CHAPTER 1

Product Overview

The Cisco Metro Ethernet (ME) 3400 Ethernet Access switch—referred to as *the switch*—is an Ethernet access switch to which you can connect other network devices, such as routers, other switches, a home access gateway (HAG), or a computer. This chapter provides a functional overview of the Cisco ME switch. These topics are included:

Setting up the Switch

See the *Cisco ME 3400 and Cisco ME 2400 Ethernet Access Switches Getting Started Guide* that shipped with the switch for instructions on how to initially configure your switch. The getting started guide also covers switch management options, basic rack-mounting procedures, port and module connections, power connection procedures, and troubleshooting help.

For instructions on setting up your switch using the command-line interface (CLI), see Appendix D, "Configuring the Switch with the CLI-Based Setup Program."

Switch Models

The Cisco ME switch can be deployed as a backbone switch, aggregating 10BASE-T, 100BASE-TX, 1000-BASE-T, and fiber-optic Ethernet traffic from other network devices.

Depending on your model, the switches support either AC or DC power. See the switch software configuration guide for examples that show how you might deploy the switch in your network.

Table 1-1 describes the switch models.

Table 1-1 Cisco ME 3400 Switch Models

Switch Model	Part Number	Description
Cisco ME 3400-24TS-AC	ME-3400-24TS-A	24 10/100 FastEthernet ports and 2 small form-factor pluggable (SFP) module ports, AC power
Cisco ME 3400-24TS-DC	ME-3400-24TS-D	24 10/100 FastEthernet ports and 2 SFP module ports, DC power
Cisco ME-3400-24FS-A	ME-3400-24FS-A	24 100BASE-FX SFP module ports and 2 Gigabit Ethernet SFP module ports, AC power
Cisco ME 3400G-12CS-AC	ME-3400G-12CS-A	12 dual-purpose ports and 4 SFP module ports, AC power
Cisco ME 3400G-12CS-DC	ME-3400G-12CS-D	12 dual-purpose ports and 4 SFP module ports, DC power
Cisco ME 3400G-2CS	ME 3400G-2CS	2 dual-purpose ports and 2 SFP module ports, AC power

Front Panel Description

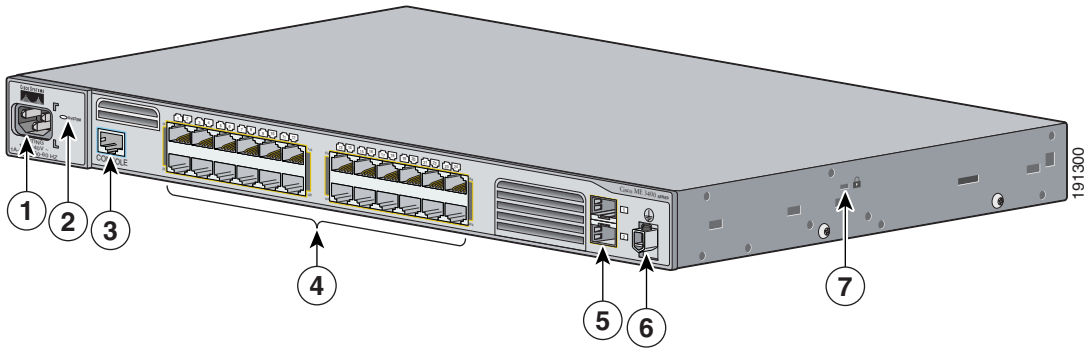
The switch front panel includes the 10/100 ports or dual-purpose ports (that you can configure as either 10/100/1000 Ethernet ports that use RJ-45 connectors or for SFP modules), dedicated SFP module ports, switch LEDs, power connectors, and the console port.

