



Dialogic® Brooktrout® Fax Products SDK

Installation and Configuration Guide

Release 6.3

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Preface

Introduction

The Dialogic® Brooktrout® **TR1000 Series SDK: Installation and Configuration Guide** explains how to install the software (firmware, Dialogic® Brooktrout® Bfv API, and driver for the Dialogic® Brooktrout® TR1034/SR140/TruFax® boards) on your host system. It also describes how to configure the driver, configure call control, and download the firmware to a hardware module.

- Chapter 1 provides a quick start for users experienced with API programming in general and the Dialogic® Brooktrout® Bfv API in particular.
- Chapter 2 explains how to install the Dialogic® Brooktrout® software and the device driver on a Red Hat Linux operating system.
- Chapter 3 explains how to install the Dialogic® Brooktrout® software and the device driver on the Solaris operating system.
- Chapter 4 explains how to install the Dialogic® Brooktrout® software on a Windows® operating system.
- Chapter 5 describes how to install the Dialogic® Brooktrout® device driver on Windows® operating systems.
- Chapter 6 describes how to configure your software and hardware on Windows® systems.
- Chapter 7 lists the directories where files are installed.
- Chapter 8 describes how to use the Dialogic® Brooktrout® TECUpdate Utility.

-
- Chapter 9 describes the firmware files, how to load them, and how to update the boot ROM.
 - Appendix A describes compliance with North American and European standards that includes general telecommunications and safety.
 - Appendix B describes how to create a custom installation program for the manual configuration of the driver.
 - Appendix C describes how to use the driver reinitialization utility.
 - A glossary provides definitions for some of the terms used in the manual.

A copy of this manual in Adobe Acrobat PDF format is included in the **Documents** directory on the Dialogic® Brooktrout® Fax Products SDK CD-ROM.

Refer to Dialogic® Brooktrout® SR140 Fax Software Windows® User Guide and Dialogic® Brooktrout® SR140 Fax Software Linux User Guide for instructions to activate the software using the License Manager.

Operating System Support

See the latest Dialogic® Brooktrout® **TR1000 Series SDK: Release Notes** for the supported operating systems. A copy of the Release Notes is found in the **Documents** directory on the TR1034/SR140/TruFax® SDK CD-ROM.

Compile Compatibility

Applications compiled with either Brooktrout SDK 3.2, Brooktrout SDK 3.3, Brooktrout SDK 4.0, Brooktrout SDK 4.1, or 5.0, 5.1, or 5.2 work without recompiling in SDK 6.0 as long as the application called the BT_API_SET_VER macro. See the Dialogic® Brooktrout® **Bfv API Reference Manual, Volume 1**.

You might also require one of the following:

- Windows® libraries, see [*Special Considerations on page 119*](#)
- Linux libraries, see [*Special Considerations on page 49*](#)
- Solaris libraries, see [*Special Considerations on page 70*](#)

Manual Conventions

This manual uses the following conventions:

- ***Italics*** denote file names, directory names, and program names within the general text.
- The **Courier** font in bold indicates a command sequence entered by the user at the system prompt, for example:
cd /boston/bfv.api
- The Courier font not bolded indicates system output, for example:
C:>Files installed.
- The Courier font also denotes programming code, such as C and C++. Programming code appears in program examples.
- **Bold** indicates names of variables, Dialogic® Brooktrout® Bfv API functions, dialog boxes, dialog box controls, windows, and menu items.
- Square brackets [] indicate that the information to be typed is optional.
- Angle brackets < > indicate that you must supply a value with the parameter.



The Caution icon is used to indicate an action that could cause harm to the software or hardware.



The Warning icon is used to indicate an action that could cause harm to the user.

Related Documents

Hardware Documents

These installation cards come with their respective boards:

- ***Installing the Dialogic® Brooktrout® TR1034 Digital Board (Multiple Spans)*** explains how to install a TR1034 digital board
- ***Installing the Dialogic® Brooktrout® TR1034 Digital/Ethernet PCI Board*** (Single Span) explains how to install a Dialogic® Brooktrout® TR1034 digital PCI board with an H.100 interface.
- ***Installing the Dialogic® Brooktrout® TR1034 Analog PCI Board*** explains how to install a Dialogic® Brooktrout® TR1034 analog PCI board.
- ***Installing the Dialogic® Brooktrout® TR1034 Analog LS/DID Combination PCI Board*** explains how to install the board and connect telephone service for both Analog Loop Start (ALS) and Direct Inward Dialing (DID).
- ***Installing the Dialogic® Brooktrout® TR1034 BRI PCI Board*** explains how to install a Dialogic® Brooktrout® TR1034 BRI PCI board.
- ***Installing the Dialogic® Brooktrout® TruFax® 100-R and 200-R Analog PCI Boards*** explains how to install a Dialogic® Brooktrout® TruFax® analog PCI board.
- ***Installing the Dialogic® Brooktrout® TruFax® BRI PCI Boards*** explains how to install a Dialogic® Brooktrout® TruFax® BRI PCI board.

Software Documents

For product information, white papers, FAQs, and more, access the Dialogic web site at ***www.dialogic.com***.

These volumes come with the Dialogic® Brooktrout® SDK:

- The ***Dialogic® Brooktrout® Fax Products SDK Developer Guide*** describes the Dialogic® Brooktrout® Bfv API and gives information about Call Transfer, Automatic Speech Recognition, BSMI, and how to package Dialogic® Brooktrout® software for your customers.
- ***Volume 1, Administration, Management, and Configuration, Bfv API Reference Manual*** provides information about the following Bfv API components:

- ◆ Administration and Initialization functions
- ◆ Firmware, Configuration, Status and Monitoring functions
- ◆ Debugging, Error Handling and Return Values
- ◆ Miscellaneous functions
- ***Volume 2, Bfv-Level Call Control and Call Switching, Bfv API Reference Manual*** provides information about the following Bfv API components:
 - ◆ Bfv API-level Call Control functions
 - ◆ Dialing Database functions
 - ◆ Call Control data structures and macros
- ***Volume 3, Media Processing Bfv API Reference Manual*** provides information about the following Bfv API components:
 - ◆ Signal Generation and Detection functions
 - ◆ Voice Play and Record functions
 - ◆ Infopkt file functions
- ***Volume 4, Fax Processing, Bfv API Reference Manual*** provides information about the following Bfv API components:
 - ◆ Fax functions and macros
 - ◆ TIFF-F files functions and macros

- **Volume 5, BSMI-Level Call Control and Call Switching, Bfv API Reference Manual** provides information about the following BOSTON Simple Message Interface (BSMI) Bfv API components:
 - ◆ BSMI-level Call Control functions
 - ◆ Message structures
 - ◆ R2 Signaling Protocol messages
 - ◆ Local Exchange Carrier (LEC) Protocol messages
 - ◆ Host to Module and Module to Host messages
 - ◆ B-Channel and D-Channel Maintenance procedures
- **Volume 6, Appendices, Bfv API Reference Manual** is a grouping of appendices that relate to the reference material in Volumes 1 through 5, including:
 - ◆ Configuration files
 - ◆ Bfv API structures
 - ◆ Hangup codes, Cause codes, Infopkt parameters
 - ◆ Country-specific dialing requirements
 - ◆ Call Progress notes
 - ◆ Deprecated and unsupported functionality

Getting Technical Support

Dialogic provides technical support for customers who have purchased hardware or software products from Dialogic. If you purchased products from a reseller, please contact that reseller for technical support.

To obtain technical support, please use the web site below:

www.dialogic.com/support/

Terminology

Updated Terminology

The current version of this document includes terminology that differs from previous versions. Please note the changes below:

Former Terminology	Replaced with...
Host-based fax	Dialogic® Brooktrout® SR140 Fax Software or Brooktrout SR140 Fax Software or SR140 Software or SR140
Virtual modules	
Virtual boards	
Software modules	
VoIP modules	
SR140 virtual modules	
TR1000 Series SDK	Dialogic® Brooktrout® SDK
TR1000 Series Product	Dialogic® Brooktrout® Fax Board or Brooktrout fax board or board
TR1000 Series Module	
TR1000 Series Board	
Brooktrout System Software	
Brooktrout System Software	Dialogic® Brooktrout® Runtime Software

Dialogic® Brooktrout® TR1034 Fax Board Terminology

The Dialogic® Brooktrout® TR1034 Fax Board is also referred to herein by one or more of the following terms, or like terms including "TR1034":

- Brooktrout TR1034 Fax Board
- Brooktrout TR1034 Board
- TR1034 Fax Board
- TR1034 Board
- TR1034

1 - Quick Start Steps

This chapter provides a series of steps that you can perform to quickly set up and test your installation of the Computer Telephony and software.

Because the installation and configuration procedures can be quite different for Windows® systems from those for Linux and Solaris systems, this chapter gives separate quick start instruction for Windows® systems.

This chapter includes the following:

- ***Determining the Board Module Number on page 33***
- ***Dialogic® Brooktrout® SR140 Fax Software on page 34***
- ***Quick Start for Windows® Systems on page 35***
- ***Quick Start for Linux and Solaris Systems on page 37***

Determining the Board Module Number

You need to know the module numbers (IDs) and associated channel numbers of each Dialogic® Brooktrout® fax board (for example: TR1034, TruFax®, or SR140 virtual module) in your system for a variety of tasks, including:

- Firmware download
- Telephony and network configuration
- Using some utilities (see the chapter in the developer guide on sample applications and utilities)

A hardware module is a unit that communicates (using the BOSTON software) on a Dialogic® Brooktrout® board. In general, each module corresponds to a control processor on the board. Most Dialogic® Brooktrout® boards have one module. The driver assigns each system with its own unique module number. Module numbers are normally referred to and displayed in hex.

Dialogic® Brooktrout® PCI boards contain a rotary switch that allows selection of a module number in a range from 2 through F.

To find the module numbers of the Dialogic® Brooktrout® boards in your system, run the ***modinfo*** program:

```
modinfo
```

The ***modinfo*** program provides the number of channels on each module. See the chapter on sample applications and utilities in the developer guide for more information.

The driver assigns other module numbers in addition to those for hardware modules. These can often be seen when running ***modinfo***, for example.

- Module 1 represents the driver.
- Module FE is shared by all applications.
- Module 0x41 is the default for Dialogic® Brooktrout® SR140 (virtual modules).

Dialogic® Brooktrout® SR140 Fax Software

The Dialogic® Brooktrout® SR140 Fax Software is a software-based virtual module that allows you to use T.38 fax without installing Computer Telephony. It is supported on Windows® and Linux systems only and uses IP-enabled call control through SIP and H.323 stacks.

If you have Dialogic® Brooktrout® SR140 Fax Software, you must install the TR1034/SR140/TruFax® Brooktrout SDK software first. Then you can turn on Dialogic® Brooktrout® SR140 Fax Software using the Dialogic® Brooktrout® License Manager. For more information, see:

- ***Installing the SDK on Windows® on page 78***
- Activating Dialogic® Brooktrout® Products in the Dialogic® Brooktrout® SR140 Windows® User Guide.

Quick Start for Windows® Systems

If you have SR140 Fax Software, see ***Dialogic® Brooktrout® SR140 Fax Software on page 34*** for setup information, otherwise continue with Step 1.

Step 1: Install Computer Telephony and Software

➤ **Do the following to install the Computer Telephony and software:**

1. Before you install a Dialogic® Brooktrout® board, install the Brooktrout SDK by inserting the TR1034/SR140/TruFax® Brooktrout SDK from the CD-ROM drive. Then follow the directions in ***Installing the SDK on Windows® on page 78***.

This procedure places the contents of the CD into a directory on your hard drive. The directory is either one you specify or the default (**\Brooktrout\Boston**).

See ***Directory Structure on page 202*** for the list of directories and their contents in this structure.

2. Power down the computer and install the board in a PCI slot.
For installation instructions, see the hardware installation card that came with your board.
Although you can install the hardware before you install the software, Dialogic recommends that you install the software first.
3. Power up the computer and log on.
 - ♦ When the status LED on the board is flashing yellow, the board is ready to have the firmware downloaded (see ***Step 2: Configuration Tool and Firmware Starts on page 36***).
 - ♦ When the system sees the TR1034/TruFax® board, install the driver on a Windows® operating system (see ***Installing the Plug-and-Play Driver on page 97***).

Step 2: Configuration Tool and Firmware Starts

- To run the configuration tool and download firmware, use these steps:

1. Run the Dialogic® Brooktrout® Configuration Tool **configtool.exe** to configure the driver and the call control parameters. See [*Using the Dialogic® Brooktrout® Configuration Tool on Windows® Systems on page 130*](#).

The Configuration Tool also starts the driver and downloads the firmware to the module.

Note: For the Dialogic® Brooktrout® Configuration Tool to work with Windows® 2000, you must install Internet Explorer 6.0 or higher.

2. Reboot the system after running **configtool.exe** to have the driver configuration take effect.

Step 3: Compile and Run the Sample Application

To test your board and its setup, you can run the voice sample application, found in the **Boston\bfv.api\app.src** directory. However, before you can run the sample application, you must compile it. To compile sample applications, follow the instructions in the developer guide (see the chapter about **Sample Applications and Utilities**).

Next Steps

After you have verified that your board is functioning properly and can record and play speech, you can run your existing application, test your new application, or create a new application.

For more information, see these chapters in the developer guide:

- **Introduction to the Bfv API** describes the Bfv API
- **Debugging** describes how to debug your applications
- **Sample Applications and Utilities** describes how to compile and use the sample applications

Quick Start for Linux and Solaris Systems

The SR140 Fax Software is not supported on the Solaris operating systems.

Step 1: Install Computer Telephony and Software

➤ **Do the following to install Computer Telephony and software:**

1. Install the Dialogic® Brooktrout® board in a PCI slot in your computer chassis. For installation instructions, see the hardware installation card that came with your board.

When the status LED on the board is flashing yellow, it is ready to have the firmware downloaded. See Step 2.

2. Insert the Brooktrout SDK CD into a CD drive and follow the directions in the applicable chapter for your operating system (***Installing the SDK on Red Hat Linux on page 40*** or ***Installing the SDK on Solaris on page 60***).

This procedure places the contents of the CD into a directory on your hard drive. The directory can be one you specify or the default, `/usr/sys/brooktrout/boston`. See ***Directory Structure on page 202*** for the list of directories and their contents in the `/boston` directory structure.

3. Start the driver. Linux and Solaris, if you want, can start the driver, but you can wait until the software is installed before you start the driver. See the appropriate chapter that applies to your operating system.

Step 2: Select and Download the Firmware Files

Select the Firmware Files

All Dialogic® Brooktrout® boards need certain firmware files including:

- The control processor firmware called ***cp.bin***.
- The correct DSP firmware file for your board and product. See ***Downloading Firmware on page 219*** for the names of the DSP firmware files.

Download the Firmware

See ***Manually Downloading the Firmware on page 223*** for the instructions for downloading the firmware.

Step 3: Configure the Call Control Parameters

Dialogic recommends that you use the call control configuration file named ***callctrl.cfg*** to configure call control parameters. See [***Using a Call Control Configuration File on page 200***](#) for more information.

Step 4: Compile and Run the Sample Application

To test your board and its setup, you can run the voice sample application, found in the ***bfv.api/app.src*** directory. However, before you can run the sample application, you must compile it. To compile sample applications, follow the instructions in the chapter on compiling the sample applications in the developer guide.

Next Steps

After you have verified that your board is functioning properly and can record and play speech, you can run your existing application, test your new application, or create a new application.

For more information, see these chapters in the developer guide:

- ***Introduction to the Bfv API*** describes the Dialogic® Brooktrout® Bfv API.
- ***Debugging*** describes how to debug your applications.
- ***Sample Applications and Utilities*** describes how to compile and use the sample applications.

2 - Installing the SDK on Red Hat Linux

This chapter describes how one can install Dialogic® Brooktrout® software on Red Hat Linux operating systems.

This chapter contains the following:

- *Installation Steps on page 41*
- *Configuring the Driver Manually on page 45*
- *Special Considerations on page 49*
- *Reviewing Compiler and Linker Options on page 54*
- *Recompiling on Linux Platforms on page 57*

Installation Steps

If you have Dialogic® Brooktrout® SR140 Fax Software, you must install the TR1034/SR140/TruFax® Brooktrout SDK software first. Then you can turn on SR140 Fax Software using the Dialogic® Brooktrout® License Manager. See the ***Dialogic® Brooktrout® SR140 Linux User Guide***.

- **To install the Dialogic® Brooktrout® software on Linux, follow the steps below:**

When running driver installation programs, scripts, or functions, you must be logged in as `root` or have administrative privileges. Dialogic supports only the standard GNU C compiler that ships with Linux.

1. Install the firmware, driver, and Bfv API software onto your computer.
If you are reinstalling or upgrading software from a previous Brooktrout SDK, you must first remove the previously installed software before installing this software.
See ***Removing the Software on page 44***.
2. Compile the sample applications and utilities (optional).
See the chapter on sample applications and utilities in the developer guide.
3. Run the `dinstall` program to manually configure the driver (optional).
See ***Configuring the Driver Manually on page 45***.
4. Download the firmware, optionally configure the telephony parameters, see:
 - ♦ ***Chapter , Downloading Firmware on page 219***
 - ♦ ***Using a Call Control Configuration File on page 200***.

Installing the Software

The TR1034/SR140/TruFax® SDK CD-ROM comes with an installation program that uses ***rpm*** to install the files on your hard drive. To use the program, follow the directions below. You must be logged in as **root** or **su** to install/uninstall the software and configure the driver.

➤ **Use the following procedure to install software files:**

1. Mount the installation CD-ROM:

```
mount -t iso9660 -r /dev/cdrom /mnt/cdrom
```

2. Enter the command line to go to the **Linux** directory on the CD-ROM drive:

```
cd /mnt/cdrom/Software/Linux/Red Hat
```

3. Run the setup program by entering the following at a command prompt:

```
sh ./setup.sh
```

The program displays a message if it does not detect an Intel microprocessor and terminates. If the processor is Intel, the program then displays a copyright notice and the following information:

```
Welcome to the Brooktrout Setup Program.
```

```
Program to install Boston API/Driver and Firmware Packages
```

```
WARNING: This program is protected by copyright law and international treaties.
```

```
Unauthorized reproduction or distribution of this program, or any portion thereof, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.
```

The program issues the following message only if you have the driver called **bfax**, that runs on the TR114 board:

```
The Brooktrout Driver package called "bfax" has been detected on your system. It is OK to have both "BRKTBOSetup" and "bfax" installed on your system. Since these packages share common files, you may encounter errors during package removal.
```

The program then displays:

```
Press ENTER to continue or 'q' then ENTER to quit setup.
```

4. The program then displays:

```
Default install directory is /usr/sys/brooktrout
```

```
Please enter desired install directory or just press ENTER to use default directory.
```

5. After you enter an install directory or accept the default directory location, the program prompts you to identify files to install:

- 1) Boston API/Driver Package.
- 2) Firmware Package.
- 3) Boston API/Driver and Firmware Packages.
- 0) Exit Installation.

Please enter the number corresponding to the files you wish to install?

6. Type the number of your choice.

If the packages you selected have been installed, the program gives you as message to that effect, such as:

The Boston API/Driver Package was installed previously.

Otherwise, the program gives you a message such as:

Running RPM to install the Boston API/Driver Package

7. The program then asks:

Would you like to configure the driver at this time
[y or n]?

If you choose Boston API/Driver and Firmware Packages and the default directory, the directory **/usr/sys/Brooktrout** contains the directories and files shown in ***Chapter , Directory Structure on page 202.***

After installing the software, you must download the firmware. See ***Chapter , Downloading Firmware on page 219.***

Removing the Software

When you install the software on Linux, you can choose one or two packages. If you choose to install the “Bfv Binary files,” **rpm** installs a package called **BRKTBOSSsetup**. If you choose “Firmware files,” **rpm** installs a package called **BRKTBOSSsetup-fw**.

If you choose to install “Bfv Binary files and firmware files,” then both of the above packages are installed.

Each package must be removed with a separate command.

- **To remove all files and directories created during the installation, enter:**

```
rpm -e BRKTBOSSsetup-fw  
rpm -e BRKTBOSSsetup
```

These commands remove only the files and directories that the installation procedure placed on the system.

Starting or Stopping the Driver

You must start or stop the driver as shown below. You can also add the command lines to system startup scripts, if needed.

- **To start the driver, enter:**

```
/etc/startbost
```

- **To stop or shut down the driver, enter:**

```
/etc/startbost -r
```

Reinitializing the Driver

You can reinitialize the driver to its starting state in terms of channels assigned to modules and module number assignments using the **driver_reinit.exe** utility located in the **boston/driver/linux/user** directory (see [Reinitializing the Device Driver on page 259](#)).

Configuring the Driver Manually

To configure the driver manually, change to the **`/usr/sys/brooktrout/boston/driver/linux/install`** directory and run the **`dinstall`** program.

The configuration dialog is as follows:

```
Installing Brooktrout Boston Device Driver Version 6.0.0
Maximum number of PCI/cPCI hardware modules (default 16):
Physical buffer size (default 32768):
Application buffer size (default 10240):
Machine ID, in hex (default 1):
Do initial reset (default 1):
History enable (default 0):
```

If you enter **`1`**, **`dinstall`** asks the following questions:

```
History size (default 1024000):
Number of physical channel histories (default 0):
Number of application channel histories (default 0):
Configure advanced parameters (n)?
```

If you enter **`y`**, **`install`** asks the following questions:

```
Number of I2O frames per module (default 16):
Driver flow control interval (default 250):
Internal memory allocation minimum (default 152):
Internal memory allocation quanta (default 128):
To reserve module numbers, enter mod_id (serial number)
and mod_num, in hex. Mod_num will default as indicated:
mod_id mod_num[F0]:
```

```
Configure test parameters (n)?
```

(If you enter **`y`**, three test options are listed)

```
Test1:
```

```
Test2:
```

```
Test3:
```

Configuring Boston driver:

Phys buf size 32768

App buffer size 10240

Machine ID 1

History size 1024000

Num phys hist bufs 0

Num apl hist bufs 0

The maximum number of PCI hardware modules can be left at its default. However, if fewer modules are in use, to conserve memory, this value can be set to a smaller number. Each hardware module uses approximately 60K.

History Logging

When the Boston driver is installed, history logging is disabled by default. When you manually install the driver using ***dinstall***, the default is set to disable history logging (you can choose to override this option). History logging is a powerful debugging tool, especially when working with Dialogic Technical Services and Support. However, it does consume a significant amount of CPU time when running very high call loads. Therefore, leave history logging off for systems that have high call loads and are CPU-bound. For low-load systems or when debugging, enable history logging.

Leave the number of physical and application channel histories at 0 unless you are directed to change this by Dialogic Technical Services and Support. If you change the physical or application buffer size, do not change the value to one smaller than the default.

If you specify a number for the physical channel histories, ***dinstall*** asks if you want to restrict the physical channels to administrative channel 1.

Restrict physical channels to admin channel 1 (default 1):
Choose the default (enable).

Advanced Configuration Parameters

If you select advanced configuration parameters, the software prompts you for the number of I2O frames, driver flow control interval, internal memory allocation parameters, module reservations, and test parameters. Do not configure advanced parameters except under the advice of Dialogic Technical Services and Support.

Linux Kernel Versions

Different versions of Linux have different kernel version numbers, and patches to Linux can also change the kernel version number. The binary distribution comes with driver support for a number of kernel versions. Dialogic® Brooktrout® drivers will be installed for all the installed kernel versions that are supported. If the currently installed kernel version is not supported, driver installation aborts.

The driver is configured and ready to be started.

See [*Starting or Stopping the Driver on page 44*](#) and [*Recompiling on Linux Platforms on page 57*](#).

The Dialogic® Brooktrout® SDK supports the Linux Physical Address Extension (PAE) kernels, starting with Linux 5.0. This support allows greater memory utilization on systems with four gigabytes of memory.

Removing the Manually Configured Driver

➤ **To uninstall the driver, use these steps:**

1. Change to the following directory:
`/usr/sys/brooktrout/boston/driver/linux/install`
2. Enter the following at the command prompt:
`./dinstall -r.`

Using Boston Host Service Under Linux

Boston Host Service (Bostsrv) is used to initialize modules. Upon startup it detects Dialogic® Brooktrout® modules, loads FW and initializes the call control. You must use Boston Host Service to run a multi-process application or to use SR140 Fax Software) modules. Boston Host Service is optional for other Dialogic® Brooktrout® modules.

When you use the Boston Host Service (Bostsrv) with a Linux system the following syntax applies:

- Go to following directory:

```
cd /usr/sys/brooktrout/boston/bfv.api/linux/bin/x
```

x depends on the version of Linux in use:

- ◆ 7 - Linux ES/AS 3.0 or earlier
- ◆ 3.4 - Linux ES/AS 4.0
- ◆ 4.1 - Linux ES/AS 5.0

- Use any of the following command line options:

Option	Meaning
-c <file>	Full path to the btcall.cfg file and name of the btcall.cfg file
-D	Run as daemon (in background)
-f <path>	Full path to board firmware
-k	Stops the daemon
-stop	Stops the daemon
-query	Queries whether the server is running
-debug	Console app/debugging
-v	Enable Bfv API debug mode
-l <file>	Log output to file (can be used with -debug and -D)

Note: **-c** and **-f** are required.

For example:

```
Bostsrv -c /usr/sys/brooktrout/boston/config/btcall.cfg  
-f /usr/sys/brooktrout/boston/fw
```

Root login for Unix

When using Unix, you must log in as root to run Bostsrv from the command line in debug mode. Bostsrv creates a process id file in the root `owned/var/run` directory. This prevents multiple copies from running at the same time. It also supports the kill, stop, and query operations.

Special Considerations

When you install the Software on a Red Hat Linux operating system, consider the following:

- ***PCI Considerations on page 50***
- ***Dialogic® Brooktrout® Bfv API Libraries and Makefiles on page 51***
- ***Writing Multithreaded Programs on page 51***
- ***Warning and Error Messages on page 52***
- ***Determining Installation Parameters on page 52***
- ***Command Line Configuration for dinstall on page 52***
- ***Driver File Locations on page 54***
- ***Reviewing Compiler and Linker Options on page 54***
- ***Message About “Tainted” Kernel on page 55***
- ***SELinux on page 56***

PCI Considerations

When configuring the device driver, you must select 0 when asked for the number of ISA boards.

The operating system and/or system BIOS assigns base addresses and interrupt numbers to the PCI boards, which can change when the system is rebooted, especially if devices are added or moved.

If multiple PCI boards are in use, it is often not apparent which boards correspond to which module numbers or contain which ordinal channel values. See ***Determining the Board Module Number on page 33*** for more information about modules and module number assignment.

Dialogic® Brooktrout® Bfv API Libraries and Makefiles

The Dialogic® Brooktrout® Bfv API libraries are supplied in several forms for the appropriate Linux versions. The primary libraries are shared (.so) libraries. In addition, there are static (.a) libraries; their use is deprecated and are supplied for compatibility only.

To run an application compiled with the **.so** libraries, the operating system needs to find the **.so** libraries at runtime. The installation procedure automatically installs these libraries into a known system location: **/usr/lib**. If you are performing installation manually, you can either copy the libraries there, or add the directory locations containing the **.so** libraries to the environment variable **LD_LIBRARY_PATH**.

Follow the makefiles supplied in the **app.src** or **bapp.src** directory for all applications. In particular, since all the supplied libraries were compiled as multithreaded, compile all your applications this way. See also, [*Reviewing Compiler and Linker Options on page 54*](#).

Writing Multithreaded Programs

The Bfv API supports multithreaded programs using the **pthread**s package. When developing a multithreaded program, be sure to follow the programming guidelines described in your system documentation.

When new threads are created, often a stack size can be specified. The stack size must be sufficiently large to store all local variables used both by the application and the Bfv API. If the stack size is not large enough, unpredictable behavior can result.

Dialogic usually finds a stack size of 64K to be sufficient but, depending on the application's stack allocation demands, more memory might be required.

Warning and Error Messages

If the driver has an error or warning to report (often related to driver startup problems), the report always appears on the system console, if such a device exists for that platform. Additionally, a limited amount of messages are sometimes available if you use the **crash** command and select the **panic** option. These messages are logged to the **/var/log/messages** text file.

Determining Installation Parameters

Any time after you install the driver (but not removed) you can determine what installation parameters were used by looking at the **/etc/startbost** file.

Command Line Configuration for dinstall

When configuring the device driver using **dinstall**, you can specify the command line option **-c** to cause the **dinstall** program to not prompt you for any parameters. Instead, the **dinstall** program uses the responses that you supply following the **-c** option on the command line.

If you use the **-c** option, you must include all the parameters described below, in order, regardless of whether or not the parameter has meaning on the system in question. If a parameter does not apply, it is ignored. The parameters are not checked for validity.

Note: Prompting for removal of old driver versions is not performed.

When configuring the driver using **dinstall**, you must include the following parameters:

Parameter	Defaults
Reserved	0
Reserved	-1
Max num PCI/cPCI hw modules	16
Physical buffer size	32768
Application buffer size	10240

Reserved	0
Machine ID	1
Reset option (1 or 0)	1
History Enable	0
History Size	1024000
Num physical histories	0
Num app histories	0
Restrict phys channels (1 or 0)	1
Number of I2O frames	*0
Flow control interval	*0
Memory alloc minimum	*0
Memory alloc quanta	*0
Reserved	0
Test parameter 1	*0
Test parameter 2	*0
Test parameter 3	*0
Reserved module info module id, module number, 0 to terminate	*0
Reserved	0

The advanced parameters, marked with * in the list above, can always be safely set to 0. This tells the driver to use the default values.

There are currently no parameters used with `-c` when removing the driver, but the option might still be given on the command line for future use.

For example, to configure the driver for 0 ISA hardware modules and up to 16 PCI hardware modules, use the following settings:

- physical buffer size 32768
- application buffer size 10240
- machine ID 1
- reset on
- history enabled
- history size 1024000
- physical histories 0

- application histories 0
- restrict physical channels
- all default advanced parameters

Enter the following at the command line:

```
./dinstall -c 0 -l 16 32768 10240 0 1 1 1 1024000 0 0 1 0 0 0 0 0 0 0 0 0
```

Driver File Locations

When using **dinstall** to configure the device driver, you need not have all files from the distribution. However, the locations of files used by the installation procedure relative to the directory from which **dinstall** is being run must be the same as that in the normal distribution.

Assuming a directory named **install** from which **dinstall** is being run, the following files must be present:

install/dinstall

install/dinstlib

kernel/kvers/*

These files and directories appear in the standard distribution under the directory **driver/linux**.

The **kvers** directory contains subdirectories named after each kernel version for which binaries are available. The software supports the standard uni and multiprocessor releases, as well as alternate releases. See the Release Notes for the supported kernel versions.

Reviewing Compiler and Linker Options

The makefiles contained in the **app.src** and **bapp.src** directories provide a number of command line options to the compiler and linker. Using these options, the compiler and linker produce object files and executables compatible with the Bfv API library.

Dialogic strongly recommends that you use these options for all your Dialogic® Brooktrout® Bfv API applications. But for those who want to change the set of options the compiler and linker use, the

following is a list of the nonstandard options and their functions. The options used for compilation are marked with (**C**) and those for linking are marked with (**L**).

- | | |
|-----------------------------|--|
| <code>-DBFAX_THREADS</code> | (C) Specifies a multithreaded program to the API. |
| <code>-lpthreads</code> | (L) Multithreaded library. |

Message About “Tainted” Kernel

On some versions of Linux, when the Boston Device Driver is loaded, the following message might get logged to the system log file:

```
boston: module license 'Proprietary' taints kernel
```

This strongly worded message from the operating system is just to inform the user that a driver which does not conform to the GNU Public License (GPL) has been loaded.

The Boston Driver does not conform to the GPL because it is not distributed in source form. The only option for a driver that does not conform to the GPL is to claim its license type is “Proprietary”, and that causes the message to be logged. It should therefore be treated as harmless and ignored.

SELinux

SELinux prevents `bostlib_mt.so` and other Dialogic-supplied shared libraries from loading because they require text relocation, which is very common for third-party shared libraries.

Follow one of the methods below to allow shared libraries to load:

- Disable SELinux as follows:
 - ◆ In `/etc/selinux/config`, set SELINUX to `disabled` and reboot.
- Set the SELinux mode to `permissive` - which will still cause warnings to pop up and appear in the logs, but the programs will work.
 - ◆ In `/etc/selinux/config`, set SELINUX to `permissive`, and reboot.
- Allow the shared library to do text relocation. For each shared library (`.so`) file that fails to load, run the following program:

```
chcon -t textrel_shlib_t <library name>
```

Recompiling on Linux Platforms

This section provides instructions for recompiling the Boston driver to support new kernel patches.

Use the instructions below to recompile the Boston driver on supported Linux platforms so that the driver can operate with any kernel patch for supported Linux versions. Dialogic only supports official kernel patches as released by Red Hat. After you follow the procedure, the driver supports only the exact version of the kernel currently running on your system, including architecture and variant.

Note: This feature only provides support for the Boston driver, the kernel mode code. Other parts of the Brooktrout SDK (the user mode code) might also need rebuilding and this feature will not help in these situations.

Supported versions include:

- Red Hat Enterprise Linux ES/AS 4.0 and 5.0

The fully precompiled installable driver binaries reside under the ***driver/linux/kernel/kvers*** directory. This directory contains subdirectories corresponding to each kernel version, variant, and architecture, with a driver binary in each (named ***boston.o*** or ***boston.ko***).

For each Linux OS version supported, the only precompiled driver supplied supports the original kernel that shipped with that version of Linux.

Each of these directories also contains a file named ***bostbase.a***, which is a library containing precompiled object files compiled for that same kernel version, variant, and architecture.

The driver/linux/kernel directory contains files named ***kerndep.c***, ***kerndep.h***, and ***makefile.kerndep***.

Before building a Dialogic® Brooktrout® driver for a patch version, install the kernel source, the compiler, and other standard development tools on the system.

- **To build a driver for a kernel patch version, enter the following at the command prompt:**

```
make -f makefile.kerndep
```

This command performs several steps.

- ◆ Determines what the base Red Hat release is that the booted kernel is based on, what the kernel version is that corresponds to the base release, and what the variant and architecture are.
- ◆ Compiles the source file **kerndep.c** on the current booted kernel setup.
- ◆ Links the resulting object file with the **bostbase.a** file from the directory corresponding to the base kernel version for the current variant and architecture.
- ◆ Puts the resulting driver binary into an appropriate **kvers** subdirectory for the actual kernel version in use.

After compiling the driver, use the standard manual **dinstall** script provided on the CD to manually configure the driver.

If the kernel source is not installed in a standard location, use the optional `KERNEL_SOURCE=<dir>` command line option to specify the kernel source location to the **make** utility.

For Red Hat Linux releases ES/AS 3.0 and earlier:

The kernel source is the package whose name is of the form **kernel-source-<version>**, in the file **kernel-source-<version>.i386.rpm**. This package is automatically installed if you tell the Linux installation program to install everything.

For Red Hat Linux releases ES/AS 4.0 and later:

The kernel source itself is not required; instead, a **development kit** is required. This kit is in the package whose name is of the form **kernel-devel-<version>**, in the file **kernel-devel-<version>.i686.rpm** or **kernel-smp-devel-<version>.i686.rpm**. This kit is automatically installed if you tell the Linux installation program to install everything. In this case, `KERNEL_SOURCE` should point to the appropriate subdirectory of **/usr/src/kernels** which would normally be one of **<version>-i686** or **<version>-smp-i686**.

3 - Installing the SDK on Solaris

This chapter describes how one can install Dialogic® Brooktrout® software on Solaris operating systems.

Note: The SR140 is not supported on Solaris operating systems.

This chapter has the following sections:

- *Installation Steps on page 61*
- *Configuring the Driver Manually on page 66*
- *Special Considerations on page 70*
- *Reviewing Compiler and Linker Options on page 76*

Installation Steps

To install the software on Solaris, follow the steps below. When running driver installation programs, scripts, or functions, you must be logged in as root or have administrative privileges.

The software is for either SPARC® or Intel x86. Dialogic supports only official development environments from Sun, such as Sun Workshop, Sun Pro, and Forte. In particular, GNU development environments are not supported.

Note: The SR140 is not supported on Solaris operating systems.

➤ ***To install hardware and software, use the following steps:***

1. Install the firmware, driver, and Bfv API software onto your computer.

If you are reinstalling or upgrading the software, you must first remove the previously installed software before installing this software.

See ***Removing the Software on page 64.***

2. Compile the sample applications and utilities (optional).
See in the developer guide the chapter on compiling the sample applications.
3. Run the ***dinstall*** program to configure the driver (optional).
See ***Configuring the Driver Manually on page 66.***
4. Download the firmware and configure the call control parameters, see:
 - ♦ ***Chapter , Downloading Firmware on page 219***
 - ♦ ***Using a Call Control Configuration File on page 200***

Installing the Software

The Brooktrout SDK CD-ROM comes with an installation program that uses **pkgadd** to install the files on your hard drive. To use the program, follow the directions below. You must install/uninstall the software and configure the driver from the **root** directory.

➤ ***To install files on your hard drive, do the following:***

1. Insert the installation CD-ROM.

The CD-ROM splash screen should automatically display in the File Manager window. If it does not, check with your Solaris documentation for instructions for displaying the CD-ROM.

2. Traverse to the **Solaris** directory on the CD-ROM by entering this command line:

```
cd /cdrom/<volume label>/Software/Solaris
```

Where <volume label> is the label on the CD (for example, tr1034v31).

3. Go to the subdirectory with the Solaris files for x86 or SPARC. Enter either:

```
cd "Solaris x86
```

```
cd "Solaris SPARC"
```

4. Run the setup program by entering the following at the command prompt:

```
sh ./setup.sh
```

The program begins with the following messages:

```
The following packages are available
```

```
1. BOSsetup Series 6.0.0 SDK (SPARC) 6.0.0
```

```
Select packages you wish to process (or 'all' to  
process all packages) (default: all) [?,??,q]:
```

5. Select **1**.

The program displays the following information:

WARNING: This program is protected by copyright law and international treaties. Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.

