Hardware Specifications

Firepower 8000 Series devices are delivered on a variety of platforms to meet the needs of your organization.

Rack and Cabinet Mounting Options

You can mount Firepower devices in racks and server cabinets. The appliance comes with a rack-mounting kit. For information on mounting the appliance in a rack, refer to the instructions delivered with the rack-mounting kit.

Firepower 8000 Series Devices

The Firepower 8000 Series devices use network modules (NetMods) that contain either copper or fiber sensing interfaces. The devices can be shipped fully assembled or you can install the modules. Assemble your device before installing the Firepower System. See the assembly instructions shipped with your modules.

Some 8000 Series devices can be stacked to increase the capability of the system. For each stacking kit, you replace a NetMod with a stacking module and cable the devices together using the 8000 Series stacking cable. See Using Devices in a Stacked Configuration, page 3-10 for more information.

The Firepower 8000 Series device can be delivered on a variety of chassis:

- AMP8050 is a 1U chassis and can contain up to three modules.
- Firepower 8120, 8130, 8140, and AMP8150, also known as the 81xx Family, is a 1U chassis and can contain up to three modules. For the Firepower 8140 only, you can add a stacking kit for a total 2U configuration.
- Firepower 8250, part of the 82xx Family, is a 2U chassis and can contain up to seven modules. You can add up to three stacking kits for a total 8U configuration.
- Firepower 8260, part of the 82xx Family, is a 4U configuration with two 2U chassis. The primary chassis contains one stacking module and up to six sensing modules. The secondary chassis contains one stacking module. You can add up to two stacking kits for a total 8U configuration.
- Firepower 8270, part of the 82xx Family, is a 6U configuration with three 2U chassis. The primary chassis contains two stacking modules and up to five sensing modules. Each secondary chassis contains one stacking module. You can add one stacking kit for a total 8U configuration.

- Firepower 8290, part of the 82xx Family, is an 8U configuration with four 2U chassis. The primary chassis contains three stacking modules and up to four sensing modules. Each secondary chassis contains one stacking module. This model is fully configured and does not accept a stacking kit.
- Firepower 8350 and AMP8350, part of the 83xx Family, is a 2U chassis and can contain up to seven modules. You can add up to three stacking kits for a total 8U configuration.
- Firepower 8360 and AMP8360, part of the 83xx Family, is a 4U configuration with two 2U chassis. The primary chassis contains one stacking module and up to six sensing modules. The secondary chassis contains one stacking module. You can add up to two stacking kits for a total 8U configuration.
- Firepower 8370 and AMP8370, part of the 83xx Family, is a 6U configuration with three 2U chassis. The primary chassis contains two stacking modules and up to five sensing modules. Each secondary chassis contains one stacking module. You can add one stacking kit for a total 8U configuration.
- Firepower 8390 and AMP8390, part of the 83xx Family, is an 8U configuration with four 2U chassis. The primary chassis contains three stacking modules and up to four sensing modules. Each secondary chassis contains one stacking module. This model is fully configured and does not accept a stacking kit.

Note The AMP models have many of the same form factors as their Firepower counterparts, but have been optimized to take advantage of the Firepower System's network-based advanced malware protection (AMP) capabilities.

See the following sections for more information:

- Firepower 8000 Series Chassis Front View, page 2-2
- Firepower 8000 Series Chassis Rear View, page 2-6
- Firepower 8000 Series Physical and Environmental Parameters, page 2-9
- Firepower 8000 Series Modules, page 2-13

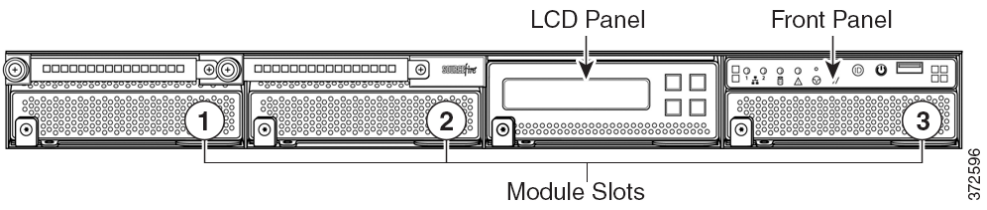
Firepower 8000 Series Chassis Front View

The Firepower 8000 Series chassis can be in the AMP8x50, 81xx Family, the 82xx Family, or the 83xx Family. See the *Regulatory Compliance and Safety Information for FirePOWER and FireSIGHT Appliances* document for safety considerations for AMP8x50, 81xx Family, 82xx Family, and 83xx Family appliances.

