



Installing and Configuring Cisco SM-X Single-Wide High Density Analog Voice Service Module on Cisco 4000 Series ISR

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This document provides information that you should know before and during the installation of the new Cisco SM-X Single Wide High Density Analog Voice Service Module on Cisco 4000 Series Integrated Services Routers.

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Information About Single-Wide High Density Analog Voice Service Modules

Cisco High-Density Analog Voice and Fax Service Modules provide enterprises, managed services providers, and service providers the ability to directly connect public-switched telephone networks (PSTNs) and existing telephony equipment to Cisco 4000 Series Integrated Services Routers. These fixed-port (FXS and FXO) modules provide Dual-Tone Multifrequency (DTMF) detection, voice compression and decompression, call progress tone generation, Voice Activity Detection (VAD), echo cancellation, and adaptive jitter buffering.

Cisco SM-X is a service module that can be inserted into the service module slots on Cisco 4000 Series Integrated Services Routers. Cisco SM-X provides VoIP connectivity to analog devices such as analog desk phones, analog conference room phones, fax machines and modems. Cisco SM-X provides a high number of FXS ports per RU on Cisco 4000 Series Integrated Services Routers.

The FXO port is used to connect to PBX or key systems, or to provide off-premises connections to the PSTN. It supports battery reversal detection and caller ID. The FXO port is also used to connect to analog Centralized Automatic Message Accounting (CAMA) trunks to provide dedicated E-911 service (in North America only).

The FXS port is used to connect analog phones, modems, fax machines, and speaker phones to an enterprise IP voice system, so you can use them as extensions to your Cisco or third-party IP call-control system. Having these devices tightly integrated with the IP-based phone system is advantageous for increased manageability, scalability, and cost-effectiveness. The Direct Inward Dialing (DID) port is used to provide off-premises DID connection from the central office. It serves only incoming calls from the PSTN. Caller ID is not supported in DID mode.

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Cisco High-Density Analog Voice and Fax Service Modules are available in a single-wide or double-wide form factor.

Cisco SM-X single-wide service module has the following ports:

- 8 Port FXS and 12 Port FXO—Includes 8 FXS ports and 12 FXPO ports
- 16 Port FXS and 2 Port FXO—Includes 16 FXS ports and 2 FXPO ports
- 24 Port FXS and 4 Port FXO—Includes 24 FXS ports and 4 FXPO ports

The following table provides information about Cisco SM-X single-wide service module SKU:

Table 1 Cisco SM-X Single-Wide SKU

Interface	Maximum Number of FXS-E Ports	Maximum Number or RENs	LED	Number of Failed-over Ports
SM-X-8-FXS/12FXO	8	16	EN LED (Amber/Green) ACT LED (Green)	8 ports on RJ-21
SM-X-16-FXS/2FXO	16	16	EN LED (Amber/Green) ACT LED (Green)	2 ports on RJ-21
SM-X-24-FXS/4FXO	16	16	EN LED (Amber/Green) ACT LED (Green)	4 ports on RJ-11

The slot, bay, and port information for Cisco SM-X single-wide FXS service module is as follows:

Table 2 Cisco SM-X Single-Wide FXS Service Module Slot, Bay, and Port Numbers

Interface	Slot	Bay	Port
SM-X-8-FXS/12FXO	1-2	0	0-7
SM-X-16-FXS/2FXO	1-2	0	0-15
SM-X-24-FXS/4FXO	1-2	0	0-23

The slot, bay, and port information for Cisco SM-X single-wide FXO service module is as follows:

Table 3 Cisco SM-X Single-Wide FXO Service Module Slot, Bay, and Port Numbers

Interface	Slot	Bay	Port
SM-X-8-FXS/12FXO	1-2	0	8-19
SM-X-16-FXS/2FXO	1-2	0	16-17
SM-X-24-FXS/4FXO	1-2	0	24-27

Features and Benefits

The new generation of Cisco High-Density Analog Voice and Fax Service Modules improves upon the previous high-density analog and digital extension modules (EVMs). These improvements are as follows:

