# Cisco Model DPC3212 DOCSIS 3.0 8x4 Cable Modem with Embedded Digital Voice Adapter

The Cisco® Model DPC3212 DOCSIS 3.0 8x4 Cable Modem with Embedded Digital Voice Adapter (DPC3212) is a high-speed cable modem with an embedded digital voice adapter. The DPC3212 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 DPC3212 uses advanced line-interface technology to provide multi-country, toll-quality, telephone service using existing in-home wiring. The DPC3212 features two-line or single-line RJ-11 telephone port(s) for voice and supports 10 REN total, 5 REN phone loading on each phone line.

**Figure 1.** DPC3212 DOCSIS 3.0 8x4 Cable Modem with Embedded Digital Voice Adapter (image may vary from actual product and specification)


The DPC3212 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 DPC3212 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
- Expanded tuning range, 88-1002 MHz

### Embedded Digital Voice Adapter

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

### Connections

- 10/100/1000 BASE-T auto-sensing/auto-MDIX Ethernet port
- 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 LED status indicators on the front-panel provide an informative and easy-to-understand display that indicates the cable modem 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.** DPC3212 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 |
| Color | Black case, black faceplate, silver text, green/amber LEDs |
| Branding | Cisco logo and model number |

**Figure 3.** DPC3212 Back Panel (image may vary from actual product and specification)


**Table 2.** Back Panel Connections

| Feature | Description |
|---|---|
| POWER SWITCH (not shown) | Turns power on and off to the device (power switch provided on all products carrying the CE mark) |
| POWER<br>Connector Color: Black | Connects modem to the DC output of the AC power adapter |
| TELEPHONE 1 and 2<br>Color: Gray | RJ-11 telephone ports connect to home telephone wiring and to conventional telephones or fax machines |
| ETHERNET<br>Connector Color: Yellow | RJ-45 Ethernet port connect to the Ethernet port on your PC or your home network |
| USB<br>Connector Color: Blue | USB 2.0 port connects to a USB port on your PC |
| REBOOT EMTA | Power cycles the modem |
| CABLE<br>Connector Color: White | F-connector connects to an active cable signal from your service provider |

