

Refurbished CISCO NM-HD-2V Datasheet

CISCO > INTERFACES-MODULES

Cisco IP Communications Voice/Fax Network Modules

Cisco Voice/WAN Interface Cards

Description	2-slot IP communications voice/fax network module.
Application	Supports up to eight channels of analog/BRI voice using medium complexity codec or six channels using any supported codec. (No support for T1/E1 or data WAN)

Number of Cisco IP Communications Voice/Fax Network Modules Allowed per Cisco Platform

Cisco Platform	Maximum Number of Network Modules Allowed
Cisco 2811/2821/2851 Integrated Services Routers	1
Cisco 3825 Integrated Services Router	2
Cisco 3845 Integrated Services Router	4
Cisco 2901/2911/2921/2951 Integrated Services Routers	0 / 1 / 1 / 2
Cisco 3925/3945 Integrated Services Routers	2 / 4

Features and Benefits

Feature	Description and Benefits
IP Telephony Unified communications	Integrates all Cisco IP Communications solutions by providing flexible and reliable connectivity to public or private switched telephone networks around the world. Provides gateway for Cisco IP phones to PSTN or traditional PBXs and private automatic branch exchanges (PABXs). Provides gateway to PSTN for traditional PBXs, phones, fax machines, and key communication systems connected to a voice, data, and video infrastructure.
Toll Bypass	Reduce or eliminate toll charges assessed by long distance and local carriers by transporting voice and fax traffic across the enterprise intranet, LAN, metropolitan-area network (MAN), or WAN. Works with existing phones, faxes, PBXs, and key systems. Connection trunks creates a permanent tie-line replacement structure (digital-to-digital, digital-to-analog, or analog-to-analog capabilities). Interoperates end-to-end with Cisco IP phones, analog phones, fax machine connections, and PBX or PABX connections to and from other Cisco voice enabled products.
Voice over Packet Transport	Voice/Fax over IP-VoIP traffic at Layer 3 can travel over any Layer 1 or Layer 2 media, including ISDN, leased lines, serial connections, and Ethernet. Compressed Real-Time Protocol (cRTP) offers RTP header compression and packet fragmentation techniques that allow toll-quality voice and fax transmissions over any WAN connection. Call Admission Control and PSTN Fallback uses Service Assurance Agent (SAA) to determine latency, delay and jitter and provide real-time Calculated Planning Impairment Factor (ICPIF) calculations before establishing a call across an IP infrastructure. SAA packets emulate voice packets receiving the same priority as voice throughout the entire network. Advanced QoS Mechanisms-These configurable Cisco IOS Software features reserve appropriate bandwidth and prioritize voice and fax traffic to help ensure transparent delivery of toll-quality voice and fax. They include Resource Reservation Protocol (RSVP), queuing techniques (such as Low Latency Queuing), IP Precedence, and differentiated services code points (DSCPs).
Call Control Signaling	Supports H.323 V1/V2/V3/V4, MGCP 0.1/1.0, and SIP call control protocols. Also supports Cisco UCM using MGCP, H.323, or SIP.

