

## Cisco Model DPC2202 DOCSIS 2.0 Cable Modem with Embedded Digital Voice Adapter

The Cisco® Model DPC2202 DOCSIS 2.0 Cable Modem with Embedded Digital Voice Adapter (DPC2202) is a high-speed cable modem with an embedded digital voice adapter. The DPC2202 features two RJ-11 telephone ports for voice service along with a 10/100BASE-T Ethernet port and a USB 1.1 port for high-speed data connectivity.

The DPC2202 is designed to meet PacketCable™ 1.5 and DOCSIS® 2.0 specifications as well as being backward compatible with DOCSIS 1.1 and DOCSIS 1.0 networks. The DPC2202 uses advanced line-interface technology to provide multi-country, toll-quality, telephone service using existing in-home wiring. The DPC2202 supports 10 REN total, 5 REN loading on each line.

**Figure 1.** DPC2202 DOCSIS 2.0 Cable Modem with Embedded Digital Voice Adapter (image may vary from actual product and specification)



The DPC2202 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's (MGCP/NCS) specifications. Software upgrades are available to support Session Initiation Protocol (SIP) call signaling.

### Features

- Two-line embedded digital voice adapter for wired telephony service
- Expanded tuning range, 88-930 MHz
- Toll-quality, high-compression, and high-fidelity (exceeding toll quality) CODEC options
- Attractive, compact design that allows for vertical, horizontal, or wall-mounted placement
- Front panel LEDs provide visual feedback of real-time operational status
- 10/100BASE-T auto-sensing/auto-MDIX Ethernet port
- USB 1.1 data port (optional)

**Figure 2.** DPC2202 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, green LEDs, silver text
Branding	Cisco logo and model number

**Figure 3.** DPC2202 Back Panel (image may vary from actual product and specification)



**Table 2.** Back Panel Connections

Feature	Description
POWER Connector Color: Black	Connects the modem to the DC output of the AC power adapter
TELEPHONE 1 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 connect to the Ethernet port on your PC or your home network
USB (option) Connector Color: Blue	USB 1.1 port connects to the USB port on your PC
REBOOT EMTA	Power cycles the modem
CABLE Connector Color: White	F-connector connects to an active cable signal from your service provider

## Product Specifications

**Table 3.** Product Specifications

Specification	Value
<b>Voice Specifications</b>	
Call Signaling Protocol	<p>MGCP/NCS including configurable IPsec encryption.</p> <p>Configurable to support RFC2833 event signaling</p> <p>Supports Bell103 detection : Improves alarm panel and Point of Sale (POS) interoperability by optimizing DSP for bell 103 protocol</p> <p>Software upgradeable to support Session Initiation Protocol (SIP)</p> <p>The following SIP standards are supported</p> <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-realtimifax-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>
Provisioning Modes	<p>Full PacketCable secure provisioning</p> <p>Kerberos support with NVRAM ticket caching</p> <p>Configurable PacketCable-lite (MTA config file provisioning without security)</p> <p>Configurable for non-PacketCable (MTA configuration using DOCSIS config file)</p>
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>
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 VAD
Jitter Buffer Support	Adaptive dynamically controlled
Latency Control	Configurable min / max jitter buffer size

Specification	Value
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 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. Advanced support for Dynamic Payload Header Suppression using Propane Technology.
Management	SNMPv3, SNMPv2, Telnet 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> </ul> Other call features available with compliant CMS
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, ETSI 101 909-18
<b>RF Downstream</b>	
Frequency Range	88 to 1002 MHz
Demodulation	64 QAM or 256 QAM
Maximum Data Rate	30.34 Mbps for 64 QAM 42.88 Mbps for 256 QAM
Bandwidth	6 MHz
Operating Level Range	-15 to +15 dBmV
Input Impedance	75 ohms

