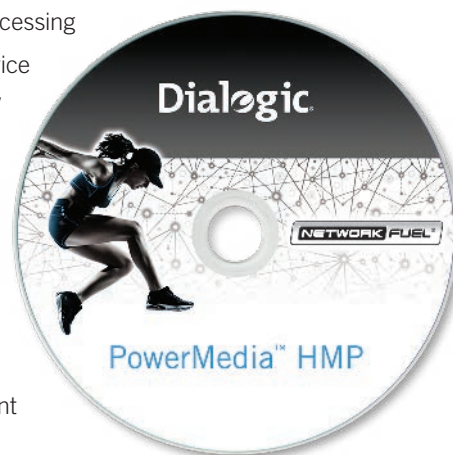


## Dialogic® PowerMedia™ HMP for Windows

Security-Enhanced Media Processing Software for Cost-Effective IP and TDM-Based Telephony Solutions

**Dialogic® PowerMedia™ HMP for Windows (HMP Windows)** is scalable, feature-rich media processing software for building innovative and cost-effective voice solutions suitable for enterprise or service provider deployment. HMP Windows can enable basic SIP or hybrid connectivity, audio play/record, transcoding, fax, automated interactive voice response (IVR), and high-end live interactions, such as contact centers and audio conferencing or speech portals. With HMP Windows, Dialogic brings decades of media processing and signaling development experience to a pure software media engine, allowing developers to transition many existing Dialogic hardware-based applications to software-based IP-enabled solutions, or create completely new interactive applications. HMP Windows extends the capabilities of software-based IP media processing with security features that scale up to 5000 SIP signaling sessions or 2000 concurrent voice user sessions per system.



Features	Benefits
<b>Supports up to 2000 channels of G.711 RTP with voice play or record on COTS servers</b>	Allows high-density media processing on COTS servers
<b>Supports rich media processing on Multi-Processor, Multi-Core Intel and AMD processor-based platforms</b>	Presents a broad choice of processing platforms on which to build cost-effective IP and TDM telephony solutions
<b>VMware ESXi Virtualization support</b>	Promotes lower CAPEX, and deployment of communications solutions on virtual machines
<b>Supports Dialogic® HMP Interface Boards (DNI Boards) for T1/E1, and analog media boards (4 port)</b>	Enables converged solutions in enterprise and service provider environments with easy migration to pure IP platforms
<b>Security support of SRTP and SIP TLS</b>	Provides encryption protection at the media layer with SRTP and at the signaling layer with TLS
<b>Support for local Dialogic® Global Call API for Call Control and Dialogic® R4 API for Media</b>	R4 API and Global Call API allow easy migration of existing applications by providing compatibility at the API level with other Dialogic® telecom products.
<b>Conferencing features include coaching, active talker notification, tone clamping, echo cancellation, and scalability with a maximum of 580 conferees per system</b>	Facilitates development of advanced conferencing applications
<b>Supports play, record, and synchronization of voice and H.263-format video in a multimedia stream that includes video I-frame detection to trigger start of record as well as transmit-of-tone notification when recording begins</b>	Enables media processing for video-based messaging and content delivery media servers

## Applications

- IP media gateways
- IVR and announcements
- Voice mail and unified messaging server
- Converged PBX
- Video messaging server
- Video portal
- Prepaid/debit card services
- Contact center and outbound dialing
- Conferencing server
- Speech-enabled applications

HMP Windows performs media processing tasks on general-purpose servers based on Intel architecture without requiring specialized hardware. The HMP Windows software provides media services for building flexible, scalable, and cost-effective next-generation IP media servers and converged telephony applications. Because it is implemented as a software-only product with a variety of media processing configurations, HMP Windows minimizes investment, development, deployment, and operational costs.

In order to provide real-time media processing performance, HMP Windows is implemented as a kernel-mode driver that runs at real-time priority. HMP Windows is optimized to run on multi-processor, multi-core Intel Xeon processor-based platforms and AMD Opteron processors.

