Cisco Model DPC2420 DOCSIS 2.0 Wireless Residential Gateway with Embedded Digital Voice Adapter

The Cisco® Model DPC2420 DOCSIS 2.0 Wireless Residential Gateway with embedded digital voice adapter (DPC2420) is a high-performance home gateway that combines a cable modem, two-line or single-line digital voice adapter, router and wireless access point in a single device providing a cost-effective voice and networking solution for both the home and small office.

The DPC2420 is designed to meet PacketCable™ 1.5 and DOCSIS® 2.0 specifications, as well as offering backward compatibility for operation in PacketCable 1.0 and DOCSIS 1.1, and 1.0 networks.

Figure 1. Cisco Model DPC2420 DOCSIS 2.0 Wireless Residential Gateway (image may vary from actual product and specification)

Designed for the active digital home or office, the DPC2420 integrated router features a Dynamic Host Configuration Protocol (DHCP) server, Network Address and Port Translation (NAT/NAPT) and a Stateful Packet Inspection (SPI) firewall. These features allow the user to share a single high-speed public Internet connection as well as share files and folders between devices within the home network by attaching multiple wired and wireless devices in the user's home or office to the wireless residential gateway.

Consumer-friendly features like Wireless Protected Setup (WPS) and user-configured Parental Control can protect the home network from unwelcome intruders and family members from access to undesirable websites.

Features

DOCSIS

- Compliant with DOCSIS 2.0, 1.1, and 1.0 standards along with PacketCable 1.5, 1.0 specifications to deliver high-end performance and reliability

Connections

- One 100/10BASE-T Ethernet port to provide wired connectivity
- 802.11g Wireless Access Point (WAP) with four Service Set Identifiers (SSIDs)
- WPS, including a push-button switch to activate WPS for simplified and secure wireless setup
- RJ-11 telephony port(s) for connecting to in-home wiring or directly to conventional telephones or fax machines

Design and Function

- User-friendly web GUI for setup and configuration
- DOCSIS-5 compliant LED labeling and behavior provides a user- and technician-friendly method to check operational status and act as a troubleshooting tool
- Attractive, compact design to lie flat on the desktop or shelf, or mount easily on a wall
- TR-068 compliant color-coded interface ports and corresponding cables simplify installation and setup

Management

- User-configurable Parental Control blocks access to undesirable Internet sites
- Provisionable via DOCSIS, SNMP, and/or XML

Security

- User-configurable Parental Control blocks access to undesirable Internet sites
- Advanced firewall technology deters hackers and protects the home network from unauthorized access

Software and Documentation

- CD-ROM containing user guide

Figure 2. Cisco Model DPC2420 Front Panel (image may vary from actual product and specification)

Table 1. Front Panel Features

Feature	Description
Indicators	Power, DS, US, Online, PC, Wireless LAN, Wireless LAN Setup, Tel Line1, Tel Line2
Color	Black, black lens, silver text
Branding	Cisco and model number

Figure 3. Cisco Model DPC2420 Back Panel (image may vary from actual product and specification)

Table 2. Back Panel Features

Feature	Description
POWER Connector Color: Black	Connects the wireless home gateway 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 (single-line version not shown)
ETHERNET Connector Color: Yellow	One RJ-45 Ethernet port connects to the Ethernet port on your PC or your home network
REBOOT EMTA	Power cycles the cable modem
CABLE Connector Color: White	F-connector connects to an active cable signal from your service provider
WIRELESS SETUP	Activates WPS, which allows you to add wireless devices to the wireless network of the residential gateway
MAC ADDRESS LABEL	Displays the MAC address of the cable modem
ANTENNA (not shown)	(2) internal antennas provide a communication connection for the built-in 802.11g wireless

