Cisco Model DPC2425R2 DOCSIS 2.0 Wireless Residential Gateway with Embedded Digital Voice Adapter

The Cisco® Model DPC2425R2 DOCSIS 2.0 Wireless Residential Gateway with Embedded Digital Voice Adapter (DPC2425R2) is a high-performance home gateway that combines a cable modem, two-line digital voice adapter, router and 802.11n wireless access point in a single device providing a cost-effective voice and networking solution for both the home and small office.

The DPC2425R2 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 DPC2425R2 DOCSIS 2.0 Wireless Residential Gateway with Embedded Digital Voice Adapter (image may vary from actual product and specification)

Designed for the active digital home or office, the DPC2425R2 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.

Cisco Connect® software makes home wireless simple and accessible for everyone by empowering consumers to easily set up and manage all of their wireless devices anywhere in their homes. The simple user interface was designed to transform how families use the Internet in their homes so they can enjoy the freedom of wireless access without the traditional frustration and complexity of setting up a home network.

Consumer-friendly features such as wireless ON/OFF button, 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

- Four 10/100 BASE-T Ethernet ports to provide wired connectivity
- High-performance broadband Internet connectivity to energize your online experience
- 802.11n Draft-Compliant, Single Band 2.4 GHz Single Stream 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
- Wireless ON/OFF button (optional) to activate or turn off the wireless feature
- Two RJ-11 telephony ports for connecting to in-home wiring or directly to conventional telephones or fax machines

Battery Backup (Selected models only)

- The DPC2425R2 can be ordered with or without the capability to provide battery backup powering. Units with battery backup capability have one battery bay to hold a user-replaceable and rechargeable Li-Ion battery cartridge that provides backup power in the event of an AC power failure

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
- LEDs provide a user-friendly method to check real-time operational status
- 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
- Advanced firewall technology deters hackers and protects the home network from unauthorized access
- Allows automatic software upgrades by your service provider
- Cisco Connect – wireless network setup and management software (optional)

Software and Documentation

- CD-ROM containing user guide and Cisco Connect (optional)

Figure 2. Cisco Model DPC2425R2 Front Panel, standard enclosure (image may vary from actual product and specification)

Figure 3. Cisco Model DPC2425R2 Front Panel, battery enclosure (image may vary from actual product and specification)

Table 1. Front Panel Features

Feature	Description
Indicators and Controls	Power, DS, US, Online, Link, Wireless ON/OFF (option), Wireless ON/OFF button (option), Wireless Setup, Wireless Setup button, TEL1, TEL2, Battery (on select models)
Color	Black housing, black lens, silver text
Branding	Cisco logo and model number

Figure 4. Cisco Model DPC2425R2 Back Panel, standard enclosure (image may vary from actual product and specification)

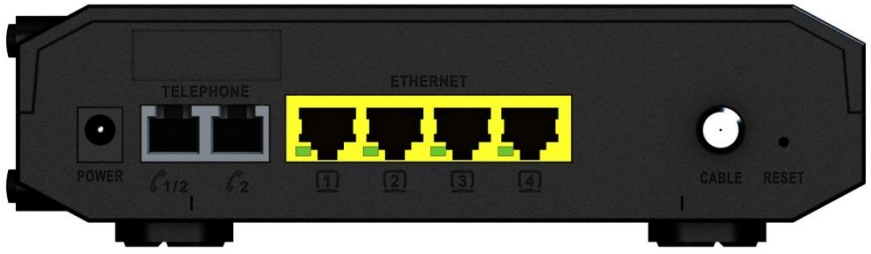

Figure 5. Cisco Model DPC2425R2 Back Panel, battery enclosure (image may vary from actual product and specification)

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
POWER SWITCH (Not Shown)	Turns power ON and OFF to the device (available only on products carrying the CE mark)
TELEPHONE 1 and 2 Color: Gray	RJ-11 telephone ports connect to home telephone wiring and to conventional telephones or fax machines
ETHERNET (1 – 4) Connector Color: Yellow	Four RJ-45 Ethernet ports connect to the Ethernet port on your PC or home network
CABLE Connector Color: White	F-connector connects to an active cable signal from the service provider
RESET	Resets the cable modem
ANTENNA (internal)	Two internal antennas provide a communication connection for the built-in 802.11n wireless access point

Figure 6. Models Available

Models Available

Standard (Non-battery) enclosure

Battery Enclosure
(Support for one battery cartridge)

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)
Voice CODEC support	Negotiate CODEC to use based on ordered list

Specification	Value
Voice (continued)	
CODECs	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 (0.4mm) 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 stack IPV4/IPV6 CM and CPE. Optional eRouter support.