AMP8x50 and Firepower 81xx Family Chassis Front View

The front view of the chassis contains the solid-state disk drive, LCD panel, front panel, and three module slots.

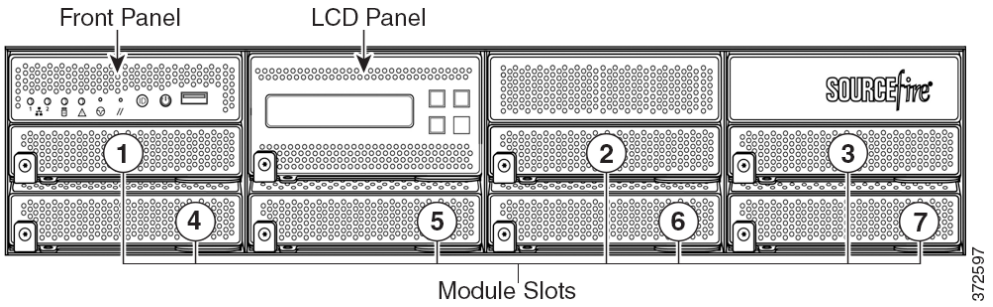
Figure 2-1 AMP8x50 and Firepower 81xx Family (Chassis: CHAS-1U-AC/DC) Front View



Firepower 82xx Family and Firepower and AMP 83xx Family Chassis Front View

The front view of the chassis contains the LCD panel, front panel, and seven module slots.

Figure 2-2 Firepower 82xx Family (Chassis: CHAS-2U-AC/DC) and Firepower and AMP 83xx Family (PG35-2U-AC/DC) Front View



The following table describes the features on the front of the appliance.

Table 2-1 Firepower 8000 Series System Components: Front View

Feature	Description
Solid-state disk drive (81xx Family, AMP8x50)	Houses a solid-state drive (SSD) that functions as the primary system drive used for the operating system, the Firepower System software, and local file storage of events and configuration files. See Installing a Malware Storage Pack, page C-1 for information about installing an optional second SSD for expanded local file storage of suspected malware.
Module slots	Contain the modules. For information on available modules, see Firepower 8000 Series Modules, page 2-13.
LCD panel	Operates in multiple modes to configure the device, display error messages, and view system status. For more information, see Using the LCD Panel on a Firepower Device, page 4-1.
Front panel controls	Houses LEDs that display the system's operating state, as well as various controls, such as the power button. For more information, see Figure 2-4Firepower 82xx Family and Firepower and AMP 83xx Family Front Panel, page 2-4.
Front panel USB port	The USB 2.0 port allows you to attach a keyboard to the device.

See the following sections for more information:

- Firepower 8000 Series Front Panel, page 2-3
- Firepower 8000 Series Chassis Rear View, page 2-6

Firepower 8000 Series Front Panel

The front panel for the Firepower and AMP 81xx Family, 82xx Family, and 83xx Family contain the same components.

Figure 2-3 Firepower 81xx Family Front Panel

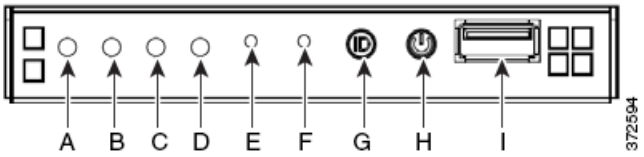


Figure 2-4 Firepower 82xx Family and Firepower and AMP 83xx Family Front Panel

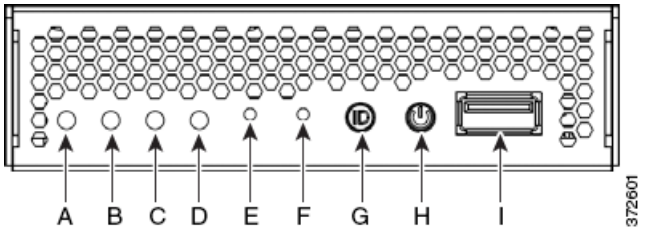


Table 2-2 Firepower 8000 Series Front Panel Components

A	NIC activity LED	F	Reset button
B	Reserved	G	ID button
C	Solid-state drive activity LED	H	Power button and LED
D	System status LED	I	USB 2.0 connector
E	Non-maskable interrupt button		

The front panel of the chassis houses LEDs, which display the system's operating state. The following table describes the LEDs on the front panel

Table 2-3 Firepower 8000 Series Front Panel LEDs

LED	Description
NIC activity	Indicates whether there is any network activity: • Green indicates there is network activity. • If the light is off, there is no network activity.
Solid-state drive activity	Indicates the SSD status: • Blinking green indicates the fixed disk drive is active. • Amber indicates a fixed disk drive fault. • If the light is off, there is no drive activity or the system is powered off.