Product Specifications

Table 3. Product Specifications

Specification	Value
Voice	
Call Signaling Protocol	• MGCP/NCS including configurable IPsec encryption • Configurable to support RFC 2833 event signaling • Supports Bell103 detection: Improves alarm panel and Point of Sale (POS) interoperability by optimizing DSP for Bell103 protocol • Software upgradeable to support Session Initiation Protocol (SIP) • The following SIP standards are supported: ◦ RFC 2617 HTTP Authentication: Basic and Digest Access Authentication ◦ RFC 2833 RTP Payload for DTMF Digits, Telephony Tones, and Telephony Signals ◦ RFC 2976 The SIP INFO Method ◦ RFC 3261 SIP: Session Initiation Protocol ◦ RFC 3262 Reliability of Provisional Responses in Session Initiation Protocol ◦ RFC 3263 Session Initiation Protocol: Offer / Answer Model with the Session Description Protocol (SDP) ◦ RFC 3264 Session Initiation Protocol (SIP): Locating SIP Servers ◦ RFC 3265 Session Initiation Protocol (SIP) - Specific Event Notification ◦ RFC 3420 Internet Media Type message/sipfrag ◦ RFC 3428 Session Initiation Protocol (SIP) for Instant Messaging ◦ RFC 3489 STUN - Simple Traversal of User Datagram Protocol (UDP) Through Network Address Translators (NATs) ◦ RFC 3515 The Session Initiation Protocol (SIP) Refer Method ◦ RFC 3842 A Message Summary and Message Waiting Indication Event Package for the Session Initiation Protocol (SIP) ◦ RFC 3892 The Session Initiation Protocol (SIP) Referred-By Mechanism ◦ RFC 3903 Session Initiation Protocol Extension for Event State Publication ◦ Draft-ietf-mmusic-sdescription-09 Session Description Protocol Security Descriptions for Media Streams ◦ Draft-ietf-mmusic-sdp-new-24 SDP: Session Description Protocol Replacement for RFC 2327 ◦ Draft-ietf-sip-replaces-02 The Session Initiation Protocol (SIP) "Replaces" Header ◦ Draft-ietf-sip-session-timer-08 The SIP Session Timer ◦ Draft-ietf-sipping-cc-transfer-01 Session Initiation Protocol Call Control – Transfer ◦ Draft-ietf-sipping-realtimefax-01 SIP Support for Real-time Fax: Call Flow Examples and Best Current Practices ◦ Draft-johnston-sipping-rtcp-summary-07 SIP Service Quality Reporting Event ◦ Draft-rosenberg-sipping-acr-code-00 Rejecting Anonymous Requests in the Session Initiation Protocol (SIP)
Basic Configuration (per line)	• SIP Signaling Port (local receive and source port) • SIP Registrar • SIP Proxy • SIP Outbound Proxy • Username • Password • Authentication name
Provisioning Modes	• Basic, Secure, Hybrid provisioning • Full PacketCable secure provisioning • Kerberos support with NVRAM ticket caching • Configurable PacketCable-lite (MTA config file provisioning without security) • Configurable for non-PacketCable (MTA configuration using DOCSIS config file)

Specification	Value
Voice (continued)	
Voice CODEC support	Negotiate CODEC to use based on ordered list
CODECs	Standard: G.711, T.38 Fax Relay, iLBC and BV16 Software upgradeable to support other, CODEC combinations including: • G.711 and G.728 • G.711 and G.729 • G.711 and G.729 a/e • G.711 and BV16 and BV32 (High fidelity – near CD quality) • G.711 and G.723 • G.711 and G.726
Line Diagnostics	GR-909
CODEC Packetization Levels	10, 20, or 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 activated detection (VAD)
Jitter Buffer Support	Adaptive dynamically controlled
Latency Control	Configurable min / max jitter buffer size
Audio Gain Levels	Independently configurable transmit and receive audio gains
Silence Suppression	Configurable VAD with comfort noise generation
Packet Loss Concealment	ANSI T1.521-1999
Call Connection Quality Monitoring	RTCP, RFC 1889, RFC 1890, SNMP MIB for last-call quality statistics
Dialing Modes	DTMF and configurable pulse dial support
DTMF Relay	RFC 2833 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, SNMPv1, Telnet/SSH with configurable user ID and password, internal log, and external Syslog support
Echo Cancellation	• G.168 with extended echo tail support • 32 mS max tail length
VAD	Voice activity detection
CNG	Comfort noise generation
Voice band data	Machine tone detection used to auto switch to data optimized CODEC configuration
T.38 Fax	Supports V.29 and V.17 Modem