The front panels are described in these sections:

Cisco ME 3400-24TS AC and DC Switches Front Panel

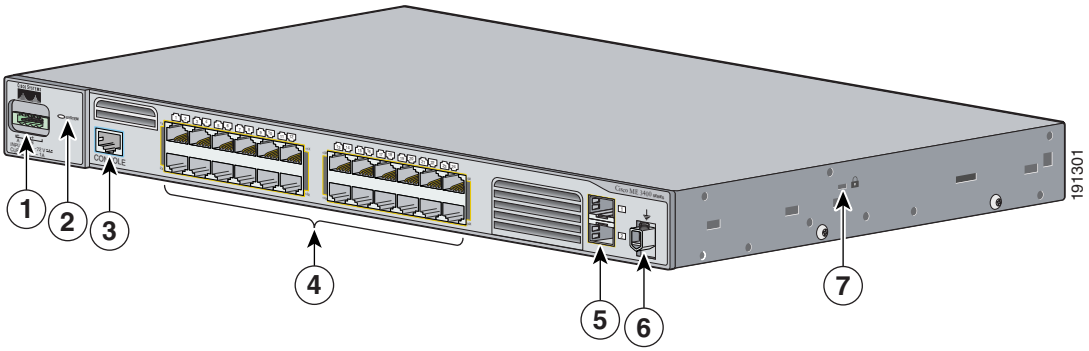
Figure 1-1 shows the Cisco ME 3400G-24TS AC switch front panel. Figure 1-2 shows the Cisco ME 3400G-24TS DC switch front panel. The 10/100 Fast Ethernet ports are grouped in pairs. The first member of the pair (port 1) is above the second member (port 2) on the left. Port 3 is above port 4, and so on. The Gigabit Ethernet uplink SFP module ports are numbered 1 and 2.

Figure 1-1 Cisco ME 3400-24TS AC Ethernet Access Switch Front Panel



1	AC power connector	**4**	10/100 Fast Ethernet ports	**7**	Cable lock
2	System LED	**5**	Gigabit Ethernet SFP module ports		
3	Console port	**6**	Ground connector		

Figure 1-2 Cisco ME 3400-24TS DC Ethernet Access Switch Front Panel

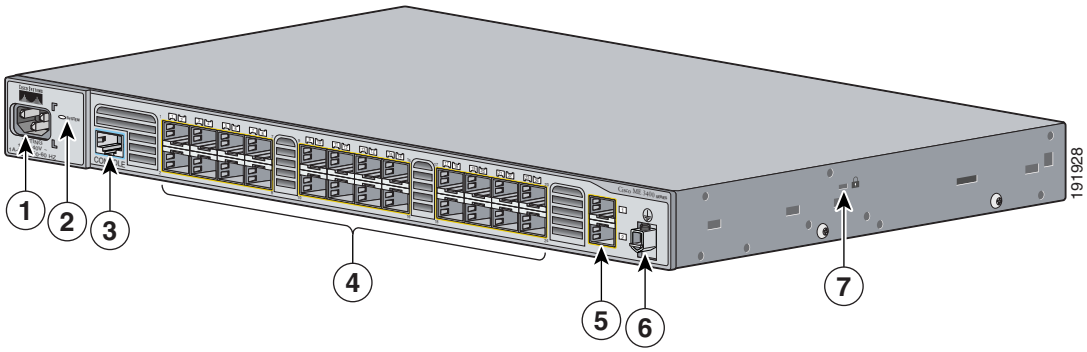


1	DC power connector	**4**	10/100 Fast Ethernet ports	**7**	Cable lock
2	System LED	**5**	Gigabit Ethernet SFP module ports		
3	Console port	**6**	Ground connector		

Cisco ME 3400-24FS Switch AC Switch Front Panel

The Cisco ME 3400-24FS AC switch has 24 100BASE-FX SFP module ports and 2 Gigabit Ethernet SFP module ports, as shown in Figure 1-3. The first member of the pair (port 1) is above the second member (port 2) on the left. Port 3 is above port 4, and so on. The Gigabit Ethernet uplink SFP module ports are numbered 1 above and 2 below.

