

# Cisco High-Density Analog Service Module

The Cisco® High-Density Analog Service Modules on the Cisco Integrated Services Routers enable enterprises to enjoy the benefits of unified communications while using their existing analog phones, modems, and fax machines.

The Cisco Unified Communications portfolio of products and applications enables organizations to communicate more effectively - helping them streamline business processes, grow revenue, lower costs, and improve productivity. The Cisco High-Density Analog Service Modules enable organizations to migrate to unified communications at their own pace and budget by taking full advantage of the investments they have already made. These modules allow organizations to gain the benefits of unified communications while using existing analog phones and fax machines.

## Product Overview

The Cisco High-Density Analog Service Modules (SM-D-72FXS and SM-D-48FXS-E) for analog voice and fax devices are doublewide voice and fax interface modules for Cisco 2951, 3925, 3925E, 3945, and 3945E Integrated Services Routers (ISRs). They enable packet voice technologies with support for Skinny Client Control Protocol (SCCP), H.323, Media Gateway Control Protocol (MGCP), and Session Initiation Protocol (SIP). These modules provide enterprises and managed service providers the ability to directly connect the public switched telephone network (PSTN) and existing telephony equipment to ISRs. With support for high-density analog ports, these modules are ideal for networks with high density voice and fax sessions requirements (Figures 1 and 2).

**Figure 1.** Cisco SM-D-72FXS High-Density Analog Service Module



**Figure 2.** Cisco SM-D-48FXS-E High-Density Analog Service Module



The Cisco High-Density Analog Service Modules provide gateway services for virtually any unified communications environments, including those that use Cisco Unified Communications Manager, Cisco Hosted Collaboration Solution (HCS), Cisco Unified Communications Manager Express, Cisco Business Edition, and even third-party IP private branch exchange (IP PBX) environments. Being integrated onto the Cisco ISR means that the network can operate at any point on the voice, video, and integrated data spectrum - with the ability to add connections for both analog telephony devices and IP telephony endpoints. Either topology environment will support business needs for a high concentration of analog voice ports for modem calls, fax calls, and analog supplementary services.

## Features and Benefits

- Cisco IOS® Software-based hardware: The hardware includes uniform Cisco command-line interface (CLI) and Simple Network Management Protocol Version 3 (SNMPv3) support for ease of gateway configuration and operation.
- Robust voice quality: Cisco experience in providing toll-quality packet-voice service helps ensure that the high-density analog service modules provide clear, robust voice quality that end users have come to expect from telephony services.
- Investment protection: Customers can continue to use existing analog phones, fax machines, and modems while taking advantage of unified communications. Basic analog phone connectivity is needed when the infrastructure (wiring) or application neither supports nor requires IP phones. The analog service modules support centralized and highly concentrated analog phone line deployments, allowing organizations to deploy unified communications without needing to purchase IP phones for all users.
- Greater flexibility: These modules provide more deployment options for Cisco ISRs. They can be deployed on existing routers and, if desired, in tandem with other applications running on that same router. This flexibility provides greater investment protection and real estate savings.
- Reduced barrier to entry to unified communications: The high-density analog service modules provide a low-cost alternative for low-end analog phones and allow organizations to take advantage of unified communications with a lower overall investment.

## Analog Phone Connectivity

The Cisco High-Density Analog Service Modules are ideal for analog phone deployments ranging from centralized to sparsely concentrated or distributed topologies. They provide a high level of availability at locations with Media Gateway Control Protocol (MGCP) fallback and the ease of manageability using Cisco IOS Software monitoring features. They offer many supplementary analog calling features depending on the call control and signaling type used. Table 1 lists the supplementary analog calling features available on these modules.

**Table 1.** Analog Supplementary Features Available on High-density Analog Service Modules

	SCCP Features with Cisco Unified Communications Manager	SCCP Features with Cisco Unified Communications Manager Express	SIP Features with Cisco Unified Communications Manager
Basic call	X	X	X
Call forward all	X	X	
Call forward busy	X	X	
Call forward cancel	X	X	
Call forward no answer	X	X	
Call hold or resume	X	X	X
Call pickup group	X	X	
Call pickup local	X	X	
Call transfer blind	X	X	
Call transfer consultative	X	X	X
Call waiting	X	X	X
Caller ID	X	X	X
Caller ID on call waiting	X	X	X
Malicious caller ID	X		