Specification	Value
Voice (continued)	
Call Feature Support	• Caller ID • Call Waiting with Caller ID • Cancel Call Waiting • Call Conferencing (3-way calls) • Configurable Hook-Flash Support • Distinctive Ringing (Configurable for up to 11 ring patterns per phone line) • Ring Splash • Stutter Dial Tone • Off hook Warning Tone • Open Switch Interval support to enhance answering machine compatibility • Configurable Star Codes • Euro/US Hook-Flash Type • Call Transfer • Message Waiting Indicator • Warm Line • Call Forwarding Unconditional • Call Forwarding on Busy • Call Forwarding No Answer • Call Return • Redial Call • Automatic Redial • Other call features available with compliant CMS or gateway
Networking (non-call) Services	• Known Good Proxy • Proxy Failover • Registration Control • UDP, TCP • TLS • DNS • DQoS-lite • STUN • Static NAT • NAT Keep Alive
SIP Header Control	• User-Agent Header Control • Server Header Control • Accept Language Header Control • Proxy Require Header Control • FQDN in URI Control • To-tag Matching Control • Escape Star Character in URI Field
Administrative Features	• Call Data Record • Call Statistics Agent • Debug Console Logging • Debug Logger
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 (0.4 mm) on each phone line. Supports operation with typical in-home telephone wiring
Country-Specific Telephone Parameters Supported	Australia, United States, Japan, United Kingdom, Germany, France, Belgium, Netherlands, Finland, Italy, Switzerland, Sweden, Denmark, Brazil, Poland, Czech, Hungary, Romania, ETSI 101 909-18
IPV6	dual IPV4/IPV6 CM and EMTA

Specification	Value
Residential Gateway	
ICSA (Independent Computer Security Association) Firewall Compliant	• IP Address and Port Number • TCP flags, ICMP types, fragmentation • Connection Creation and Teardown • Timestamps • Payload Modification
Parental Controls	• Content Filtering with Per-User Policies • Domain Block/Deny • Keyword Blocking • Java X Applet Blocking • Per-User MAC Address Filtering
Advanced Event Logging	• Filtering Activity • Session Tracking • User Notification via E-mail Alert and SNMP Traps
DOS attack protection	• Replay Attack Protection • Malformed Packet Protection • SYN Flooding • TCP Hijacking • LAND Attack • WinNuke/OOBNuke (Invalid TCP urgent pointer) • Christmas Tree • SYN/FIN (jackal) • BackOffice (UDP 32337) • NetBus • Smurf • Tear Drop • ICMP Flooding • Ping of Death • TCP Port Probe • UDP Port Probe • New Tear • Nestea • SYNdrop • Jolt • Boink • Bonk
Routing Features	• NAPT, NAT, and Pass-through (layer 2) Operational Modes • RIP v1/v2 • Static Routes • Port Forwarding • Port Triggering • UPnP IGD 1.0, QoS 1.0

Specification	Value
Residential Gateway (continued)	
ALG Support	• FTP • Real Audio • H.323 • ICQ • IPSec Pass-through • L2TP Pass-through • PPTP Pass-through • TFTP • mIRC • PIRCH • MS NetMeeting • Net2phone • AOL and MSN Messenger • Yahoo Messenger • Go2Call • Hotline Server • Visual IRC • CuSeeme • AT&T Instant Messenger Anywhere • Active Worlds • Buddy Phone Calista IP Phone • Delta Three PC to Phone • Dial Pad • Dwyco Video Conferencing • OrbitRC • Xircon • Netscape Chat
Wireless Access Point	
802.11g	• 2.4 GHz 802.11g wireless access point • (2) Internal Antennas • Wi-Fi Compliant (WPA2, WPA2-PSK, WPA, WPA-PSK, WEP) • WMM-QoS (Wireless Multi Media - Quality of Service) • WMM Power Save • WPS • Wireless Bridging - WDS (Wireless Distribution System) – allows connection to “Range Extender Products” • RADIUS Authentication (Client, EAP-TLS, EAP-TTLS, EAP-PEAP, EAP-MD5) • MBSSID (4 SSIDs with unique NAT scopes) • Wi-Fi "Hot Spot" support (Static DHCP IP Scope over tunnel)
RF Downstream	
Operating Frequency Range	88 to 930 MHz
Demodulation	64 QAM or 256 QAM
Maximum Data Rate	30 Mbps for 64 QAM and 43 Mbps for 256 QAM
Bandwidth	6 MHz
Operating Level Range	-15 to +15 dBmV
Input Impedance	75 ohms