Specification	Value
Residential Gateway	
Gateway Configuration Management	• TR-069 and subset of TR-098 data model (optional) • Extensive custom SNMP MIB for the Gateway • Provisioning with XML and/or with SNMP • HNAP server 1.2+ • SNMP v1/v2/v3
ICSA (Independent Computer Security Association) Firewall Compliant	• IP Address, Port Number and MAC address filtering • TCP flags, ICMP types, fragmentation • Connection Creation and Teardown • Timestamps • Payload Modification • Web filtering: Pop-ups, Cookies, Java & ActiveX scripts • Intrusion detection/prevention: WAN ping blocking, IP fragment blocking, Port scan detection, TCP Port Probe, UDP Port Probe • DoS Protection: inbound, outbound, WAN interface, LAN interface, SYN flood, Ping of Death, Smurf, Bonk, Jolt, Land, Nestea, Newtear, Syndrop, Teardrop, WinNuke/OOBNuke (Invalid TCP urgent pointer), x1234, Saihyousen , Oshare, ARP flood, TCP Hijacking, Christmas Tree, SYN/FIN (jackal), BackOffice (UDP 32337), NetBus, ICMP Flowding,
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 Flowding • Ping of Death • TCP Port Probe • UDP Port Probe • New Tear • Nestea • SYNdrop • Jolt • Boink • Bonk
Routing Features	• IPv4 and IPv6 dual stack • NAPT, NAT, and Pass-through (layer 2) Operational Modes • RIP v1/v2 with MD5 • Static Routes • Port Forwarding • Port Triggering • UPnP IGD 1.0 • RFC3489 (STUN) "Port-restricted cone NAT" behavior • IPSec Pass-through • L2TP Pass-through • PPTP Pass-through

Specification	Value
Residential Gateway (continued)	
ALG Support	• FTP • Real Audio • H.323 • ICQ • 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	
802.11b/g/n	• 2.4 GHz Single Band, Single Stream 1x1 wireless access point • Two (2) internal antenna • Wi-Fi Compliant (WPA2-Enterprise, WPA2-PSK, WPA-Enterprise, WPA-PSK, WEP) • WMM-QoS (Wireless Multi Media - Quality of Service), WMM Power Save • WPS • Wireless ON/OFF button (option) • 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 1002 MHz, 108 to 1002 MHz
Tuner Frequency Range	88 to 1002 MHz, 108 to 1002 MHz
Demodulation	64 QAM or 256 QAM
Maximum Data Rate	1 downstream 6 MHz channel, 42.88 Mbps for 256 QAM and 30.34 Mbps for 64 QAM
Bandwidth	6 or 8 MHz
Operating Level Range	-15 to +15 dBmV
Input Impedance	75 ohms
RF Upstream	
Operating Frequency Range	5 to 42 MHz, 5 to 85 MHz
Transmitter Frequency Range	5 to 42 MHz, 5 to 85 MHz
Upstream Transmission	1 upstream channel

Specification	Value
RF Upstream (continued)	
Modulation	QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM / ATDMA, 128 QAM / SCDMA
Maximum Data Rate per channel	Modulation / Channel Bandwidth (MHz) / Raw Data Rate (Mbps) QPSK 1.6 2.56 16 QAM 1.6 5.12 QPSK 3.2 5.12 16 QAM 3.2 10.2 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 30.7
Bandwidth	200 kHz to 6.4 MHz
Maximum Operating Level	Modulation / Power TDMA QPSK +8 to +58 dBmV 8 QAM +8 to +55 dBmV 16 QAM +8 to +55 dBmV 32 QAM +8 to +54 dBmV 64 QAM +8 to +54 dBmV SCDMA QPSK +8 to +53 dBmV 8 QAM +8 to +53 dBmV 16 QAM +8 to +53 dBmV 32 QAM +8 to +53 dBmV 64 QAM +8 to +53 dBmV 128 QAM +8 to +53 dBmV
Electrical	
Input Voltage	12 VDC
Power Consumption (DC, in modem module)	10.3 Watts (no battery) 16.2 Watts (with battery)
Data Ports	Auto-negotiate with Auto-MDIX RJ-45 Ethernet (4)
RF	Female F-Type
Output Impedance	75 ohms
Mechanical	
Dimensions (W x D x H) • Battery Enclosure • Standard Enclosure	 With F-Type connector: 7.01 in. x 6.52 in. x 2.56 in. (17.8 cm x 16.57 cm x 6.5 cm) Without F-Type connector: 7.01 in. x 5.91 in. x 2.56 in. (17.8 cm x 15 cm x 6.5 cm) With F-Type connector: 6.93 in. x 6.33 in. x 1.77 in. (17.6 cm x 16.07 cm x 4.5 cm) Without F-Type connector: 6.93 in. x 5.71 in. x 1.77 in. (17.6 cm x 14.5 cm x 4.5 cm)
Weight • Battery Enclosure • Standard Enclosure	 17.8 oz. (0.504 kg), no battery 22 oz. (0.624 kg), with battery 12.9 oz. (0.366 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)

