP_GrpB_linefree_charge	22	'1'	
CDP_GrpB_linefree_nocharge	23	'5'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	fedc ba98 7654 3210 Binary: 1000 0000 0000 0000 Hex: 8000 Decimal: 32768
CDP_Grp1_RecvErrMask1	52	0	fedc ba98 7654 3210 Binary: 0000 0000 0000 0000 Hex: 0000 Decimal: 0
CDP_Grp1_TermToneMask2	53	36864	fedc ba98 7654 3210 Binary: 1001 0000 0000 0000 Hex: 9000 Decimal: 36864
CDP_Grp1_RecvErrMask2	54	0	fedc ba98 7654 3210 Binary: 0000 0000 0000 0000 Hex: 0000 Decimal: 0
CDP_Grp1_TermToneMask3	55	32768	fedc ba98 7654 3210 Binary: 1000 0000 0000 0000 Hex: 8000 Decimal: 32768
CDP_Grp1_RecvErrMask3	56	0	fedc ba98 7654 3210 Binary: 0000 0000 0000 0000 Hex: 0000 Decimal: 0

Table 27. Tone and Tone Mask Parameters for Malaysia R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp2_TermToneMask	57	02046	fedc ba98 7654 3210 Binary: 0000 0111 1111 1110 Hex: 07FE Decimal: 2046
CDP_Grp2_RecvErrMask	58	63488	fedc ba98 7654 3210 Binary: 1111 1000 0000 0000 Hex: F800 Decimal: 63488
CDP_GrpA_TermToneMask1	59	00088	fedc ba98 7654 3210 Binary: 0000 0000 0101 1000 Hex: 0058 Decimal: 88
CDP_GrpA_TermToneMask2	60	00074	fedc ba98 7654 3210 Binary: 0000 0000 0100 1010 Hex: 004A Decimal: 74
CDP_GrpA_TermToneMask3	61	00090	fedc ba98 7654 3210 Binary: 0000 0000 0101 1010 Hex: 005A Decimal: 90
CDP_GrpA_TermToneMask4	62	00090	fedc ba98 7654 3210 Binary: 0000 0000 0101 1010 Hex: 005A Decimal: 90
CDP_GrpA_RecvErrMask1	63	64512	fedc ba98 7654 3210 Binary: 1111 1100 0000 0000 Hex: FC00 Decimal: 64512
CDP_GrpA_RecvErrMask2	64	65300	fedc ba98 7654 3210 Binary: 1111 1111 0001 0100 Hex: FF14 Decimal: 65300
CDP_GrpA_RecvErrMask3	65	65284	fedc ba98 7654 3210 Binary: 1111 1111 0000 0100 Hex: FF04 Decimal: 65284
CDP_GrpA_RecvErrMask4	66	65284	fedc ba98 7654 3210 Binary: 1111 1111 0000 0100 Hex: FF04 Decimal: 65284

Table 27. Tone and Tone Mask Parameters for Malaysia R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_RecvErrMask5	67	65284	fedc ba98 7654 3210 Binary: 1111 1111 0000 0100 Hex: FF04 Decimal: 65284
CDP_GrpB_TermToneMask	68	00126	fedc ba98 7654 3210 Binary: 0000 0000 0111 1110 Hex: 007E Decimal: 126
CDP_GrpB_CallAnsweredTermToneMask	69	00098	fedc ba98 7654 3210 Binary: 0000 0000 0110 0010 Hex: 0062 Decimal: 98
CDP_GrpB_RecvErrMask	70	65408	fedc ba98 7654 3210 Binary: 1111 1111 1000 0000 Hex: FF80 Decimal: 65408

MELCAS Lineside Bidirectional Protocol Parameter Configuration 37

This chapter discusses the capabilities and parameters of the MELCAS Lineside Bidirectional protocol in the following topics:

37.1 General Protocol Information

Protocol File Set

The files used with the MELCAS Lineside protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_sw_e1_mcls_io.qs and pdk_sw_e1_mcls_io.hot (or pdk_sw_e1_mcls_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_sw_e1_mcls_io.psi
Country Dependent Parameters	pdk_sw_e1_mcls_io.cdp	pdk_sw_e1_mcls_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_sw_e1_mcls_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

None.

37.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_e1_mcls_io.cdp* file are:

- CDP_BT_PostDialDelay
- CDP_BT_PreDialDelay
- CDP_ByPassHookFlashOnConsultationDrop
- CDP_ByPassHookFlashOnTransfer
- CDP_ConnectType (Outbound)
- CDP_Dialtone_Timeout
- CDP_DTMF_DIALING (Outbound)
- CDP_ReconnectDelay
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_ST_DialTone_Enabled
- CDP_xfer_CPA_Enabled

CDP_BT_DialTone_Enabled

Description: Determines whether the protocol waits for dial tone when it receives a blind transfer command from the application.

Values:

- 0 [default]: After receiving a blind transfer command, the protocol will not wait for dial tone, and will start dialing.
- 1: After receiving a blind transfer command, the protocol will expect dial tone from the switch, and will wait for dial tone before starting to dial the digits.

CDP_BT_PostDialDelay

Description: Defines the time that the protocol waits for sending CAS_clearfwd signal after sending digits to the switch.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_BT_PreDialDelay

Description: Defines the time that the protocol waits for sending digits after receiving a blind transfer command.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_ByPassHookFlashOnConsultationDrop

Description: Permits the protocol to bypass signaling a hookflash when dropping a consultation call. When enabled, no hookflash CAS signaling is sent and only applicable state changes are delivered to the application.

Values:

- 0 [default]: Parameter is disabled.
- 1: Parameter is enabled.

Guidelines: Normally, this parameter should be disabled. It should be enabled only when all consultation calls are assumed to initiate the disconnect.

CDP_ByPassHookFlashOnTransfer

Description: Permits the protocol to bypass signaling a hookflash when initiating either a supervised or unsupervised transfer via **gc_SetUpTransfer( )** or **gc_BlindTransfer( )** respectively. When enabled, no hookflash CAS signaling is sent and only applicable state changes are delivered to the application.

Values:

- 0 [default]: Parameter is disabled.
- 1: Parameter is enabled.

Guidelines: Normally, this parameter should be disabled.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_Dialtone_Timeout

Description: Defines the time that the protocol waits for dial tone from the remote end. This will be ignored if **CDP_ST_DialTone_Enabled** and **CDP_BT_DialTone_Enabled** are set to 0.

If the time defined by this parameter is exceeded before dial tone is detected, the protocol will change the call state to fail with reason nodialtone.

Values: Time in milliseconds. Default is 10000 (10 seconds).

CDP_DTMF_DIALING (Outbound)

Description: Specifies whether digits are dialed in DTMF format or pulse format.

Values:

- 0: Pulse format
- 1 [default]: DTMF format

CDP_ReconnectDelay

Description: Specifies the intentional delay before the primary call is back to the connected state after the consultation call is released.

Values: Time in milliseconds. Default is 0.

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_ST_DialTone_Enabled

Description: Determines whether the protocol waits for dial tone when it receives a supervised transfer command from the application.

Values:

- 0 [default]: After receiving a supervised transfer command, the protocol will not wait for dial tone, and will start dialing.
- 1: After receiving a supervised transfer command, the protocol will expect dial tone from the switch, and will wait for dial tone before starting to dial the digits.

CDP_xfer_CPA_Enabled

Description: Specifies whether to enable call analysis for transfer calls. This parameter determines whether pre- and post-call analysis are required for the consultation call.

Values:

- 0: Do not enable call analysis for transfer calls.
- 1 [default}: Enable call analysis for transfer calls.

MELCAS Network Bidirectional Protocol Parameter Configuration 38

This chapter discusses the capabilities and parameters of the MELCAS Network Bidirectional protocol in the following topics:

38.1 General Protocol Information

Protocol File Set

The files used with the MELCAS Network protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_sw_e1_mcsw_io.qs and pdk_sw_e1_mcsw_io.hot (or pdk_sw_e1_mcsw_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_sw_e1_mcsw_io.psi
Country Dependent Parameters	pdk_sw_e1_mcsw_io.cdp	pdk_sw_e1_mcsw_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_sw_e1_mcsw_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

This protocol is not guaranteed to conform to or be in compliance with any official switch specifications and should be used only for testing purposes.

38.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_e1_mcsw_io.cdp* file are:

- CDP_DTMF_DIALING (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_TERM_TONE_STRING (Inbound)
- TONE_BUSY
- TONE_RINGBACK

CDP_DTMF_DIALING (Inbound)

Description: Specifies whether digits are dialed in DTMF format or pulse format.

Values:

- 0: Pulse format
- 1 [default]: DTMF format

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected.

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_TERM_TONE_STRING (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is used only when **CDP_DTMF_DIALING** is set to 1.

Typically, the dialed digits are received until a tone corresponding to the characters specified in this string is received, or until **CDP_NUM_OF_DNIS_DIGITS** digits are received.

Values: Default is "#"

TONE_BUSY

Description: When a call is rejected (dropped) in the OFFERED state with a reason other than GC_NORMAL_CLEARING, the protocol sends this tone. In case of

GC_NORMAL_CLEARING, the call is cleared by sending cas_disc_clr and then cas_idle line signals on the line.

Values: Default is 400,40,0,0,-17,0,150,50,400,100,0,1

Guidelines: See Table 28 for the meaning of each argument of a tone definition.

TONE_RINGBACK

Description: Specifies the ringback tone for this protocol.

Values: Default is 600,60,0,0,-17,0,100,50,400,100,1,1

Guidelines: See Table 28 for the meaning of each argument of a tone definition.

Table 28. TONE_t Signal Definition Parameters

Parameter Number	Name	Description	Detect/ Generate	Edge/Cadence Detection
1	Frequency 1	Frequency of first tone (in Hertz)	Detect, Generate	Edge, Cadence
2	Frequency 1 deviation	Frequency deviation for first tone (in Hertz)	Detect	Edge, Cadence
3	Frequency 2	Frequency of second tone (in Hertz)	Detect, Generate	Edge, Cadence
4	Frequency 2 deviation	Frequency deviation for second tone (in Hertz)	Detect	Edge, Cadence
5	Amplitude 1	Amplitude of first tone (in dB)	Generate	Neither
6	Amplitude 2	Amplitude of second tone (in dB)	Generate	Neither
7	On time	On duration (in milliseconds) **Note:** The minimum recommended value is 50.	Detect, Generate	Cadence
8	On time deviation	On time deviation (in milliseconds) **Note:** The minimum recommended value is 50.	Detect	Cadence
9	Off time	Off duration (in milliseconds) **Note:** The minimum recommended value is 50.	Detect, Generate	Cadence
10	Off time deviation	Off time deviation (in milliseconds) **Note:** The minimum recommended value is 50.	Detect	Cadence

Table 28. TONE_t Signal Definition Parameters (Continued)

Parameter Number	Name	Description	Detect/ Generate	Edge/Cadence Detection
11	Mode	Detection notification: • 1 for the onset of the tone. This specifies leading edge in edge detection mode and onset of cadence detection in cadence detection mode. • 0 for the termination of the tone. This specifies trailing edge in edge detection mode and the termination of the cadence after the specified number of cycles in cadence detection mode.	Detect	Edge, Cadence
12	Repeat count	Repetition count (the number of repetitions on cycles)	Detect, Generate	Cadence

Mexico R2 Bidirectional Protocol Parameter Configuration 39

This chapter discusses the capabilities and parameters of the Mexico R2 Bidirectional protocol in the following topics:

39.1 General Protocol Information

Protocol File Set

The files used with the Mexico R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_mx_r2_io.qs and pdk_mx_r2_io.hot (or pdk_mx_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_mx_r2_io.psi
Country Dependent Parameters	pdk_mx_r2_io.cdp	pdk_mx_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_mx_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

None.

39.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_mx_r2_io.cdp* file are:

- CDP_ANI_ENABLED
- CDP_ANI_MaxDigits
- CDP_CallingPartyCategory_3
- CDP_CallingPartyCategory_6
- CDP_ConnectType (Outbound)
- CDP_DNIS_DIGITS_BEFORE_ANI
- CDP_DNIS_ENABLED
- CDP_DNIS_MaxDigits
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GrpB_Tone
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_NUM_OF_ANI_DIGITS
- CDP_NUM_OF_DNIS_DIGITS
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

CDP_ANI_ENABLED

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_ANI,feature_CAT,feature_Billing,feature_MoreDNIS"
```

CDP_ANI_MaxDigits

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_CallingPartyCategory_3

Description: Specifies the category of the calling subscriber, II(3).

Values:

- 1 [default]: Operator with offering facility
- 2: Normal subscriber
- 3: Reserve
- 4: Reserve
- 5: ATME equipment
- 6: Maintenance equipment
- 7: Reserve
- 8: Reserve - interception operator
- 9-15: Reserve

CDP_CallingPartyCategory_6

Description: Specifies the category of the calling subscriber, II(6).

Values:

- 1: Reserve
- 2: Normal subscriber
- 3 [default]: Box
- 4: Time and cost
- 5: Reserve - equipment ATME
- 6: Maintenance equipment
- 7: Share - 2
- 8: Share - 3
- 9: Share - 1
- 10: Reserve - Operator without possibility of offer
- 11-15: Reserve

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the

result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.

- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DNIS_DIGITS_BEFORE_ANI

Description: Determines the number of dialed number identification service (DNIS) digits that are to be received before any ANI digits are received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digit(s) are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that ANI digits must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before ANI digits are received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_DNIS_ENABLED

Description: Enables or disables the reception of DNIS digits.

Values:

- 0: Disable the reception of DNIS digits.
- 1 [default]: Enable the reception of DNIS digits.

Guidelines: Even if this parameter is set to 0, the first forward tone received will be the first DNIS digit only.

The behavior of the protocol is not predictable if this parameter is set to a value other than 0 or 1.

For Dialogic® DM3 boards, if DNIS is disabled, you also have to remove **feature_DNIS** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_ANI,feature_CAT,feature_Billing,feature_MoreDNIS"
```

CDP_DNIS_MaxDigits

Description: Specifies the maximum number of DNIS digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GrpB_Tone

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1 [default]: Line free, chargeable
- 6: Line free, not chargeable

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_NUM_OF_ANI_DIGITS

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by III-15 tone.
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by III-15 tone.
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0 [default]: Disables overlap sending. ‘f’ will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause ‘f’ to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

39.3 Tone and Tone Mask Parameters

Table 29 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 29. Tone and Tone Mask Parameters for Mexico R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	A-1 (see specs). Group A backward signal requesting next Group I DNIS digit.
CDP_GrpA_N_1	02	'2'	A-2 (see specs). Send Group I first digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	A-3 (see specs). This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendCat_6	04	'6'	A-6 (see specs). Group A backward signal requesting Group II(6) and change to reception of Group C (ANI digits).
CDP_GrpA_SendOnErr	05	'4'	A-4 and B-4 (see specs). These tones are sent to forward register in case of error during exchange of tones: congestion.
CDP_GrpB_SendOnErr	06	'4'	
CDP_GrpC_SendOnErr	07	'4'	

Table 29. Tone and Tone Mask Parameters for Mexico R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_linefree_charge	08	'1'	B-1 to 6 (see specs). This tone is sent on receipt of category for Group II. After this tone, sequence of R2MF tone exchange is over and call is through. This is the last R2MF tone in establishment of a call.
CDP_GrpB_EngagedSubs	09	'2'	
CDP_GrpB_InterruptedSubs	10	'3'	
CDP_GrpB_Blockade	11	'4'	
CDP_GrpB_linefree_nocharge	12	'5'	
CDP_GrpB_ResFree	13	'6'	
CDP_GrpC_SendANI	14	'1'	C-1
CDP_GrpC_AddrCmpltChgGpB	15	'3'	C-3 (see specs). This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpC_SendNextDNIS	16	'5'	C-5 (see specs). This tone is sent on receipt of ANI, Group III signals.This signal is sent to receive the next partial DNIS digit and results in the changeover to Group A signals.
CDP_GrpC_SendFirstDNIS	17	'0'	This tone is sent on receipt of ANI, Group III signals.This signal is sent to receive the next partial DNIS digit and results in the changeover to Group A signals.
Mask Parameters			
CDP_Grp1_TermToneMask	51	32768	The incoming end needs to either know the number of DNIS digits, or I-15 will terminate the DNIS digits reception.
CDP_Grp1_RecvErrMask	52	30721	I-0, I-11 to I-14 tones are assumed as errors. In case of conflict, set this parameter accordingly. The default value of this parameter is (7801 Hex => 30721 decimal).
CDP_Grp2_6_TermToneMask	53	00988	For II (6): As per specifications, the tones 2 to 4 and 6 to 9 are valid category tones so this parameter is equal to 988 decimal (03DC Hex). For II (3): As per specifications, the tones 1 to 6 are valid category tones so this parameter is equal to 126 decimal (007E Hex).
CDP_Grp2_3_TermToneMask	54	00126	
CDP_Grp2_6_RecvErrMask	55	64547	For II (6): As per specifications, tones 0, 1, 5 and 10 to 15 are treated as error so the value of this parameter is 64547 decimal (FC23 Hex.). For II (3): As per specifications, tones 0 and 7 to 15 are treated as errors so the value of this parameter is 65409 decimal (FF81 Hex.).
CDP_Grp2_3_RecvErrMask	56	65409	
CDP_Grp3_TermToneMask	57	32768	The incoming would either know the number of ANI digits or will be terminated by III-15. So this parameter is set to 32768 decimal (8000 Hex).

Table 29. Tone and Tone Mask Parameters for Mexico R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp3_RecvErrMask	58	30721	As per specifications I-0, I-11 to I-14 are treated as errors so the value of this parameter is 30721 decimal (7801 Hex.).
CDP_GrpA_TermToneMask1	59	00074	For DNIS (Group I): As per specifications, A-1, A-3, and A-6 can terminate the compelled signaling cycles of sending DNIS digits.
CDP_GrpA_TermToneMask2	60	00042	For CAT_6 (Group II-6): After Outgoing register shall send category digit, this compelled signaling sequence can be terminated by C-1, A-3, or C-5, in which case the incoming register would be requesting the calling party's number (ANI digits). If it does not have ANI it will just send I-15.
CDP_GrpA_RecvErrMask1	61	65457	For DNIS (Group I): Tones A-1 to A-3, and A-6 are considered OK. Any tone other than this will be error, i.e., A-0, A-4, A-5, and A-7 to A-15 are erroneous. So this parameter will be equal to 65457 decimal (FFB1 Hex).
CDP_GrpA_RecvErrMask2	62	65493	For CAT_6 (Group II-6): Any tone other than C-1, A-3, and C5 will be treated as error.
CDP_GrpB_TermToneMask	63	00126	After Outgoing register shall send category digit, this compelled signaling sequence can be terminated by B-1 to B-6 signals = 007E (hex) = 126 (decimal).
CDP_GrpB_RecvErrMask	64	65409	Tones B-1 to B-6 shall be considered OK. The rest are considered error. = FF81 (hex) = 65409 (decimal).
CDP_GrpB_CallAnsweredTermToneMask	65	00034	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-1 or B-5 (Line Free Charge/No Charge) Value = 0022 (hex) = 34 (decimal).
CDP_GrpC_TermToneMask3	66	00108	For ANI (Group III): As per specifications, C-2 (Send FirstGpI ChangeTo GpA), C-3 (Send GpII ChangeTo GpB), C-5 (Send NextGpI ChangeTo GpA), or C-6 (Send SameGpIII ChangeTo GpA) can terminate the compelled signaling cycles of sending ANI digits. So this parameter will be set to 108 decimal (006C Hex.).
CDP_GrpC_TermToneMask4	67	00008	For partial DNIS (Group I): As per specifications, A-3 can terminate the compelled signaling cycles of sending partial DNIS digits. So this parameter will be set to 8 decimal (0008 Hex).

Table 29. Tone and Tone Mask Parameters for Mexico R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpC_RecvErrMask3	68	65425	For ANI (Group III): C-1, C-2, C-3, C-5, or C-6 is OK. Any other tone will be an error. So this parameter is set as 65425 decimal (FF91 Hex).
CDP_GrpC_RecvErrMask4	69	65525	For partial DNIS (Group I): A-1 or A-3 is OK. Any other tone will be an error So this parameter is set as 65525 decimal (FFF5 Hex).

Morocco R2 Bidirectional Protocol Parameter Configuration

40

This chapter discusses the capabilities and parameters of the Morocco R2 Bidirectional protocol in the following topics:

40.1 General Protocol Information

Protocol File Set

The files used with the Morocco R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_ma_r2_io.cdp	pdk_ma_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_ma_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

40.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_ma_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Coin box or subscriber with charge metering
- 5: Operator
- 6: Data transmission
- 11: C. P. T. P.
- 12: Special line
- 13: Mobile user
- 14: Virtual private network line
- 15: Special line

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the

result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.

- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Line free, chargeable (B-6)
- 7: Line free, not chargeable (B-7)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/
```

```
/*
-----------------------------
Metering AS pulsed clear-back
-----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

40.3 Tone and Tone Mask Parameters

Table 30 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 30. Tone and Tone Mask Parameters for Morocco R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'5'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'9'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	
CDP_GrpA_SendANIAvailability	10	'5'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'A'	Restart sending DNIS digits.