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- **On-board Digital Signal Processor (DSP)**—The FXO and FXS service modules contain an onboard DSP and don't require the router to have a dedicated packet voice DSP module (PVDM) on the motherboard. The DSP on the voice module is necessary for the voice features. It also provides for echo cancellation of up to 128-ms echo-tail length for demanding network conditions.
- **Support for Online Insertion and Removal (OIR)**—The FXS and FXO service modules support Online Insertion and Removal (OIR), reducing the downtime required for new or replacement modules. The service modules can be inserted into the SM-X slot on the supported Cisco 4000 Series ISRs without powering off the router.
- **FXS-E (extended loops) support**—FXS ports on the new modules support FXS-E with the following details:
 - Higher loop current (35 mA) to accommodate specialty phones
 - Longer loop length for loops with 26 AWG wire, up to 11,000 feet (3400 meters)
 - Higher ringing voltage (65 Vrms, no load)

Note: Switching between the modes requires reload of the ISR chassis.

FXO failover bypass ports—A failover bypass port, also called a failover trunk bypass, provides a way to use designated analog phone ports to make phone calls through the PSTN during a power outage.

In addition to the above features, the service modules supports the following features:

- Caller line ID
- G.711, G.729a, and G.726
- G722, iLBC, GSMAMR-NB, and Internet Speech Audio Codec (iSAC)
- Fax detection, pass-through, and relay (T.38)
- Modem pass-through
- DTMF detection
- Echo cancellation
- Voice activity detection
- Comfort noise generation
- Real-Time Control Protocol (RTCP)
- Acoustic shock protection
- Real-Time Transport Protocol (RTP)
- RFC 4733 Digit Relay
- Noise reduction is on the roadmap

The FXS features include:

- Support for either FXS or DID functionality
- Message-Waiting Indicator (MWI)
- Cable detection: GR909 line test

The FXO features include:

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- Support for both ground-start and loop-start modes
- Call Detail Record (CDR) information
- Support for interworking with Cisco Unified Communications Manager (Skinny Client Control Protocol [SCCP]), H.323, Session Initiation Protocol (SIP), and Media Gateway Control Protocol (MGCP) 1.0
- Cable detection
- Overload protection

Analog Phone Connectivity

Cisco High-Density Analog Voice and Fax Service Modules are ideal for analog phone deployments ranging from centralized to sparsely concentrated or distributed topologies. Cisco 4000 Series Integrated Services Routers offer many supplementary analog calling features, depending on the call control and signaling type used. All supplementary analog features are supported through the FXS and FXO service modules. The analog interface on Cisco 4000 Series also supports Feature Access Codes (FACs) for invoking supplementary services.

Fax and Modem Connectivity

FXS ports on the Cisco High-Density Analog Voice and Fax Service Modules support fax machines and modems. When using fax machines, the gateways support T.38 fax relay and fax pass-through. 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 Cisco VG Series Gateways and are transferred over the network using modem pass-through.

Protocols Supported

The voice gateways support the following protocols:

- SCCP
- H.323v4
- MGCP
- SIP
- Real-Time Transport Protocol (RTP)
- Secure Real-Time Transport Protocol (SRTP)
- Trivial File Transfer Protocol (TFTP)
- HTTP server
- Simple Network Management Protocol (SNMP)
- Telnet
- Dynamic Host Configuration Protocol (DHCP)
- 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

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- Codec support: G.711, and G.729a
- RADIUS and TACACS+ for Telnet and authorization

The following table lists the feature specifications for Cisco SM-X single-wide service module.

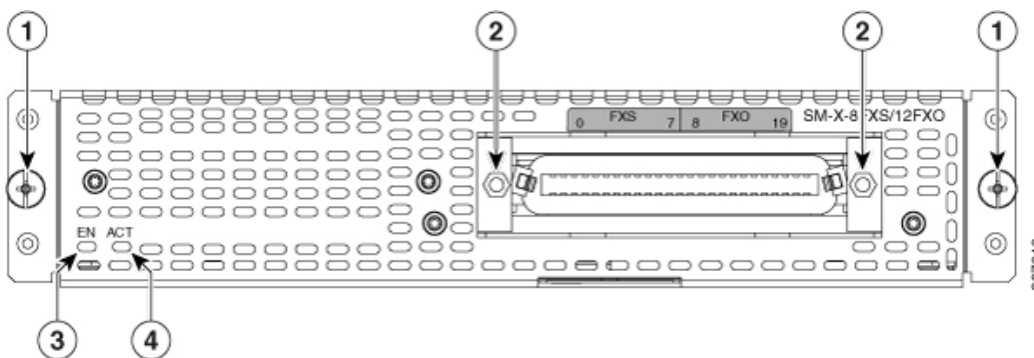
Table 4 Cisco SM-X Single-Wide Service Module Feature Specifications