	SCCP Features with Cisco Unified Communications Manager	SCCP Features with Cisco Unified Communications Manager Express	SIP Features with Cisco Unified Communications Manager
Conference call	Up to three parties	Up to three parties	Up to three parties
Impromptu conference call	Up to three parties	Up to three parties	
Meet-me conference call	X	X	
Directed call park		X	
Directed call pickup		X	
Directed call pickup of ringing extension		X	
Redial	X	X	
Speed dial	X	X	
Call toggle	X	X	X
Music on Hold (MoH)	X		
Shared-line support*	X		
Shared-line privacy	X		
Precedence and preemption	X		
Call back on busy	X		
DC voltage visible message waiting indication (VMWI)	X		

\*Simultaneous ringing, hold, and resume across analog and IP phone

The high-density analog service modules support Feature Access Codes (FAC) in conjunction with Cisco Unified Communications Manager and Cisco Unified Communications Manager Express. Refer to documentation for these applications details.

## Fax and Modem Connectivity

The high-density analog service modules support fax machines and modems. When using fax machines, the modules support Cisco Fax Relay, T.38 Fax Relay, and fax pass-through. Cisco and T.38 Fax Relay technologies allow transfer of faxes across the network with high reliability using less bandwidth than a voice call. All modems can be connected to the analog service modules and will be transferred over the network using modem pass-through.

## Protocols Supported

- SCCP
- H.323v4
- MGCP
- SIP
- Real-Time Transport Protocol (RTP)
- Secure Real-Time Transport Protocol (SRTP)
- Trivial File Transfer Protocol (TFTP)
- HTTP server
- SNMP

- Telnet
- Dynamic Host Configuration Protocol (DHCP)
- Domain Name System (DNS)
- Cisco Unified Communications Manager or Cisco Unified Communications Manager Express redundancy support using Hot Standby Router Protocol (HSRP)
- Call survivability: MGCP failover to an H.323 connection to the Survivable Remote Site Telephony (SRST) router
- T.38 Fax Relay and modem pass-through
- Codec support, G.711, and G.729a
- RADIUS and TACACS+ for Telnet and authorization

## Technical Specifications

Table 2 gives the technical specifications of the Cisco High-Density Analog Service Modules.

The high-density service module (dense wavelength division multiplexing [DWDM]) is supported on the following platforms:

- Cisco 3945
- Cisco 3945e
- Cisco 3925
- Cisco 3925e
- Cisco 2951

The modules can be plugged in the following DWDM slots of the following platforms:

- On Cisco 3945 and 3945e: Only on slot 4
- On Cisco 3925, 3925e, and 2951: Only on slot 2

**Table 2.** Technical Specifications of Cisco High-Density Analog Service Modules

Category		
<b>Part no.</b>	SM-D-72FXS and SM-D-48FXS-E	
<b>Feature Comparison of SM-D-72FXS and SM-D-48FXS-E Modules</b>		
<b>Part No.</b>	SM-D-72FXS	SM-D-48FXS-E
<b>No. of foreign-exchange-station (FXS) ports</b>	72 (0-71)	48 (0-47)
<b>No. of ports configurable as FXS-Extended loop length</b>	4 (port 0-port 3)	48 (all ports)
<b>RJ-21 connectors</b>	3	2
<b>Foreign-exchange-office (FXO) bypass ports</b>	2 (FXO bypass port 0: PSTN to port 46) (FXO bypass port 1: PSTN to port 47)	2 (FXO bypass port 0: PSTN to port 46) (FXO bypass port 1: PSTN to port 47)
<b>Compatibility</b>		
<b>Cisco IOS Software Release</b>	15.2(4)M2 or later	
<b>Cisco Unified Communications Manager Version</b>	8.6.2(SU2), 9.0.1, or later	
<b>Cisco Unified Communications Manager Express Version</b>	7.1, 8.0, 8.1, 8.5, 8.6, 8.8, 9.0, 9.1, or later	