Welcome to the Brooktrout Setup Program.

Depending on your needs this program will install the Boston API & Driver on your system.

Press Enter to continue or press 'q' then Enter to quit setup.

6. The program checks for the operating system:

The setup program detected Solaris as your operating system. Is this correct [y or n]?

7. Type **y**.

If the program cannot detect the operating system, it requests that you choose one:

If your operating system type is not listed below, then it is not supported and you may want to exit this program.

- (1) Sunsoft Solaris
- (2) Exit Installation

Select your operating system type from the above list:

8. Type **1**.

The program prompts you for the files to install:

- 1) Boston API/Driver Files.
- 2) Firmware Files.
- 3) Boston API/Driver Files and Firmware files.
- 0) Exit Installation.

Please enter the files you wish to install?

9. Type the number of your choice.

The program displays:

Default install directory is /usr/sys/brooktrout.

Please enter desired install directory or Enter for default?

10. After you enter an install directory or use the default directory, the program asks:

Would you like to configure the driver at this time [y or n]?

11. The program asks:

Do you want to continue with the installation of
BOSsetup [y, n?]

If you answer **y**, the program installs the files, configures the
driver, and configures the number of channels.

If you choose Bfv binary and firmware files, the directory
/usr/sys/Brooktrout contains the directories and files shown in
[*Chapter , Directory Structure on page 202.*](#)

After installing the software, you can download the firmware and
configure the call control for the board, see:

- [*Chapter , Downloading Firmware on page 219*](#)
- [*Using a Call Control Configuration File on page 200*](#)

Removing the Software

To remove all of the files and directories previously installed with
pkgadd, use the **pkgrm** program.

➤ ***To uninstall both the Bfv API and driver, enter:***

pkgrm BOSsetup

This command removes only the files and directories that the
installation procedure placed on the system.

Starting or Stopping the Driver

Because the Boston driver loads automatically when needed, there are no explicit steps required to load the driver.

➤ ***To stop or shut down the driver, enter:***

```
/etc/bostunld -r
```

Reinitializing the Driver

You can reinitialize the driver to its starting state in terms of channels assigned to modules and module number assignments using the ***driver_reinit.exe*** utility located in the ***boston/driver/solaris/user*** directory (see [***Reinitializing the Device Driver on page 259***](#)).

Configuring the Driver Manually

- ***To configure the driver manually, change to the installation directory and run the dinstall program:***

The configuration dialog is as follows:

Installing Brooktrout Boston Device Driver Version 5.2.0

Maximum number of PCI/cPCI hardware modules (default 16):

Physical buffer size (default 32768):

Application buffer size (default 10240):

Machine ID, in hex (default 1):

Do initial reset (default 1):

History enable (default 0):

If you enter **1**, **dinstall** asks the following questions:

History size (default 1024000):

Number of physical channel histories (default 0):

Number of application channel histories (default 0):

Configure advanced parameters (n)?

If you enter **y**, **dinstall** asks the following questions:

Number of I2O frames per module (default 16):

Driver flow control interval (default 250):

Internal memory allocation minimum (default 152):

Internal memory allocation quanta (default 128):

To reserve module numbers, enter mod_id (serial number) and mod_num, in hex. Mod_num will default as indicated:

mod_id mod_num[F0]:

Configure test parameters (n)?

If you enter **y**, three test options are listed:

Test1:

Test2:

Test3:

Configuring Boston driver:

Phys buf size 32768

App buffer size 10240

Machine ID 1

History size 1024000

Num phys hist bufs 0

Num apl hist bufs 0

Leave the maximum number of PCI hardware modules at its default. However, if fewer modules are in use, you can reduce this number to conserve memory. Each hardware module uses approximately 60K.

History Logging

When the Boston driver is installed, history logging is disabled by default. When you manually install the driver using ***dinstall***, the default is set to disable history logging (which you can choose to override). History logging is a powerful debugging tool, especially when working with Dialogic Technical Services and Support. However, it does consume a significant amount of CPU time when running very high call loads. Therefore, leave history logging off for systems that have high call loads and are CPU-bound. For low-load systems or when debugging, enable history logging.

Leave the number of physical and application channel histories at 0 unless you are directed to change this by Dialogic Technical Services and Support. If you change the physical or application buffer size, do not change the value to one smaller than the default.

If you specify a number for the physical channel histories, ***dinstall*** asks if you want to restrict the physical channels to administrative channel 1:

Restrict physical channels to admin channel 1 (default 1):

Choose the default (enable).

Advanced Configuration Parameters

If you selected advanced configuration parameters, the software prompts you for the number of I2O frames, driver flow control interval, internal memory allocation parameters, module reservations, and test parameters. Do not configure advanced parameters except under the advice of Dialogic Technical Services and Support.

The driver is configured and ready to be started.

Resource Allocation Failures

Depending on the options chosen and the state of the system, various resource allocation failures can occur. The errors are displayed and logged, but because of the architecture of Solaris drivers, the installation procedure has no way to know that the driver load failed.

Removing the Manually Configured Driver

To uninstall the driver, navigate to the **`/usr/sys/brooktrout/boston/driver/solaris/install`** directory and enter the following at a command line:

```
./dinstall -r.
```

Using Boston Host Service Under Solaris

When a developer needs to run a multi-process application, you must use the Boston Host Service (Bostsrv). Bostsrv is installed and started automatically by the Configuration Tool before you start your own application. The command line process is not required.

Note: You need to use the Boston Host Service, but it is optional for other Brooktrout modules.

When you use the Boston Host Service (Bostsrv) with a Solaris system the following syntax applies:

- Go to following directory:

```
cd /usr/sys/brooktrout/boston/bfv.api/solaris/bin
```

- Use any of the following command line options:

Option	Meaning
-c <file>	Full path to the btcall.cfg file and name of the btcall.cfg file
-D	Run as daemon (in background)
-f <path>	Full path to board firmware
-k	Stops the daemon
-stop	Stops the daemon
-query	Queries whether the server is running
-debug	Console app/debugging
-v	Enable Bfv API debug mode
-l <file>	Log output to file (can be used with -debug and -D)

Note: **-c** and **-f** are required. For example:

```
Bostsrv -c /usr/sys/brooktrout/boston/config/btcall.cfg  
-f /usr/sys/brooktrout/boston/fw
```

Root login for Unix

When using Unix, you must log in as root to run Bostsrv from the command line in debug mode. Bostsrv creates a process id file in the root `owned/var/run` directory. This prevents multiple copies from running at the same time. It also supports the kill, stop, and query operations.

Special Considerations

When you install the software on a Solaris operating system, consider the following:

- ***PCI Considerations on page 70***
- ***Dialogic® Brooktrout® Bfv API Libraries and Makefiles on page 71***
- ***Writing Multithreaded Programs on page 71***
- ***Warning and Error Messages on page 72***
- ***Memory Allocation Error on page 72***
- ***pci_pci Loading Message on page 72***
- ***Determining Installation Parameters on page 72***
- ***Command Line Configuration for dinstall on page 73***
- ***Structure Packing on page 74***
- ***Compiler Issues on page 75***
- ***Driver File Locations on page 75***

PCI Considerations

When configuring the device driver, you must select 0 when asked for the number of ISA boards.

The operating system and/or system BIOS assigns base addresses and interrupt numbers to the PCI boards, which might change when the system is rebooted, especially if devices are added or moved.

If multiple PCI boards are in use, to determine the module numbers of boards or ordinal channel values, see ***Determining the Board Module Number on page 33*** for more information about modules and module number assignment.



On some systems, when certain Dialogic® Brooktrout® boards are installed the system might hang at boot time if the device driver is not already installed. Remove the boards, install the driver, then reinstall the boards.

Dialogic® Brooktrout® Bfv API Libraries and Makefiles

The Dialogic® Brooktrout® Bfv API libraries are supplied in several forms. 32-bit versions are always supplied, and for Solaris SPARC version 7 and higher, there are also 64-bit versions. The primary libraries are shared (.so) libraries. There are also static (.a) libraries; their use is deprecated and they are supplied for compatibility only.

To compile an application with the **.so** libraries, the operating system needs to find the **.so** libraries at runtime. The installation procedure automatically installs these libraries into a known system locations: `/usr/lib` (for 32-bit) and `/usr/lib/sparcv9` (for 64-bit). If you are performing installation manually, you can either copy the libraries there, or add the directories containing the **.so** libraries to the environment variables `LD_LIBRARY_PATH` (for 32-bit) and `LD_LIBRARY_PATH_64` (for 64-bit).

The **app.src** and **bapp.src** directories contain makefiles that compile using the 32-bit version of the Bfv API libraries. There is also a sections of the makefile that can be uncommented to use the 64-bit versions of the library. Follow the instructions in the makefile to make these changes.

All applications should try to follow the makefiles supplied in the **app.src** or **bapp.src** directory. In particular, since all the supplied libraries were compiled as multi threaded, compile all applications this way. See also, [*Reviewing Compiler and Linker Options on page 76*](#).

Writing Multithreaded Programs

When developing a multithreaded program, be sure to follow the programming guidelines described in your system documentation.

When new threads are created, often a stack size can be specified. The stack size must be sufficiently large to store all local variables used both by the application and the Bfv API. If the stack size is not large enough, unpredictable behavior can result.

Dialogic usually finds a stack size of 64K to be sufficient but, depending on the application stack allocation demands, more memory might be required.

Warning and Error Messages

If the driver has an error or warning to report (often related to driver startup problems), the message always appears on the system console if such a device exists for Solaris. In addition, messages are available in other ways. A limited amount of messages are sometimes available if you use the `crash` command selecting the `panic` function within. The messages are logged to a text file: */var/log/messages*.

Memory Allocation Error

On some systems, the driver might fail to load with a memory allocation error appearing on the console. This could happen either as part of running *dinstall* or the first time running a Bfv API application since booting the system.

This error occurs because the system's kernel virtual memory space becomes fragmented over time and cannot provide space for the amount of memory required. This error is especially likely if you chose a large history size.

If the driver is loaded soon after boot time (by running any application that uses the driver), the chances of being able to allocate the memory are much higher.

pci_pci Loading Message

On some systems, at boot time a message might appear on the system console mentioning forced loading of `pci_pci`. This message can safely be ignored.

Determining Installation Parameters

Any time after the driver has been installed (but not removed), you can determine what installation parameters were used by looking at the file */platform/<arch>/kernel/drv/boston.conf*. Where *<arch>* is *i86pc* on x86 platforms and *sun4u* on SPARC platforms.

Command Line Configuration for dinstall

When configuring the device driver using **dinstall**, you can specify the command line option **-c** to cause the **dinstall** program to not prompt you for any parameters. Instead, the **dinstall** program uses the responses that you supply following the **-c** option on the command line.

If you use the **-c** option, you must include all the parameters described below, in order, regardless of whether or not the parameter has meaning on the system in question. If a parameter does not apply, it is ignored. The parameters are not checked for validity.

Note: Prompting for removal of old driver versions is not performed.

When configuring the driver using **dinstall**, you must include the following parameters:

Parameter	Defaults
Reserved	0
Reserved	-1
Max num PCI/CPOS hardware modules	16
Physical buffer size	32768
Application buffer size	10240
Reserved	0
Machine ID	1
Reset option (1 or 0)	1
History Enable	0
History Size	1024000
Num physical histories	0
Num app histories	0
Restrict phys channels (1 or 0)	1
Number of I2O frames	*0
Flow control interval	*0
Memory alloc minimum	*0
Memory alloc quanta	*0
Reserved	0
Test parameter 1	*0
Test parameter 2	*0
Test parameter 3	*0

Reserved module info	*0
module id, module number	
0 to terminate	
Reserved	0
Int Prio (Reserved on SPARC)	0

The advanced parameters, marked with * in the list above, can always be safely set to 0. This setting tells the driver to use the default values.

There are currently no parameters used with `-c` when removing the driver, but the option might still be given on the command line for future use.

For example, to configure the driver for 0 ISA hardware modules and up to 16 PCI hardware modules use the following settings:

- physical buffer size 32768
- application buffer size 10240
- machine ID 1
- reset on
- history enabled
- history size 1024000
- physical histories 0
- application histories 0
- restrict physical channels
- all default advanced parameters

Enter the following at the command line:

```
./dinstall -c 0 -l 16 32768 10240 0 1 1 1 1024000 0 0 1 0 0 0 0 0 0 0 0 0 0
```

Structure Packing

The Bfv API uses packing, via the `#pragma pack` directive, to ensure that certain structures are packed at known correct boundaries. Certain compilers (including some versions of the C++ compiler for Solaris) seem not to handle packing properly. When using compilers with this problem, the best solution is to write source code modules that use Dialogic® Brooktrout® functions and structures in C. Then, if desired, write other portions in C++.

Compiler Issues

This version of the Bfv API was compiled with version 4.2 or later of the Sun C compiler (Sun Workshop C/C++ 4.2). Object files and libraries compiled with these versions of the C compiler might be incompatible with those compiled with earlier versions.

To ensure proper functioning of your applications when using an older version of the C compiler, Dialogic recommends that you contact Dialogic Technical Services and Support for the source version of the Bfv API and compile the Bfv API library using the older compiler.

After installing your Sun C compiler, be sure that your paths are set up correctly before you begin working with the Dialogic® Brooktrout® software. Failure to do so could cause accidental use of incorrect default compiler components resulting in many errors.

Driver File Locations

When using **dinstall** to configure the device driver, you need not have all files from the distribution. However, the locations of files used by the installation procedure relative to the directory from which **dinstall** is being run must be the same as that in the normal distribution.

Assuming a directory named **install** from which **dinstall** is being run, the following files must be present:

install/dinstall
install/dinstlib
kernel/27/boston32
kernel/27/boston64 (SPARC only)
kernel/bostunld

These files and directories appear in the standard distribution under the directory **driver/solaris**.

Reviewing Compiler and Linker Options

The makefiles contained in the ***app.src*** and ***bapp.src*** directories provide a number of command line options to the compiler and linker. Using these options, the compiler and linker produce object files and executables compatible with the Bfv API library.

Dialogic strongly recommends that you use these options for all your Bfv API applications. But for those who want to change the set of options the compiler and linker use, the following is a list of the nonstandard options and their functions. The options used for compilation are marked with **(C)** and those for linking are marked with **(L)**.

<code>-DSOLARIS</code>	(C) Define that indicates that Solaris is running.
<code>-D_REENTRANT</code>	(C) For multithreaded programs.
<code>-misalign</code>	(L) Solaris SPARC only. Allows the program to work with packed structures.
<code>-lthread</code>	(L) Multithreaded library.
<code>-xCC</code>	(C) The level of ANSI conformance.
<code>-xarch=v9 -xregs=no%appl -xO3</code>	(C,L) Solaris SPARC 64-bit only. The three of these options together instruct the compiler/linker that 64-bit should be used in a manner consistent with the Bfv API libraries.
<code>-lCstd -lCrun</code>	(L) C++ libraries. Required when new call control is used.

4 - Installing the SDK on Windows®

This chapter describes how one can install Dialogic® Brooktrout® software on Windows® operating systems.

This chapter contains the following sections:

- ***System Requirements for Installation on page 79***
- ***Installing the Dialogic® Brooktrout® SDK on page 81***
- ***Removing or Modifying the Software on page 89***
- ***x64 Windows API Libraries on page 92***

System Requirements for Installation

When running the installation, you need the following:

- Administrator privileges.
- Sufficient available disk space on the drive that contains the Windows® temp directory to extract the ***sdk_windows.exe*** file.
By default the Windows® operating system sets it to [WINDOWS_VOLUME]\temp, where WINDOWS_VOLUME is the drive where the operating system is installed. If you do not have enough space, you will need to adjust the TEMP environment variable to point to a drive that contains at least 200 MB of free space.
- An Intel computer that contains an Intel x86 or x64 (including Pentium) CPU only.
- The minimum system specification for running the TR1034/SR140/TruFax® Brooktrout SDK is based on the number of channels running on the system. For software only solutions, the maximum CPU utilization the Dialogic® Brooktrout® HBF software can use when running a number of fax channels simultaneously is shown in ***Table 1***. For hardware only solutions, the minimum processor and memory requirements are shown in ***Table 2*** for Intel based systems, and ***Table 3*** for SPARC based systems.

Table 1. Maximum CPU Utilization

Processor	4 Lines	8 Lines	24 Lines	48 Lines	120 Lines
Pentium 4 - 2.66 GHz	3%	5%	16%	33%	80%
Pentium 4 - 3.4 GHz	2%	4%	12%	20%	60%
Dual Pentium 4 - 2.66 GHz	2%	3%	10%	20%	45%

Table 2. Intel System Performance Requirements

Maximum No. of Channels	Processor	Memory	Maximum No. of Boards
120	Celeron 1 GHz.	128 MB.	1
192	Pentium 4 2.26 GHz.	256 MB.	2
360	Pentium 4 2.4 GHz.	512 MB.	3
480	One or Two Xeon 2.0 GHz	2 GB.	4

Table 3. SPARC System Performance Requirements

Maximum No. of Channels	Processor	Memory	Maximum No. of Boards
120	UltraSPARC IIIi 1.06 GHz.	512 MB.	1
192	UltraSPARC IIIi 1.28 GHz.	512 MB.	2
360	UltraSPARC IIIi 1.28 GHz.	1 GB.	3
480	One or Two UltraSPARC IIIi 1.28 GHz	2 GB.	4

Installation Packages

There are two installation packages for Windows®. This chapter describes the Brooktrout SDK installation (***sdk_windows.exe***), which is for application developers.

The installation package for end users (***boston.msi***) is described in the ***Developer Guide, Packaging Your Application for Windows®***. This chapter explains how you can integrate and redistribute the runtime software with your own installation procedures for your users.

The SDK contains support for x64 libraries which allow customers to build x64 applications that take full advantage of the Windows® x64 performance. Refer to ***x64 Windows API Libraries on page 92***

Installing the Dialogic® Brooktrout® SDK

Ordinarily, you install the Dialogic® Brooktrout® SDK from the distribution CD. However, there are other ways that the installation can be launched. For example, you can also install it from the Dialogic web site.

Also, although Dialogic recommends that you install the Brooktrout SDK before you install your Computer Telephony, if you choose to install the boards first, the **Found New Hardware Wizard** searches for and launches the installation. If the Wizard cannot find ***sdk_windows.exe***, it prompts you to browse and locate the installation software.

If you have Dialogic® Brooktrout® SR140 fax software, you must install the TR1034/SR140/TruFax® Brooktrout SDK software first. Then you can turn on SR140 Fax Software using the Dialogic® Brooktrout® License Manager. See the ***Dialogic® Brooktrout® SR140 User Guide***.

Note: If you have a previous version of the Brooktrout SDK installed on your system, you must uninstall it before you can successfully install the latest Brooktrout SDK. The InstallShield Wizard does not install the latest Brooktrout SDK if there is a previous version on your system; however, it notifies you of the previous version and suggests corrective action. See ***Removing or Modifying the Software on page 89*** for more information.

➤ **To install the TR1034/SR140/TruFax® SDK from the CD-ROM:**

1. Insert the SDK CD-ROM into a CD drive.
The Autorun program starts automatically.
If the Autorun program does not start automatically:
 - a. Go to the CD root directory on the CD-ROM.
 - b. Launch **autorun.exe**.

Autorun Menu

The Autorun Menu appears:



2. Choose **Install SDK** from the list of options, which starts the setup procedure and runs **InstallShield** to extract the files needed to install the Brooktrout SDK on your system.
The splash screen followed by the **Welcome** window appears.
3. Click **Next**.
The **License Agreement** window appears.
4. Read the license agreement and, if you agree, select the appropriate option and click **Next**.
The **Destination Folder** dialog box appears.

5. Click **Change** to choose a folder or click **Next** for the default folder, **C:\Brooktrout\Boston**.

In the example, **C:\Brooktrout\Boston** is the destination folder where the application software installs the Brooktrout SDK contents.

If you choose **Next**, go to **Step 7**.

If you choose **Change**, the **Change Current Destination Folder** dialog box appears.

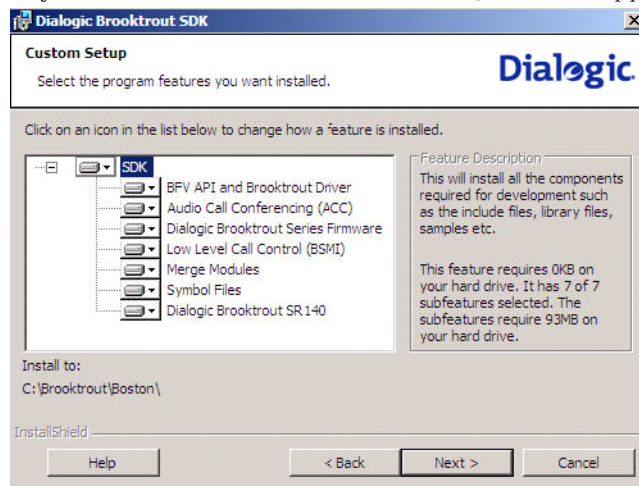
6. Click **OK** after selecting a new location for the software, which takes you back to the **Destination Folder** dialog box.
7. Click **Next** on the **Destination Folder** dialog box.

The **Setup Type** dialog box appears.

8. Choose one of the setup types:
 - ♦ Select **Complete** for the full software development kit that includes the Bfv and other APIs used for writing your applications, the tool to configure your boards and software, the runtime system, and troubleshooting tools.
 - ♦ Select **Custom** for picking specific software elements that exactly match your development needs.

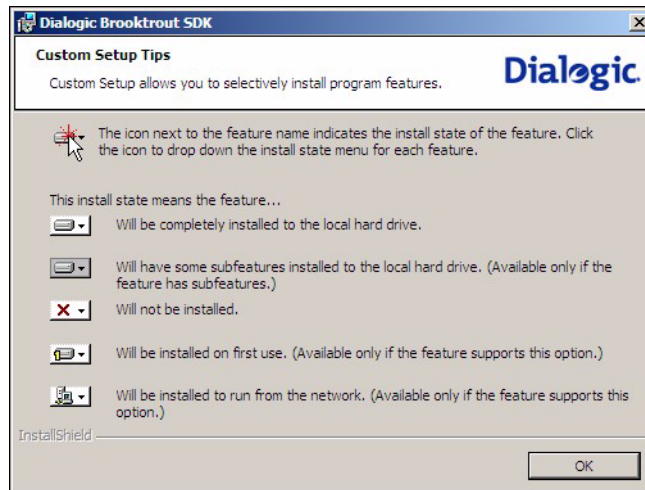
Custom Setup

If you choose **Custom**, the **Custom Setup** window appears.



Custom Setup Tips

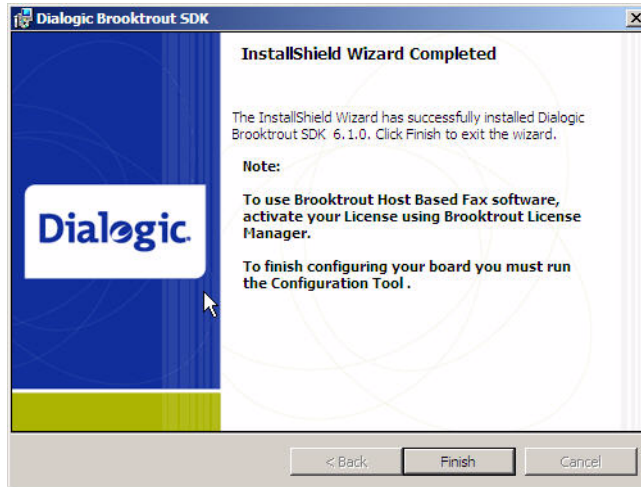
For help, click **Help** to see the **Custom Setup Tips** window.



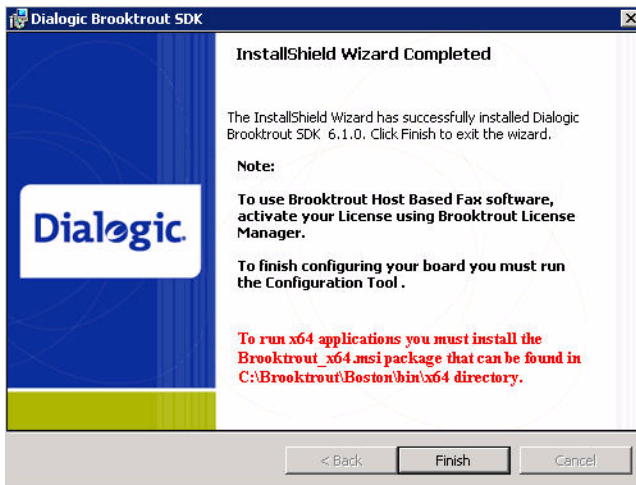
9. After reading the **Help**, click **OK** to return to the **Custom Setup** window.
10. Select the components you want to install and click **Next**.
If you choose **Complete** or if you select a custom installation, the **Ready to Install** window appears.
11. Click **Install** to install the software.
The **Installing Brooktrout Boston SDK** window appears.
After the software is installed, the **InstallShield Completed** windows appears.
The installation program reminds you to install your Computer Telephony using the **Add New Hardware Wizard**.
12. Click **Finish**.

InstallShield Wizard Completed

When the x32 Windows® installation finishes, the following InstallShield Wizard Completed window appears:



When the x64 Windows® installation finishes, the following InstallShield Wizard Completed window appears:



13. Shut off your computer and install the board using the instructions in the hardware installation guide that came with the board.

Installation Directory

When the installation is complete, the resulting directory, **[INSTALLDIR]**: (**C:\Brooktrout\Boston** is the default), contains the directories according to the options you choose. See [Chapter , Directory Structure on page 202](#) for the installed directories and files.

**Installing Licenses
(SR140 Only)**

14. After rebooting your system, you can install your Dialogic® Brooktrout® license. See the **SR140 Fax Software Windows® User Guide** for more information.

Sample Applications

15. You must compile the sample applications if you want to use them. See the chapter in the **Dialogic® Brooktrout® Fax Products SDK Developer Guide** on compiling the sample applications.

Remove Previous Version

The InstallShield Wizard does not install the latest Brooktrout SDK if you have a previous version of the SDK. You must remove it before installing the latest SDK.

See ***Removing or Modifying the Software on page 89*** and ***Removing the Plug-and-Play Driver on page 107***.

Removing or Modifying the Software

After you install the Brooktrout SDK, you can modify, repair, or remove it by running ***sdk_windows.exe*** again. Modifying or removing the Brooktrout SDK means reinstalling the software to add or delete functionality.

You can also remove or change the Brooktrout SDK or a previous version of the Brooktrout SDK by using **Add/Remove Programs** from the **Control Panel**.

➤ ***To uninstall or modify the existing software from the Control Panel:***

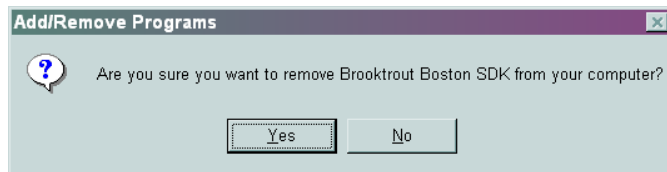
1. Click either the following:
 - ◆ **My Computer** → **Control Panel** → **Add/Remove Programs**
 - ◆ **Start** → **Settings** → **Control Panel** → **Add/Remove Programs**For Windows 2008:
 - ◆ **Start** → **Settings** → **Control Panel** → **Programs and Features**.

Add/Remove Program

The **Add/Remove Programs** window appears.

2. Select **Brooktrout Boston SDK** from the program list.

If you click **Remove**, the system asks you if you want to remove the software in the **Add/Remove Programs** dialog box.



3. Click **Yes**.
4. If you click **Change** in the **Add/Remove Program** window, the **Welcome** window from the software installation appears.

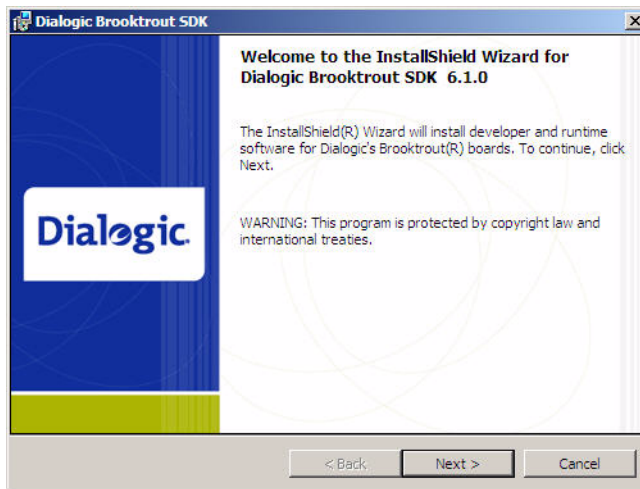
Windows Server® 2003 x64 and Windows® 2008 x64

The Brooktrout x64.msi package installs all the x64 components required to run x64 applications that use Brooktrout libraries. Refer to [*Brooktrout_x64.msi on page 92*](#).

To keep the installation and removal of this component reliable, you install this package separately after installing either sdk_windows.exe or boston.msi.

Dialogic® Brooktrout® Welcome

This is the same window that you get if you run **sdk_windows.exe** again. For details, see [*Installing the Dialogic® Brooktrout® SDK on page 81*](#).



5. Click **Next**.
The **Program Maintenance** window appears.
6. Choose one of the options and click **Next**.
If you choose **Modify**, the **Custom Setup** window appears.
7. Select the components you want to modify and click **Next**.
The **Ready to Modify the Program** window appears.

8. Click **Install**.

The software installs the Dialogic® Brooktrout® SDK.

If you choose **Repair**, the **Ready to Repair** window appears.

9. Click **Install** to have the wizard install the Dialogic® Brooktrout® software again.

Then the **InstallShield Wizard Completed** window appears after the software is reinstalled to either modify or repair it.

If you choose **Remove**, the **Remove the Program** window appears.

10. Click **Remove**.

The **Uninstalling Dialogic® Brooktrout® SDK** window appears.

When the removal of the software is complete, the **InstallShield Wizard Complete** window appears.

11. Click **Finish** to complete the operation.

These procedures only remove the files and directories that the installation procedure placed on the system.

x64 Windows API Libraries

The x64 libraries allow customers to build x64 applications that take full advantage of Windows® x64 performance.

x64 system

On a x64 system, the Brooktrout package installs the x64 version of the libraries in the following directory:

`windows\system32`

The x32 libraries are installed in the following directory:

`windows\syswow64`

x32 system

On a x32 system, the Brooktrout package installs the x32 version of the libraries in the following directory:

`windows\system32`

No x64 libraries are installed in the system directory.

All files are available in the Brooktrout folder.

Brooktrout_x64.msi

The Brooktrout_x64.msi package installs all of the x64 components required to run x64 applications that use Brooktrout libraries.

This package installs the following:

- Visual Studio 2005 x64 components
- x64 libraries in system directories

You install this package separately after installing either `sdk_windows.exe` or `boston.msi`. You can remove this package separately as well.

This package is available in two locations:

- On the CD under the directory `software\windows`
- Inside of the `sdk_windows.exe` package in the directory `Boston\bin\x64` after the `sdk_windows.exe` package is installed.

Merge Module

The merge module `dynamic_dlls_x64.msm` is available in the `sdk_windows.exe` package. You can use it instead of the `Brooktrout_x64.msi`. If you use this merge module to support x64 applications you do not have to do anything else.

Files

The merge module installs the following files in `c:\windows\system32`:

- `bostdll.dll`
- `bsmidll.dll`
- `osidll.dll`

If you do not use the merge module or the package, you must manually add Visual Studio 2005 x64 components to the installation and the three `.dll` files above.

System Files

You can install either combination of packages below:

- `sdk_windows.exe` and `Brooktrout_x64.msi`
- `Boston.msi` and `Brooktrout_x64.msi`

After installing them, the following configuration will be on the x32 and x64 operating systems:

x32 operating system

A 32 bit operating system will have the following files installed in the `system32` directory:

- `system32\bostdll.dll`
- `system32\bostsrv.exe`
- `system32\bostsrv.dll`
- `system32\bsmidll.dll`
- `system32\brkth323.dll`
- `system32\brktsip.dll`

x64 operating system

A x64 operating system will have the following files installed in the `system32` directory:

x64 version of the package dlls:

- system32\bostdll.dll
- system32\bostsrv.exe
- system32\bostsrv.dll
- system32\bsmidlld.dll
- system32\brkth323.dll
- system32\brktsip.dll

x32 version of the package dlls:

- systemWow64\bostdll.dll
- systemWow64\bostsrv.exe
- systemWow64\bostsrv.dll
- systemWow64\bsmidlld.dll
- systemWow64\brkth323.dll
- systemWow64\brktsip.dll

All the above files will also be available in the Brooktrout\boston directory.

Note: The system32 directory on a x64 system is visible only by using 64-bit applications like Explorer. The x32 applications are not able to access that location.

Building Your Own Solution

➤ ***If you do not want to use either the Brooktrout_x64.msi package or the merge module dynamic_dlls_x64.msm you can build your own solution as follows:***

1. Install Visual Studio 2005 components for x64.
2. Install the Brooktrout libraries in system32 (bostdll.dll, bsmidlld.dll, and osidlld.dll)

5 - Installing the Device Driver on Windows®

This chapter describes how one can install the device driver on Windows® systems.

This chapter contains the following:

- ***Installing and Configuring Options on page 96***
- ***Installing the Plug-and-Play Driver on page 97***
- ***Installing and Configuring the Driver using a Command (cmd) Prompt on page 112***
- ***Using the Boston Host Service on page 117***
- ***Special Considerations on page 119***

Installing and Configuring Options

Once the computer telephony hardware and software are installed on your system, you must install and configure the device driver for the Dialogic® Brooktrout® boards. This chapter describes two methods for installing the device driver:

- Automatically by letting the operating system identify the device, find the driver, and install it. See ***Installing the Plug-and-Play Driver on page 97.***
 - ◆ You must be running on Windows® 2000 (or later) to install the driver automatically using the Plug-and-Play (PnP) feature of the operating system.
 - ◆ SR140 (virtual module) users can also use the Dialogic® Brooktrout® Configuration Tool to install the driver.
- Manually running the ***install*** program from the command line. See ***Installing and Configuring the Driver using a Command (cmd) Prompt on page 112.***

You can install the PnP driver manually using the ***install*** program with Windows® 2000 (or later).

Note: For Windows Server® 2008 users: If you do not run the driver installation program with administrative privileges, a dialog box will appear requiring you to respond to continue the installation.

Installing the Plug-and-Play Driver

After you have installed your Dialogic® Brooktrout® board the operating system can automatically install the driver for your board.



The Microsoft hotfix 909666 is required when running Windows Server® 2003 x64. Obtain the hotfix from Microsoft at <http://support.microsoft.com/> by referencing the knowledge base number 909666. System crashes can occur without this hotfix.

Note: The dialog boxes for Windows® 2000 Plug-and-Play driver installation are somewhat different from those for newer versions of Windows® systems. The dialog boxes shown in this chapter show Plug-and-Play driver installation on a Windows® 2000 system.

➤ ***Do the following to install the driver for your board:***

1. Turn on your computer.

As the operating system finishes booting, the **Found New Hardware Wizard** window might appear.

Found New Hardware Wizard

This window does not appear if the hardware was already detected from a prior boot or if you are upgrading from an older installation.

See ***Updating Computer Telephony and the Plug-and-Play Driver on page 104*** for information about upgrading.

- Click **Next** to continue the device driver installation.

Installing Hardware Device Driver

The Install Hardware Device Driver window appears.



- Choose the **Search for a suitable driver for my device (recommended)** and click **Next**.

Locating Driver Files

The Locate Driver Files window appears so the wizard can search for a suitable driver.



Browsing for the .inf File

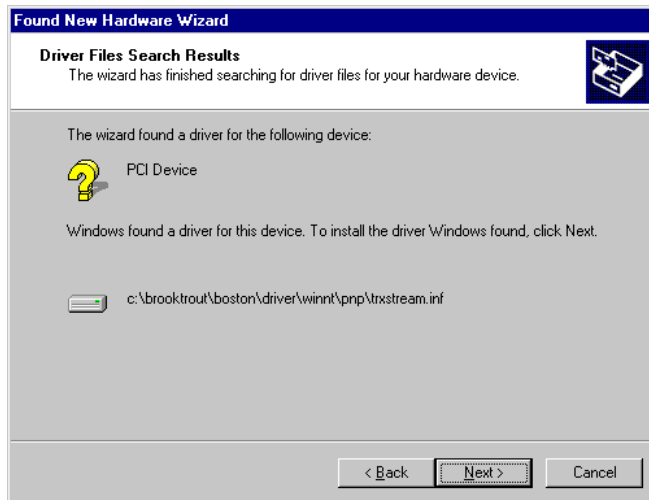
4. Check **Specify a Location** and click **Next**.
5. The following window appears where you can browse to select the **trxstream.inf** file located in the following folder:
C:\Brooktrout\Boston\driver\winnt\pnp



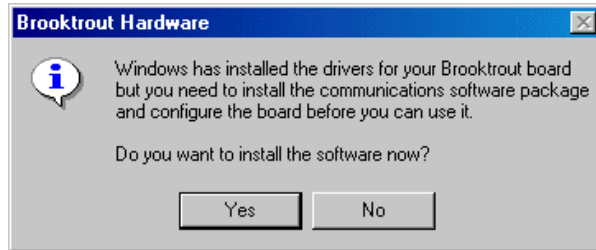
6. Click **OK**.

Finding the Driver File

The **Driver File Search Results** window appears.



