

## Cisco Model DPQ3212 8x4 DOCSIS 3.0 Cable Modem with Embedded Digital Voice Adapter

The Cisco® Model DPQ3212 8x4 DOCSIS 3.0 Cable Modem with Embedded Digital Voice Adapter (DPQ3212) is a high-speed cable modem with an embedded digital voice adapter. The DPQ3212 provides a faster connection to the Internet by incorporating eight bonded downstream channels along with four bonded upstream channels. These bonded channels deliver downstream data rates in excess of 340 Mbps. That's up to eight times faster than conventional single-channel DOCSIS® 2.0 cable modems.

The DPQ3212 uses advanced line-interface technology to provide multi-country, toll-quality, telephone service using existing in-home wiring. The DPQ3212 features two RJ-11 telephone ports for voice and supports 5 REN phone loading on each phone line.

**Figure 1.** DPQ3212 8x4 DOCSIS 3.0 Cable Modem with Embedded Digital Voice Adapter (image may vary from actual product and specification)



The DPQ3212 is designed to meet PacketCable™ 1.5 and DOCSIS 3.0 specifications as well as being backward compatible with DOCSIS 2.0, 1.1, and 1.0 networks. The DPQ3212 fully supports the CODECs specified in PacketCable 1.5. Additional CODECs are available through a software upgrade that includes a high-fidelity CODEC option for toll-quality plus service. Standard VoIP call signaling is compliant with PacketCable (MGCP/NCS) specifications. Software upgrades are available to support Session Initiation Protocol (SIP) call signaling.

## Features

### DOCSIS

- Eight (8) bonded downstream channels with data rates in excess of 340 Mbps
- Four (4) bonded upstream channels with data rates in excess of 120 Mbps
- Designed to meet DOCSIS 3.0 specifications as well as backward compatibility with existing DOCSIS 2.0, 1.1 and 1.0 networks
- Enhanced packet processing technology to maximize performance
- Integrated battery backup provides power on loss of AC power

### Embedded Digital Voice Adapter

- Two-line embedded digital voice adapter for wired telephony service
- Toll-quality, high-compression, and high-fidelity (exceeding toll quality) CODEC options

### Connections

- Bridged 10/100/1000 Mbps Ethernet port with Auto-negotiate and Auto-MDIX and USB 2.0 data port
- Support for up to 64 users (1 USB port user and up to 63 users on user-supplied Ethernet hubs)

### Design and Function

- Attractive compact design and versatile orientation to stand vertically, lie flat on the desktop or shelf, or mount easily on a wall
- Dual-color LEDs on the front-panel provide an informative and easy-to-understand display to indicate real-time operational status
- Color-coded connectors and cables for easy installation and setup
- Rugged electronic components for long-term reliability

### Management

- Software upgradeable by network download
- Remote manageability using SNMP V1/V2 and V3

### Software and Documentation

- CD-ROM containing user guide and USB driver installation software for Microsoft Windows 7, Windows Vista, Windows XP, and Windows 2000 operating systems

**Figure 2.** DPQ3212 Front Panel (image may vary from actual product and specification)



**Table 1.** Front Panel Features

Feature	Description
Indicators	POWER, DS, US, ONLINE, LINK, TEL1, TEL2, BATTERY
Color	Black textured case, smooth black faceplate, silver text, green/amber LEDs
Branding	Cisco logo and model number

**Figure 3.** DPQ3212 Back Panel (image may vary from actual product and specification)



**Table 2.** Back Panel Connections

Feature	Description
TELEPHONE 1/2 and 2 Color: Gray	RJ-11 telephone ports connect to home telephone wiring and to conventional telephones or fax machines
ETHERNET Connector Color: Yellow	RJ-45 Ethernet port connects to the Ethernet port on your PC or your home network
USB (option) Color: Blue	USB 2.0 Type 2 port to connect to your PC (USB port option is not included on all hardware configurations)
REBOOT EMTA	Power cycles the modem
CABLE Connector Color: White	F-connector connects to an active cable signal from your service provider
POWER Connector Color: Black	Connects modem to AC power

