



## **Using Dialogic® Boards to Enhance Interactive Voice Response Applications**



## Executive Summary

Interactive Voice Response (IVR) systems let businesses give their customers access to data, such as basic account information, order status, and travel arrangements, over the phone. IVR systems allow for highly efficient customer service and often serve as a front-end for live call center agents. Combining IVR systems with Automatic Speech Recognition (ASR) technology lets customers interact verbally with the system, rather than use the phone keypad, providing enhanced convenience for hands-free and mobile access. Dialogic® JCT Media Boards and PBX Integration Boards provide technology to support the features and functions of today's IVR solutions.



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## Introduction

Interactive Voice Response (IVR) systems provide more efficient customer service by enabling customers to access their basic account information over the phone. Adding multimedia resources to your IVR — including fax, ASR, Text-To-Speech (TTS), web, and Voice over IP (VoIP) functionality — can transform IVR into an Interactive Media Response (IMR) system, and can increase customer satisfaction.

Dialogic® JCT Media Boards and Dialogic® PBX Integration Boards provide multimedia processing and call control boards that can enable today's flexible IVR solutions. Dialogic® development tools and professional services enable developers, integrators, service providers, and end users to create customized applications and systems.

## Interactive Voice Response Applications

The following list is a sample of Interactive Voice Response (IVR) applications that can be enabled by the JCT Media Boards and PBX Integration Boards:

- Audio text
- Inbound/outbound fax (fax-back)
- Speech-enabled IVR

## JCT Media Boards and PBX Integration Boards

JCT Media Boards and PBX Integration Boards are suitable for developing applications that require multimedia functionality in a single PCI slot. The consistent features, application programming interface, and installation requirements of the JCT Media Boards and PBX Integration Boards enable scaling of applications from four analog lines to two E1 trunks (60 voice channels) using a single PCI slot with little or no changes to existing software. When additional PCI slots are available, more boards can be added to further increase system density.

The following table shows the various environments and applications that the JCT Media Boards and PBX Integration Boards support:

Environment	Dialogic Boards
Telco or service provider (xSP) with E1/T1 trunks (SS7*, ISDN, or CAS signaling)	Dialogic® D/600JCT-2E1 JCT Media Board Dialogic® D/600JCT-1E1 JCT Media Board Dialogic® D/480JCT-2T1 JCT Media Board Dialogic® D/480JCT-1T1 JCT Media Board
Medium-to-large enterprise with E1/T1 trunks (ISDN or CAS signaling)	Dialogic® D/300JCT-E1 JCT Media Board Dialogic® D/600JCT-1E1 JCT Media Board Dialogic® D/240JCT- T1 JCT Media Board Dialogic® D/480JCT-1T1 JCT Media Board
Medium-to-large enterprise with analog trunks or analog PBX extensions	Dialogic® D/120JCT-LS JCT Media Boards
Small-medium-large enterprise with compatible** digital PABX ports	Dialogic® D/82JCT-U PBX Integration Board Dialogic® D/42JCT-U PBX Integration Board
Small-to-medium enterprise with analog trunks or analog PABX extensions	Dialogic® D/41JCT-LS JCT Media Board Dialogic® VFX/41JCT-LS JCT Media Board

\* SS7 signaling requires additional hardware. For more information, visit the Dialogic® Signaling Boards and SS7 Products web site at <http://www.dialogic.com/support/helpweb/signaling/default.htm>

\*\*For PBX compatibility information, visit the Dialogic® PBX Integration Boards web site at [http://www.dialogic.com/products/tdm\\_boards/signaling/default.htm](http://www.dialogic.com/products/tdm_boards/signaling/default.htm)

## Features and Benefits

JCT Media Boards and PBX Integration Boards are well suited for developers and service providers interested in creating and deploying cost-effective, highly scalable, low- to high-density IVR applications that require multimedia resources including voice, software-based speech recognition, and fax.

JCT Media Boards and PBX Integration Boards reduce the cost of ownership for systems requiring multimedia functionality by featuring programmable ports capable of supporting voice, fax, call handling, and host-based speech technologies. They let system integrators and developers lower costs by incorporating more ports per chassis, using less expensive desktop-style machines, and simplifying configuration and installation.

Most of the JCT Media Boards and PBX Integration Boards feature Continuous Speech Processing (CSP) support for host-based Automatic Speech Recognition (ASR), and come pre-loaded with DSP-based Softfax fax capability. The CSP barge-in capability, coupled with perfect digit DTMF functionality lets users get to their messages quickly by speaking or keying ahead through the menu options.

The following JCT Media Boards have CSP capability:

D/600JCT-1E1	D/600JCT	ISDN or CAS = 30 ports CSP
D/480JCT-2T1	D/480JCT	CAS = 48 ports CSP
D/480JCT-1T1	D/480JCT	ISDN=24 ports CSP
D/240JCT-T1	D/240JCT	CAS = 24 ports CSP
D/120JCT-LS	D/120JCT	12 ports CSP
D/41JCT-LS	D/41JCT	4 ports CSP
VFX/41JCT-LS	VFX/41JCT	4 ports CSP

Low bit rate coders such as GSM and G.726 (the de facto standard when complying with Voice Profile for Internet Messaging [VPIM] applications) provide the capability to migrate legacy IVR systems to enhanced IMR solutions.

Advanced features in the JCT Media Boards and PBX Integration Boards enable self-service options such as click-to-talk, voice portal services for information retrieval and v-Commerce capabilities, advanced call routing and call data handling, and more. These features are designed to provide customer satisfaction and a positive end-user experience.