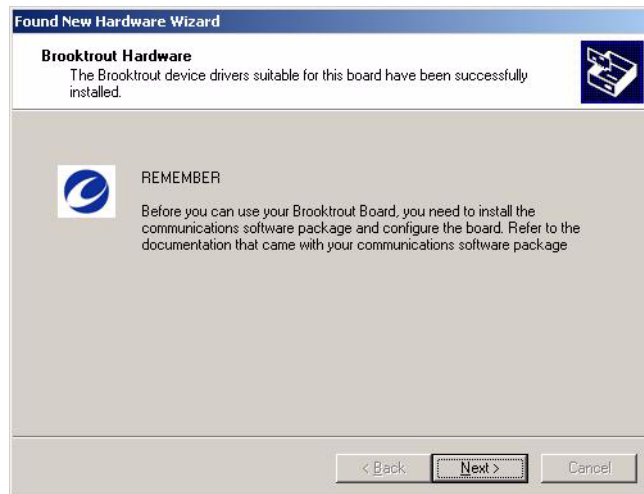
7. The **Hardware Co-Installer** checks if the Dialogic® Brooktrout® Software is installed on your system.
 - a. Click **Next** to install the Dialogic® Brooktrout® Software. If you do not have Dialogic® Brooktrout® Software installed, before the **Completing the Found New Hardware Wizard** window appears, the **Computer Telephony** dialog box provides these options:



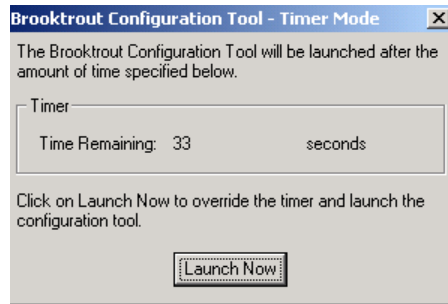
- ♦ Click **Yes** to install the Dialogic® Brooktrout® Software.
- ♦ Click **No** to install the Dialogic® Brooktrout® Software later. Follow the directions on the **Install Path** dialog box, then click **OK** to install the software.

Note: Restart the system when prompted by the final step in the Brooktrout SDK installation.

- b. The **Hardware Co-Installer** window and the Dialogic® Brooktrout® Configuration Tool **Timer** dialog boxes appear.



- c. Click the **Launch Now** button in the **Timer Mode** dialog box to set a timer that launches the Configuration Tool after a specified amount of time.



Do not click the **Launch Now** button if you have more than one Dialogic® Brooktrout® board. Instead, finish the **Found New Hardware Wizard** installation. The Windows® system continues to detect and install the remaining Dialogic® Brooktrout® boards. The timer automatically resets for each successive installation.

Refer to the ***Plug-and-Play Installation Scenarios*** in the ***Developer Guide***.

8. Click **Next** to the **Co-Installer** window.
The **Completing the Found New Hardware Wizard** window appears.
9. Click **Finish**.
The Plug-and-Play installation is complete.

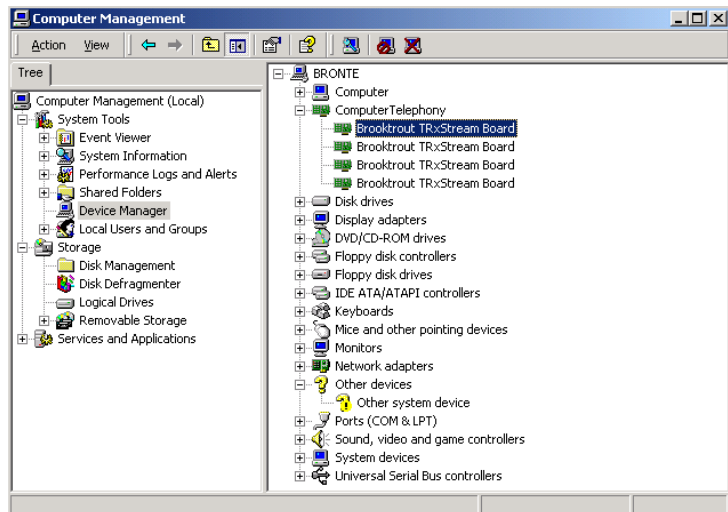
Verifying Dialogic® Brooktrout® Board Integration

➤ ***To verify that the Dialogic® Brooktrout® board is successfully installed on your system:***

1. Click one of either:

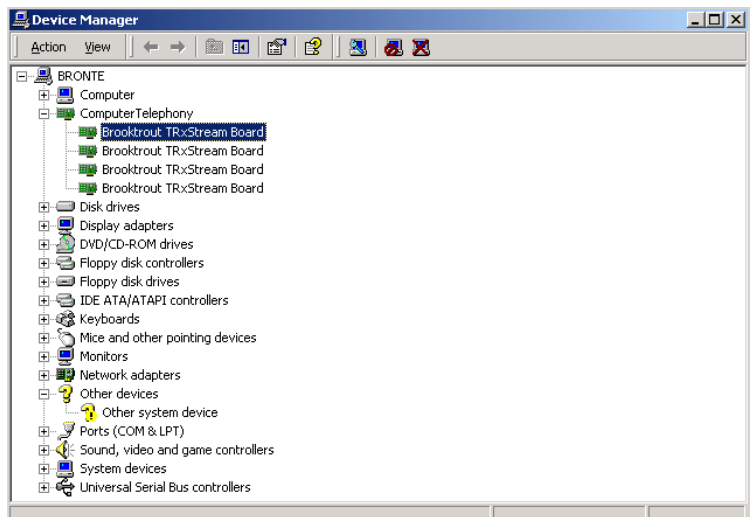
- ◆ Control Panel → Administrative Tools → Computer Management

The Computer Management window appears:



- ◆ Control Panel → System → Hardware → Device Manager

The Device Manager window appears:

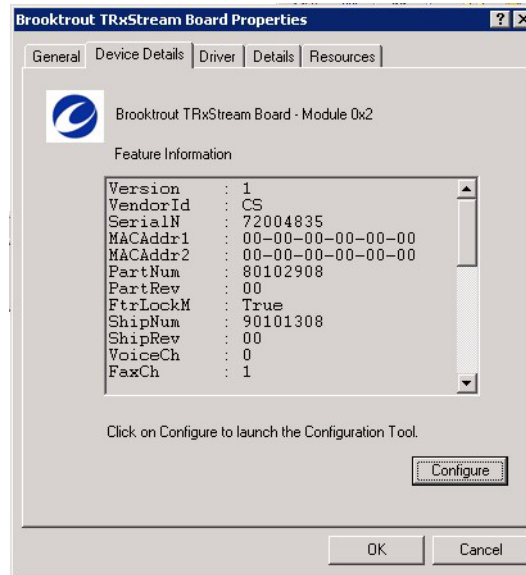


2. To view the properties of the Dialogic® Brooktrout® board in your system, double-click the board name in one of the windows shown above.

Viewing Dialogic® Brooktrout® Board Properties

The **Brooktrout TRxStream Board Properties** dialog box appears.

3. Click the **Device Details** tab.



4. Click the **Configure** button to use the Dialogic® Brooktrout® Configuration Tool Wizard to configure the device driver as well as other facilities of the board (for example, telephony).

For extra help, see [Configuring Software on page 128](#) for information about configuring your system. The Configuration Tool starts in Wizard mode if the boards are identical, or Advanced Mode if the boards are different.

Updating Computer Telephony and the Plug-and-Play Driver

A Plug-and-Play-compliant device driver cannot be started unless the devices managed by the driver are physically installed in the host system **and** are in an enabled state. Brooktrout SDKs prior to Brooktrout SDK 3.1 did not ship with a Plug-and-Play-compliant device driver.

Removing Dialogic® Brooktrout® Hardware

➤ ***To remove the previous version of the Computer Telephony and device driver:***

1. Click **Start** → **Settings** → **Control Panel**.
Select the **Add/Remove Hardware** option to remove the previously installed Dialogic® Brooktrout® boards.
The **Add/Remove Hardware Wizard** window appears.
2. Click **Next**.
The **Choose a Hardware Task** window appears.
3. Select **Uninstall/Unplug a device** and click **Next**.
The **Choose a Removal Task** window appears.
4. Select **Uninstall a device** and click **Next**.
The **Installed Devices** window appears.
5. Select the device labeled **PCI Device** (or possibly **Network Controller** for some older digital boards) and click **Next**.
Note: If you have more than one device named **PCI Device** listed under **Devices**, select the first one.
The **Uninstall a Device** window appears.
6. Select **Yes** and click **Next**.
The **Add/Remove Hardware Complete** window appears and informs you that the device was successfully removed.
7. Click **Finish**.
8. Follow Step 1 through Step 6 to remove each Dialogic® Brooktrout® board that is listed as **PCI Device** (or possibly **Network Controller**) in the **Devices** list in the **Installed Devices** window.

Once the Plug-and-Play installation process is completed, verify that the Computer Telephony category appears correctly in the **Device Manager** and contains all installed Dialogic® Brooktrout® hardware.

See [Verifying Dialogic® Brooktrout® Board Integration on page 102](#).

Updating Previous Versions of the Plug-and-Play Driver

After you update the driver, reboot your system to ensure that the new driver is used.

➤ ***To update the device driver, follow these steps:***

1. Open the Windows Device Manager.
2. Select **Start** → **Settings** → **Control Panel** → **Administrative Tools** → **Computer Management**.
3. Select the **Device Manager** node.
4. Expand the **Computer Telephony** node.
5. Right-click a Dialogic® Brooktrout® board and select **Properties** to open the board properties window.
6. Select the **Driver** tab and look for the **Update Driver** button.
7. Click **Update Driver** to start the Update Driver Wizard.
8. Click **Next**.
9. After the **Install Hardware Device Drivers** window appears, select **Search for a suitable driver for my device**.
10. The **Locate Driver Files** window appears, select **Specify a location**.
11. On the next window, choose **Browse** and locate the **trxstream.inf** file located on the CD under the **Windows Plug-and-Play** folder, or if you have already installed the Brooktrout SDK, locate the file under **[INSTALLDIR]\driver\winnt\pnp**.

If the specified location for the new **trxstream.inf** file is different from the location for the old **trxsteam.inf** file, and if the file still exists in the old location on your system, the update does not work. The system uses the old file and location instead of the new one. Delete the old copy of the **trxstream.inf** file and its Plug-and-Play components before installing the new one.

If you do not have the software installed, the Co-Installer provides an option to install the software. It also launches the Configuration Tool in Timer mode. You can wait the specified amount of time before launching the Configuration Tool, or launch it immediately in Advanced Mode.

12. Click **OK** and then **Next**.
13. Click **Next** and then **Finish**.

Removing the Plug-and-Play Driver

Installing a Dialogic® Brooktrout® device using the Plug-and-Play Manager (Found New Hardware Wizard) creates some backup files and registry entries. The Windows® Plug-and-Play Manager uses this information to automatically install the device on rebooting.

To completely remove the Plug-and-Play driver from the system, you must perform a complete cleanup after you remove the device from the Device Manager.



Make sure you stop all your applications and the Boston Host Service before uninstalling the device driver.

Note: The following instructions include steps to take when removing the plug and play driver for versions earlier than 5.2 and for removing the plug and play driver for the 5.2 version released with Brooktrout SDK 5.0.0.

For Earlier Versions of the Driver (Prior to 5.2.0)

➤ ***To remove an earlier version (prior to Brooktrout SDK 5.2.0) of the Plug-and-Play driver, do the following:***

1. Open Windows Device Manager.
2. Expand the **Brooktrout Hardware** node.
3. Remove all the Brooktrout boards listed under the **Brooktrout Hardware** node.
 - a. Expand the “Computer Telephony” node.
 - b. Right click the Brooktrout board node and select.
 - c. Uninstall, Confirm Device Removal, and click OK.
4. Open **Command Prompt** and type “net stop boston” to stop the Boston driver that can still be running.
5. Delete the following files:

`C:\WINNT\SYSTEM32\DRIVERS\boston.sys`

`C:\WINNT\SYSTEM32\brktBdevpp.dll`

`C:\WINNT\SYSTEM32\brktBdevco.dll`

6. Examine the registry value `InfPath` located under:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Class\{50CE2010-E61B-40EF-9EAA-2BCDE74F8C6C}\0000.
```

This value contains the name of the backup copy of the **trxstream.inf** file, that Windows® created during device installation under the **C:\WINNT\INF** directory.

Removing the Plug and Play Driver

7. Delete the **INF** file of this name from **C:\WINNT\INF** along with the corresponding **PNF** file. Except for the extension, the **INF** file and the **PNF** file have the same names. For example, if the **INF** file is **oem11.inf**, the name of the **PNF** file is **oem11.pnf**.
8. Delete the following registry keys:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Class\{50CE2010-E61B-40EF-9EAA-2BCDE74F8C6C}
```

```
HKEY_LOCAL_MACHINE\SOFTWARE\Brooktrout Technology\DeviceCoInstaller
```

```
HKEY_LOCAL_MACHINE\SOFTWARE\Brooktrout Technology\DevicePropertyPage
```

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\boston
```

9. Reboot the system and verify that the **Brooktrout Hardware** node is not listed in the **Device Manager**.

For Driver Version 5.2 (Brooktrout SDK Version 5.2.0 and Later.)

➤ **To remove the Plug-and-Play driver, do the following:**

1. Open Windows Device Manager.
2. Expand the **Computer Telephony** node.
3. Remove all the Brooktrout boards listed under the **Computer Telephony** node.
 - a. Expand the “Computer Telephony” node.
 - b. Right click the Brooktrout board node and select.
4. Open **Command Prompt** and type “net stop boston” to stop the Boston driver that can still be running.

5. Delete the following files:

`C:\WINNT\SYSTEM32\DRIVERS\boston.sys`

`C:\WINNT\SYSTEM32\brktBdevpp.dll`

`C:\WINNT\SYSTEM32\brktBdevco.dll`

6. Examine the registry value `InfPath` located under:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Class\{8CF4CA66-A2CC-48FA-BC1D-6A64E47F6D27}.
```

Search for the first key which contains the following values:

- ♦ `DriverDesc=Brooktrout TRxStream Board`

This key should contain the name of the backup copy of the ***trxstream.inf*** file that Windows® created during the device installation under ***C:\winnt\INF***.

7. Delete the ***INF*** file of this name from ***C:\WINNT\INF*** along with the corresponding ***PNF*** file. Except for the extension, the ***INF*** file and the ***PNF*** file have the same names. For example, if the ***INF*** file is ***oem11.inf***, the name of the ***PNF*** file is ***oem11.pnf***.
8. Delete the following registry keys:

For 32-bit operating system:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Brooktrout Technology\DeviceCoInstaller
```

```
HKEY_LOCAL_MACHINE\SOFTWARE\Brooktrout Technology\DevicePropertyPage
```

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\boston
```

For 64-bit operating system:

```
HKEY_LOCAL_MACHINE\SOFTWARE\WOW6432Node\Brooktrout Technology\DeviceCoInstaller
```

```
HKEY_LOCAL_MACHINE\SOFTWARE\WOW6432Node\Brooktrout Technology\DevicePropertyPage
```

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\boston
```

9. Reboot the system and verify that the **Brooktrout TRxStream** node(s) is not listed under the **Computer Telephony** class node in the **Device Manager**.

Disabling Plug-and-Play Driver Installation

After you install a Dialogic® Brooktrout® board, the Windows® operating system might display a window stating that a new PCI device was found and offer to detect/install a driver for it. Proceed with the automatic detection. The operating system will not find a matching driver. Do not attempt to supply a driver when asked.

➤ ***The detection of new hardware occurs after each reboot unless you perform the following procedure:***

1. When Welcome to Found New Hardware Wizard appears, click **Next**.
2. Select **Search for a suitable driver for my device (recommended)**.
3. Click **Next**, uncheck all choices, then click **Next** again.
4. Select **Disable device**
5. Click **Finish**.

➤ ***Another approach is to:***

1. Click **Cancel** for ALL new devices that are found.
2. Right-click **My Computer**.
3. Right-click **Properties**.
4. Right-click **Hardware**
5. Right-click **Device Manager**.
6. Look for: **Other Devices**.
7. Right-click all devices with: **?**.
8. Select **Disable**.

Reinitializing the Driver

You can reinitialize the driver to its starting state in terms of channels assigned to modules and module number assignments using the ***driver_reinit.exe*** utility located in the ***boston\driver\winnt\user*** directory (see [***Reinitializing the Device Driver on page 259***](#)).

Installing and Configuring the Driver using a Command (cmd) Prompt

To install and configure the driver manually, change to the **[InstallDir]\driver\winnt\install** directory and run the **install** program. You can use this application to install Plug-and-Play drivers.

The configuration dialog is as follows:

```
Installing Brooktrout Boston Device Driver Version 5.2.0
Maximum number of PCI/cPCI hardware modules (default 16):
Physical buffer size (default 32768):
Application buffer size (default 10240):
Machine ID, in hex (default 1):
Do initial reset (default 1):
History enable (default 0):
```

If you enter **1**, **install** asks the following questions:

```
History size (default 1024000):
Number of physical channel histories (default 0):
Number of application channel histories (default 0):
Configure advanced parameters (n)?
```

If you enter **y**, **install** asks the following questions:

```
Number of I2O frames per module (default 16):
Driver flow control interval (default 250):
Internal memory allocation minimum (default 152):
Internal memory allocation quanta (default 128):
To reserve module numbers, enter mod_id (serial number)
and mod_num, in hex. Mod_num will default as indicated:
mod_id mod_num[f0]:
```

```
Configure test parameters (n)?
```

If you enter **y**, three test options are listed:

```
Test1:
```

```
Test2:
```

```
Test3:
```

Configuring Boston driver:

Phys buf size 32768

App buffer size 10240

Machine ID 1

History size 1024000

Num phys hist bufs 0

Num apl hist bufs 0

Load driver with no devices present? (y or n, default y):

When using Boston PCI hardware modules, a system memory adjustment may be required in order to properly access the modules. For a small number of modules this is often not required, but many factors, including other devices that are or will be in the system, affect this. After this adjustment is made, the system must be rebooted.

Do you wish to perform this adjustment? (default n):

After installing the Plug-and-Play driver, the following message appears:

Installing Plug and Play driver.

The Plug and Play driver was successfully installed.

The maximum number of PCI hardware modules can be left at its default. However, if fewer modules are in use, this value can be set to a smaller number to conserve memory. Each hardware module uses approximately 60K.

The following exit codes from the install program, either for driver installation or removal, can be used to determine if there was an error and/or if a reboot is required.

0 - No error and no reboot required

1 - No error and reboot required

-1 - Error and no reboot required

-2 - Error and reboot required

For more information, see:

- ***Command Line Configuration for Install on page 123***
- ***Windows® Operating System on page 252***

History Logging

When the ***install*** program installs the Boston driver, history logging is disabled by default (0). When you manually install the driver using ***install***, the default is set to disable history logging (which you can choose to override). History logging is a powerful debugging tool, especially when working with Dialogic Technical Services and Support. However, it does consume a significant amount of CPU time when running very high call loads. Therefore, leave history logging off for systems that have high call loads and are CPU bound. For low-load systems or when debugging, enable history logging (1).

Leave the number of physical and application channel histories at 0 unless you are directed to change this by Dialogic Technical Services and Support. If you change the physical or application buffer size, do not change the value to one smaller than the default.

If you specify a number for the physical channel histories, ***install*** asks if you want to restrict the physical channels to administrative channel 1.

Restrict physical channels to admin channel 1 (default 1):
Choose the default (enable).

Advanced Configuration Parameters

If you select advanced configuration parameters, the software prompts you for the number of I2O frames, driver flow control interval, internal memory allocation parameters, module reservations, and test parameters. Do not configure advanced parameters except under the advice of Dialogic Technical Services and Support.

Memory Resources

When Dialogic® Brooktrout® PCI hardware modules are installed in the system, a certain type of memory resource might be exhausted or dangerously low if you do not perform a memory adjustment. For small numbers of modules, the adjustment is often not required, but there is no way to predict the point at which it becomes necessary, since each system is different. Need for the adjustment depends on the system configuration, whether other drivers or devices are using

this type of memory or will in the future, and possibly other factors. If you choose to perform the system memory adjustment, ***install*** prompts you for the system memory size.

Enter the number of MB of memory in the system[32]?

If a memory adjustment has been performed by another program, ***install*** prompts you as to how to proceed.

Do you wish to (1) skip adjusting,
 (2) replace adjustment, or
 (3) add to the adjustment

Proceeding with any of the adjustments in this case might not properly succeed or be reversible later, but the ***install*** program does the best it can to make the adjustment safely.

The program then advises you to reboot.

You must reboot the system for the memory configuration changes to take effect.

A reboot is recommended. Do you wish to reboot now? [n]

The ***install*** application also prompts you to reboot the system if Windows® requires a system restart to complete the Plug-and-Play installation.

Removing the Driver with a Command (cmd) Prompt

To remove the driver, enter the following at the Command Prompt:

```
install -r
```

You must include the following parameter (see [Command Line Configuration for Install on page 123](#)):

```
Reboot (if needed) after memory readjustment (1 or 0)
```

This option successfully removes all the Dialogic® Brooktrout® PnP devices that are installed using the **trxstream.inf** file that came with your Brooktrout SDK. If you installed the Dialogic® Brooktrout® PnP hardware using some other INF file that registers the Dialogic® Brooktrout® boards under a class other than Computer Telephony, the **-r** option can fail to completely uninstall this device.

Reinitializing the Driver

You can reinitialize the driver to its starting state in terms of channels assigned to modules and module number assignments using the **driver_reinit.exe** utility located in the **boston\driver\winnt\user** directory (see [Reinitializing the Device Driver on page 259](#)).

Using the Boston Host Service

The Boston Host Service (Bostsrv) is used to initialize modules. Upon startup it detects Dialogic® Brooktrout® modules, loads FW and initializes the call control. You must use the Boston Host Service to run a multi-process application or to use Dialogic® Brooktrout® SR140 Fax Software. The Boston Host Service is optional for other Dialogic® Brooktrout® modules.

The Boston Host Service is installed and started automatically by the Configuration Tool when you click the Apply button. The command line process is not required.

To run the Boston Host Service with the Boston driver, use any of these commands.

What you can do with Bostsrv	Command Line
To start the service	net start bostservice
To stop the service	net stop bostservice
To install the service	bostsrv -install
To remove the service	bostsrv -remove
To run as a console application for debugging	bostsrv -debug
To enable Bfv API debug mode	bostsrv -v
To log output to file (can be used with debug and -install)	bostsrv -l <file>

Note: If you are running Windows® 2008, you must have administrative privileges to run, start, or stop the Boston Host Service.

Installing Bostsrv

➤ ***To install the Boston Host Service, in a Command Prompt window:***

1. Enter the following at the a command prompt:

```
bostsrv -install
```

2. Enter name and location of the bcall configuration file. (default shown)

C:\Brooktrout\Boston\bfv.api\winnt\bin\bcall.cfg

3. Enter the location of the firmware files. (default shown)

C:\Brooktrout\Boston\fw

4. Enter the following at the a command prompt:

```
net start bostservice
```

```
The Brooktrout Technology Boston Host Service is  
starting...
```

Starting Bostsrv

- ***To start the Boston Host Service, in a Command Prompt window:***

Enter the following at the a command prompt:

```
net start bostservice
```

```
The Brooktrout Technology Boston Host Service is  
starting...
```

To set the Boston Host Service to start automatically, set startup mode to **Automatic** using Windows® Services window. This initializes the Dialogic® Brooktrout® modules upon machine starter reboot. You can also perform this step through the **Options, Preferences....Boston Host Service in Start Mode** in the Configuration Tool.

Troubleshooting Bostsrv

System Error 59

When the Boston Host Service fails to start as a service with a system error 59, verify that you correctly entered the configuration file name and path location, as shown in [*Installing Bostsrv on page 117*](#) for the **bcall.cfg** file.

If you do not specify the full path to the protocol for the **callctrl.cfg** file, within the **bcall.cfg file**, a system error 59 can also occur.

Special Considerations

When you install the device driver on a Windows® operating system, consider the following topics:

- ***PCI Considerations on page 119***
- ***Dialogic® Brooktrout® Bfv API Libraries and Makefiles on page 120***
- ***Writing Multithreaded Programs on page 120***
- ***Using BOSTDLLD with Debugging Enabled on page 120***
- ***Determining Installation Parameters on page 121***
- ***Driver Startup on page 122***
- ***Global Variables on page 122***
- ***Limits on Open Files on page 122***
- ***Process Priority on page 123***
- ***Command Line Configuration for Install on page 123***
- ***Version Information on page 126***

PCI Considerations

The operating system and/or system BIOS assigns base addresses and interrupt numbers to the PCI boards, that might change when the system is rebooted, especially if devices are added or moved.

If multiple PCI boards are in use, see ***Determining the Board Module Number on page 33*** to determine the module numbers of boards or ordinal channel values.

Dialogic® Brooktrout® Bfv API Libraries and Makefiles

Dialogic only supplies dynamically linked C runtime libraries (BOSTDLLD).

The ***app.src*** and ***bapp.src*** directories contain makefiles that compile using BOSTDLLD.DLL version of the Bfv API libraries. All applications should try to follow the makefiles supplied in the ***app.src*** or ***bapp.src*** directory. In particular, since all the supplied libraries were compiled as multi threaded, compile all your applications this way. See also, [*Reviewing Compiler and Linker Options on page 76*](#).

When using a dynamically linked version of the library, either add the directory name containing the DLL to your PATH environment variable, or copy the DLL into a directory already in PATH. For example:

```
\Brooktrout\boston\bfv.api\winnt\lib
```

Writing Multithreaded Programs

When new threads are created, often a stack size can or must be specified. The stack size must be sufficiently large to store all local variables used both by the application and the Bfv API. If the stack size is not large enough, unpredictable behavior can result.

Dialogic usually finds a stack size of 64K to be sufficient but, depending on the application stack allocation demands, more memory might be required.

Using BOSTDLLD with Debugging Enabled

When using the DLL version of the Bfv API library with a debug version of your application, take special care when handling FILE * file pointers or dynamically allocated memory.

Some functions use FILE * pointers that the application must open. Applications can also access FILE * pointers that the Bfv API has opened (with the ***TIFF_FP*** macro). There are also some instances where memory is allocated by the Bfv API that must be freed by the application, for example, ***BfvLinesAvail*** and ***PAGE_RES*** structures.

The runtime libraries used by BOSTDLLD are separate from the debug ones used by the application. The meanings and applicability of the file pointers and allocated memory differ and are incompatible between the two copies of the runtime libraries. To avoid these kinds of pointer problems, the Bfv API provides a set of *_dll_...* functions. See **Volume 1** of the **Bfv API Reference Manual**.

Determining Installation Parameters

Any time after the driver has been installed (but not removed), you can determine what installation parameters were used.

➤ ***To determine installation parameters, do the following:***

1. Run ***regedit*** or ***regedit32***.
2. Locate the key:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services  
  \Boston\Parameters
```

3. Look at the values under this key.

Driver Startup

After you install the driver, it has a service associated with it named ***boston***, a kernel-mode driver.

If driver startup fails, the error message that appears is almost always unrelated to the actual cause of failure. The Event Log contains an error message supplied by the driver. Using the Event Viewer, look for the most recent entries in the System section labeled ***boston***. Occasionally the Event Log fills up. If this happens, set ***Action\Properties\Overwrite*** events as needed.

Under kernel debugging environments, the debugger also contains a message. Under other conditions, entries can also appear in the ***Event Log\debugger***. If you encounter unusual behavior, check the ***Event Log\debugger***.

Global Variables

If you plan to compile your application for use with the Dialogic® Brooktrout® Bfv API library, do not use local variable names that match any of the names of the global variables defined by the Bfv API library. Such duplications will prevent the application from compiling.

The Bfv API global variables include:

- the variables used by ***getopt*** (for example, `optind`)
- the `_mill_priority` variable, specific to Windows®

Limits on Open Files

The Microsoft® Visual C++® compiler library limits the number of files that can be opened. Developers often encounter this limit when developing multithreaded Dialogic® Brooktrout® Bfv API applications. Microsoft has updated their libraries, greatly increasing this limit. For Visual C++® 4.1+, the limit is 512 files. You can increase this limit using the ***_setmaxstdio*** function from the compiler library.

Process Priority

The Bfv API automatically raises the priority of any process that calls **BfvLineAttach** to `HIGH_PRIORITY_CLASS`. Dialogic recommends using this priority to keep delays to application processes performing fax or speech functions to a minimum. Priority raising occurs the first time the application calls **BfvLineAttach** only, and is controlled by the global variable `_mill_priority`, which contains the new priority for the process.

Command Line Configuration for *Install*

When configuring the device driver using ***install*** or removing it using ***install -r***, you can specify the command line option `-c` to cause the ***install*** program to not prompt you for any parameters. Instead, the ***install*** program uses the responses that you supply following the `-c` option on the command line.

If you use the `-c` option, you must include all the parameters described below, in order, regardless of whether or not the parameter has meaning on the system in question. If a parameter does not apply, it is ignored. The parameters are not checked for validity.

Note: The software does not prompt for removal of old driver versions.

When configuring the driver using ***install***, you must include the following parameters:

Parameter	Defaults
Reserved	p
Reserved	0
Reserved	-1
Max num PCI hardware modules	16
Physical buffer size	32768
Application buffer size	10240
Reserved	0
Machine ID	1
Reset option (1 or 0)	1
History Enable	0

History Size	1024000
Num physical histories	0
Num app histories	0
Restrict phys channels (1 or 0)	1
Number of I2O frames	*0
Flow control interval	*0
Memory alloc minimum	*0
Memory alloc quanta	*0
Reserved	0
Test parameter 1	*0
Test parameter 2	*0
Test parameter 3	*0
Reserved module info	*0
module id, module number	
0 to terminate	
Load driver with no devices present (y or n) - (n = pnp, y = software only solution)	n
Do mem adjustments (y or n)	n
What to do if already adjusted (1, 2, or 3)	1
Memory in system	0
Reserved	0
Reboot after mem adjustment (1 or 0)	0

The advanced parameters, marked with * in the list above, can always be safely set to 0. This setting tells the driver to use the default values.

For example, to configure the driver for up to 16 PCI hardware modules use the following settings:

```
physical buffer size 32768
application buffer size 10240
machine ID 1
reset on
history enabled
history size 1024000
physical histories 0
application histories 0
restrict physical channels 0
all default advanced parameters 0
```

not to start at boot 0
no memory adjustments 0
not reboot 0

Enter the following at the command line:

```
install -c p 0 -1 16 32768 10240 0 1 1 1 1024000 0 0 1 0 0 0 0 0 0 0 0 y n  
1 0 0 0
```

For more information, see [*Windows® Operating System on page 252*](#).

Driver File Locations (install)

When using ***install*** to configure the device driver, you do not need all files from the distribution. However, the file locations used by the configuration procedure relative to the directory where ***install*** is run must be the same as that in the normal distribution.

Assuming a directory named ***install*** where ***install*** is being run, the following files must be present:

install\install.exe

pn\brooktrout.cat

pn\trxstream.inf

pn\TRxStream\x86 (directory for the following 32-bit OS files)

boston.pdb

boston.sys

brktBdevco.dll

brktBdevpp.dll

pn\TRxStream\x64 (directory for the following 64-bit OS files)

boston.pdb

boston.sys

brktBdevco.dll

brktBdevpp.dll

These files and directories appear in the standard distribution under the directory ***driver\winnt***.

Build Requirements for install

You need the Windows® 2000 DDK installed to compile the ***install.exe*** application. For more information about the Microsoft® Windows® Device Driver Kit, see ***microsoft.com***. ***install.exe*** links to the DDK libraries: ***setupapi.lib*** and ***newdev.lib***. It also links to the ***shlwapi.lib*** system library.

Version Information

The driver file, ***boston.sys***, and the DLL library file, ***bostdld.dll***, contain version resource information. Use the system File Manager or Explorer to view this information.

Reviewing Compiler and Linker Options

The makefiles contained in the **app.src** and **bapp.src** directories provide a number of command line options to the compiler and linker. Using these options, the compiler and linker produce object files and executables compatible with the Bfv API library.

Dialogic strongly recommends that you use these options for all your Bfv API applications. But for those who want to change the set of options the compiler and linker use, the following is a list of the nonstandard options and their functions. The options used for compilation are marked with (**C**) and those for linking are marked with (**L**).

The makefile uses the standard `$(cflags)` from **ntwin32.mak** and `$(cvarsdll)` for the dynamically-linked C runtime libraries. It uses the standard `$(conlflags)` for linking.

<code>\$(cflags)</code>	(C) Options for CFLAGS.
<code>\$(cvarsdll)</code>	(C) Options defining dynamic runtime library.
<code>\$(conlflags)</code>	(L) Options for linking console mode program.
<code>-nologo</code>	(C) Do not print logos.
<code>-DWINNT</code>	(C) Defines a symbol that identifies the environment.
<code>-UMSDOS, -U_MSDOS</code>	(C) Undefines symbols that the compiler might define that can cause problems at compilation.
<code>-DMILL_DLL</code>	(C) Defines a symbol that is required when using the DLL Bfv API library.
<code>libcpmt.lib</code>	(L) C++ libraries. Required when new call control is used.
<code>NODEBUG=1</code>	Note: This is a makefile line, not a compilation or link flag.

This line is needed in the makefile when compiling with certain versions of Visual Studio® to prevent it from automatically compiling for debugging and producing inappropriate warning messages.

6 - Configuring Software

This chapter describes how one can configure the Dialogic® Brooktrout® Fax Software for your Dialogic® Brooktrout® boards.

Dialogic has created ways to configure the Dialogic® Brooktrout® software including:

- ***Using the Dialogic® Brooktrout® Configuration Tool on Windows® Systems on page 130***
- ***Running the Dialogic® Brooktrout® Configuration Tool on page 133***

For Windows® operating systems, you can use the Configuration Tool in one of several modes:

- ◆ ***Configuring in Wizard Mode on page 143***
- ◆ ***Advanced Mode on page 169***
- ◆ ***Offline Mode on page 192***
- ◆ ***Silent Mode on page 197***

When a Configuration Tool parameter panel includes Advanced Settings, use the Advanced Settings button to view them.

- ◆ ***Advanced Settings on page 198***
- ***Using a Call Control Configuration File on page 200***

For all operating systems, you can configure the call control by creating a call control configuration file that is read by the ***BfvLineReset*** function.

For more information, see:

- ***Volume 6, Appendix A*** in the ***Bfv API Reference Manual***
- Bfv API Function Locator in any volume of the Reference Manual

Using the Dialogic® Brooktrout® Configuration Tool on Windows® Systems

When you use one of the Windows® operating systems, you can configure your module with the Dialogic® Brooktrout® Configuration Tool for Windows® (**configtool.exe**).

Note: For the Dialogic® Brooktrout® Configuration Tool to work with Windows® 2000, you must install Internet Explorer 6.0 or higher.

The Dialogic® Brooktrout® Configuration Tool is a graphical user interface program that you can use to create and modify the configuration files, edit and update the driver parameters, and configure and initialize the module. The Configuration Tool also installs the Plug-and-Play driver, if not already installed.

It can be launched in the following modes.

- ***Wizard Mode on page 130***
- ***Advanced Mode on page 131***
- ***Offline Mode on page 131***
- ***Timer Mode on page 132***
- ***Silent Mode on page 132***

A brief summary of each mode function is highlighted here:

Wizard Mode

Guides you in configuring Computer Telephony and software. To use Wizard mode, all Dialogic® Brooktrout® modules in your system must be of the same type and the Configuration Tool must recognize the modules as Dialogic® Brooktrout® boards.

When the system contains different types of modules or the Configuration Tool does not recognize a module, the Configuration Tool selects Advanced Mode automatically.

See ***Configuring in Wizard Mode on page 143***.

Advanced Mode

Requires that you have some knowledge of computer telephony, communications protocols, and Computer Telephony. The Configuration Tool automatically selects Advanced Mode when there are different types of modules installed or when you explicitly indicate Advanced Mode by using a command line switch to start, possibly to configure each module differently (even if the modules are the same kind).

A toolbar provides the following options:

- The **Save** button:
Saves the configuration.
- The **Apply** button:
 - ◆ Saves your configuration to the appropriate configuration file.
 - ◆ If driver parameters were modified, it dynamically reconfigures the drivers on a PnP operating system.
 - ◆ If the Boston Host Service is not installed, installs the Boston Host Service.
 - ◆ If the Boston Host Service is running, stops the Boston Host Service.
 - ◆ Starts the Boston Host Service.

See [*Advanced Mode on page 169*](#)

Offline Mode

Allows you to create/edit configuration files when no boards are installed. In Offline Mode, the toolbar option **Apply** is not present and no checks are performed on the existence of the modules specified in the configuration.

The toolbar enables two options that are disabled in Advanced Mode: **Add** and **Remove**. These buttons allow you to modify the configuration files to add or remove modules.

See [*Offline Mode on page 192*](#).

Silent Mode

Reads configuration files from the location specified at installation (usually **C:\Brooktrout\Boston\config**), starts the device driver (if necessary). The graphical user interface is not displayed.

The Configuration Tool creates a log file (**configuration.log**) that contains all the actions that it executed and the results of these actions. This log file is located in the current working directory.

See ***Silent Mode on page 197***.

Timer Mode

Sets a timer that launches the Configuration Tool after a specified amount of time. You can override the time and launch the Configuration Tool immediately. You might want to override the timer when you do not need to check on the existence of modules.

Running the Dialogic® Brooktrout® Configuration Tool

You can run the Configuration Tool from:

- The program menu:

Start → Program → Brooktrout → Configuration Tool

- The command line:

C:\Brooktrout\Boston\utils\winnt\bin\configtool.exe

- ◆ To specify the mode on the command line, use one of the following:

/a - Advanced Mode
/o - Offline Mode
/s - Silent Mode
/t - Timer Mode
/w - Wizard Mode

- ◆ Other command line arguments include:

/c (configip)

Displays the following note:

Note: /c option brings up the **Configure IP Stack** dialog box only if there are IP enabled devices installed.

/d (debug)

Enable the debug flag, which initiates writing of the debug information to the **configuration.log** file.

/e (expert)

Show all hidden parameters. Use this mode only under the guidance of Dialogic Technical Services and Support personnel. See **Getting Technical Support on page 29**.