Feature	SM-X-8FXS/12FXO	SM-X-16FXS/2FXO	SM-X-24FXS/4FXO
Tip and Ring Interface for each FXS port			
Interface	FXS/FXO (RJ-21) RJ-21 ports 0 to 7: FXS RJ-21 ports 8 to 19: FXO	FXS/FXO (RJ-21) RJ-21 ports 0 to 15: FXS RJ-21 ports 16 and 17: FXO	FXS (RJ-21), FXO (RJ-11) RJ-21 ports 0 to 23: FXS RJ-11 ports 24 to 27: FXO
Address signaling format	In-band DTMF Out-of-band pulse (8 to 12 pps)	In-band DTMF Out-of-band pulse (8 to 12 pps)	In-band DTMF Out-of-band pulse (8 to 2 pps)
FXS signaling formats	FXS loop-start, ground-start, and DID signaling	FXS loop-start, ground-start, and DID signaling	FXS loop-start, ground-start, and DID signaling

Cisco SM-X-8-FXS/12FXO Service Module Specifications

Physical Description and LEDs

Figure 1 Cisco SM-X-8-FXS/12FXO Service Module

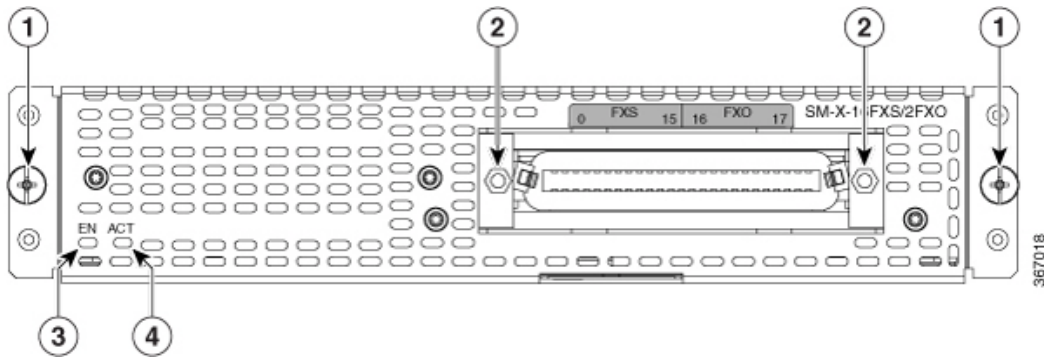


1	Chassis screws	2	Service module screws
3	EN LED	4	ACT LED

Cisco SM-X-16-FXS/2FXO Service Module Specifications

Physical Description and LEDs

Figure 2 Cisco SM-X-16-FXS/2FXO Service Module

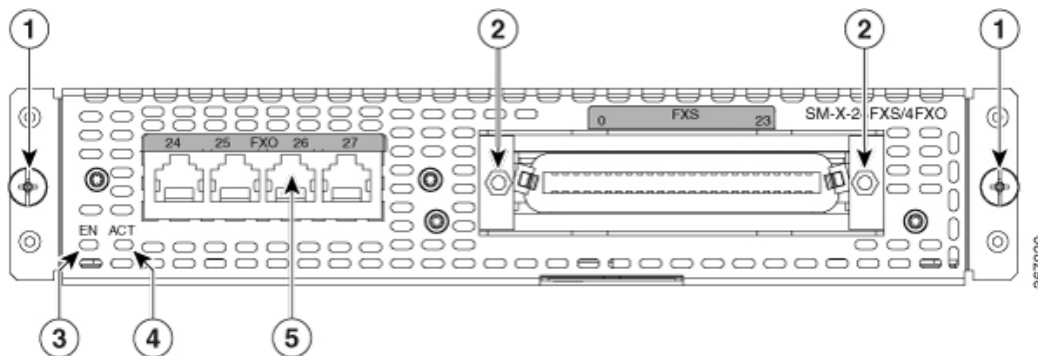


1	Chassis screws	2	Service module screws
3	EN LED	4	ACT LED

Cisco SM-X-24-FXS/4FXO Service Module Specifications

Physical Description and LEDs

Figure 3 Cisco SM-X-24-FXS/4FXO Service Module



1	Chassis screws	2	Service module screws
3	EN LED	4	ACT LED
5	FXO port		

Technical and Compliance Specifications

The following table details the technical specifications of Cisco SM-X single-wide service modules.

Table 5 Cisco SM-X Single-Wide Service Module Technical Specifications

Description	SM-X-8FXS/12FXO	SM-X-16FXS/2FXO	SM-X-24FXS/4FXO
Physical			
Dimensions (H x W x D)	1.58 x 7.44 x 7.6 inches	1.58 x 7.44 x 7.6 inches	1.58 x 7.44 x 7.6 inches
Weight	1.90 lb (0.86 kg)	1.98 lb (0.90 kg)	2.12 lb (0.96 kg)
Power			
AC power	53.55W	70.32W	79.37W
Current	4.46A on 12V	5.86A on 12V	6.61A on 12V
Voltage	12V from backplane	12V from backplane	12V from backplane
On-hook voltage	-44V		
Off-hook loop current	25 mA (maximum) for short loop-length-port 35 mA for long loop-length-port		
