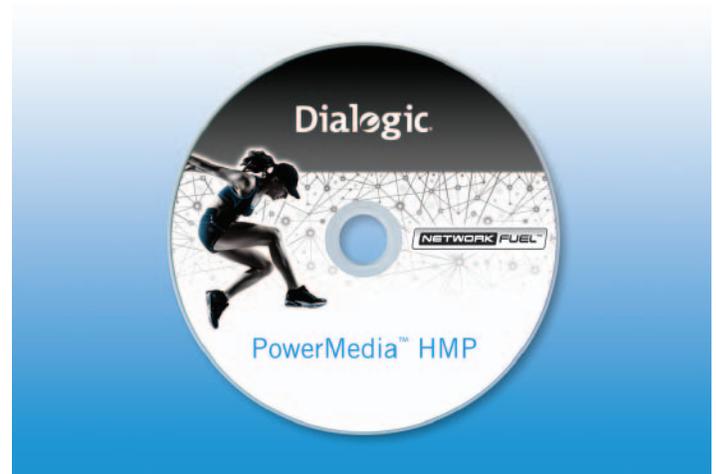


Dialogic® PowerMedia™ HMP for Windows

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

Dialogic® PowerMedia™ HMP for Windows¹ (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.



1 Formerly known as Dialogic® PowerMedia™ Host Media Processing Software Release 3.0 for Windows

Features	Benefits
Supports up to 2000 channels of G.711 RTP with voice play or record on standard server platforms	Allows high-density media processing on standard servers
Supports rich media processing on Multi-Processor, Multi-Core Intel and AMD processor-based platforms.	Presents a broad choice of processing platforms on which to build cost-effective IP and TDM telephony solutions
Supports Dialogic® HMP Interface Boards (DNI Boards) for T1/E1, and analog media boards (4 and 8 port)	Enables converged solutions in enterprise and service provider environments with easy migration to pure IP platforms
Security support of SRTP and SIP TLS	Provides encryption protection at the media layer with SRTP and at the signaling layer with TLS
Support for local Dialogic® Global Call API for Call Control and Dialogic® R4 API for Media	R4 API and Global Call API allow easy migration of existing applications by providing compatibility at the API level with other Dialogic® telecom products.
Conferencing features include coaching, active talker notification, tone clamping, echo cancellation, and scalability with a maximum of 580 conferees per system	Facilitates development of advanced conferencing applications
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	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 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 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 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 four- and 8-line HMP Analog boards are ideal 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 the industry-standard 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 a 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 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 so HMP Windows can 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) 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 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

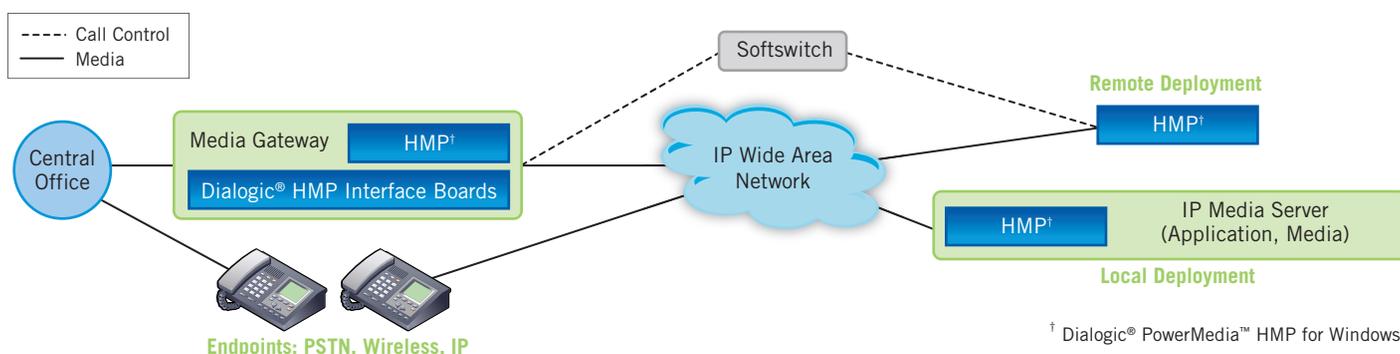
Sample configurations for IP media servers developed with HMP Windows include network announcements, Interactive Voice Response (IVR), voice mail, and conferencing servers.

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 illustrate typical 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.