/i <INF file location>

Use the specified INF file to install the PnP driver when it is not installed or installed but not started.

You must uninstall any previous version of the plug and play driver INF file. See **Removing the Plug-and-Play Driver on page 107** or **Removing the Driver with a Command (cmd) Prompt on page 116**.

`/f <cfgfile>`

Specify the name and location of the user-defined configuration file <cfgfile> while launching the Configuration Tool. For example:

`/f C:\Brooktrout\Boston\custom\btcall.cfg`

`/p`

Show the **Brooktrout Configuration Tool - Preferences** dialog box

`/q`

Do not display the **Brooktrout Configuration Tool - Preferences** dialog box.

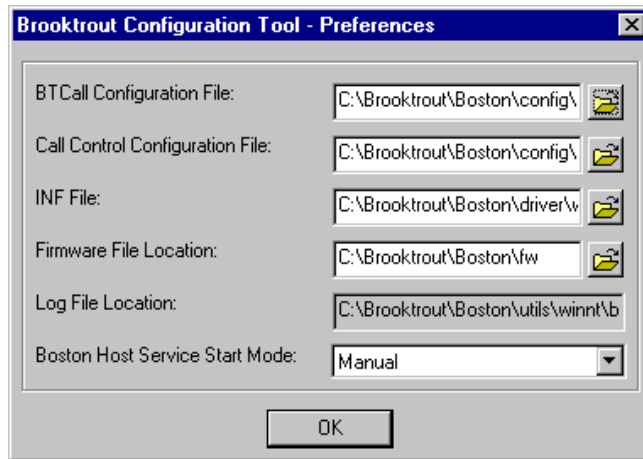
You can use any options in combination with a mode when launching the Configuration Tool. When run from any mode, including the command line without a mode option switch, the Configuration Tool starts in Wizard Mode, if the modules are of same type. Otherwise, the Configuration Tool starts in Advanced Mode.

Choosing the File Location

When you start the Configuration Tool for the first time, you can choose the locations for various files using the **Brooktrout Configuration Tool - Preferences** dialog box.

Note: You might want to set these file locations before you start the Configuration Tool. See [Setting File Locations Prior to First Execution on page 135](#).

Preferences Dialog Box



Setting File Locations Prior to First Execution

- **To suppress the Preference dialog box with specified configuration files locations other than the defaults, before the first use of the application, follow these steps:**
- 1. Modify the following fields in the **settings.cfg** file (see [Example of settings.cfg File on page 136](#)):
 - ◆ btcall_cfg_path
 - ◆ cc_cfg_path
 - ◆ log_cfg_path
 - ◆ firmware_dir

The **settings.cfg** file must be placed in the same directory as the Configuration Tool program (**configtool.exe**):

C:\Brooktrout\Boston\utils\winnt\bin

2. Launch the Configuration Tool with the /q command line option:

```
C:\Brooktrout\Boston\utils\winnt\bin\configtool.exe /q
```

After launching the Configuration Tool for the first time, you can access the **Preferences** dialog box only through Advanced Mode (see [Advanced Mode Buttons on page 171](#)) or by launching the Configuration Tool using /p command line option:

```
C:\Brooktrout\Boston\utils\winnt\bin\configtool.exe /p
```

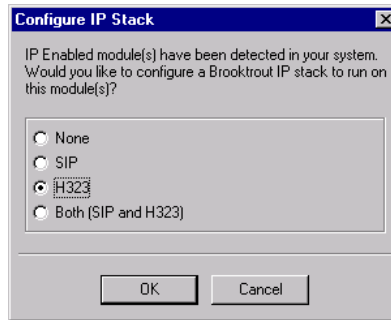
Example of settings.cfg File

```
ip_stack_config=sip
home_dir=C:\Brooktrout\Boston
boston_source_path=C:\Brooktrout\Boston\driver\winnt\kernel\compile\i386
    \boston.sys
inf_source_path=C:\Brooktrout\Boston\driver\winnt\pnp\trxstream.inf
bostsrv_source_path=C:\Brooktrout\Boston\bfv.api\winnt\bin\bostsrv.exe
firmware_dir=C:\Brooktrout\Boston\fw
protocol_dir=C:\Brooktrout\Boston\config
btcall_cfg_path=C:\Brooktrout\Boston\config\btcall.cfg
cc_cfg_path=C:\Brooktrout\Boston\config\callctrl.cfg
log_cfg_path=C:\Brooktrout\Boston\bin\configuration.log
lic_mgr_path=C:\Brooktrout\Boston\bin\brktlicmgr.exe
modules_are_connected=false
vb_fname=C:\Brooktrout\Boston\fw\bostvb.dll
```

Configure IP Stack Dialog Box

When the Configuration Tool detects an IP-enabled device for the first time, it displays the **Configure IP Stack** dialog box:

Choose the IP stack you want to configure:



- **None:** IP stack not installed
- **SIP:** SIP stack installed (default)
- **H.323:** H.323 stack installed
- **Both (SIP and H.323):** Both SIP and H.323 stacks installed. (Supported only in SDV Versions prior to 5.2.0).

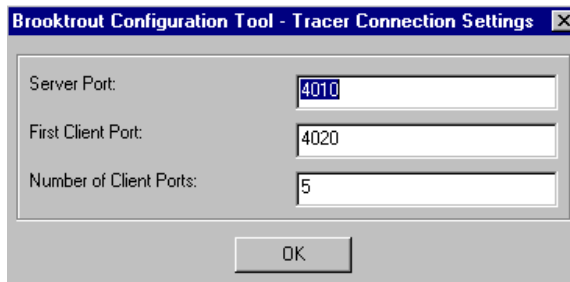
When any option is selected, all previously added host modules are removed.

The settings for the IP stack can also be made in the **settings.cfg** file, see [Example of settings.cfg File on page 136](#).

Trace Connection Settings Dialog Box

You use the Trace Connection Setting dialog to configure the connection parameters for the Brktcctrace (server) application, and your end user application (client). See the **Debugging** chapter in your developer guide for details about the **Brktcctrace** application.

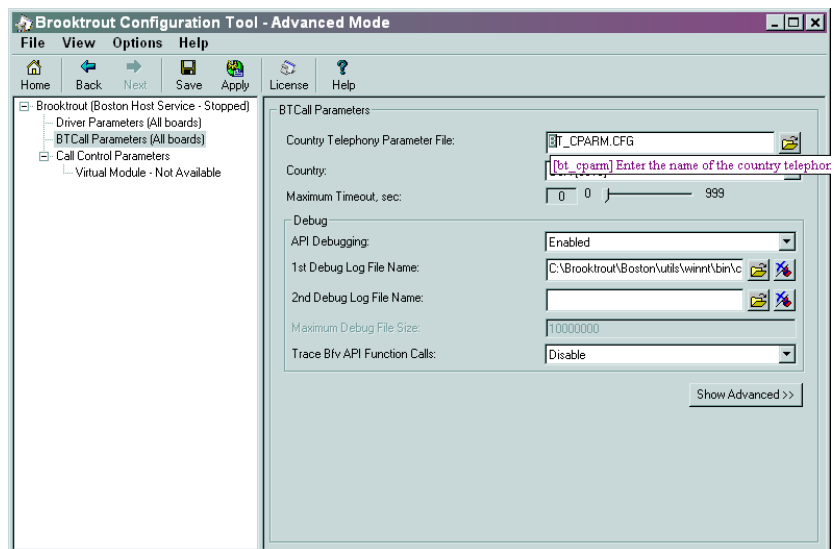
Server Port:	Specifies the server port number.
First Client Port:	Specifies the client port that the server will first try to connect to.
Number of Client Ports:	Specifies the maximum number of clients.



Getting Help From the Dialogic® Brooktrout® Configuration Tool

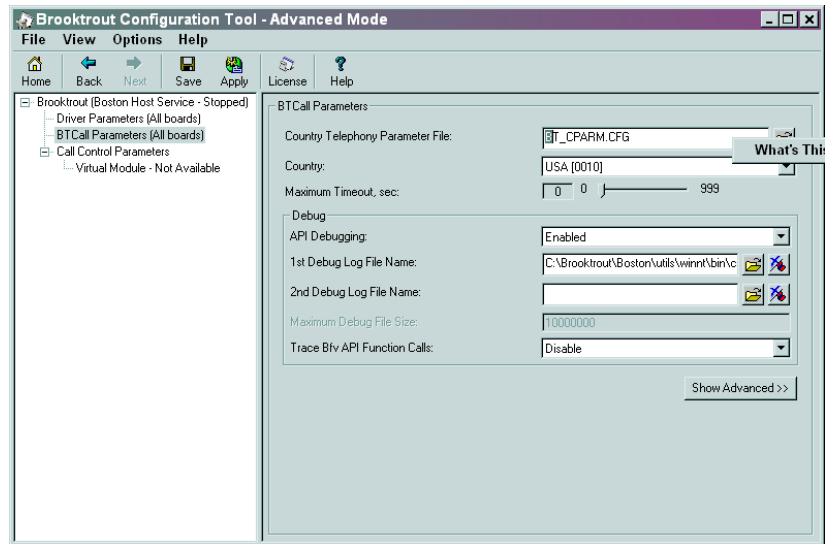
The Configuration Tool provides context sensitive online help for parameters. The Help displays the purpose and description of the parameter including the default value and range, if applicable.

- Hold the cursor over the parameter input area to see a brief parameter definition:

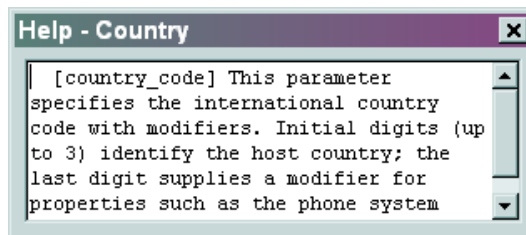


- Right-click the parameter drop-down box to get a more complete definition for Configuration Tool parameters.

The **What's This?** popup menu appears:



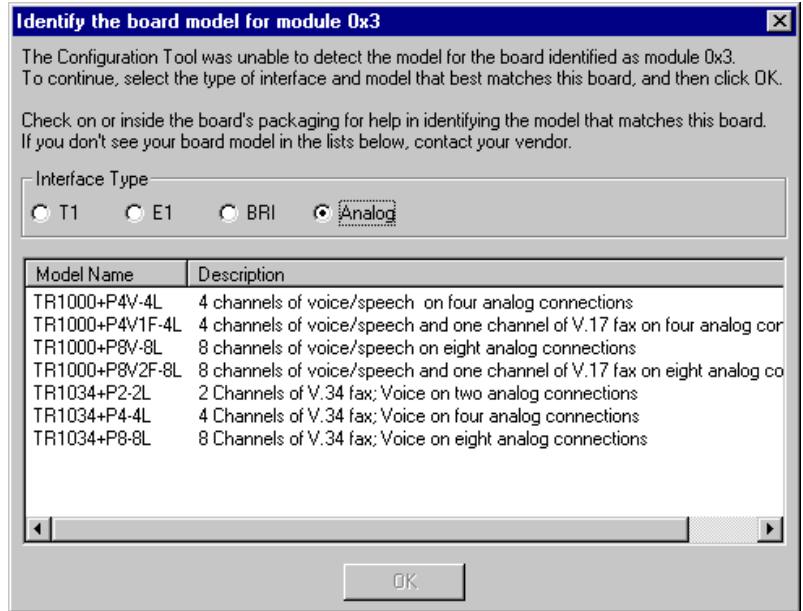
- Left-click the **What's This?** popup menu for a definition like the following. You can resize this text box, if necessary.



Identifying the Model of the Board

➤ **When you launch the Configuration Tool and it is unable to automatically identify the board:**

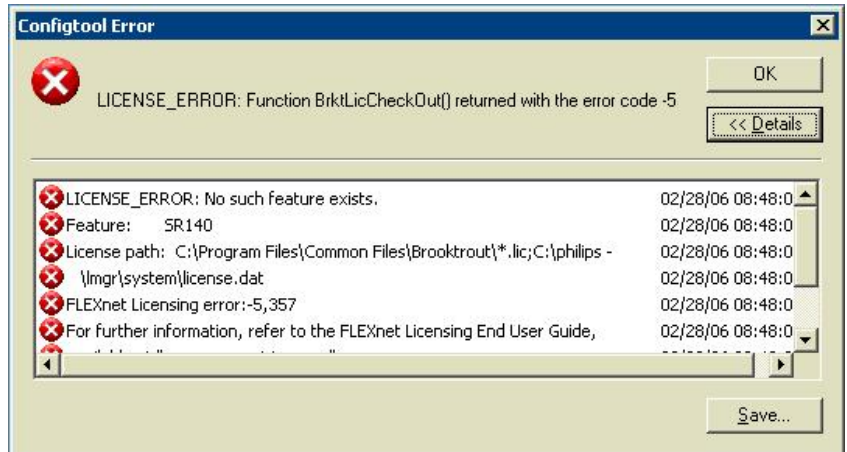
1. The Configuration Tool displays a dialog box similar to the following.



2. Choose an **Interface Type** and highlight the board model, then click **OK**.
3. If the Configuration Tool is not able to detect the board, then it launches the tool in Advanced Mode, (see [Advanced Mode Buttons on page 171](#)) even if you included the /w parameter on the command line.

Resolving the Configtool Error Message

When you launch the Configuration Tool and the tool displays the **Configtool Error** screen, use the following instructions to eliminate this licensing conflict.



This error message displays when you have licenses from other vendors installed in a generic location and not in a vendor specific location. This conflict is possible with other products that use Macrovision licensing, and occurs when a Macrovision-protected application uses the `LM_LICENSE_FILE` environment variable rather than a vendor-specific name.

The Macrovision FlexNET licensing module queries for SR140 licenses. The query fails for the licenses that are installed in the generic location due to absence of the necessary vendor information.

This error message can only occur when a SR140 Fax Software license is not installed.

➤ **To resolve this conflict and eliminate the Configuration tool error message screen:**

1. On the **Desktop**, right-click on **My Computer**
2. Select:
Properties → Advanced → Environment Variables
3. Click **New** and create an environment variable
<VENDOR_NAME>_LICENSE_FILE, replacing <VENDOR_NAME>
with the application or vendor name. For example,
ACME_DLS_LICENSE_FILE
4. Set the value of the <VENDOR_NAME>_LICENSE_FILE variable to
the same value as LM_LICENSE_FILE.
For example:
If LM_LICENSE_FILE = C:\acme\lmgr\system\license.dat,
then set

ACME_DLS_LICENSE_FILE =
C:\acme\lmgr\system\license.dat
5. To delete the LM_LICENSE_FILE environment variable, highlight
the current value with the mouse and click on **Delete**.
6. Click **Start → Run**.
7. Enter **regedit**, and click **OK**.
8. Expand:
HKEY_LOCAL_MACHINE\SOFTWARE\FLEXlm License Manager
key and verify that there is a registry entry named
LM_LICENSE_FILE under this key.
9. If the LM_LICENSE_FILE registry entry exists, rename the entry
to <VENDOR_NAME>_LM_LICENSE_FILE. Replace <VENDOR_NAME>
with the application or vendor name. For example,
ACME_DLS_LICENSE_FILE
10. Verify:
 - a. The Configuration Tool no longer displays the error message
box.
 - b. The other application using Macrovision licensing still runs.

Configuring in Wizard Mode

This section describes how to use the Wizard Mode to configure Dialogic® Brooktrout® Fax Software. You can use Wizard Mode to get most typical systems up and running with minimal effort.

In Wizard Mode, after you answer the basic questions, the Configuration Tool does the following.

- Automatically creates the necessary configuration file
- Installs and starts the drivers, if required
- Starts the Boston Host Service

Wizard Mode requires that all the modules be of the same kind. All modules are configured identically, that is, the modifications to the configuration apply uniformly to all the modules.

You can use Wizard Mode in a homogeneous configuration where:

- all the boards are of an identical type

or

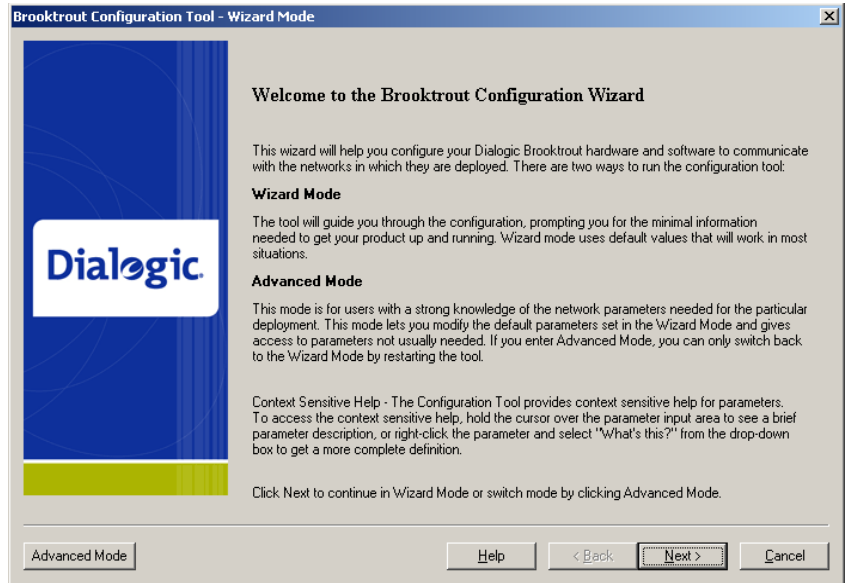
- the system contains only SR140 virtual boards.

In a non-homogeneous configuration, the Configuration Tool will automatically start in Advanced Mode.

➤ **To use Wizard Mode:**

1. Start the Configuration Tool if it has not already been started by the Plug-and-Play installation procedure. See ***Running the Dialogic® Brooktrout® Configuration Tool on page 133.***

2. The **Welcome** window appears.



3. When the **Welcome** window appears, you can choose to click the **Advanced Mode** button or the **Next** button.

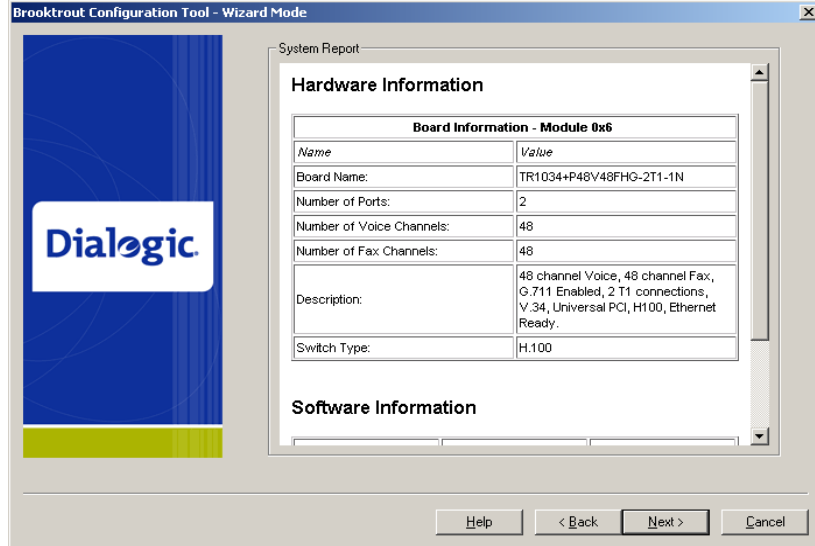
- ◆ **Advanced Mode**

If you select **Advanced Mode**, the Configuration Tool exits Wizard Mode and starts in Advanced Mode (see [Advanced Mode on page 169](#)).

- ◆ **Next**

If you click the **Next** button, Wizard Mode continues and creates the necessary configuration file after you answer the basic questions.

4. The **System Report** appears on the right-hand panel, then click **Next**.



System Report

Hardware Information

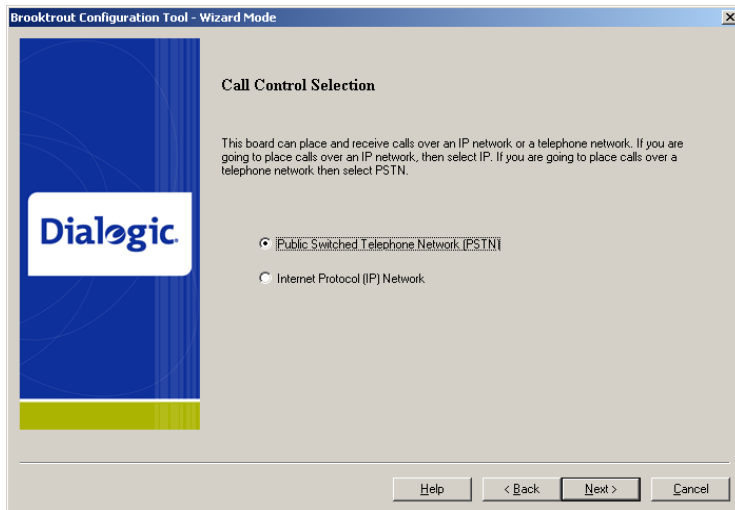
Board Information - Module 0x6	
Name	Value
Board Name:	TR1034+P48V48FHG-2T1-1N
Number of Ports:	2
Number of Voice Channels:	48
Number of Fax Channels:	48
Description:	48 channel Voice, 48 channel Fax, G.711 Enabled, 2 T1 connections, V.34, Universal PCI, H100, Ethernet Ready.
Switch Type:	H.100

Software Information

Buttons: Help, < Back, Next >, Cancel

This example shows the information for a T1 board.

5. Click **Next** and the following screen appears if the system detects a board that supports both IP and PSTN.



Call Control Selection

This board can place and receive calls over an IP network or a telephone network. If you are going to place calls over an IP network, then select IP. If you are going to place calls over a telephone network then select PSTN.

☒ Public Switched Telephone Network (PSTN)
☐ Internet Protocol (IP) Network

Buttons: Help, < Back, Next >, Cancel

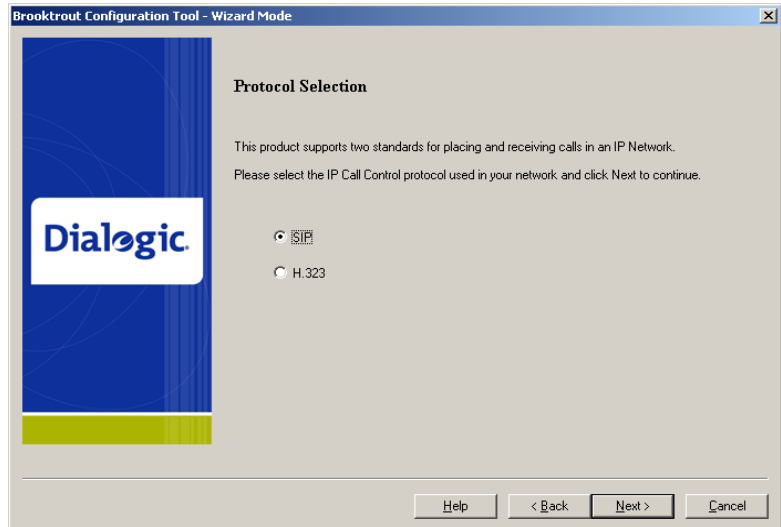
6. If you want to configure IP call control, select **Internet Protocol (IP) Network** and refer to [Configuring IP Call Control on page 147](#).

If you want to configure PSTN call control, select **Public Switched Telephone Network (PSTN)** and refer to ***Configuring PSTN on page 165***

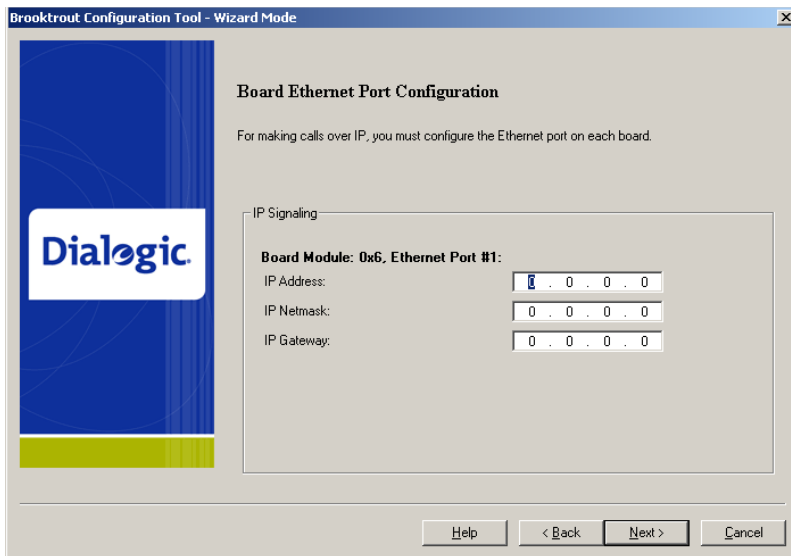
Configuring IP Call Control

➤ **Follow the steps below to configure IP Call Control:**

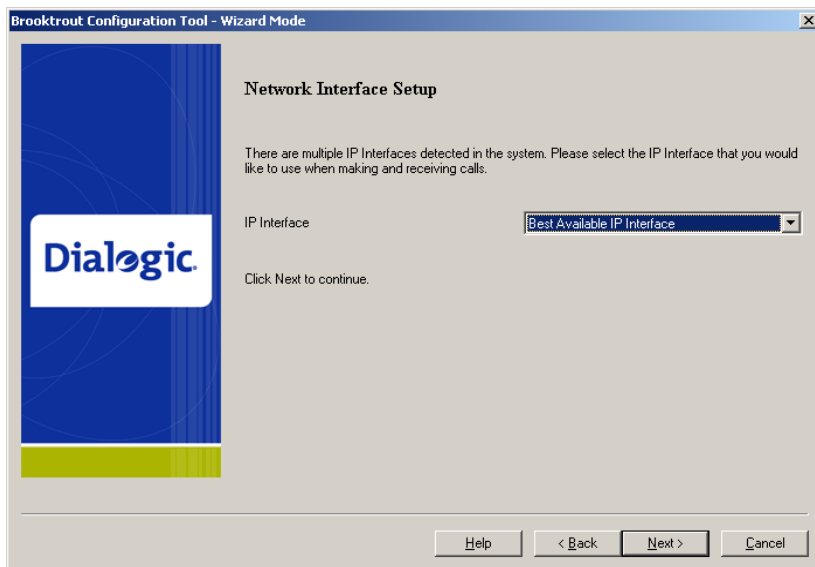
1. The following screen appears either after you select **Internet Protocol (IP) Network** or if your system supports only IP Call Control.



2. Select **SIP** or **H.323**. Click **Next** and the following screen appears if your system is board-based. If your system is software based the following step is skipped.



3. Configure the Ethernet Port for each board detected. Click **Next** and the following screen appears if there are multiple IP Interfaces detected in the system.



4. Specify which network interface to use for IP calls.

5. Refer to one of the sections below depending on which protocol you want to configure:

Configuring SIP Call Control Protocol on page 149

Configuring H.323 Call Control on page 157

Configuring SIP Call Control Protocol

The section contains the following procedures.

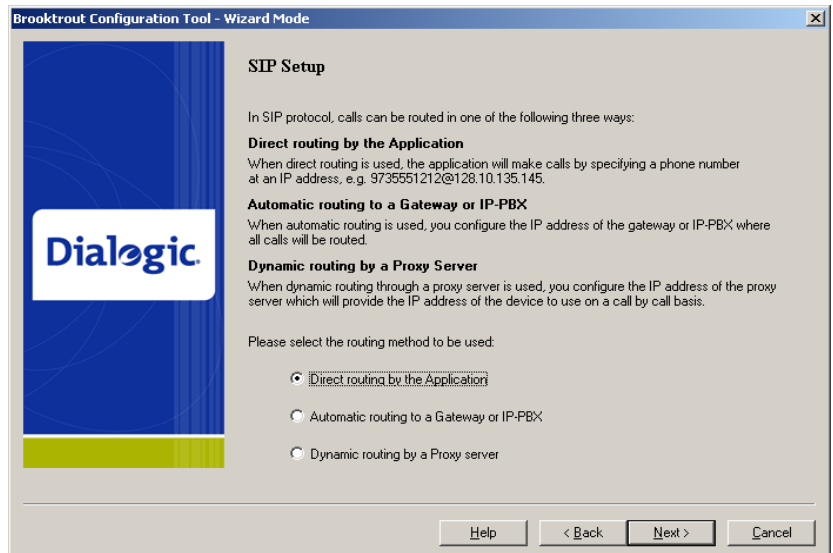
Configuring Direct Routing by the Application on page 149

Configuring SIP Call Control with Gateway or IP-PBX on page 150

Configuring SIP Call Control with a Proxy Server on page 151

Configuring Direct Routing by the Application

If you chose to configure the SIP Call Control protocol the following screen appears:



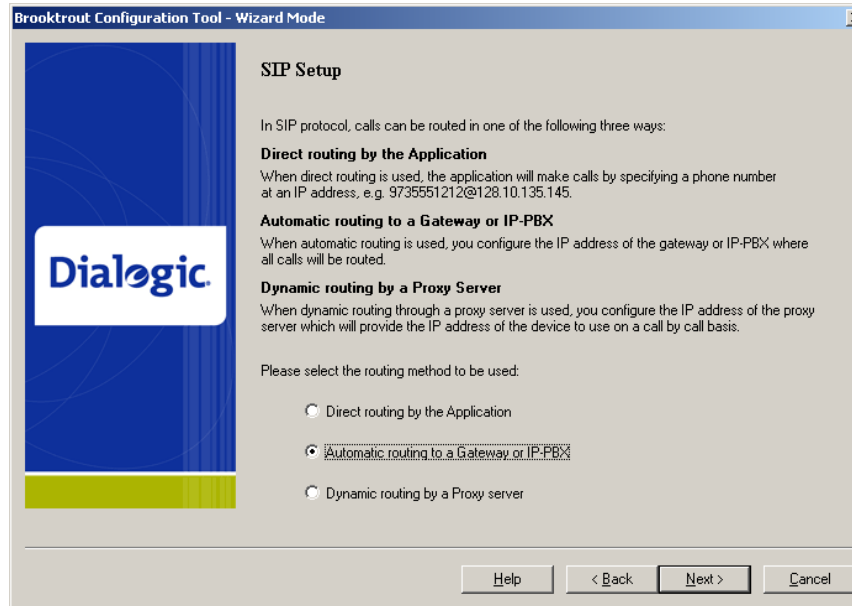
- **Follow the steps below to configure Direct Routing by the Application.**

1. Select Direct routing by the Application.

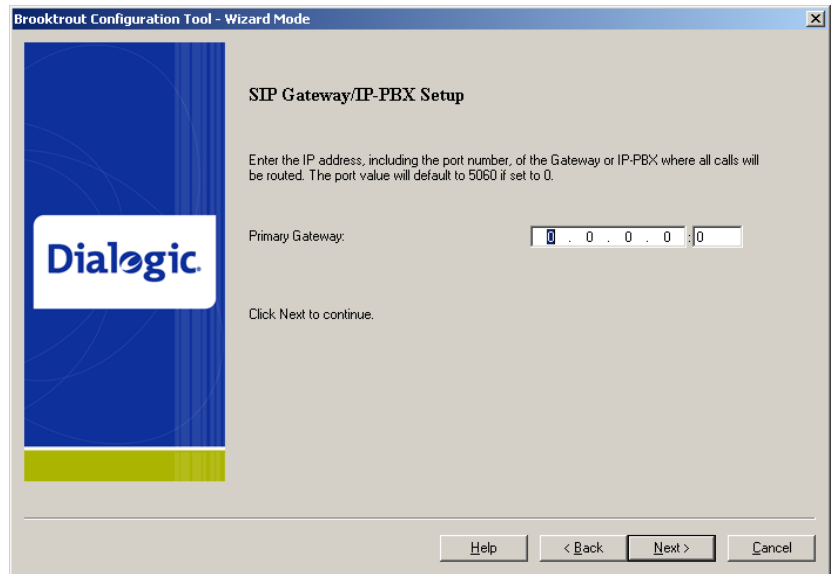
2. There is no routing configuration required because the application routes the call. Click **Next** and refer to [*Configuring SIP Fax Setup on page 156*](#)

Configuring SIP Call Control with Gateway or IP-PBX

If you chose to configure the SIP Call Control, the following screen appears.



- **Follow the steps below to configure SIP Call Control with a Gateway or IP-PBX.**
1. Select **Automatic routing to a Gateway or IP-PBX**. Click **Next** and the following screen appears.



2. Enter the Primary Gateway. Click **Next** and refer to [*Configuring the SIP Registrar on page 154*](#)

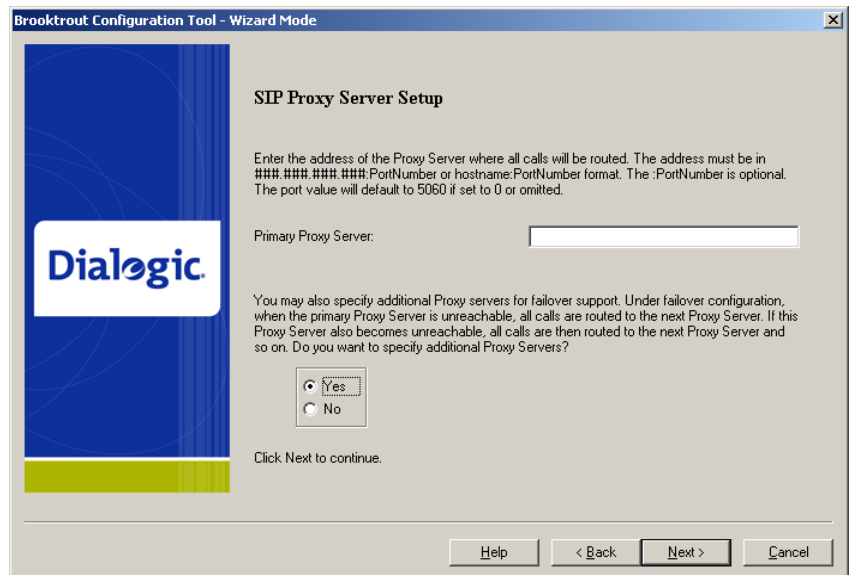
Configuring SIP Call Control with a Proxy Server

If you chose to configure the SIP Call Control the following screen appears.

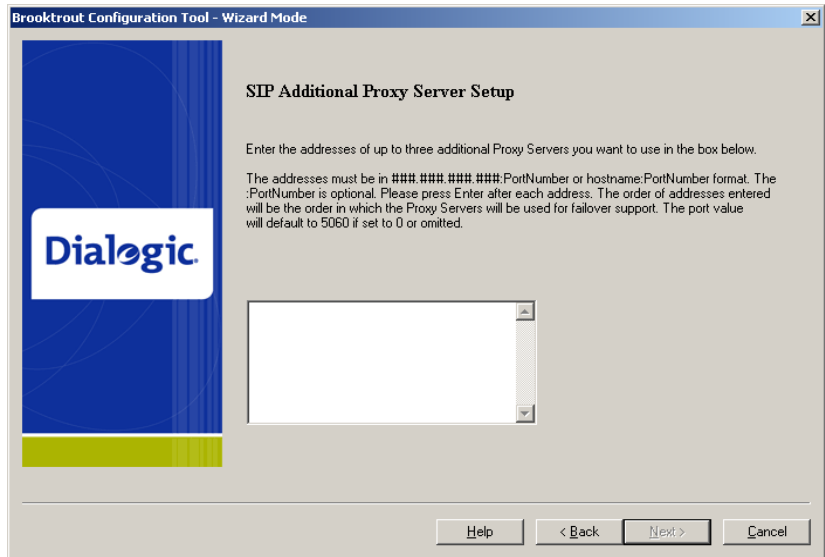


➤ **Follow the steps below to configure SIP Call Control with a SIP Proxy Server**

1. Select **Dynamic routing by a Proxy Server**. Click **Next** and the following screen appears.



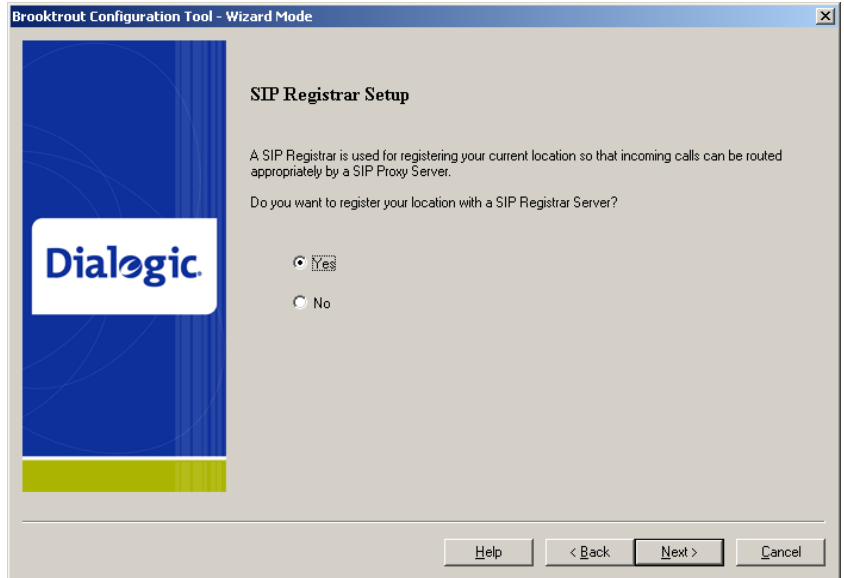
2. Enter the IP address of the Primary Proxy Server and select **Yes** if there are additional proxy servers to configure. Click **Next** and the following screen appears.



3. Enter the IP address of any additional proxy servers. Click **Next** and continue to the next step ***Configuring the SIP Registrar on page 154***

Configuring the SIP Registrar

- When the screen below appears, you can configure a SIP Registrar.



Brooktrout Configuration Tool - Wizard Mode

SIP Registrar Setup

A SIP Registrar is used for registering your current location so that incoming calls can be routed appropriately by a SIP Proxy Server.