## Product Specifications

**Table 3.** Product Specifications

Specification	Value
<b>Voice</b>	
Call Signaling Protocol	<ul style="list-style-type: none"> <li>• MGCP/NCS including configurable IPsec encryption</li> <li>• Configurable to support RFC2833 event signaling</li> <li>• Supports Bell103 detection: Improves alarm panel and Point of Sale (POS) interoperability by optimizing DSP for Bell 103 protocol</li> <li>• Software upgradeable to support Session Initiation Protocol (SIP)</li> <li>• The following SIP standards are supported             <ul style="list-style-type: none"> <li>◦ RFC 2617 HTTP Authentication: Basic and Digest Access Authentication</li> <li>◦ RFC 2976 The SIP INFO Method</li> <li>◦ RFC 3261 SIP: Session Initiation Protocol</li> <li>◦ RFC 3262 Reliability of Provisional Responses in Session Initiation Protocol (SIP)</li> <li>◦ RFC 3263 Session Initiation Protocol (SIP): Locating SIP Servers</li> <li>◦ RFC 3264 An Offer/Answer Model with Session Description Protocol (SDP)</li> <li>◦ RFC 3265 Session Initiation Protocol (SIP)-Specific Event Notification</li> <li>◦ RFC 3420 Internet Media Type message/sipfrag</li> <li>◦ RFC 3428 Session Initiation Protocol (SIP) Extension for Instant Messaging</li> <li>◦ RFC 3515 The Session Initiation Protocol (SIP) Refer Method</li> <li>◦ RFC 3842 A Message Summary and Message Waiting Indication Event Package for the Session Initiation Protocol (SIP)</li> <li>◦ RFC 3892 The Session Initiation Protocol (SIP) Referred-By Mechanism</li> <li>◦ RFC 3903 Session Initiation Protocol (SIP) Extension for Event State Publication</li> <li>◦ Draft-ietf-mmusic-sdp-new-24 SDP: Session Description Protocol (Replacement for RFC 2327)</li> <li>◦ Draft-ietf-sipping-cc-transfer-01 Session Initiation Protocol Call Control – Transfer</li> <li>◦ Draft-ietf-sip-session-timer-08 The SIP Session Timer</li> <li>◦ Draft-ietf-sipping-realtimefax-01 SIP Support for Real-time Fax: Call Flow Examples and Best Current Practices</li> <li>◦ Draft-ietf-mmusic-sdescription-09 Session Description Protocol Security</li> <li>◦ Descriptions for Media Streams</li> <li>◦ Draft-ietf-sip-replaces-02 The Session Initiation Protocol (SIP) "Replaces" Header</li> </ul> </li> </ul>
Provisioning Modes	<ul style="list-style-type: none"> <li>• Full PacketCable secure provisioning</li> <li>• Kerberos support with NVRAM ticket caching</li> <li>• Configurable PacketCable-lite (MTA config file provisioning without security)</li> <li>• Configurable for non-PacketCable (MTA configuration using DOCSIS config file)</li> </ul>
CODECs	<p>Standard: G.711, T.38 Fax Relay, iLBC and BV16</p> <p>Software upgradeable to support other CODEC combinations including:</p> <ul style="list-style-type: none"> <li>• G.711 and G.728</li> <li>• G.711 and G.729</li> <li>• G.711 and G.729 a/e</li> <li>• G.711 and BV16 and BV32 (High fidelity – near CD quality)</li> <li>• G.711 and G.723</li> <li>• G.711 and G.726</li> </ul> <p>Note: Other codec combinations can be downloaded as required.</p>
CODEC Packetization Intervals	10, 20, and 30ms
CODEC Synchronization	CODEC synchronization to UGS time clock allows slip-free end-to-end sync to PSTN clock (minimizes frame slips that can cause Fax/Analog Modem call failures)
CODEC Encryption	Configurable to support AES-128 encryption or no encryption modes
Hearing Impaired Services Support	TDD support including detection of V.18 including Annex A
Fax and Analog Modem support	DSP based Modem/Fax Tone detection and support for Voice Band Data Mode with auto-CODEC negotiation and auto-control of echo canceller, jitter buffer, and Voice Activation Detection (VAD)
Jitter Buffer Support	Adaptive dynamically controlled