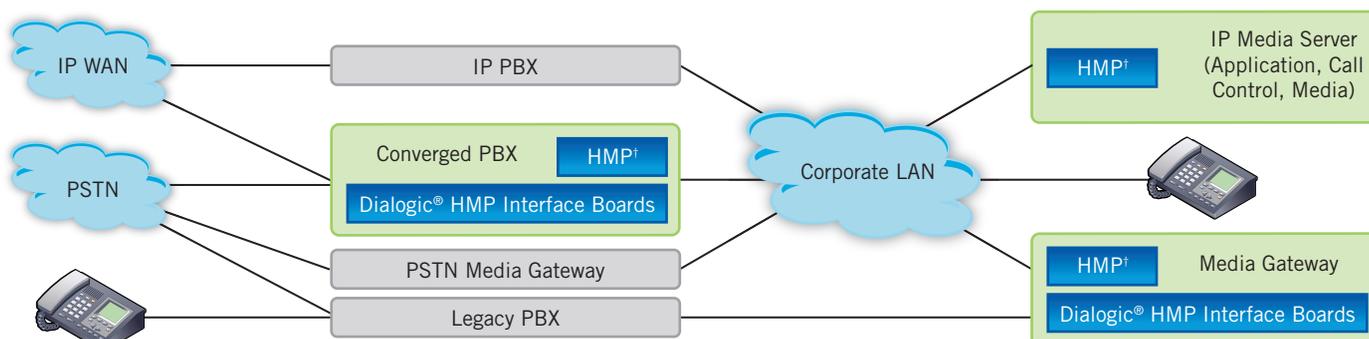


† Dialogic® PowerMedia™ HMP for Windows

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.



† Dialogic® PowerMedia™ HMP for Windows

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.