Table 30. Tone and Tone Mask Parameters for Morocco R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_SIT	15	'2'	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'8'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'0'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'7'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	As per specifications the digit I-15 (end of dialing) represents the end of dialing so this parameter is set to 32768 decimal (8000 Hex).
CDP_Grp1_RecvErrMask1	52	30721	As per specifications I-0, I-11 to I-14 are treated as errors so the value of this parameter is 30721 decimal (7801 Hex).
CDP_Grp1_TermToneMask2	53	36864	I-15 (end of Dialing) or I-12 (the requested information is not available) can terminate the compelled cycle, value is 36864 decimal (9000 Hex).
CDP_Grp1_RecvErrMask2	54	24577	As per specifications I-0, I-13 and I-14 are treated as errors so the value of this parameter is 24577 decimal (6001 Hex).
CDP_Grp1_TermToneMask3	55	01026	As per specs I-1 or I-10 can terminate the compelled signaling cycle so the value of this parameter is 1026 decimal (0402 Hex).
CDP_Grp1_RecvErrMask3	56	64509	Any tone other than I-0, I-10 is treated as error so the value of this parameter is 64509 decimal (FBFD Hex).
CDP_Grp2_TermToneMask	57	63614	As per specifications the tones II-1 to II-6 and II-11 to II-15 are valid category tones so the value is 63614 decimal (F87E Hex).
CDP_Grp2_RecvErrMask	58	01921	As per specifications II-0, II-7 to II-10 are treated as errors so the value of this parameter is 1921 decimal (0781 Hex).

Table 30. Tone and Tone Mask Parameters for Morocco R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_TermToneMask1	59	00042	As per specifications, A-1, A-3, and A-5 can terminate the compelled signaling cycles of sending DNIS digits. So the value is 42 decimal (002A Hex).
CDP_GrpA_TermToneMask2	60	00042	After Outgoing register shall send category digit, this compelled signaling sequence can be terminated either by A-5, in which case the incoming register would be requesting the calling party's number (ANI digits), or it may ask for the remaining DNIS digits by sending A-1 tone, or it can ask the category and change the meaning of next tones to groupB by sending A-3. So this parameter will be set to 42 decimal (002A Hex).
CDP_GrpA_TermToneMask3	61	00010	As per specifications, A-1, A-3 can terminate the compelled signaling cycles of sending ANI digits. This parameter will be set to 10 decimal (000A Hex).
CDP_GrpA_TermToneMask4	62	00010	
CDP_GrpA_RecvErrMask1	63	63505	Tones A-1 to A-3 and A-5 to A-10 are considered OK. Any tone other than this will be error (see Specs). So this parameter will be equal to 63505 decimal (F811 Hex).
CDP_GrpA_RecvErrMask2	64	65493	Any tone other than A-1, A-3, or A-5 will be treated as error. So this parameter is set as 65493 decimal (FFD5 Hex).
CDP_GrpA_RecvErrMask3	65	65493	Only A-1, A-3, or A-5 is expected. Any other tone will be an error. So this parameter is set as 65493 decimal (FFD5 Hex).
CDP_GrpA_RecvErrMask4	66	65495	Any tone other than A-3 or A-5 will indicate an error. So this parameter is set as 65495 decimal (FFD7 Hex).
CDP_GrpA_RecvErrMask5	67	65493	Any tone other than A-1, A-3, or A-5 will indicate an error. So this parameter is set as 65493 decimal (FFD5 Hex).
CDP_GrpB_TermToneMask	68	00508	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: B-2 (Send << number changed >> recorded announcement) B-3 (Subscriber's Line Busy) B-4 (Congestion) B-5 (Unallocated National Number) B-6 (Subscriber's Line Free, Charge) B-7 (Subscriber's Line Free, No Charge) B-8 (Subscriber's Line Out of Service) So this parameter will be set to 508 decimal (01FC Hex).

Table 30. Tone and Tone Mask Parameters for Morocco R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_CallAnsweredTermToneMask	69	00192	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-6 or B-7 (Line Free Charge/NoCharge)
CDP_GrpB_RecvErrMask	70	65027	Any tone out of B-0, B-1, B-9 to B-15 shall be considered as error. So this parameter is set as 65027 decimal (FE03 Hex).

NEC Lineside E1 Bidirectional Protocol Parameter Configuration 41

This chapter discusses the capabilities and parameters of the NEC Lineside E1 Bidirectional protocol in the following topics:

41.1 General Protocol Information

Protocol File Set

The files used with the NEC Lineside E1 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_sw_e1_fxs_io.qs and pdk_sw_e1_fxs_io.hot (or pdk_sw_e1_fxs_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_sw_e1_fxs_io.psi
Country Dependent Parameters	pdk_sw_e1_necls_io.cdp	pdk_sw_e1_necls_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_sw_e1_necls_io

†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.

Protocol Limitations

After a call is transferred with **gc_SetUpTransfer( )**, you cannot issue a **gc_DropCall( )** on the original call. You must drop the consultation call before the original call can be dropped. The behavior of the protocol is undefined if you try to drop the original call without dropping the consultation call first.

41.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_e1_necls_io.cdp* file are:

- CDP_BlindXferTime
- CDP_BlockOnLOOS
- CDP_ConnectOnNoDialTone (Outbound)
- CDP_ConnectOnNoRingBack (Outbound)
- CDP_DelayInDialling (Outbound)
- CDP_DialToneWaitTime (Outbound)
- CDP_MinPBXHangupTime (Inbound)
- CDP_OnhookTime (Outbound)
- CDP_PBXDiscEnabled
- CDP_ProtocolStopsOffhook
- CDP_ReconnectDelay
- CDP_WaitDialToneEnabled (Outbound)

CDP_BlindXferTime

Description: After sending the address digits on a BlindTransfer request, the protocol waits for the time specified by this parameter before sending CAS_ONHOOK and switching back to IDLE state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_BlockOnLOOS

Description: Allows the protocol to send out CAS_OFFHOOK to block the line whenever a channel is set out-of-service (by the application calling the **gc_SetChanState( )** function).

Note: The ability to block the line is not supported on all switches, so this parameter is disabled by default.

Values:

- 0 [default]: Do not send CAS_OFFHOOK when a channel is set out-of-service.
- 1: Send CAS_OFFHOOK when a channel is set out-of-service.

CDP_ConnectOnNoDialTone (Outbound)

Description: Determines how the protocol should proceed when dial tone is not detected. If the parameter is enabled (set to 1), and no dial tone is detected, a local collision with an inbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0: Do not assume local collision and disconnect the call if no dial tone is detected.
- 1 [default]: Assume local collision and connect the perceived inbound call if no dial tone is detected.

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1.

CDP_ConnectOnNoRingBack (Outbound)

Description: Determines how the protocol should proceed when no ringback tone is detected. If the parameter is enabled (set to 1), and no ringback is detected, a remote collision with a remote outbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0 [default]: Do not assume remote collision and disconnect the call if no ringback is detected.
- 1: Assume remote collision and connect the call if no ringback is detected.

CDP_DelayInDialling (Outbound)

Description: Specifies the delay time in dialing when the parameter **CDP_WaitDialToneEnabled** is not enabled.

Values: Default is 100 milliseconds.

CDP_DialToneWaitTime (Outbound)

Description: Defines the time that the protocol waits for a dial tone before an outbound call can be made.

Values: Time in milliseconds. Default is 10000 (10 seconds).

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1. If the time defined by this parameter is exceeded before dial tone is detected, the action taken depends on the value of the **CDP_ConnectOnNoDialTone** parameter as follows:

- If the **CDP_ConnectOnNoDialTone** parameter is set to 1, a local collision is assumed and the incoming call is connected.
- If the **CDP_ConnectOnNoDialTone** parameter is set to 0, the call attempt fails and a disconnect event is forwarded with a reason of no dial tone.

CDP_MinPBXHangupTime (Inbound)

Description: Specifies the length of the ring cycle and is used to determine if the remote end has dropped an incoming call. The timer is reset at the start of each ring cycle. If the timer expires without resetting, ringing has been acknowledged to stop indicating the PBX has dropped the call, as the caller has abandoned the call before it was answered.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_OnhookTime (Outbound)

Description: If Lineside E1 is outbound only and starts in the off-hook state, it remains in the off-hook state until it receives a **gc_MakeCall( )**. This parameter specifies the time during which Lineside E1 should remain on-hook before processing the **gc_MakeCall( )**.

Values: Time in milliseconds. Default is 500 (0.5 seconds).

CDP_PBXDiscEnabled

Description: Determines if the remote PBX can initiate call disconnection via CAS line signaling.

Values:

- 0: Disable call disconnect supervision, since it is not supported by the PBX.
- 1 [default]: Enable call disconnect supervision provided by the PBX.

CDP_ProtocolStopsOffhook

Description: Determines the state of the hook switch signaling (on-hook or off-hook) when the protocol stops after **gc_Close( )**.

Note: This parameter has no effect on Dialogic® DM3 boards, because the protocol is not stopped until the board is stopped.

Values:

- 0 [default]: Set the hook switch state to on-hook.
- 1: Set the hook switch state to off-hook.

CDP_ReconnectDelay

Description: Specifies the intentional delay before the primary call is back to the connected state after the consultation call is released.

Values: Time in milliseconds. Default is 0.

Guidelines: A 2-second delay is recommended for some switches.

CDP_WaitDialToneEnabled (Outbound)

Description: Determines if the protocol should wait for a dial tone before dialing. Note that this parameter does **not** apply to supervised transfers (consultation calls), in which case the dial tone is not verified.

Values:

- 0 [default]: Do not wait for dial tone before dialing.
- 1: Wait for dial tone before dialing.

Nortel Meridian Lineside E1 Bidirectional Protocol Parameter Configuration

42

This chapter discusses the capabilities and parameters of the Nortel Meridian Lineside E1 Bidirectional protocol in the following topics:

42.1 General Protocol Information

Protocol File Set

The files used with the Nortel Meridian Lineside E1 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_sw_e1_ntmd_io.qs and pdk_sw_e1_ntmd_io.hot (or pdk_sw_e1_ntmd_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_sw_e1_ntmd_io.psi
Country Dependent Parameters	pdk_sw_e1_ntmd_io.cdp	pdk_sw_e1_ntmd_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_sw_e1_ntmd_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

After a call is transferred with **gc_SetUpTransfer( )**, you cannot issue a **gc_DropCall( )** on the original call. You must drop the consultation call before the original call can be dropped. The behavior of the protocol is undefined if you try to drop the original call without dropping the consultation call first.

42.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_e1_ntmd_io.cdp* file are:

- CDP_BlindXferTime
- CDP_BlockOnLOOS
- CDP_ConnectOnNoDialTone (Outbound)
- CDP_ConnectOnNoRingBack (Outbound)
- CDP_DelayInDialling (Outbound)
- CDP_DialToneWaitTime (Outbound)
- CDP_MinPBXHangupTime (Inbound)
- CDP_OnhookTime (Outbound)
- CDP_PBXDiscEnabled
- CDP_ProtocolStopsOffhook
- CDP_ReconnectDelay
- CDP_ReleaseGuardTimeout
- CDP_SeizeAck_Timeout
- CDP_WaitDialToneEnabled (Outbound)
- CDP_WaitForIdle
- CDP_WaitForIdle_Timeout
- CDP_WaitForReleaseGuard
- CDP_WaitForSeizeAck

CDP_BlindXferTime

Description: After sending the address digits on a BlindTransfer request, the protocol waits for the time specified by this parameter before sending CAS_ONHOOK and switching back to IDLE state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_BlockOnLOOS

Description: Allows the protocol to send out CAS_OFFHOOK to block the line whenever a channel is set out-of-service (by the application calling the **gc_SetChanState( )** function).

Note: The ability to block the line is not supported on all switches, so this parameter is disabled by default.

Values:

- 0 [default]: Do not send CAS_OFFHOOK when a channel is set out-of-service.
- 1: Send CAS_OFFHOOK when a channel is set out-of-service.

CDP_ConnectOnNoDialTone (Outbound)

Description: Determines how the protocol should proceed when dial tone is not detected. If the parameter is enabled (set to 1), and no dial tone is detected, a local collision with an inbound call is assumed, and the call immediately transitions to Connected state. This parameter is used only if **CDP_WaitDialToneEnabled** is set to 1.

Values:

- 0: Do not assume local collision and disconnect the call if no dial tone is detected.
- 1 [default]: Assume local collision and connect the perceived inbound call if no dial tone is detected.

CDP_ConnectOnNoRingBack (Outbound)

Description: Determines how the protocol should proceed when no ringback tone is detected. If the parameter is enabled (set to 1), and no ringback is detected, a remote collision with a remote outbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0 [default]: Do not assume remote collision and disconnect the call if no ringback is detected.
- 1: Assume remote collision and connect the call if no ringback is detected.

CDP_DelayInDialling (Outbound)

Description: Specifies the delay time in dialing when the parameter **CDP_WaitDialToneEnabled** is not enabled.

Values: Time in milliseconds. Default is 100.

CDP_DialToneWaitTime (Outbound)

Description: Defines the time that the protocol waits for a dial tone before an outbound call can be made.

Values: Time in milliseconds. Default is 10000 (10 seconds).

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1. If the time defined by this parameter is exceeded before dial tone is detected, the action taken depends on the value of the **CDP_ConnectOnNoDialTone** parameter as follows:

- If the **CDP_ConnectOnNoDialTone** parameter is set to 1, a local collision is assumed and the incoming call is connected.
- If the **CDP_ConnectOnNoDialTone** parameter is set to 0, the call attempt fails and a disconnect event is forwarded with a reason of no dial tone.

CDP_MinPBXHangupTime (Inbound)

Description: Specifies the length of the ring cycle and is used to determine if the remote end (that is, the PBX) has dropped an incoming call. The timer is reset at the start of each ring cycle. If the timer expires without resetting, ringing has been acknowledged to stop indicating the PBX has dropped the call, as the caller has abandoned the call before it was answered.

Values: Time in milliseconds. Default is 5000 (5 seconds).

Guidelines: The value of this parameter is typically set to 6 seconds, which corresponds to the complete ring cycle (2 seconds on and 4 seconds of silence).

CDP_OnhookTime (Outbound)

Description: If Lineside E1 is outbound only and starts in the off-hook state, it remains in the off-hook state until it receives a MakeCall. This parameter specifies the time during which Lineside E1 should remain on-hook before processing the MakeCall.

Values: Time in milliseconds. Default is 500 (0.5 seconds).

CDP_PBXDiscEnabled

Description: Determines if the remote PBX can initiate call disconnection via CAS line signaling.

Values:

- 0: Disable call disconnect supervision, since it is not supported by the PBX.
- 1 [default]: Enable call disconnect supervision provided by the PBX.

CDP_ProtocolStopsOffhook

Description: Determines the state of the hook switch signaling (on-hook or off-hook) when the protocol stops after **gc_Close( )**.

Note: This parameter has no effect on Dialogic® DM3 boards, because the protocol is not stopped until the board is stopped.

Values:

- 0 [default]: Set the hook switch state to on-hook.
- 1: Set the hook switch state to off-hook.

CDP_ReconnectDelay

Description: Specifies the intentional delay before the primary call is back to the connected state after the consultation call is released.

Values: Time in milliseconds. Default is 0.

Guidelines: A 2-second delay is recommended for some switches.

CDP_ReleaseGuardTimeout

Description: When **CDP_WaitForReleaseGuard** is set, specifies the time that the protocol will block the line before setting the line to the idle state.

Values:

- 0: The line is set to the idle state immediately.
- Non-zero [default is 2000]: Time in milliseconds that the protocol will block the line before setting the line to the idle state.

CDP_SeizeAck_Timeout

Description: When **CDP_WaitForSeizeAck** is set, defines the maximum time-out in milliseconds for a CAS_SEIZEACK event once the line is seized by sending a CAS_OFFHOOK. The remote end is expected to acknowledge the CAS_OFFHOOK event during this interval. If not, the outgoing call is considered to have failed.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_WaitDialToneEnabled (Outbound)

Description: Determines if the protocol should wait for a dial tone before dialing. Note that this parameter does **not** apply to supervised transfers (consultation calls) in which case the dial tone is not verified.

Values:

- 0 [default]: Do not wait for dial tone before dialing.
- 1: Wait for dial tone before dialing.

CDP_WaitForIdle

Description: Specifies whether the protocol will wait for IDLE; otherwise, the line is set to IDLE state immediately.

Values:

- 0 [default]: Do not wait for IDLE.
- 1: Wait for IDLE. See **CDP_WaitForIdle_Timeout** parameter.

CDP_WaitForIdle_Timeout

Description: When **CDP_WaitForIdle** is set, defines the maximum time-out in milliseconds for the protocol to wait for the switch to go IDLE after the protocol is initialized.

Values: Time in milliseconds. Default is 2000 (2 seconds).

CDP_WaitForReleaseGuard

Description: Specifies whether the protocol will wait for ReleaseGuard.

Values:

- 0 [default]: Do not wait for ReleaseGuard.
- 1: Wait for ReleaseGuard. See **CDP_ReleaseGuardTimeout** parameter.

CDP_WaitForSeizeAck

Description: Specifies whether the protocol will wait for SEIZEACK.

Values:

- 0 [default]: Do not wait for SEIZEACK.
- 1: Wait for SEIZEACK. See **CDP_SeizeAck_Timeout** parameter.

North American Analog Bidirectional Protocol Parameter Configuration

43

This chapter discusses the capabilities and parameters of the North American Analog Bidirectional protocol in the following topics:

43.1 General Protocol Information

Protocol File Set

The files used with the North American Analog protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module		pdk_na_an_io.psi
Country Dependent Parameters		pdk_na_an_io.cdp
	gc_OpenEx( ) Protocol Name	
		pdk_na_an_io
NOTE: This protocol is supported on Dialogic® Springware boards only. On Dialogic® DM3 boards, the analog protocol is embedded in the firmware.		

Protocol Limitations

None.

43.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_na_an_io.cdp* file are:

- CDP_BlindXferTime
- CDP_BtStartTimer
- CDP_ConnectOnNoRingBack (Outbound)
- CDP_Detect_DialTone (Outbound)
- CDP_Dgts_For_Outside_Line_In_PBX_ENV (Outbound)
- CDP_DialTone_As_Disconnect_In_Connected
- CDP_DisconnectToneSup
- CDP_PBX_DialToneTimeout (Outbound)
- CDP_Time_Before_Blind_Dialing_Under_PBX_Env (Outbound)
- CDP_Timeout_Wait_For_RingOff_When_Drop_In_Offered (Inbound)
- CDP_Working_Under_PBX_Env (Outbound)

CDP_BlindXferTime

Description: Specifies the delay time between the third party ringing and the controller going on-hook, i.e., disconnecting; it can be used to guard against network latencies, ensuring that the end-to-end audio path has been established before transfer.

Values: Time in milliseconds. Default is 2000 (2 seconds).

CDP_BtStartTimer

Description: For a **supervised** transfer, specifies the maximum time that the protocol will wait after issuing hookflash as a part of **gc_SetupTransfer( )** and before the application issues **gc_MakeCall( )**.

For a **blind** transfer, specifies the maximum time that the protocol will wait after issuing hookflash as a part of **gc_BlindTransfer( )** and before the protocol completes the digit dial. Since the call is made within Global Call, this parameter can be used as a bail-out timer to dial tone detection when CDP_Detect_DialTone (Outbound) is enabled and none is detected during the elapsed time.

Values: Time in milliseconds. Default is 8000 (8 seconds).

CDP_ConnectOnNoRingBack (Outbound)

Description: Determines how the protocol should proceed when a remote collision occurs, that is, when the remote side (PBX) is making an outbound call and an inbound call is detected. In this case, call analysis on the local side will indicate no ringback tone. Setting this parameter can configure the protocol to connect the call even if a ringback tone is not detected.

Values:

- 0: Do not connect a call if no ringback is detected.
- 1 [default]: Connect a call even if no ringback is detected.

Guidelines: On media detection by call analysis, this parameter is overridden.

CDP_Detect_DialTone (Outbound)

Description: Determines whether the protocol should wait for the regular dial tone (**TONE_DIAL**) when making a call. When this parameter is disabled, the number can be dialed without waiting for the dial tone. When this parameter is enabled (the default), the protocol waits for the dial tone after the initial digits (**CDP_Dgts_For_Outside_Line_In_PBX_ENV**) are dialed before dialing the number.

Values:

- 0: Do not wait for dial tone before dialing number.
- 1 [default]: Wait for dial tone before dialing number.

Guidelines: When working under a PBX environment, there are two dial tones: the PBX dial tone (defined by **TONE_PBX_DIAL**) and the regular dial tone (defined by **TONE_DIAL**). **CDP_Time_Before_Blind_Dialing_Under_PBX_Env** provides the option of bypassing the PBX dial tone. **CDP_Detect_DialTone** provides the option of bypassing the regular dial tone.

CDP_Dgts_For_Outside_Line_In_PBX_ENV (Outbound)

Description: Specifies the digit to be dialed for a PBX outside line. This parameter is valid only if **CDP_Working_Under_PBX_Env** is set to 1.

Values: Default is "9".

CDP_DialTone_As_Disconnect_In_Connected

Description: Specifies if the reception of a dial tone is treated as a remote disconnect in the connected state.