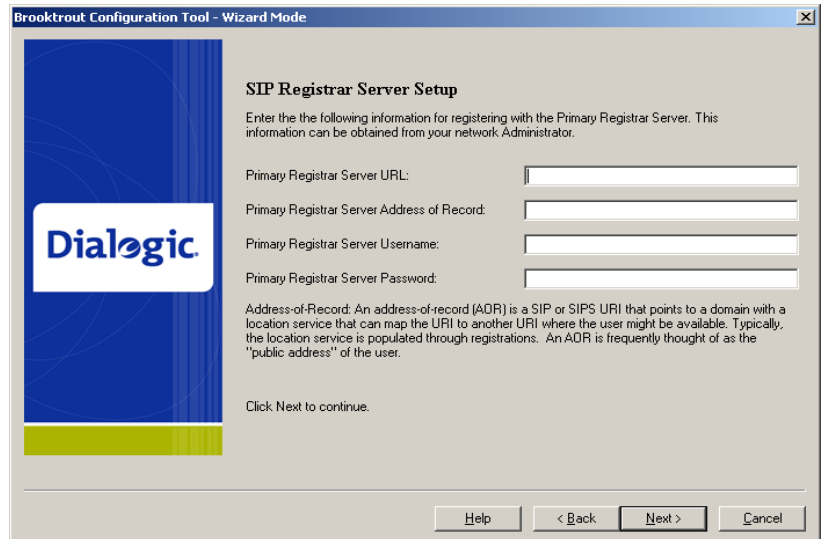
Do you want to register your location with a SIP Registrar Server?

☒ Yes

☐ No

Buttons: Help, < Back, Next >, Cancel

1. From the screen above, select **Yes** to set up a SIP registrar. Click **Next** and the following screen appears.



Brooktrout Configuration Tool - Wizard Mode

SIP Registrar Server Setup

Enter the the following information for registering with the Primary Registrar Server. This information can be obtained from your network Administrator.

Primary Registrar Server URL:

Primary Registrar Server Address of Record:

Primary Registrar Server Username:

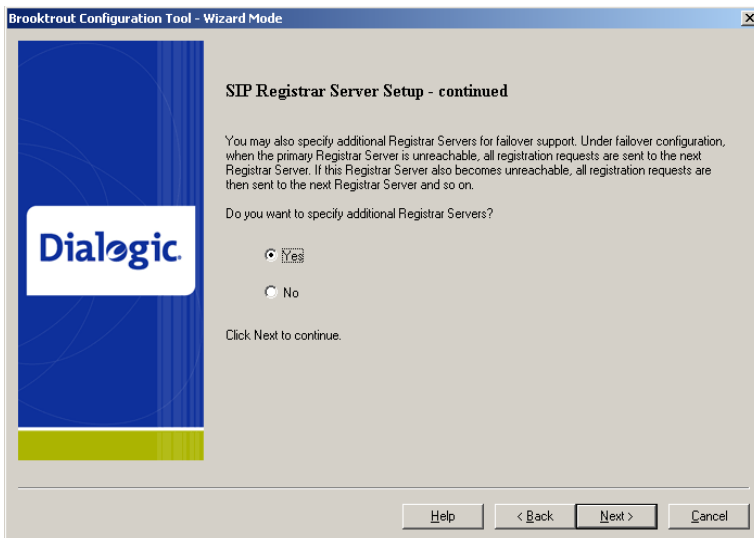
Primary Registrar Server Password:

Address-of-Record: An address-of-record (ADR) is a SIP or SIPS URI that points to a domain with a location service that can map the URI to another URI where the user might be available. Typically, the location service is populated through registrations. An ADR is frequently thought of as the "public address" of the user.

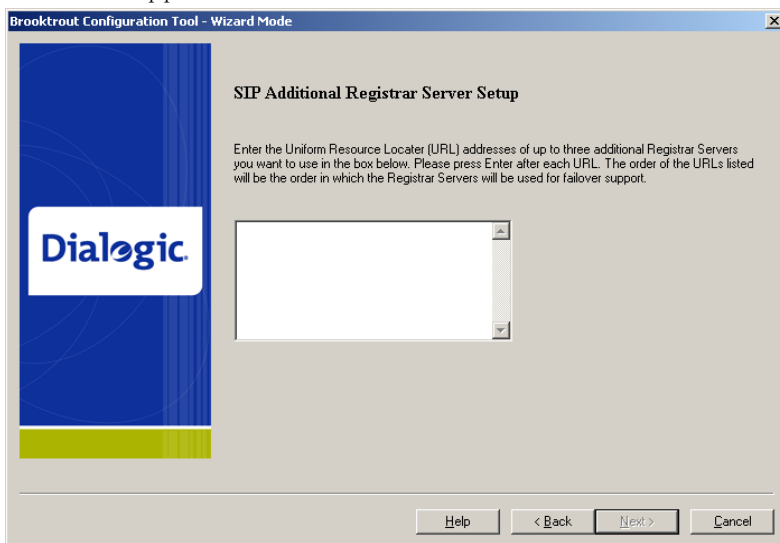
Click Next to continue.

Buttons: Help, < Back, Next >, Cancel

2. Complete the information on this screen and click **Next**. The following screen appears.



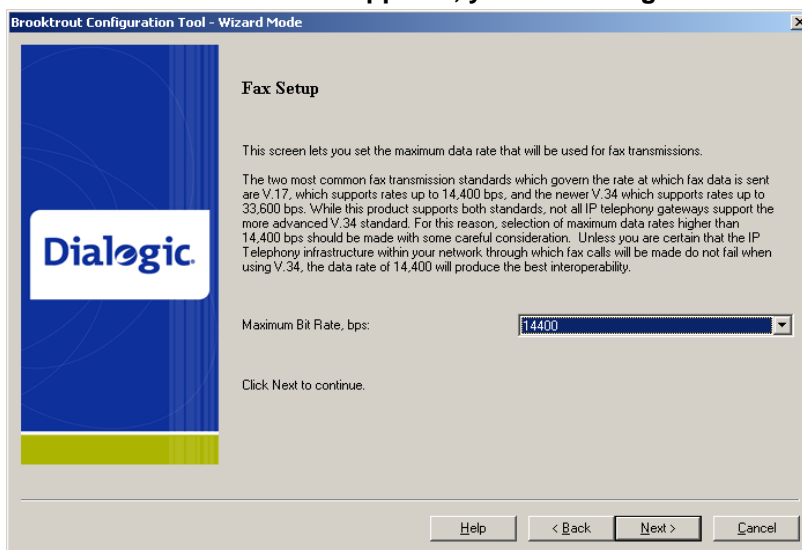
3. Select **Yes** to configure additional registrar servers. The following screen appears.



4. Enter the IP addresses of the additional registrar servers. Click **Next** and the following screen appears. Refer to ***Configuring SIP Fax Setup on page 156***

Configuring SIP Fax Setup

- When the screen below appears, you can configure Fax.



1. Configure the fax transmission and the configuration is complete. Click **Next** and refer to ***Applying Changes after the Configuration is Complete on page 163.***

Configuring H.323 Call Control

You can configure H.323 Call Control three ways:

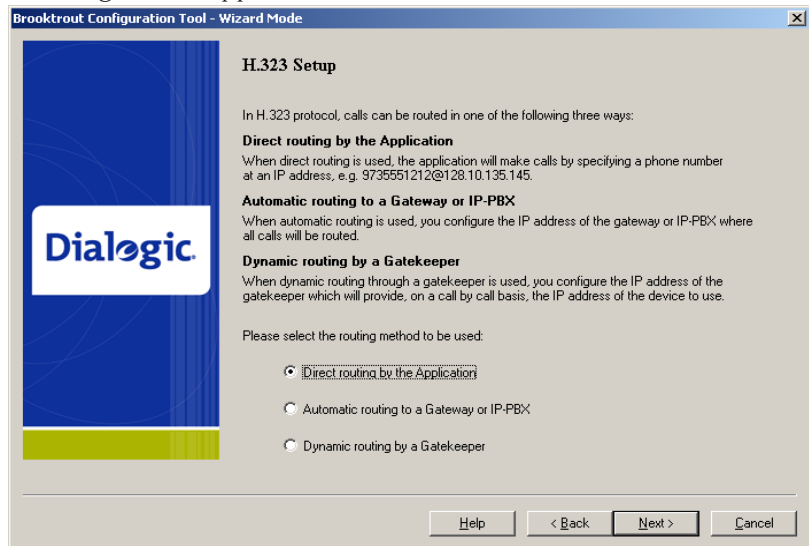
Configuring H.323 Direct Routing by the Application on page 157

Configuring H323 Call Control with a Gateway on page 158

Configuring H.323 Call Control with a Gatekeeper on page 159

Configuring H.323 Direct Routing by the Application

If you chose to configure the H.323 Call Control, protocol the following screen appears.



➤ **Follow the steps below to configure Direct Routing by the Application.**

1. Select **Direct routing by the Application**.
2. This is no routing configuration required because the application routes the call. Click **Next** and refer to ***Configuring H.323 Fax Setup on page 161***

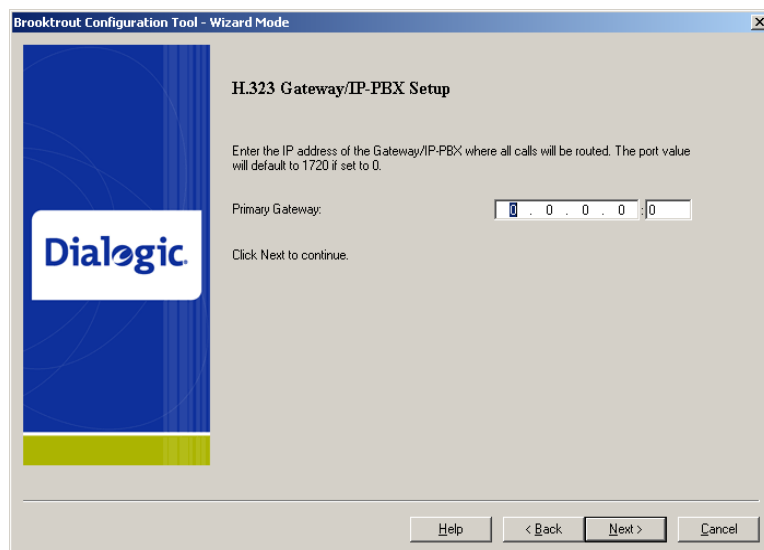
Configuring H323 Call Control with a Gateway

If you chose to configure the H.323 Call Control protocol the following screen appears.



➤ **Follow the steps below to configure H.323 Call Control with a Gateway or IP-PBX.**

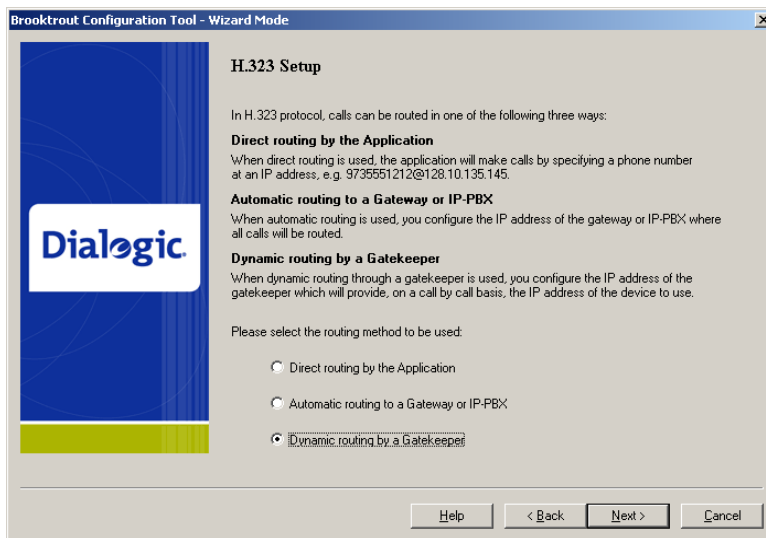
1. Select **Automatic Routing to a Gateway or IP-PBX**. Click **Next** and the following screen appears.



2. Enter the Primary Gateway IP address. Click **Next** and refer to ***Configuring H.323 Fax Setup on page 161.***

Configuring H.323 Call Control with a Gatekeeper

If you chose to configure the H.323 Call Control protocol the following screen appears.



➤ **Follow the steps below to configure H.323 Call Control with a Gatekeeper:**

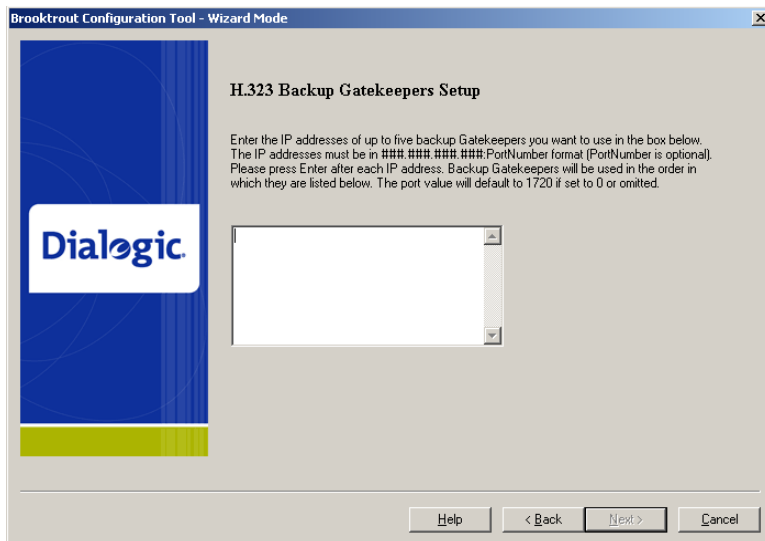
1. Select **Dynamic Routing by a Gatekeeper**. Click **Next** and the following screen appears.

The screenshot shows the 'H.323 Gatekeeper Setup' window. On the left is a blue vertical bar with the 'Dialogic' logo. The main area has a title 'H.323 Gatekeeper Setup' and instructions: 'Enter the IP address, including port number, of the primary Gatekeeper where all calls will be routed. The port value will default to 1720 if set to 0.' Below this is a text field for 'Primary Gatekeeper' containing '0.0.0.0' and a port field containing '0'. A 'Click Next to continue.' instruction is present. At the bottom are buttons for 'Help', '< Back', 'Next >', and 'Cancel'.

2. Enter the IP Address of the Primary Gatekeeper. Click **Next** and the following screen appears.

The screenshot shows the 'H.323 Gatekeeper Setup - continued' window. On the left is a blue vertical bar with the 'Dialogic' logo. The main area has a title 'H.323 Gatekeeper Setup - continued' and instructions: 'You may also specify backup Gatekeepers that can be used for failover situations. If the primary Gatekeeper cannot be reached, all calls will then be routed to the next backup Gatekeeper that is available.' Below this is the question 'Do you want to specify backup Gatekeepers?' with radio buttons for 'Yes' (selected) and 'No'. A 'Click Next to continue.' instruction is present. At the bottom are buttons for 'Help', '< Back', 'Next >', and 'Cancel'.

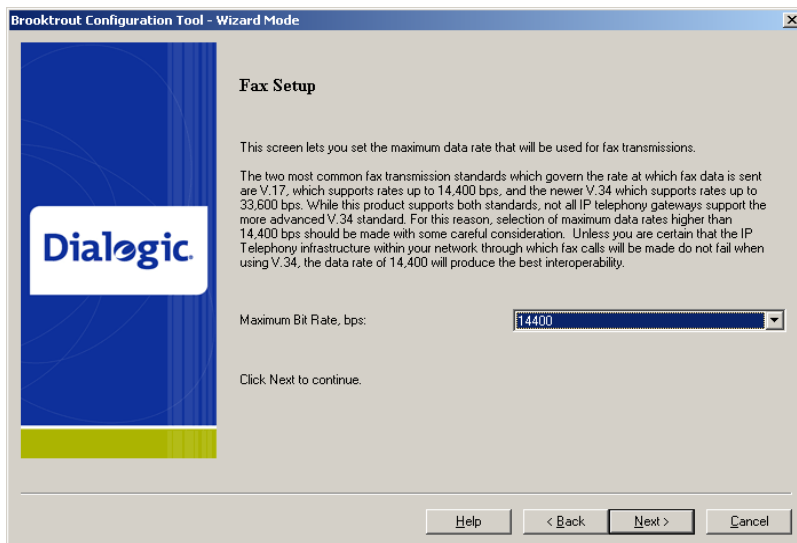
3. Select **Yes** to specify additional gatekeepers. Click **Next** and the following screen appears.



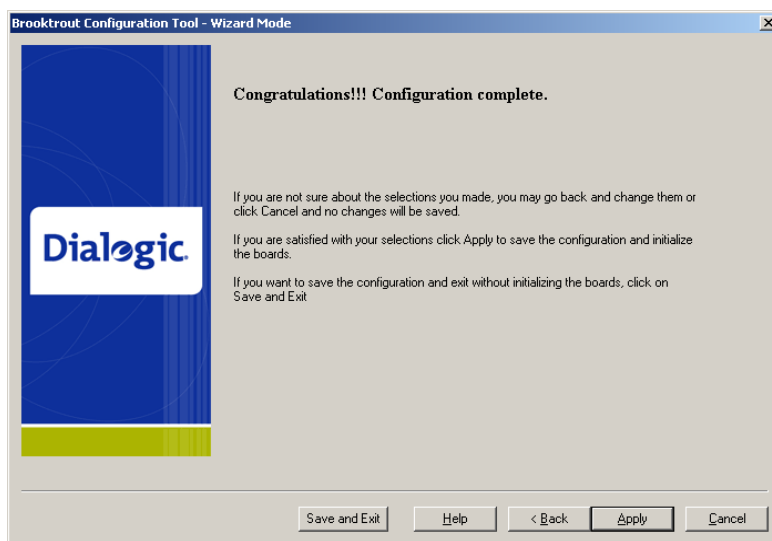
4. Enter the IP addresses of the additional gatekeepers. Click **Next** and refer to [Configuring H.323 Fax Setup on page 161](#)

Configuring H.323 Fax Setup

- When the screen below appears, you can configure Fax.

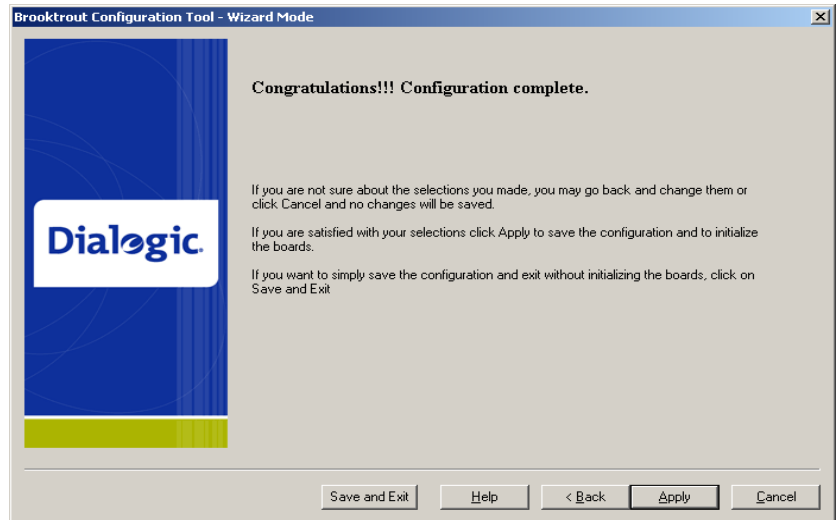


1. Configure the fax transmission and the configuration is complete. Click **Next** and refer to ***Applying Changes after the Configuration is Complete on page 163.***



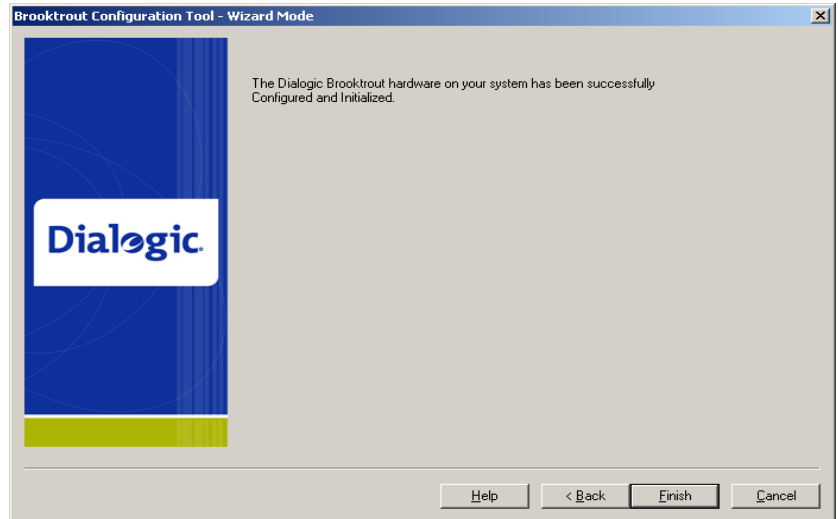
Applying Changes after the Configuration is Complete

➤ *Follow the steps below to save apply the changes.*



1. Click either **Save and Exit**, **Help**, **Back**, **Apply**, or **Cancel**.
 - ◆ **Save and Exit**
 - ◆ Save the configuration and Exit without initializing the modules.
 - ◆ **Help**
 - ◆ Displays help for the Configuration Tool.
 - ◆ **Back**
 - ◆ Displays previous page.
 - ◆ **Apply**
 - ◆ Saves the configuration and initializes the modules.
 - ◆ **Cancel**
 - ◆ Does not save the configuration and exits.

2. Click **Apply** and the board is initialized and configured. The following screen appears.

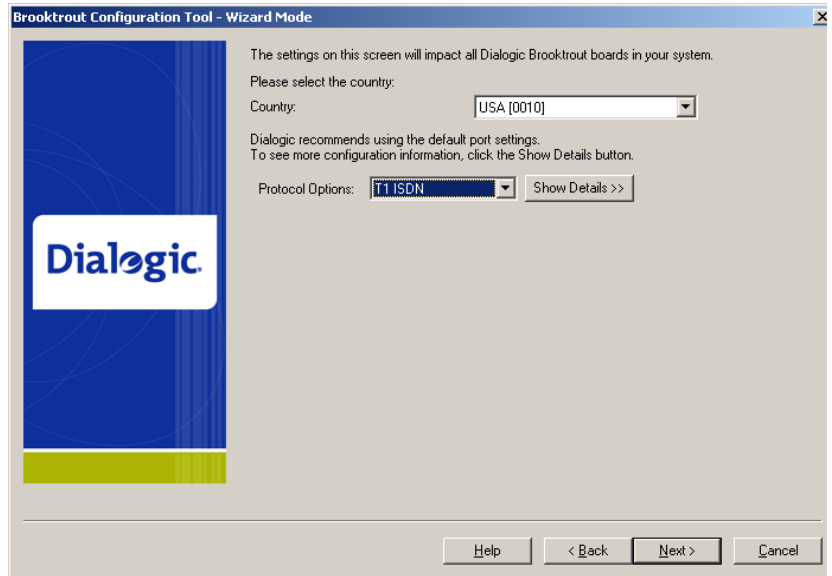


Configuring PSTN

Protocol Options

Dialogic recommends that you accept the defaults that are based on the modules the Configuration Tool identified in your system. In this example, the module uses the T1 ISDN protocol.

Note: In Wizard Mode all the ports of all the modules will be configured with the same port setting.



- Click the **Show Details >>** button.

Note the details of the protocol chosen by the Configuration Tool.

Protocol Details

The protocol details appear in the panel below the **Protocol Options**. The options are dependent on the protocol chosen.

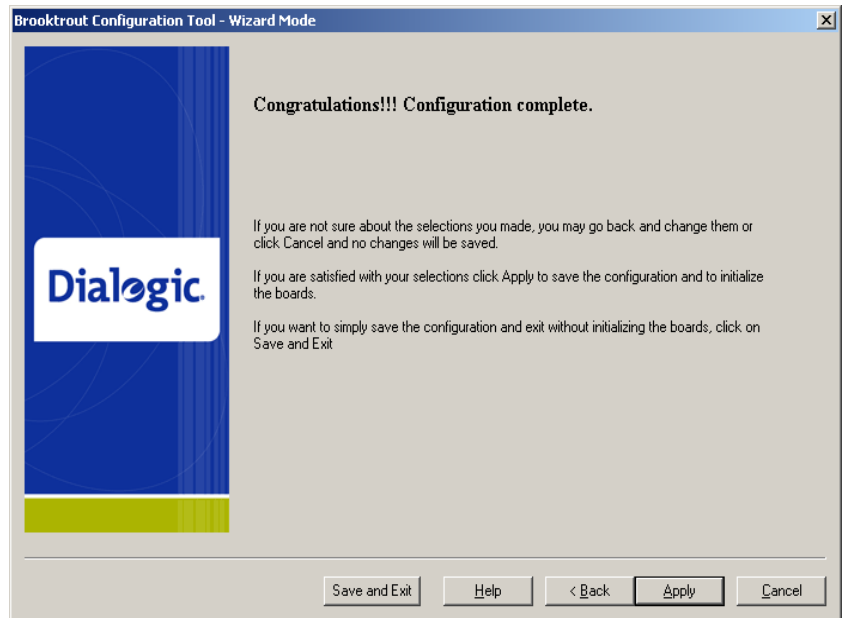
This example displays the options for the T1 ISDN protocol.

See the Configuration Files in **Volume 6** of the **Bfv API Reference Manual** for more information about the protocol parameters.

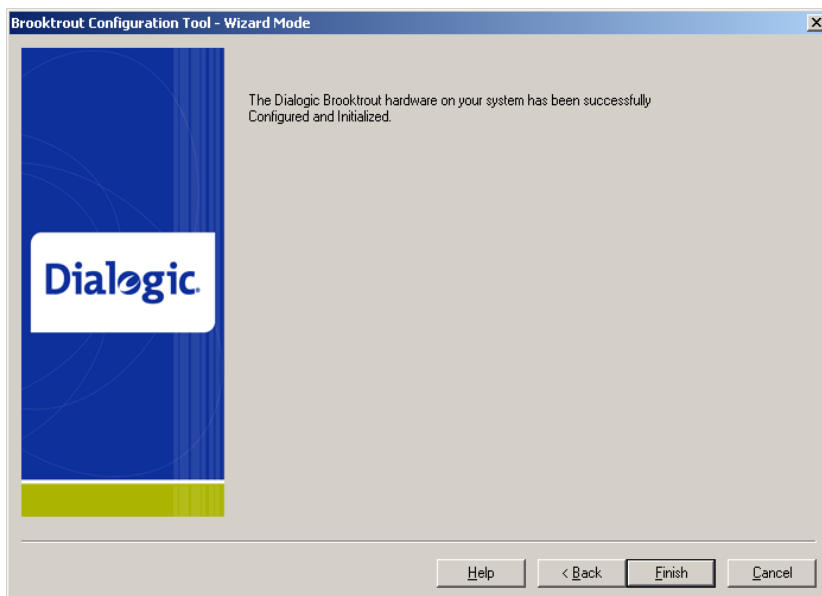
Note: In wizard mode all the ports of all the modules will be configured with the same port setting.

- Click **Next**.

The following screen appears.



5. Click either Save and Exit, Help, Back, Apply, or Cancel.
 - ◆ Save and Exit
 - ◆ Save the configuration and Exits without initializing the modules.
 - ◆ Help
 - ◆ Displays help for the Configuration Tool.
 - ◆ Back
 - ◆ Displays previous page.
 - ◆ Apply
 - ◆ Saves the configuration and initializes the modules.
 - ◆ Cancel
 - ◆ Does not save the configuration and exits.
6. The **Finish** window appears if you selected **Apply**.



7. Click **Finish** to complete the configuration.

Advanced Mode

If you have different types of Dialogic® Brooktrout® modules in your system or you want to configure your identical modules differently, you must use Advanced Mode:

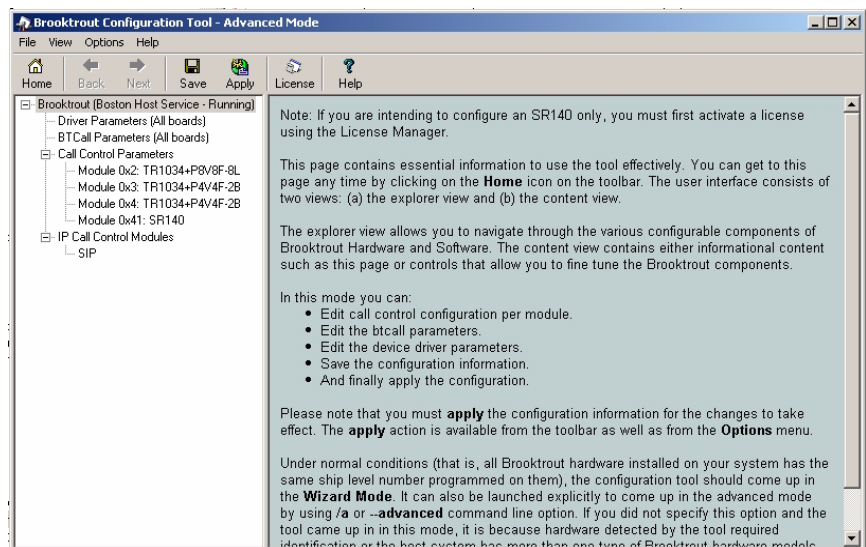
- When the Dialogic® Brooktrout® Configuration Tool detects that you have different modules, it starts in Advanced Mode.
- When you start the Configuration Tool in Wizard Mode, you can move to Advanced Mode immediately by clicking the **Advanced Mode** button.

The Advanced Settings parameters for all module types are presented in logical groups. The ordering of the groups is alphabetical. The ordering of parameters within a group is according to their relative importance.

Most parameters are hidden unless you click **Show Advanced**. Generally, a user does not need to change the advanced parameters. See [Call Control Parameters on page 176](#).

Advanced Mode Window

When you enter Advanced Mode, the **Brooktrout Configuration Mode - Advanced Mode** window appears.



Navigating in Advanced Mode

- **To navigate in Advanced Mode use the menus and buttons on the tool bar and the tree view on the left panel of the dialog boxes.**

Select one of the following to view the accompanying right panel information:

- ◆ Select **Brooktrout** to display the welcome window, if you are not already there.
- ◆ Select **Driver Parameters** to display the Driver Parameters dialog box.
For sample values, see [*Driver Parameters \(All boards\) on page 172.*](#)
- ◆ Select **BTCall Parameters** to display the BTCall Parameters dialog box.
For sample values, see [*BTCall Parameters \(All boards\) on page 174.*](#)
- ◆ Select **Call Control Parameters** to display the Call Control Parameters dialog box.
For sample values, see [*Call Control Parameters on page 176.*](#)
- ◆ Select **IP Call Control Parameters** to display the IP Call Control Parameters dialog box.
For sample values, see [*IP Call Control Modules on page 187.*](#)

Advanced Mode Menus

- **The following menu items are available in the Advanced Mode window:**

- The **File** menu allows you to exit from the Configuration Tool.
- The **View** menu allows you to choose the previous or next window.
- The **Options** menu allows you to:
 - ◆ Choose to apply and/or save the configuration.
 - ◆ Reconfigure the driver.
 - ◆ Launch the Dialogic® Brooktrout® License Manager.
 - ◆ Configure the IP Stack.
 - ◆ Edit Trace Connections Settings.
 - ◆ Set your preferences for the locations of the ***btcall.cfg*** and ***callctrl.cfg*** configuration files, the firmware, and log files. The **Preferences** dialog box is shown in [*Choosing the File Location on page 135.*](#)
 - ◆ Display the toolbar.

- The **Help** menu provides the following options:
 - ◆ Access to the Configuration Tool Help Index **Contents** tree.
 - ◆ Access to the Configuration Tool Help **Index** tab where you can navigate through the Help index entries.
 - ◆ **Search** tab where you can look for any text entry.
 - ◆ **About** provides version and copyright information for the Configuration Tool.

Advanced Mode Buttons

➤ The Advanced Mode window contains these buttons:

- Select the **Home** button to go to the welcome window if you are not already there.
- The **Next** and **Back** buttons take you to the next or previous pages, respectively.
- The **Save** button saves your configuration.
- The **Apply** button installs, starts or stops the Boston Host Service. It also saves your configuration to the appropriate configuration file.

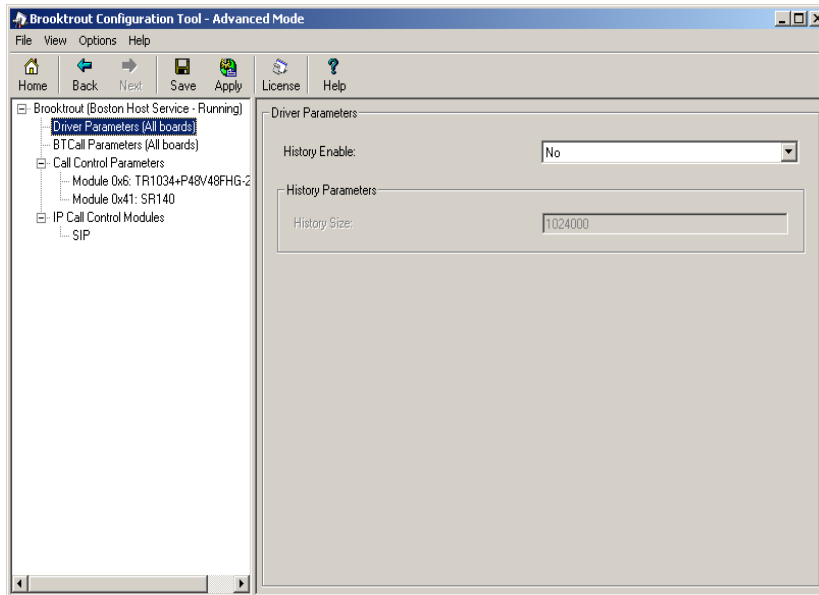
If driver parameters were modified, it dynamically reconfigures the drivers on a PnP operating system.

- The **License** button launches the Dialogic® Brooktrout® License Manager (***bkrthcmgr.exe***).
- The **Help** button displays help for the Configuration Tool in any mode.

Driver Parameters (All boards)

Click on **Driver Parameters (All Boards)** in the left panel to display the **Driver Parameters** in the right panel.

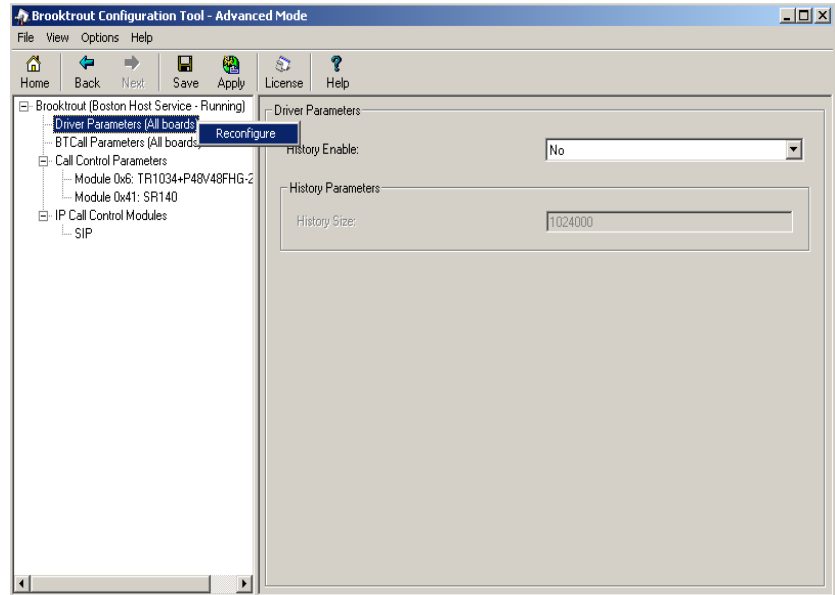
See ***Installing and Configuring the Driver using a Command (cmd) Prompt on page 112.***



Reconfigure Drivers

Right-click on **Driver Parameters (All Boards)** in the left panel to reconfigure the driver.

This option dynamically updates the driver parameters by calling ***reconfig*** on a PnP system.



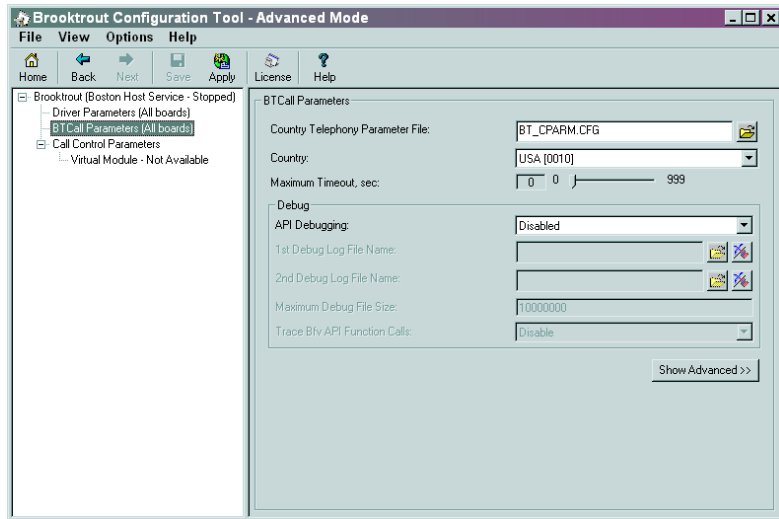
BTCall Parameters (All boards)

Click on **BTCall Parameters (All Boards)** in the left panel to display the **BTCall Parameters** in the right panel.

Debugging Options

Debugging Disabled

When debugging is disabled, all the **BTCall Parameters** debugging-related parameters are grayed out.



See the User-Defined Configuration File in **Volume 6** of the **Bfv API Reference Manual** for parameter information.

For more information about the **Show Advanced >>** button, see [Advanced Settings on page 198](#).