Specification	Value
<b>Voice (continued)</b>	
Latency Control	Configurable min / max jitter buffer size
Audio Gain Levels	Independently Configurable Tx and Rx audio gains
Silence Suppression	Configurable VAD with comfort noise generation
Packet Loss Concealment	ANSI T1.521-1999
Call Connection Quality Monitoring	RTCP, RFC1889, RFC1890, SNMP MIB for last call quality statistics
Dialing Modes	DTMF and configurable pulse dial support
DTMF Relay	RFC2833 including fast (40mS) DTMF Relay for alarm system signaling compatibility
Layer 2 Quality of Service	<ul style="list-style-type: none"> <li>Full PacketCable secure DQOS with GateID including UGS and UGS/AD</li> <li>DQOS Lite support including UGS and UGS/AD</li> </ul>
Layer 3 Quality of Service	Configurable DiffServe/TOS support for Signaling, RTP, and RTCP flows
Payload Header Suppression (PHS)	<ul style="list-style-type: none"> <li>Supported for RTP and RTCP packet flows to reduce per-call network bandwidth.</li> <li>Advanced support for Dynamic Payload Header Suppression using Proprietary Technology.</li> </ul>
Management	SNMPv3, SNMPv2, and SNMPv1, Telnet /SSH with configurable user ID and password, internal log, and external Syslog support
Echo Cancellation	G.168 with extended echo tail support
Call Feature Support	<ul style="list-style-type: none"> <li>Caller ID</li> <li>Call Waiting with Caller ID</li> <li>Cancel Call Waiting</li> <li>Call Conferencing (3-way calls)</li> <li>Configurable hook flash support</li> <li>Distinctive Ringing (Configurable for up to 11 ring patterns per phone line)</li> <li>Ring Splash</li> <li>Stutter Dial Tone</li> <li>Off hook warning tone</li> <li>Open Switch Interval support to enhance answering machine compatibility</li> <li>Configurable star codes</li> <li>Euro/US hook-flash type</li> <li>Call transfer</li> <li>Message Waiting Indicator</li> <li>Warm Line</li> <li>Call Forwarding Unconditional</li> <li>Call Forwarding on Busy</li> <li>Call Forwarding No Answer</li> <li>Call return</li> <li>Redial Call</li> <li>Automatic redial</li> <li>Other call features available with compliant CMS or gateway</li> </ul>
Telephone Ring Loading	Full 5 REN support on each phone line (10 REN total)
Ring Signal	Configurable balanced ring with configurable DC offset
Max Phone Line Distance	Supports up to 1000 ft of AWG26 wire (0.4mm) on each phone line. Supports operation with typical in-home telephone wiring
Country-Specific Telephone Parameters Supported	United States, Japan, United Kingdom, Germany, France, Belgium, Netherlands, Finland, Italy, Switzerland, Sweden, Denmark, Brazil, Australia, Poland, Czech Republic, Hungary, Romania, ETSI 101 909-18
<b>RF Downstream</b>	
Operating Frequency Range	88 to 1002 or 108 to 1002 MHz
Tuner Frequency Range	88 to 1002 or 108 to 1002 MHz
Tuner	(2) Frequency agile block tuners, 32 MHz bandpass each
Demodulation	8 demodulators, 4 per tuner, each demodulator; 64 QAM or 256 QAM
Maximum Data Rate	8 downstream channels, each 6 MHz channel: 42.88 Mbps for 256 QAM and 30.34 Mbps for 64 QAM