## Product Specifications

**Table 3.** Product Specifications

| Specification | Value |
|---|---|
| **Voice Specifications** | |
| Call Signaling Protocol | MGCP/NCS including configurable IPsec encryption.<br>Configurable to support RFC2833 event signaling<br>Supports Bell103 detection: Improves alarm panel and Point of Sale (POS) interoperability by optimizing DSP for Bell103 protocol<br>Software upgradeable to support Session Initiation Protocol (SIP)<br>The following SIP standards are supported<br>• RFC 2617 HTTP Authentication: Basic and Digest Access Authentication<br>• RFC 2976 The SIP INFO Method<br>• RFC 3261 SIP: Session Initiation Protocol<br>• RFC 3262 Reliability of Provisional Responses in Session Initiation Protocol (SIP)<br>• RFC 3263 Session Initiation Protocol (SIP): Locating SIP Servers<br>• RFC 3264 An Offer/Answer Model with Session Description Protocol (SDP)<br>• RFC 3265 Session Initiation Protocol (SIP)-Specific Event Notification<br>• RFC 3420 Internet Media Type message/sipfrag<br>• RFC 3428 Session Initiation Protocol (SIP) Extension for Instant Messaging<br>• RFC 3515 The Session Initiation Protocol (SIP) Refer Method<br>• RFC 3842 A Message Summary and Message Waiting Indication Event Package for the Session Initiation Protocol (SIP)<br>• RFC 3892 The Session Initiation Protocol (SIP) Referred-By Mechanism<br>• RFC 3903 Session Initiation Protocol (SIP) Extension for Event State Publication<br>• Draft-ietf-mmusic-sdp-new-24 SDP: Session Description Protocol (Replacement for RFC 2327)<br>• Draft-ietf-sipping-cc-transfer-01 Session Initiation Protocol Call Control – Transfer<br>• Draft-ietf-sip-session-timer-08 The SIP Session Timer<br>• Draft-ietf-sipping-realtimefax-01 SIP Support for Real-time Fax: Call Flow Examples and Best Current Practices<br>• Draft-ietf-mmusic-sdescription-09 Session Description Protocol Security<br>• Descriptions for Media Streams<br>• Draft-ietf-sip-replaces-02 The Session Initiation Protocol (SIP) "Replaces" Header |
| Provisioning Modes | • Full PacketCable secure provisioning<br>• Kerberos support with NVRAM ticket caching<br>• Configurable PacketCable-lite (MTA config file provisioning without security)<br>• Configurable for non-PacketCable (MTA configuration using DOCSIS config file) |
| CODECs | Standard: G.711, T.38 Fax Relay, iLBC and BV16<br>Software upgradeable to support other CODEC combinations including:<br>• G.711 and G.728<br>• G.711 and G.729<br>• G.711 and G.729 a/e<br>• G.711 and BV16 and BV32 (High fidelity – near CD quality)<br>• G.711 and G.723<br>• G.711 and G.726<br>Note: Other codec combinations can be downloaded as required. |
| CODEC Packetization Intervals | 10, 20, and 30 mS |
| 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 |
|---|---|
| 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 | • Full PacketCable secure DQOS with GateID including UGS and UGS/AD<br>• DQOS Lite support including UGS and UGS/AD |
| Layer 3 Quality of Service | Configurable DiffServe/TOS support for Signaling, RTP, and RTCP flows |
| Payload Header Suppression (PHS) | • Supported for RTP and RTCP packet flows to reduce per-call network bandwidth.<br>• Advanced support for Dynamic Payload Header Suppression using Propane Technology. |
| 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 | • Caller ID<br>• Call Waiting with Caller ID<br>• Cancel Call Waiting<br>• Call Conferencing (3-way calls)<br>• Configurable hook flash support<br>• Distinctive Ringing (Configurable for up to 11 ring patterns per phone line)<br>• Ring Splash<br>• Stutter Dial Tone<br>• Off hook warning tone<br>• Open Switch Interval support to enhance answering machine compatibility<br>• Configurable star codes<br>• Euro/US hook-flash type<br>• Call transfer<br>• Message Waiting Indicator<br>• Warm Line<br>• Call Forwarding Unconditional<br>• Call Forwarding on Busy<br>• Call Forwarding No Answer<br>• Call return<br>• Redial Call<br>• Automatic redial<br>• Other call features available with compliant CMS or gateway |
| 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 |
| **RF Downstream** | |
| Operating Frequency Range | 88 to 1002 MHz or 54 to 1002 MHz (option) |
| Tuner Frequency Range | 88 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:<br>42.88 Mbps for 256 QAM and 30.34 Mbps for 64 QAM |
| Bandwidth | 6 MHz |