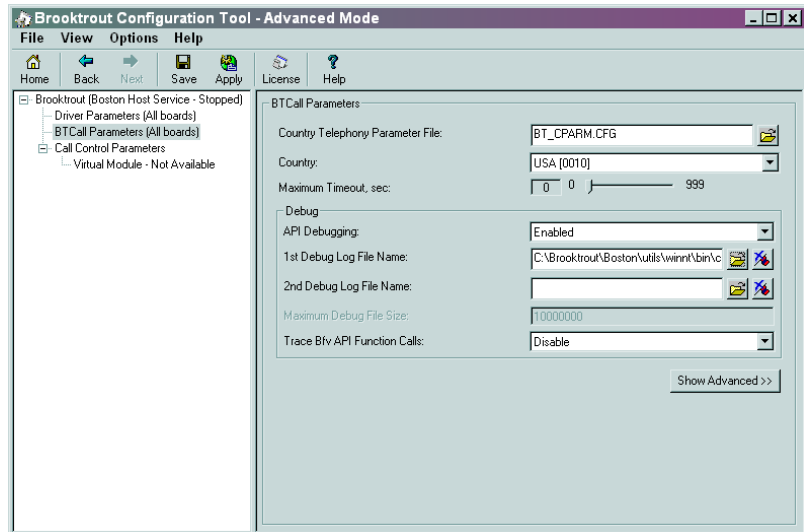
Note: Most users never need to alter the Advanced Settings parameter values.

Debugging Enabled

When you enable Bfv API Debugging, you can:

- Trace the entry
- Exit to each Bfv API call
- List the parameter passed into a function

See the right panel for specific debug parameter information.



Call Control Parameters

Click on **Call Control Parameters** in the left panel to display the **Report** tab in the right panel.

See [About the Call Control Configuration File on page 200](#) and **Volume 6** of the *Bfv API Reference Manual* for parameter information.

Reporting and Debugging (Tracing)

Report Panel

The **Report** tab displays the Call Control Parameters port configuration information.

The screenshot shows the Brooktrout Configuration Tool - Advanced Mode interface. The left panel displays a tree view with the following structure:

- Brooktrout (Boston Host Service - Stopped)
 - Driver Parameters (All boards)
 - BTCall Parameters (All boards)
 - Call Control Parameters**
 - Module 0x6: TR1034+P48V48FHG-2
 - Module 0x41: SR140
 - IP Call Control Modules
 - SIP

The right panel displays the **Call Control Port Configuration** report, which is divided into two sections:

Board Information - Module 0x41

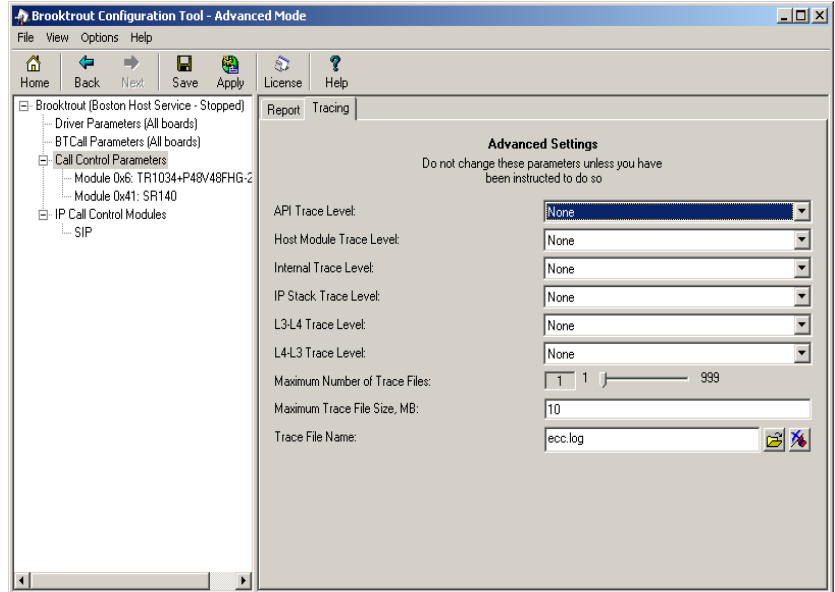
Name	Value
Board Name:	SR140

Board Information - Module 0x6

Name	Value
Board Name:	TR1034+P48V48FHG-2T1-1N
Port A:	T1 ISDN
Port B:	T1 ISDN

Tracing Panel

The **Tracing** tab displays the Call Control Tracing debug parameters.



Note: Do not change any of these parameters until you have consulted with Dialogic Technical Services and Support. See [*Getting Technical Support on page 29*](#).

Module Tab Settings

Click the module name in the left panel tree view to modify information about each hardware module.

The right panel **Global Settings** tab appears.

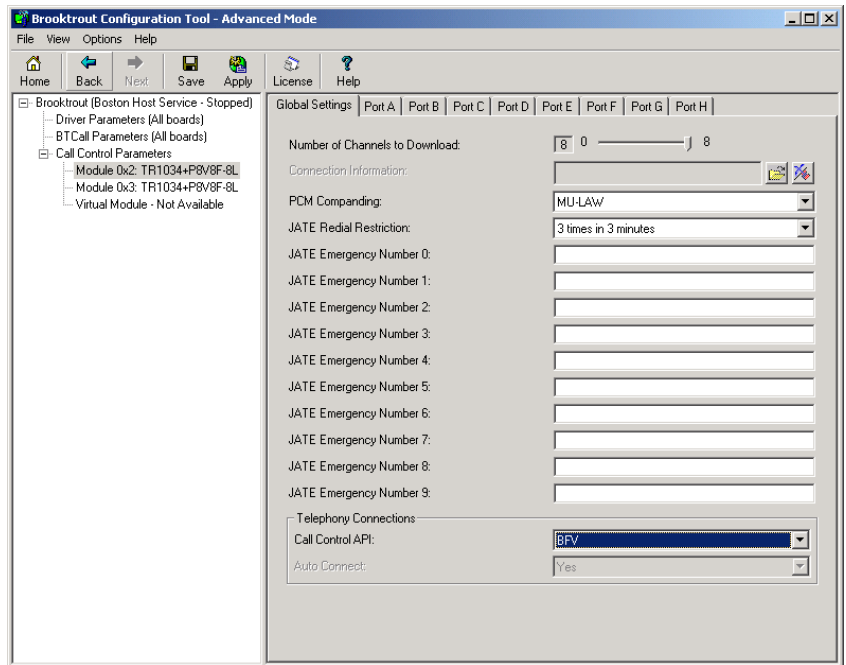
Global Settings Tab

Note: If a virtual module (SR140) is detected, the right panel tabs are different, see [SR140 Modules on page 183](#).

JATE Redial Parameters

If you set the **country_code** parameter in the **btcall.cfg** file to Japan, the JATE emergency and redial parameters are enabled on the **Global Settings** tab.

When you set the **country_code** parameter to any other value, the JATE parameters are disabled.



Choosing Call Control Type for Call Control Modules

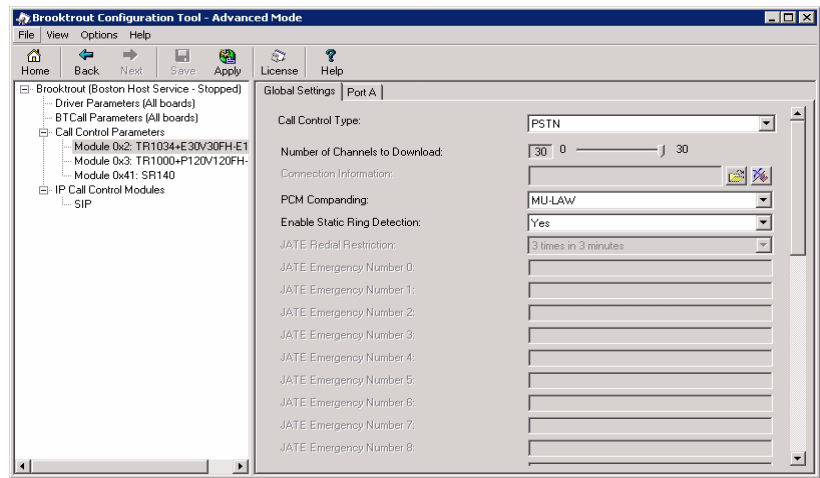
When you choose a module that has Ethernet ports, the **Call Control Type** parameter appears in the **Global Settings** tab.

You can configure a module to use PSTN call control or IP call control by setting the **Call Control Type** parameter.

Note: When using the Configuration Tool, do not manually modify the call control type and model parameters in the *callctrl.cfg* file. These are internal Configuration Tool parameters.

PSTN Call Control Type

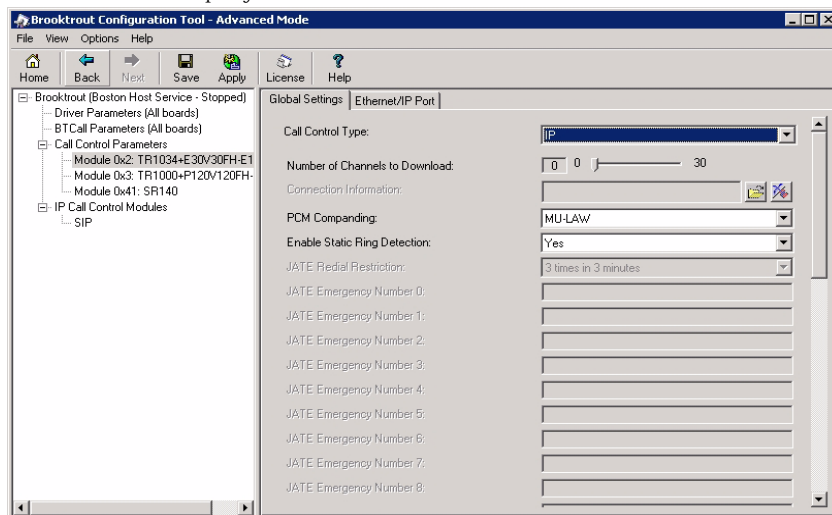
The **Global Settings**, **Clock Settings**, and **Port** tabs are visible when you select the **PSTN** option:



Note: Modules that do not have Ethernet ports, do not have the **Call Control Type** parameter appear in the **Global Settings** tab.

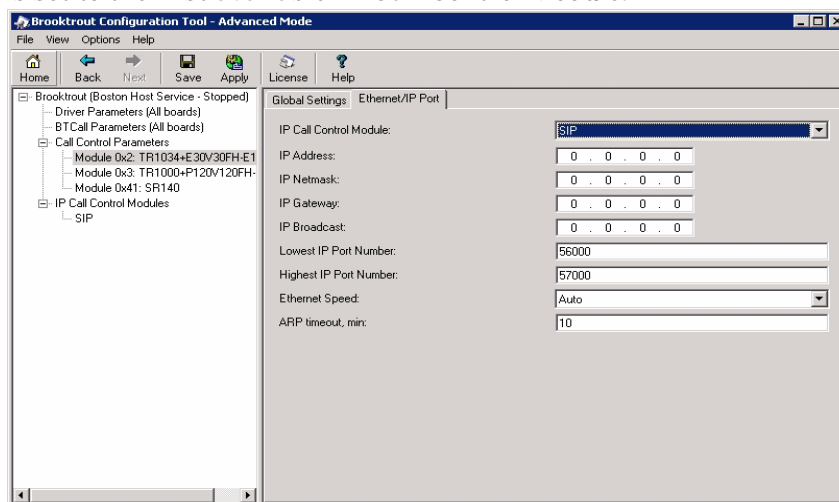
IP Call Control Type

Choose the **IP** option to associate this **Call Control Type** with the Dialogic® Brooktrout® module. The Configuration Tool removes the **Port** tabs and displays the **Ethernet/IP Port** tab:



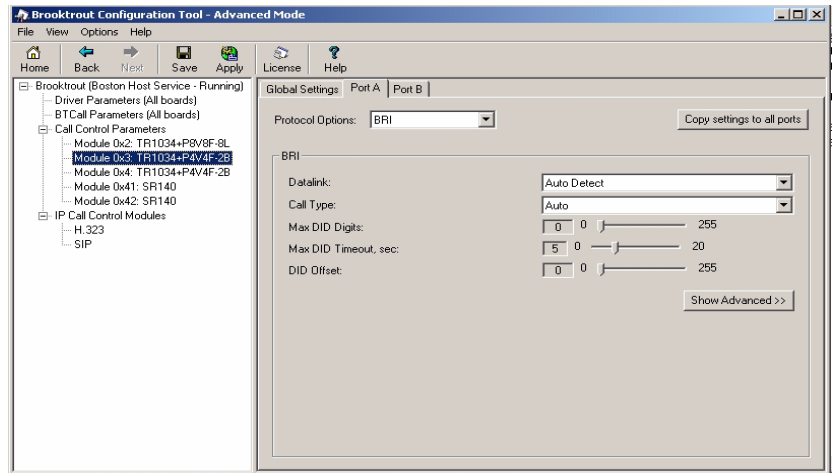
Ethernet/IP Port Tab

Only modules equipped with Ethernet ports that have the **Call Control Type** parameter in the **Global Settings** tab set to **IP** show the **Ethernet/IP Port** tab. By default, the **IP Call Control Module** parameter is set to the first available IP Call Control Module:



Port Tabs

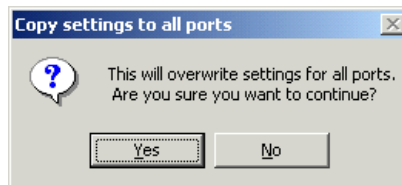
Click on one of the **Port** tabs to view or edit the port settings.



Copy Settings to All Ports

If this module has more than one port, you can copy these settings when you click on the **Copy settings to all ports** button.

A **Copy settings to all ports** dialog box appears.



To confirm your changes, click **Yes**.

Number of Rings

The Number of Rings parameter (for analog protocol options) specifies the number of rings that the system detects before a system reports a new incoming call to the application.

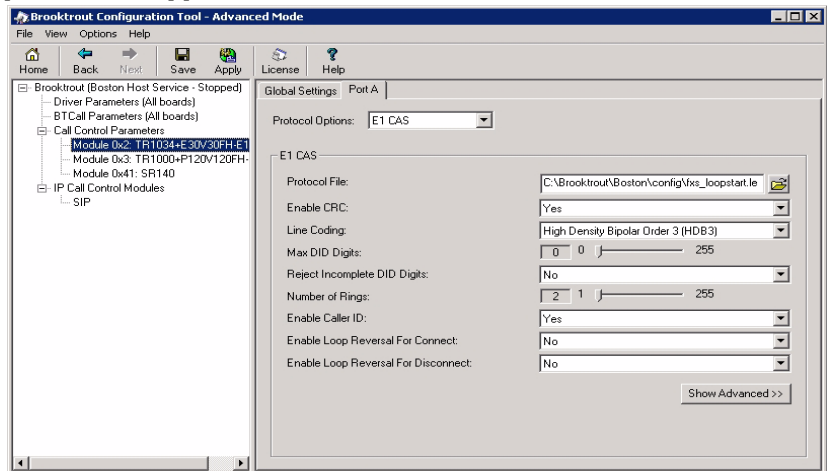
The Number of Rings default is set to 1. However, when you enable the Caller ID parameter, the Number of Rings is set to 2. This has no effect on the minimum value of the Number of Rings parameter.

Note: In North America and some other locations, the system sends the caller ID signal between the first and second rings. To detect the caller ID correctly, you must set the Number of Rings parameter to a value of 2 or greater to prevent the system from reporting the call to the application before the caller ID is sent by the Central Office.

For more information about the **Show Advanced >>** button, see [Advanced Settings on page 198](#).

E1 CAS Port

When you choose the E1 CAS Protocol option, the following E1 CAS parameters appear:



When using E1 or BRI lines, the phone number is longer than 20 digits. You can include up to 255 digits for Euro_ISDN phone numbers using the **Max DID Digits** parameter.

SR140 Modules

- **When you choose a SR140 module in the left panel, the right panel tabs change.**

SR140 modules features and number of channels depends on the license installed on the user system. You can obtain, install, update, and remove the license using the Dialogic® Brooktrout® License Manager utility.

Note: A special demo license is available in either a single- or two-channel configuration that will run for a 30 day period. Contact your Dialogic sales representative to obtain this license. Products with demo licenses run with limited functionality. Only one Demo license may be used at a time. Demo licenses will have incoming and outgoing fax pages overlaid with a 'Demonstration' watermark. Once a demo license is upgraded to a permanent license, there will be no watermark on the incoming or outgoing fax pages. You can upgrade the demo license to a permanent license by activating new license keys without having to re-install the software.

The **Apply** button on the toolbar starts the Boston Host Service to initialize the board. See [*Advanced Mode Buttons on page 171*](#).

The **License** button on the toolbar launches the Dialogic® Brooktrout® License Manager (*bkrlicmgr.exe*).

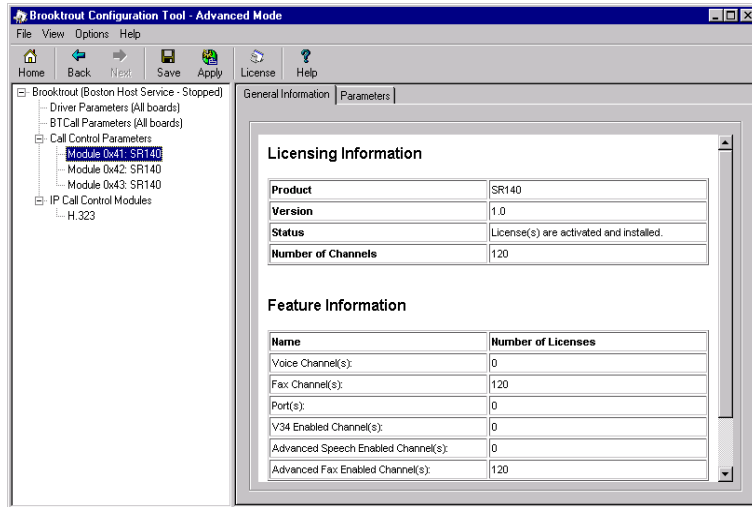
For more information, see:

- [*Using the Boston Host Service on page 117*](#)
- Activating Dialogic® Brooktrout® Products in the *Dialogic® Brooktrout® SR140 Windows® User Guide*.
- *Volume 6 of the Bfv API Reference Manual*

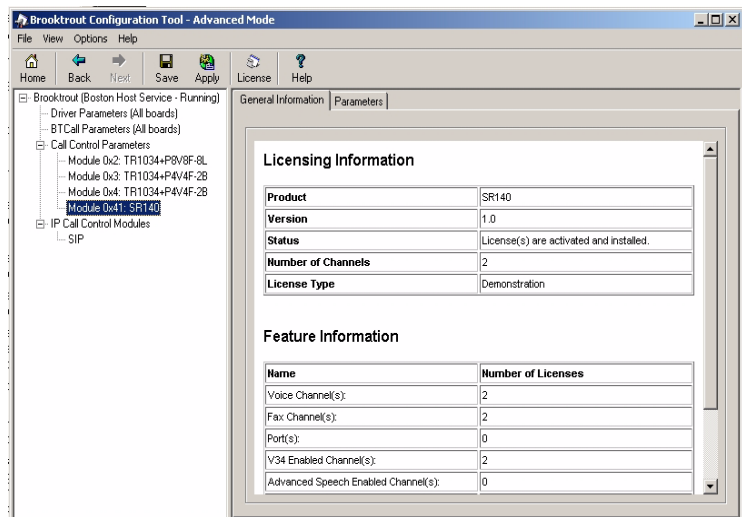
General Information Tab for SR140

The Dialogic® Brooktrout® licensing library is queried for the licensing status, number of channels, and features.

The following screen shows a permanent license.



The following screen shows a demonstration license:

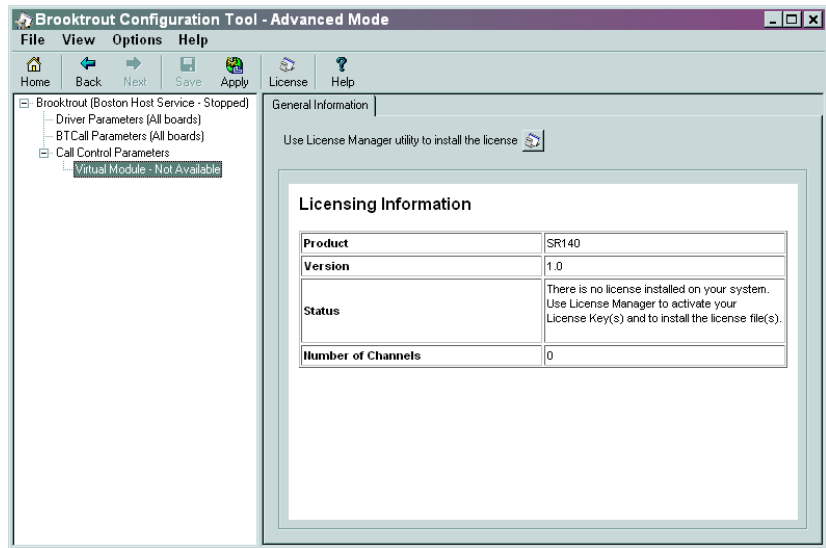


No License Available

A SR140 virtual module displays in the **General Information** tab even when there is no valid license installed.

You can click the button after **Use License Manager** utility to install the license to invoke the Dialogic® Brooktrout® License Manager utility (*brktlicmgr.exe*).

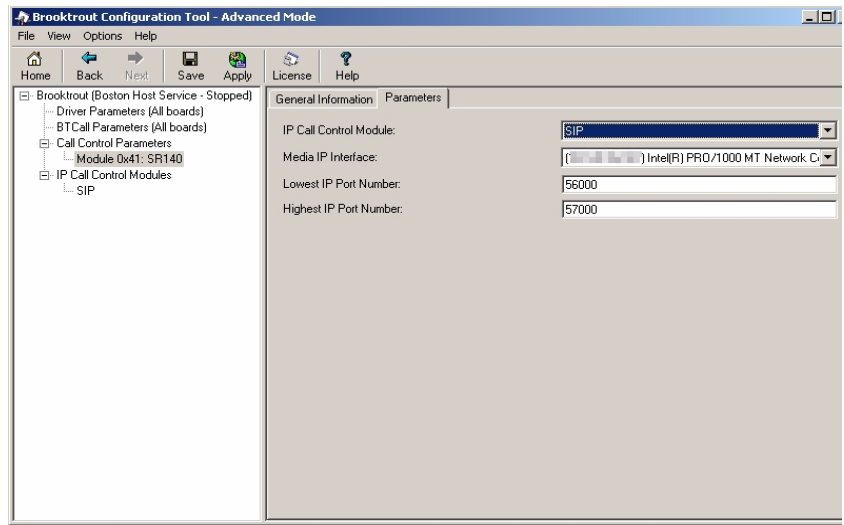
For more information, see Activating Dialogic® Brooktrout® Products in the ***Dialogic® Brooktrout® SR140 Windows® User Guide***.



Parameters Tab for SR140

The **Parameters** tab displays the call control module type, Media IP Interface and IP port number information.

Note: The Media IP Interface parameter applies only to SR140 modules.



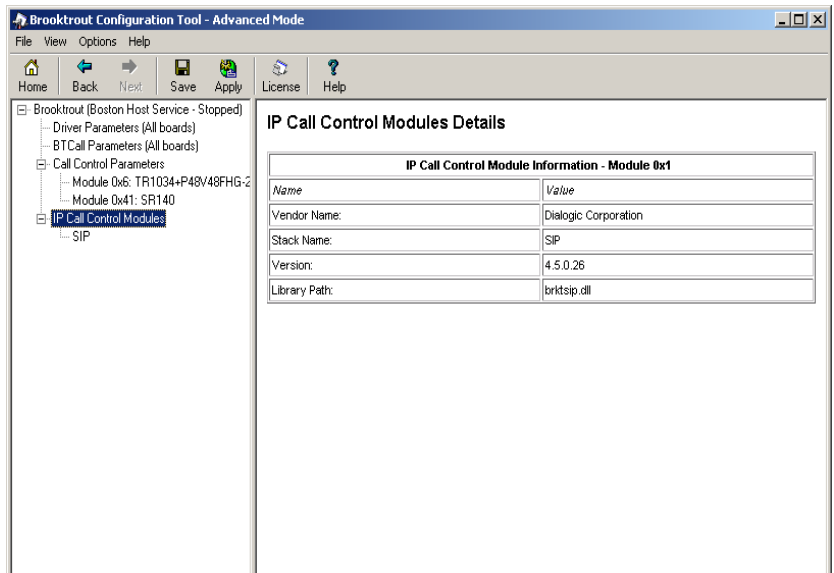
IP Call Control Modules

- Click **IP Call Control Modules** on the left panel to display information about any IP-enabled modules on the system in the right panel.

This option is present only when the system has at least one IP-enabled board. Parameters are saved to the **callctrl.cfg** file.

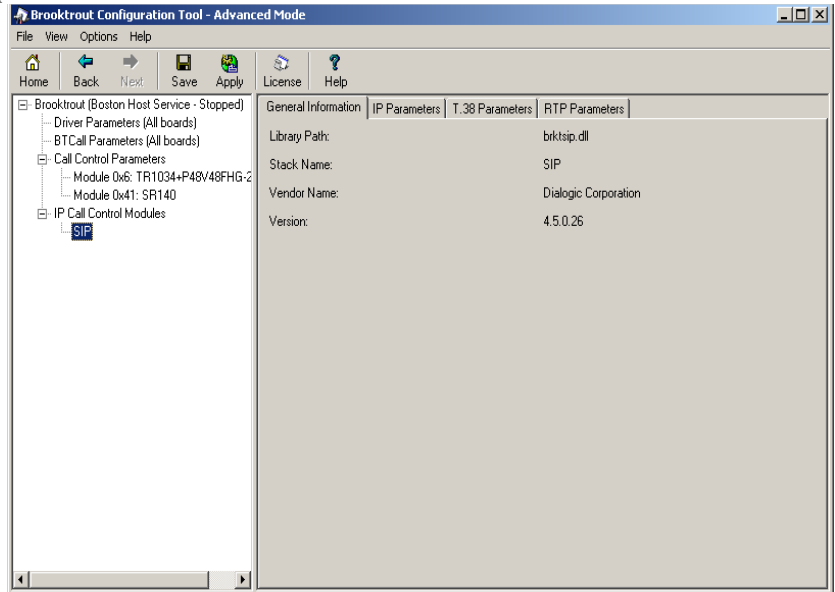
See [Using a Call Control Configuration File on page 200](#) and **Volume 6** of the **Bfv API Reference Manual** for parameter information.

IP Call Control Modules Details



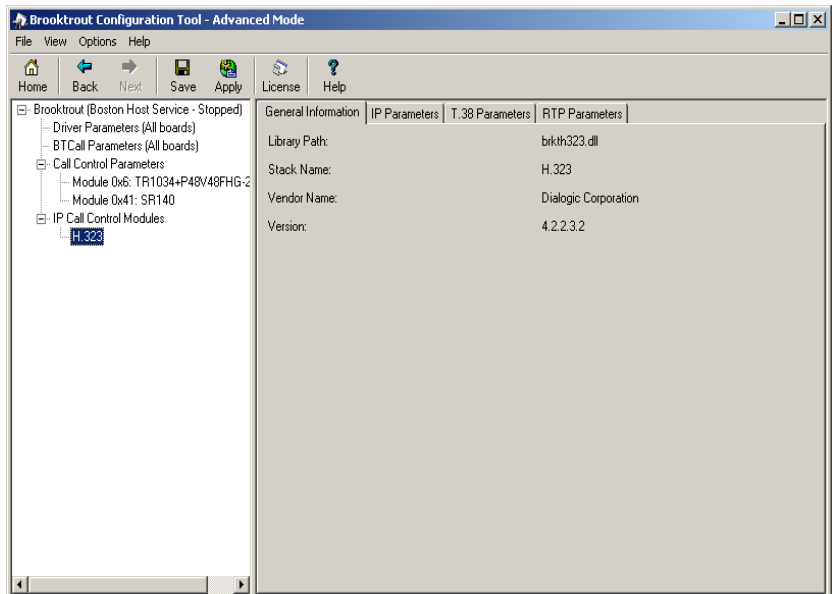
General Information Tab for SIP Stack

The **General Information** tab contains information about the library path, stack name, vendor name, and version number.



General Information Tab for H.323 Stack

When you select to configure an H.323 stack, the **General Information** tab details can look like this example:



IP Parameters Tab for SIP Stack

The SIP Parameters tab contains the following parameters.

The screenshot shows the 'Brooktrout Configuration Tool - Advanced Mode' window. The left sidebar shows a tree view with 'SIP' selected under 'IP Call Control Modules'. The main panel has tabs for 'General Information', 'IP Parameters', 'T.38 Parameters', and 'RTP Parameters'. The 'IP Parameters' tab is active, displaying the following fields:

- Maximum SIP sessions: 256 (range 1 to 1000)
- Primary Gateway: 0 . 0 . 0 . 0 :0
- Primary Proxy Server: [empty]
- Additional Proxy Server #2: [empty]
- Additional Proxy Server #3: [empty]
- Additional Proxy Server #4: [empty]
- Primary Registrar Server: [empty]
- Additional Registrar Server #2: [empty]
- Additional Registrar Server #3: [empty]
- Additional Registrar Server #4: [empty]
- From value: Anonymous <sip:no_from_info@anonymous.invalid>
- Contact name: 0 . 0 . 0 . 0 :0
- Username: [empty]
- Session name: no_session_name
- Session description: [empty]
- Description URI: [empty]

IP Parameters Tab for H.323 Stack

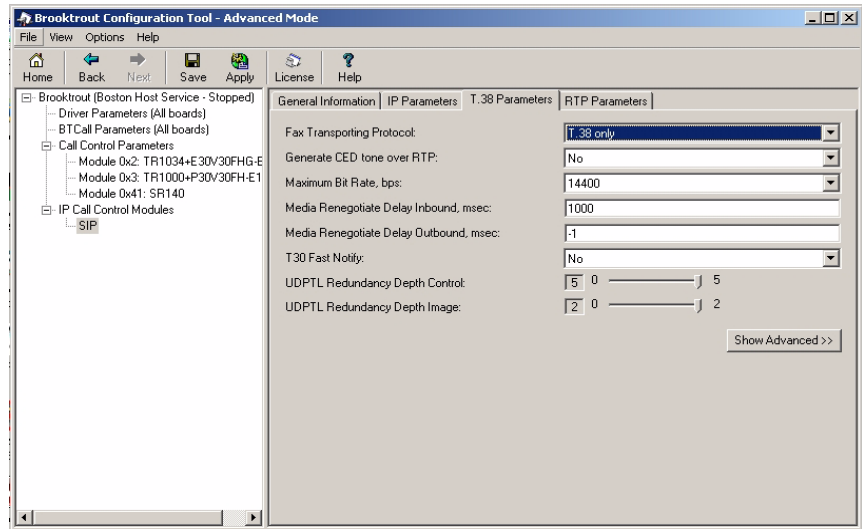
When you select to configure an H.323 stack, the IP Parameters tab details can look like this example:

The screenshot shows the 'Brooktrout Configuration Tool - Advanced Mode' window. The left sidebar shows a tree view with 'H.323' selected under 'IP Call Control Modules'. The main panel has tabs for 'General Information', 'IP Parameters', 'T.38 Parameters', and 'RTP Parameters'. The 'IP Parameters' tab is active, displaying the following fields:

- Local IP Address: 0 . 0 . 0 . 0 :0
- Maximum H323 Sessions: 256
- Primary Gateway: 0 . 0 . 0 . 0 :0
- Register with a Gatekeeper: 0 (range 0 to 1)
- Gatekeeper ID: [empty]
- Primary Gatekeeper: 0 . 0 . 0 . 0 :0
- Gatekeeper Time To Live: 0
- Support Alternate Gatekeepers: 0 (range 0 to 1)
- E.164 Aliases: [empty]
- Local H.323 terminal ID: [empty]
- Fallback Gatekeeper #2: 0 . 0 . 0 . 0 :0
- Fallback Gatekeeper #3: 0 . 0 . 0 . 0 :0
- Fallback Gatekeeper #4: 0 . 0 . 0 . 0 :0
- Fallback Gatekeeper #5: 0 . 0 . 0 . 0 :0

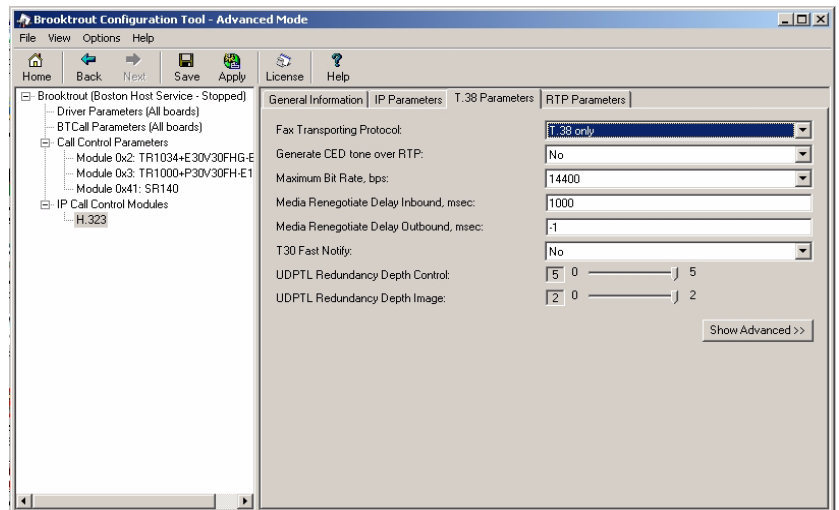
T.38 Parameters Tab for SIP Stack

The T.38 Parameters tab for a SIP stack contains the following parameters.



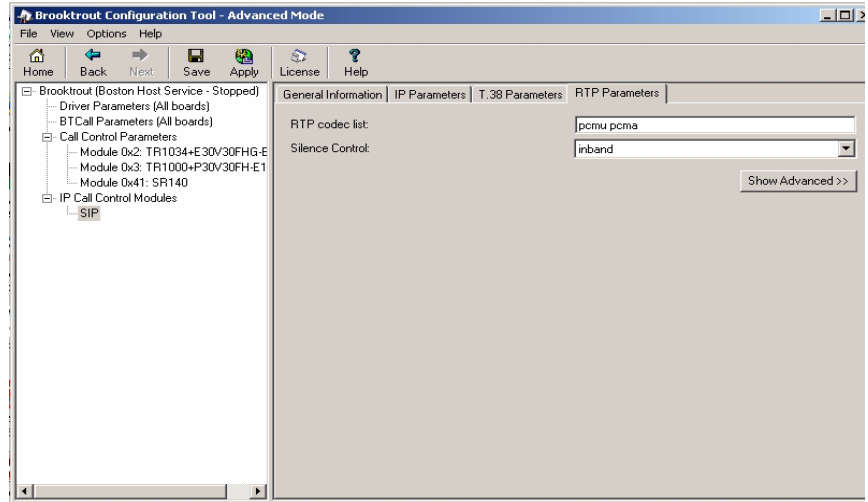
T.38 Parameters for H.323 Stack

The T.38 Parameters tab for an H.323 stack contains the following parameters.



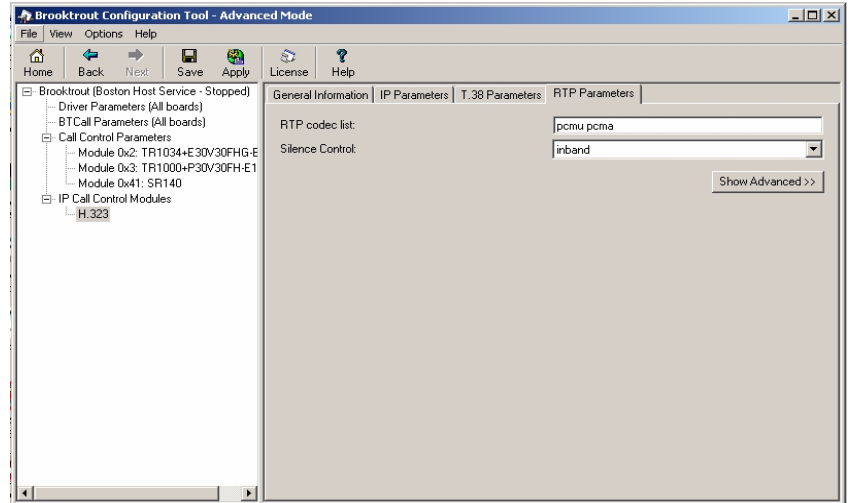
RTP Parameters Tab for SIP Stack

The RTP Parameters tab for a SIP stack contains the following parameters.



RTP Parameters for H.323 Stack

The RTP Parameters tab for an H.323 stack contains the following parameters.



Offline Mode

With Offline Mode you can:

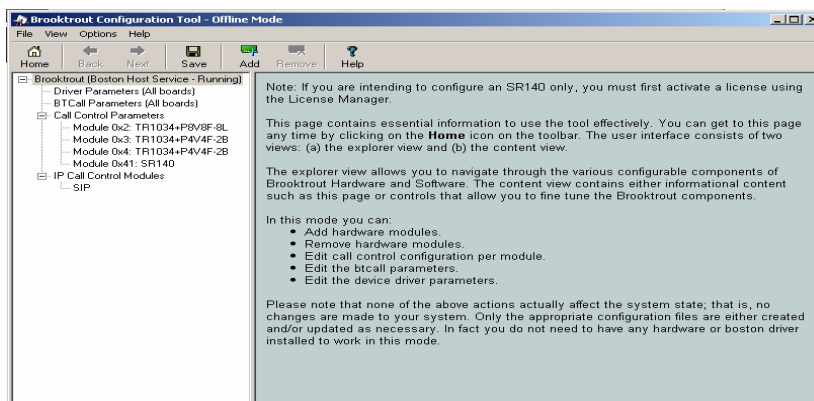
- Create or edit configuration files such as ***btcall.cfg*** and ***callctrl.cfg***.
- Edit the device driver parameters.
- Add or remove, modules (boards).

