

Cisco MRP3-8FXOM1 Card for the Cisco ICS 7750

The Cisco MRP3-8FXOM1 card is a Multiservice Route Processor (MRP) card for the Cisco Integrated Communications System (ICS) 7750 that brings businesses within North America and other countries a cost-effective yet flexible method to connect trunks to their converged IP network.

The Cisco ICS 7750 Integrated Communications System brings the benefits of converged IP services to midmarket businesses and enterprise branch offices. The Cisco ICS 7750 is a versatile IP telephony and services solution that helps businesses harness the power of the Internet through converged applications, enabling them to anticipate and respond to customer needs more efficiently. It integrates call processing, voice applications, and multiservice IP routing within the system chassis to deliver true convergence while enhancing system manageability. The system's modular architecture enables expansion of call processing, routing capacity, IP services, and the power to deliver high availability and system scalability. The Cisco ICS 7750 gives customers the flexibility to choose the optimal configuration for their business environments, and allows them to increase profitability through improved customer interactions.

As companies adapt to the Internet economy, they need a communications solution that enables them to migrate their communications to a converged IP infrastructure while maintaining the investment protection of their existing analog trunks. The Cisco MRP3-8FXOM1 card (Figure 1) is a Multiservice Route Processor (MRP) card for the Cisco ICS 7750 that brings businesses within North America and other countries a cost-effective yet flexible method to connect trunks to their converged IP network.

Product Description

The Cisco MRP3-8FXOM1 card is a high-density Foreign Exchange Office (FXO) M1 gateway card built from industry-proven Cisco hardware and Cisco IOS® Software technology. The card offers eight integrated FXO M1 ports along with one modular voice interface card/WAN interface card (VIC/WIC) slot. Each FXO M1 port offers caller ID support and battery reversal detection support if trunks are equipped with this capability from the public switched telephone network (PSTN). This card provides you with the FXO density you need along with the flexibility to support other voice and data interfaces that are required for business communication within your offices.

Figure 1
Cisco MRP3-8FXOM1 card





The Cisco MRP3-8FXOM1 card is built on the same proven voice-over-IP (VoIP) technology used in Cisco 1700, 2600, and 3600 Series multiservice routers to ensure end-to-end interoperability between IP and time-division multiplexing (TDM) endpoints. The Cisco MRP3-8FXOM1 card contains onboard Flash memory for storing Cisco IOS Software images locally on the card, letting you configure a unique voice and data feature image for each MRP card in the Cisco ICS 7750 system. This card also enables you to take advantage of all existing Cisco VoIP services and voice-compression formats to meet your voice quality and data bandwidth transmission requirements.

The Cisco MRP3-8FXOM1 card has one modular slot that accepts existing Cisco VICs and WICs. This slot provides the same VIC and WIC support available on the Cisco 1750, 1751, 2600, and 3600 routers, allowing you to build upon current Cisco networks while maintaining interoperability and consistent end-to-end service between locations. This is particularly important when networking an enterprise branch office throughout a distributed enterprise network.

Data Connectivity

Cisco WICs support a wide range of services, including synchronous and asynchronous serial, ISDN Basic Rate Interface (BRI), and serial with digital service unit/channel service unit (DSU/CSU) options for primary and backup WAN connectivity. Bandwidth options range from 56 Kbps up to T1 data speeds per MRP card.

Voice Connectivity

Cisco VIC cards include support for FXO, for analog central office trunks in North America, Asia, Europe, and Australia; Foreign Exchange Station (FXS), for analog station devices; ear and mouth, for analog tie-line support; analog direct-inward dial (DID); T1 channel associated signaling (CAS); and Primary Rate Interface, E1 PRI, and BRI for digital central office trunks. This support makes it simple to link your Cisco ICS 7750 system to the PSTN and existing private branch exchanges (PBXs), as well as common analog devices like fax machines and teleconferencing stations. The modular design enables the Cisco MRP3-8FXOM1 card to deliver new voice interface support, as these technologies become available in the marketplace.

Data Services

For WAN and Internet connections, the Cisco MRP3-8FXOM1 card delivers enhanced network security using IP Security (IPSec) software encryption technology. By supporting the IEEE 802.1p/q standard, the MRP cards can also be configured as a virtual LAN (VLAN) router for routing voice and data traffic over the LAN infrastructure. These cards support quality of service (QoS) to ensure your voice traffic receives the highest priority in your network.