Figure 1-3 Cisco ME 3400-24FS AC Ethernet Access Switch Front Panel

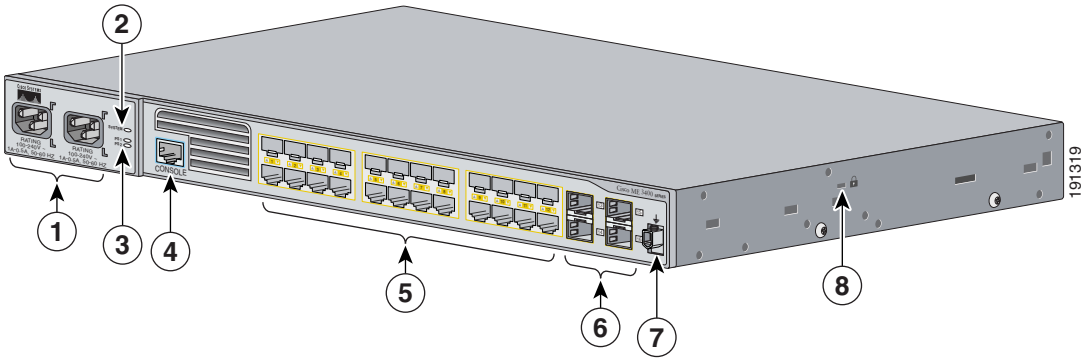


1	AC power connector	**4**	100BASE-FX SFP module ports	**7**	Cable lock
2	System LED	**5**	Gigabit Ethernet SFP module ports		
3	Console port	**6**	Ground connector		

Cisco ME 3400G-12CS AC and DC Switches Front Panel

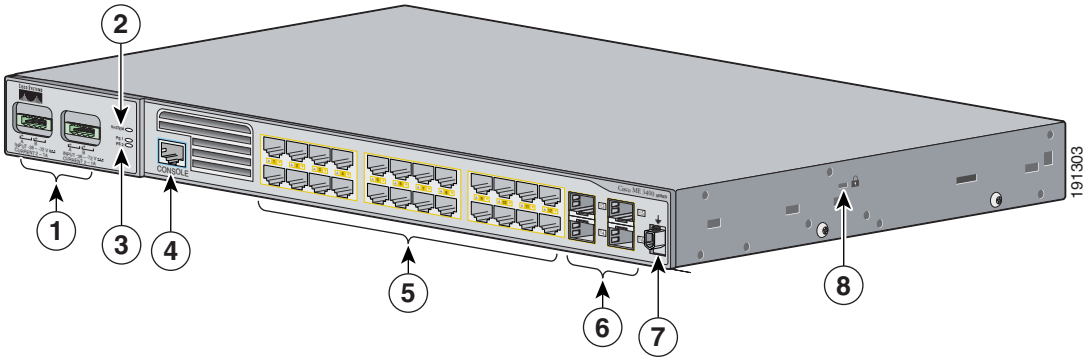
The Cisco ME 3400G-12CS AC and DC switches have dual-purpose ports, numbered 1 through 12, as shown in Figure 1-4 (Cisco ME 3400G-12CS-AC switch) and Figure 1-5 (Cisco ME 3400G-12CS-DC switch). You can configure the dual-purpose ports as either 10/100/1000 ports that use RJ-45 connectors or configure them for SFP modules. The Gigabit Ethernet uplink SFP module ports are numbered 13 through 16.

Figure 1-4 Cisco ME 3400G-12CS-AC Ethernet Access Switch Front Panel



1	AC power connectors	**4**	Console port	**7**	Ground connectors
2	System LED	**5**	Dual-purpose ports	**8**	Cable lock
3	Power supply 1 and 2 LEDs	**6**	SFP module ports		

Figure 1-5 Cisco ME 3400G-12CS-DC Ethernet Access Switch Front Panel

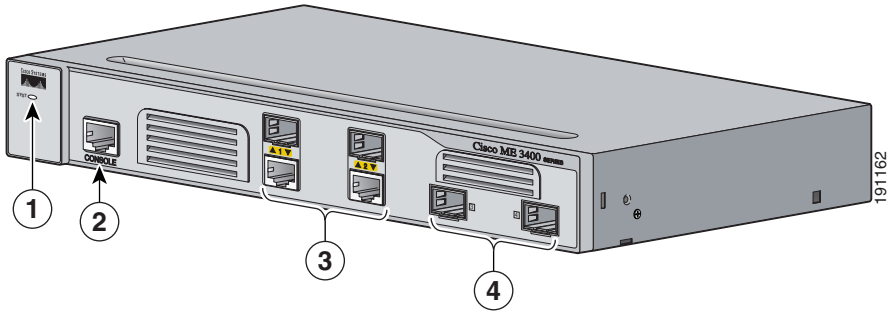


1	DC power connectors	**4**	Console port	**7**	Ground connectors
2	System LED	**5**	Dual-purpose ports	**8**	Cable lock
3	Power supply 1 and 2 LEDs	**6**	SFP module ports		

Cisco ME 3400G-2CS Switch Front Panel

The Cisco ME 3400G-2CS switch has two dual-purpose ports, numbered 1 and 2, as shown in Figure 1-6. You can configure the dual-purpose ports as either 10/100/1000 ports that use RJ-45 connectors or configure them for SFP modules. The Gigabit Ethernet uplink SFP module ports are numbered 3 and 4.