To help customers accelerate their time-to-market and migrate existing applications to IP, the HMP Windows software also supports two direct application programming interfaces (APIs): Dialogic® R4 API for media processing and Dialogic® Global Call API for call control. These APIs are consistent with Dialogic® DM3 architecture to enable quick development and migration from a TDM board-based platform to a platform using HMP Windows.

## Security Features

HMP Windows supports security features to encrypt media and signaling information for media transactions. Secure RTP (SRTP) provides encryption, message authentication, and integrity and replay protection to RTP data so that conversations cannot be stolen for later playback. Transport Layer Security (TLS) is available in SIP to protect signaling data so that dialing or keypad input information cannot be stolen.

## Multimedia Support

When deployed in an IP network, HMP Windows supports the initiation and termination of a multimedia (audio/video) call, which includes SIP-based call control and H.263 video format. HMP Windows synchronizes voice and video streams for playback on IP video phones and video-enabled soft clients, and it can also deliver only the audio portion of a video call to an audio-only endpoint.

## Easy Migration to Hybrid TDM-IP and Pure IP Solutions

When combined with Dialogic® HMP Interface Boards (DNI Boards or 4 port Analog Boards), HMP Windows provides a cost-effective platform for developers to build TDM solutions and later migrate them easily to hybrid platforms and then to pure IP deployments. The hybrid platforms can be deployed as IP media gateways, enhanced services platforms, and converged PBX solutions.

When deployed in the TDM network with DNI Boards, HMP Windows supports a wide range of PSTN protocols including ISDN and CAS. The DNI Boards are software-selectable T1 and E1 trunks, and extend the flexible software model with downloadable firmware. For small- and medium-sized enterprise computer telephony (CT) applications, the 4 port HMP Analog board is well suited for connection to legacy POTS networks.

HMP Windows uses the Ethernet Network Interface Card (NIC) typically present in host server platforms to provide IP network connectivity, and optional DNI Boards to provide PSTN connectivity. It supports SIP protocol for voice and video call session establishment. The H.323 protocol is supported for voice calls, along with H.450.2 for supplementary services.

## Interoperability

HMP Windows is compliant with important industry standards (including the IETF RFC 3261 SIP standard and ITU H.323 and H.450.2 specifications), which allow easy interoperability for call control with a wide range of gateways, gatekeepers, and other IP endpoints.

HMP Windows also supports RTP/RTCP protocols for media streaming over IP using G.711, G.726, G.723.1, and G.729ab formats and an Ethernet NIC for network connectivity. This provides interoperability for high-quality media streaming with a wide variety of IP gateways and endpoints that adhere to IETF and ITU standards. To improve the quality of media streaming over the network, HMP Windows supports G.711 frame sizes of 10 ms, 20 ms, and 30 ms, and features such as Quality of Service (QoS) threshold alarms and packet loss concealment. Additional QoS features include the ability to detect and report timeouts in RTP and RTCP sessions to an application and change the default IPv4 type of service (ToS) byte setting.

## Other Notable Features

Additional features of HMP Windows include:

- The ability to integrate most third-party call or connection control protocol stacks
- The ability to programmatically control the volume of RTP sessions in order to improve the end-user experience
- Support for a variety of media processing functions for building high-quality voice applications:
  - Play with volume control
  - Record with Automatic Gain Control (AGC)
  - Dual Tone Multi-Frequency (DTMF)
  - User-defined tone detection and generation, including industry-standard RFC 2833/4733 and H.245 User Input Indication (UII) mechanisms
- Support for outbound call progress analysis with positive voice detection and positive answering machine detection algorithms
- Support for continuous speech processing functionality with APIs fully compatible with other Dialogic® boards, allowing HMP Windows to integrate with Automatic Speech Recognition (ASR) and Text-To-Speech (TTS) engines

## Licensing

Since HMP Windows is implemented as a software-only product, it can be installed and upgraded as easily as other software. HMP Windows is licensed via a model that node locks the software using FlexNet software from Macrovision.