Values:

- 0 [default]: Dial tone is ignored if received in the Connected state.
- 1: Reception of dial tone is treated as a remote disconnect in the Connected state.

CDP_DisconnectToneSup

Description: Enables or disables disconnect tone supervision; specifies if the reception of a disconnect tone is treated as a remote disconnect in the connected state.

Values:

- 0: Disables disconnect tone supervision; disconnect tone is ignored if received in the Connected state.
- 1 [default]: Enables disconnect tone supervision; reception of disconnect tone is treated as a remote disconnect in the Connected state.

CDP_PBX_DialToneTimeout (Outbound)

Description: Specifies the maximum time (in milliseconds) that the protocol waits for PBX dial tone before sending out digits. This parameter is valid only if **CDP_Working_Under_PBX_Env** is set to 1.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_Time_Before_Blind_Dialing_Under_PBX_Env (Outbound)

Description: Specifies the time that the protocol waits before dialing any digits if working under a PBX environment. This parameter is valid only if **CDP_Working_Under_PBX_Env** is set to 1.

Values:

- 0 [default]: Ignore this parameter. The protocol waits for a PBX dial tone (**TONE_PBX_DIAL**) before dialing any digits.
- Non-zero time in milliseconds: The protocol does not wait for a PBX dial tone; instead, the protocol waits for the time specified by this parameter before dialing any digits.

Guidelines: When working under a PBX environment, there are two dial tones: the PBX dial tone (defined by **TONE_PBX_DIAL**) and the regular dial tone (defined by **TONE_DIAL**). **CDP_Time_Before_Blind_Dialing_Under_PBX_Env** provides the option of bypassing the PBX dial tone. **CDP_Detect_DialTone** provides the option of bypassing the regular dial tone.

CDP_Timeout_Wait_For_RingOff_When_Drop_In_Offered (Inbound)

Description: Specifies the maximum time that the protocol waits for the outbound side to stop ringing before sending a GCEV_DROPCALL to the application, if DropCall is issued in the offered state. GCEV_DROPCALL is sent to the application at the expiration of this timer, or when RingOff is detected, whichever comes first. If the value of this parameter is 0, GCEV_DROPCALL is sent as soon as the protocol receives the DropCall request.

Values:

- 0 [default]: GCEV_DROPCALL is sent as soon as the protocol receives the DropCall request.
- Non-zero time in milliseconds: Time that the protocol waits for the outbound side to stop ringing before sending a GCEV_DROPCALL.

CDP_Working_Under_PBX_Env (Outbound)

Description: Specifies the sequence of actions taken by the protocol while making a call.

If set to 1, the protocol takes the following actions while making a call:

1. Go off-hook.
2. If **CDP_Time_Before_Blind_Dialing_Under_PBX_Env** is 0, go to step 3. Otherwise, go to step 5.
3. Wait for PBX dial tone (defined by **TONE_PBX_DIAL**).
4. Go to step 6.
5. Wait for **CDP_Time_Before_Blind_Dialing_Under_PBX_Env** milliseconds.
6. Dial the digit(s) specified by **CDP_Dgts_For_Outside_Line_In_PBX_ENV**.
7. Wait for regular dial tone (defined by **TONE_DIAL**) if enabled through **CDP_Detect_DialTone**. (**TONE_DIAL** should not be modified by the user.)
8. Dial number specified by application via the **gc_MakeCall( )** function.

Values:

- 0 [default]: Skip steps 2 to 6 above.
- 1: Perform steps 1 to 8 above.

Pakistan R2 Bidirectional Protocol Parameter Configuration

44

This chapter discusses the capabilities and parameters of the Pakistan R2 Bidirectional protocol in the following topics:

44.1 General Protocol Information

Protocol File Set

The files used with the Pakistan R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_pk_r2_io.cdp	pdk_pk_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_pk_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

44.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_pk_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 5: Operator
- 6: Data transmission
- 7: Subscriber (international)
- 8: Data transmission (international)
- 9: Subscriber with priority (international)
- A: Operator with forward facility (international)

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the

result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.

- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Line free, not chargeable (B-6)
- 7: Line free, chargeable (B-7)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/
```

```
/*
-----------------------------
Metering AS pulsed clear-back
-----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS**, **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- Non-zero [default is 4]: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

Guidelines: **CDP_NUM_OF_ANI_DIGITS** must have a non-zero value for Pakistan R2 protocol.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

Guidelines: **CDP_NUM_OF_DNIS_DIGITS** must have a non-zero value for Pakistan R2 protocol.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

44.3 Tone and Tone Mask Parameters

Table 31 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 31. Tone and Tone Mask Parameters for Pakistan R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'5'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'9'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	
CDP_GrpA_SendANIAvailability	10	'5'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'0'	Restart sending DNIS digits.

Table 31. Tone and Tone Mask Parameters for Pakistan R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_SIT	15	'2'	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'8'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'0'	
CDP_GrpB_linefree_charge	22	'7'	
CDP_GrpB_linefree_nocharge	23	'6'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	14336	fedc ba98 7654 3210 Binary: 0011 1000 0000 0000 Hex: 3800 Decimal: 14336
CDP_Grp1_RecvErrMask1	52	57344	fedc ba98 7654 3210 Binary: 1110 0000 0000 0000 Hex: E000 Decimal: 57344
CDP_Grp1_TermToneMask2	53	04096	fedc ba98 7654 3210 Binary: 0001 0000 0000 0000 Hex: 1000 Decimal: 4096
CDP_Grp1_RecvErrMask2	54	26624	fedc ba98 7654 3210 Binary: 0110 1000 0000 0000 Hex: 6800 Decimal: 26624
CDP_Grp1_TermToneMask3	55	14336	fedc ba98 7654 3210 Binary: 0011 1000 0000 0000 Hex: 3800 Decimal: 14336
CDP_Grp1_RecvErrMask3	56	57344	fedc ba98 7654 3210 Binary: 1110 0000 0000 0000 Hex: E000 Decimal: 57344

Table 31. Tone and Tone Mask Parameters for Pakistan R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp2_TermToneMask	57	02030	fedc ba98 7654 3210 Binary: 0000 0111 1110 1110 Hex: 07EE Decimal: 2030
CDP_Grp2_RecvErrMask	58	63504	fedc ba98 7654 3210 Binary: 1111 1000 0001 0000 Hex: F810 Decimal: 63504
CDP_GrpA_TermToneMask1	59	00120	fedc ba98 7654 3210 Binary: 0000 0000 0111 1000 Hex: 0078 Decimal: 120
CDP_GrpA_TermToneMask2	60	00106	fedc ba98 7654 3210 Binary: 0000 0000 0110 1010 Hex: 006A Decimal: 106
CDP_GrpA_TermToneMask3	61	00090	fedc ba98 7654 3210 Binary: 0000 0000 0101 1010 Hex: 005A Decimal: 90
CDP_GrpA_TermToneMask4	62	00090	fedc ba98 7654 3210 Binary: 0000 0000 0101 1010 Hex: 005A Decimal: 90
CDP_GrpA_RecvErrMask1	63	65024	fedc ba98 7654 3210 Binary: 1111 1110 0000 0000 Hex: FE00 Decimal: 65024
CDP_GrpA_RecvErrMask2	64	65428	fedc ba98 7654 3210 Binary: 1111 1111 1001 0100 Hex: FF94 Decimal: 65428
CDP_GrpA_RecvErrMask3	65	65412	fedc ba98 7654 3210 Binary: 1111 1111 1000 0100 Hex: FF84 Decimal: 65412
CDP_GrpA_RecvErrMask4	66	65412	fedc ba98 7654 3210 Binary: 1111 1111 1000 0100 Hex: FF84 Decimal: 65412

Table 31. Tone and Tone Mask Parameters for Pakistan R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_RecvErrMask5	67	65412	fedc ba98 7654 3210 Binary: 1111 1111 1000 0100 Hex: FF84 Decimal: 65412
CDP_GrpB_TermToneMask	68	00510	fedc ba98 7654 3210 Binary: 0000 0001 1111 1110 Hex: 01FE Decimal: 510
CDP_GrpB_CallAnsweredTermToneMask	69	00096	fedc ba98 7654 3210 Binary: 0000 0000 0110 0000 Hex: 0060 Decimal: 96
CDP_GrpB_RecvErrMask	70	65024	fedc ba98 7654 3210 Binary: 1111 1110 0000 0000 Hex: FE00 Decimal: 65024

Philippines R2 Bidirectional Protocol Parameter Configuration

45

This chapter discusses the capabilities and parameters of the Philippines R2 Bidirectional protocol in the following topics:

45.1 General Protocol Information

Protocol File Set

The files used with the Philippines R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_ph_r2_io.cdp	pdk_ph_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_ph_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

45.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_ph_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the

result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.

- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the

description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Line idle

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in “pulsed answer” mode and one for using metering in “pulsed clear-back” mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/

/*
----------------------------
Metering AS pulsed clear-back
----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and

then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

45.3 Tone and Tone Mask Parameters

Table 32 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 32. Tone and Tone Mask Parameters for Philippines R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'5'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'9'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	

Table 32. Tone and Tone Mask Parameters for Philippines R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_SendANIAvailability	10	'2'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'0'	Restart sending DNIS digits.
CDP_GrpB_SIT	15	'0'	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'8'	
CDP_GrpB_NormalClearing	20	'3'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'0'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'2'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	36864	fedc ba98 7654 3210 Binary: 1001 0000 0000 0000 Hex: 9000 Decimal: 36864
CDP_Grp1_RecvErrMask1	52	16384	fedc ba98 7654 3210 Binary: 0100 0000 0000 0000 Hex: 4000 Decimal: 16384
CDP_Grp1_TermToneMask2	53	36864	fedc ba98 7654 3210 Binary: 1001 0000 0000 0000 Hex: 9000 Decimal: 36864
CDP_Grp1_RecvErrMask2	54	16384	fedc ba98 7654 3210 Binary: 0100 0000 0000 0000 Hex: 4000 Decimal: 16384

Table 32. Tone and Tone Mask Parameters for Philippines R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp1_TermToneMask3	55	36864	fedc ba98 7654 3210 Binary: 1001 0000 0000 0000 Hex: 9000 Decimal: 36864
CDP_Grp1_RecvErrMask3	56	16384	fedc ba98 7654 3210 Binary: 0100 0000 0000 0000 Hex: 4000 Decimal: 16384
CDP_Grp2_TermToneMask	57	36862	fedc ba98 7654 3210 Binary: 1000 1111 1111 1110 Hex: 8FFE Decimal: 36862
CDP_Grp2_RecvErrMask	58	28672	fedc ba98 7654 3210 Binary: 0111 0000 0000 0000 Hex: 7000 Decimal: 28672
CDP_GrpA_TermToneMask1	59	00120	fedc ba98 7654 3210 Binary: 0000 0000 0111 1000 Hex: 0078 Decimal: 120
CDP_GrpA_TermToneMask2	60	00106	fedc ba98 7654 3210 Binary: 0000 0000 0110 1010 Hex: 006A Decimal: 106
CDP_GrpA_TermToneMask3	61	00090	fedc ba98 7654 3210 Binary: 0000 0000 0101 1010 Hex: 005A Decimal: 90
CDP_GrpA_TermToneMask4	62	00090	fedc ba98 7654 3210 Binary: 0000 0000 0101 1010 Hex: 005A Decimal: 90
CDP_GrpA_RecvErrMask1	63	64512	fedc ba98 7654 3210 Binary: 1111 1100 0000 0000 Hex: FC00 Decimal: 64512
CDP_GrpA_RecvErrMask2	64	65428	fedc ba98 7654 3210 Binary: 1111 1111 1001 0100 Hex: FF94 Decimal: 65428

Table 32. Tone and Tone Mask Parameters for Philippines R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_RecvErrMask3	65	65412	fedc ba98 7654 3210 Binary: 1111 1111 1000 0100 Hex: FF84 Decimal: 65412
CDP_GrpA_RecvErrMask4	66	65412	fedc ba98 7654 3210 Binary: 1111 1111 1000 0100 Hex: FF84 Decimal: 65412
CDP_GrpA_RecvErrMask5	67	65412	fedc ba98 7654 3210 Binary: 1111 1111 1000 0100 Hex: FF84 Decimal: 65412
CDP_GrpB_TermToneMask	68	00508	fedc ba98 7654 3210 Binary: 0000 0001 1111 1100 Hex: 01FC Decimal: 508
CDP_GrpB_CallAnsweredTermToneMask	69	00066	fedc ba98 7654 3210 Binary: 0000 0000 0100 0010 Hex: 0042 Decimal: 66
CDP_GrpB_RecvErrMask	70	65026	fedc ba98 7654 3210 Binary: 1111 1110 0000 0010 Hex: FE02 Decimal: 65026

Poland R2 Bidirectional Protocol Parameter Configuration 46

This chapter discusses the capabilities and parameters of the Poland R2 Bidirectional protocol in the following topics:

46.1 General Protocol Information

Protocol File Set

The files used with the Poland R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_po_r2_io.cdp	pdk_po_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_po_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

46.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_po_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 10.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Coin box or subscriber with charge metering
- 5: Telephone operator
- 6: Data transmission
- 11: C. P. T. P.
- 12: Special line
- 13: Mobile user
- 14: Virtual private network line
- 15: Special line

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the

result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.

- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Chargeable (B-6)
- 7: Not chargeable (B-7)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)

- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/

/*
----------------------------
Metering AS pulsed clear-back
----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. ‘f’ will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause ‘f’ to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0 [default]: GCEV_ALERTING is sent after receiving a ringback tone.
- 1: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

46.3 Tone and Tone Mask Parameters

Table 33 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 33. Tone and Tone Mask Parameters for Poland R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'5'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.

Table 33. Tone and Tone Mask Parameters for Poland R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'5'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	A-10 (spare, reply with I-12_.
CDP_GrpA_SendANIAvailability	10	'5'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'9'	Restart sending DNIS digits.
CDP_GrpB_SIT	15	'5'	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'3'	
CDP_GrpB_Rejected	19	'8'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'1'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'0'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	As per specifications the digit I-15 (end of dialing) represents the end of dialing so this parameter is set to 32768 decimal (8000 Hex).
CDP_Grp1_RecvErrMask1	52	30721	As per specifications I-0, I-11 to I-14 are treated as errors so the value of this parameter is 30721 decimal (7801 Hex).
CDP_Grp1_TermToneMask2	53	36864	I-15 (end of Dialing) or I-12 (the requested information is not available) can terminate the compelled cycle, value is 36864 decimal (9000 Hex).

Table 33. Tone and Tone Mask Parameters for Poland R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp1_RecvErrMask2	54	30721	As per specifications I-0, I-11 to I-14 are treated as errors so the value of this parameter is 30721.
CDP_Grp1_TermToneMask3	55	36864	I-15 (end of dialing) or I-12 (the requested information is not available) can terminate the compelled cycle, so the value of this parameter is 36864 decimal (9000 Hex).
CDP_Grp1_RecvErrMask3	56	28671	Any tone other than I-0 to I-11 and I-13, I-14 are treated as errors.
CDP_Grp2_TermToneMask	57	8190	As per specifications the tones II-1 to II-12 are valid category tones.
CDP_Grp2_RecvErrMask	58	57344	Any tone other than II-1 to II-12 are considered as error tones.
CDP_GrpA_TermToneMask1	59	104	As per specifications, A-3, A-5, and A-6 can terminate the compelled signaling cycles of sending DNIS digits. So the value is 104 decimal (0068 Hex).
CDP_GrpA_TermToneMask2	60	106	As per specifications, A-6, A-5, A-3, or A-1 can terminate the compelled signaling cycles of sending ANI availability digit. So this parameter will be set to 106 decimal (6A Hex).
CDP_GrpA_TermToneMask3	61	74	As per specifications, A-1, A-3, A-6 can terminate the compelled signaling cycles of sending ANI digits.
CDP_GrpA_TermToneMask4	62	74	
CDP_GrpA_RecvErrMask1	63	63504	Tones A-1 to A-3 and A-5 to A-10 are considered OK. Any tone other than this will be error (see Specs). So this parameter will be equal to 63504 decimal (F810 Hex).
CDP_GrpA_RecvErrMask2	64	63488	Any tone other than A-1 to A-10 will be treated as error. So this parameter is set as 63488 decimal (F800 Hex).
CDP_GrpA_RecvErrMask3	65	63488	
CDP_GrpA_RecvErrMask4	66	63488	
CDP_GrpA_RecvErrMask5	67	63488	
CDP_GrpB_TermToneMask	68	379	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: B-0 (Subscriber's Line Free, No Charge) B-1 (ClearingFromInboundOnly) B-3 (Subscriber's Line Busy) B-4 (Congestion) B-5 (SIT) B-6 (Subscriber's Line Free, Charge) B-8 (Subscriber's Line Out of Service) So this parameter will be set to 379 decimal (17B Hex).

Table 33. Tone and Tone Mask Parameters for Poland R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_CallAnsweredTermToneMask	69	65	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-6 or B-0 (Line Free Charge/NoCharge)
CDP_GrpB_RecvErrMask	70	65156	Any tone out of B-2, B-7, B-9 to B-15 shall be considered as error. So this parameter is set as 65156 decimal (FE84 Hex).

Samsung PBX Lineside E1 Bidirectional Protocol Parameter Configuration

47

This chapter discusses the capabilities and parameters of the Samsung PBX Lineside E1 Bidirectional protocol in the following topics:

47.1 General Protocol Information

Protocol File Set

The files used with the Samsung PBX Lineside E1 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_sw_e1_ssls_io.qs and pdk_sw_e1_ssls_io.hot (or pdk_sw_e1_ssls_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_sw_e1_ssls_io.psi
Country Dependent Parameters	pdk_sw_e1_ssls_io.cdp	pdk_sw_e1_ssls_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_sw_e1_ssls_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

None

47.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_e1_ssls_io.cdp* file are:

- CDP_BlindXferTime
- CDP_ConnectOnNoDialTone (Outbound)
- CDP_ConnectOnNoRingBack (Outbound)
- CDP_DelayInDialling (Outbound)
- CDP_DialToneWaitTime (Outbound)
- CDP_PBXDiscEnabled
- CDP_ProtocolStopsOffhook
- CDP_ReleaseGuardTimeout
- CDP_SeizeAck_Timeout
- CDP_WaitDialToneEnabled (Outbound)
- CDP_WaitForIdle_Timeout

CDP_BlindXferTime

Description: After sending the address digits on a BlindTransfer request, the protocol waits for the time specified by this parameter before sending CAS_ONHOOK and switching back to IDLE state.

Values: Time in milliseconds. Default is 2000 (2 seconds).

CDP_ConnectOnNoDialTone (Outbound)

Description: Determines how the protocol should proceed when dial tone is not detected. If the parameter is enabled (set to 1), and no dial tone is detected, a local collision with an inbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0: Do not assume local collision and disconnect the call if no dial tone is detected.
- 1 [default]: Assume local collision and connect the perceived inbound call if no dial tone is detected.

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1.

CDP_ConnectOnNoRingBack (Outbound)

Description: Determines how the protocol should proceed when no ringback tone is detected. If the parameter is enabled (set to 1), the protocol will not wait for ringback tone to go to the Connected state. After sending address digits, it will go to the Connected state after receiving the CAS_ANSWER signal.

Values:

- 0: Wait for ringback tone to go to Connected state.
- 1 [default]: Do not wait for ringback tone to go to the Connected state.

CDP_DelayInDialling (Outbound)

Description: Specifies the delay time in dialing when the parameter **CDP_WaitDialToneEnabled** is not enabled.

Values: Time in milliseconds. Default is 2000 (2 seconds).

CDP_DialToneWaitTime (Outbound)

Description: Defines the time that the protocol waits for a dial tone before an outbound call can be made.

Values: Time in milliseconds. Default is 10000 (10 seconds).

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1. If the time defined by this parameter is exceeded before dial tone is detected, the action taken depends on the value of the **CDP_ConnectOnNoDialTone** parameter as follows:

- If the **CDP_ConnectOnNoDialTone** parameter is set to 1, a local collision is assumed and the incoming call is connected.
- If the **CDP_ConnectOnNoDialTone** parameter is set to 0, the call attempt fails and a disconnect event is forwarded with a reason of no dial tone.

CDP_PBXDiscEnabled

Description: Determines if the remote PBX can initiate call disconnection.

Values:

- 0: Disable call disconnect supervision, since it is not supported by the PBX.
- 1 [default]: Enable call disconnect supervision provided by the PBX.

CDP_ProtocolStopsOffhook

Description: Determines the state of the hook switch signaling (on-hook or off-hook) when the protocol stops after **gc_Close( )**.

Note: This parameter has no effect on Dialogic DM3 boards, because the protocol is not stopped until the board is stopped.

Values:

- 0 [default]: Set the hook switch state to on-hook.
- 1: Set the hook switch state to off-hook.

CDP_ReleaseGuardTimeout

Description: Specifies the time that the protocol will block the line before setting the line to the idle state.

Values:

- 0: The line is set to the idle state immediately.
- Non-zero [default is 2000]: Time in milliseconds that the protocol will block the line before setting the line to the idle state.