Figure 1-6 Cisco ME 3400G-2CS Ethernet Access Switch



1	System LED	**3**	Dual-purpose ports
2	Console port	**4**	SFP module ports

10/100 Ports (Only the Cisco ME-3400-24TS Switches)

You can set the 10/100 ports on the Cisco ME 3400-24TS switches to operate in any combination of half duplex, full duplex, or 10 or 100 Mb/s. You can set the ports for speed and duplex autonegotiation, in compliance with IEEE 802.3ab. The default setting is autonegotiate.

When set for autonegotiation, the port senses the speed and duplex settings of the attached device and advertises its own capabilities. If the connected device also supports autonegotiation, the switch port negotiates the best connection (the fastest line speed that both devices support and full-duplex transmission if the attached device supports it) and configures itself accordingly. In all cases, the attached device must be within 328 feet (100 meters).

User-network interfaces (UNIs) and network node interfaces (NNIs) are supported on the Cisco ME switches. UNIs are typically connected to a host, such as a PC or a Cisco IP phone. NNIs are typically connected to a router or to another switch. By default, the 10/100 ports on the Cisco ME switch are configured as UNIs.

A port can be reconfigured from UNI to NNI and the reverse. When a port is reconfigured as another interface type, it inherits all the characteristics of that interface type. All ports on the Cisco ME switch are either UNI or NNI at any time.

For information on configuring interfaces, see the software configuration guide.

Dual-Purpose Ports (Only the Cisco ME 3400G-12CS and Cisco ME 3400G-2CS Switches)

You can configure the dual-purpose ports on the Cisco ME 3400G-12CS switches and the Cisco ME 3400G-2CS switches as either 10/100/1000 ports or as SFP module ports.

You can set the 10/100/1000 ports to autonegotiate. You can also configure them as fixed 10, 100, or 1000 Mb/s (Gigabit) Ethernet ports.

The switch dynamically selects the media type for each dual port (10/100/1000BASE-T or SFP). When a link is achieved on one media type, the switch disables the other media type until the active link goes down. If links are active on both media, the SFP module port has priority. You cannot configure this priority.

UNIs and NNIs are supported on the dual-purpose ports. UNIs are typically connected to a host, such as a PC or a Cisco IP phone. NNIs are typically connected to a router or to another switch. By default, the dual-purpose ports are UNIs. A port can be reconfigured from UNI to NNI and the reverse. When a port is reconfigured as another interface type, it inherits all the characteristics of that interface type. All ports on the Cisco ME switch are either UNI or NNI at any time.

You can configure the speed and duplex settings consistent with the selected media type.

For information on configuring interfaces, see the software configuration guide.

SFP Module Ports

The Cisco ME switch supports Gigabit Ethernet and 100 megabit Ethernet, field-replaceable SFP transceiver modules to establish fiber-optic and copper connections to other network devices. The SFP modules that use fiber-optic connections need fiber-optic cables with LC connectors. The SFP modules that use copper connections need Category 5 or higher cables with RJ-45 connectors.

The Cisco ME switch uses Gigabit Ethernet SFP modules to establish fiber-optic and 1000BASE-T connections. These transceiver modules are field-replaceable, providing the interfaces when inserted in an SFP module slot. You can use the SFP modules for Gigabit connections to other switches.

The 10/100 Fast Ethernet ports and the dual-purpose ports on Cisco ME 3400-12CS and Cisco ME 3400-2CS switches are configured as UNIs. The SFP module uplink ports are configured as NNIs. If the switch is running the metro base or metro access image, you can configure only four ports on the switch as NNIs at one time, but you can configure all ports on the switch as UNIs. Starting with Cisco IOS Release 12.2(25)SEG, if the switch is running the metro IP access image, you can configure an unlimited number of NNIs.

Note The Cisco ME-3400-24FS switch downlink ports support only the 100BASE-BX, 100BASE-FX, and 100BASE-LX SFP modules.