HMP Windows can be licensed and deployed in virtually any combination of call control and media processing channels, enabling customers to choose the combination of media processing resources they need. Simply locate the media processing channel modes you require (see Table 1 below) and reference the Product Code when ordering.

Product Code	Type of Resource	Features
DMIPS10I30W	IP Call Control	Provides IP Call Control for SIP or H.323 with H.450.2 supplementary services through Global Call API support
DMIPS10R30W	RTP G.711 (and G726)	Provides the capability of streaming digitized voice over RTP or SRTP, using the G.711 or G726 coder. Required for each RTP session.
DMIPS10E30W	Enhanced RTP	Adds the capability of streaming voice over RTP using the G.723.1, G.729a, and G.729b coders to the RTP G.711 resource. Add on top of the RTP G.711 resource.
DMIPS10V30W	Voice	Allows play with volume control, record with AGC, DTMF, user-defined tone detection and generation, including RFC 2833/4733 and H.245 UII
DMIPS10S30W	Speech integration	Integrates HMP Windows with speech engines for ASR and TTS support by using the continuous speech processing APIs. Add on top of the voice resource.
DMIPS10C30W	Conferencing	Includes advanced features such as coach/pupil mode, tone clamping, and active talker notification
DMIPS10F30W	Fax termination	Allows V.17 and T.38 fax termination (over UDP)
DMIPS10M30W	Multimedia	Provides audio and video resources for multimedia messaging. Video format is H.263 (profile 0 level 30)

Table 1. Dialogic® PowerMedia™ HMP for Windows Resources

## Configurations

Sample configurations for IP media servers developed with HMP Windows include network announcements, Interactive Voice Response (IVR), voice mail, and conferencing servers.

Note that in these sample configurations, an IP media server is always the endpoint that terminates an IP connection in the network. Depending on the customer environment (service provider or enterprise), the IP media server can be deployed in a number of ways. The following figures and their accompanying descriptions illustrate exemplary deployment environments.

### Service Provider Configuration

Figure 1 illustrates how an IP media server based on HMP Windows can be deployed in a typical service provider environment for IVR, announcements, voice mail/messaging, speech, or conferencing applications.

An IP-PSTN gateway terminates PSTN connections. A softswitch manages call establishment and teardown over IP. Once the call is established, an RTP connection is created between the IP media server and an endpoint. The softswitch tells the IP media server, IP endpoints, and IP-PSTN gateway when to establish or drop connections.