Each board series offers specialized features to help satisfy the needs of their targeted markets:

- The single span JCT Media Boards, featuring the D/240JCT-T1 and D/300JCT-E1, provides the functionality and network connectivity to enable medium-to-large enterprises to deploy IVR. The digital signaling capability of E-1 and T-1 trunks provides the network connectivity method of choice for larger enterprises.
- The dual span JCT Media Boards, featuring the D/600JCT-2E1 and D/480JCT-2T1, provide the density, functionality, and network connectivity to enable telcos and service providers to offer IVR.
- The D/120JCT-LS is a core building block for global multimedia solutions in medium-to-large enterprises. With 12 analog loop-start telephony ports, this high-density PCI voice processing board features a unique dual-processor architecture that handles telephony signaling and performs DTMF and audio/voice signal-processing tasks on-board, which reduces host CPU overhead.
- The D/82JCT-U offers eight digital interfaces connecting to some of the most widely used PBXs on the market. IVR applications built with the D/82JCT-U can enable small-to-medium-to-large enterprises to increase the value of their PBX investment and reap the benefits of digital signaling for call control.

- The D/42JCT-U offers four digital interfaces connecting to some of the most widely used PBXs on the market. IVR applications built with the D/42JCT-U can enable small-to-medium enterprises to increase the value of their PBX investment and reap the benefits of digital signaling for call control.
- The D/41JCT-LS is the entry-level, high-performance four-port analog voice and fax processing board for IVR applications in small-to-medium enterprises. Capable of supporting fax on all four ports simultaneously, this board offers the most features per channel of any of the JCT Media Boards.
- The VFX/41JCT-LS is the entry-level, high-performance, four-port analog voice and fax processing board for IVR applications in small-to-medium enterprises. This board has the same features as the D/41JCT-LS, but offers four channels of an enhanced version of fax.

JCT Media Boards and PBX Integration Boards enable developers, system integrators and end users to lower costs and rapidly scale their IVR systems by installing multiple boards in industry-standard PCI computers and servers.

## Typical Configurations

In Figure 1, a user initiates a call that is transmitted via the PSTN and arrives on an analog or digital trunk. The trunks are connected to the IVR system via a JCT Media Board or PBX Integration Board contained inside the IVR Server.

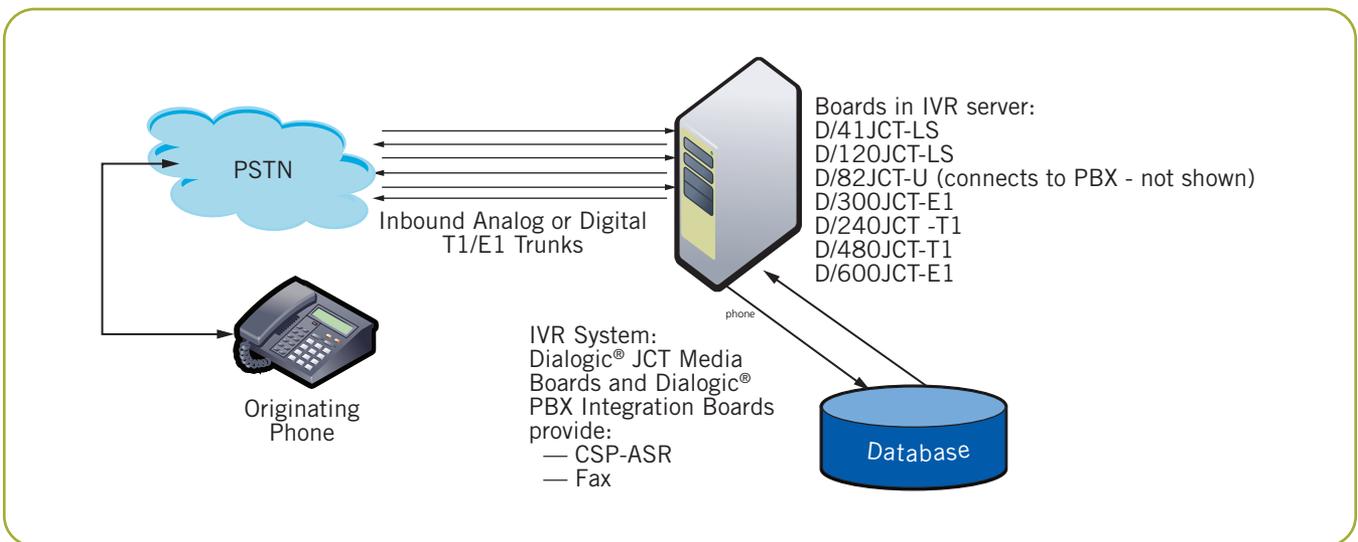


Figure 1. Interactive Voice Response System Configuration

The board's network interface capabilities connect the call to a set of pre-recorded prompts that were stored on the IVR system. In response to the pre-recorded prompts, the caller enters information via the telephone keypad to send instructions to the IVR System that either makes an inquiry or processes a transaction. The JCT Media Board or PBX Integration Board receives and interprets the DTMF signals that the caller entered. Alternatively, the caller speaks the command and the JCT Media Board or PBX Integration Board pre-processes the voice command in preparation for recognition by the speech recognition engine. The IVR software retrieves information from the database regarding the inquiry or transaction, translates the database information to pre-recorded voice information, and the JCT Media Board or PBX Integration Board transmits the voice information back to the caller. This process is repeated until the caller has either received the desired information or completed the transaction(s).

## For More Information

Dialogic® JCT Media Boards — [http://www.dialogic.com/products/tdm\\_boards/media\\_processing/default.htm](http://www.dialogic.com/products/tdm_boards/media_processing/default.htm)

Dialogic® PBX Integration Boards — [http://www.dialogic.com/products/tdm\\_boards/signaling/default.htm](http://www.dialogic.com/products/tdm_boards/signaling/default.htm)

To learn more, visit our site on the World Wide Web at <http://www.dialogic.com>.

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