Specification	Value
Standards and Approvals	
Designed to meet with the following standards	DOCSIS 2.0, 1.1, 1.0, PacketCable 1.5 IEEE 802.11b/g/draft n WEP, WPA, and WPA2 WMM, WPS
Regulatory Compliance	
Regulatory and Safety Approvals	As required per country where the DPC2425R2 will be used

Ordering Information

Table 4. Ordering Information

Description	Part Number
DPC2425R2 DOCSIS 2.0 Wireless Residential Gateway with Embedded Digital Voice Adapter Includes: • 802.11n 1x1 Wireless Access Point • 100-240 VAC/50-60 Hz internal power supply • Power cord, North America (polarized) • Ethernet cable, 1.2 meters • One (1) 2600 mAh Lithium-Ion battery • CD-ROM containing user guide and Cisco Connect ***North America***	DPC2425-4042629-K9
DPC2425R2 DOCSIS 2.0 Wireless Residential Gateway with Embedded Digital Voice Adapter Includes: • 802.11n 1x1 Wireless Access Point • 100-120 VAC/50-60 Hz, 12 VDC/ 1 A desktop linear switching power supply, North America • Ethernet cable, 1.2 meters • Standard housing (no battery backup capability) • CD-ROM containing user guide and Cisco Connect ***North America***	DPC2425-4042630-K9
DPC2425R2 DOCSIS 2.0 Wireless Residential Gateway with Embedded Digital Voice Adapter Includes: • 802.11n 1x1 Wireless Access Point • 100-240 VAC/50-60 Hz, 12 VDC/ 1 A desktop switching regulated power supply, North America • Power cord, North America (polarized) • Ethernet cable, 1.2 meters • Battery housing, no Lithium-Ion battery provided • CD-ROM containing user guide and Cisco Connect ***North America***	DPC2425-4042631-K9
DPC2425R2 DOCSIS 2.0 Wireless Residential Gateway with Embedded Digital Voice Adapter Includes: • 802.11n 1x1 Wireless Access Point • 100-240 VAC/50-60 Hz internal power supply • Power cord, Europe (non-polarized) • Ethernet cable, 1.2 meters • One (1) 2600 mAh Lithium-Ion battery • CD-ROM containing user guide and Cisco Connect ***Chile***	DPC2425-4042632-K9
DPC2425R2 DOCSIS 2.0 Wireless Residential Gateway with Embedded Digital Voice Adapter Includes: • 802.11n 1x1 Wireless Access Point • 100-120 VAC/50-60 Hz, 12 VDC/ 1 A desktop linear switching power supply, North America • Ethernet cable, 1.2 meters • Standard housing (no battery backup capability) • CD-ROM containing user guide and Cisco Connect ***Columbia***	DPC2425-4042633-K9

Description	Part Number
DPC2425R2 DOCSIS 2.0 Wireless Residential Gateway with Embedded Digital Voice Adapter Includes: • 802.11n 1x1 Wireless Access Point • 220 VAC/50-60 Hz, 12 VDC/ 1 A desktop linear switching power supply,Argentina • Ethernet cable, 1.2 meters • Standard housing (no battery backup capability) • CD-ROM containing user guide and Cisco Connect ***Argentina***	DPC2425-4042634-K9

Replacement Components

Table 5. Replacement Components

Description	Part Number
Power Supply - Class 2 Switching Regulated	
100-240 VAC/50-60 Hz, 15 VDC / 1.5 A desktop-style switching regulated power supply with detachable power cord (order power cord separately)	4039445
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
220-240 VAC / 50-60 Hz, 12 VDC / 1 A wall-mount style linear switching power supply, Europe	4040240
220 VAC/50-60 Hz, 12 VDC / 1 A wall-mount style linear-switching power supply, Argentina	4025790
Power Cord	
Power cord, 2 conductors, North America (polarized)	186750
Power cord, 2 conductors, North America (non-polarized)	4026134
Power cord, 2 conductors, Europe (non-polarized)	503414
Battery	
2600 mAh Li-Ion rechargeable battery	4033435
Data Cable	
Ethernet cable, 1.2 meters	740580
CD-ROM	
CD-ROM with user guide and Cisco Connect	4042999

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