Operating temperature	32° to 104°F (0° to 40°C)	32° to 104°F (0° to 40°C)	32° to 104°F (0° to 40°C)
Nonoperating temperature	-40° to 158°F (-40° to 70°C)	-40° to 158°F (-40° to 70°C)	-40° to 158°F (-40° to 70°C)
FXS loop resistance	Up to 600 ohms for short loop-length-port Up to 1400 ohms for long loop-length-port		
DID loop resistance	Up to 1400 ohms		
Ring frequency	20, 25, 30, and 50 Hz		
REN loading	5 RENs per port (short-loop-length port) 2 RENs per port (long-loop-length port)		
Impedance	600c, 600r, 900c, 900r, complex1, complex2, complex3, complex4, complex5, and complex6		
FXS loop length	Short-loop-length port: 3000 ft (900 m) with 26 AWG, 5500 ft (1700 m) with 24 AWG Long-loop-length port: 11,000 ft (3400 m) with 26 AWG, 18,000 ft (5500 m) with 24 AWG		
Cables	Category 3 and Category 5		

The following table details the compliance specifications of Cisco SM-X single-wide service modules.

Table 6 Cisco SM-X single-wide service module Compliance Specifications

Compliance Specification	Description
Safety	<ul style="list-style-type: none"> ■ UL 60950-1 ■ CAN/CSA C22.2 No. 60950-1 ■ EN 60950-1 ■ AS/NZS 60950-1 ■ IEC 60950-1
Telecom	<ul style="list-style-type: none"> ■ TIA/EIA/IS-968 ■ CS-03 ■ TBR21 (FXO) ■ ES 201 970 (FXS) ■ S002, S003
EMC	<ul style="list-style-type: none"> ■ 47 CFR, Part 15 ■ CES-003 Issue 4 ■ EN55022 Class A/B ■ CISPR22 Class A/B ■ AS/NZS 3548 Class A ■ VCCI V-3 ■ CNS 13438 ■ EN 300-386
Immunity	<ul style="list-style-type: none"> ■ EN 55024, CISPR 24 ■ EN50082-1 ■ EN 61000-6-1 ■ EN300-386

Platform and Software Requirements

Cisco High-Density Analog Voice and Fax Service Modules are supported on Cisco 4000 Series Integrated Services Routers effective with Cisco IOS XE Fuji 16.7.1 or later. The service modules provide gateway services for Cisco Unified Communications using Cisco Unified Communications Manager with SRST or Cisco Unified Communications Manager Express. The following table provides information about the software version that is compatible with FXO and FXS service modules.