Specification	Value				
RF Downstream (continued)					
Bandwidth	6 MHz				
Operating Level Range	−15 to +15 dBmV				
Input Impedance	75 ohms				
RF Upstream					
Operating Frequency Range	5 to 42 MHz, 5 to 65 MHz, or 5 to 85 MHz				
Transmitter Frequency Range	5 to 42 MHz, 5 to 65 MHz, or 5 to 85 MHz				
Upstream Transmission	4 upstream channels				
Modulation	QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM at ATDMA mode QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM, 128 QAM at SCDMA mode				
Maximum Data Rate per channel	<u>Modulation</u>	<u>Channel Bandwidth (MHz)</u>	<u>Raw Data Rate (Mbps)</u>		
	QPSK	1.6	2.56		
	16 QAM	1.6	5.12		
	QPSK	3.2	5.12		
	16 QAM	3.2	10.24		
	32 QAM	3.2	12.8		
	64 QAM	3.2	15.4		
	16 QAM	6.4	20.5		
32 QAM	6.4	25.6			
64 QAM	6.4	30.72			
Bandwidth	200 kHz to 6.4 MHz				
Maximum Operating Level  TDMA	<u>Modulation</u>	<u>1 Channel</u>	<u>2 Channels</u>	<u>3 or 4 Channels</u>	
	QPSK	+61 dBmV	+58 dBmV	+55dBmV	
	8 QAM	+58 dBmV	+55 dBmV	+52dBmV	
	16 QAM	+58 dBmV	+55 dBmV	+52dBmV	
	32 QAM	+57 dBmV	+54 dBmV	+51dBmV	
	64 QAM	+57 dBmV	+54 dBmV	+51dBmV	
	SCDMA	QPSK	+56 dBmV	+53 dBmV	+53 dBmV
		8 QAM	+56 dBmV	+53 dBmV	+53 dBmV
		16 QAM	+56 dBmV	+53 dBmV	+53 dBmV
32 QAM		+56 dBmV	+53 dBmV	+53 dBmV	
64 QAM		+56 dBmV	+53 dBmV	+53 dBmV	
128 QAM		+56 dBmV	+53 dBmV	+53 dBmV	
Other					
Input Voltage	100-120 VAC / 50-60 Hz or 100-240 VAC / 50-60 Hz				
Power Consumption	~14 Watts				
Data Ports	Ethernet 10/100/1000BASE-T (Auto-sensing with Auto-MDIX): RJ-45 Ethernet (1) USB 2.0, Type B (factory installed option)				
RF	Female “F” type				
Impedance	75 ohm				
Mechanical					
Dimensions (W x D x H) (approximate)	Not including “F” connector: 7 in. x 5.9 in. x 2.8 in. (17.8 cm x 15.0 cm x 7.0 cm)				
Weight (approximate)	No battery: 18.9 oz (0.536 kg) With battery: 24.6 oz (0.698 kg)				
Battery Type and Capacity	1 cartridge, Li-Ion, 3 cells, 2600 mAh				
Operating Temperature	32° to 104°F (0° to 40°C)				

Specification	Value
<b>Mechanical (continued)</b>	
Operating Humidity	0 to 90% RH non-condensing
Storage Temperature	-4° to 140°F (-20° to 60°C)
<b>Standards and Approvals</b>	
Designed to Comply with the Following Standards	PacketCable 1.5, 1.0 DOCSIS 3.0, 2.0, 1.1, 1.0
Regulatory and Safety Approvals	As required per country where the DPQ3212 will be used