Offline Mode allows you to create/edit configuration files when no boards are installed.

Offline Mode Window

When you enter Offline Mode, the **Brooktrout Configuration Tool - Offline Mode** window appears.

To navigate in Offline Mode, use the menus and buttons on the tool bar and the left panel tree view. The buttons are similar to **Advanced Mode** (see [Advanced Mode on page 169](#)) except that the **Apply** button is not present and **Add** and **Remove** buttons are available. These buttons allow you to add/remove items to and from the configuration files or add/remove modules from the configuration.

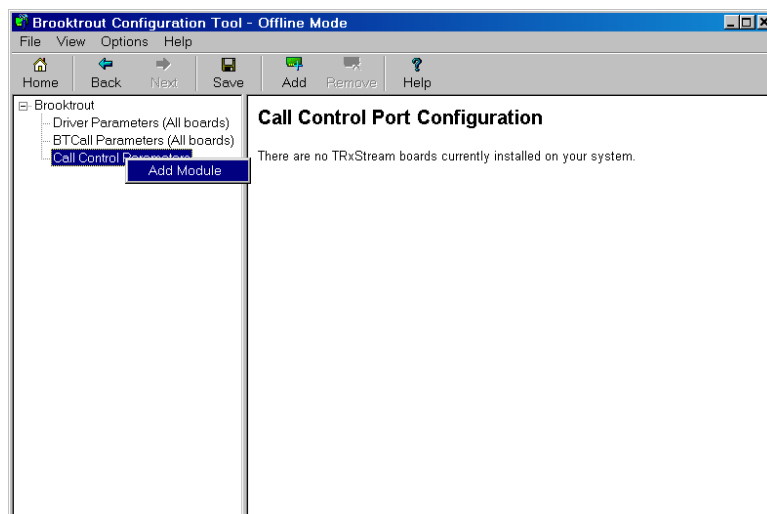


Adding a Module

- **Use the right mouse button to add and remove modules.**

1. Right-click on **Call Control Parameters** to add a module.

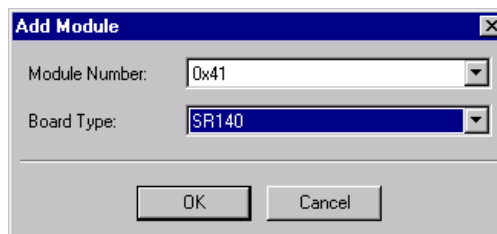
The following right panel information appears when no modules are installed.



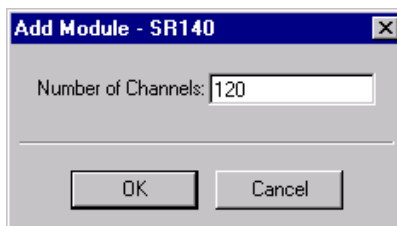
2. The **Add Module** dialog box appears.

Select the **Module Number** and **Board Type**, then click **OK**. See [Determining the Board Module Number on page 33](#) for more information

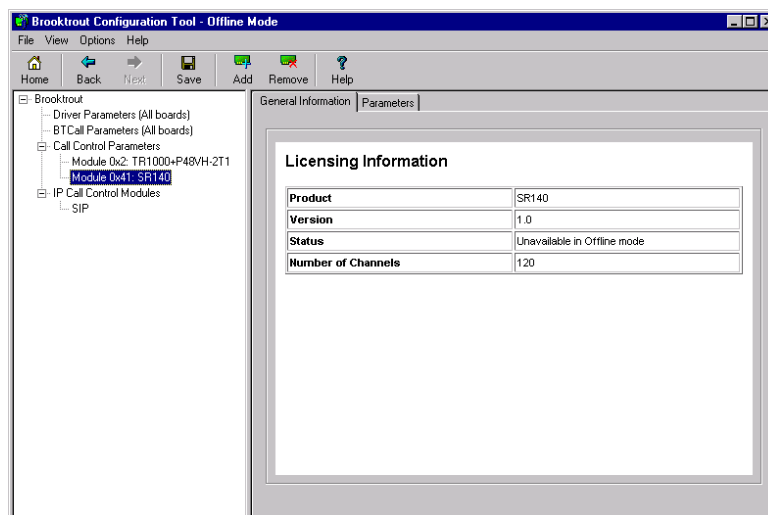
Note: Always set the module number for the SR140 to start with 0x41, because the Configuration Tool Advanced Mode initializes the SR140 module as that default.



3. Enter the correct **Number of Channels** when a SR140 module type is selected, then click **OK**:



4. Click the **General Information** tab to see the added information. This example shows information for a SR140 module:

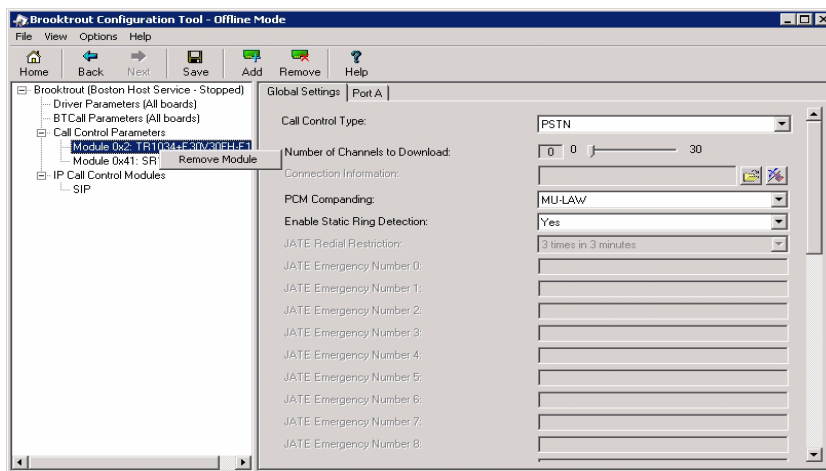


Note: For SR140 modules, you can edit the **Number of Channels** parameter entry of the call control configuration file.

Removing a Module

- **Right-click on a module name to remove it from the configuration.**

In the left panel, select the **Remove Module** option to remove the module from the configuration.

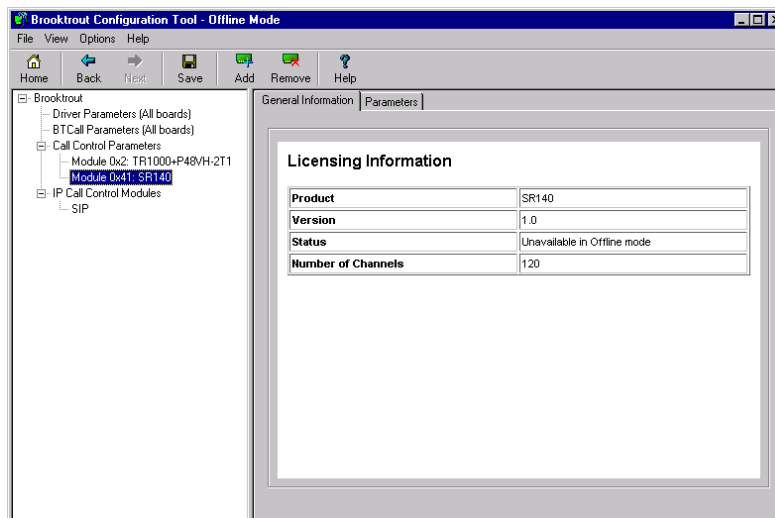


SR140 Modules in Offline Mode

When a SR140 module is detected in Offline Mode, the feature information is unavailable.

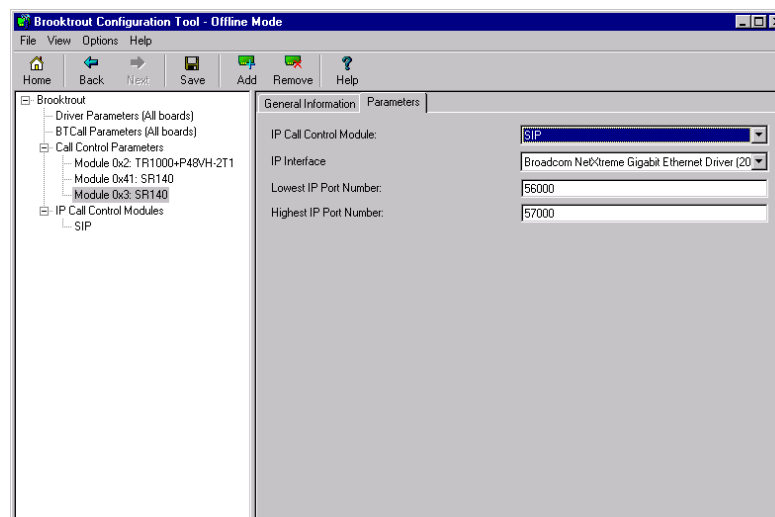
General Information Tab for SR140

The following information is displayed in the **General Information** panel for SR140 modules:



Parameters Tab for SR140

The **Parameters** tab displays the editable parameters for the SR140 module.



Silent Mode

To specify Silent Mode, use command line option `/s`, for example:

```
c:\Brooktrout\Boston\utils\winnt\bin\configtool.exe /s
```

You have no interaction once you start the configuration tool.

However, you can find information on the actions that were carried out during Silent Mode by referring to the ***configuration.log*** file that is located in the current working directory.

To manually configure the configuration file locations without using the **Preferences** dialog box (see [Preferences Dialog Box on page 135](#)) in Silent Mode, use the command line `/q` option, for example:

```
c:\Brooktrout\Boston\utils\winnt\bin\configtool.exe /q
```

When SR140 modules are present in Silent Mode, this mode does not display any windows or dialog boxes; however, the following occurs:

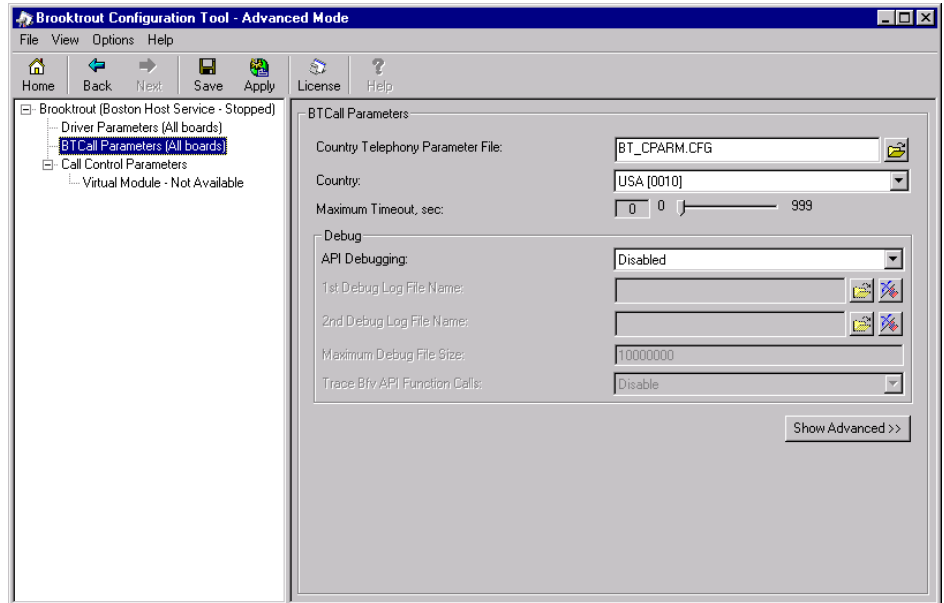
- Reads the configuration file
- Boston device driver starts, if stopped
- Validates data
- Writes information to the configuration file
- Boston Host Service starts

See **Volume 6** in the ***Bfv API Reference Manual*** for information about the configuration files.

Advanced Settings

Show Advanced Button

When a parameter panel (for example: **Driver Parameters**, **BTCall Parameters**, **Call Control Parameters**) has advanced settings, the **Show Advanced >>** button appears on the bottom right of the right panel:

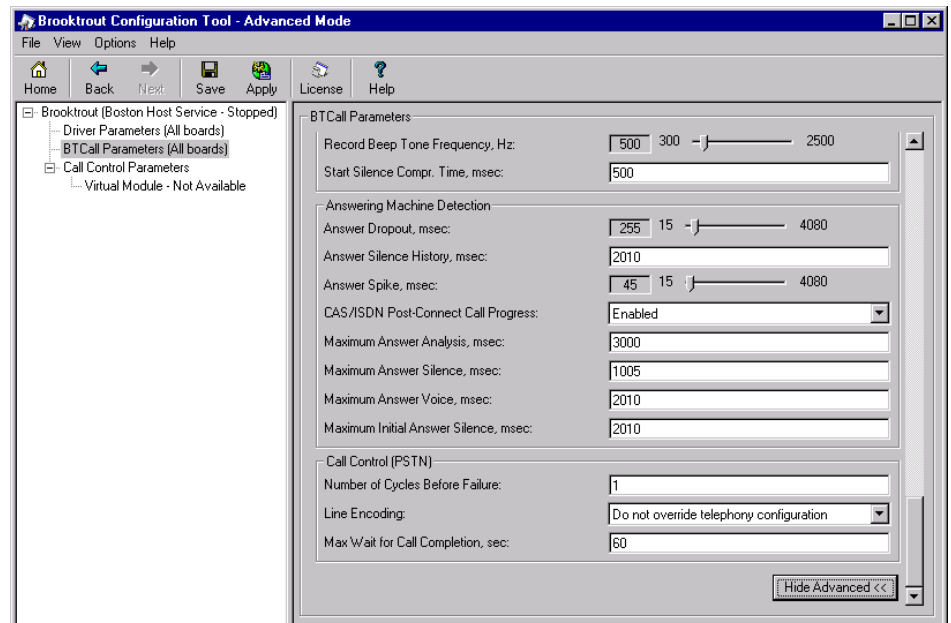


Hide Advanced Button

When you click **Show Advanced**, the **Advanced Settings** portion of the panel appears, and the **Hide Advanced <<** button is displayed.

There can be more than one panel of parameter information for **Advanced Settings**.

Note: Most users never need to alter the **Advanced Settings** parameter values. If you know these settings are incorrect, please contact Dialogic Technical Services and Support for more information. See [Getting Technical Support on page 29](#).



Using a Call Control Configuration File

The call control configuration file (***callctrl.cfg***) contains parameters that define how to configure your Dialogic® Brooktrout® boards for call control. The ***callctrl.cfg*** file replaces the ***teleph.cfg*** and ***ecc.cfg*** files previously used to define the call control configuration.

If you want to configure call control on your Dialogic® Brooktrout® boards, you can create a ***callctrl.cfg*** file on all supported operating systems (Linux, Solaris, and Windows®). On Windows® operating systems, you have the option of using the Dialogic® Brooktrout® Configuration Tool to configure the call control, or you can create or edit a call control configuration file that is read by the configuration tool. See [***Using the Dialogic® Brooktrout® Configuration Tool on Windows® Systems on page 130***](#) and ***Volume 6, Appendix A*** of the ***Bfv API Reference Manual***.

About the Call Control Configuration File

The call control configuration file is an ASCII file that contains general configuration parameters for all telephony hardware modules and static telephony connections to be formed for all modules. You can create your own file or edit one of the sample files supplied with the Brooktrout SDK in the ***Brooktrout\Boston\config\samples.cfg*** directory.

A complete description of the parameters in the call control configuration file along with examples of analog LS, analog DID, BRI, E1 ISDN (PRI), E1 CAS, E1 R2 CAS, T1 ISDN, T1 RBS, and IP call control configuration files is provided in ***Volume 6, Appendix A*** of the ***Bfv API Reference Manual***.

The ***call_control*** parameter in the user-defined configuration (***btcall.cfg***) file specifies the path and filename of the call control configuration file. The Bfv API and the Configuration Tool use ***callctrl.cfg*** as the default value. The application passes the ***callctrl.cfg*** file containing all the telephony configuration information for the BOSTON modules to the ***BfvLineReset*** function. ***BfvLineReset*** uses this information to reset and initialize the system.

The call control configuration (***callctrl.cfg***) file is divided into the following sections:

- Global parameters for call control that select trace options such as the name and size of the trace file and whether to turn tracing on or off.
- Global module parameters that define connections, specify A-law or μ -law, and specify ***autoconnect*** for the entire module.
- Generic clock configuration parameters that specify clock mode and source and H.100-specific parameters for the entire module.
- Port configuration parameters that describes the signaling protocol of a port and the specific parameters for the port based on the signaling protocol.
- IP call control configuration parameters that describe IP-enabled boards on the system.
- Ethernet interface parameters where you can configure modules with multiple interfaces.

Call Control (***callctrl.cfg***) File Examples

See ***Volume 6, Appendix A***, in the ***Bfv API Reference Manual*** for configuration file (***callctrl.cfg***) examples, including (but not limited to) the following port-specific configurations:

- Analog ports (loop start (LS) and direct inward dialing DID))
- ISDN BRI ports
- E1 CAS, E1 R2 CAS, and E1 ISDN ports
- T1 ISDN and T1 RBS ports
- SIP ports
- H.323 ports
- T1/E1 QSIG ports

7 - Directory Structure

This chapter contains tables that show the directory structure used for all installed binary, firmware, and sample source files, both platform-independent and platform-specific for all operating system platforms.

Some facilities might not be used with your Brooktrout SDK.

For information on how to compile sample applications using Windows® Developer Studio® Project files, Dialogic® Brooktrout® files, and makefiles, refer to the ***Dialogic® Brooktrout® Fax Products SDK Developer Guide***.

Installed Files Directory Structures

The directory structures created when you install the Bfv API are dependent on the operating system platform that you are using:

- ***Table 4 - Platform-Independent Files on page 203***
- ***Table 5 - Linux-Specific Files on page 205***
- ***Table 6 - Solaris-Specific Files on page 207***
- ***Table 7 - Windows-Specific Files on page 209***

See one of the following for the default directory:

- ◆ Windows: \Brooktrout\Boston
- ◆ Unix: /usr/sys/brooktrout/boston

Table 4. Platform-Independent Files

Directory	Contents
<i>acc.api</i>	Sub-directory for Audio Conferencing (ACC) files
<i>acc.api/inc</i>	ACC library header file
<i>acc.api/samples</i>	Directories for ACC sample files
<i>acc.api/samples/bridgeconf</i>	Sample application for a bridge conference
<i>acc.api/samples/simpleconf</i>	Sample application for a simple conference
<i>bfv.api</i>	Sub-directory for the Bfv API files
<i>bfv.api/app.src</i>	Configuration files and sample application source files
<i>bfv.api/app.src/ivr_msg</i>	Specific infopkt files for the IVR sample application
<i>bfv.api/app.src/params</i>	Country parameter file
<i>bfv.api/bapp.src</i>	Configuration files and BOSTON-specific sample application source files
<i>bfv.api/fonts</i>	Fonts for ASCII fax transmission
<i>bfv.api/inc</i>	Bfv API library header files
<i>bfv.api/misc</i>	High-level sample files

Table 4. Platform-Independent Files (Continued)

Directory	Contents
<i>bfv.api/samples</i>	Low-level sample files
<i>bfv.api/utlis/fonts</i>	Font files
<i>bin</i>	Runtime executable, libraries, and help files for audio conferencing, IP call control and Dialogic® Brooktrout® License Manager
<i>bsmi.api</i>	Sub-directory for BOSTON Simple Message Interface files
<i>bsmi.api/bapp.src</i>	BSMI sample source files
<i>bsmi.api/inc</i>	BSMI library header files including country-specific R2 CAS protocol files
<i>config</i>	Sub-directory for call control configuration files and protocol variants
<i>config/samples.cfg</i>	Sample configuration files
<i>driver</i>	Driver directories
<i>driver/common</i>	Files used by low level applications to communicate with driver
<i>driver/inc</i>	Header files used by both driver and low level applications
<i>driver/fw/cmndset</i>	Firmware command set header files
<i>fw</i>	Firmware files
<i>utlis/oslib</i>	Sub-directory for operating system independent files
<i>utlis/osilib/inc</i>	Operating system independent library header file
<i>utlis/oslib/osi.src</i>	Operating system independent source files

Table 5. Linux-Specific Files

Directory	Contents
<i>acc.api/linux</i>	Sub-directory for Linux-specific Audio Conferencing (ACC)
<i>acc.api/linux/lib/3.4</i>	Compiled library files for ACC for Enterprise Linux ES/AS 4.0
<i>acc.api/linux/lib/7</i>	Compiled library files for ACC for Enterprise Linux ES/AS 3.0 or earlier
<i>acc.api/linux/lib/4.1</i>	Compiled library files for ACC for Enterprise Linux Edition 5.0
<i>acc.api/linux/samples</i>	Sub-directory for sample ACC applications
<i>acc.api/linux/samples/bridgeconf</i>	Makefile, configuration files, and program files for a bridge conference
<i>acc.api/linux/samples/simpleconf</i>	Makefile, configuration files, and program files for a simple conference
<i>bfv.api/linux</i>	Sub-directory for Linux-specific compilation areas and utilities for Bfv API
<i>bfv.api/linux/app.src</i>	Makefile and configuration files for sample applications
<i>bfv.api/linux/bapp.src</i>	Makefile, configuration files, and compiled executables for BOSTON-specific sample applications
<i>bfv.api/linux/bin/3.4</i>	Bfv API binary files for Enterprise Linux ES/AS 4.0
<i>bfv.api/linux/bin/7</i>	Bfv API binary files for Enterprise Linux ES/AS 3.0 or earlier
<i>bfv.api/linux/bin/4.1</i>	Bfv API binary files for Enterprise Linux 5.0
<i>bfv.api/linux/lib/3.4</i>	Compiled Bfv API libraries for Enterprise Linux ES/AS 4.0
<i>bfv.api/linux/lib/7</i>	Compiled Bfv API libraries for Enterprise Linux ES/AS 3.0 and earlier
<i>bfv.api/linux/lib/4.1</i>	Compiled Bfv API libraries for Enterprise Linux 5.0
<i>bfv.api/linux/utils/bin</i>	Compiled G3 utilities

Table 5. Linux-Specific Files (Continued)

Directory	Contents
<i>bsmi.api/linux</i>	Sub-directory for Linux-specific BOSTON Simple Message Interface files
<i>bsmi.api/linux/bapp.src</i>	Makefile
<i>bsmi.api/linux/lib/3.4</i>	Compiled library files for BSMI for Enterprise Linux ES/AS 4.0
<i>bsmi.api/linux/lib/7</i>	Compiled library files for BSMI for Enterprise Linux ES/AS 3.0 and earlier
<i>bsmi.api/linux/lib/4.1</i>	Compiled library files for BSMI for Enterprise Linux 5.0
<i>driver/linux</i>	Sub-directory for Linux-specific driver compilation areas and utilities
<i>driver/linux/common/3.4</i>	Enterprise Linux ES/AS 4.0 driver libraries
<i>driver/linux/common/7</i>	Enterprise Linux ES/AS 3.0 (and earlier) driver libraries
<i>driver/linux/common/4.1</i>	Enterprise ES/AS 5.0 driver libraries
<i>driver/linux/install</i>	Installation program and library
<i>driver/linux/kernel</i>	Compiled binaries for the driver
<i>driver/linux/user</i>	Compiled binaries for the driver utility programs
<i>utils/linux</i>	Sub-directory for Linux-specific tracing utilities and configuration files
<i>utils/osilib/linux/lib</i>	Sub-directory for compiled OSI libraries for Linux
<i>utils/osilib/linux/lib/3.4</i>	Compiled OSI libraries for Enterprise Linux ES/AS 4.0
<i>utils/osilib/linux/lib/7</i>	Compiled OSI libraries for Enterprise Linux ES/AS 3.0 and earlier
<i>utils/osilib/linux/lib/4.1</i>	Compiled OSI libraries for Enterprise Linux 5.0
<i>utils/osilib/linux/osi.src</i>	Makefiles for OSI libraries

Table 6. Solaris-Specific Files

Directory	Contents
<i>acc.api/solaris</i>	Sub-directory for Solaris-specific Audio Conferencing (ACC) files
<i>acc.api/solaris/lib/32</i>	Compiled library files for ACC for Solaris 32-bit systems
<i>acc.api/solaris/lib/64</i>	Compiled library files for ACC for Solaris 64-bit systems (SPARC only)
<i>acc.api/solaris/samples</i>	Sub-directories for sample ACC applications
<i>acc.api/solaris/samples/bridgeconf</i>	Makefile, configuration files, and program files for a bridge conference
<i>acc.api/solaris/samples/simpleconf</i>	Makefile, configuration files, and program files for a simple conference
<i>bfv.api/solaris</i>	Sub-directory for Solaris-specific compilation areas, and utilities for Bfv API
<i>bfv.api/solaris/app.src</i>	Makefile and configuration files
<i>bfv.api/solaris/bapp.src</i>	Makefile, configuration files, and compiled executables for BOSTON-specific sample applications
<i>bfv.api/solaris/bin/32</i>	Bfv API binary files for Solaris 32-bit systems
<i>bfv.api/solaris/lib/32</i>	Compiled Bfv API libraries for 32-bit systems
<i>bfv.api/solaris/lib/64</i>	Compiled Bfv API libraries for 64-bit systems (SPARC only)
<i>bfv.api/solaris/utils</i>	Sub-directory for G3 utilities
<i>bfv.api/solaris/utils/bin</i>	Compiled G3 utilities
<i>bsmi.api/solaris</i>	Sub-directories for Solaris-specific BOSTON Simple Message Interface files
<i>bsmi.api/solaris/bapp.src</i>	Makefile
<i>bsmi.api/solaris/lib/32</i>	Compiled library files for BSMI for Solaris 32-bit systems
<i>bsmi.api/solaris/lib/64</i>	Compiled library files for BSMI for Solaris 64-bit systems (SPARC only)

Table 6. Solaris-Specific Files (Continued)

Directory	Contents
<i>driver/solaris</i>	Sub-directory for Solaris-specific compilation areas and utilities
<i>driver/solaris/common/32</i>	Solaris-specific 32-bit driver libraries
<i>driver/solaris/common/64</i>	Solaris-specific 64-bit driver libraries
<i>driver/solaris/install</i>	Installation program
<i>driver/solaris/kernel</i>	
<i>driver/solaris/kernel/27</i>	Compiled binaries for the 32-and 64-bit drivers
<i>driver/solaris/user</i>	Sub-directory for compiled binaries for the driver utility programs
<i>utils/osilib/solaris/lib</i>	Sub-directory for compiled OSI libraries for Solaris
<i>utils/osilib/solaris/lib/32</i>	Compiled OSI libraries for Solaris 32-bit systems
<i>utils/osilib/solaris/lib/64</i>	Compiled OSI libraries for Solaris 64-bit systems
<i>utils/osilib/solaris/osi.src</i>	Makefiles for OSI libraries
<i>utils/solaris</i>	Configuration files for Solaris tracing utilities
<i>utils/solaris//32</i>	Tracing utility for 32-bit systems
<i>utils/solaris//64</i>	Tracing utility for 64-bit systems
Solaris SPARC Systems	
<i>usr/lib/sparcv9</i>	Compiled library files for SPARC V9 operating systems

The Call Tracer utility, and a sample configuration file, can be found in the **\Brooktrout\Boston\utils\winnt\bin** directory when installing the Brooktrout SDK, or in the **\Brooktrout\bin** directory when installing just the Brooktrout SDK.

Table 7. Windows-Specific Files

Directory	Contents
<i>acc.api</i>	Files for Windows-specific Audio Conferencing (ACC)
<i>acc.api\winnt\inc</i>	Library header files
<i>acc.api\winnt\lib</i>	Compiled library files for ACC
<i>acc.api\winnt\samples</i>	Sub-directory for ACC sample applications
<i>acc.api\winnt\samples\bridgeconf</i>	Makefile, configuration files, and program files for a bridge conference
<i>acc.api\winnt\samples\bridgeconf\res</i>	Resource files
<i>acc.api\winnt\samples\simpleconf</i>	Makefile, configuration files, and program files for a simple conference
<i>acc.api\winnt\samples\simpleconf\res</i>	Resource files
<i>bfv.api\winnt</i>	Sub-directory for Windows-specific compilation areas and utilities
<i>bfv.api\winnt\app.src</i>	Makefile, configuration files, and sample application files
<i>bfv.api\winnt\bapp.src</i>	Makefile, configuration files, and compiled executables for BOSTON-specific sample applications
<i>bfv.api\winnt\bin</i>	Boston Host Service executable and library
<i>bfv.api\winnt\lib</i>	Compiled Bfv API libraries
<i>bfv.api\winnt\utils</i>	Sub-directory for G3 utilities
<i>bfv.api\winnt\utils\bin</i>	Compiled G3 utilities
<i>bsmi.api\winnt</i>	Sub-directory for Windows-specific BOSTON Simple Message Interface files
<i>bsmi.api\winnt\lib</i>	Compiled library files for BSMI
<i>bsmi.api\winnt\bapp.src</i>	Makefile

Table 7. Windows-Specific Files (Continued)

Directory	Contents
<i>bsmi.api\winnt\bin</i>	Debugging program and configuration file.
<i>driver\winnt</i>	Sub-directory for Windows® platform-specific compilation areas and utilities
<i>driver\winnt\common</i>	Windows-specific driver libraries
<i>driver\winnt\install</i>	Installation program and associated files for 32- and 64-bit operating systems
<i>driver\winnt\user</i>	Compiled binaries for the driver utility programs
<i>driver\winnt\pnp</i>	Plug-and-Play <i>.inf</i> file
<i>driver\winnt\pnp\TRxStream</i>	PnP boston driver, driver symbol file, co-installer and device property pages for 32- and 64-bit operating systems.
<i>utils\winnt\bin</i>	Dialogic® Brooktrout® Configuration Tool, AccuCall, and Call Tracer executables, help and configuration files
<i>utils\osilib\winnt\lib</i>	Compiled OSI libraries
<i>utils\osilib\winnt\osi.src</i>	Makefiles for OSI library
<i>%SYSTEMROOT%\system32\</i>	Boston Host Service executable and library for 32-bit systems.
<i>%SYSTEMROOT%\syswow64\</i>	Boston Host Service executable and library for 64-bit systems.
Note: <i>%SYSTEMROOT%</i> is usually <i>C:\winnt</i> or <i>C:\windows</i> .	

8 - Using the Dialogic® Brooktrout® TECUpdate Utility

This chapter describes how one can use the Dialogic® Brooktrout® Technology Expansion Capability (TEC) utility to display and upgrade the configured feature set on an installed board.

This chapter includes the following:

- ***Starting Dialogic® Brooktrout® TECUpdate on page 212***
- ***When Errors Occur on page 214***
- ***Running the Dialogic® Brooktrout® TECUpdate Utility on page 216***
- ***Error Logging on page 218***

To successfully perform an upgrade, you need to know the serial number of your board and have an appropriate license key provided by Dialogic.

Use the Dialogic® Brooktrout® TECUpdate utility to record the serial number of your board before you contact Dialogic to order the license file. When you receive an email with your updated license file, you can again use the TECUpdate utility to download the license file and expand the functionality of your board.

Starting Dialogic® Brooktrout® TECUpdate

The Dialogic® Brooktrout® TECUpdate utility is installed as a separate software package. For more information:

- See the chapter on packaging your application in the ***Developer Guide***.
- Contact your authorized Dialogic reseller or application partner.

Distribute the TECUpdate utility to your end users even if you do not plan to distribute the Dialogic® Brooktrout® Configuration Tool, so that your customers can update their systems as needed.

The TECUpdate utility assumes that the:

- Firmware is downloaded to the board.
- Dialogic® Brooktrout® BOSTON driver is started.

You can run the TECUpdate utility from the file system (for example, Windows® Explorer), Start Menu or the command line:

- File System:

[InstallDIR]\TECUpdate.exe

where: InstallDIR is the directory where you installed the utility.

- Start Menu:

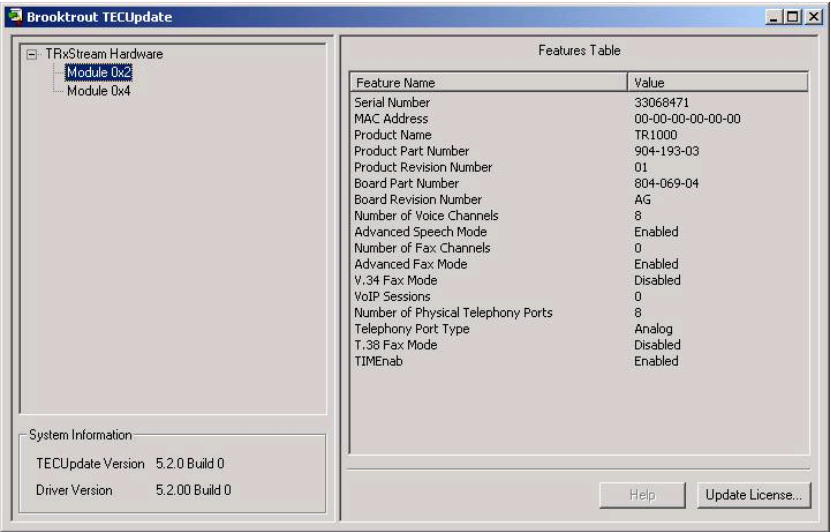
Start → Programs → Brooktrout → TECUpdate_setup.exe

- Command Line:

c:\Brooktrout\boston\TECUpdate.exe

The TECUpdate utility queries and displays information for the selected module. TECUpdate operates with Dialogic® Brooktrout® drivers from Brooktrout SDK 2.1.0 and above.

Following a successful start, the **Brooktrout TECUpdate** window appears. See [Running the Dialogic® Brooktrout® TECUpdate Utility on page 216](#) for specific steps to obtain module information.



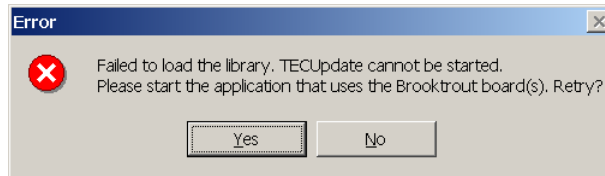
When Errors Occur

If an error occurs, it is recorded in the error log file (see [Error Logging on page 218](#)). Contact Dialogic Technical Services and Support with the error log information if you cannot resolve the problem.

If there are firmware or driver errors, the following **Error** dialogs are possible:

Driver Error

- Click **Yes** to retry after loading the driver. Before trying to run TECUpdate again, an **Error** dialog asks you to load the driver:



Yes

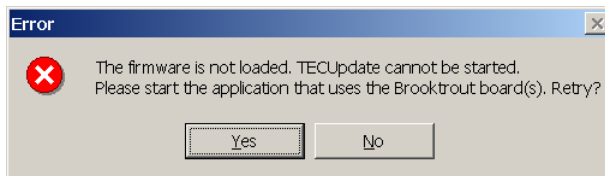
Tries to determine if the driver is started, then proceeds with the TECUpdate initialization process. If an error occurs, the dialog reappears.

No

TECUpdate utility exits.

Firmware Error

- Click **Yes** to retry after downloading the firmware. Before trying to run TECUpdate again, an **Error** dialog asks you to load the driver:



Yes

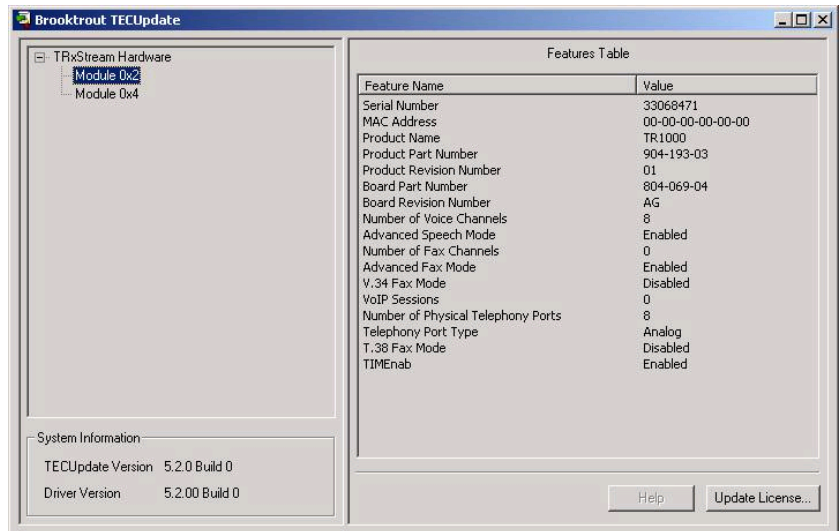
Tries to determine if the firmware is loaded, then proceeds with the TECUpdate initialization process. If an error occurs, the dialog reappears.

No

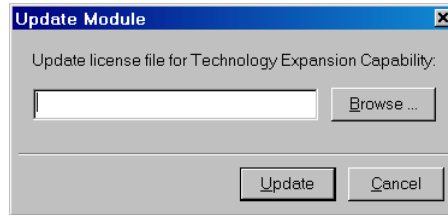
TECUpdate utility exits.

Running the Dialogic® Brooktrout® TECUpdate Utility

- ***To display and update information for each module in your system, do the following:***
- Click on a specific module to display its information:
 - The left panel contains the tree for TRxStream Hardware. All modules installed in your system are shown.
 - The lower left panel contains the **TECUpdate Version** and **Driver Version** information.
 - The right panel displays the feature set for the selected module.
 - The lower right panel contains an online **Help** and **Update License** buttons. **Update License** allows you to update the feature configuration for a selected module using a specified license file.

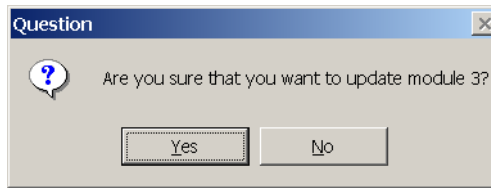


- Click **Update License** to load the license file updates.
The **Update Module** dialog appears:

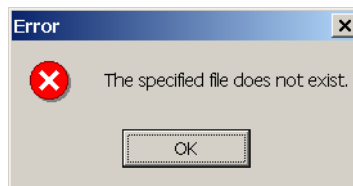


- Click **Browse** to locate the license file (*.lic), then click **Update** to begin the updating process.
- Click **Yes** to begin the download of the license file.