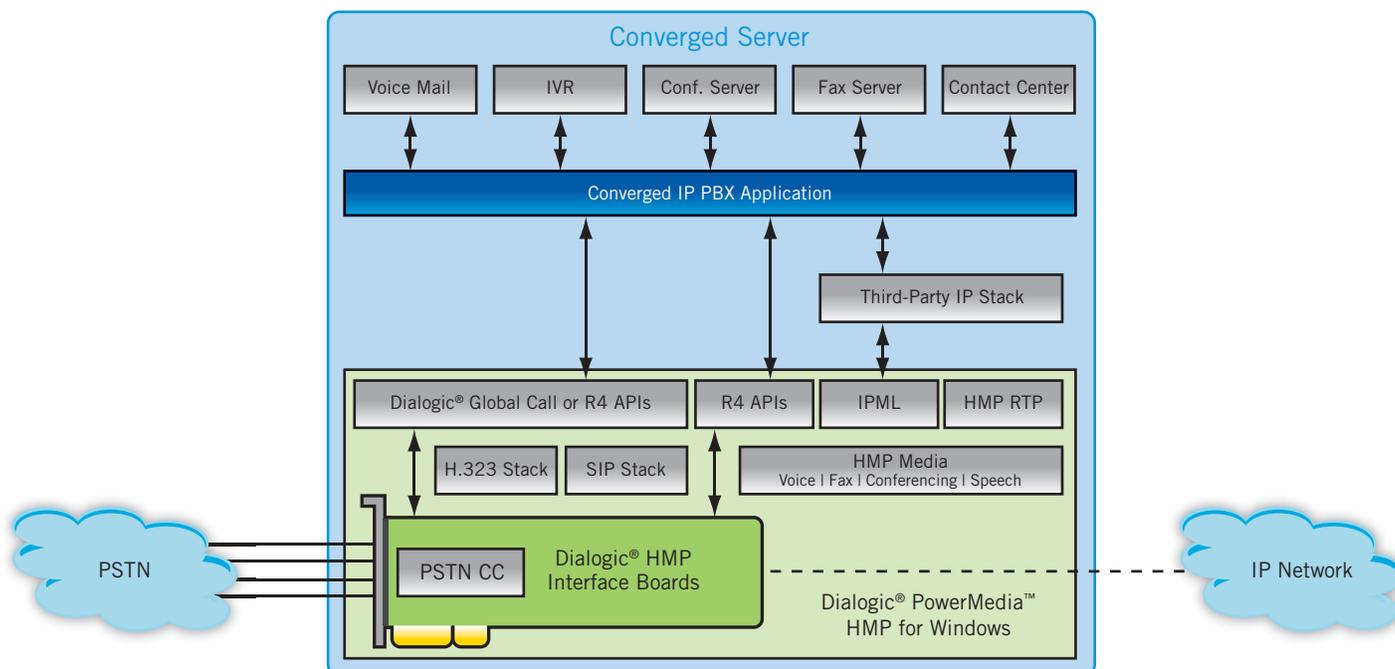


Figure 3. Dialogic® PowerMedia™ HMP for Windows in a Converged PBX

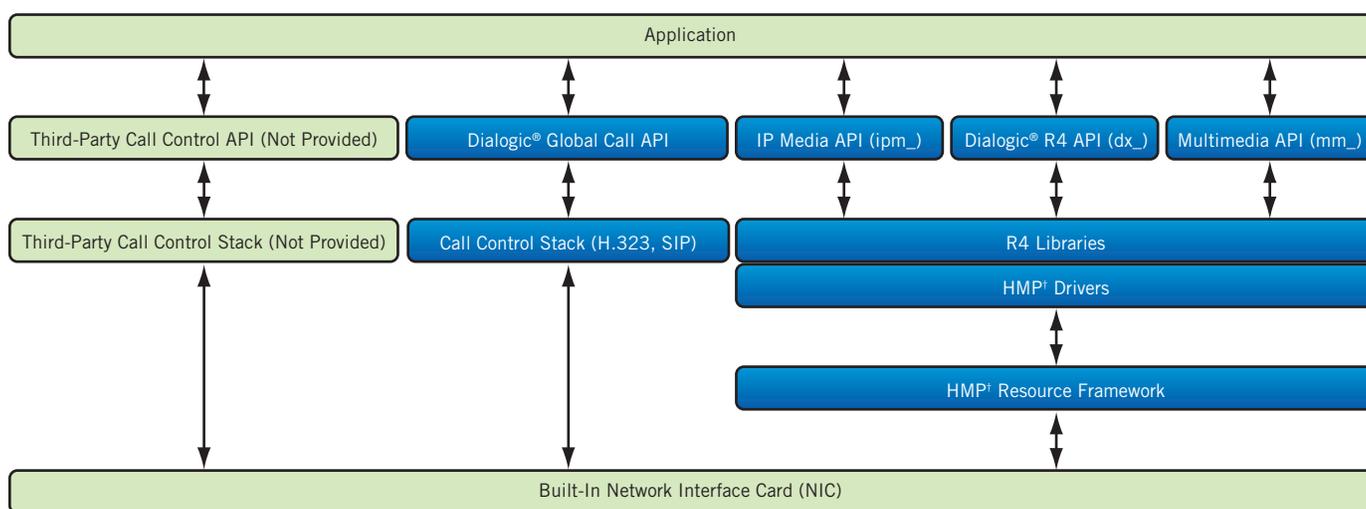
In this converged architecture, the application can support IP and TDM trunking, as well as drive IP phones or softphones, all from a single platform. This ability delivers a remarkable level of deployment flexibility, and the opportunity to extend current Dialogic technology-based applications into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

Software Support

HMP Windows is a standalone product and can function with Windows 7, Windows Server 2008, Windows XP, Windows Server 2003, Windows Server Web Edition SP2, or Windows Server 2003 R2 Enterprise Edition.

Functional Description

Figure 4 shows a block diagram for a local implementation of HMP Windows where the application and HMP Windows reside on the same server.



† 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, μ -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

inband 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, μ -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) **to** proprietary format

Convert proprietary format **to and from** 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
Dialogic® DNI/601TEPHMP Digital Network Interface Board – two span with 48 T1 or 60 E1 channels
Dialogic® DNI/610TEPE2HMP Digital Network Interface Board – two span with 48 T1 or 60 E1 channels
Dialogic® DNI/1210TEPE2HMP Digital Network Interface Board – four span with 120 T1 or 120 E1 channels
Dialogic® DNI/2410TEPE2HMP Digital Network Interface Board – eight span with 192 T1 or 240 E1 channels

Analog Interface

Dialogic® D/4PCIU4SEQ Board - 4 port analog loop-start with speech
Dialogic® D/4PCIU4FEQ Board - 4 port analog loop-start with fax
Dialogic® D/80PCIE-LSQ Media Board – 8 port analog loop-start with media.

Licensing

Enabling method

Node-locked using FlexNet licensing utility

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 digital interface boards for HMP Windows

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

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The logo for Network Fuel, featuring the words "NETWORK FUEL" in a bold, sans-serif font. The word "NETWORK" is in white on a black background, and "FUEL" is in black on a white background. A small "TM" trademark symbol is to the right. The logo is set against a background of a complex network diagram with nodes and connecting lines.

NETWORK FUEL™