For more information on configuring interfaces, see the software configuration guide. For more information about cabling specifications for SFP modules, see the "SFP Module Cable Specifications" section on page A-4.

SFP Modules

The Cisco ME switch supports these Cisco SFP modules:

- 100BASE-BX
- 100BASE-FX
- 100BASE-LX
- 1000BASE-BX
- 1000BASE-LX/LH
- 1000BASE-SX
- 1000BASE-T
- 1000BASE-ZX
- CWDM
- DWDM

When installed in Cisco ME switches, 1000BASE-T SFP modules can operate at 10, 100, or 1000 Mb/s in full-duplex mode or at 10 or 100 Mb/s in half-duplex mode. For more information about these SFP modules, see your SFP module documentation.

You can use any combination of SFP modules that your switch supports. The only restrictions are that each port must match the wavelength specifications on the other end of the cable and that the cable must not exceed the stipulated cable length for reliable communications listed in the "SFP Module Cable Specifications" section on page A-4.

Use only Cisco SFP modules on your switch. Each SFP module has an internal serial electrically erasable programmable read-only memory (EEPROM) that is encoded with security information. This encoding provides a way for Cisco to identify the module and to ensure that it meets the performance, quality, and interoperability requirements for the device.

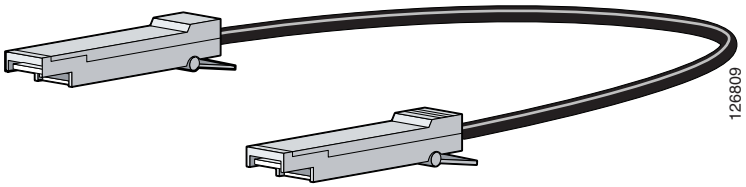
For information about Cisco SFP modules, see the documentation at this URL:

http://www.cisco.com/en/US/products/hw/modules/ps5455/tsd_products_support_series_home.html

SFP Module Patch Cable

The Cisco ME switch supports the SFP module patch cable, a 0.5-meter, copper, passive cable with SFP module connectors at each end (see Figure 1-7). The patch cable connects two Cisco ME switches in a cascaded configuration.

Figure 1-7 SFP Module Patch Cable



See the "Inserting and Removing the SFP Module Patch Cable" section on page 2-19 for more information about using the SFP module patch cable.

On the Cisco ME-3400-24FS-A switch, only the Gigabit Ethernet uplink ports support the SFP module patch cable.

You can order the SFP module patch cable (part number CAB-SFP-50CM=).

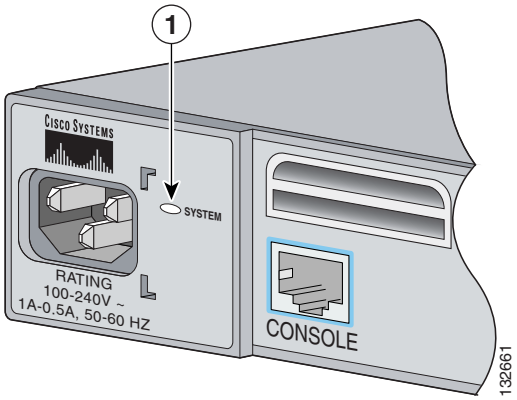
LEDs

You can use the switch System and port LEDs to monitor switch activity and performance. The LEDs are described in these sections:

System LED

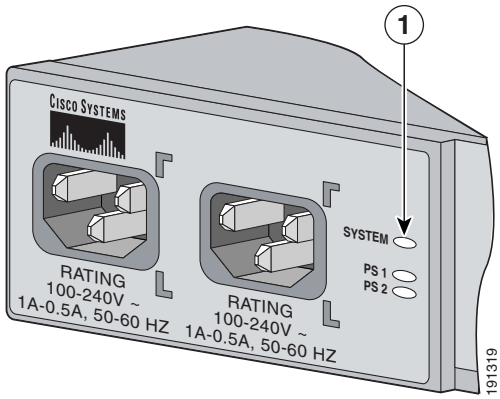
These illustrations show the location of the System LED:

Figure 1-8 Cisco ME 3400-24TS and Cisco ME 3400-24FS Switches System LED



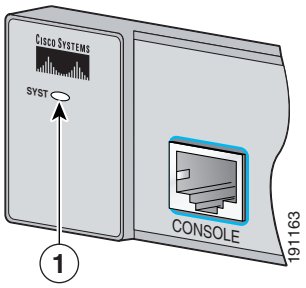
1	System LED

Figure 1-9 Cisco ME 3400G-12CS Switch System LED



1	System LED

Figure 1-10 Cisco ME 3400G-2CS Switch System LED



1	System LED

The System LED shows whether the system is receiving power and is functioning properly. Table 1-2 lists the LED colors and their meanings.