CDP_SeizeAck_Timeout

Description: Defines the maximum time-out in milliseconds for a CAS_SEIZEACK event once the line is seized by sending a CAS_OFFHOOK. The remote end is expected to acknowledge the CAS_OFFHOOK event during this interval. If not, the outgoing call is considered to have failed.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_WaitDialToneEnabled (Outbound)

Description: Determines if the protocol should wait for a dial tone before dialing.

Values:

- 0 [default]: Do not wait for dial tone before dialing.
- 1: Wait for dial tone before dialing.

CDP_WaitForIdle_Timeout

Description: Defines the maximum time-out in milliseconds for the protocol to wait for the switch to go IDLE after the protocol is initialized.

Values: Time in milliseconds. Default is 10000 (10 seconds).

Saudi Arabia R2 Bidirectional Protocol Parameter Configuration 48

This chapter discusses the capabilities and parameters of the Saudi Arabia R2 Bidirectional protocol in the following topics:

48.1 General Protocol Information

Protocol File Set

The files used with the Saudi Arabia R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_sa_r2_io.cdp	pdk_sa_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_sa_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

48.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sa_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CAInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber (one of the Group II forward signals).

Values:

- 1 [default]: II-1, subscriber without priority
- 2: II-2, subscriber with priority
- 3: II-3, maintenance equipment
- 5: II-5, operator
- 6: II-6, data transmission
- 7: II-7, subscriber (or operator without forward transfer facility)
- 8: II-8, data transmission
- 9: II-9, subscriber with priority
- A: II-10, operator with forward transfer facility
- B: II-11, coin telephone station barred from international access
- C: II-12, ISD coin telephone station
- D: II-13, private metering telephone station
- E: II-14, interception service operator
- F: II-15, exchange from which call is not transferred further

cdp_CAInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of

CDP_OVERLAP_SENDING_ENABLED parameter), the remote end may also send A1 to request more information.

- 1: 'f' (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1: Line free, chargeable but the clearing of the call is under called party
- 3: Subscriber's line busy
- 4: Congestion
- 5: Unassigned number
- 6 [default]: Line free, chargeable
- 7: Subscriber's line free, no charge
- 8: Subscriber's line out of service
- 9: Subscriber's line marked for interception service

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/

/*
----------------------------
Metering AS pulsed clear-back
----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 0.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0 [default]: GCEV_ALERTING is sent after receiving a ringback tone.
- 1: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

48.3 Tone and Tone Mask Parameters

Table 34 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 34. Tone and Tone Mask Parameters for Saudi Arabia R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'5'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.

Table 34. Tone and Tone Mask Parameters for Saudi Arabia R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'0'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'0'	
CDP_GrpA_SendANIAvailability	10	'0'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'A'	Restart sending DNIS digits.
CDP_GrpB_SIT	15	'2'	After Group B tone is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'4'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'1'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'7'	
CDP_grp1_string_requestdenied	24	'0'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'0'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	As per specifications the digit I-15 (end of dialing) represents the end of dialing so this parameter is set to 32768 decimal (8000 Hex).
CDP_Grp1_RecvErrMask1	52	20481	As per specifications I-0, I-11 to I-14 are treated as errors so the value of this parameter is 20481 decimal (5001 Hex).
CDP_Grp1_TermToneMask2	53	32768	I-15 (end of Dialing) or I-12 (the requested information is not available) can terminate the compelled cycle.

Table 34. Tone and Tone Mask Parameters for Saudi Arabia R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp1_RecvErrMask2	54	20481	As per specifications I-0, I-12, and I-14 are treated as errors so the value of this parameter is 20481 decimal (5001 Hex).
CDP_Grp1_TermToneMask3	55	32768	I-15 can terminate the compelled cycle so the value of this parameter is 32768 decimal (8000 Hex).
CDP_Grp1_RecvErrMask3	56	32767	Any tone other than I-15 is treated as error so the value of this parameter is 32767 decimal (7FFF Hex).
CDP_Grp2_TermToneMask	57	65518	As per specifications the tones II-1 to II-3 and II-5 to II-15 are valid category tones so the value is 65518 decimal (FFEE Hex).
CDP_Grp2_RecvErrMask	58	00017	As per specifications II-0, II-4 are treated as errors so the value of this parameter is 17 decimal (11 Hex).
CDP_GrpA_TermToneMask1	59	00104	As per specifications, A-3, A-5, and A-6 can terminate the compelled signaling cycles of sending DNIS digits. So the value is 104 decimal (0068 Hex).
CDP_GrpA_TermToneMask2	60	00106	After Outgoing register shall send category digit, this compelled signaling sequence can be terminated either by A-5, in which case the incoming register would be requesting the calling party's number (ANI digits), or it may ask for the remaining DNIS digits by sending A-1 tone, or it can ask the category and change the meaning of next tones to groupB by sending A-3 or A-6. So this parameter will be set to 106 decimal (0068 Hex).
CDP_GrpA_TermToneMask3	61	00074	As per specifications, A-1, A-3, or A-6 can terminate the compelled signaling cycles of sending ANI digits. This parameter will be set to 74 decimal (004A Hex).
CDP_GrpA_TermToneMask4	62	00072	As per specifications, A-3 or A-6 can terminate the compelled signaling cycles of sending ANI digits. This parameter will be set to 72 decimal (0048 Hex).
CDP_GrpA_RecvErrMask1	63	64529	Tones A-1 to A-3 and A-5 to A-9 are considered OK. Any tone other than this will be error (see Specs). So this parameter will be equal to 64529 decimal (FC11 Hex).
CDP_GrpA_RecvErrMask2	64	65429	Any tone other than A-1, A-3, A-5, or A-6 will be treated as error. So this parameter is set as 65429 decimal (FF95 Hex).
CDP_GrpA_RecvErrMask3	65	65429	
CDP_GrpA_RecvErrMask4	66	64595	Any tone other than A-3 or A-5 will indicate an error. So this parameter is set as 65495 decimal (FFD7 Hex).

Table 34. Tone and Tone Mask Parameters for Saudi Arabia R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_RecvErrMask5	67	65429	Any tone other than A-1,A-3, A-5, or A-6 will be treated as error. So this parameter is set as 65429 decimal (FF95 Hex).
CDP_GrpB_TermToneMask	68	00254	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: CDP_GrpB_SIT = '2' (Number Changed) CDP_GrpB_UserBusy = '3' (Line engaged) CDP_GrpB_NetworkCongestion = '4' (congestion) CDP_GrpB_UnAssignedNumber = '7' (Number Indistinct) CDP_GrpB_Rejected = '4' (Jamming) CDP_GrpB_NormalClearing = '4' CDP_GrpB_linefree_charge_ClearingFromInboundOnly = '1' (call clearing under called subscriber) CDP_GrpB_linefree_charge = '6' (line free charge) CDP_GrpB_linefree_nocharge = '5' (line free no charge)
CDP_GrpB_CallAnsweredTermToneMask	69	00098	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-1, B-5 or B-6 (Line Free Charge/NoCharge/Charge and call clearing is under the control of called subscriber)
CDP_GrpB_RecvErrMask	70	64513	Any tone out of B-0 and B-10 to B-15 shall be considered as error. So this parameter is set as 64513 decimal (FC01 Hex).

Singapore R2 Bidirectional Protocol Parameter Configuration 49

This chapter discusses the capabilities and parameters of the Singapore R2 Bidirectional protocol in the following topics:

49.1 General Protocol Information

Protocol File Set

The files used with the Singapore R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_sg_r2_io.cdp	pdk_sg_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_sg_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

49.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sg_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1: Operator with trunk offering
- 2 [default]: Ordinary subscriber or operator without trunk offering facility
- 3: Pay phone (local/STD/IDD calls)
- 4: Ex-directory subscriber (defined but not in use)
- 5: Coinafon
- 6: Test equipment
- 7: Line test desk
- 8: Interception operator
- 9: Call from transit exchange that does not normally have the calling subscriber number information (for example, trunk/gateway)
- A: Indication of a transferred call

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the

result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.

- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1 [default]: Called party free, chargeable
- 5: Called party free, not chargeable

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/
```

```
/*
-----------------------------
Metering AS pulsed clear-back
-----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values: Time in milliseconds. Default is 0, which disables the timer.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

49.3 Tone and Tone Mask Parameters

Table 35 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 35. Tone and Tone Mask Parameters for Singapore R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'6'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'6'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'0'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'9'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	
CDP_GrpA_SendANIAvailability	10	'5'	
CDP_GrpA_N_1	11	'8'	Send N-1 tone.
CDP_GrpA_N_2	12	'9'	Send N-2 tone.
CDP_GrpA_N_3	13	'0'	Send N-3 tone.
CDP_GrpA_Restart	14	'2'	Restart sending DNIS digits.

Table 35. Tone and Tone Mask Parameters for Singapore R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_SIT	15	'0'	After Group B tone is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through.
CDP_GrpB_UserBusy	16	'2'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'7'	
CDP_GrpB_Rejected	19	'4'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'6'	
CDP_GrpB_linefree_charge	22	'1'	
CDP_GrpB_linefree_nocharge	23	'5'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	fedc ba98 7654 3210 Binary: 1000 0000 0000 0000 Hex: 8000 Decimal: 32768
CDP_Grp1_RecvErrMask1	52	26872	fedc ba98 7654 3210 Binary: 0111 0000 0000 0000 Hex: 7000 Decimal: 28672
CDP_Grp1_TermToneMask2	53	36864	fedc ba98 7654 3210 Binary: 1001 0000 0000 0000 Hex: 9000 Decimal: 36864
CDP_Grp1_RecvErrMask2	54	26624	fedc ba98 7654 3210 Binary: 0110 1000 0000 0000 Hex: 6800 Decimal: 26624
CDP_Grp1_TermToneMask3	55	32768	fedc ba98 7654 3210 Binary: 1000 0000 0000 0000 Hex: 8000 Decimal: 32768
CDP_Grp1_RecvErrMask3	56	26872	

Table 35. Tone and Tone Mask Parameters for Singapore R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp2_TermToneMask	57	02046	fedc ba98 7654 3210 Binary: 0000 0111 1111 1110 Hex: 07FE Decimal: 2046
CDP_Grp2_RecvErrMask	58	63488	fedc ba98 7654 3210 Binary: 1111 1000 0000 0000 Hex: F800 Decimal: 63488
CDP_GrpA_TermToneMask1	59	00216	fedc ba98 7654 3210 Binary: 0000 0000 1101 1000 Hex: 00D8 Decimal: 216
CDP_GrpA_TermToneMask2	60	00074	fedc ba98 7654 3210 Binary: 0000 0000 0100 1010 Hex: 004A Decimal: 74
CDP_GrpA_TermToneMask3	61	00026	fedc ba98 7654 3210 Binary: 0000 0000 0001 1010 Hex: 001A Decimal: 26
CDP_GrpA_TermToneMask4	62	00026	fedc ba98 7654 3210 Binary: 0000 0000 0001 1010 Hex: 001A Decimal: 26
CDP_GrpA_RecvErrMask1	63	64544	fedc ba98 7654 3210 Binary: 1111 1100 0010 0000 Hex: FC20 Decimal: 64544
CDP_GrpA_RecvErrMask2	64	65460	fedc ba98 7654 3210 Binary: 1111 1111 1011 0101 Hex: FFB4 Decimal: 65460
CDP_GrpA_RecvErrMask3	65	63516	
CDP_GrpA_RecvErrMask4	66	63516	
CDP_GrpA_RecvErrMask5	67	63516	
CDP_GrpB_TermToneMask	68	00254	fedc ba98 7654 3210 Binary: 0000 0000 1111 1110 Hex: 00FE Decimal: 254

Table 35. Tone and Tone Mask Parameters for Singapore R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_CallAnsweredTermToneMask	69	00034	fedc ba98 7654 3210 Binary: 0000 0000 0010 0010 Hex: 0022 Decimal: 34
CDP_GrpB_RecvErrMask	70	65280	fedc ba98 7654 3210 Binary: 1111 1111 0000 0000 Hex: FF00 Decimal: 65280

South Africa R2 Bidirectional Protocol Parameter Configuration 50

This chapter discusses the capabilities and parameters of the South Africa R2 Bidirectional protocol in the following topics:

50.1 General Protocol Information

Protocol File Set

The files used with the South Africa R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_za_r2_io.cdp	pdk_za_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_za_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

50.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_za_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Customer
- 2: Priority call
- 3: Maintenance call
- 4: Pay phone
- 5: Operator
- 6: Data transmission
- b: Operator with a trunk offering facility
- c: Calling party's category not available/calling party's number not available

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1 [default]: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1: Line free, charge on answer. The release of the call is under control of the incoming equipment.
- 2: Customer transferred
- 3: Customer line busy
- 4: Congestion
- 5: Unallocated national number
- 6 [default]: Customer's line free, charge on answer
- 7: Customer's line free, no charge on answer
- 8: Customer's line out of order
- 9: Call office, free, charge on answer

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in “pulsed answer” mode and one for using metering in “pulsed clear-back” mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/

/*
----------------------------
Metering AS pulsed clear-back
----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0: ANI collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

50.3 Tone and Tone Mask Parameters

Table 36 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 36. Tone and Tone Mask Parameters for South Africa R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'5'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.

Table 36. Tone and Tone Mask Parameters for South Africa R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'0'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	
CDP_GrpA_SendANIAvailability	10	'0'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'0'	Restart sending DNIS digits.
CDP_GrpB_SIT	15	'2'	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'0'	
CDP_GrpB_NormalClearing	20	'8'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'1'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'7'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	
CDP_Grp1_RecvErrMask1	52	24577	
CDP_Grp1_TermToneMask2	53	36864	
CDP_Grp1_RecvErrMask2	54	24577	
CDP_Grp1_TermToneMask3	55	36864	
CDP_Grp1_RecvErrMask3	56	24577	
CDP_Grp2_TermToneMask	57	65534	
CDP_Grp2_RecvErrMask	58	00001	

Table 36. Tone and Tone Mask Parameters for South Africa R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_TermToneMask1	59	00104	
CDP_GrpA_TermToneMask2	60	00106	
CDP_GrpA_TermToneMask3	61	00074	
CDP_GrpA_TermToneMask4	62	00074	
CDP_GrpA_RecvErrMask1	63	65041	
CDP_GrpA_RecvErrMask2	64	65429	
CDP_GrpA_RecvErrMask3	65	65429	
CDP_GrpA_RecvErrMask4	66	65431	
CDP_GrpA_RecvErrMask5	67	65041	
CDP_GrpB_TermToneMask	68	01022	
CDP_GrpB_CallAnsweredTermToneMask	69	00706	
CDP_GrpB_RecvErrMask	70	64769	

Sweden P7 Bidirectional Protocol Parameter Configuration 51

This chapter discusses the capabilities and parameters of the Sweden P7 Bidirectional protocol in the following topics:

51.1 General Protocol Information

Protocol File Set

The files used with the Sweden P7 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards†	Dialogic® Springware Boards
Protocol Module	pdk_se_p7_io.qs and pdk_se_p7_io.hot (or pdk_se_p7_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_se_p7_io.psi
Country Dependent Parameters	pdk_se_p7_io.cdp	pdk_se_p7_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable‡	pdk_se_p7_io

†Support on Dialogic® DM3 boards requires Dialogic System Release 6.0 for PCI or later.
‡On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.

Protocol Limitations

From the Accepted state, the protocol used in this country does not support a forced release of the line; that is, issuing a **gc_DropCall( )** function after a **gc_AcceptCall( )** function. If a forced release is attempted, the function will fail and an error is returned. To recover, the application should issue a **gc_AnswerCall( )** function followed by **gc_DropCall( )** and **gc_ReleaseCall( )** functions. However, anytime a GCEV_DISCONNECTED event is received in the Accepted state, the **gc_DropCall( )** function can be issued.

51.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_se_p7_io.cdp* file are:

- CDP_Dial_Using_DTMF (Outbound)
- CDP_DialToneEnabled (Outbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

CDP_Dial_Using_DTMF (Outbound)

Description: Determines whether DTMF digits are sent.

Values:

- 0: Decadic pulses are used for sending digits.
- 1 [default]: DTMF digits are sent.

CDP_DialToneEnabled (Outbound)

Description: Determines whether to wait for a dial tone before sending digits to the remote end.

Values:

- 0 [default]: Do not wait for dial tone before sending digits to the remote end.
- 1: Wait for dial tone before sending digits to the remote end.

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

Sweden P7 PBX Bidirectional Protocol Parameter Configuration 52

This chapter discusses the capabilities and parameters of the Sweden P7 PBX Bidirectional protocol in the following topics:

52.1 General Protocol Information

Protocol File Set

The files used with the Sweden P7 PBX protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards†	Dialogic® Springware Boards
Protocol Module	pdk_se_p7_pbx_io.qs and pdk_se_p7_pbx_io.hot (or pdk_se_p7_pbx_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_se_p7_pbx_io.psi
Country Dependent Parameters	pdk_se_p7_pbx_io.cdp	pdk_se_p7_pbx_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable‡	pdk_se_p7_pbx_io

†Support on Dialogic® DM3 boards requires Dialogic System Release 6.0 for PCI or later.
‡On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.

Protocol Limitations

From the Accepted state, the protocol used in this country does not support a forced release of the line; that is, issuing a **gc_DropCall( )** function after a **gc_AcceptCall( )** function. If a forced release is attempted, the function will fail and an error is returned. To recover, the application should issue a **gc_AnswerCall( )** function followed by **gc_DropCall( )** and **gc_ReleaseCall( )** functions. However, anytime a GCEV_DISCONNECTED event is received in the Accepted state, the **gc_DropCall( )** function can be issued.

52.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_se_p7_pbx_io.cdp* file are:

- CDP_Dial_Using_DTMF (Inbound)
- CDP_DialToneEnabled (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_MaxDigits (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_Str_TermToneString (Inbound)

CDP_Dial_Using_DTMF (Inbound)

Description: Determines whether DTMF digits will be received.

Values:

- 0: Decadic pulses are used for receiving digits.
- 1 [default]: DTMF digits will be received.

CDP_DialToneEnabled (Inbound)

Description: Determines whether to wait for a dial tone before sending digits to the remote end.

Values:

- 0 [default]: Do not wait for dial tone before sending digits to the remote end.
- 1: Wait for dial tone before sending digits to the remote end.

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_MaxDigits (Inbound)

Description: Specifies the maximum number of digits that can be received when using this protocol. If, however, DTMF is used, and the parameter **CDP_Str_TermToneString** is

non-NULL, then this parameter means the number of maximum digits to be received. If some terminating digit is received before receiving this number of digits, the digit collection is terminated.

Values: Default is 4.

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_Str_TermToneString (Inbound)

Description: Specifies the string of digits that can terminate the receiving of digits. For example, if this parameter is set to #*, if * or # is received from the remote end while receiving DTMF digits, the protocol will stop receiving more digits.

Values: Default is #*.

Guidelines: This parameter is used only if DTMF is used for receiving digits. This parameter can be set to a NULL string (“”). In this case, the **CDP_MaxDigits** number of digits is received from the remote end.

53 T1 FXS Ground Start Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the T1 FXS Ground Start Bidirectional protocol in the following topics:

53.1 General Protocol Information

Protocol File Set

The files used with the T1 FXS Ground Start protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_sw_e1_gdsls_io.qs and pdk_sw_e1_gdsls_io.hot (or pdk_sw_e1_gdsls_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_sw_e1_gdsls_io.psi
Country Dependent Parameters	pdk_sw_t1_gdsls_io.cdp	pdk_sw_t1_gdsls_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_sw_t1_gdsls_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

None.

53.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_sw_t1_gdsls_io.cdp* file are:

- CDP_BlindXferTime
- CDP_BlockOnLOOS
- CDP_Connect_Upon_Media
- CDP_ConnectOnNoDialTone (Outbound)
- CDP_DelayInDialling (Outbound)
- CDP_DialToneWaitTime (Outbound)
- CDP_MinPBXHangupTime (Inbound)
- CDP_ReleaseGuardTimeout
- CDP_RemoteBlockingTimeout
- CDP_SeizeAck_Timeout
- CDP_WaitDialToneEnabled (Outbound)

CDP_BlindXferTime

Description: After sending the address digits on a BlindTransfer request, the protocol waits for the time specified by this parameter before sending CAS_ONHOOK and switching back to IDLE state.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_BlockOnLOOS

Description: Allows the protocol to send out CAS_OFFHOOK to block the line whenever a channel is set out-of-service (by the application calling the **gc_SetChanState( )** function).

Note: The ability to block the line is not supported on all switches, so this parameter is disabled by default.

Values:

- 0 [default]: Do not send CAS_OFFHOOK when a channel is set out-of-service.
- 1: Send CAS_OFFHOOK when a channel is set out-of-service.

CDP_Connect_Upon_Media

Description: Determines whether a call should transition to the Connected state immediately on positive media detection, such as voice, fax, or modem detection.

Values:

- 0 [default]: Specifies that a call does not transition to the Connected state immediately on positive media detection, but relies on signaling bit changes to indicate that a connection has been established.
- 1: Specifies that a call transitions to the Connected state immediately upon positive media detection.

CDP_ConnectOnNoDialTone (Outbound)

Description: Determines how the protocol should proceed when dial tone is not detected. If the parameter is enabled (set to 1), and no dial tone is detected, a local collision with an inbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0 [default]: Do not assume local collision and disconnect the call if no dial tone is detected.
- 1: Assume local collision and connect the perceived inbound call if no dial tone is detected.