Table 2-3 Firepower 8000 Series Front Panel LEDs (continued)

LED	Description
System status	Indicates the system status: • Green indicates the system is operating normally. • Blinking green indicates the system is operating in a degraded condition. • Blinking amber indicates the system is in a non-critical condition. • Amber indicates the system is in a critical or non-recoverable condition, or the system is starting up. • If the light is off, the system is starting up or off. **Note** The amber status light takes precedence over the green status light. When the amber light is on or blinking, the green light is off. See Table 2-4 on page 2-5 for more information.
System ID	Helps identify a system installed in a high-density rack with other similar systems: • A blue light indicates the ID button is pressed and a blue light is on at the rear of the appliance. • No light indicates the ID button is not pressed.
Power button and LED	Indicates whether the system has power: • Green indicates that the system has power. • If the light is off, the system does not have power.

The following table describes the conditions under which the system status LEDs might be lit.

Table 2-4 Firepower 8000 Series System Status

Condition	Description
Critical	Any critical or non-recoverable threshold crossing associated with the following events: • temperature, voltage, or fan critical threshold crossing • power subsystem failure • system inability to power up due to incorrectly installed processors or processor incompatibility • critical event logging errors, including System Memory Uncorrectable ECC error and fatal/uncorrectable bus errors, such as PCI SERR and PERR

Table 2-4 Firepower 8000 Series System Status (continued)

Condition	Description
Non-critical	A non-critical condition is a threshold crossing associated with the following events: • temperature, voltage, or fan non-critical threshold crossing • chassis intrusion • Set Fault Indication command from system BIOS; the BIOS may use the command to indicate additional, non-critical status such as system memory or CPU configuration changes
Degraded	A degraded condition is associated with the following events: • one or more processors are disabled by Fault Resilient Boot (FRB) or BIOS • some system memory disabled or mapped out by BIOS • one of the power supplies unplugged or not functional **Tip** If you observe a degraded condition indication, check your power supply connections first. Power down the device, disconnect both power cords, reconnect the power cords to reseat them, and then restart the device. **Caution** To power down safely, use the procedure in the Managing Devices chapter in the *Firepower Management Center Configuration Guide*, or the `system shutdown` command from the CLI.

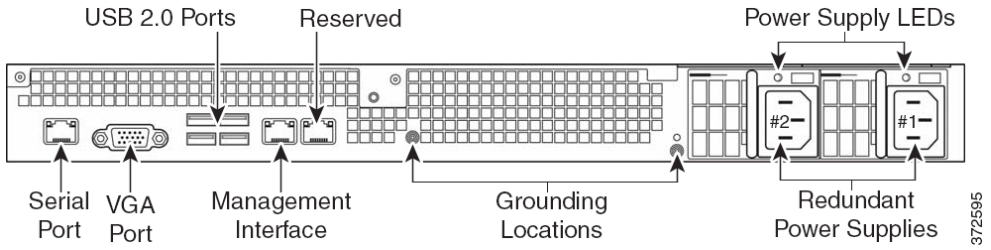
Firepower 8000 Series Chassis Rear View

The Firepower 8000 Series chassis can be in the 81xx Family, 82xx Family, or 83xx Family.

AMP8x50 and Firepower 81xx Family Chassis Rear View

The rear of the chassis contains connection ports, the management interface, and the power supplies.