Voice Services

For IP voice networks, the Cisco MRP 3-8FXOM1 card support G.711, G.726, and G.729a(b) coder-decoders (codecs), enabling interoperability between different IP endpoints, such as analog devices and Cisco IP phones. Configurable digital signal processing (DSP) resource modules, also known as packet voice/data modules (PVDMs), provide the codec compression and transcoding services to support different voice and data network traffic configurations, particularly for branch offices using VoIP.

Because the Cisco MRP3-8FXOM1 card supports Cisco IOS Software, you can keep up with the latest in VoIP advances to adapt to your changing business communication requirements.



Key Benefits

Versatile Voice and Data Connectivity and Cisco IOS Software Technology

The modular VIC/WIC design enables you to configure the Cisco MRP3-8FXOM1 card to support your specific voice and data communications needs today, and to easily add bandwidth, voice trunk capacity, new Cisco IOS Software services, and redundancy as your business needs change.

System Availability

Onboard Flash memory allows local storage of Cisco IOS Software images, speeding card boot time and improving Cisco ICS 7750 system availability, allowing the overall system to be brought up more quickly.

Scalable, High-Density Capacity

The Cisco MRP3-8FXOM1 card offers choices, allowing you to meet system-wide, analog trunking requirements while providing options for other voice and data interfaces. For example, with the addition of a Cisco VIC-4FXO-M1 interface card, a single Cisco MRP3-8FXOM1 card can scale to 12 FXO M1 ports. For customers who require a T1 connection to the PSTN yet don't have enough traffic demand for a second T1, the Cisco MRP3-8FXOM1 card could support the T1 interface and yet provide eight FXO M1 channels to the PSTN. The universal card design lets you deploy multiple Cisco MRP3-8FXOM1 cards to scale to your needs. With its six-slot chassis design, the Cisco ICS 7750 allows room for adding additional Cisco MRP3-8FXOM1 cards or other MRP cards to ensure investment protection over time.

Simplified Management

The Cisco MRP3-8FXOM1 card enables voice and data services to be consolidated in a single card, simplifying management and support. The card is designed to function within the Cisco ICS 7750, and each MRP card in the Cisco ICS 7750 system is monitored by the system alarm processor. In the rare event that the MRP experiences downtime, technicians can be notified through page alerts or e-mail notifications, so the issue can be resolved immediately and the outage duration can be minimized.

Industry-Proven Cisco IOS Software Delivers Reliability

Cisco IOS Software technology delivers reliable, end-to-end connectivity over the PSTN and WAN for communications between your branch offices, customers, and partners. Field-replaceable VIC and WIC cards increase system connectivity uptime. QoS can also be configured through Cisco IOS Software, to ensure voice communications receive the highest priority in your network. VLANs help segregate your LAN voice and data traffic to ensure communications are secure and are delivered only to the intended audience.



Cisco IOS Software Technology

Internet and Intranet Access

Cisco IOS Software provides an extensive set of features that make the Cisco MRP3-8FXOM1 card ideal for flexible, high-performance communications across both intranets and the Internet:

- Multiprotocol routing (IP, IPX, and AppleTalk); IBM/SNA; and transparent bridging over ISDN, asynchronous serial, and synchronous serial such as leased lines, Frame Relay, Switched Multimegabit Data Service (SMDS), Switched 56, and X.25
- WAN optimization, including dial-on-demand routing (DDR), bandwidth-on-demand and Open Shortest Path First (OSPF)-on-demand circuit, Snapshot routing, compression, filtering, and spoofing to reduce WAN costs

Security

Cisco IOS Software supports an extensive set of basic and advanced network security features, including access control lists (ACLs), user authentication, authorization, and accounting (such as Password Authentication Protocol [PAP] and Challenge Handshake Authentication Protocol [CHAP], Terminal Access Controller Access Control System [TACACS+], and Remote Authentication Dial-In User Service [RADIUS]), and data encryption. To increase network security, the integrated Cisco IOS Firewall Feature Set protects internal LANs from network attacks with context-based access control (CBAC), while IPSec tunneling with data-encryption-standard (DES) and triple-DES encryption provide standards-based data privacy, integrity, and authenticity as data travels through a public network. For remote access VPNs, Layer 2 Forwarding (L2F) and Layer 2 Tunneling Protocol combine with IPSec encryption to provide a secure multiprotocol solution for IP, IPX, and AppleTalk traffic. Mobile users can dial in to a service provider's local point of presence (POP), where data is "tunneled" (or encapsulated inside a second protocol such as IPSec or Layer 2 Tunneling Protocol) back to the Cisco MRP3-8FXOM1 card to securely access the corporate network via the Internet.