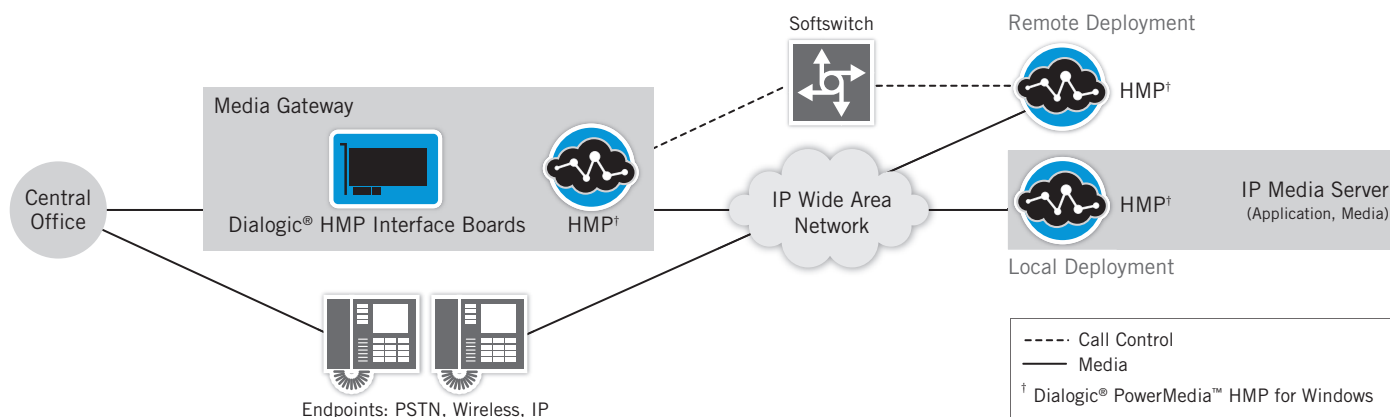


Figure 1. Dialogic® PowerMedia™ HMP for Windows in a Service Provider Environment

## Enterprise Configurations

Figure 2 shows how HMP Windows can be deployed in a media gateway or a converged PBX in an enterprise environment for IVR, video portal, auto attendant, voice mail, unified messaging, speech, or conferencing services.

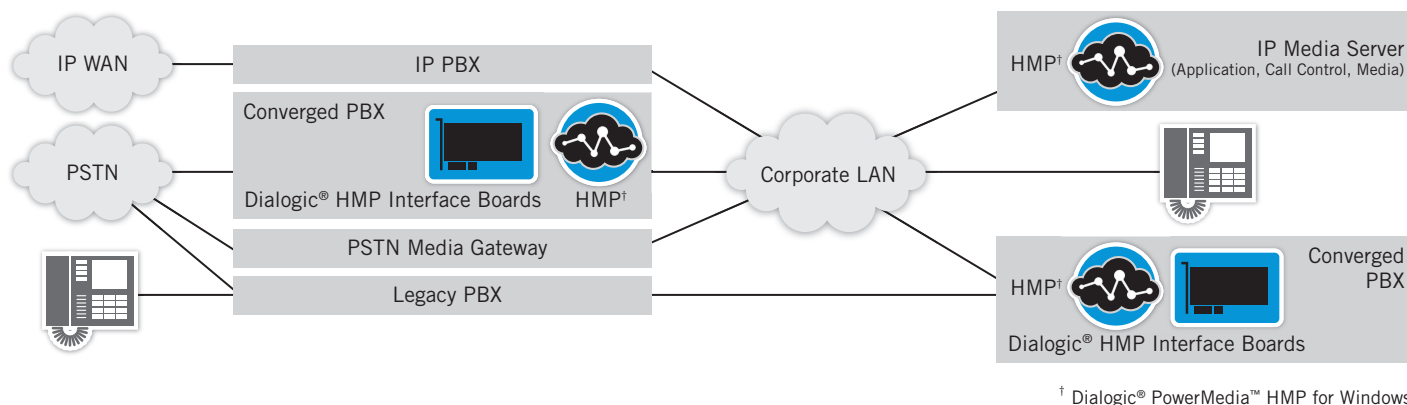


Figure 2. Dialogic® PowerMedia™ HMP for Windows in an Enterprise Environment

Figure 3 provides a more detailed architectural view of the converged PBX element shown in Figure 2. HMP Windows presents the media and API to the application. It also controls the Dialogic® HMP Interface Boards (DNI Boards) for T1 and E1 connectivity.