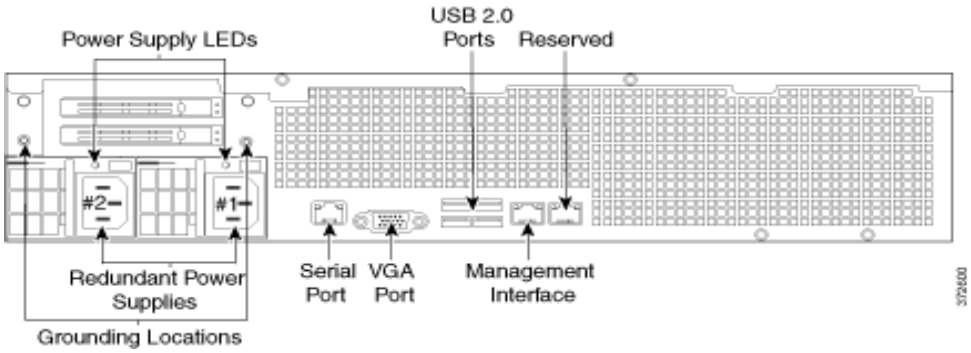
Figure 2-5 AMP8x50 and Firepower 81xx Family (Chassis: CHAS-1U-AC/DC) Rear View



Firepower 82xx Family Chassis Rear View

The rear of the chassis contains power supplies, solid-state disk drives, connection ports, and the management interface.

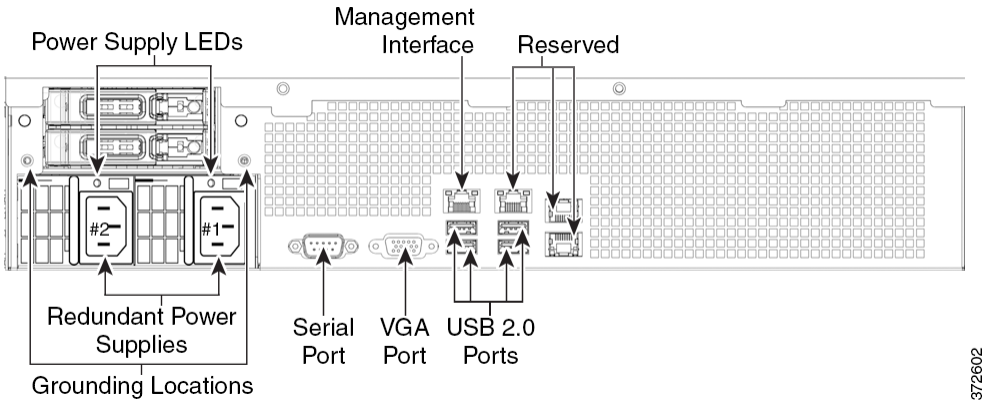
Figure 2-6 Firepower 82xx Family (Chassis: CHAS-2U-AC/DC) Rear View



Firepower and AMP 83xx Family Chassis Rear View

The rear of the chassis contains power supplies, solid-state disk drives, connection ports, and the management interface.

Figure 2-7 Firepower and AMP 83xx Family (Chassis: PG35-2U-AC/DC) Rear View



The following table describes the features that appear on the rear of the appliance.

Note The Firepower 83xx Family hardware platform has six fans that display as FAN2 through FAN7. This is expected behavior. There is no FAN1 on the 83xx Family platform.

Table 2-5 Firepower 8000 Series System Components: Rear View

Feature	Description
VGA port USB 2.0 ports	Allows you to attach a monitor, keyboard, and mouse to the device, as an alternative to using the serial port, to establish a direct workstation-to-appliance connection.
RJ45 serial port (81xx Family and 82xx Family)	Allows you to establish a direct workstation-to-appliance connection (using an RJ45 to DB-9 adapter) for direct access to all of the management services on the device. The RJ45 serial port is used for maintenance and configuration purposes **only** and is not intended to carry service traffic.

Table 2-5 Firepower 8000 Series System Components: Rear View (continued)

Feature	Description
RS232 serial port (83xx Family)	Allows you to establish a direct workstation-to-appliance connection for direct access to all of the management services on the device. The RJ232 serial port is used for maintenance and configuration purposes **only** and is not intended to carry service traffic.
10/100/1000 Ethernet management interface	Provides for an out-of-band management network connection. The management interface is used for maintenance and configuration purposes **only** and is not intended to carry service traffic.
Redundant power supplies	Provides power to the device through an AC power source. Looking at the rear of the chassis, power supply #1 is on the right and power supply #2 is on the left.
Solid-state disk drive (82xx Family and 83xx Family)	Houses a solid-state drive (SSD) that functions as the primary system drive used for the operating system, the Firepower System software, and local file storage of events and configuration files.
Grounding locations	Allows you to connect the appliance to the Common Bonding Network. See the Power Requirements for Firepower 8000 Series Devices, page A-1 for more information.