Table 7 Compatible Software Versions with the FXO and FXS Service Modules

Product Category	Software Version
Cisco IOS XE Software	Cisco IOS XE Fuji 16.7.1
Cisco Unified Communications Manager	10.5.2(SU6), 11.5.2(SU4), 12.0.1 and higher
Cisco Unified Communications Manager Express	Any version that is compatible with Cisco IOS XE Fuji 16.7.1
Third-party Call Control	IP-based trunk; SIP and H.323

Configuration Methods

After Cisco SM-X single-wide service module is operating and able to communicate, use the procedures in [Cisco SM-X single-wide service module Software Configuration Guide](#) to configure the specific services and functions or to make changes to the existing configuration.

There are multiple methods for configuring Cisco 4000 Series Integrated Services Routers:

- System configuration dialog
- Configuration mode—Cisco IOS software CLI
- setup command facility—Remote configuration through a LAN
- SNMP-based application—CiscoView or HP OpenView
- HTTP-based configuration server—Provides access to the CLI from a web browser

Safety Precautions

This section contains the following warning statements. A warning means danger. You are in a situation that could cause bodily injury. Before working on an equipment, be aware of the hazards involved with electrical circuitry and standard safety practices to prevent accidents.

IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS

Warning: Do not work on the system or connect or disconnect cables during periods of lightning activity. Statement 1001

Warning: To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ-45 connectors. Use caution when connecting cables. Statement 1021

Warning: Hazardous network voltages are present in WAN ports regardless of whether power to the unit is OFF or ON. To avoid electric shock, use caution when working near WAN ports. When detaching cables, detach the end away from the unit first. Statement 1026

Warning: This equipment contains a ring signal generator (ringer), which is a source of hazardous voltage. Do not touch the RJ-11 (phone) port wires (conductors), the conductors of a cable connected to the RJ-11 port, or the associated circuit-board when the ringer is active. The ringer is activated by an incoming call. Statement 1042

Warning: For connections outside the building where the equipment is installed, the following ports must be connected through an approved network termination unit with integral circuit protection.
FXS Statement 1044

Installing Cisco SM-X Single-Wide Service Module On Cisco 4000 Series Integrated Services Routers

1. Shut down the electrical power to the slot in the router either by turning off the electrical power to the router or by issuing the online insertion and removal (OIR) commands. Leave the power cable plugged in to channel ESD voltages to ground. For more information on OIR, see the “Managing Cisco Enhanced Services and Network Interface Modules” chapter in the *Cisco 4000 Series ISRs Software Configuration Guide*.
2. Remove the blank faceplates installed over the network interface module slot that you intend to use.
Tip: Save blank faceplates for future use.
3. Align the module with the guides in the chassis walls or slot divider and slide it gently into the NIM slot on the router.
4. Push the module into place until you feel the edge connector seat securely into the connector on the router backplane. The module faceplate should contact the chassis rear panel.
5. Using a number 1 Phillips or flat-blade screwdriver, tighten the captive screws on the service module.
6. Connect the module to the network and reenale the power to the slot in the router.

Removing Cisco SM-X single-wide Service Module On Cisco 4000 Series Integrated Services Routers

1. Shut down the electrical power to the slot in the router either by turning off the electrical power to the router or by issuing the online insertion and removal (OIR) commands. Leave the power cable plugged in to channel ESD voltages to ground. For more information on OIR, see the “Managing Cisco Enhanced Services and Network Interface Modules” chapter in the *Cisco 4000 Series ISRs Software Configuration Guide*.
2. Using a number 1 Phillips or flat-blade screwdriver, loosen the captive screws on the NIM.
3. Slide the service module out.
4. If you are not replacing the module, install a blank faceplate over the empty slot to ensure proper air flow.

Connecting Cisco SM-X Single-wide Service Module to a Network

1. Connect the serial cable to the connector on the Service module faceplate.
2. Use a RJ-21 cable to connect to SM-X single wide service module.
3. Connect one end of the appropriate serial cable to the connector on the card faceplate.
4. Turn on power to the router by pressing the power switch to the ON (|) position.
5. Check that the CONN LED goes on, which indicates that the serial port detects the WAN serial connection.