Specification	Value																											
<b>RF Upstream</b>																												
Frequency Range	5 to 42 MHz 5 to 85 MHz (option)																											
Modulation	QPSK 8 QAM 16 QAM 32 QAM 64 QAM 128 QAM TCM																											
Maximum Data Rate	5.12 Mbps for QPSK 10.2 Mbps for 16 QAM 30.0 Mbps for A-TDMA and SCDMA																											
Bandwidth	200 kHz to 6.4 MHz																											
Operating Level Range (all values +/- 0.5 dB $\mu$ V )	<table border="0"> <thead> <tr> <th></th> <th colspan="2"><u>DOCSIS Mode</u></th> </tr> </thead> <tbody> <tr> <td rowspan="5">TDMA</td> <td>QPSK</td> <td>+8 to +58 dBmV</td> </tr> <tr> <td>8QAM</td> <td>+8 to +55 dBmV</td> </tr> <tr> <td>16QAM</td> <td>+8 to +55 dBmV</td> </tr> <tr> <td>32QAM</td> <td>+8 to +54 dBmV</td> </tr> <tr> <td>64QAM</td> <td>+8 to +54 dBmV</td> </tr> <tr> <td rowspan="6">SCDMA</td> <td>QPSK</td> <td>+8 to +53 dBmV</td> </tr> <tr> <td>8QAM</td> <td>+8 to +53 dBmV</td> </tr> <tr> <td>16QAM</td> <td>+8 to +53 dBmV</td> </tr> <tr> <td>32QAM</td> <td>+8 to +53 dBmV</td> </tr> <tr> <td>64QAM</td> <td>+8 to +53 dBmV</td> </tr> <tr> <td>128QAM</td> <td>+8 to +53 dBmV</td> </tr> </tbody> </table>		<u>DOCSIS Mode</u>		TDMA	QPSK	+8 to +58 dBmV	8QAM	+8 to +55 dBmV	16QAM	+8 to +55 dBmV	32QAM	+8 to +54 dBmV	64QAM	+8 to +54 dBmV	SCDMA	QPSK	+8 to +53 dBmV	8QAM	+8 to +53 dBmV	16QAM	+8 to +53 dBmV	32QAM	+8 to +53 dBmV	64QAM	+8 to +53 dBmV	128QAM	+8 to +53 dBmV
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Output Impedance	75 ohms																											
<b>Other</b>																												
Input Voltage	15 VDC																											
Power Consumption (Modem Module)	4.68 Watts																											
Data Ports	Ethernet 10/100BASE-T (Auto-sensing with Auto-MDIX), USB 1.1 Type 2																											
RF	Female "F" type																											
<b>Mechanical</b>																												
Dimensions (W x D x H) (approximate)	Not including "F" connector: 5 7/8 in. x 4 3/4 in. x 1 1/2 in. (15 cm x 12.2 cm x 3.8 cm)																											
Weight (approximate)	8.9 oz (0.25 kg)																											
Operating Temperature	32° to 104°F (0° to 40°C)																											
Operating Humidity	0 to 90% RH non-condensing																											
Storage Temperature	-20° to 60°C (-4° to 140°F)																											
<b>Standards and Approvals</b>																												
Designed to Comply with the Following Standards	PacketCable 1.5, 1.0 DOCSIS 2.0, DOCSIS 1.1, DOCSIS 1.0																											
Regulatory and Safety Approvals	As required per country where the DPC2202 will be used																											

## Ordering Information

**Table 4.** Ordering Information

Model	Description	Part Number
<b>2 Voice Ports, North American Tuning Plan – NTSC</b>		
Model DPC2202	DPC2202 DOCSIS 2.0 Cable Modem with Embedded Digital Voice Adapter. Includes: <ul style="list-style-type: none"> <li>• 100-120 VAC/60 Hz, 15 VDC/1 A desktop linear-switching power supply</li> <li>• Ethernet and USB data cables</li> <li>• CD-ROM containing user guide</li> </ul> <b>North America</b>	4029160
Model DPC2202	DPC2202 DOCSIS 2.0 Cable Modem with Embedded Digital Voice Adapter. Includes: <ul style="list-style-type: none"> <li>• 100-120 VAC/60 Hz, 15 VDC/1 A desktop linear-switching power supply</li> <li>• Ethernet and USB data cables</li> <li>• CD-ROM containing user guide</li> </ul> <b>North America(Customer-specific Configuration)</b>	4029161
Model DPC2202	DPC2202 DOCSIS 2.0 Cable Modem with Embedded Digital Voice Adapter. Includes: <ul style="list-style-type: none"> <li>• 220 VAC/50 Hz, 12 VDC/1 A desktop linear-switching power supply</li> <li>• No USB port</li> <li>• Ethernet cable</li> <li>• CD-ROM containing user guide</li> </ul> <b>Argentina</b>	4029837
<b>1 Voice Port, North American Tuning Plan – NTSC</b>		
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Model DPC2202	DPC2202 DOCSIS 2.0 Cable Modem with Embedded Digital Voice Adapter. Includes: <ul style="list-style-type: none"> <li>• 220 VAC/50-60 Hz, 15 VDC/1 A desktop linear-switching power supply</li> <li>• No USB port</li> <li>• Ethernet cable</li> <li>• CD-ROM containing user guide</li> </ul> <b>Argentina (Customer-specific Configuration)</b>	4028934

## Replacement Components

**Table 5.** Replacement Components

Description	Part Number
<b>Power Supply</b>	
<i>Class 2 Linear Switching</i>	
100-120 VAC / 50-60 Hz, 15 VDC /1 A desktop style linear-switching power supply for North America	4020982
220 VAC / 50-60 Hz, 15 VDC /1 A desktop style linear-switching power supply for Argentina	4025790
<b>Data Cables</b>	
Ethernet cable, 1.2 meters	740580
USB cable, 1.0 Meter	740579
<b>CD-ROM</b>	
CD-ROM with user guide	4025495



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