International Telecommunications Union (ITU) Standard Voice Codecs	G.711, G.729, G.729a/b, G.723.1, G.726, G.728, iLBC, G.722-These are standards-based compression technologies allowing transmission of voice across IP.
Telephony Interface Signaling Support	Supports the following signaling protocols: FXO/FXS loop-start and ground-start signaling E&M (wink, immediate, delay) Inbound signaling (such as dual-tone multifrequency [DTMF], multifrequency support) T1 and E1 channel associated signaling (CAS) T1 and E1 PRI Q.931 user side and network side T1 and E1 PRI QSIG E1 MelCAS E1 R2 CAS T1 and E1 Transparent common channel signaling (CCS) (with multiple-D channel) Country-specific signaling
Voice Features	Echo Cancellation-Cancels echo on tail circuits up to 32 msec (configurable tail length) Silence Suppression, Voice Activity Detection (VAD)-Bandwidth is used only when someone is speaking. During silent periods of a phone call, bandwidth is available for data traffic. Comfort Noise Generation-This feature reassures the phone user that the connection is being maintained, even when no voice packets are being transmitted Private Line Automatic Ring-Down (PLAR)-Provides a direct connection to another digital or analog voice port by lifting a telephone handset on one end. Includes "Trader Turret" PLAR Local/Advanced Voice Busy-Out-Automatically busies out any desired voice trunk line to a PBX or PSTN when a direct WAN or LAN connection to the router or any part of the network to the destination port is down Caller ID Support-Per-port configurable caller ID (with per call un-blocking) over analog FXS and FXO interfaces Hunt Groups Across Cards-Calls can be forwarded automatically to the first available line Integrated Add and Drop Multiplexer (Drop and Insert)-Performs add and drop multiplexing for voice within a dual-port voice network module. Eliminates the requirement, maintenance, support, and expense of using an external add and drop multiplexer. Channel Bank-Supports the conversion of analog voice ports into digital voice traffic using DS-0 channels on a T1 or E1 interface (only supported on NM-HD-2VE) Dial Plan Mapping-Simplifies configuration and management through automatic mapping of dialed phone numbers to IP addresses Interactive Voice Response (IVR) Support-Provides automated attendant, voice-mail support, and call routing based on desired service Hoot and Holler over IP-Delivers superior quality Hoot and Holler multicast voice services and multicast conferencing over the WAN using existing end-points.
Voice Port Interfaces	Support FXS, FXO (includes CAMA), DID, E/M, BRI (S/T, NT/T), T1, and E1. (T1 and E1 only supported on NM-HD-2VE)
Voice Port-Specific Features	FXS and FXO-Provide battery polarity reversal detection and initiation for disconnect supervision and far-end answer supervision ISDN BRI Network Side and Phantom Power-The VIC2-2BRI-NT/TE provides the ability to connect a PBX or PABX configured as user side directly to the router. Also provides phantom power to accommodate equipment that requires it Analog CAMA Trunk Connection-The VIC2-2FXO and VIC2-4FXO provide the ability to connect to analog CAMA trunks which provide dedicated E-911 services. Each Cisco VIC port can be individually configured as an FXO or a CAMA port via Cisco IOS Software. Per Port Disable-Allows disabling of any single port without affecting any other port on the same VIC or network module. LED indicators for voice-processing resources and port status.
Fax and Modem	Fax and Modem Pass-Through-Allows fax and modem traffic to pass through a voice port. Fax Relay-Provides a more robust protocol for fax transmission over packet networks. Also supports the T.37 and T.38 fax protocols.
Data Features (Only Supported on NM-HD-2VE)	Support serial data WAN access using T1/E1 or fractional T1/E1 network interface N X 64 Kbps or N X 56 Kbps channel group data rates (T1:N=1 to 24, E1:N=1 to 31) Supports up to 32 data channel groups with a total bandwidth of up to 2 Mbps Supports integrated data WAN access and DS-0 voice channels on the same T1/E1
High-Performance Flexible Digital Signal Processor (DSP) Architecture	Channel Capacity-Supports up to 48 voice channels. See network module specifications below for further details. Flexible DSP Architecture-There is no need to specify codec complexity at configuration. An appropriate codec is dynamically selected when a call is established, while allocating DSP resources optimally. Feature Upgrades-The DSP architecture allows for addition of new features through simple code updates.

Software and Memory Requirements for Voice/Fax Network Modules and Voice Interface Cards

Product	NM-HD-1V NM-HD-2V NM-HD-2VE
Cisco 2800 Series	Cisco IOS Software

	Release 12.3(8)T4 IP Voice" images
Cisco 3800 Series	Cisco IOS Software Release 12.3(11)T IP Voice" images
Cisco 2900 and 3900 Series	Cisco IOS Software Release 15.0(1)M UC Technology" images

Specifications for IP Communications Voice/Fax Network Modules

Description	2-slot Cisco IP Communications voice/fax network module
Cisco Part Number	800-21591-01
FCC Specifications	FCC Class B device
Spare	NM-HD-2V=
Voice Channel Capacity	6 any complexity or 8 medium complexity
Mean Time Between Failure (MTBF)	1,312,760 hours
Cisco VICs Required, on 2800/3800/2900/3900	Requires at least one Cisco VIC (maximum of two): VIC3-2FXS/DID VIC3-2FXS-E/DID VIC3-4FXS/DID VIC2-2FXO VIC2-4FXO VIC3-2E/M VIC2-2BRI-NT/TE

VIC3-2FXS/DID Specifications: 2-Port FXS/DID Voice/Fax Interface Card (for On-Premise Use Only)