The 10/100/1000 management interface is located on the rear of the appliance. The following table describes the LEDs associated with the management interface.

Table 2-6 Firepower 8000 Series Management Interface LEDs

LED	Description
Left (activity)	Indicates activity on the port: • A blinking light indicates activity. • No light indicates there is no activity.
Right (link)	Indicates whether the link is up: • A light indicates the link is up. • No light indicates there is no link.

The power supply modules are located on the rear of the appliance. The following table describes the LEDs associated with the management interface.

Table 2-7 Firepower 8000 Series Power Supply LEDs

LED	Description
Off	The power supply is not plugged in.
Amber	No power supplied to this module. or A power supply critical event such as module failure, a blown fuse, or a fan failure; the power supply shuts down.
Blinking amber	A power supply warning event, such as high temperature or a slow fan; the power supply continues to operate.

Table 2-7 Firepower 8000 Series Power Supply LEDs (continued)

LED	Description
Blinking green	AC input is present; volts on standby, the power supply is switched off.
Green	The power supply is plugged in and on.

The following table lists the signals on a typical DB-9 serial connector and the corresponding pins on the device's RJ45 serial connectors. You can use this table to construct an adapter for serial connections.

Table 2-8 Firepower 8000 Series RJ45 to DB-9 Adapter Pin-Out

DB-9 Pin	Signal	Description	RJ45 Pin
1	DCD/DSR	Data carrier detect/data set ready	7
2	RD	Receive data	6
3	TD	Transmit data	3
4	DTR	Data terminal ready	2
5	GND	Ground	4 & 5
6		No connection	
7	RTS	Request to send	1
8	CTS	Clear to send	8
9		No connection	

Firepower 8000 Series Physical and Environmental Parameters

The following table describes the physical attributes and environmental parameters for AMP8x50 and 81xx Family devices.

Table 2-9 AMP8x50 and 81xx Family Physical and Environmental Parameters

Parameter	Description
Form factor	1U
Dimensions (D x W x H)	28.7 in. x 17.2 in. x 1.73 in. (72.8 cm x 43.3 cm x 4.4 cm)
Weight maximum installed	43.5 lbs (19.8 kg)
Copper 1000BASE-T configurable bypass NetMod	Quad-port Gigabit copper Ethernet configurable bypass interfaces in a paired configuration Cable and distance: Cat5E at 50 m
Fiber 10GBASE configurable bypass MMSR or SMLR NetMod	Dual-port fiber configurable bypass interfaces with LC connectors Cable and distance: LR is single-mode at 5000 m (available) SR is multimode fiber (850 nm) at 550 m (standard)
Fiber 1000BASE-SX configurable bypass NetMod	Quad-port fiber configurable bypass interfaces 1000BASE-SX with LC connectors Cable and distance: SX is multimode fiber (850 nm) at 550 m (standard)

Table 2-9 AMP8x50 and 81xx Family Physical and Environmental Parameters (continued)

Parameter	Description
Copper 1000BASE-T non-bypass NetMod	Quad-port Gigabit copper Ethernet non-bypass interfaces in a paired configuration Cable and distance: Cat5E at 50 m
Fiber 10GBASE non-bypass MMSR or SMLR NetMod	Quad-port fiber non-bypass interfaces with LC connectors Cable and distance: LR is single-mode at 5000 m (available) SR is multimode fiber (850 nm) at 550 m (standard)
Fiber 1000BASE-SX non-bypass NetMod	Quad-port fiber non-bypass interfaces 1000BASE-SX with LC connectors Cable and distance: SX is multimode fiber (850 nm) at 550 m (standard)
Power supply	Dual 650 W redundant power supplies designed for AC or DC. AC Voltage: 100 VAC to 240 VAC nominal (85 VAC to 264 VAC maximum) AC Current: 5.2A maximum over the full range, per supply 2.6A maximum for 187 VAC to 264 VAC, per supply AC Frequency range: 47 Hz to 63 Hz DC Voltage: -48 VDC nominal referenced to RTN -40 VDC to -72 VDC maximum DC Current: 11A maximum, per supply
Solid-state drive (SSD)	200GB 2.5-inch SSD. See Installing a Malware Storage Pack, page C-1 for information about installing an optional second SSD for expanded local file storage of suspected malware.
Operating temperature	50°F to 95°F (10°C to 35°C)
Non-operating temperature	-29°F to 158°F (-20°C to 70°C)
Operating humidity	5% to 85% non-condensing
Non-operating humidity	5% to 90%, non-condensing with a maximum wet bulb of 82°F (28°C) at temperatures from 77°F to 95°F (25°C to 35°C)
Altitude	0ft (sea level) to 6000 ft (0 to 1800 m)
Cooling requirements	1725 BTU/hour You must provide sufficient cooling to maintain the appliance within its required operating temperature range. Failure to do this may cause a malfunction or damage to the appliance.
Acoustic noise	Max normal operating noise is 87.6 dB LWAd (high temperature). Typical normal operating noise is 80 dB LWAd.
Operating shock	No errors with half a sine wave shock of 2G (with 11 ms duration)
Airflow	160 ft^3 (4.5 m^3) per minute Restriction of the airflow such as blocking the front or back or enclosing the unit in a cabinet without sufficient clearance may cause the unit to overheat, even if the ambient temperature is in the operating range. Airflow through the appliance enters at the front and exits at the rear. The minimum recommended clearance in the front and back is 7.9 in. (20 cm). This minimum can only be used if you can ensure a supply of low temperature air at the front of the appliance.