## Ordering Information

**Table 4.** Ordering Information

Description	Part Number
<b>5-42/88-1002 MHz Diplex Filter</b>	
DPQ3212 DOCSIS 3.0 Cable Modem with Embedded Digital Voice Adapter. Includes: <ul style="list-style-type: none"> <li>• USB 2.0 port</li> <li>• 100-120 VAC / 50-60 Hz, Internal PS</li> <li>• Power cord, North America (polarized)</li> <li>• No Li-Ion battery provided</li> <li>• Ethernet cable</li> <li>• USB cable</li> <li>• CD-ROM containing user guide and USB driver</li> </ul> <b>North America</b>	4027665
DPQ3212 DOCSIS 3.0 Cable Modem with Embedded Digital Voice Adapter. Includes: <ul style="list-style-type: none"> <li>• USB 2.0 port</li> <li>• 100-240 VAC / 50-60 Hz, Internal PS</li> <li>• Power cord, Australia</li> <li>• No Li-Ion battery provided</li> <li>• Ethernet cable, 2.0 meters</li> <li>• Telephone cable, 3.0 meters</li> <li>• CD-ROM containing user guides and USB driver</li> </ul> <b>Australia (Customer-specific configuration)</b>	4035623
DPQ3212-2600 DOCSIS 3.0 Cable Modem with Embedded Digital Voice Adapter. Includes: <ul style="list-style-type: none"> <li>• USB 2.0 port</li> <li>• 100-120 VAC / 50-60 Hz, Internal PS</li> <li>• Power cord, North America (polarized)</li> <li>• One (1) 3-cell, 2600 mAh Li-Ion battery</li> <li>• Ethernet cable</li> <li>• USB cable</li> <li>• CD-ROM containing user guide and USB driver</li> </ul> <b>North America</b>	4027666
DPQ3212-2600 DOCSIS 3.0 Cable Modem with Embedded Digital Voice Adapter. Includes: <ul style="list-style-type: none"> <li>• <b>No USB port</b></li> <li>• 100-240 VAC / 50-60 Hz, Internal PS</li> <li>• Power cord, North America (polarized)</li> <li>• One (1) 3-cell, 2600 mAh Li-Ion battery</li> <li>• Ethernet Cable, 1.2 meters</li> <li>• CD-ROM containing user guides</li> </ul> <b>North America (Customer-specific configuration)</b>	4033434

Description	Part Number
<b>5-42/88-1002 MHz Diplex Filter (continued)</b>	
DPQ3212-2600 DOCSIS 3.0 Cable Modem with Embedded Digital Voice Adapter. Includes: <ul style="list-style-type: none"> <li>• USB 2.0 port</li> <li>• 100-240 VAC / 50-60 Hz, Internal PS</li> <li>• Power cord, Australia (polarized)</li> <li>• One (1) 3-cell, 2600 mAh Li-Ion battery</li> <li>• Ethernet cable, 2.0 meters</li> <li>• Telephone cable, 3.0 meters</li> <li>• CD-ROM containing user guide and USB driver</li> </ul> <b>Australia (Customer-specific configuration)</b>	4035624
DPQ3212-2600 DOCSIS 3.0 Cable Modem with Embedded Digital Voice Adapter. Includes: <ul style="list-style-type: none"> <li>• USB 2.0 port</li> <li>• 100-120 VAC / 50-60 Hz, Internal PS</li> <li>• Power cord, North America (polarized)</li> <li>• One (1) 3-cell, 2600 mAh Li-Ion battery</li> <li>• Ethernet Cable, 1.2 meters</li> <li>• USB cable</li> <li>• CD-ROM containing user guides and USB driver</li> </ul> <b>North America (Customer-specific configuration)</b>	4039662

## Replacement Components

**Table 5.** Replacement Components

Description	Part Number
<b>Power Cord</b>	
Power Cord, 2 conductors, NEMA 1-15P to C7P, 6 foot, North America (polarized)	186750
Power Cord, 2 conductors, 6 foot, Australia (polarized)	4025792
<b>Data Cable</b>	
Ethernet cable, 1.2 meters	740580
Ethernet cable, 2.0 meters	4018790
USB cable, 1.0 meter	740579
<b>Battery</b>	
2600 mAh Li-Ion battery	4033435
<b>CD-ROM</b>	
CD-ROM with user guide and USB drivers	4029649



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