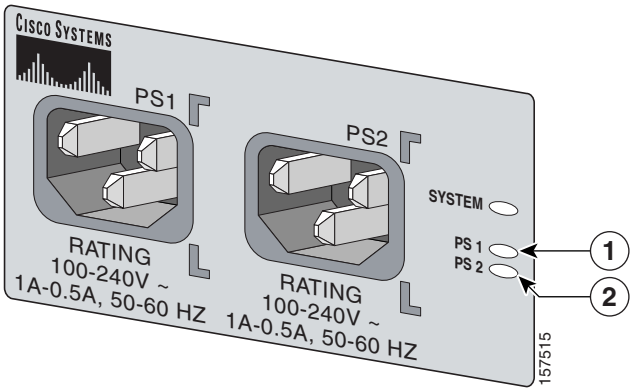
Table 1-2 System LED

Color	System Status
Off	System is not powered on.
Blinking green	POST is in progress.
Green	System is operating normally.
Amber	System is receiving power but is not functioning properly.

Power Supply LEDs (Only Cisco ME 3400G-12CS Switches)

The Cisco ME 3400G-12CS switches have power supply LEDs labeled PS1 and PS2, as shown in Figure 1-11. The lit LED shows which power supply is on. Figure 1-11 shows the PS LEDs for an AC switch. The PS LEDs for a DC switch are in the same position on the front panel.

Figure 1-11 Cisco ME 3400G-12CS Switch PS LEDs



1	PS1 LED	**2**	PS2 LED

Port LEDs

Each RJ-45 port and SFP module slot has a port LED. These port LEDs, as a group or individually, display information about the switch and about the individual ports. Table 1-3 explains how to interpret the port LED colors.

Table 1-3 Meaning of Port LED Colors

LED Color	Meaning
Off	No link, or port was administratively shut down.
Green	Link present but not sending or receiving data.
Blinking green	Activity. Port is sending or receiving data.

Table 1-3 Meaning of Port LED Colors (continued)

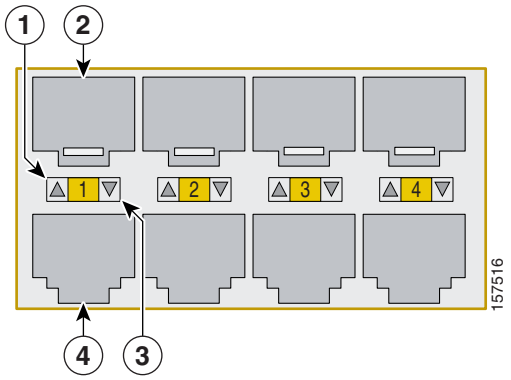
LED Color	Meaning
Alternating green-amber	Link fault. Error frames can affect connectivity, and errors such as excessive collisions, CRC errors, and alignment and jabber errors are monitored for a link-fault indication.
Amber	Port is disabled.

Dual-Purpose Port LEDs

The LEDs on the Cisco ME 3400G-12CS switch dual-purpose ports, as shown in Figure 1-12, show which is connected: either an RJ-45 connector or an SFP module. The Cisco ME3400G-2CS switch dual-purpose ports are similar to those shown in this section.

You can configure each dual-purpose port as either 10/100/1000 ports that use RJ-45 connectors or as SFP module ports, but not both types at the same time. The LEDs show how the port is being used—either as an RJ-45 Ethernet port or as an SFP module.

Figure 1-12 Cisco ME 3400G-12CS Switch Dual-Purpose Port LEDs



1	SFP module port in-use LED	**3**	RJ-45 port in-use LED
2	SFP module slot	**4**	RJ-45 connector

The LED colors have the same meanings as described in Table 1-3 on page 1-10.