The following table describes the physical attributes and environmental parameters for Firepower 82xx Family and the Firepower and AMP 83xx Family devices.

Table 2-10 Firepower 82xx Family and Firepower and AMP 83xx Family Physical and Environmental Parameters

Parameter	Description	
Form factor	2U	
Dimensions (D x W x H)	29.0 in. x 17.2 in. x 3.48 in. (73.5 cm x 43.3 cm x 88.2 cm)	
Weight maximum installed	82xx Family:	58 lbs (25.3 kg)
	83xx Family:	67 lbs (30.5 kg)
Copper 1000BASE-T configurable bypass NetMod	Quad-port Gigabit copper Ethernet configurable bypass interfaces in a paired configuration Cable and distance: Cat5E at 50 m	
Fiber 10GBASE MMSR or SMLR configurable bypass NetMod	Dual-port fiber configurable bypass interfaces with LC connectors Cable and distance: LR is single-mode at 5000 m (available) SR is multimode fiber (850 nm) at 550 m (standard)	
Fiber 1000BASE-SX configurable bypass NetMod	Quad-port fiber configurable bypass interfaces1000BASE-SX with LC connectors Cable and distance: SX is multimode fiber (850 nm) at 550 m (standard)	
Fiber 40GBASE-SR4 configurable bypass NetMod	Dual-port fiber configurable bypass interfaces with OTP/MTP connectors Cable and distance: OM3: 100 m at 850 nm Multimode OM4: 150 m at 850 nm Multimode	
Copper 1000BASE-T non-bypass NetMod	Quad-port Gigabit copper Ethernet non-bypass interfaces in a paired configuration Cable and distance: Cat5E at 50 m	
Fiber 10GBASE non-bypass MMSR or SMLR NetMod	Quad-port fiber non-bypass interfaces with LC connectors Cable and distance: LR is single-mode at 5000 m (available) SR is multimode fiber (850 nm) at 550 m (standard)	
Fiber 1000BASE-SX non-bypass NetMod	Quad-port fiber non-bypass interfaces 1000BASE-SX with LC connectors Cable and distance: SX is multimode fiber (850 nm) at 550 m (standard)	

Table 2-10 Firepower 82xx Family and Firepower and AMP 83xx Family Physical and Environmental Parameters