Cisco IOS Software QoS Features

Through Cisco IOS Software, the Cisco MRP3-8FXOM1 card can support 802.1p/q inter-VLAN trunking and WAN QoS capabilities. WAN QoS features include Resource Reservation Protocol (RSVP), Weighted Fair Queuing (WFQ), Low-Latency Queuing (LLQ), Class-Based Weighted Fair Queueing (CBWFQ), traffic shaping, fragmentation interleaving, and IP Precedence. These features enable you to prioritize traffic on your networks by user, application, traffic type, and other parameters, to ensure that your business-critical data and delay-sensitive voice traffic receive the priority they need as they move across the network.

The Cisco MRP3-8FXOM1 card also offers voice compression to allow for more efficient data performance and throughput. Cisco IOS Software technology enables more efficient use of a single digital-trunk interface to support converged voice and data services.



Cisco MRP3-8FXOM1 Technical Specifications

Per Cisco MRP3-8FXOM1 Board

- Inserts as a card into universal slot within the Cisco ICS 7750 chassis
- Onboard memory: 64-MB DRAM (maximum 128 MB)
- One memory upgrade slot (options): 16-, 32-, and 64-MB DRAM
- Onboard Flash memory: 16-MB Flash SIMM (maximum 80 MB)
- One Flash memory upgrade slot (options): 16-, 32-, and 64-MB Flash SIMM
- MRP3-8FXOM1 contains a single PVDM-256K-8 onboard
- One modular VIC/WIC slot
- One PVDM module expansion slot: supports 4-, 8-, 12-, 16-, and 20-channel PVDMs
- Advanced data networking feature support, including:
 - IPSec 56 and 3DES, firewall
- Supports Fax Relay, Fax Pass-Through, and Modem Pass-Through
- Interoperable with Cisco MRP300, MRP3-8FXS, and MRP3-16FXS in same Cisco ICS 7750 chassis
- Requires Cisco ICS System Manager 2.6 or later
- Requires IOS Software 12.2(8)YN or later
- Requires Cisco Call Manager: CCM 3.3(2) or later

Per Fixed FXO M1 Ports

- Eight analog FXO M1 voice/fax trunk interface ports with battery reversal detection and caller ID (for United States, Canada, Japan, and other countries)
- Terminal equipment support for analog voice trunks
- Eight RJ-11 connectors
- LED activity indicator per port
- Signaling formats: loop start and ground start
- Address signaling formats: in-band DTMF and out-of-band pulse (10/20 pps)
- Tone disconnect supervision: call disconnect supervisions and far-end answer supervision
- Battery reversal supported for wink-start signaling
- Battery polarity disconnect: call disconnects on power of < 600 ms



Voice and WAN Interface Cards

Table 1 Cisco WAN Interface Cards for Cisco MRP3-8FXOM1 VIC/WIC

| WIC Module | Description |
|---------------|--|
| WIC-1T | One serial, asynchronous, and synchronous (T1/E1) |
| WIC-2T | Two serial, asynchronous, and synchronous (T1/E1) |
| WIC-2A/S | Two low-speed serial (up to 128 Kbps), asynchronous, and synchronous |
| WIC-1B-S/T | One ISDN BRI S/T |
| WIC-1B-U | One ISDN BRI U with integrated NT1 |
| WIC-1DSU-56K4 | One integrated 56/64 Kbps, four-wire DSU/CSU |
| WIC-1DSU-T1 | One integrated T1/fractional T1 DSU/CSU |

Table 2 Cisco Voice and Voice/WAN Interface Cards for Cisco MRP3-8FXM1 VIC/VWIC

| VIC Module | Description |
|--------------------------|---|
| VIC-4FXO-M1 | Four-port FXO M1 voice/fax trunk interface card |
| VIC-4FXS/DID | Four-port FXS/DID voice/fax interface card (ports can be configured for either FXS or DID) |
| VIC-2FXS | Two-port FXS voice/fax interface card |
| VIC-2FXO | Two-port FXO voice/fax interface card |
| VIC-2FXO-M1 | Two-port FXO voice/fax interface card with battery reversal and caller ID (for North America) |
| VIC-2FXO-M2 | Two-port FXO voice/fax interface card with battery reversal (for Europe) |
| VIC-2FXO-M3 | Two-port FXO voice/fax interface card (for Australia) |
| VIC-2E/M | Two-port E&M voice/fax interface card |
| VIC-2DID | Two-port DID voice interface card |
| VIC-2BRI-NT/TE (NT & TE) | Two-port BRI voice interface card |
| VWIC-1MFT-T1 | One-port T1/fractional T1 multiflex trunk with DSU/ CSU (for CAS and PRI) |
| VWIC-2MFT-T1 | Two-port T1/fractional T1 multiflex trunk with DSU/ CSU (for CAS and PRI) |
| VWIC-1MFT-E1 | One-port E1/fractional E1 multiflex trunk with DSU/CSU (for PRI) |
| VWIC-2MFT-E1 | Two-port E1/fractional E1 multiflex trunk with CSU/DSU (for PRI) |