Console Port

You can connect the switch to a PC by means of the console port and an RJ-45-to-DB-9 female cable. If you want to connect the switch console port to a terminal, you need to provide an RJ-45-to-DB-25 female DTE adapter. You can order a kit (part number ACS-DSBUASYN=) containing that adapter from Cisco. For console port and adapter pinout information, see the "Connector and Cable Specifications" section on page A-1.

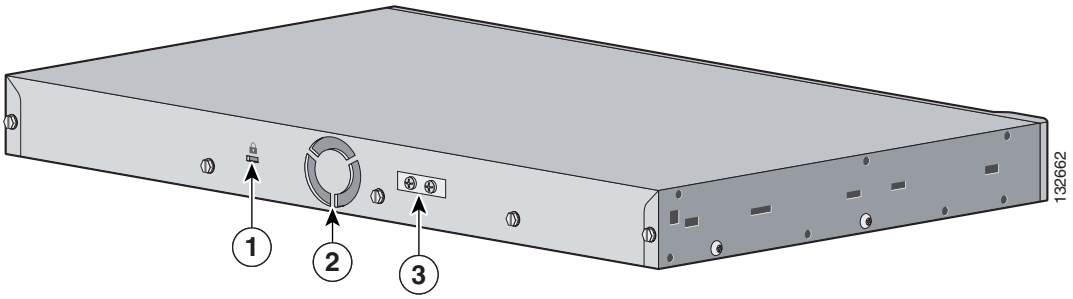
Rear Panel Description

The Cisco ME switches rear panels are described in these sections:

Cisco ME 3400-24TS Switch Rear Panel

The rear panel on the Cisco ME 3400-24TS switch has a cable lock, an exhaust fan, and a ground connector. (See Figure 1-13.)

Figure 1-13 Cisco ME 3400-24TS Switch Rear Panel

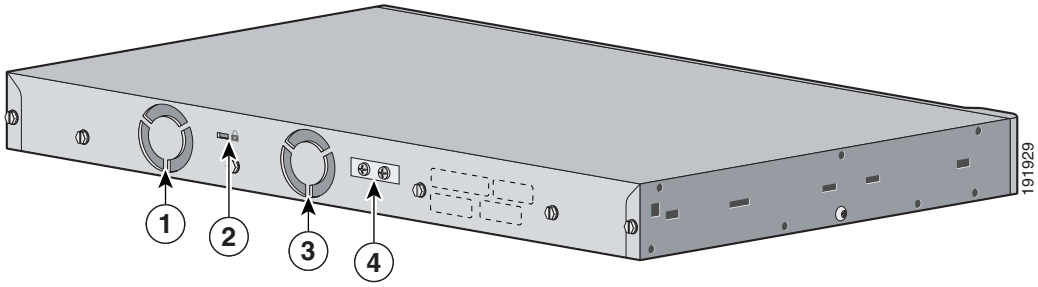


1	Cable lock	**3**	Ground connector
2	Fan exhaust		

Cisco ME 3400-24FS Switch Rear Panel

The rear panel on the Cisco ME 3400-24FS switch has a cable lock, two exhaust fans, and a ground connector. (See Figure 1-14.)

Figure 1-14 Cisco ME 3400-24FS Switch Rear Panel

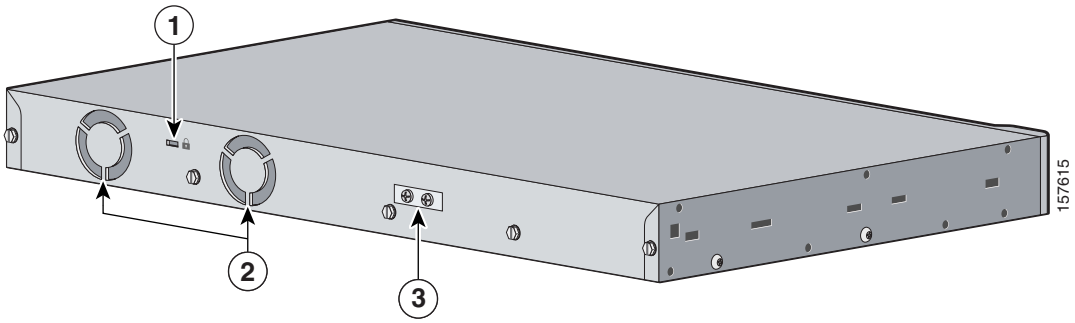


1	Exhaust fan 1	**3**	Exhaust fan 2
2	Cable lock	**4**	Ground connector

Cisco ME 3400G-12S Switch Rear Panel

The rear panel on the Cisco ME 3400G-12CS switch has a cable lock, two exhaust fans, and a ground connector. (See Figure 1-15.) The switch can operate with only one fan. You should replace a switch that has a failed fan as soon as possible.