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1.

CDP_DelayInDialling (Outbound)

Description: Specifies the delay time in dialing when the parameter **CDP_WaitDialToneEnabled** is not enabled.

Values: Time in milliseconds. Default is 50.

CDP_DialToneWaitTime (Outbound)

Description: Defines the time that the protocol waits for a dial tone before an outbound call can be made.

Values: Time in milliseconds. Default is 10000 (10 seconds).

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1. If the time defined by this parameter is exceeded before dial tone is detected, the action taken depends on the value of the **CDP_ConnectOnNoDialTone** parameter as follows:

- If the **CDP_ConnectOnNoDialTone** parameter is set to 1, a local collision is assumed and the incoming call is connected.
- If the **CDP_ConnectOnNoDialTone** parameter is set to 0, the call attempt fails and a disconnect event is forwarded with a reason of no dial tone.

CDP_MinPBXHangupTime (Inbound)

Description: Specifies the length of the ring cycle and is used to determine if the remote end has dropped an incoming call. The timer is reset at the start of each ring cycle. If the timer expires without resetting, ringing has been acknowledged to stop indicating the call was dropped, as the caller has abandoned the call before it was answered.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_ReleaseGuardTimeout

Description: Specifies the time that the protocol will block the line before setting the line to the idle state.

Values:

- 0: The line is set to the idle state immediately.
- Non-zero [default is 400]: Time in milliseconds that the protocol will block the line before setting the line to the idle state.

CDP_RemoteBlockingTimeout

Description: Specifies the length of time to wait for before detecting if the remote side is out of service.

Values: Time in milliseconds. Default is 0, i.e., the feature is disabled.

CDP_SeizeAck_Timeout

Description: Defines the maximum time-out in milliseconds for a CAS_SEIZEACK event once the line is seized by sending a CAS_SEIZE. The remote end is expected to acknowledge the CAS_SEIZE event during this interval. If not, the outgoing call is considered to have failed.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_WaitDialToneEnabled (Outbound)

Description: Determines if the protocol should wait for a dial tone before dialing. Note that this parameter does **not** apply to supervised transfers (consultation calls), in which case the dial tone is not verified.

Values:

- 0 [default]: Do not wait for dial tone before dialing.
- 1: Wait for dial tone before dialing.

Taiwan Modified R1 Bidirectional Protocol Parameter Configuration 54

This chapter discusses the capabilities and parameters of the Taiwan Modified R1 Bidirectional protocol in the following topics:

54.1 General Protocol Information

Protocol File Set

The files used with the Taiwan Modified R1 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_tw_mr1_io.qs and pdk_tw_mr1_io.hot (or pdk_tw_mr1_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_tw_mr1_io.psi
Country Dependent Parameters	pdk_tw_mr1_io.cdp	pdk_tw_mr1_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_tw_mr1_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

None.

54.2 Country Dependent Parameter Descriptions

The modifiable parameters in the *pdk_tw_mr1_io.cdp* file are:

- CDP_ANI_Timeout
- CDP_CallScenario
- CDP_SeizeAck_Timeout

CDP_ANI_Timeout

Description: Defines the maximum time-out in milliseconds to wait for ANI. Some switches in Taiwan do not send ANI, depending on the caller. If this parameter is enabled, the protocol starts the timer while receiving ANI. If no ANI is received when the timer expires, the protocol continues to send a GCEV_OFFERED event.

Values: Time in milliseconds. Default is 1000 (1 second). If 0, the timer is disabled.

CDP_CallScenario

Description: Specifies the call scenario.

Values:

- 0: DNIS+ST ANSWER
- 1 [default]: DNIS+ST ANIWink KP+ANI+ST ANSWER

Guidelines: For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_SeizeAck_Timeout

Description: Defines the maximum time-out in milliseconds for a CAS_SEIZEACK event once the line is seized by sending a CAS_SEIZE. The remote end is expected to acknowledge the CAS_SEIZE event during this interval. If not, the outgoing call is considered to have failed.

Values: Time in milliseconds. Default is 5000 (5 seconds).

55 Taiwan T1 E&M Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Taiwan T1 E&M Bidirectional protocol in the following topics:

55.1 General Protocol Information

The Taiwan T1 E&M protocol is used with the Taiwan Lucent Definity G3V8 switch with T1 signaling.

Protocol File Set

The files used with the Taiwan T1 E&M protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_tw_em_io.qs and pdk_tw_em_io.hot (or pdk_tw_em_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_tw_em_io.psi
Country Dependent Parameters	pdk_tw_em_io.cdp	pdk_tw_em_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_tw_em_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

Automatic number identification (ANI) is not supported by this version of the Taiwan T1 E&M protocol.

55.2 Country Dependent Parameter Descriptions

The only modifiable parameter in the *pdk_tw_em_io.cdp* file is:

- CDP_CallAnalysis_Enabled

CDP_CallAnalysis_Enabled

Description: Specifies whether to enable call analysis.

Values:

- 0: Do not enable call analysis.
- 1 [default]: Enable call analysis.

Thailand R2 Bidirectional Protocol Parameter Configuration

56

This chapter discusses the capabilities and parameters of the Thailand R2 Bidirectional protocol in the following topics:

56.1 General Protocol Information

Protocol File Set

The files used with the Thailand R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_th_r2_io.cdp	pdk_th_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_th_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

56.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_th_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1: Operator
- 2 [default]: Ordinary subscriber
- 3: Coin box unit fee
- 4: Reserve for multicoin coin box
- 5: STD coin box
- 6: Test equipment
- 7: Line test desk
- 8: Intercepted operator
- 9: Reserve for data communication
- A: Immediate charge information service
- B: Subscriber with private meter
- F: No information about the A-party's category

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is

considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 1 [default]: Called subscriber free with metering
- 5: Called subscriber free without metering

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/
```

```
/*
-----------------------------
Metering AS pulsed clear-back
-----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is “#*”

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

56.3 Tone and Tone Mask Parameters

Table 37 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 37. Tone and Tone Mask Parameters for Thailand R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'1'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'6'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'0'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'9'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	
CDP_GrpA_SendANIAvailability	10	'5'	
CDP_GrpA_N_1	11	'0'	Send N-1 tone.
CDP_GrpA_N_2	12	'0'	Send N-2 tone.
CDP_GrpA_N_3	13	'0'	Send N-3 tone.
CDP_GrpA_Restart	14	'2'	Restart sending DNIS digits.

Table 37. Tone and Tone Mask Parameters for Thailand R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_SIT	15	'0'	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'2'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'4'	
CDP_GrpB_Rejected	19	'4'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'6'	
CDP_GrpB_linefree_charge	22	'1'	
CDP_GrpB_linefree_nocharge	23	'5'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	fedc ba98 7654 3210 Binary: 1000 0000 0000 0000 Hex: 8000 Decimal: 32768
CDP_Grp1_RecvErrMask1	52	30721	fedc ba98 7654 3210 Binary: 0111 1000 0000 0001 Hex: 7801 Decimal: 30721
CDP_Grp1_TermToneMask2	53	36864	fedc ba98 7654 3210 Binary: 1001 0000 0000 0000 Hex: 9000 Decimal: 36864
CDP_Grp1_RecvErrMask2	54	30721	fedc ba98 7654 3210 Binary: 0111 1000 0000 0001 Hex: 7801 Decimal: 30721
CDP_Grp1_TermToneMask3	55	32768	fedc ba98 7654 3210 Binary: 1000 0000 0000 0000 Hex: 8000 Decimal: 32768
CDP_Grp1_RecvErrMask3	56	30721	fedc ba98 7654 3210 Binary: 0111 1000 0000 0001 Hex: 7801 Decimal: 30721

Table 37. Tone and Tone Mask Parameters for Thailand R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp2_TermToneMask	57	00004	fedc ba98 7654 3210 Binary: 0000 0000 0000 0100 Hex: 0004 Decimal: 4
CDP_Grp2_RecvErrMask	58	30737	fedc ba98 7654 3210 Binary: 0111 1000 0001 0001 Hex: 7811 Decimal: 30737
CDP_GrpA_TermToneMask1	59	00088	fedc ba98 7654 3210 Binary: 0000 0000 0101 1000 Hex: 0058 Decimal: 88
CDP_GrpA_TermToneMask2	60	00074	fedc ba98 7654 3210 Binary: 0000 0000 0100 1010 Hex: 004A Decimal: 74
CDP_GrpA_TermToneMask3	61	00026	fedc ba98 7654 3210 Binary: 0000 0000 0001 1010 Hex: 001A Decimal: 26
CDP_GrpA_TermToneMask4	62	00026	fedc ba98 7654 3210 Binary: 0000 0000 0000 1010 Hex: 001A Decimal: 26
CDP_GrpA_RecvErrMask1	63	65440	fedc ba98 7654 3210 Binary: 1111 1111 1010 0000 Hex: FFA0 Decimal: 65440
CDP_GrpA_RecvErrMask2	64	65428	fedc ba98 7654 3210 Binary: 1111 1111 1001 0100 Hex: FF94 Decimal: 65428
CDP_GrpA_RecvErrMask3	65	65412	fedc ba98 7654 3210 Binary: 1111 1111 1000 0100 Hex: FF84 Decimal: 65412
CDP_GrpA_RecvErrMask4	66	65412	fedc ba98 7654 3210 Binary: 1111 1111 1000 0100 Hex: FF84 Decimal: 65412

Table 37. Tone and Tone Mask Parameters for Thailand R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_RecvErrMask5	67	65412	fedc ba98 7654 3210 Binary: 1111 1111 1000 0100 Hex: FF84 Decimal: 65412
CDP_GrpB_TermToneMask	68	00126	fedc ba98 7654 3210 Binary: 0000 0000 0111 1110 Hex: 007e Decimal: 126
CDP_GrpB_CallAnsweredTermToneMask	69	00034	fedc ba98 7654 3210 Binary: 0000 0000 0010 0010 Hex: 0022 Decimal: 34
CDP_GrpB_RecvErrMask	70	65408	fedc ba98 7654 3210 Binary: 1111 1111 1000 0000 Hex: FF80 Decimal: 65408

United States T1 Bidirectional Protocol Parameter Configuration 57

This chapter discusses the capabilities and parameters of the United States T1 Bidirectional protocol in the following topics:

57.1 General Protocol Information

Protocol File Set

The files used with the United States T1 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_us_mf_io.qs and pdk_us_mf_io.hot (or pdk_us_mf_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_us_mf_io.psi
Country Dependent Parameters	pdk_us_mf_io.cdp	pdk_us_mf_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_us_mf_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

After a call is transferred with **gc_SetUpTransfer( )**, you cannot issue a **gc_DropCall( )** on the original call. You must drop the consultation call before the original call can be dropped. The behavior of the protocol is undefined if you try to drop the original call without dropping the consultation call first.

57.2 Country Dependent Parameter Descriptions

The modifiable parameters in the *pdk_us_mf_io.cdp* file are:

- CDP_BLIND_XFER_DIALTONE_TIMEOUT

- CDP_BLIND_XFER_POST_TIME
- CDP_BLIND_XFER_PRE_TIME
- CDP_BlockOnLOOS
- CDP_FORCED_RELEASE_ENABLED
- CDP_HOOKFLASH_ON_XFER
- CDP_HOOKFLASH_ON_XFER_DROP
- CDP_IN_ACCEPTBEFORERING
- CDP_IN_ANI_DigitType
- CDP_IN_ANI_Enabled
- CDP_IN_ANI_KP_Needed
- CDP_IN_ANI_MaxDigits
- CDP_IN_ANI_ST_Needed
- CDP_IN_ANI_Type_Pre
- CDP_IN_ANI_WINK_Needed
- CDP_IN_ANIKPDigit
- CDP_IN_ANISTDigit
- CDP_IN_DialTone_Needed
- CDP_IN_DNIS_BeforeANI
- CDP_IN_DNIS_DigitType
- CDP_IN_DNIS_Enabled
- CDP_IN_DNIS_KP_Needed
- CDP_IN_DNIS_MaxDigits
- CDP_IN_DNIS_ST_Needed
- CDP_IN_DNIS_WINK_Needed
- CDP_IN_DNISKPDigit
- CDP_IN_DNISSTDigit
- CDP_IN_EnableRingBack
- CDP_IN_GetDigitTime
- CDP_IN_RemoteBlockingTimeout
- CDP_IN_ResumeCallTimeout
- CDP_IN_WinkStart
- CDP_MIN_CallLength
- CDP_Min_HangupTime
- CDP_OUT_ANI_DigitType
- CDP_OUT_ANI_Enabled
- CDP_OUT_ANI_KP_Needed
- CDP_OUT_ANI_ST_Needed
- CDP_OUT_ANI_Type_Pre

- CDP_OUT_ANI_WINK_Needed
- CDP_OUT_ANIKPDigit
- CDP_OUT_ANISTDigit
- CDP_OUT_ANIString
- CDP_OUT_ConnectType
- CDP_OUT_DialTone_Needed
- CDP_OUT_DialTone_Timeout
- CDP_OUT_DNIS_BeforeANI
- CDP_OUT_DNIS_DigitType
- CDP_OUT_DNIS_Enabled
- CDP_OUT_DNIS_KP_Needed
- CDP_OUT_DNIS_ST_Needed
- CDP_OUT_DNIS_WINK_Needed
- CDP_OUT_DNISKPDigit
- CDP_OUT_DNISSTDigit
- CDP_OUT_EnableRingBack
- CDP_OUT_SeizeAck_Timeout
- CDP_OUT_SeizeDelay
- CDP_OUT_Send_Alerting_After_Dialing
- CDP_OUT_WinkStart
- CDP_SETUP_XFER_CPA
- CDP_SETUP_XFER_DIALTONE_TIMEOUT
- CDP_USE_DEFAULTANI
- CDP_Xfer_DigitType

CDP_BLIND_XFER_DIALTONE_TIMEOUT

Description: Defines the maximum time-out to wait for dial tone during a blind transfer.

Values:

- Time in milliseconds. Default is 5000 (5 seconds).
- 0: Disables waiting for dial tone during a blind transfer.

CDP_BLIND_XFER_POST_TIME

Description: Specifies the time between blind transfer dialing and hangup.

Values: Time in milliseconds. Default is 1000 (1 second).

CDP_BLIND_XFER_PRE_TIME

Description: Specifies the time between blind transfer hookflash and dialing.

Values: Time in milliseconds. Default is 0.

CDP_BlockOnLOOS

Description: Allows the protocol to send out CAS_BLOCKING to block the line whenever a channel is set out-of-service (by the application calling the **gc_SetChanState( )** function).

Note: The ability to block the line is not supported on all switches, so this parameter is disabled by default.

Values:

- 0 [default]: Do not send blocking pattern when a channel is set out-of-service.
- 1: Send blocking pattern when a channel is set out-of-service.

CDP_FORCED_RELEASE_ENABLED

Description: Enables the protocol to support "forced release" of incoming calls from the Accepted state. The T1 protocol specification does not support forced release of incoming calls from the Accepted state. However, support for forcing release of incoming calls is supported in this implementation for flexibility with Global Call applications, which are permitted to call **gc_DropCall( )** from the Accepted state. In this scenario, the call will be answered transparently without notification of the application and then immediately disconnected, i.e., a "forced release" of the line. Note that in doing this, additional implications exist and must be considered, i.e., billing, etc.

Values:

- 0: Does not support forced release. No implicit answer will be performed transparently in this scenario, and only a CAS hangup (idle) signal will be generated.
- 1 [default]: Supports forced release.

CDP_HOOKFLASH_ON_XFER

Description: Determines if a hookflash is sent by the protocol when a supervised and blind transfer is requested.

Values:

- 0: Do not send hookflash.
- 1 [default]: Send the hookflash.

CDP_HOOKFLASH_ON_XFER_DROP

Description: Determines if a hookflash is sent by the protocol if a supervised transfer request is aborted via a **gc_DropCall( )** function.

Values:

- 0: Do not send hookflash.
- 1 [default]: Send the hookflash.

CDP_IN_ACCEPTBEFORERING

Description: Determines if an accept event should be sent before sending ringback tones.

Values:

- 0: Send the accept event after sending ringback tones.
- 1 [default]: Send the accept event before sending ringback tones.

CDP_IN_ANI_DigitType

Description: Determines the digit type for inbound automatic number identification (ANI) digits.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

CDP_IN_ANI_Enabled

Description: Enables ANI collection. The ANI digits are terminated either by **CDP_IN_ANISTDigit** if **CDP_IN_ANI_ST_Needed** is set to 1, or by the maximum number of digits set by **CDP_IN_ANI_MaxDigits**.

Values:

- 0: ANI collection not enabled.
- 1 [default]: ANI collection enabled.

Guidelines: For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_ANI,feature_transfer"
```

CDP_IN_ANI_KP_Needed

Description: Specifies whether the ANI prefix digit is used.

Values:

- 0: ANI prefix digit is not needed.
- 1 [default]: ANI prefix digit is needed.

CDP_IN_ANI_MaxDigits

Description: Specifies the maximum number of ANI digits expected. ANI collection terminates if this value is reached.

Values: Default is 12 ANI digits.

CDP_IN_ANI_ST_Needed

Description: Specifies whether ANI digits are terminated by **CDP_IN_ANISTDigit**.

Values:

- 0: No termination digit added; ANI digits are terminated by the maximum number of digits set by **CDP_IN_ANI_MaxDigits**.
- 1 [default]: Termination digit added; ANI digits are terminated by the value set by **CDP_IN_ANISTDigit**.

CDP_IN_ANI_Type_Pre

Description: Specifies whether ANI digits are expected before generating the answer signal.

Values:

- 0: Do not expect ANI digits before the answer signal.
- 1 [default]: Expect ANI digits before the answer signal.

CDP_IN_ANI_WINK_Needed

Description: Specifies if a CAS_WINK signaling pattern should be generated immediately after the reception of the ANI digits.

Values:

- 0 [default]: Do not generate the CAS_WINK signaling pattern after ANI.
- 1: Generate the CAS_WINK signaling pattern after ANI.

CDP_IN_ANIKPDigit

Description: Specifies the ANI prefix digit. This parameter has no effect if **CDP_IN_ANI_KP_Needed** is set to 0.

Values: Default is *.

CDP_IN_ANISTDigit

Description: Specifies the ANI ST digit. This parameter has no effect if **CDP_IN_ANI_ST_Needed** is set to 0.

Values: Default is *.

CDP_IN_DialTone_Needed

Description: Specifies whether a dial tone should be generated after receiving a CAS_SEIZE to notify the CO that it can begin dialing.

Values:

- 0 [default]: Do not generate a dial tone.
- 1: Generate a dial tone.

CDP_IN_DNIS_BeforeANI

Description: Specifies whether dialed number identification service (DNIS) digits are received before ANI digits. This parameter is applicable only if **CDP_IN_DNIS_Enabled** is set to 1.

Values:

- 0 [default]: Receive the ANI digits before the DNIS digits.
- 1: Receive the DNIS digits before the ANI digits.

CDP_IN_DNIS_DigitType

Description: Determines the digit type for inbound DNIS digits.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

CDP_IN_DNIS_Enabled

Description: Enables DNIS collection. The DNIS digits are terminated either by **CDP_IN_DNISSTDigit** if **CDP_IN_DNIS_ST_Needed** is set to 1, or by the maximum number of digits set by **CDP_IN_DNIS_MaxDigits**.

Values:

- 0: DNIS collection not enabled.
- 1 [default]: DNIS collection enabled.

Guidelines: For Dialogic® DM3 boards, if DNIS is disabled, you also have to remove **feature_DNIS** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_ANI,feature_transfer"
```

CDP_IN_DNIS_KP_Needed

Description: Specifies whether the DNIS prefix digit is used.

Values:

- 0 [default]: DNIS prefix digit is not needed.
- 1: DNIS prefix digit is needed.

CDP_IN_DNIS_MaxDigits

Description: Defines the maximum number of DNIS digits.

Values: Default is 12 DNIS digits.

CDP_IN_DNIS_ST_Needed

Description: Specifies whether DNIS digits are terminated by **CDP_IN_DNISSTDigit**.

Values:

- 0: No termination digit added; DNIS digits are terminated by the maximum number of digits set by **CDP_IN_DNIS_MaxDigits**.
- 1 [default]: Termination digit added; DNIS digits are terminated by the value set by **CDP_IN_DNISSTDigit**.

CDP_IN_DNIS_WINK_Needed

Description: Specifies whether a CAS_WINK signaling pattern should be generated immediately after the reception of the DNIS digits.

Values:

- 0 [default]: Do not generate the CAS_WINK signaling pattern after DNIS.
- 1: Generate the CAS_WINK signaling pattern after DNIS.

CDP_IN_DNISKPDigit

Description: Specifies the DNIS prefix digit. This parameter has no effect if **CDP_IN_DNIS_KP_Needed** is set to 0.

Values: Default is *.

CDP_IN_DNISSTDigit

Description: Specifies the DNIS ST digit. This parameter has no effect if **CDP_IN_DNIS_ST_Needed** is set to 0.

Values: Default is *.

CDP_IN_EnableRingBack

Description: Specifies whether a ringback should be generated before answering a call. The number of rings generated is determined by the value passed by the **gc_AcceptCall( )** or **gc_AnswerCall( )** function.