Configuring Single-wide High Density Analog Voice Service Module

Prerequisites

- Obtain two-wire line service from your service provider or from a PBX.
- Complete your company's dial plan.
- Establish a working telephony network based on your company's dial plan.
- Establish a working connection to the network.
- Install appropriate voice interface hardware on the router
- Gather the following information about the telephony connection of the voice port:
 - Telephony signaling interface: FXO and FXS
 - Locale code (usually the country) for call progress tones
 - For FXO, type of dialing: DTMF (touch-tone) or pulse and type of signal: loop-start or ground-start
- Disconnect signaling by performing the following set of tasks:
 - supervisory disconnect signal
 - battery-reversal
 - no supervisory disconnect signal. See Understanding FXO Disconnect Problem for detailed configuration information.
- If you are connecting a voice-port interface to a PBX, it is important to understand the PBX's wiring scheme and timing parameters. You can gather this information from your PBX vendor or the reference manuals that accompany your PBX.

Configuring an FXO Interface

Perform this task to configure the Single-wide High Density Analog Voice Service Module as an FXO interface.

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. ■ Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.

Configuring Single-wide High Density Analog Voice Service Module

Step 3	voice-port slot/bay/port Example: Router(config)# voice-port 1/0/8	Enters voice-port configuration mode.
Step 4	signal {groundStart loopStart} Example: Router(config-voiceport)# signal groundStart	Selects the access signaling type to match that of the telephony connection that you are making. The default setting for FXO voice ports in loopStart. <ul style="list-style-type: none"> ■ groundStart—Specifies the use of groundstart signaling used for FXO and FXS interfaces. Groundstart signaling allows both sides of a connection to place a call and to hang up. ■ loopStart—Specifies the use of loop start signaling used for FXO and FXS interfaces. With loopstart signaling, only one side of a connection can hang up.
Step 5	cptone locale Example: Router(config-voiceport)# cptone us	Selects the two-letter locale for the voice call progress tones and other locale-specific parameters to be used on this voice port. The default is us .
Step 6	dial-type {dtmf mf pulse} Example: Router(config-voiceport)# dial-type dtmf	Specifies the dialing method for outgoing calls. The default dialing method is dtmf touch-tone dialing. <ul style="list-style-type: none"> ■ dtmf—Specifies the dual tone multifrequency (DTMF) touch-tone dialing. ■ mf—Specifies the multifrequency tone dialing. ■ pulse—Specifies the pulse (rotary) dialing.
Step 7	ring number number Example: Router(config-voiceport)# ring number 1	Specifies the maximum number of rings to be detected before an incoming call is answered by the router. The default is 1.
Step 8	description string Example: Router(config-voiceport)# description Voice Port One	Attaches a text string to the configuration that describes the connection for this voice port. This description appears in various displays and is useful for tracking the purpose or use of the voice port. The string argument is a character string from 1 to 255 characters in length. By default, there is no text string (describing the voice port) attached to the configuration.
Step 9	no shutdown Example: Router(config-voiceport)# no shutdown	Activates the voice port. If a voice port is not being used, shut down the voice port by using shutdown command.

Examples

The following example shows the two options for configuring an FXO interface.

Option 1:

```
voice-port 1/0/8
```

Configuring Single-wide High Density Analog Voice Service Module

```

st4451(config-voiceport)#secondary ?
dialtone Secondary dialtone option for FXO port
st4451(config-voiceport)#secondary dialtone ?
<cr>

```

Option 2:

```

voice-port 1/0/8
  st4451(config-voiceport)#connection ?
  plar Private Line Auto Ringdown
  st4451(config-voiceport)#connection plar ?
WORD A string of digits including wild cards
opx Off-Premises eXtension PLAR
st4451(config-voiceport)#connection plar opx ?
WORD A string of digits including wild cards
st4451(config-voiceport)#connection plar opx 2345

```

Configuring an FXS Interface

Perform this task to configure the Single-wide High Density Analog Voice Service Module as an FXS interface.