Figure 1-15 Cisco ME 3400G-12CS Switch Rear Panel

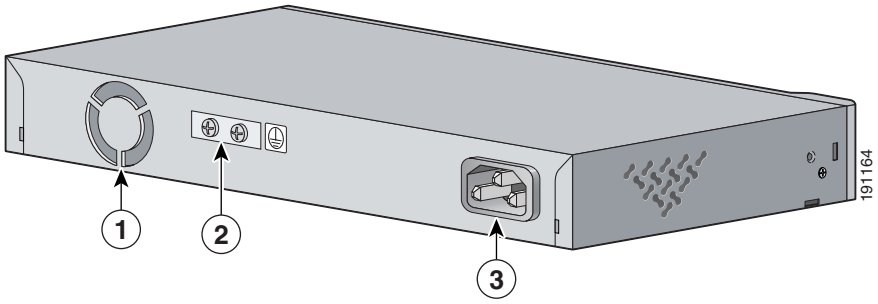


1	Cable lock	**3**	Ground connector
2	Fan exhaust		

Cisco ME 3400-2CS Switch Rear Panel

The rear panel on the Cisco ME 3400G-2CS switch has a fan exhaust, a ground connector, and an AC power connector. Figure 1-16 shows the Cisco ME 3400G-2CS switch rear panel.

Figure 1-16 Cisco ME 3400-2CS Switch Rear Panel



1	Fan exhaust	**3**	AC power connector
2	Ground connector		

Power Supply Features

These sections describe the power supply features for the Cisco ME AC and DC switches.

For redundancy, the Cisco ME 3400G-12CS switch has two power supplies. The switch runs with one power supply, but you should replace a switch that has a failed power supply as soon as possible.

Cisco ME AC Switch Power Supply

The Cisco ME AC switch is powered through an internal power supply. The AC power supply is an autoranging unit that supports input voltages between 100 and 240 VAC. Use the supplied AC power cord to connect the AC power connector to an AC power outlet.

Cisco ME DC Switch Power Supply

The Cisco ME DC switch internal power supplies support input voltages between –36 to –72 VDC. For more information, see Appendix B, "Technical Specifications."

See Appendix C, "Connecting to DC Power," for instructions on connecting the Cisco ME DC switches.

To order spare or replacement DC connectors, use one of these sources:

- Digi-Key, part number 277-1013-ND, www.digikey.com
- Phoenix Contact, part number 1757035, www.phoenixcontact.com

Management Options

These management options are available for the Cisco ME switch:

- Cisco IOS CLI

  The switch CLI is based on Cisco IOS software and is enhanced to support desktop-switching features. You can fully configure and monitor the switch from the CLI. You can access the CLI either by connecting your management station directly to the switch console port or by using Telnet from a remote management station. See the switch command reference on Cisco.com for more information.

  For setup instructions that use the CLI, go to Appendix D, "Configuring the Switch with the CLI-Based Setup Program."

- CiscoView application

  The CiscoView device-management application displays the switch image that you can use to set configuration parameters and to view switch status and performance information. The CiscoView application, which you purchase separately, can be a standalone application or part of a Simple Network Management Protocol (SNMP) platform. See the CiscoView documentation for more information.

- SNMP network management

  You can manage switches from a SNMP-compatible management station that is running platforms such as HP OpenView or SunNet Manager. The switch supports a comprehensive set of Management Information Base (MIB) extensions and four Remote Monitoring (RMON) groups. See the switch software configuration guide on Cisco.com and the documentation that came with your SNMP application for more information.

Network Configurations

See the switch software configuration guide on Cisco.com for an explanation of network configuration concepts. The software configuration guide also provides examples of network configurations that use the switch to create dedicated network segments that are interconnected through Ethernet connections.