Specification	Value
RF Upstream	
Frequency Range	5 to 42 MHz
Modulation	QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM / ATDMA, 128 QAM / SCDMA
Maximum Data Rate	5.12 Mbps for QPSK 10.2 Mbps for 16 QAM 30.0 Mbps for ATDMA and SCDMA
Bandwidth	200 kHz to 6.4 MHz
Operating Level Range (all values +/- 0.5 dBmV) TDMA SCDMA	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 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
Electrical	
Input Voltage	12 VDC
Power Consumption (modem module)	~5 Watts Online
Data Ports	100/10BASE-T (Auto-sensing with Auto-MDIX): RJ-45 Ethernet (1)
Telephony Ports	RJ-11 (2)
RF	Female F-Type
Output Impedance	75 ohms
Mechanical	
Dimensions (W x D x H)	F-Type Connector included: 5.96 in. x 5.2 in. x 1.46 in. (15.1 cm x 13.3 cm x 3.7 cm)
Weight	9.8 oz. (0.28 kg)
Operating Temperature	32˚ to 104˚F (-0˚ to 40˚C)
Operating Humidity	0 to 95% RH non-condensing
Storage Temperature	-4˚ to 158˚F (-20˚ to 70˚C)
Standards and Approvals	
Designed to meet with the following standards	DOCSIS 2.0, 1.1, 1.0, PacketCable 1.5, 1.0 IEEE 802.11g WEP, WPA, and WPA2 WMM, WPS
Regulatory Compliance	
Regulatory and Safety Approvals	As required per country where the DPC2420 will be used

Ordering Information

Table 4. Ordering Information

Description	Part Number
Two (2) Voice Ports	
DPC2420 DOCSIS 2.0 Wireless Voice Gateway. Includes: • 100-120 VAC/50-60 Hz, 12 VDC/ 1.0 A desktop linear-switching power supply for North America • Ethernet cable • CD-ROM containing user guide ***Columbia*** *(Customer-specific configuration)*	4034146
DPC2420 DOCSIS 2.0 Wireless Voice Gateway. Includes: • 100-240 VAC/50-60 Hz, 12 VDC/ 1.0 A desktop switching-regulated power supply with detachable power cord • Power cord (Brazil) • Ethernet cable • CD-ROM containing user guide ***Brazil*** *(Customer-specific configuration)*	4034147
DPC2420 DOCSIS 2.0 Wireless Voice Gateway. Includes: • 220 VAC/50-60 Hz, 12 VDC/ 1.0 A desktop linear-switching power supply for Argentina • Ethernet cable • CD-ROM containing user guide ***Argentina*** *(Customer specific configuration)*	4037022
One (1) Voice Port	
DPC2420 DOCSIS 2.0 Wireless Voice Gateway. Includes: • 220 VAC/50-60 Hz, 12 VDC/ 1.0 A desktop linear-switching power supply for Argentina • Ethernet cable • CD-ROM containing user guide ***Argentina*** *(Customer-specific configuration)*	4037021
DPC2420 DOCSIS 2.0 Wireless Voice Gateway. Includes: • 100-120 VAC/50-60 Hz, 12 VDC/ 1.0 A desktop linear-switching power supply for North America • Ethernet cable • CD-ROM containing user guide ***North America*** *(Customer-specific configuration)*	4037428

Replacement Components

Table 5. Replacement Components

Description	Part Number
Power Supply	
Class 2 Linear-Switching	
100-120 VAC / 50-60 Hz, 12 VDC / 1 A desktop style linear-switching power supply, North America	4020982
230 VAC / 50-60 Hz, 12 VDC / 1 A wall-mount linear-switching power supply, Europe	4020995
220 VAC / 58-60 Hz, 12 VDC / 1 A desktop style linear-switching power supply, Argentina	4025790
Class 2 Switching Regulated	
100-240 VAC / 50-60 Hz, 12 VDC / 1 A desktop style switching-regulated power supply with detachable power cord (order power cord separately)	4030554
Power Cord	
Power cord, 2 conductors, 6 foot, polarized, North America	186750
Power cord, 2 conductors, non-polarized, Brazil	4009115
Power cord, 2 conductors, 6 foot, non-polarized, Australia	4025792
Power cord, Brazil	4023633
Data Cable	
USB cable, 1.0 meter	740579
Ethernet cable, 1.2 meters	740580
Ethernet cable, 2.0 meters	4018790
CD-ROM	
CD-ROM with user guides	4034145

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