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> ■ Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	voice-card slot/port Example: Router(config)# voice-card 1/0	Enters voice-card configuration mode.
Step 4	voice-port slot/bay/port Example: Router(config)# voice-port 1/0/1	Enters voice-port configuration mode.
Step 5	signal {groundStart loopStart} Example: Router(config-voiceport)# signal groundStart	Selects the access signaling type to match that of the telephony connection that you are making. The default setting for FXS voice ports in loopStart. <ul style="list-style-type: none"> ■ groundStart—Specifies the use of groundstart signaling used for FXO and FXS interfaces. Groundstart signaling allows both sides of a connection to place a call and to hang up. ■ loopStart—Specifies the use of loop start signaling used for FXO and FXS interfaces. With loopstart signaling, only one side of a connection can hang up.

Configuring Single-wide High Density Analog Voice Service Module

Step 6	cptone locale Example: <pre>Router(config-voiceport)# cptone us</pre>	Selects the two-letter locale for the voice call progress tones and other locale-specific parameters to be used on this voice port. The default is us .
Step 7	ring frequency {20 25 30 50} Example: <pre>Router(config-voiceport)# ring frequency 50</pre>	Selects the ring frequency, in hertz, used on the FXS interface. <ul style="list-style-type: none"> ■ The frequency must match the connected telephony equipment and may be country-dependent. If the ring frequency is not set properly, the attached telephony device may not ring or it may buzz.
Step 8	ring cadence {pattern-number [define pulse interval]} Example: <pre>Router(config-voiceport)# ring cadence pattern01</pre> Example: <pre>Router(config-voiceport)# ring cadence define 2 4 3 1</pre>	Specifies an existing ring pattern or defines a new one. The default is the pattern specified by the cptone locale that has been configured. The following ring cadence patterns have a predefined ring-pulse time and a ring-interval time. <ul style="list-style-type: none"> ■ pattern01—2 seconds on, 4 seconds off ■ pattern02—1 second on, 4 seconds off ■ pattern03—1.5 seconds on, 3.5 seconds off ■ pattern04 —1 second on, 2 seconds off ■ pattern05—1 second on, 5 seconds off ■ pattern06 —1 second on, 3 seconds off ■ pattern07— 0.8 second on, 3.2 seconds off ■ pattern08—1.5 seconds on, 3 seconds off ■ pattern09—1.2 seconds on, 3.7 seconds off ■ pattern10—1.2 seconds on, 4.7 seconds off ■ pattern11—0.4 second on, 0.2 second off, 0.4 second on, 2 seconds off ■ pattern12—0.4 second on, 0.2 second off, 0.4 second on, 2.6 seconds off ■ define—User-definable ring cadence pattern. Each number pair specifies one ring-pulse time and one ring-interval time. You must enter numbers in pairs, and you can enter from 1 to 6 pairs. The second number in the last pair that you enter specifies the interval between rings.
Step 9	description string Example: <pre>Router(config-voiceport)# description Voice Port One</pre>	Attaches a text string to the configuration that describes the connection for this voice port. This description appears in various displays and is useful for tracking the purpose or use of the voice port. The string argument is a character string from 1 to 255 characters in length. By default, there is no text string (describing the voice port) attached to the configuration.

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Step 10	no shutdown Example: Router(config-voiceport)# no shutdown	Activates the voice port. If a voice port is not being used, shut down the voice port by using shutdown command.
Step 11	exit Example: Router(config-voiceport)# exit	Exits the voice port configuration mode and returns to the privileged EXEC mode.
Step 12	show voice port summary Example: Router# show voice port summary	Exits the voice port configuration mode and returns to the privileged EXEC mode.

Examples

The following example shows a partial running configuration of an FXS interface.

```
voice-card 1/0
# using default local-bypass
!
voice-port 1/0/0
  cptone CA
!
voice-port 1/0/1
  signal groundStart
!
voice-port 1/0/2
  signal did loop-start
  cptone CA
!
voice-port 1/0/3
connection plar 12345
!
dial-peer voice 20 pots
  destination pattern 33020
  port 0/2/0
dial-peer voice 21 pots
  destination pattern 33021
  port 0/2/1
dial-peer voice 22 pots
  destination pattern 33022
  port 0/2/2
dial-peer voice 23 pots
  destination pattern 33023
  port 0/2/3
dial-peer voice 12345 voip
  destination pattern 12345
  session target ipv4:1.5.25.100
```