| Specification | Value |
|---|---|
| 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<br>QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM, 128 QAM at SCDMA mode |
| Maximum Data Rate per channel | Modulation / Channel Bandwidth (MHz) / Raw Data Rate (Mbps)<br>QPSK / 1.6 / 2.56<br>16 QAM / 1.6 / 5.12<br>QPSK / 3.2 / 5.12<br>16 QAM / 3.2 / 10.24<br>32 QAM / 3.2 / 12.8<br>64 QAM / 3.2 / 15.4<br>16 QAM / 6.4 / 20.5<br>32 QAM / 6.4 / 25.6<br>64 QAM / 6.4 / 30.72 |
| Bandwidth | 200 kHz to 6.4 MHz |
| Maximum Operating Level | Modulation / 1 Channel / 2 Channels / 3 or 4 Channels<br>TDMA<br>QPSK / +61 dBmV / +58 dBmV / +55 dBmV<br>8 QAM / +58 dBmV / +55 dBmV / +52 dBmV<br>16 QAM / +58 dBmV / +55 dBmV / +52 dBmV<br>32 QAM / +57 dBmV / +54 dBmV / +51 dBmV<br>64 QAM / +57 dBmV / +54 dBmV / +51 dBmV<br>SCDMA<br>QPSK / +56 dBmV / +53 dBmV / +53 dBmV<br>8 QAM / +56 dBmV / +53 dBmV / +53 dBmV<br>16 QAM / +56 dBmV / +53 dBmV / +53 dBmV<br>32 QAM / +56 dBmV / +53 dBmV / +53 dBmV<br>64 QAM / +56 dBmV / +53 dBmV / +53 dBmV<br>128 QAM / +56 dBmV / +53 dBmV / +53 dBmV |
| **Other** | |
| Input Voltage | 15 VDC / 1 A |
| Power Consumption (Modem Module) | ~9.6 Watts |
| Data Ports | Ethernet 10/100/1000BASE-T (Auto-sensing with Auto-MDIX): RJ-45 Ethernet (1)<br>USB 2.0: USB Type B (1) |
| RF | Female “F” type |
| Impedance | 75 ohms |
| **Mechanical** | |
| Dimensions (W x D x H) (approximate) | Not including “F” connector:<br>6.9 in. x 5.7 in. x 1.96 in. (17.6 cm x 14.5 cm x 5.0 cm) |
| Weight (approximate) | 13.8 oz (0.39 kg) |
| Operating Temperature | 32˚ to 104˚F (0˚ to 40˚C) |
| Operating Humidity | 0 to 90% RH non-condensing |
| Storage Temperature | -4˚ to 140˚F (-20˚ to 60˚C) |

| Standards and Approvals | |
|---|---|
| Designed to Comply with the Following Standards | PacketCable 1.5, 1.0<br>DOCSIS 3.0, 2.0, 1.1, 1.0 |
| Regulatory and Safety Approvals | As required per country where the DPC3212 will be used |

## Ordering Information

**Table 4.** Ordering Information

| Description | Part Number |
|---|---|
| **5-42/88-1000 MHz diplex filter** | |
| DPC3212 DOCSIS 3.0 Cable Modem with Embedded Digital Voice Adapter, includes:<br>• USB 2.0 port<br>• 100-120 VAC/50-60 Hz, 15 VDC/1A, desktop linear switching power supply, North America<br>• Ethernet cable<br>• USB cable<br>• CD-ROM containing user guide and USB driver<br>***North America*** | 4034437 |
| DPC3212 DOCSIS 3.0 Cable Modem with Embedded Digital Voice Adapter, includes:<br>• USB 2.0 port<br>• 230 VAC/50-60 Hz, 15 VDC/1 A, wall-mount linear switching power supply, UK<br>• Ethernet cable<br>• USB cable<br>• CD-ROM containing user guide and USB driver<br>***Hong Kong (Customer-specific configuration)*** | 4038587 |
| DPC3212 DOCSIS 3.0 Cable Modem with Embedded Digital Voice Adapter, includes:<br>• USB 2.0 port<br>• 220 VAC/50-60 Hz, 15 VDC/1A, desktop linear switching power supply, Argentina<br>• Ethernet cable<br>• USB cable<br>• CD-ROM containing user guide and USB driver<br>***Argentina*** | 4037936 |

## Replacement Components

**Table 5.** Replacement Components

| Description | Part Number |
|---|---|
| **Power supply** | |
| *Class 2 Linear Switching* | |
| 100-120 VAC / 50-60 Hz, 15 VDC /1 A Desktop linear switching power supply, North America | 4018776 |
| 220 VAC / 50Hz, 15 VDC /1.0 A Desktop linear switching power supply, Argentina | 4023778 |
| *Class 2 Switching Regulated* | |
| 230-240 VAC / 50-60 Hz, 15 VDC / 1 A Wall-mount linear switching power supply, UK | 4018795 |
| **Data Cable** | |
| Ethernet cable, 1.2 meters | 740580 |
| USB cable, 1.0 meter | 740579 |
| **CD-ROM** | |
| CD-ROM with user guides and USB driver | 4029648 |



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Part Number 7016876 Rev B
December 2010