Parameter	Description	
Power supply	82xx Family:	Dual 750 W redundant power supplies designed for AC or DC. AC Voltage: 100 VAC to 240 VAC nominal (85 VAC to 264 VAC maximum) AC Current: 8A maximum over the full range, per supply 4A maximum for 187 VAC to 264 VAC, per supply AC Frequency range: 47 Hz to 63 Hz DC Voltage: -48 VDC nominal referenced to RTN -40 VDC to -72 VDC maximum DC Current: 18A maximum, per supply
	83xx Family:	Dual 1000 W redundant power supplies designed for AC or DC. AC Voltage: 100 VAC to 240 VAC nominal (85 VAC to 264 VAC maximum) AC Current: 11A maximum over the full range, per supply 5.5A maximum for 187 VAC to 264 VAC, per supply AC Frequency range: 47 Hz to 63 Hz DC Voltage: -48 VDC nominal referenced to RTN -40 VDC to -72 VDC maximum DC Current: 25A maximum, per supply
Solid-state drive (SSD)	82xx Family:	200GB 2.5-inch SSD.
	83xx Family:	800GB 2.5-inch SSD.
	See Installing a Malware Storage Pack, page C-1 for information about installing an optional second SSD for expanded local file storage of suspected malware.	
Operating temperature	82xx Family:	50°F to 95°F (10°C to 35°C)
	83xx Family:	41°F to 104°F (5°C to 40°C)
Non-operating temperature	-29ºF to 158ºF (-20ºC to 70ºC)	
Operating humidity	5% to 85% non-condensing	
Non-operating humidity	5% to 90%, non-condensing with a maximum wet bulb of 82°F (28°C) at temperatures from 77°F to 95°F (25°C to 35°C)	
Altitude	0 ft (sea level) to 6000 ft (0 to 1800 m)	
Cooling requirements	up to 2900 BTU/hour You must provide sufficient cooling to maintain the appliance within its required operating temperature range. Failure to do this may cause a malfunction or damage to the appliance.	
Acoustic noise	Max normal operating noise is 81.6 dB LWAd (high temperature). Typical normal operating noise is 81.4 dB LWAd.	

Table 2-10 Firepower 82xx Family and Firepower and AMP 83xx Family Physical and Environmental Parameters

Parameter	Description
Operating shock	No errors with half a sine wave shock of 2G (with 11 ms duration)
Airflow	Front to back, 210 ft^3 (6 m^3) per minute Restriction of the airflow such as blocking the front or back or enclosing the unit in a cabinet without sufficient clearance may cause the unit to overheat, even if the ambient temperature is in the operating range. Airflow through the appliance enters at the front and exits at the rear. The minimum recommended clearance in the front and back is 7.9 in. (20cm). This minimum can only be used if you can ensure a supply of low temperature air at the front of the appliance.

Firepower 8000 Series Modules

The sensing interfaces for the Firepower 8000 Series appliances can be delivered with copper or fiber interfaces.

Caution Modules are **not** hot-swappable. See Inserting and Removing Firepower 8000 Series Network Modules, page B-1 for more information.

The following modules contain configurable bypass sensing interfaces:

- a quad-port 1000BASE-T copper interface with configurable bypass capability. See Quad-Port 1000BASE-T Copper Configurable Bypass NetMod, page 2-13.
- a quad-port 1000BASE-SX fiber interface with configurable bypass capability. See Quad-Port 1000BASE-SX Fiber Configurable Bypass NetMod, page 2-14 for more information.
- a dual-port 10GBASE (MMSR or SMLR) fiber interface with configurable bypass capability. See Dual-Port 10GBASE (MMSR or SMLR) Fiber Configurable Bypass NetMod, page 2-16 for more information.
- a dual-port 40GBASE-SR4 fiber interface with configurable bypass capability (2U devices only). See Dual-Port 40GBASE-SR4 Fiber Configurable Bypass NetMod, page 2-17 for more information.

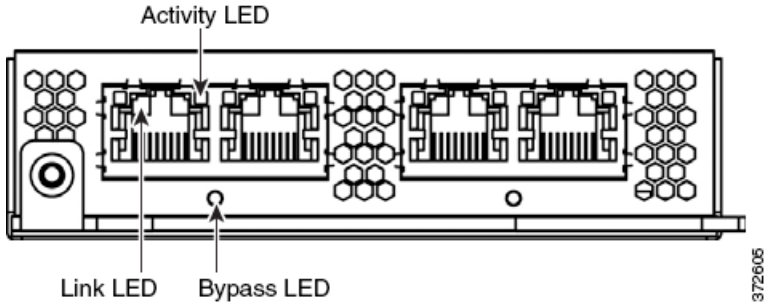
The following modules contain non-bypass sensing interfaces:

- a quad-port 1000BASE-T copper interface without bypass capability. See Quad-Port 1000BASE-T Copper Non-Bypass NetMod, page 2-19 for more information.
- a quad-port 1000BASE-SX fiber interface without bypass capability. See Quad-Port 1000BASE-SX Fiber Non-Bypass NetMod, page 2-19 for more information.
- a quad-port 10GBASE (MMSR or SMLR) fiber interface without bypass capability. See Quad-Port 10GBASE (MMSR or SMLR) Fiber Non-Bypass NetMod, page 2-20 for more information.