The following example shows a partial running configuration of an FXO interface.

```
voice-card 0/3
no local-bypass
!
```

Configuring Single-wide High Density Analog Voice Service Module

```

voice-port 0/3/0
  cptone CA
  connection plar opx 12345
!
voice-port 0/3/1
  signal groundStart
  connect plar 12345
!
voice-port 0/3/2
  secondary dialtone
  cptone CA
!
voice-port 0/2/3
  connect plar 12345
!
dial-peer voice 30 pots
  destination pattern 33030
  port 0/3/0
dial-peer voice 31 pots
  destination pattern 33031
  port 0/3/1
dial-peer voice 32 pots
  destination pattern 33032
  port 0/3/2
dial-peer voice 23 pots
  destination pattern 33033
  port 0/3/3
dial-peer voice 12345 voip
  destination pattern 12345
  session target ipv4:1.5.25.100

```

The following is a sample output from the show voice port summary.

Device# **show voice port summary**

PORT	CH	SIG-TYPE	ADMIN	OPER	IN STATUS	OUT STATUS	EC
1/0/0	--	fxs-ls	up	dorm	on-hook	idle	y
1/0/1	--	fxs-ls	up	dorm	on-hook	idle	y
1/0/2	--	fxs-ls	up	dorm	on-hook	idle	y
...							
1/0/7	--	fxs-ls	up	dorm	on-hook	idle	y
1/0/8	--	fxo-ls	up	dorm	idle	onhook	y
1/0/9	--	fxo-ls	up	dorm	idle	onhook	y
1/0/10	--	fxo-ls	up	dorm	idle	onhook	y
1/0/11	--	fxo-ls	up	dorm	idle	onhook	y
...							
1/0/18	--	fxo-ls	up	dorm	idle	onhook	y
1/0/19	--	fxo-ls	up	dorm	idle	onhook	y
2/0/0	--	fxs-ls	up	dorm	on-hook	idle	y
2/0/1	--	fxs-ls	up	dorm	on-hook	idle	y
2/0/2	--	fxs-ls	up	dorm	on-hook	idle	y
...							
2/0/15	--	fxs-ls	up	dorm	on-hook	idle	y
2/0/16	--	fxo-ls	up	dorm	idle	onhook	y
2/0/17	--	fxo-ls	up	dorm	idle	onhook	y

PWR FAILOVER PORT	PSTN FAILOVER PORT
1/0/0	FXO BYPASS 1/0/8
1/0/1	FXO BYPASS 1/0/9
1/0/2	FXO BYPASS 1/0/10
1/0/3	FXO BYPASS 1/0/11
1/0/4	FXO BYPASS 1/0/12

Configuring Single-wide High Density Analog Voice Service Module

1/0/5	FXO BYPASS 1/0/13
1/0/6	FXO BYPASS 1/0/14
1/0/7	FXO BYPASS 1/0/15
2/0/0	FXO BYPASS 2/0/16
2/0/1	FXO BYPASS 2/0/17

Number of DID ports supported on each SM:

SM-X-8FXS/12FXO: 8
SM-X-16FXS/2FXO: 16
SM-X-24FXS/4FXO: 16

Total REN supported on each SM:

SM-X-8FXS/12FXO: 16
SM-X-16FXS/2FXO: 16
SM-X-24FXS/4FXO: 16

Additional References

Related Documents

Related Topic	Document Title
Installing Cisco 4000 Series Integrated Services Router	Hardware Installation Guide for Cisco 4000 Series Integrated Services Routers
Configuring Cisco 4000 Series Integrated Services Routers	Cisco 4000 Series ISRs Software Configuration Guide
Interface commands	Cisco IOS Interface and Hardware Component Command Reference
Regulatory compliance and safety information	Cisco Network Modules and Interface Cards Regulatory Compliance and Safety Information

MIBS

MIB	MIBs Link
<ul style="list-style-type: none"> ■ OLD-CISCO-CHASSIS-MIB ■ CISCO-ENTITY-VENDORTYPE-OID-MIB ■ CISCO-PRODUCTS-MIB 	<p>To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL:</p> <p>http://www.cisco.com/go/mibs</p>

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

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