Values:

- 0 [default]: Do not generate a ringback.
- 1: Generate a ringback.

CDP_IN_GetDigitTime

Description: Specifies the total time the protocol will wait for the digit collection process to complete (for both DNIS and ANI).

Values: Time in milliseconds. Default is 30000 (30 seconds).

Guidelines: The value of **CDP_IN_GetDigitTime** must be greater than the values of the **PSL_TONE_RECEIVEDIGITS_FIRSTDIGIT_TO** and **PSL_TONE_RECEIVEDIGITS_INTERDIGIT_TO** parameters.

CDP_IN_RemoteBlockingTimeout

Description: Provides the ability to detect remote blocking and specifies the time to wait before sending a GCEV_BLOCKED event indicating the remote end is out of service. This can be used in the case of call clearing from the local end, if the protocol does not receive the expected CAS idle signal from the remote end within the specified time

Values:

- 0 [default]: Disables detection of remote blocking.
- Time in milliseconds: Enables detection of remote blocking and sets the time-out period.

CDP_IN_ResumeCallTimeout

Note: The suspend/resume calls feature is supported on Dialogic® DM3 boards only and requires one of the following Dialogic® System Releases: System Release 6.1 for Linux, System Release 6.0 CompactPCI for Windows® (with Feature Pack 1), and System Release 6.0 PCI for Windows® (with Service Update).

Note: The application should include *dm3cc_parm.h* when using this feature.

Description: Provides the ability to suspend and resume calls. When this parameter is enabled, a caller can hang up and then pick up again without having the call terminated. After receiving a disconnect from the remote end, the protocol must receive a CAS_RESUME within the specified time-out period to resume the call. (See Guidelines below for information about the CAS_RESUME signal.)

If **CDP_IN_ResumeCallTimeout** is enabled and the protocol receives a disconnect line signal from the remote end, the disconnect is not reported immediately. Instead, the protocol reports that the remote end has suspended the call, and starts the timer. The application receives a GCEV_EXTENSION event with an associated value PDKVAL_SUSPEND (0x50000). If the protocol receives the CAS_RESUME signal before the timer expires, the application is notified that the remote end has resumed the call through another GCEV_EXTENSION event with an associated value PDKVAL_RESUME (0x50001).

During this suspend and resume period, the call is still in the Connected state. If the timer expires before receiving the CAS_RESUME signal, the call will be disconnected and the application receives a GCEV_DISCONNECTED event.

Values:

- 0 [default]: Disables the suspend/resume feature.
- Time in milliseconds: Enables the suspend/resume feature and sets the time-out period in which the call can be resumed.

Guidelines: The signal pattern for resuming the call (that is, when the user picks up the phone again) can be defined by modifying the CAS_RESUME signal definition in the CDP file. By default, it is the same as CAS_SEIZE.

Within the application, the GCEV_EXTENSION event must be enabled. The **gc_SetConfigData( )** function is used to do this. For example:

```
LINEDEV linedev;
GC_PARM_BLK * t_parm_data_blkp = NULL;  /* must be initialized to 0 */
long t_requestID;

     gc_util_insert_parm_val(&t_parm_data_blkp, CCSET_EXTENSIONEVT_MSK, GCACT_ADDMSK,
sizeof(long), EXTENSIONEVT_SUSPEND_RESUME);
     if ( gc_SetConfigData(GCTGT_CCLIB_CHAN, linedev, t_parm_data_blkp, 0,
GCUPDATE_IMMEDIATE, &t_requestID, EV_ASYNC)  )
     {
          /* Error process */
     }
     gc_util_delete_parm_blk(t_parm_data_blkp);  /* Must be called to free the memory */
```

For more detailed information about Global Call functions and events, see the *Dialogic® Global Call API Programming Guide* and *Dialogic® Global Call API Library Reference*.

CDP_IN_WinkStart

Description: Specifies whether to generate a seizure acknowledgment CAS_WINK after receiving a CAS_SEIZE.

Values:

- 0: Immediate start.
- 1 [default]: Wink start.

CDP_MIN_CallLength

Description: Specifies the minimum length of time that an inbound or outbound call can be connected.

Values: Time in milliseconds. Default is 300 milliseconds.

CDP_Min_HangupTime

Description: Controls the amount of time after hangup during which the protocol will ignore any signaling transitions. It is primarily used to prevent a race condition where, after an outbound channel hangs up after the call has been delivered but before a call is connected, the remote inbound channel might answer anyway, and the ensuing transition can be interpreted as a CAS_SEIZE.

Values: Time in milliseconds. Default is 0.

Guidelines: This parameter is needed only if CAS_ANSWER and CAS_SEIZE transitions are the same, and usually only useful when running the protocol back to back, as most live switches would not attempt to answer a call that has been disconnected.

CDP_OUT_ANI_DigitType

Description: Determines the digit type for outbound ANI digits.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

CDP_OUT_ANI_Enabled

Description: Enables ANI generation.

Values:

- 0: ANI collection not enabled.
- 1 [default]: ANI collection enabled.

CDP_OUT_ANI_KP_Needed

Description: Specifies whether the ANI prefix digit is used.

Values:

- 0: ANI prefix digit is not needed.
- 1 [default]: ANI prefix digit is needed.

CDP_OUT_ANI_ST_Needed

Description: Specifies whether ANI digits are terminated by **CDP_OUT_ANISTDigit**.

Values:

- 0: No termination digit added.
- 1 [default]: Termination digit added.

CDP_OUT_ANI_Type_Pre

Description: Specifies whether ANI digits will be generated before the reception of an answer signal.

Values:

- 0: Do not generate ANI digits before the answer signal.
- 1 [default]: Generate ANI digits before the answer signal.

CDP_OUT_ANI_WINK_Needed

Description: Specifies whether a CAS_WINK signaling pattern should be received immediately after the generation of the ANI digits.

Values:

- 0 [default]: A CAS_WINK signaling pattern does not have to be received.
- 1: A CAS_WINK signaling pattern must be received.

CDP_OUT_ANIKPDigit

Description: Specifies the ANI prefix digit. This parameter has no effect if **CDP_OUT_ANI_KP_Needed** is set to 0.

Values: Default is *.

CDP_OUT_ANISTDigit

Description: Specifies the ANI ST digit. This parameter has no effect if **CDP_OUT_ANI_ST_Needed** is set to 0.

Values: Default is *.

CDP_OUT_ANIString

Description: Specifies the string used as the ANI digits if **CDP_OUT_ANI_Enabled** is set to 1.

Values: Default is 5678.

CDP_OUT_ConnectType

Description: Specifies the mode for outbound connection detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_OUT_DialTone_Needed

Description: Specifies whether a dial tone must be received after generating a CAS_SEIZE.

Values:

- 0 [default]: Do not receive a dial tone.
- 1: Receive a dial tone.

CDP_OUT_DialTone_Timeout

Description: Defines the time-out while waiting for a dial tone after a line seizure. This parameter is not used if **CDP_OUT_WinkStart** is set to 0.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_OUT_DNIS_BeforeANI

Description: Specifies whether DNIS digits are sent before ANI digits. This parameter is applicable only if **CDP_OUT_DNIS_Enabled** is set to 1.

Values:

- 0 [default]: Send the ANI digits before the DNIS digits.
- 1: Send the DNIS digits before the ANI digits.

CDP_OUT_DNIS_DigitType

Description: Determines the digit type for outbound DNIS digits.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

CDP_OUT_DNIS_Enabled

Description: Enables DNIS.

Values:

- 0: DNIS not enabled.
- 1 [default]: DNIS enabled.

CDP_OUT_DNIS_KP_Needed

Description: Specifies whether the DNIS prefix digit is used.

Values:

- 0 [default]: DNIS prefix digit is not needed.
- 1: DNIS prefix digit is needed.

CDP_OUT_DNIS_ST_Needed

Description: Specifies whether DNIS digits are terminated by **CDP_OUT_DNISSTDigit**.

Values:

- 0: No termination digit added.
- 1 [default]: Termination digit added.

CDP_OUT_DNIS_WINK_Needed

Description: Specifies whether a CAS_WINK signaling pattern should be received immediately after sending the DNIS digits.

Values:

- 0 [default]: The reception of a CAS_WINK signaling pattern is not required.
- 1: The reception of a CAS_WINK signaling pattern is required.

CDP_OUT_DNISKPDigit

Description: Specifies the DNIS prefix digit. This parameter has no effect if **CDP_OUT_DNIS_KP_Needed** is set to 0.

Values: Default is *.

CDP_OUT_DNISSTDigit

Description: Specifies the DNIS ST digit. This parameter has no effect if **CDP_OUT_DNIS_ST_Needed** is set to 0.

Values: Default is *.

CDP_OUT_EnableRingBack

Description: Specifies whether a ringback must be received before a call is answered. The number of rings is determined by the value passed by the **gc_AcceptCall( )** or **gc_AnswerCall( )** function.

Values:

- 0 [default]: Do not receive a ringback.
- 1: Receive a ringback.

CDP_OUT_SeizeAck_Timeout

Description: Specifies the time-out while waiting for a CAS_WINK after a line seizure.

Values: Time in milliseconds. Default is 5000 (5 seconds).

CDP_OUT_SeizeDelay

Description: Specifies the desired delay between a makecall and a line seize attempt.

Values: Time in milliseconds. Default is 1000 (1 second).

CDP_OUT_Send_Alerting_After_Dialing

Description: Determines when the protocol sends a GCEV_ALERTING event to the application.

Values:

- 0 [default]: GCEV_ALERTING is sent when ringback is detected.
- 1: If call progress analysis is disabled, GCEV_ALERTING is sent after dialing is completed. If call progress analysis is enabled, GCEV_ALERTING is sent after dialing is initiated.

CDP_OUT_WinkStart

Description: Specifies whether a CAS_WINK seizure acknowledgment must be received following the generation of a seize request.

Values:

- 0: Immediate start, that is, no wink required.
- 1 [default]: Wink start, that is, wink required.

CDP_SETUP_XFER_CPA

Description: Enables call progress analysis during supervised transfer.

Values:

- 0: Call progress analysis disabled during supervised transfer.
- 1 [default]: Call progress analysis enabled during supervised transfer.

CDP_SETUP_XFER_DIALTONE_TIMEOUT

Description: Defines the maximum time-out to wait for dial tone during a supervised transfer.

Values:

- Time in milliseconds. Default is 5000 (5 seconds).
- 0: Disables waiting for dial tone during a supervised transfer.

CDP_USE_DEFAULTANI

Description: Once **CDP_OUT_ANI_Enabled** is set, specifies whether to use **CDP_OUT_ANIString** for the ANI. Otherwise, the number set by the application is used.

Values:

- 0 [default]: The number set by the application is used for ANI.
- 1: Use **CDP_OUT_ANIString** for the ANI.

CDP_Xfer_DigitType

Description: Determines the digit type for transfers.

Values:

- 1 [default]: DTMF digits.
- 2: MF digits.

57.3 Parameter Values for Feature Groups A, B, and D

Table 38 shows the parameters that should be set in your CDP file for Feature Groups A, B, and D.

Table 38. Parameter Values for Feature Groups A, B, and D

Parameter	FGA	FGB	FGD
CDP_IN_ANI_Enabled	0	0	1
CDP_IN_ANI_WINK_Needed	NA	NA	1
CDP_IN_DNIS_BeforeANI	NA	NA	1
CDP_IN_DNIS_Enabled	0	1	1
CDP_IN_DNIS_WINK_Needed	NA	0	0
CDP_IN_WinkStart	0	1	1
CDP_OUT_ANI_Enabled	0	0	1
CDP_OUT_ANI_WINK_Needed	NA	NA	1
CDP_OUT_DNIS_BeforeANI	NA	NA	1
CDP_OUT_DNIS_Enabled	0	1	1
CDP_OUT_DNIS_WINK_Needed	NA	0	0
CDP_OUT_WinkStart	0	1	1
NA - Not applicable. Modifying these values will have no effect because they are overridden by other settings.			

58 United States T1 FXS/LS Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the United States T1 FXS/LS Bidirectional protocol in the following topics:

58.1 General Protocol Information

The United States T1 FXS/LS protocol is used in a system where a foreign exchange subscriber (FXS), for example, a voice mail system, is connected to a foreign exchange originator (FXO), for example, a private branch exchange (PBX).

Protocol File Set

The files used with the United States T1 FXS/LS protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_us_ls_fxs_io.qs and pdk_us_ls_fxs_io.hot (or pdk_us_ls_fxs_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_us_ls_fxs_io.psi
Country Dependent Parameters	pdk_us_ls_fxs_io.cdp	pdk_us_ls_fxs_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_us_ls_fxs_io

†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.

Protocol Limitations

The United States T1 FXS/LS protocol has the following limitations:

- The protocol is **not** symmetrical. It is intended to converse with an FXO protocol at the remote side.
- After a call is transferred with **gc_SetUpTransfer( )**, you cannot issue a **gc_DropCall( )** on the original call. You must drop the consultation call before the original call can be dropped. The behavior of the protocol is undefined if you try to drop the original call without dropping the consultation call first.

58.2 Country Dependent Parameter Descriptions

The modifiable parameters in the *pdk_us_ls_fxs_io.cdp* file are:

- CDP_AllowDblHookflashOnConsultationDrop
- CDP_BlockOnLOOS
- CDP_BTPostDialDelay
- CDP_BTPreDialDelay
- CDP_BypassHookflashOnConsultationDrop
- CDP_BypassHookflashOnTransfer
- CDP_CONNECT_UPON_MEDIA
- CDP_ConnectOnNoDialTone
- CDP_ConnectOnNoRingBack
- CDP_DialToneWaitTime
- CDP_DisconnectToneSup
- CDP_IMMEDIATE_ACCEPTSTATE
- CDP_MinPBXHangupTime
- CDP_OnhookDuration
- CDP_PBXAnswerEnabled
- CDP_PBXDiscEnabled
- CDP_PostOffhookDelay
- CDP_ProtocolStartsOffhook
- CDP_ProtocolStopsOffhook
- CDP_ReconnectDelay
- CDP_Send_Alerting_Or_Connected_After_Dial
- CDP_WaitDialToneEnabled

CDP_AllowDblHookflashOnConsultationDrop

Description: Permits the protocol to send a second hookflash CAS signaling following the first one (that is, double hookflash) when dropping a consultation call. When enabled, double hookflash CAS signals are sent to the switch.

Values:

- 0 [default]: Parameter is disabled.
- 1: Parameter is enabled.

Guidelines: Normally, this parameter should be disabled. It should be enabled only when a double hookflash is required for some switches to drop the consultation call.

When this parameter is enabled, the **CDP_BypassHookflashOnConsultationDrop** parameter must be disabled (that is set to 0).

CDP_BlockOnLOOS

Description: Allows the protocol to send out CAS_OFFHOOK to block the line whenever a channel is set out-of-service (by the application calling the **gc_SetChanState( )** function).

Note: The ability to block the line is not supported on all switches, so this parameter is disabled by default.

Values:

- 0 [default]: Do not send CAS_OFFHOOK when a channel is set out-of-service.
- 1: Send CAS_OFFHOOK when a channel is set out-of-service.

CDP_BTPostDialDelay

Description: Defines the intentional delay before hanging up after dialing on a blind transfer.

Values: Time in milliseconds. Default is 500 (0.5 seconds).

CDP_BTPreDialDelay

Description: Defines the intentional delay after the blind transfer hookflash and the start of dialing. Note that this should not be necessary assuming the wait for dial tone parameter, **CDP_WaitDialToneEnabled**, is enabled.

Values: Time in milliseconds. Default is 1000 (1 second).

CDP_BypassHookflashOnConsultationDrop

Description: Permits the protocol to bypass signaling a hookflash when dropping a consultation call. When enabled, no hookflash CAS signaling is sent and only applicable state changes are delivered to the application.

Values:

- 0 [default]: Parameter is disabled.
- 1: Parameter is enabled.

Guidelines: Normally, this parameter should be disabled. It should be enabled only when all consultation calls are assumed to initiate the disconnect.

CDP_BypassHookflashOnTransfer

Description: Permits the protocol to bypass signaling a hookflash when initiating either a supervised or unsupervised transfer via **gc_SetUpTransfer( )** or **gc_BlindTransfer( )** respectively. When enabled, no hookflash CAS signaling is sent and only applicable state changes are delivered to the application.

Values:

- 0 [default]: Parameter is disabled.
- 1: Parameter is enabled.

Guidelines: Normally, this parameter should be disabled.

CDP_CONNECT_UPON_MEDIA

Description: Determines whether a call should transition to the Connected state immediately on positive media detection, such as voice, fax, or modem detection.

Values:

- 0: Specifies that a call does not transition to the Connected state immediately on positive media detection, but relies on signaling bit changes to indicate that a connection has been established.
- 1 [default]: Specifies that a call transitions to the Connected state immediately upon positive media detection.

CDP_ConnectOnNoDialTone

Description: Determines how the protocol should proceed when dial tone is not detected. If the parameter is enabled (set to 1), and no dial tone is detected, a local collision with an inbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0: Do not assume local collision and disconnect the call if no dial tone is detected.
- 1 [default]: Assume local collision and connect the perceived inbound call if no dial tone is detected.

CDP_ConnectOnNoRingBack

Description: Determines how the protocol should proceed when no ringback tone is detected. If the parameter is enabled (set to 1), and no ringback is detected, a remote collision with a remote outbound call is assumed, and the call immediately transitions to Connected state.

Values:

- 0: Do not assume remote collision and disconnect the call if no ringback is detected.
- 1 [default]: Assume remote collision and connect the call if no ringback is detected.

CDP_DialToneWaitTime

Description: Defines the time that the protocol waits for a dial tone before an outbound call can be made.

Values: Time in milliseconds. Default is 5000 (5 seconds).

Guidelines: This parameter is applicable only if the **CDP_WaitDialToneEnabled** parameter is set to 1. If the time defined by this parameter is exceeded before dial tone is detected, the action taken depends on the value of the **CDP_ConnectOnNoDialTone** parameter as follows:

- If the **CDP_ConnectOnNoDialTone** parameter is set to 1, a local collision is assumed and the incoming call is connected.
- If the **CDP_ConnectOnNoDialTone** parameter is set to 0, the call attempt fails and a disconnect event is forwarded with a reason of no dial tone.

CDP_DisconnectToneSup

Description: Enables or disables disconnect tone supervision.

Values:

- 0: Disables disconnect tone supervision.
- 1 [default]: Enables disconnect tone supervision.

CDP_IMMEDIATE_ACCEPTSTATE

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

CDP_MinPBXHangupTime

Description: Specifies the length of the ring cycle and is used to determine if the remote end (that is, the PBX) has dropped an incoming call. The timer is reset at the start of each ring cycle. If the timer expires without resetting, ringing has been acknowledged to stop indicating the PBX has dropped the call, as the caller has abandoned the call before it was answered.

Values: Time in milliseconds. Default is 6000 (6 seconds).

Guidelines: The value of this parameter is typically set to 6 seconds which corresponds to the complete ring cycle (2 seconds on and 4 seconds of silence).

CDP_OnhookDuration

Description: Defines the intentional delay for going on-hook prior to making a call. This behavior is only required when the **gc_WaitCall( )** function has not been called to this point.

Once the **gc_WaitCall( )** function is called in a session, the line device is always on-hook when idle and hence this parameter is ignored.

Values: Time in milliseconds. Default is 2000 (2 seconds).

CDP_PBXAnswerEnabled

Description: Determines whether the remote PBX supports call answer supervision via CAS line signaling. If this parameter is enabled and the device detects the specified CAS answer line signaling, the outbound call transitions to the Connected state provided call progress is not mandated in the make call.

Values:

- 0: Disable call answer supervision, since it is not supported by the PBX.
- 1 [default]: Enable call answer supervision provided by the PBX.

CDP_PBXDiscEnabled

Description: Determines if the remote PBX can initiate call disconnection via CAS line signaling.

Values:

- 0: Disable call disconnect supervision, since it is not supported by the PBX.
- 1 [default]: Enable call disconnect supervision provided by the PBX.

CDP_PostOffhookDelay

Description: Defines the intentional delay after the off-hook prior to dialing digits. This is used primarily in scenarios when **CDP_WaitDialToneEnabled** is disabled (zero).

Values: Time in milliseconds. Default is 0.

CDP_ProtocolStartsOffhook

Description: Determines the state of the hook switch signaling (on-hook or off-hook) upon opening the device.

Values:

- 0: Set the hook switch state to on-hook.
- 1 [default]: Set the hook switch state to off-hook.

CDP_ProtocolStopsOffhook

Description: Determines the state of the hook switch signaling (on-hook or off-hook) when the protocol stops after **gc_Close( )**.

Note: This parameter has no effect on Dialogic® DM3 boards, because the protocol is not stopped until the board is stopped.

Values:

- 0 [default]: Set the hook switch state to on-hook.
- 1: Set the hook switch state to off-hook.

CDP_ReconnectDelay

Description: Specifies the intentional delay before the primary call is back to the connected state after the consultation call is released.

Values: Time in milliseconds. Default is 0.

Guidelines: A 2-second delay is recommended for some switches.

CDP_Send_Alerting_Or_Connected_After_Dial

Description: Controls when the protocol will send a GCEV_ALERTING or GCEV_CONNECTED event to the application.