Table 3 Cisco ICS 7750 Cisco IOS Software and Memory Requirements

| Cisco IOS Software Data and Voice Feature Sets | DRAM |
|---|-------|
| IP/Voice Plus | 64 MB |
| IP/Voice Plus + Firewall + IPSec 56 | 64 MB |
| IP/Voice Plus + Firewall + 3DES | 64 MB |
| IP/Voice Plus + IPX/AppleTalk/IBM | 64 MB |
| IP/Voice Plus + IPX/AppleTalk/IBM + Firewall + IPSec 56 | 64 MB |
| IP/Voice Plus + IPX/AppleTalk/IBM + Firewall + 3DES | 64 MB |
| IOS Software Image for ICS-7750 AV Bundle: ics7700-sv12y10-mz | 64 MB |
| ICO Image for ICS-7750 DV Bundle: ics7700-sv3y10-mz | 64 MB |

Physical Specifications

Dimensions and Weight

- Height: 10.5 in. (26.67 cm)
- Width: 1.6 in. (4.06 cm)
- Depth: 8.25 in. (20.96 cm) including ejector handle depth; 7.0 in. (17.78 cm) without ejector handle
- Weight (MRP3-8FXOM1): 1.15 lb (0.52 kg), with no VIC/WIC cards installed

Power Requirements

All voltages are DC:

- 0.95A at +5V
- 0.55A at +3.3V
- 1.5A at +12V

Negligible current at -12V

Power Dissipation

23W (worst case)

Environmental Range

Operational

- Acoustic noise: 43 dB (under normal operating conditions)
- Temperature range: 32 to 104 F (0 to 40 C)
- Altitude: 10,000 ft (3000 m)
- Relative humidity: 10 to 85%
- Shock: 54 in/s (1.37 m/s)
- Vibration: 0.35 g from 3 to 500 Hz

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Non-operational

- Temperature shock: -4 to 149 F (-20 to 65 C) at 41 F (5 C) per minute
- Temperature range: -4 to 149 F (-20 to 65 C)
- Altitude: 5027 yds (4570 m)
- Relative humidity: 5 to 95%

Safety

- UL 1950, 3rd edition
- C-UL per CSA C22.2 1950
- TUV Bauart per EN 60950

EMC

- BSMI CNS13438, class B
- CAN/CSA-C22.2 No. 950-95 [Canada]
- CISPR22, 1997, class B
- CFR47, Part 15, Subpart B, 1995, class B
- EN 55024: 1998, class B ITE Immunity Standard
- EN 60950: 1992 [CENELEC; includes EU and EFTA]
- GB 4943-95 [PRC]
- ICES003, issue 3:1998, class B
- IEC 60950: 1991
- NOM-019-SCFI-1998 [Mexico]
- TS001 [Australia]
- UL 1950, 3rd Edition, 1995 [US]
- VCCI V- 3/97.04, class B

Table 4 EN 55024:1998 ITE Immunity Standard

| | |
|--------------------|---|
| IEC 1000-4-2:1995 | Immunity to Electrostatic Discharges |
| IEC 1000-4-3:1995 | Immunity to Radio Frequency Electromagnetic Fields |
| IEC 1000-4-4:1995 | Immunity to Electrical Fast Transients |
| IEC 1000-4-5:1995 | Immunity to Power Line Transients (Surges) |
| IEC 1000-4-6:1996 | Immunity to Radio Frequency Induced Conducted Disturbances |
| IEC 1000-4-8:1995 | Immunity to Power Frequency Magnetic Fields |
| IEC 1000-4-11:1995 | Immunity to Voltage Dips, Voltage Variations, and Short Voltage Interruptions |

Telecom

- FCC Part 68
- RS-464 compatible (exception for Ground Start conventional ringing voltage)
- European RTTE Directive 99/05/EC
- Australia ACA TS-002. TS-003. TS-004, TS 031
- Industry Canada CS-03



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