Interface Type	FXS (on-premise connection only) and DID trunk
Cisco IOS Software Release	12.4(20)T
Cisco Part Number	800-30501-01
Compliance	FCC Class B device, CE
Safety Conformance	UL1950
Spare	VIC3-2FXS/DID=
Address Signaling Formats	In-band DTMF Out-of-band pulse (8-12 pps)
Signaling Modes	FXS: Loop-start, ground-start DID: Immediate, Delay-dial, WinkStart
DID Loop Resistance	Up to 1800 ohms (including terminal equipment)
FXS Loop Resistance	Up to 600 ohms (including phone or terminal equipment)
On-Hook Voltage	-44V
Off-Hook Loop Current	25 mA (max)
Ringing Tone	Configurable for different country requirements
Ringing Voltage	45 Vrms into 5REN at zero loop length (balanced)
Ringing Frequencies	20 Hz, 25 Hz, 30 Hz, 50 Hz
REN Loading	5 REN/port, 8 REN/VIC (max)
Disconnect Supervision	Power denial (Calling Party Control, far-end disconnect)
Caller ID	On-hook transmission of frequency-shift-keying (FSK) data
Loop Length	1500 ft (450 m) 24 AWG Category 5 twisted pair cable
Physical Connector	RJ-11

Number of Connectors/Ports	Two
MTBF	2,534,574 hours

VIC3-2FXS-E/DID Specifications: 2-Port FXS-E/DID Voice/Fax Interface Card (for OPX Lite Applications)

Interface Type	FXS (for OPX Lite applications) and DID trunk
Cisco IOS Software Release	12.4(20)T
Cisco Part Number	800-27471-02
Compliance	FCC Class B device, CE
Safety Conformance	UL1950
Spare	VIC2-2FXS-E/DID=
Address Signaling Formats	In-band DTMF Out-of-band pulse (8-12 pps)
Signaling Modes	FXS: loop-start, ground-start DID: Immediate, delay dial, wink start
DID Loop Resistance	Up to 1800 ohms (including terminal equipment)
FXS Loop Resistance	Up to 1400 ohms (including phone or terminal equipment)
On-Hook Voltage	-44V
Off-Hook Loop Current	35 mA for FXS and 25 mA for DID (max)
Ringing Tone	Configurable for different country requirements
Ringing Voltage	62 Vrms into 2 REN at zero loop length (balanced)
Ringing Frequencies	20 Hz, 25 Hz, 30 Hz, 50 Hz
REN Loading	2 REN / port (max)
Ringing DC Offset Options	10V, 20V, 24V, 30V and 35V DC (reduces ringing amplitude), Default = 0V (balanced)
Disconnect Supervision	Power denial (Calling Party Control, far-end disconnect)
Caller ID	On-hook transmission of frequency-shift-keying (FSK) data
Loop Length	Up to 11,000 feet (3.3 KM) 24 AWG Category 5 twisted pair cable
Physical Connector	RJ-11
Number of Connectors/Ports	Two
MTBF	2,534,574 hours

VIC3-4FXS/DID Specifications: 4-Port FXS or DID Voice/Fax Interface Card

Interface Type	FXS and DID trunk
Cisco IOS Software Release	12.4(20)T
Cisco Part Number	800-27473-02
Compliance	FCC Class B device, CE
Safety Conformance	UL1950
Spare	VIC3-4FXS/DID
Address Signaling Formats	In-band DTMF Out-of-band pulse (8-12 pps)
Signaling Modes	FXS: loop-start, ground-start DID: Immediate, Delay-dial, WinkStart
DID Loop Resistance	Up to 1800 ohms (including terminal equipment)
FXS Loop Resistance	Up to 600 ohms (including phone or terminal equipment)

On-Hook Voltage	-44V
Off-Hook Loop Current	25 mA (max)
Ringing Tone	Configurable for different country requirements
Ringing Voltage	45 Vrms into 5 REN at zero loop length (balanced)
Ringing Frequencies	20 Hz, 25 Hz, 30 Hz, 50 Hz
REN Loading	5 REN/port, 8 REN/VIC (max) and 2 REN/port with mixed mode FXS/DID ports
Disconnect Supervision	Power denial (Calling Party Control, far-end disconnect)
Caller ID	On-hook transmission of frequency-shift-keying (FSK) data
Loop Length	1500 ft (450 m.) 24 AWG Category 5 twisted pair cable
Physical Connector	RJ-11
Number of Connectors/Ports	Four
MTBF	2,131,306 hours