Values:

- 0 [default]: GCEV_ALERTING is sent when ringback is detected, and GCEV_CONNECTED is sent when the call is connected.
- 1: GCEV_ALERTING is sent after dialing is completed if call progress analysis is disabled, or after dialing is initiated if call progress analysis is enabled. However, if call progress analysis is disabled and **CDP_PBX_AnswerEnabled** is also disabled, then GCEV_CONNECTED will be sent after dialing instead of GCEV_ALERTING, because the protocol would not be able to reach the Connected state otherwise.

CDP_WaitDialToneEnabled

Description: Determines if the protocol should wait for a dial tone before dialing. Note that this parameter does **not** apply to supervised transfers (consultation calls), in which case the dial tone is not verified.

Values:

- 0: Do not wait for dial tone before dialing.
- 1 [default]: Have the FXS wait for dial tone before dialing.

58.3 FXS Signaling Bit States

The signaling bits for the various line states handled by the United States T1 FXS/LS protocol are shown in Table 39.

Note: FXS is a foreign exchange subscriber (for example, a voice mail system) connected to a foreign exchange originator (FXO, for example, a PBX). The A and B signaling bit meanings are not the same for both FXO and FXS; that is, they are not symmetrical.

Table 39. FXS Signaling Bit States

Line State	TX Bits		RX Bits		Comment
	A	B	A	B	
Loop open	0	1			On-hook
Loop closed	1	1			Off-hook
Normal talking state	1	1	0	1	
Detect idle	X	X	0	1	It is not possible to detect that the FXO side (PBX) is idle by examining the current state of the signaling bits. If the FXS (voice mail) side is on-hook, the line acts like an analog phone, that is, it is only possible to determine if the line is ringing or not. If the FXS side is off-hook, the incoming signaling bits are not guaranteed to be in any state, unless answer supervision and disconnect supervision are enabled.
Ringing	0	1	0	0	Ring (on state)
Current feed	0	1	0	1	Ring (off state)
Current feed reversal	1	1	X	R	Answer supervision, battery reversal. Answer supervision is implemented by alternating the B-bit between 0 and 1 in successive superframes. This feature is not supported by all PBX systems.
Current feed open	1	1	1	1	Disconnect supervision. Disconnect supervision should be interpreted as valid if the signaling bits remain in this state for more than 600 msec. This feature is not supported by all PBX systems.

58.4 FXS Call Scenarios

Table 40 through Table 45 show the signaling bit states for some common call scenarios.

Table 40. Outgoing Call from Voice Mail (FXS)

Line State	TX Bits		RX Bits		Comment
	A	B	A	B	
Idle	0	1	0	1	On-hook
Voice mail goes off-hook (waiting for dial tone)	1	1	0	1	Off-hook
Dial	1	1	0	1	
Remote side answers	1	1	0	1/0	Answer supervision, if supported by PBX

Table 41. Incoming Call to Voice Mail (FXS)

Line State	TX Bits		RX Bits		Comment
	A	B	A	B	
Idle	0	1	0	1	On-hook
PBX applies ringing: During ringing At interval between ringing	 0 0	 1 1	 0 0	 0 1	 Ring No ring
Voice mail answers call	1	1	0	X	
Normal talking state	1	1	0	X	

Table 42. Incoming Call to Voice Mail (FXS) and Transfer to Extension

Line State	TX Bits		RX Bits		Comment
	A	B	A	B	
Idle	0	1	0	1	On-hook
PBX applies ringing: During ringing At interval between ringing	 0 0	 1 1	 0 0	 0 1	 Ring No ring
Voice mail answers call	1	1	0	X	
Voice mail play prompt	1	1	0	X	"Please enter the extension number…"
Voice mail does hook flash	H†	1	0	X	A-bit temporarily set to 0 then back to 1
Voice mail dials extension	1	1	0	X	Delay before dialing
Voice mail goes off-hook	0	1	0	X	Delay before hang up
Voice mail waits for new call	0	1	0	X	Delay before accepting a new call
†H indicates that the A-bit state transitions from 1 to 0 to 1 to provide the hook flash.					

Table 43. Incoming Call to Voice Mail (FXS) but Abandoned Before Transfer

Line State	TX Bits		RX Bits		Comment
	A	B	A	B	
Idle	0	1	0	1	On-hook
PBX applies ringing: During ringing At interval between ringing	 0 0	 1 1	 0 0	 0 1	 Ring No ring
PBX abandons call	0	1	0	1	Caller hangs up
PBX stops ringing call	0	1	0	1	

Table 44. Voice Mail (FXS) Disconnects Call

Line State	TX Bits		RX Bits		Comment
	A	B	A	B	
Normal talking state	1	1	0	X	
Voice mail goes on-hook	0	1	0	X	
Idle	0	1	0	1	

Table 45. PBX (FXO) Disconnects Call

Line State	TX Bits		RX Bits		Comment
	A	B	A	B	
Normal talking state	1	1	0	X	
PBX hangs up	1	1	1	X	Disconnect supervision, if supported by PBX
Idle	0	1	0	1	

Uzbekistan R2 Bidirectional Protocol Parameter Configuration 59

This chapter discusses the capabilities and parameters of the Uzbekistan R2 Bidirectional protocol in the following topics:

59.1 General Protocol Information

Protocol File Set

The files used with the Uzbekistan R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_uz_r2_io.cdp	pdk_uz_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_uz_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

59.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_uz_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Coin box or subscriber with charge metering
- 5: Telephone operator
- 6: Data transmission
- 11: C. P. T. P.
- 12: Special line
- 13: Mobile user
- 14: Virtual private network line
- 15: Special line

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the

result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.

- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Chargeable (B-6)
- 7: Not chargeable (B-7)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/

/*
----------------------------
Metering AS pulsed clear-back
----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. ‘f’ will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause ‘f’ to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0 [default]: GCEV_ALERTING is sent after receiving a ringback tone.
- 1: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

59.3 Tone and Tone Mask Parameters

Table 46 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 46. Tone and Tone Mask Parameters for Uzbekistan R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'9'	Group A backward signal requesting next ANI digit.

Table 46. Tone and Tone Mask Parameters for Uzbekistan R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'0'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'0'	
CDP_GrpA_SendANIAvailability	10	'0'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'9'	Restart sending DNIS digits.
CDP_GrpB_SIT	15	'2'	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'8'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'0'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'7'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			

Table 46. Tone and Tone Mask Parameters for Uzbekistan R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp1_TermToneMask1	51	32768	As per specifications the digit I-15 (end of dialing) represents the end of dialing so this parameter is set to 32768 decimal (8000 Hex).
CDP_Grp1_RecvErrMask1	52	30720	
CDP_Grp1_TermToneMask2	53	32768	
CDP_Grp1_RecvErrMask2	54	30720	
CDP_Grp1_TermToneMask3	55	32768	
CDP_Grp1_RecvErrMask3	56	30720	
CDP_Grp2_TermToneMask	57	02030	
CDP_Grp2_RecvErrMask	58	63504	
CDP_GrpA_TermToneMask1	59	00042	As per specifications, A-1, A-3, A-5, and A-9 can terminate the compelled signaling cycles of sending DNIS digits. So the value is 42 decimal (002A Hex).
CDP_GrpA_TermToneMask2	60	00042	After Outgoing register shall send category digit, this compelled signaling sequence can be terminated either by A-5, in which case the incoming register would be requesting the calling party's number (ANI digits), or it may ask for the remaining DNIS digits by sending A-1 tone, or it can ask the category and change the meaning of next tones to groupB by sending A-3. So this parameter will be set to 42 decimal (002A Hex).
CDP_GrpA_TermToneMask3	61	00010	As per specifications, A-1, A-3 can terminate the compelled signaling cycles of sending ANI digits. This parameter will be set to 10 decimal (000A Hex).
CDP_GrpA_TermToneMask4	62	00010	
CDP_GrpA_RecvErrMask1	63	64529	Tones A-1 to A-3 and A-5 to A-9 are considered OK. Any tone other than this will be error (see Specs). So this parameter will be equal to 64529 decimal (FC11 Hex).
CDP_GrpA_RecvErrMask2	64	65493	Any tone other than A-1, A-3, or A-5 will be treated as error. Only A-1, A-3, or A-5 is expected. Any other tone will be an error. So this parameter is set as 65493 decimal (FFD5 Hex).
CDP_GrpA_RecvErrMask3	65	65493	
CDP_GrpA_RecvErrMask4	66	65495	Any tone other than A-3 or A-5 will indicate an error. So this parameter is set as 65495 decimal (FFD7 Hex).
CDP_GrpA_RecvErrMask5	67	65493	Any tone other than A-1, A-3, or A-5 will indicate an error. So this parameter is set as 65493 decimal (FFD5 Hex).

Table 46. Tone and Tone Mask Parameters for Uzbekistan R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_TermToneMask	68	00508	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: B-2 (Send << number changed >> recorded announcement) B-3 (Subscriber's Line Busy) B-4 (Congestion) B-5 (Unallocated National Number) B-6 (Subscriber's Line Free, Charge) B-7 (Subscriber's Line Free, No Charge) B-8 (Subscriber's Line Out of Service) So this parameter will be set to 508 decimal (01FC Hex).
CDP_GrpB_CallAnsweredTermToneMask	69	00192	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-6 or B-7 (Line Free Charge/NoCharge)
CDP_GrpB_RecvErrMask	70	65027	Any tone out of B-0, B-1, B-9 to B-15 shall be considered as error. So this parameter is set as 65027 decimal (FE03 Hex).

Venezuela R2 Bidirectional Protocol Parameter Configuration 60

This chapter discusses the capabilities and parameters of the Venezuela R2 Bidirectional protocol in the following topics:

60.1 General Protocol Information

Protocol File Set

The files used with the Venezuela R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_ve_r2_io.cdp	pdk_ve_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_ve_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

60.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_ve_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Coin box or subscriber with charge metering
- 5: Operator
- 6: Data transmission
- 11: C. P. T. P.
- 12: Special line
- 13: Mobile user
- 14: Virtual private network line
- 15: Special line

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the

result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.

- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1 [default]: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Line free, chargeable (B-6)
- 7: Line free, not chargeable (B-7)

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/
```

```
/*
-----------------------------
Metering AS pulsed clear-back
-----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

60.3 Tone and Tone Mask Parameters

Table 47 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 47. Tone and Tone Mask Parameters for Venezuela R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'5'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'9'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'9'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	
CDP_GrpA_SendANIAvailability	10	'5'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'A'	Restart sending DNIS digits.

Table 47. Tone and Tone Mask Parameters for Venezuela R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_SIT	15	'2'	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'8'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'0'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'7'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	32768	As per specifications the digit I-15 (end of dialing) represents the end of dialing so this parameter is set to 32768 decimal (8000 Hex).
CDP_Grp1_RecvErrMask1	52	30721	As per specifications I-0, I-11 to I-14 are treated as errors so the value of this parameter is 30721 decimal (7801 Hex).
CDP_Grp1_TermToneMask2	53	36864	I-15 (end of Dialing) or I-12 (the requested information is not available) can terminate the compelled cycle, value is 36864 decimal (9000 Hex).
CDP_Grp1_RecvErrMask2	54	24577	As per specifications I-0, I-13 and I-14 are treated as errors so the value of this parameter is 24577 decimal (6001 Hex).
CDP_Grp1_TermToneMask3	55	01026	As per specs I-1 or I-10 can terminate the compelled signaling cycle so the value of this parameter is 1026 decimal (0402 Hex).
CDP_Grp1_RecvErrMask3	56	64509	Any tone other than I-0, I-10 is treated as error so the value of this parameter is 64509 decimal (FBFD Hex).
CDP_Grp2_TermToneMask	57	63614	As per specifications the tones II-1 to II-6 and II-11 to II-15 are valid category tones so the value is 63614 decimal (F87E Hex).
CDP_Grp2_RecvErrMask	58	01921	As per specifications II-0, II-7 to II-10 are treated as errors so the value of this parameter is 1921 decimal (0781 Hex).

Table 47. Tone and Tone Mask Parameters for Venezuela R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_TermToneMask1	59	00554	As per specifications, A-1, A-3, A-5, and A-9 can terminate the compelled signaling cycles of sending DNIS digits. So the value is 554 decimal (022A Hex).
CDP_GrpA_TermToneMask2	60	00554	After Outgoing register shall send category digit, this compelled signaling sequence can be terminated either by A-5, in which case the incoming register would be requesting the calling party's number (ANI digits), or it may ask for the remaining DNIS digits by sending A-1 tone, or it can ask the category and change the meaning of next tones to groupB by sending A-3. So this parameter will be set to 554 decimal (022A Hex).
CDP_GrpA_TermToneMask3	61	00522	As per specifications, A-1, A-3, or A-9 can terminate the compelled signaling cycles of sending ANI digits. This parameter will be set to 522 decimal (020A Hex).
CDP_GrpA_TermToneMask4	62	00522	
CDP_GrpA_RecvErrMask1	63	63505	Tones A-1 to A-3 and A-5 to A-10 are considered OK. Any tone other than this will be error (see Specs). So this parameter will be equal to 63505 decimal (F811 Hex).
CDP_GrpA_RecvErrMask2	64	64981	Any tone other than A-1, A-3, A-5, or A-9 will be treated as error. So this parameter is set as 64981 decimal (FDD5 Hex).
CDP_GrpA_RecvErrMask3	65	64981	
CDP_GrpA_RecvErrMask4	66	64983	Any tone other than A-3, A-5, or A-9 will indicate an error. So this parameter is set as 64983 decimal (FDD7 Hex).
CDP_GrpA_RecvErrMask5	67	64981	Any tone other than A-1, A-3, A-5, or A-9 will indicate an error. So this parameter is set as 64981 decimal (FDD5 Hex).
CDP_GrpB_TermToneMask	68	00508	After outgoing register shall send category digit, this compelled signaling sequence can be terminated either by: B-2 (Send << number changed >> recorded announcement) B-3 (Subscriber's Line Busy) B-4 (Congestion) B-5 (Unallocated National Number) B-6 (Subscriber's Line Free, Charge) B-7 (Subscriber's Line Free, No Charge) B-8 (Subscriber's Line Out of Service) So this parameter will be set to 508 decimal (01FC Hex).

Table 47. Tone and Tone Mask Parameters for Venezuela R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_CallAnsweredTermToneMask	69	00192	This mask indicates that the call has been answered. Used for call analysis purpose in last dial command. B-6 or B-7 (Line Free Charge/NoCharge)
CDP_GrpB_RecvErrMask	70	65027	Any tone out of B-0, B-1, B-9 to B-15 shall be considered as error. So this parameter is set as 65027 decimal (FE03 Hex).

61 Vietnam R2 Bidirectional Protocol Parameter Configuration

This chapter discusses the capabilities and parameters of the Vietnam R2 Bidirectional protocol in the following topics:

61.1 General Protocol Information

Protocol File Set

The files used with the Vietnam R2 protocol are listed and described in the following table.

File Type	File Name(s)	
	Dialogic® DM3 Boards	Dialogic® Springware Boards
Protocol Module	pdk_r2_io.qs and pdk_r2_io.hot (or pdk_r2_io.arm.hot for Dialogic® DMT160TEC boards)	pdk_r2_io.psi
Country Dependent Parameters	pdk_vn_r2_io.cdp	pdk_vn_r2_io.cdp
	gc_OpenEx( ) Protocol Name	
	Not applicable†	pdk_vn_r2_io
†On Dialogic® DM3 boards, the protocol is determined at board initialization time and not when a Global Call device is opened. For compatibility, the **gc_OpenEx( )** protocol name may be specified for Dialogic® DM3 boards, but it is not used.		

Protocol Limitations

If a DropCall is attempted in the ACCEPTED state, the protocol will answer the call by sending out the ANSWER pattern before dropping the call, as forced release is not supported in this protocol.

61.2 Country Dependent Parameter Descriptions

Note: A parameter can be inbound, outbound, or both inbound and outbound. An inbound parameter is used by the protocol when it is acting as inbound. An outbound parameter is used by the protocol when it is acting as outbound. A parameter that is both can be used by the protocol when it is acting as either inbound or outbound.

The modifiable parameters in the *pdk_vn_r2_io.cdp* file are:

- CDP_ANI_ENABLED (Inbound)
- CDP_ANI_MaxDigits (Inbound)
- CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED
- CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)
- CDP_AreaCode
- CDP_CallingPartyCategory (Outbound)
- cdp_CATInsertType (Inbound)
- CDP_ConnectType (Outbound)
- CDP_DIALTONE_ENABLED
- CDP_DIGITS_DIALING_TYPE (Outbound)
- CDP_DIGITS_RECEIVING_TYPE (Inbound)
- CDP_DNIS_MaxDigits (Inbound)
- CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)
- CDP_FLAG_APPEND_F (Outbound)
- CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)
- CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)
- CDP_GrpB_Tone (Inbound)
- CDP_IMMEDIATE_ACCEPTSTATE (Inbound)
- CDP_In_ANIBeforeDNIS (Inbound)
- CDP_IS_ANIAVAILABILITY_CHECK_NEEDED
- CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)
- CDP_MeteringPulse_Time (Inbound)
- CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)
- CDP_NUM_OF_AC_DIGITS (Inbound)
- CDP_NUM_OF_ANI_DIGITS (Inbound)
- CDP_NUM_OF_DNIS_DIGITS (Inbound)
- CDP_OVERLAP_SENDING_ENABLED (Outbound)
- CDP_REJECT_WITH_A3B4 (Inbound)
- CDP_Remote_Release_Timer (Inbound)
- CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)
- CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK
- CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)
- CDP_Term_Tone_String (Inbound)
- CDP_TrunkPrefixNumber

CDP_ANI_ENABLED (Inbound)

Description: Enables or disables the reception of automatic number identification (ANI) digits.

Values:

- 0: Disable the reception of ANI digits.
- 1 [default]: Enable the reception of ANI digits.

Guidelines: If this parameter is set to a value other than 0 or 1, the behavior of the protocol is not predictable.

For Dialogic® DM3 boards, if ANI is disabled, you also have to remove **feature_ANI** from the **SYS_FEATURES** parameter in the CDP file. The **SYS_FEATURES** parameter looks like this:

```
All CHARSTRING_t SYS_FEATURES = "feature_outbound,feature_inbound,feature_DNIS,
feature_Billing,feature_ANI,feature_CAT,feature_MoreDNIS"
```

CDP_ANI_MaxDigits (Inbound)

Description: Specifies the maximum number of ANI digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED

Description: Specifies whether ANI is to be requested (inbound) or sent (outbound) with the area code.

Values:

- 0 [default]: Request (inbound) or send (outbound) ANI digits without area code.
- 1: Request (inbound) or send (outbound) area code with ANI digits.

CDP_ANI_WITHAC_FACILITY_ENABLED (Outbound)

Description: Specifies whether ANI digits and area code are sent to the inbound side. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values:

- 0 [default]: The requested information denied tone is sent to the inbound side.
- 1: ANI digits with area code are sent to the inbound side.

CDP_AreaCode

Description: Specifies the area code of the local exchange where the subscriber is connected. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 987.

CDP_CallingPartyCategory (Outbound)

Description: Specifies the category of the calling subscriber.

Values:

- 1 [default]: Subscriber without priority
- 2: Subscriber with priority
- 3: Maintenance equipment
- 4: Interception center
- 5: Operator
- 6: Data transmission
- 7: Overseas subscriber
- 8: Data transmission international working
- 9: Overseas maintenance equipment
- A: Overseas operator
- B: Pay phone
- C: Category unavailable

cdp_CATInsertType (Inbound)

Description: Allows the CATEGORY_DIGIT parameter to be inserted in DNIS or ANI, and returned with the **gc_GetDNIS( )** or **gc_GetANI( )** function.

The **gc_GetCallInfo( )** function can also be used to retrieve the CATEGORY_DIGIT parameter. However, with some Dialogic system releases, retrieving CATEGORY_DIGIT with **gc_GetCallInfo( )** is supported on Dialogic® Springware boards only. By using the **cdp_CATInsertType** parameter, CATEGORY_DIGIT can be retrieved for Dialogic® DM3 boards.

- When this parameter is set to 1 (CATEGORY_DIGIT inserted in DNIS), the **gc_GetDNIS( )** function returns fcfddddddd where f=separator, c=CATEGORY, ddddddd=DNIS.
- When this parameter is set to 2 (CATEGORY_DIGIT inserted in ANI), the **gc_GetANI( )** function returns fcfaaaaaaa where f=separator, c=CATEGORY, aaaaaaa=ANI.

Values:

- 0 [default]: CATEGORY_DIGIT is not inserted in DNIS or ANI.
- 1: CATEGORY_DIGIT is inserted in DNIS.
- 2: CATEGORY_DIGIT is inserted in ANI.

CDP_ConnectType (Outbound)

Description: Specifies the mode for outbound connect detection. Two types of connection events can be detected: the cas_answer received signaling bit pattern and the media type detection used when post-connect call analysis is enabled. The application has options as to when the call is

considered connected, as set by this parameter. The application also has options as to whether call analysis continues after the call has been connected when cas_answer is received first.