Category	
<b>Tip and Ring Interfaces for Each FXS Port (subscriber line interface card [SLIC])</b>	
<b>Interface type</b>	FXS (on-premises connection only) (RJ-21)
<b>Address signaling formats</b>	In-band dual-tone multifrequency (DTMF) Out-of-band pulse (8-12 pulse per second [pps])
<b>FXS signaling formats</b>	SM-D-72FXS and SM-D-48FXS-E support loop-start and ground-start signaling
<b>FXS loop resistance</b>	Up to 600 ohms (including phone or terminal equipment) for short-loop-length port Up to 1400 ohms (including phone or terminal equipment) for long-loop-length port
<b>On-hook voltage</b>	-44V
<b>Off-hook loop current</b>	25 mA (maximum) short-loop-length port 35 mA (maximum) long-loop-length port
<b>Ring tone</b>	Configurable for different country requirements
<b>Ring voltage</b>	54 Vrms into 5REN at zero loop length (balanced) (short-loop-length port) 62 Vrms into 2REN at zero loop length (balanced) (long-loop-length port)
<b>Ring frequency</b>	20, 25, 30, and 50 Hz
<b>Ring waveform</b>	Sine wave if no DC offset
<b>Ringer Equivalence Number (REN) loading</b>	5REN per port (short-loop-length port) 2REN per port (long-loop-length port) (Max. 40 total REN load per each SM-D-72FXS module; max. 30 total REN load per each SM-D-48FXS-E module)
<b>RJ-11 FXS port terminating impedance option</b>	600c, 600r, 900c, 900r, complex1, complex2, complex3, complex4, complex5, and complex6
<b>Disconnect supervision</b>	Power denial (calling party control and far-end disconnect)
<b>Caller ID</b>	On-hook transmission of frequency-shift-keying (FSK) data
<b>Voicemail waiting indicator (VMWI)</b>	FXS ports on high-speed WAN interface card (HWIC) slot supports FSK VMWI only FXS ports on SM-D-FXS modules support both FSK and DC voltage VMWI. Default to FSK (DC voltage VMWI is supported only with SCCP Telephony Control Application (STCAPP) protocol)
<b>FXS loop length</b>	Short-loop-length port 3000 ft, 26 AWG 5500 ft, 24 AWG Long-loop-length port 11,000 ft, 26 AWG 18,000 24 AWG
<b>Category cable</b>	Category 3 and Category 5
<b>Physical connector</b>	RJ-21 and RJ-11
<b>Certifications</b>	
<b>Safety</b>	<ul style="list-style-type: none"> <li>• UL 60950-1</li> <li>• CAN/CSA C22.2 No. 60950-1</li> <li>• EN 60950-1</li> <li>• AS/NZS 60950-1</li> <li>• IEC 60950-1</li> </ul>
<b>Immunity</b>	<ul style="list-style-type: none"> <li>• EN 55024, CISPR 24</li> <li>• EN50082-1</li> <li>• EN 61000</li> </ul>
<b>EMC</b>	<ul style="list-style-type: none"> <li>• 47 CFR, Part 15</li> <li>• ICES-003 Class A</li> <li>• EN55022 Class A</li> <li>• CISPR22 Class A</li> <li>• AS/NZS 3548 Class A</li> <li>• VCCI V-3</li> <li>• CNS 13438</li> <li>• EN 300-386</li> </ul>

Category	
<b>TELCOM</b>	<ul style="list-style-type: none"> <li>• TIA/EIA/IS-968</li> <li>• CS-03</li> <li>• ANSI T1.101</li> <li>• ITU-T G.823, G.824</li> <li>• IEEE 802.3</li> <li>• RTTE Directive</li> <li>• Homologation requirements vary by country and interface type. For specific country information, refer to the online approvals database at: <a href="http://www.ciscofax.com">http://www.ciscofax.com</a>.</li> </ul>

This equipment complies with all the regulatory requirements for connection to the communications networks of each country in which it is sold.

## Ordering Information

To order this product, use the information provided in Table 3.

**Table 3.** Ordering Information

Product Number	Product Description
<b>SM-D-72FXS</b>	72 Port FXS Double Wide High Density Analog Service Module
<b>SM-D-48FXS-E</b>	48 Port FXS OPX-Lite Double Wide High Density Analog Service Module

## Services and Support

Cisco Unified Communications Services allow you to accelerate cost savings and productivity gains associated with deploying a secure, resilient Cisco Unified Communications Solution on your network. Delivered by Cisco and our certified partners, our portfolio of deployment and technical support services is based on proven methodologies for unifying voice, video, data, and mobile applications on fixed and mobile networks. Our unique lifecycle approach to these services can enhance your technology experience to enable powerful new ways to collaborate with co-workers, partners, and customers across any workspace to accelerate business advantage.

To learn more, please visit <http://www.cisco.com/go/ucservices>.

## For More Information

To learn more about Cisco analog gateway solutions, visit <http://www.cisco.com/go/vg>.

To learn more about the complete Cisco Collaboration portfolio offering, visit:

<http://www.cisco.com/go/collaboration>.



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