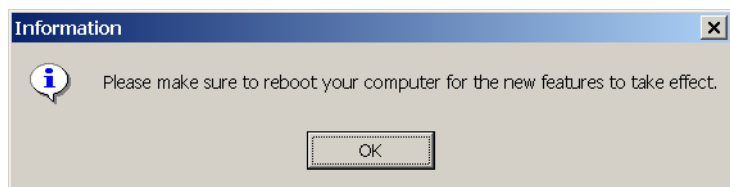
A **Question** confirmation dialog appears before the update continues.



Click **OK** when an **Error** dialog appears to return to the Browse process (Step 3) and locate the correct file.



- Click **OK** if boards were updated with the new license information. The **Feature Table** on the right panel reflects the most current information about the module.



- Reboot your computer.

Error Logging

If TECUpdate encounters an error, an **Error** dialog box is displayed. Please see the error log file for more information. The error log file includes:

- ◆ TECUpdate version
- ◆ Driver version
- ◆ Diagnostic information

Provide the log file to Dialogic Technical Services and Support for more information on solving this error. The ASCII text file is called ***TECUpdate.log*** and is stored in the current application working directory. Subsequent errors are appended to this log file.

9 - Downloading Firmware

This chapter describes how one can download the firmware to the board.

The chapter includes the following:

- ***Introduction on page 220***
- ***Firmware Files on page 221***
- ***Updating Boot ROM Flash on page 222***
- ***Manually Downloading the Firmware on page 223***

Introduction

To install the software, you can download the firmware files and optionally configure call control.

For Linux and Solaris operating systems, the procedures for downloading firmware are described here.

If your operating system is Windows, you can use the Dialogic® Brooktrout® Configuration Tool to download the firmware and configure the call control parameters.

To configure call control, see ***Using a Call Control Configuration File on page 200*** and ***Volume 6, Appendix A*** of the ***Bfv API Reference Manual***.

Firmware Files

Table 8 lists the firmware files. See the Release Notes that came with your software CD for further information.

Table 8. Firmware and Flash Update Files

File	Use
<i>bostvb.dll</i>	Firmware for the SR140 virtual module
<i>cp.bin</i>	Control processor (PPC) firmware for all platforms
<i>dsp1000.hex</i>	High density DSP firmware for voice and fax modules without V.34 fax (includes V.17 fax)
<i>dsp1000_ld.hex</i>	Low density DSP firmware for TR1034 analog and BRI modules or TruFax® analog and BRI boards (includes V.17 and V.34 fax)
<i>dsp1000_ud.hex</i>	Ultra high density DSP firmware for multi-span voice and fax modules (non-V34)
<i>dsp1000_v34.hex</i>	High density DSP firmware for TR1034 voice and fax with V.34 fax and T.38 fax
<i>dsp1034_ud.hex</i>	Ultra high density DSP firmware for multi-span TR1034 voice and fax modules with V.34 fax and T.38 fax

Updating Boot ROM Flash



Typically, it is not necessary to update your Boot ROM. Use the following procedure to update your Boot ROM Flash firmware only when told to do so by a Dialogic Technical Services and Support Representative. The *boston* driver must be running when you update the boot ROM flash.

➤ ***Use the following procedure to update your Boot ROM Flash firmware.***

1. Ensure that each board has a unique module number. Maintain a current list. See [Determining the Board Module Number on page 33](#) for more information about modules and module number assignment. You can obtain a list of modules using the ***modinfo*** program.
2. Use the ***firm*** program to perform a flash update (do not interrupt the update process):

```
firm -m <module> -t 2 flashupd.bin
```

where: <module> is the hardware module number.

Note: This process takes less than a minute to complete. It is important not to interrupt the update process. If you interrupt the update process, you cannot reboot your board.

Manually Downloading the Firmware

You must download the firmware each time you boot the machine or restart the device driver.

To download the firmware to a module, you must run the ***firmload*** or ***firm*** program, both of which are located in the ***brooktrout/boston/bfv.api/<platform>/bapp.src*** directory.

The ***firmload*** program loads the control processor and DSP firmware on all Dialogic® Brooktrout® modules found in the system.

The **-c** option for the ***firm*** and ***firmload*** commands or the ***config_spec_value*** field of ***BfvFirmwareDownload*** sets the actual number of channels supported on the module.

First, start the driver if it is not already started, and if your operating system platform requires it.

Then, change to the ***<install_root>/bfv.api/<platform>/bapp.src directory*** and run the ***firmload*** or ***firm*** program.

To run the ***firmload*** program:

```
firmload -c num_channels brooktrout/boston/fw
```

Where **num_channels** is the number of channels configured to receive a firmware download.

For example:

```
firmload -c 48 brooktrout/boston/fw
```

The firmware consists of two types, by number, which must be downloaded in the proper sequence. The ***firmload*** program automatically takes care of identifying the proper files and downloading them in the correct sequence. If you wish to download the firmware using the ***firm*** program, you must download each module separately and specify the number of channels (**-c**) in the first ***firm*** command:

```
firm -m <module> -c <num_channels> -t <firmtype>  
<firmname>
```

➤ ***The sequence is as follows:***

1. Type 2 (PROC_APP) = Control processor firmware (cp.bin)
2. Type 1 (DSP_APP) = DSP firmware, use one of the following DSP firmware files:

bostvb.dll	SR140 Fax Software
dsp1000.hex	Brooktrout boards in T1 robbed-bit, T1 or E1 ISDN
dsp1000_ld.hex	Analog and BRI boards and TruFax® analog and BRI boards
dsp1000_ud.hex	Multi-span Series ISDN boards (non-V.34)
dsp1000_v34.hex	TR1034 boards with V.34 fax and T.38 fax
dsp1034_ud.hex	Multi-span TR1034 boards with V.34 fax and T.38 fax

For example:

```
firm -m 2 -c 30 -t 2 cp.bin
```

```
firm -m 2 -t 1 dsp1000.hex
```

It takes about 10 seconds per module for the firmware to download and for the module to begin operating. Proper operation is indicated by the module status LED slowly flashing green.

See the descriptions of these programs in the developer guide chapter about sample applications and utilities.

When the firmware is downloaded to a module for the first time, the assigned ordinal channel numbers start wherever the assignment left off on the previous module. As the system initializes the modules, this numbering process creates a continuous ordering of the channel assignments across all the modules in the system. On later downloads, each module's ordinals begin at the same location, regardless of any decrease or increase in the channel count of a lower-numbered module. Therefore, if you decrease the channel count for a lower numbered module, the process creates gaps in the channel numbering assignments, possibly affecting your application. If you attempt to increase the channel count above any module's initial channel count, the system ignores the added channels.

➤ ***For the following situations, restart the driver whenever you want to:***

1. Get a continuous assignment of channel numbers after decreasing the channel count on any module.
2. Increase the number of channels above a module's initial channel count.

Note: You must reboot the system to restart the driver.

Appendix A

Compliance Information

This appendix describes how the Dialogic® Brooktrout® boards conform to compliance standards.

It has the following sections:

- ***Electromagnetic Compatibility Statements on page 228***
- ***Telecommunications Compliance Statements on page 233***
- ***Safety Compliance Statements on page 240***

Note to developers and system integrators: The following compliance information and statements must be provided to your customer or end user as part of your system documentation.

Electromagnetic Compatibility Statements

Electromagnetic compliance requirements include country specific statements for:

- ***United States of America on page 229***
- ***Canada on page 231***
- ***European Union on page 231***
- ***Japan on page 232***

The Federal Communications Commission (FCC) in the United States and Industry Canada (IC) in Canada regulate all electronic devices that connect to the telephone system and/or generate radio frequency signals. Additionally, all computing devices utilizing clock frequencies in excess of 10 kHz must be tested for compliance with RF emission limits set by the FCC and IC. The Dialogic® Brooktrout® board is such a device and must comply with the Class A or Class B regulations as specified below.

The following statements should be conspicuously located in bold letters in the end user system documentation.

United States of America

Mandatory Statements



Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

You must also add the following paragraph if shielded cables were used when testing your product:

In order to maintain compliance with FCC limits, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio & television reception.

Class A Statement (for “Class A” products)

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Class B Statements (for “Class B” products)

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this is equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

You might also find the following booklet helpful, prepared by the FCC: “***How to Identify and Resolve Radio-TV Interference Problems.***” This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402

Canada

Class A Statements (for “Class A” products)

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la class A est conforme à la norme NMB-003 du Canada.

Class B Statements (for “Class B” products)

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la class B est conforme à la norme NMB-003 du Canada.

European Union

Class A Statements (for “Class A” products)

This equipment complies with the requirements of CISPR 22 (EN 55022) for Class A Information Technology Equipment (ITE).

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user is required to take adequate measures.

Class B Statements (for “Class B” products)

This equipment complies with the requirements of CISPR 22 (EN 55022) for Class B Information Technology Equipment (ITE).

Japan

VCCI Class Statements

Class A ITE

Class A Statement (For Class A Products).

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Translation:

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may occur, in which case, the user may be required to take corrective actions.

Class B ITE

Class B Statement (For Class B Products).

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB 情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。

取扱説明書に従って正しい取り扱いをして下さい。

Translation:

This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

Telecommunications Compliance Statements

The following customer information must be provided to customers with each unit of approved terminal equipment.

The statements provided below should be conspicuously located in the end user system documentation:

United States of America

Equipment Approved After July 23, 2001

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the circuit side (bottom side) of this equipment is a label that contains, among other information, a product identifier in the format USAAAEQ##TXXXX. If requested, this information must be provided to the telephone company.

Ringer Equivalence Number (REN)

The REN is used to determine the number of devices that might be connected to a telephone line. Excessive RENs on a telephone line can result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that can be connected to a line, as determined by the total RENs, contact the local telephone company.

For products approved after July 23, 2001, the REN for this product is part of the product identifier that has the format US:AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point (e.g., 03 is a REN of 0.3). For earlier products, the REN is separately shown on the label.

Connection to Telecommunications Networks

A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant. Please refer to the installation instructions provided with this equipment for details.

Please refer to the installation instructions provided with this equipment for details concerning the Universal Service Order Codes ("USOC") that are applicable to this equipment.

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service might be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company can make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

There are no user replaceable or serviceable components in this equipment. If trouble is experienced with this equipment, for repair or warranty information, please refer to the appropriate section of the general customer instructions for this equipment. If the equipment is causing harm to the telephone network, the telephone company can request that you disconnect the equipment until the problem is resolved.

This equipment must not be used on party lines. Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for further information.

FCC Rules Regarding FAX Branding

The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device, including FAX machines, to send any message unless such message clearly contains in a margin at the top or bottom of each transmitted page or on the first page of the transmission, the date and time it is sent and an identification of the business or other entity, or other individual sending the message and the telephone number of the sending machine or such business, other entity, or individual. (The telephone number provided cannot be a 900 number or any other number for which charges exceed local or long-distance transmission charges.)

To program this information into your FAX machine, you should complete the following steps:

- Users:** To program this information into your fax machine, follow the procedure described in your user manual.
- Developers:** You must include facilities in your application to enable the user to enter the required information. Use the **BfvFaxHeader** function with the Dialogic® Brooktrout® board to place this information on each transmitted page as required. You must also include, in your user manual, instructions for entering this information into your system.

Note to OEM Partners (final equipment assemblers):

For information related to power supply source requirements, signal levels, etc., please refer to the installation instructions and general specifications provided with this equipment.

The mounting of the approved unit in the final assembly must be made so that:

- The approved unit is isolated from exposure to any hazardous voltages within the assembly.
- Adequate separation and restraint of cables and cords must be provided.
- The circuitry from the approved unit to the telephone line must be provided in wiring that carries no other circuitry (such as PC or PR leads) unless specifically allowed by the rules.
- PC board traces carrying tip and ring leads shall have sufficient spacing to avoid surge breakdown.
- The final assembler shall provide in the consumer instructions all applicable customer information.

- The approval label shall be placed on the exterior of the cabinet for each type of approved device contained therein if the approved device is enclosed in an assembly, and not readily accessible.
- Modular plugs or jacks shall be provided which comply with TIA-968-A Chapter 6 requirements for dimensions, tolerances and metallic plating.

FCC Regulations For Connecting to a T1 Interface

The Federal Communications Commission (FCC) has established rules that permit a Dialogic® Brooktrout® board to be directly connected to the telephone network:

Standardized jacks are used for connections.

This equipment can not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs. (Contact your state public utility commission or corporation commission for information).

A malfunctioning circuit can harm the telephone network.

Disconnect a malfunctioning Dialogic® Brooktrout® board from the telephone network until you determine the cause of the malfunction and repair it. If a malfunctioning Dialogic® Brooktrout® board remains connected, the telephone company can temporarily disconnect service.

The Dialogic® Brooktrout® board is approved as a DSX-1 device. Federal regulations (FCC Part 68) prohibit connection of a DSX-1 device to the network without an FCC approved Channel Service Unit (CSU). Customers connecting this device to the network shall, upon request of the telephone company, inform the telephone company of the particular lines to which such connections are made and the FCC registration of the protection device (CSU).

The CSU has been designed to prevent harm to the T1 network. If the telephone company finds that the equipment is exceeding tolerable parameters, the telephone company can temporarily disconnect service, although they will attempt to give you advance notice if possible.

If the telephone company alters their equipment in a manner that will affect use of this device, they must give you advance warning so as to give you the opportunity for uninterrupted service. You will be advised of your right to file a complaint with the FCC.

Under the FCC rules, no customer is authorized to repair this equipment. This restriction applies regardless of whether the equipment is in or out of warranty.

Before connecting the Dialogic® Brooktrout® board to telephone service, you must give a representative of the local telephone company the following information:

- The telephone numbers (Port ID) to which the Dialogic® Brooktrout® board is connected.
- SOC: 6.0P HP02
 6.0Y HP03
- FIC: 04DU9-BN 1.544 Mbps SF
 04DU9-DN 1.544 Mbps SF+B8ZS
 04DU9-1KN 1.544 Mbps ESF
 04DU9-1SN 1.544 Mbps ESF+B8ZS
- The type of wall jack required: USOC-RJ-48C
- The FCC Registration number: Labeled on back of board
- FCC registration of the protection device (CSU)

Canada

NOTICE: This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. On certain products, the abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

AVIS: Le présent matériel est conforme aux spécifications techniques d'Industrie Canada applicables au matériel terminal. Cette conformité est confirmée par le numéro d'enregistrement. Le sigle IC, placé devant le numéro d'enregistrement, signifie que l'enregistrement s'est effectué conformément à une déclaration de conformité et indique que les spécifications techniques d'Industrie Canada ont été respectées. Il n'implique pas qu'Industrie Canada a approuvé le matériel.

NOTICE: The Ringer Equivalence Number (REN) for this terminal equipment is 0.4. The REN is an indication of the number of devices allowed to be connected to a telephone interface. The termination on an interface can consist of any combination of devices subject only to the requirement that the sum of the RENs of all the devices do not exceed 5.

AVIS: L'indice d'équivalence de la sonnerie (IES) du présent matériel est de 0.4. L'IES assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface téléphonique. La terminaison d'une interface peut consister en une combinaison quelconque de dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions might not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.



Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Australia

Fail-Safe Operation (AS/ACIF S038-2001).

This equipment will be inoperable when mains power fails.



This equipment will not continue to support emergency dialing after loss of mains power.

Safety Compliance Statements

The following customer information must be provided to customers with each product.

The statements provided below should be conspicuously located in the end user system documentation:

United States of America and Canada

This product is listed by Underwriters Laboratories, a Nationally Recognized Test Laboratory (NRTL). The Listing Mark is located on the bottom surface of the board. The Dialogic® Brooktrout® board has been tested and complies with UL 60950 and CAN/CSA-C22.2 No. 60950, Safety of Information Technology Equipment, Including Electrical Business Equipment.

Install this card only in UL Listed equipment that has instructions stating that the user may install and remove accessory cards.

This product must be mounted in the final assembly so that it is isolated from exposure to any hazardous voltages (voltages greater than 42.4V peak or 60Vdc) within the assembly. Adequate separation and restraint of cables and cords must be provided.



To maintain the safety certification of the system, ensure that the power drawn from the power supply does not exceed its capacity. Please refer to the power usage table on the hardware installation card applicable to your board for information on the voltages and currents required for proper operation.

Models of this card that contain DID interfaces are for use only in equipment that has a permanent connection to protective earth and is installed in a restricted access location.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.



Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Disconnect any TNV circuit connectors (telephone line cords) from this card before removing the cover of the equipment.

Appendix B

Configuration from a Custom Installation Program

This appendix describes how one can create a custom installation program for manual configuration of the driver.

You can find installation structure and functions for the following operating systems:

- ***Linux Operating System on page 244***
- ***Solaris Operating System on page 248***
- ***Windows® Operating System on page 252***

Linux Operating System

You can perform configuration from a custom installation program by writing a program that runs **dinstall** with the `-c` option, or by writing a Bourne shell script that calls the provided installation functions described below.

Only write custom installation programs using one of these two mechanisms. Do not write them by directly including and/or modifying any of the supplied source or by writing new code to perform the same underlying system actions. Compatibility with installation functions for later versions cannot be guaranteed, but the up-to-date usage of the functions will always be documented.

The Bourne shell script containing the installation functions is **dinstlib**, located in `usr/sys/brooktrout/boston/driver/linux/install`. **Dinstall** is a particular example of a shell script that makes use of **dinstlib**.

The functions generally use shell variables to pass values in and out. An exhaustive description of these variables is not supplied here. Use the Linux driver installation and the **dinstall** script as guides (see [Chapter , Installing the SDK on Red Hat Linux on page 40](#)).

Linux Installation

mill_driver_install

Required Input Variables

Reserved	
Reserved	
Reserved	
max_pci_hw_modules	Maximum number of PCI/cPCI hardware modules.
physbufsize	Physical buffer size.
appbufsize	Application buffer size.
machine_id	Machine ID, in hex (no leading 0x).
do_reset	Reset on driver startup.
history_enable	Whether to enable history.
dhsize	History size.

<code>num_hists_phy</code>	Number of physical histories.
<code>num_hists_apl</code>	Number of application histories.
<code>hist_phy_admin_only</code>	Whether to restrict physical histories to admin channels only.
<code>num_I2O_frames_per_module</code>	Number of I2O frames per module.
<code>fc_interval</code>	Driver flow control interval, in ms.
<code>mem_drv_alloc_min</code>	Min memory allocated per allocation.
<code>mem_drv_alloc_quanta</code>	Unit of allocation increment above min.
<code>num_reserved_modules</code>	Number of reserved modules.
<code>init_mod_vals</code>	A string consisting of the hex representation of pairs of module IDs and module numbers, each with the 0x prefix. Each pair is listed with a comma in between, and commas between each pair. If none, should be set to 0.
<code>mill_test1</code>	Driver test value 1
<code>mill_test2</code>	Driver test value 2
<code>mill_test3</code>	Driver test value 3
<code>driv_kvers_dir</code>	Location of all the <i>boston.o</i> binaries. This is normally the directory <i>driver/linux/kernel/kvers</i> .

Output Variable

<code>err_msg</code>	Contains displayable error message. Note: If echo is used to display the contents, it might require the -e option to properly display some of the messages.
----------------------	---

This variable is not modified except to set to 1 or error message.

Exit Code

0 = success
1 = error

Checking the Installation

`_mill_driver_install_check`

Exit Code

0 = not installed
non-0 = installed

Defining Default Symbols

`_mill_driver_defaults`

Defines the symbols that provide defaults for use with getting parameter values.

<code>DEFAULT_MOD_NUM</code>	Default starting reserved module number.
<code>DEFAULTAPPBUFSIZE</code>	Default application buffer size.
<code>Reserved</code>	Default ISA interrupt line. Reserved, no longer in use.
<code>DEFAULTMACHINEID</code>	Default machine ID.
<code>DEFAULTMAXHWMOD</code>	Default maximum number of PCI/cPCI modules.
<code>Reserved</code>	Default number of ISA modules. Reserved, no longer in use.
<code>DEFAULTPHYBUFSIZE</code>	Default physical buffer size.
<code>DHSIZEDEF</code>	Default history size.
<code>HIST_PHY_ADMIN_ONLY_DEF</code>	Default for physical histories admin only.
<code>MAX_RESERVED_MODULE_NUMS</code>	Maximum number of module reservations.
<code>MAXAPPBUFSIZE</code>	Maximum application buffer size.
<code>MAXMACHINEID</code>	Maximum allowable machine ID.
<code>Reserved</code>	Maximum number of ISA modules. Reserved, no longer in use.
<code>MAXPHYBUFSIZE</code>	Maximum physical buffer size.
<code>MINAPPBUFSIZE</code>	Minimum application buffer size.
<code>MINMACHINEID</code>	Minimum allowable machine ID.
<code>MINPHYBUFSIZE</code>	Minimum physical buffer size.
<code>NUM_HISTS_APL_DEF</code>	Default number of application histories.
<code>NUM_HISTS_PHY_DEF</code>	Default number of physical histories.

Removing the Driver

`_mill_driver_remove`

Input Argument

`partial` (Optional) The function only performs a partial removal. Also used for removal prior to reinstallation.

Output Variable

`err_msg` Contains displayable error message.

Note: If `echo` is used to display the contents, it might require the `-e` option to properly display some of the messages.

This variable is not modified except to set to 1 or error message.

Exit Code

0 = success

1 = error

Solaris Operating System

You can perform configuration from a custom installation program by writing a program that runs **dinstall** with the **-c** option, or by writing a Bourne shell script that calls the provided installation functions described below.

Only write custom installation programs using one of these two mechanisms. Do not write them by directly including and/or modifying any of the supplied source or by writing new code to perform the same underlying system actions. Compatibility with installation functions for later versions cannot be guaranteed, but the up-to-date usage of the functions will always be documented.

The Bourne shell script containing the installation functions is **dinstlib**, located in **boston/driver/solaris/install**. **Dinstall** is a particular example of a shell script that makes use of **dinstlib**.

The functions generally use shell variables to pass values in and out. An exhaustive description of these variables is not supplied here. Use the Solaris driver installation and the **dinstall** script as guides (see [Installing the Software on page 62](#) and [Configuring the Driver Manually on page 66](#)).

Solaris Installation

mill_driver_install

Required Input Variables

Reserved	0
Reserved	0
Reserved	0
max_pci_hw_modules	Maximum number of PCI/cPCI hardware modules
physbufsize	Physical buffer size.
appbufsize	Application buffer size.
machine_id	Machine ID, in hex (no leading 0x).
do_reset	Reset on driver startup.
history_enable	Whether to enable history.
dhsize	History size.

<code>num_hists_phy</code>	Number of physical histories.
<code>num_hists_apl</code>	Number of application histories.
<code>hist_phy_admin_only</code>	Whether to restrict physical histories to admin channels only.
<code>num_I2O_frames_per_module</code>	Number of I2O frames per module.
<code>fc_interval</code>	Driver flow control interval, in ms.
<code>mem_drv_alloc_min</code>	Min memory allocated per allocation.
<code>mem_drv_alloc_quanta</code>	Unit of allocation increment above min.
<code>num_reserved_modules</code>	Number of reserved modules.
<code>init_mod_vals</code>	A string consisting of the hex representation of pairs of module IDs and module numbers, each with the 0x prefix. Each pair is listed inside braces [] with a comma in between, and commas between each pair. If none, set to 0.
<code>mill_test1</code>	Driver test value 1
<code>mill_test2</code>	Driver test value 2
<code>mill_test3</code>	Driver test value 3
<code>driv_bin_file</code>	Location of the 32-bit <i>boston</i> binary.
<code>driv_bin64_file</code>	Location of the 64-bit <i>boston</i> binary, where applicable.
<code>driv_unload_file</code>	Location of the <i>bostunld</i> binary.
<code>driv_arch_file</code>	Location of the <i>bost_arch</i> file, normally <i>driver/solaris/kernel/bost_arch</i> .

Output Variables

`err_msg` Contains displayable error message.

This variable is not modified except to set to 1 or error message.

Exit Code

0 = success

1 = error

Checking the Installation

```
_mill_driver_install_check
```

Exit Code 0 = not installed
 non-0 = installed

Defining Default Symbols

```
_mill_driver_defaults
```

Defines the symbols that provide defaults for use with variable values.

DEFAULT_MOD_NUM	Default starting reserved module number.
DEFAULTAPPBUFSIZE	Default application buffer size.
Reserved	Default ISA interrupt line. Reserved, no longer in use.
DEFAULTMACHINEID	Default machine ID.
DEFAULTMAXHWMOD	Default maximum number of PCI/cPCI modules.
Reserved	Default number of ISA modules. Reserved, no longer in use.
DEFAULTPHYBUFSIZE	Default physical buffer size.
DHSIZEDEF	Default history size.
HIST_PHY_ADMIN_ONLY_DEF	Default for physical histories admin only.
MAX_RESERVED_MODULE_NUMS	Maximum number of module reservations.
MAXAPPBUFSIZE	Maximum application buffer size.
MAXMACHINEID	Maximum allowable machine ID.
Reserved	Maximum number of ISA modules. Reserved, no longer in use.
MAXPHYBUFSIZE	Maximum physical buffer size.
MINAPPBUFSIZE	Minimum application buffer size.
MINMACHINEID	Minimum allowable machine ID.
MINPHYBUFSIZE	Minimum physical buffer size.
NUM_HISTS_APL_DEF	Default number of application histories.
NUM_HISTS_PHY_DEF	Default number of physical histories.

Removing the Driver

`_mill_driver_remove`

Input Argument

`partial` (Optional) The function only performs a partial removal.
Also used for removal prior to reinstallation.

Output Variable

`err_msg` Contains displayable error message.

This variable is not modified except to set to 1 or error message.

Exit Code

0 = success

1 = error

Windows® Operating System

You can perform configuration from a custom installation program by writing a program that runs ***install*** with the ***-c*** option, or by writing a program that calls the Dialogic-provided installation functions, described below, that can be compiled and linked into the program.

Only write custom installation programs using one of these two mechanisms. Do not write them by directly including and/or modifying any of the supplied source or by writing new code to perform the same underlying system actions. Compatibility with installation functions for later versions cannot be guaranteed, but the up-to-date usage of the functions will always be documented.

All files referred to are in the ***brooktrout\boston\driver\winnt\install*** directory. To use these functions, the custom program must include ***instlib.obj*** and ***pnplib.obj***. The object files must be linked with the custom program. ***Install.c*** is a particular example of a program that is compiled and linked in this way.

Note: To build a custom program with these object files requires the Windows® DDK (2000 or higher).

An exhaustive description of the function parameters is not supplied here. Use the Windows® driver configuration and the ***install.c*** program as guides (see ***Chapter , Installing the Device Driver on Windows® on page 95***).

Installing the Windows® Driver

Use the following function to install the Windows® PnP driver:

```
int _mill_pnp_driver_install(
    struct driver_parameters *drv_parm,
    int    do_adjustments,
    int    already_option,
    int    meg_in_system,
    int    *mem_adjust_stat,
    char   *inf_file,
    int    load_uncond,
    int    *reboot_required,
    char   **failed_win32_call,
    DWORD  *win32_err_val,
    char   **other_msg
);
```

Input Variables

already_option	Action to take if already adjusted.
appbufsize	Application buffer size.
dest_dir_name	Pointer to <code>char *</code> variable to contain the directory name in which the boston driver files were installed.
dhsize	History size.
do_adjustments	Whether to do PCI memory adjustments.
do_reset	Reset on driver startup.
driver_fname	Name of driver binary <i>boston.sys</i> file to install.
drv_parm	Pointer to a structure containing driver parameters.
failed_win32_call	Pointer to <code>char *</code> variable to contain the name of a Windows® function that failed.
fc_interval	Driver flow control interval, in ms.
hist_phy_admin_only	Whether to restrict physical histories to administrative channels only.
history_enable	Whether to enable history.
inf_file	Name of driver <i>.inf</i> file.
Reserved	ISA interrupt line is no longer used.
load_uncond	Indicates that driver should load regardless of devices being present in the system.
machine_id	Machine ID.
max_pci_hw_modules	Maximum number of PCI/cPCI hardware modules.

<code>meg_in_system</code>	Amount of memory in system.
<code>mem_adjust_stat</code>	Pointer to <code>int</code> variable to contain result of memory adjustment attempt 0 = Memory adjustment not performed 1 = Memory adjustment performed 2 = Previous adjustment detected, action dependent on <code>already_option</code>
<code>mem_drv_alloc_min</code>	Min memory allocated per allocation.
<code>mem_drv_alloc_quanta</code>	Unit of allocation increment above min.
<code>Reserved</code>	Pointer to array of ISA addresses is no longer used.
<code>Reserved</code>	Size of <code>mill_isa_addrs</code> array is no longer used.
<code>mill_test1</code>	Driver test value 1.
<code>mill_test2</code>	Driver test value 2.
<code>mill_test3</code>	Driver test value 3.
<code>num_hists_apl</code>	Number of application histories.
<code>num_hists_phy</code>	Number of physical histories.
<code>num_I2O_frames_per_module</code>	Number of I2O frames per module.
<code>Reserved</code>	Number of ISA modules is no longer used.
<code>num_reserved_modules</code>	Number of reserved modules.
<code>other_msg</code>	Pointer to <code>char *</code> variable to contain a possible error message.
<code>phybufsize</code>	Physical buffer size.
<code>pkt_version</code>	Reserved, must be 0.
<code>reboot_required</code>	Pointer to <code>int</code> variable to contain indication of whether a reboot is required.
<code>reserved_modules</code>	Pointer to array of reserved module information.
<code>reserved_modules_size</code>	Size of <code>reserved_modules</code> array.
<code>win32_err_val</code>	Win32 error code returned by failing Windows® function.

Return Value

0 = success
1 = error

Driver Parameters Structure

Use the `driver_parameters` structure to install the PnP driver (see [*Installing the Windows® Driver on page 253*](#)).

For input variable definitions, see [*Input Variables on page 253*](#).

```
struct driver_parameters
{
    int         reserved;
    int         reserved;
    unsigned    reserved;
    unsigned    reserved;
    unsigned    max_pci_hw_modules;
    unsigned    phybugsize;
    unsigned    appbufsize;
    unsigned    machine_id;
    unsigned    do_reset;
    unsigned    history_enable;
    unsigned    dhsize;
    unsigned    num_hists_phy;
    unsigned    num_hists_apl;
    unsigned    hist_phy_admin_only;
    unsigned    num_I20_frames_per_module;
    unsigned    fc_interval;
    unsigned    mem_drv_alloc_min;
    unsigned    mem_drv_alloc_quanta;
    unsigned    pkt_version;
    unsigned    num_reserved_modules;
    struct reserved_module_num *reserved_modules;
    unsigned    reserved_modules_size;
    unsigned    mill_test1;
    unsigned    mill_test2;
    unsigned    mill_test3;
};
```

Checking the Installation

Verifies that the driver is installed.

```
int _mill_pnp_driver_install_check(void);
```

Return Value

0 = not installed
1 = installed

Defining Default Symbols

The ***instlib.h*** file defines the following symbols that provide defaults for use with getting parameter values.

You can find the ***instlib.h*** file at the following location:

```
C:\Brooktrout\Boston\driver\winnt\install\
```

DEFAULT_MOD_NUM	Default starting reserved module number.
DEFAULTAPPBUFSIZE	Default application buffer size.
DEFAULTINTRLINE	Default ISA interrupt line. Reserved, no longer in use.
DEFAULTMACHINEID	Default machine ID.
DEFAULTMAXHWMOD	Default maximum number of PCI/cPCI modules.
DEFAULTNMILL	Default number of ISA modules. Reserved, no longer in use.
DEFAULTPHYBUFSIZE	Default physical buffer size.
DFLT_FC_INTERVAL	Default number of FC intervals.
DFLT_I2O_FRAMES_PER_MODULE	Default number of I2O frames per module.
DHSIZEDEF	Default history size.
DHSIZEMIN	Minimum history size.
HIST_PHY_ADMIN_ONLY_DEF	Default for physical histories admin only.
I2O_FRAMES_PER_MODULE	Number of I2O frames per module.
MAX_RESERVED_MODULE_NUMS	Maximum number of module reservations.
MAXAPPBUFSIZE	Maximum application buffer size.
MAXMACHINEID	Maximum allowable machine ID.
MAXNMILL	Maximum number of ISA modules. Reserved, no longer in use.
MAXPHYBUFSIZE	Maximum physical buffer size.

MEM_DRV_ALLOC_MIN	Minimum allocation of memory.
MEM_DRV_ALLOC_QUANTA	Number of allocation of memory.
MIN_FC_INTERVAL	Minimum number of FC intervals.
MINAPPBUFFSIZE	Minimum application buffer size.
MINMACHINEID	Minimum allowable machine ID.
MINPHYBUFFSIZE	Minimum physical buffer size.
NUM_HISTS_APL_DEF	Default number of application histories.
NUM_HISTS_PHY_DEF	Default number of physical histories.

This file also defines `SYSDIR`, a string that represents the type of platform being compiled on, and a component of the subdirectory path needed to find the compiled driver binary.

It also provides the `struct reserved_module_num` definition, used by `_mill_pnp_driver_install`.

Removing the Driver

Uninstalls the driver service and removes files. For input variable definitions, see [***Input Variables on page 253***](#).

```
int _mill_pnp_driver_remove(  
    int    *mem_adjust_stat,  
    int    *reboot_required,  
    char   **failed_win32_call,  
    DWORD  *win32_err_val,  
    char   **other_msg  
);
```

Return Value

0 = success
1 = error

Appendix C

Reinitializing the Device Driver

This appendix describes the driver reinitialization utility. This utility is used to return the device driver to a state as close as possible to that of a fresh driver start without stopping the driver.

Introducing the Driver Reinitialization Utility

The driver can be reinitialized close to its starting state in terms of channels assigned to modules and module number assignments using the ***driver_reinit*** program located in the ***boston/driver/<platform>/user*** directory.

Use of this program may avoid the need to stop and restart the driver. This is especially useful for a Windows® PnP system as the driver cannot be easily started and stopped.

Using the driver_reinit Utility

When you execute the ***driver_reinit*** program, this utility will return the driver to a state as close as possible to that of a fresh driver start without stopping the driver.

The utility will:

- Clear all ordinal channel assignments
- Remove all stored information about the modules
- Reset all the hardware modules

The utility fails if any application sessions currently exist.

Glossary

API	Application Programming Interface
ASR	Automatic Speech Recognition
Channel	A logical channel of operations provided by a Boston module. See <i>logical channel number</i> , <i>ordinal channel number</i> , <i>work channel</i> .
EC	Echo cancellation
Facility	A software entity responsible for a set of related functions that provide services to the host, e.g., fax facility and voice facility.
ISDN	Integrated Services Digital Network
IVR	Interactive Voice Response
lapdid	The term <i>lapdid</i> has its origins with the LAP-D protocol used for call control, but has an extended meaning for Dialogic products. For call control with the ISDN protocol (Q.931), <i>lapdid</i> refers to a trunk-specific HDLC controller (trunk 1 = lapdid 0, trunk 2 = lapdid 2, trunk 3 = lapdid 4 and trunk 4 = lapdid 6). For call control with the LEC protocols (RBS, etc.), <i>lapdid</i> refers to a specific 0-based trunk number (trunk 0 = lapdid 0, trunk 1 = lapdid 1,..., trunk 6 = lapdid 6 and trunk 7 = lapdid 7).
Line	A T1/E1 slot or a single analog slot. Lines are numbered starting at 1.

Logical channel number	A number used with the hardware module number to reference a channel in a system. Channel 0 is reserved and channel 1 is the administrative channel. Other channels are numbered from 2 to n+1 (where n is the number of work channels defined for the module).
Millennium Address	An address of a communicating BOSTON or Millennium entity, a facility and channel on a BOSTON module, or the BOSTON device driver. Each address consists of 4 components, the facility, the channel, the module, and the machine. It is possible to make use of most features of the firmware and the APIs without requiring direct use of these addresses.
Module	A communicating Boston entity that usually represents a CPU on a Dialogic® Brooktrout® board, a host application, a software telephony module (SR140) or the Boston driver. See <i>Determining the Board Module Number on page 33</i> for more information about modules and module number assignment.
NVRAM	Non-Volatile RAM. Random Access Memory that is not erased when the board is powered off or when the firmware is downloaded again.
Ordinal channel number	A number in the range 0 to n-1 where n is the total number of work channels on all the boards in the system.
Packet	In the BOSTON architecture, a sequence of bytes containing a BOSTON destination address, source address, and one or more commands.
PCI	Peripheral Component Interconnect
PDF	Portable Document Format
Plug-and-Play	Hardware or software that, after installation, can be used immediately without configuration. Also PnP.
Port	A TDM bus (for example: MVIP, H110), DS-1 (T1/E1), BRI or analog interface.
Stream	A logical data entity that corresponds to a physical data line on a TDM bus
T1/E1 span	The set of slots that comprises one T1 (24) or one E1 (30) line. The spans are numbered starting at 1.
TCP	Transmission Control Protocol

Time slot	A logical entity that corresponds to one telephone call.
Unit number	<ol style="list-style-type: none">1. In telephony configuration files and functions, a unit is a hardware port on a Dialogic® Brooktrout® board and is numbered starting at 0 (to denote a TDM bus); from 1 to n (for a specific T1/E1 interface).2. In some Bfv functions (for example, <i>BfvLineAttach</i>), an ordinal channel number. Its range is 0...n-1, where n is the number of channels in a system.
VAD	Voice Activity Detection
Work channel	One of the channels on a module that is available for non-administrative purposes as a result of downloading firmware. A module configured for 48 channels when firmware download is performed has 48 work channels and one administrative channel. Logical work channel numbers start at 2 on each module.

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