VIC2-2FXO and VIC2-4FXO Specifications: 2- or 4-Port FXO Voice/Fax Interface Card with Battery Reversal Detection and Caller ID (for All Countries); Includes Support for North American Analog CAMA Trunk Interface (User Side)

Interface Type	FXO
Cisco IOS Software Release	12.3(8)T
Cisco Part Number	VIC2-2FXO: 800-21597-01, VIC2-4FXO: 800-21589-01
Compliance	FCC Class B device, CE
Safety Conformance	UL1950
Spare	VIC2-2FXO=, VIC2-4FXO=
Signaling Modes	Loop-start, ground-start
Address Signaling Formats	In-band DTMF Out-of-band pulse (10/20 pps)
Tone Disconnect Supervision	Call disconnect on progress tone of less than 600 Hz
Battery Polarity Reversal Detection	Detection of disconnect supervision and far-end answer supervision via battery polarity reversal
Power Interrupt Disconnect	Call disconnect on power interrupt of > 600 ms
Physical Connector	RJ-11
Number of Connectors/Ports	Two for VIC2-2FXO, four for VIC2-4FXO
MTBF	2,043,450 hours for VIC2-2FXO; 1,245,152 hours for VIC2-4FXO

VIC3-2E/M Specifications: 2-Port E&M Voice/Fax Interface Card

Interface Type	E&M (for PBX trunking, hoot phones, or radio systems)
Cisco IOS Software Release	12.4(20)T
Cisco Part Number	800-27470-03
Compliance	FCC Class B device, CE
Safety Conformance	UL 1950
Spare	VIC3-2E/M
Address Signaling Formats	In-band DTMF Out-of-band pulse (10/20 pps)
Signaling Modes	Immediate, delay dial, wink start
Signaling Types	I, II, III, and V

E-Lead Current Limit	100 mA
M-Lead Sensitivity	3 mA
Pulse Distortion	2 percent
Physical Connector	RJ-45
Number of Connectors/Ports	Two
MTBF	1,825,192 hours

VIC2-2BRI-NT/TE Specifications : 2-Port BRI Voice/Fax Interface Card (User or Network Side)

VIC2-2BRI-NT/TE	Two-port BRI voice/fax interface card (user or network side)
Interface Type	ISDN BRI
Cisco IOS Software Release	12.3(8)T
Cisco Part Number	800-21861-01
Compliance	FCC Part 68 CS03 CTR3 TS-031 JATE Green Book
Safety Conformance	UL1950, CAN/CSA-C22.2, IEC 950, EN60950
Spare	VIC2-2BRI-NT/TE=
ITU Compliance	ITU-T Q.920, Q.921, Q.930, Q.931
Interface	Four-wire user side S/T or network-side NT (software-configurable)
ISDN Digital Access	BRI 2B+D
Physical Connector	RJ-45
Number of Connectors/Ports	Two
Phantom Power	30 mA at 40V maximum per port
MTBF	2,682,752 hours

T1 Network Interface

Transmit Bit Rate	1.544 Mbps $\pm$ 50 bps/32 PPM
Receive Bit Rate	1.544 Mbps $\pm$ 50 bps/32 PPM
Line Code	AMI, B8ZS
AMI Ones Density	Enforced for N x 56 Kbps channels
Framing Format	D4 (SF) and ESF
Output Level (LBO)	0, -7.5, or -15 dB
Input Level	+1dB0 down to -24 dB0
Data Terminal Equipment (DTE) Interface (WIC mode)	Fractional service
DTE Interface (VIC mode)	G.704/structured
Data Circuit-Terminating Equipment (DCE) Interface	G.704/structured

E1 Network Interface

Transmit Bit Rate	2.048 Mbps $\pm$ 100 bps/50 PPM
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Receive Bit Rate	2.048 Mbps $\pm$ 100 bps/50 PPM
Data Rate	1.984 Mbps (framed mode) per E1 port
Clocking	Internal and loop (recovered from network)
E1 National Bits	Fixed (non-configurable)
Encoding	HDB3
DTE Interface (WIC mode)	Fractional service
DTE Interface (VIC mode)	G.704/structured
DCE Interface	G.704/structured

The next steps...

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