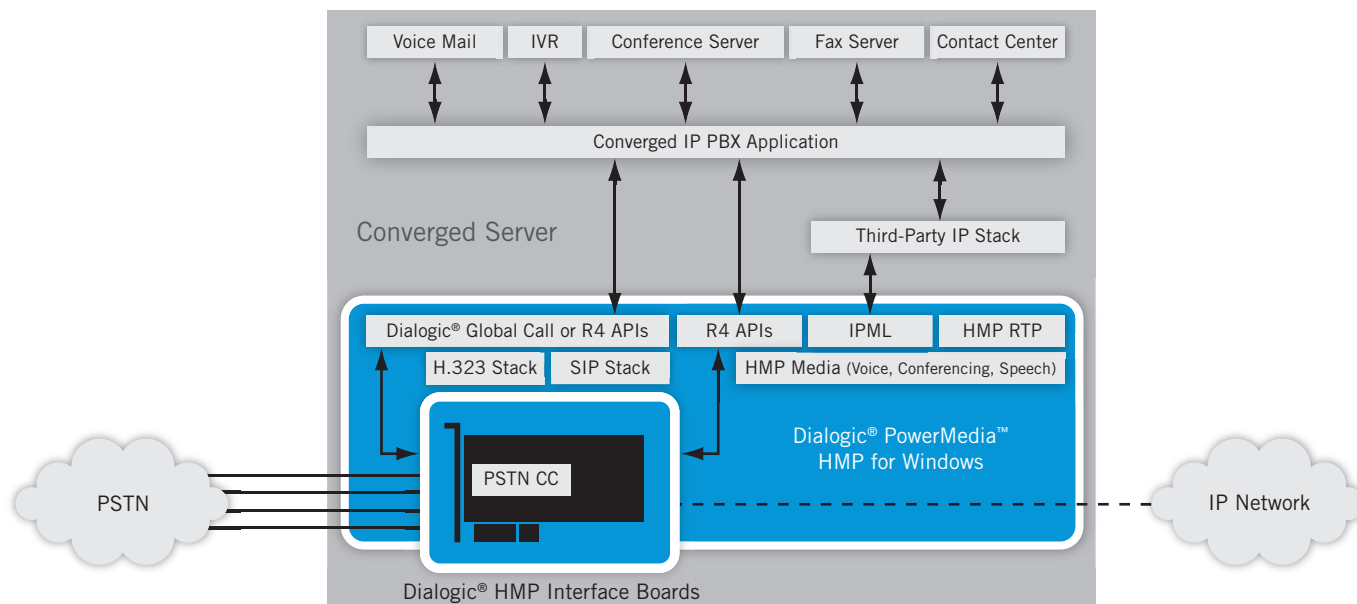


Figure 3. Dialogic® PowerMedia™ HMP for Windows in a Converged PBX

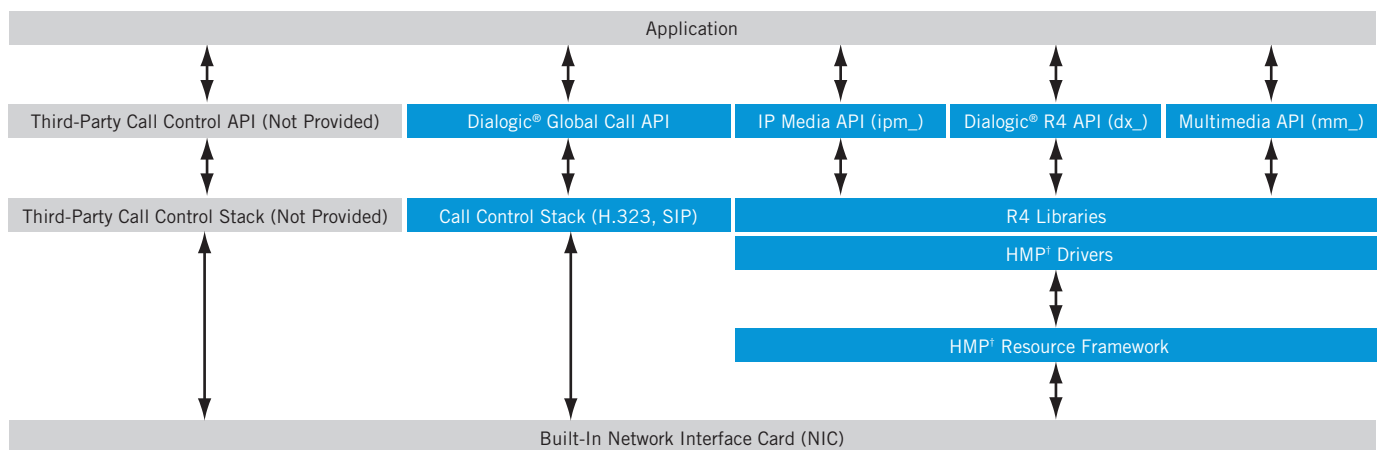
In the converged architecture of Figure 3, the application can support IP and TDM trunking, as well as drive IP phones or softphones, all from a single platform. This ability delivers a remarkable level of deployment flexibility, and the opportunity to extend current Dialogic technology-based applications into additional market segments.