Values:

- 0 [default]: The protocol transitions to the connected state only when cas_answer is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the result is sent to the application via a GCEV_MEDIADETECTED event, but the protocol does not transition to the connected state until cas_answer is received.
- 1: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis still continues and the result is sent to the application via a GCEV_MEDIADETECTED event. If call analysis is received first, the subsequent cas_answer is ignored.
- 2: The protocol transitions to the connected state when the first event (either cas_answer or call analysis) is received. If cas_answer is received first, call analysis is stopped. If call analysis is received first, the subsequent cas_answer is ignored.
- 3: The protocol transitions to the connected state only when call analysis is received. If call analysis is received first, the subsequent cas_answer is ignored. If cas_answer is received first, it is ignored.

CDP_DIALTONE_ENABLED

Description: When inbound, determines whether the protocol sends dial tone before receiving DTMF tones. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

When outbound, determines whether the protocol waits for dial tone before sending DTMF tones. This parameter is ignored if **CDP_DIGITS_DIALING_TYPE** is set to 0.

Values:

- 0 [default]: When inbound, the protocol does not send dial tone before receiving DTMF tones. When outbound, the protocol does not wait for dial tone; it dials DTMF immediately after receiving Seizeack.
- 1: When inbound, the protocol sends dial tone before receiving DTMF tones. When outbound, the protocol waits for dial tone before sending DTMF tones.

CDP_DIGITS_DIALING_TYPE (Outbound)

Description: Determines the digit type for outbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol sends DNIS digits as DTMF tones.
- 2: The protocol sends DNIS digits as MF tones.

CDP_DIGITS_RECEIVING_TYPE (Inbound)

Description: Determines the digit type for inbound DNIS digits.

Values:

- 0 [default]: The protocol exchanges address information using R2MF tones.
- 1: The protocol receives DNIS digits as DTMF tones.
- 2: The protocol receives DNIS digits as MF tones.

CDP_DNIS_MaxDigits (Inbound)

Description: Specifies the maximum number of dialed number identification service (DNIS) digits that can be received when using this protocol.

Values: Default is 16.

Guidelines: If this parameter value is set to 0, the behavior of the protocol is not predictable.

CDP_Drop_Using_ProgressTones_After_AcceptCall (Inbound)

Description: Specifies the call progress tone to be sent for dropping a call, when doing a **gc_DropCall( )** after a **gc_AcceptCall( )**.

Also specifies whether to send a call progress tone to clear the call when doing a **gc_ResetLineDev( )** in the Offered state. For this purpose, this parameter will be used only if **CDP_DIGITS_RECEIVING_TYPE** is set to 1 or 2.

Values:

- 0 [default]: The protocol sends the Answer Line signal, waits for the time specified by **CDP_TimeToRecognizeAnswer**, and then sends a Clear Backward line signal for call disconnection. In this case, the call will be charged for the remote calling subscriber, even though the call is not successful.
- 1: The protocol sends the appropriate call progress tone depending on the **gc_DropCall( )** cause to the remote end, and waits for a Clear Forward Line signal for call disconnection. For **gc_ResetLineDev( )**, the protocol sends Tone_BUSY to the remote end, and waits for a Clear Forward Line signal for call disconnection.

CDP_FLAG_APPEND_F (Outbound)

Description: When the remote end asks for the next DNIS digit through Group A backward tone, and the protocol does not have any more DNIS available to be sent, this parameter specifies whether to send the I-15 tone or to remain silent and prepare for A3 or A4 pulse from the remote end.

Values:

- 0 [default]: No tone will be sent to the remote end. In this case, A3 or A4 pulse is expected to be received from the remote end. In a case of overlapped sending (see description of **CDP_OVERLAP_SENDING_ENABLED** parameter), the remote end may also send A1 to request more information.
- 1: ‘f’ (I-15) will be sent to the remote end, indicating the end of information.

CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS (Outbound)

Description: Determines when the first extension event indicating reception of a metering pulse is generated. This parameter is ignored if **CDP_GENERATE_METERING_INDICATION_EVENT** is 0.

Values:

- 0 [default]: The first answer is not treated as metering. In this case, the first extension event indicating reception of a metering pulse is generated on receiving the first metering pulse after the Answer signal is received from the network.
- 1: The first extension event indicating reception of a metering pulse is generated on receiving the Answer signal. In this case, the first extension event indicating metering pulse is generated immediately after call is connected.

Guidelines: This parameter should be set to 1 only when the metering pulse is defined as "pulsed answer" and the first answer pulse should be treated as first metering pulse as well. (See the description of the **CDP_MeteringPulse_Time parameter** for information about specifying "pulsed answer" mode.)

CDP_GENERATE_METERING_INDICATION_EVENT (Outbound)

Description: Determines whether an extension event is posted every time a metering pulse is received from the network.

Values:

- 0 [default]: Do not generate a metering indication event.
- 1: Generate a metering indication event.

Guidelines: On outbound side, for receiving metering pulse reception indication, **CDP_GENERATE_METERING_INDICATION_EVENT** should be set to 1.

CDP_GrpB_Tone (Inbound)

Description: Determines whether the sender should be charged after receiving the tone. The tone is sent from the inbound end on receipt of Category for Group II. After this tone, the sequence of R2MF tone exchange is over and the call is connected. This is the last R2MF tone in establishment of a call.

Values:

- 6 [default]: Line idle, chargeable
- 7: Line idle, not chargeable

CDP_IMMEDIATE_ACCEPTSTATE (Inbound)

Description: Specifies when the protocol transitions a call to the Accepted state.

Values:

- 0 [default]: The protocol should wait for the number of rings specified in **gc_AcceptCall( )** to expire before transitioning to the Accepted state.
- 1: The protocol should transition a call to the Accepted state immediately upon receipt of **gc_AcceptCall( )** and before the specified number of rings have been generated.

Guidelines: This parameter is ignored if the value of the **gc_AcceptCall( )** rings parameter is 0.

CDP_In_ANIBeforeDNIS (Inbound)

Description: Specifies the order of DNIS, ANI, and Category digits. The order in which a switch sends DNIS, ANI, and Category information may be different from the default behavior for a country/protocol. So this parameter allows for two scenarios:

- DNIS+CAT1+DNIS+ANI+CAT2 (default)
- DNIS+CAT1+ANI+DNIS+CAT2

Values:

- 0 [default]: DNIS digits are received before ANI, in the pattern DNIS+CAT1+DNIS+ANI+CAT2.
- 1: ANI digits are received before the rest of DNIS, in the pattern DNIS+CAT1+ANI+DNIS+CAT2.

CDP_IS_ANIAVAILABILITY_CHECK_NEEDED

Description: Determines whether the status of ANI availability is checked before ANI digits are exchanged. At the inbound side, this parameter specifies whether ANI availability at the outbound side has to be verified or if ANI digits can be requested directly. At the outbound side, ANI digits are passed directly or the inbound side is informed of the availability (status) first.

Values:

- 0 [default]: The status of ANI availability is not checked before ANI digits are exchanged. ANI digits can be requested directly without knowing the status of the outbound side.
- 1: The status of ANI availability is checked before ANI digits are exchanged. The inbound side requests the status of ANI availability. If ANI digits are available, the inbound side requests the ANI digits. The outbound side sends the status of ANI availability and then waits for the inbound request.

CDP_IS_CALLING_LINE_IDENTIFICATION_PERMITTED (Outbound)

Description: Specifies whether Calling Line Identification is enabled. This parameter is used to enable CLIP and CLIR conditions.

Values:

- 0: Calling Line Identification Rejected (CLIR). The requested information denied tone is sent to the inbound side.
- 1 [default]: Calling Line Identification Permitted (CLIP). ANI digits are sent to the inbound side.

CDP_MeteringPulse_Time (Inbound)

Description: Enables the use of metering pulses and specifies the time duration between two consecutive metering pulses that are sent to the network in call connected state. Metering pulses are used for billing purposes.

Values: Time in milliseconds. Default is 0, which disables the sending of metering pulses.

Guidelines: For using metering on the inbound side (that is, for generating metering pulses from the inbound side), **CDP_MeteringPulse_Time** should be set to a non-zero value.

When metering is disabled (that is, when **CDP_MeteringPulse_Time** is 0), the following parameters in the CDP file should also be set to 0:
CDP_GENERATE_METERING_INDICATION_EVENT and
CDP_GEN_1ST_MET_EVT_ON_RCVNG_ANS.

When no metering pulses are sent, the CAS signals are defined in the CDP file as follows:

```
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = 0101,1101,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1110,0110,50,150,0,250,190,200,210
```

However, when metering pulses are sent (that is, when **CDP_MeteringPulse_Time** is non-zero), two alternative sets of CAS signals are defined in the CDP file, one for using metering in "pulsed answer" mode and one for using metering in "pulsed clear-back" mode. In this case, you have to remove (comment out) the definitions of the CAS signals that are used when no metering pulses are sent. Then, you have to uncomment one of the other blocks of CAS signals:

```
/*
-------------------------
Metering as Pulsed Answer
-------------------------
All CAS_SIGNAL_PULSE_t CAS_ANSWER = 1101,0101,50,150,0,250,190,200,210
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 1101,0101,50,150,0,250,190,200,210
*/
```

```
/*
-----------------------------
Metering AS pulsed clear-back
-----------------------------
All CAS_SIGNAL_TRANS_t CAS_ANSWER = 1101,0101,50,50,0,80
All CAS_SIGNAL_TRANS_t CAS_CLEARBWD = x101,0001,50,50,0,80
All CAS_SIGNAL_PULSE_t CAS_METERING = 0101,1101,50,150,0,250,190,200,210
*/
```

For more detailed information about setting these signals, see the associated comments in the CDP file.

CDP_NO_OF_DNIS_BEFORE_CAT (Inbound)

Description: Determines the number of DNIS digits that are to be received before any category information is received. If this parameter is set to non-zero, the following sequence of events occurs:

1. Partial DNIS digits are received.
2. Category digits are received.
3. The remaining DNIS digits are received.
4. ANI digits are received (if **CDP_ANI_ENABLED** is 1).
5. Category digits are received again.

Values:

- 0 [default]: Indicates that category must be received after all DNIS digits are received.
- Non-zero: Specifies the number of DNIS digits received before category information is received.

Guidelines: The behavior of the protocol will not be predictable, unless the following occurs:

- If this parameter is set to non-zero, **CDP_ANI_ENABLED** must be set to 1.
- If this parameter is set to non-zero, its value should be the minimum of **CDP_NUM_OF_DNIS_DIGITS** (if non-zero), **CDP_DNIS_MaxDigits**, and the actual DNIS digits to be received.

CDP_NUM_OF_AC_DIGITS (Inbound)

Description: Specifies the number of area code digits of the local exchange from where it received the call. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 3.

CDP_NUM_OF_ANI_DIGITS (Inbound)

Description: Specifies the expected number of ANI digits to be received.

Values:

- 0 [default]: ANI collection is terminated by I-15 (end of dialing).
- Non-zero: Specifies the number of ANI digits expected. This number should always be less than **CDP_ANI_MaxDigits**.

CDP_NUM_OF_DNIS_DIGITS (Inbound)

Description: Specifies the expected number of DNIS digits to be received.

Values:

- 0: DNIS collection is terminated by I-15 (end of dialing).
- Non-zero [default is 4]: Specifies the number of DNIS digits expected. This number should always be less than **CDP_DNIS_MaxDigits**.

CDP_OVERLAP_SENDING_ENABLED (Outbound)

Description: Enables or disables the overlap sending feature.

Values:

- 0: Disables overlap sending. 'f' will be appended to DNIS digits received with **gc_MakeCall( )** (if **CDP_FLAG_APPEND_F** is true), indicating the end of information.
- 1 [default]: Enables overlap sending. The remote end can request more DNIS information, in which case a REQMOREINFO event will be generated. **gc_SendMoreInfo( )** with Null information will either cause 'f' to be sent to the remote end or will remain silent (depending on the value of **CDP_FLAG_APPEND_F**), thus indicating to the remote end that no more DNIS digits are available.

CDP_REJECT_WITH_A3B4 (Inbound)

Description: Determines the method for rejecting a call when an R2MF tone error is received during call setup.

Values:

- 0 [default]: Call is rejected with a direct group A tone (A-10), which is a spare tone that may be used to indicate congestion.
- 1: Call is rejected with an A3-B4 tone combination, which means that the inbound (local) end sends an A-3 tone (send category and change over to group B tones). Then, the category is received and in response, a B-4 tone is sent to reject the call.

CDP_Remote_Release_Timer (Inbound)

Description: Specifies the time that the protocol waits for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

If this parameter is set to a non-zero value, in the Connected state, when the local inbound application initiates DropCall, the protocol sends CAS_CLEARBWD signal to the network and then waits (for the time equal to the value of this parameter) for the remote to send the CAS clear forward/idle bit pattern on the line. If the idle pattern is not received during this time, the protocol clears the call by sending DROPCALL termination event and subsequently generates the BLOCKED event indicating the line blocked. The protocol remains in BLOCKED state and

generates the UNBLOCKED event only when it receives the idle bit pattern on the line from remote.

If this parameter is set to 0, no BLOCKED event is generated and the protocol waits infinitely for the remote to send the idle bit pattern on the line before generating DROPCALL termination event.

Values:

- 0: Disables the timer.
- Non-zero [default is 5000]: Time in milliseconds that the protocol will wait for the remote end to send the idle bit pattern on the line before generating a DROPCALL termination event.

CDP_SEND_ALERTING_ON_R2MF_COMPLETION (Inbound)

Description: Controls when the protocol will send a GCEV_ALERTING event to the application.

Values:

- 0: GCEV_ALERTING is sent after receiving a ringback tone.
- 1 [default]: GCEV_ALERTING is sent after completion of the R2MF sequence (after receiving the last Group B tone).

CDP_SEND_BLOCK_AT_START_OR_REMOTE_BLOCK

Description: Specifies the bit pattern to be sent on the line at protocol open time and when the remote line goes BLOCKED.

Values:

- 0 [default]: If the protocol is used either as outbound only or as bidirectional.
- 1: If the protocol is used as inbound only.

CDP_send_GrpA_AddrCmpltCharge_tone (Inbound)

Description: Specifies how the protocol informs the calling user that exchange of R2MF tones is completed and to start charging.

Values:

- 0 [default]: The protocol sends the **CDP_GrpA_AddrCmpltChgGpB** tone, receives Category, and then sends **CDP_GrpB_Tone** to indicate whether the sender should be charged.
- 1: The protocol sends the **CDP_GrpA_AddrCmpltCharge** tone when the call is accepted or answered by the application in the Offered state.

CDP_Term_Tone_String (Inbound)

Description: Specifies the characters used to identify the termination of the dialed string. This parameter is ignored if **CDP_DIGITS_RECEIVING_TYPE** is set to 0.

Values: Default is "#*"

CDP_TrunkPrefixNumber

Description: Specifies the trunk number used to dial to local exchange. This parameter is valid only if **CDP_ANI_WITHAC_FACILITY_CHECK_NEEDED** is enabled.

Values: Default is 9.

61.3 Tone and Tone Mask Parameters

Table 48 lists the default values for the tone and tone mask parameters, which no longer appear in the CDP file. For information about changing these parameters, see Chapter 3, "Tone and Tone Mask Parameters". The table gives the parameter names as they appeared in a previous version of the CDP file, plus a brief description of each parameter as it used to appear as a comment in the CDP file. The value in the ID column is used when changing the default value.

Table 48. Tone and Tone Mask Parameters for Vietnam R2 Protocol

Parameter Name	ID	Default Value	Remarks
Tone Parameters			
CDP_GrpA_SendDNIS	01	'1'	Group A backward signal requesting next DNIS digit.
CDP_GrpA_SendANI	02	'5'	Group A backward signal requesting next ANI digit.
CDP_GrpA_AddrCmpltChgGpB	03	'3'	This tone indicates the receipt of complete address and causes changeover to Group II/B signals.
CDP_GrpA_SendOnErr	04	'4'	These tones are sent to forward register in case of error during exchange of tones.
CDP_GrpB_SendOnErr	05	'4'	
CDP_GrpA_SendCat	06	'5'	Group A backward tone requesting the CAT (calling line category) and doesn't cause any group change.
CDP_GrpA_AddrCmpltCharge	07	'6'	Group A backward tone used to inform the calling user, exchange of R2MF tones is completed and start charging. (Equal to Grp B tone B6.)
CDP_GrpA_SendANIWithAC	08	'9'	Group A backward tone requesting the next ANI digit in case of "ANI has to be come with Area Code and Trunk Prefix Number".
CDP_A_10	09	'A'	
CDP_GrpA_SendANIAvailability	10	'5'	
CDP_GrpA_N_1	11	'2'	Send N-1 tone.
CDP_GrpA_N_2	12	'7'	Send N-2 tone.
CDP_GrpA_N_3	13	'8'	Send N-3 tone.
CDP_GrpA_Restart	14	'2'	Restart sending DNIS digits.

Table 48. Tone and Tone Mask Parameters for Vietnam R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpB_SIT	15	'2'	After any one of B-6 and B-7 (see Specs) tones is received, category tone from Group II is sent to incoming register after which sequence of R2MF tone exchange is over and call is through; otherwise the call fails.
CDP_GrpB_UserBusy	16	'3'	
CDP_GrpB_NetworkCongestion	17	'4'	
CDP_GrpB_UnAssignedNumber	18	'5'	
CDP_GrpB_Rejected	19	'8'	
CDP_GrpB_NormalClearing	20	'4'	
CDP_GrpB_linefree_charge_ClearingFromInboundOnly	21	'0'	
CDP_GrpB_linefree_charge	22	'6'	
CDP_GrpB_linefree_nocharge	23	'7'	
CDP_grp1_string_requestdenied	24	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
CDP_grp1_tone_requestdenied	25	'c'	Group1 signal I-12, used to inform the inbound end about the requested information unavailability.
Mask Parameters			
CDP_Grp1_TermToneMask1	51	36864	fedc ba98 7654 3210 Binary: 1001 0000 0000 0000 Hex: 9000 Decimal: 36864
CDP_Grp1_RecvErrMask1	52	26624	fedc ba98 7654 3210 Binary: 0110 1000 0000 0000 Hex: 6800 Decimal: 26624
CDP_Grp1_TermToneMask2	53	36864	fedc ba98 7654 3210 Binary: 1001 0000 0000 0000 Hex: 9000 Decimal: 36864
CDP_Grp1_RecvErrMask2	54	26624	fedc ba98 7654 3210 Binary: 0110 1000 0000 0000 Hex: 6800 Decimal: 26624
CDP_Grp1_TermToneMask3	55	36864	fedc ba98 7654 3210 Binary: 1001 0000 0000 0000 Hex: 9000 Decimal: 36864
CDP_Grp1_RecvErrMask3	56	26624	fedc ba98 7654 3210 Binary: 0110 1000 0000 0000 Hex: 6800 Decimal: 26624

Table 48. Tone and Tone Mask Parameters for Vietnam R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_Grp2_TermToneMask	57	08190	fedc ba98 7654 3210 Binary: 0001 1111 1111 1110 Hex: 1FFE Decimal: 8190
CDP_Grp2_RecvErrMask	58	57344	fedc ba98 7654 3210 Binary: 1110 0000 0000 0000 Hex: E000 Decimal: 57344
CDP_GrpA_TermToneMask1	59	00120	fedc ba98 7654 3210 Binary: 0000 0000 0111 1000 Hex: 0078 Decimal: 120
CDP_GrpA_TermToneMask2	60	00106	fedc ba98 7654 3210 Binary: 0000 0000 0110 1010 Hex: 006A Decimal: 106
CDP_GrpA_TermToneMask3	61	00090	fedc ba98 7654 3210 Binary: 0000 0000 0101 1010 Hex: 005A Decimal: 90
CDP_GrpA_TermToneMask4	62	00090	fedc ba98 7654 3210 Binary: 0000 0000 0101 1010 Hex: 005A Decimal: 90
CDP_GrpA_RecvErrMask1	63	30720	fedc ba98 7654 3210 Binary: 0111 1000 0000 0000 Hex: 7800 Decimal: 30720
CDP_GrpA_RecvErrMask2	64	32660	fedc ba98 7654 3210 Binary: 0111 1111 1001 0100 Hex: 7F94 Decimal: 32660
CDP_GrpA_RecvErrMask3	65	32644	fedc ba98 7654 3210 Binary: 0111 1111 1000 0100 Hex: 7F84 Decimal: 32644
CDP_GrpA_RecvErrMask4	66	32644	fedc ba98 7654 3210 Binary: 0111 1111 1000 0100 Hex: 7F84 Decimal: 32644

Table 48. Tone and Tone Mask Parameters for Vietnam R2 Protocol (Continued)

Parameter Name	ID	Default Value	Remarks
CDP_GrpA_RecvErrMask5	67	32644	fedc ba98 7654 3210 Binary: 0111 1111 1000 0100 Hex: 7F84 Decimal: 32644
CDP_GrpB_TermToneMask	68	00510	fedc ba98 7654 3210 Binary: 0000 0001 1111 1110 Hex: 01FE Decimal: 510
CDP_GrpB_CallAnsweredTermToneMask	69	01218	fedc ba98 7654 3210 Binary: 0000 0100 1100 0010 Hex: 04C2 Decimal: 1218
CDP_GrpB_RecvErrMask	70	32256	fedc ba98 7654 3210 Binary: 0111 1110 0000 0000 Hex: 7E00 Decimal: 32256

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