## Software Support

HMP Windows is a standalone product and can function with Windows XP (including Service Pack 3), Windows Server 2003, Windows Server 2003 Web Edition SP2, Windows Server 2003 R2 Enterprise Edition, Windows Server 2008, Windows 7, Windows Server 2012 Standard Edition, Windows 8 Pro, Windows Server 2012 R2 Standard Edition, or Windows 8.1 Pro.

## Functional Description

Figure 4 shows a block diagram for an exemplary local implementation of HMP Windows where the application and HMP Windows reside on the same server. Additionally, the additional text in the Functional Description section below refers to figure 4.



† Dialogic® PowerMedia™ HMP for Windows

Figure 4. Local Implementation

The application deployed on top of HMP Windows is written to the same R4 API and Global Call API that are used for Dialogic® boards with DM3 architecture. In fact, for an application, using HMP Windows mimics what would occur when using a Dialogic board with DM3 architecture.

For media processing, the application will use the R4 API.

For call control, there are two options:

1. The SIP or H,323 stacks, distributed as part of the HMP Windows product, and the Global Call API simplify development and help in the migration of existing applications.
2. A third-party call or connection control protocol stack (SIP, MGCP, H.248) and the IP media library provide functionality to integrate the third-party call control stack with R4 APIs.

The APIs for HMP Windows are enabled through the same libraries and drivers as Dialogic® boards with DM3 architecture. The drivers sit on top of the HMP Windows resource framework, which implements media processing algorithms such as DTMF detection and generation, media stream mixing, etc. The algorithms, in turn, are aggregated into resources (such as player and recorder) as they are on Dialogic boards with DM3 architecture.

The call control stacks and the resource framework sit on top of network drivers and the NIC that are built into the host computer platform.

## Technical Specifications

### Network Interface

IP over an Ethernet connection

### Call Control over IP

Call control protocol

SIP  
H.323  
H.450.2  
Integration with third-party call and connection control stacks  
Provided via the IP media library

Security

Transport Layer Security (TLS)

### Media Streaming over IP

Protocols

RTP

Security

Secure RTP (SRTP)

Encoding formats:

G.711 A-law,  $\mu$ -law 8-bit 8K (64 kbps); frame sizes 10 ms, 20 ms, and 30 ms  
G.726  
G.723.1  
G.729a, G.729ab

QoS

Alarms  
Frames per packet control  
Packet loss concealment  
RTP/RTCP timeouts  
Ability to modify the default DiffServe/TOS byte setting

Tone generation and detection

In-band DTMF  
RFC 2833/4733  
H.245 UII

Media control over RTP

Programmatic control of inbound RTP stream gain and outbound RTP stream volume

### API Support

Call control

Global Call over SIP, H.323, H.450.2  
Third-party stack integrated via IP Media Library

IP media (QoS, alarms)

R4 IPML (ipm\_)

Voice processing

R4 voice (dx\_)

Virtual CT Bus routing

R4 routing (sc\_)

Conferencing

R4 conferencing (cnf\_)  
R4 conferencing (dcb\_)

Fax

R4 fax (fx\_)

Continuous speech processing

R4 EC (ec\_)

Event reporting, device enumeration, and other related functionality

R4 SRL (sr\_)

Multimedia

R4 multimedia (mm\_)

## Channel Density

Using G.711, a maximum of 2000 concurrent user sessions per system of voice, or 580 conferencing. A wide variety of other configurations that combine RTP streaming, voice, fax, speech, multimedia, and conferencing resources are also available, and the maximum number of concurrent sessions per system is configuration-dependent.

## Voice Processing Features

Features supported	Play, record, and tone generation and detection
Play	Volume control and index play
Record	AGC
Audio file formats for play/record	OKI ADPCM 24K, 32K G.711 A-law, $\mu$ -law 48K, 64K (Vox and Wave formats) Linear PCM 8b 11K (Wave format only) Linear PCM 8b 8K
Tone generation and detection	In-band DTMF generation and detection User-defined global tone generation and detection (GTG, GTD) RFC 2833 tone generation and detection H.245 UII tone generation and detection

## Video Processing Features

Features supported	Play, record
Play	Playback of voice and video or voice only Synchronization of voice and video
Record	Store synchronized voice and video to a file
Video stream format	H.263 (profile 0 level 30)
Picture sizes	CIF, QCIF, sub-QCIF
File formats	Proprietary video file format Audio file (.pcm): Linear PCM 16b 8K Video file (.vid): H.263 bit-stream data
Offline conversion tool	Convert AVI Type-2 (DVSD or DV25) files (PAL or NTSC) <b>to</b> proprietary format Convert proprietary format <b>to and from</b> 3GP Release 4 file format (.3gp)
Tone generation and detection	RFC 2833 In-band

## Conferencing Features

Total parties per server	580
Advanced features	N-way summing Coach/pupil mode DTMF detection DTMF clamping Active talker notification



## Supported Dialogic® HMP Interface Boards

Network Interface (DNI Boards)	Dialogic® DNI/310TEPE2HMP Digital Network Interface Board – one span with 24 T1 or 30 E1 channels, PCIe, 306-483 Dialogic® DNI/610TEPE2HMP Digital Network Interface Board – two span with 48 T1 or 60 E1 channels, PCIe, 306-484 Dialogic® DNI/1210TEPE2HMP Digital Network Interface Board – four span with 120 T1 or 120 E1 channels, PCIe, 306-428 Dialogic® DNI/2410TEPE2HMP Digital Network Interface Board – eight span with 192 T1 or 240 E1 channels, PCIe, 306-427
Analog Interface	Dialogic® D/4PCIU4SEQ Board - 4 port analog loop-start with speech, PCIe, 310-936 Dialogic® D/4PCIUFEQ Board - 4 port analog loop-start with fax, PCIe, 310-935

## Virtualization Support

Hypervisors	VMWare ESXi 5.x
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## Licensing

Enabling method	Node-locked using FlexNet licensing utility
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## Hardware System Requirements

### Memory Requirements

4 GB recommended

### System Requirements

IP-only solutions — Single- or dual-processor platform with an Ethernet NIC (Note: 1000BaseT is recommended)

Converged solutions — Single- or dual-processor platform with an Ethernet NIC and Dialogic® HMP Interface Boards

### Processors Supported

Pentium III, Pentium 4, Pentium M, Pentium Extreme Edition, Celeron M, and multi-processor, multi-core Intel Xeon processor-based platforms. Multi-processor, multi-core AMD Opteron processor-based platforms.

HMP Windows provides a very high level of flexibility in choosing media processing configurations, making it not feasible to list all the available combinations of media processing resources here. Contact your authorized Dialogic distributor or account manager for help in configuring your system and for detailed system configuration information.

## Operating System Requirements

Windows XP (including Service Pack 3), Windows Server 2003, Windows Server 2003 Web Edition SP2, Windows Server 2003 R2 Enterprise Edition, Windows Server 2008, Windows 7, Windows Server 2012 Standard Edition, Windows 8 Pro, Windows Server 2012 R2 Standard Edition, or Windows 8.1 Pro.

# Dialogic®

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