In addition, you can use a stacking module to connect two Firepower 8140, up to four Firepower 8250, or up to four Firepower or AMP 8350 devices to combine their processing power and increase throughput. See Stacking Module, page 2-21 for more information.

Quad-Port 1000BASE-T Copper Configurable Bypass NetMod

The quad-port 1000BASE-T copper configurable bypass NetMod contains four copper ports and link, activity, and bypass LEDs.



Use the following table to understand the link and activity LEDs on copper interfaces.

Table 2-11 Copper Link/Activity LEDs

Status	Description
Both LEDs off	The interface does not have link and is not in bypass mode.
Link amber	The speed of the traffic on the interface is 10Mb or 100Mb.
Link green	The speed of the traffic on the interface is 1Gb.
Activity blinking green	The interface has link and is passing traffic.

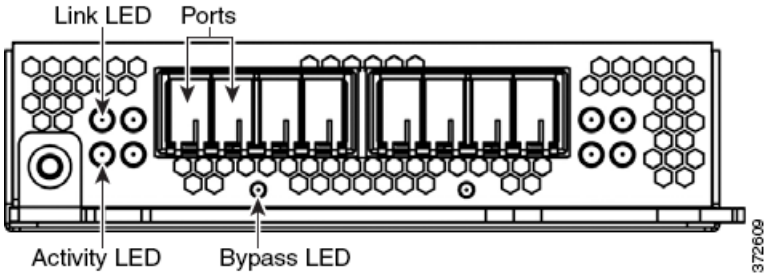
Use the following table to understand the bypass LEDs on copper interfaces.

Table 2-12 Copper Bypass LEDs

Status	Description
Off	The interface does not have link and is not in bypass mode.
Steady green	The interface has link and is passing traffic.
Steady amber	The interface has been intentionally brought down.
Blinking amber	The interface is in bypass mode; that is, it has failed open.

Quad-Port 1000BASE-SX Fiber Configurable Bypass NetMod

The quad-port 1000BASE-SX fiber configurable bypass NetMod contains four fiber ports and link, activity, and bypass LEDs.



Use the following table to understand link and activity LEDs of the fiber interfaces.

Table 2-13 Fiber Link/Activity LEDs

Status	Description
Top	For an inline or passive interface: • A blinking light indicates the interface has activity. • No light indicates there is no activity.
Bottom	For an inline interface: • A light indicates the interface has activity. • No light indicates there is no activity. For a passive interface, the light is always on.

Use the following table to understand bypass LEDs on the fiber interfaces.

Table 2-14 Fiber Bypass LEDs

Status	Description
Off	The interface does not have link and is not in bypass mode.
Steady green	The interface has link and is passing traffic.
Steady amber	The interface has been intentionally brought down.
Blinking amber	The interface is in bypass mode; that is, it has failed open.

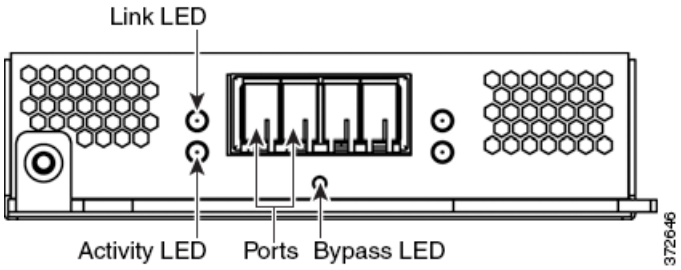
Use the following table to understand the optical specifications of the fiber interfaces.

Table 2-15 1000BASE-SX NetMod Optical Parameters

Parameter	1000BASE-SX
Optical connectors	LC duplex
Bit rate	1000Mbps
Baud rate/encoding/tolerance	1250Mbps 8b/10b encoding
Optical interface	Multimode
Operating distances	656 ft (200 m) for 62.5 µm/125 µm fiber 1640 ft (500 m) for 50 µm/125 µm fiber
Transmitter wavelength	770-860 nm (850 nm typical)
Maximum average launch power	0 dBm
Minimum average launch power	-9.5 dBm
Maximum average power at receiver	0 dBm
Receiver sensitivity	-17 dBm

Dual-Port 10GBASE (MMSR or SMLR) Fiber Configurable Bypass NetMod

The dual-port 10GBASE (MMSR or SMLR) fiber configurable bypass NetMod contains two fiber ports and link, activity, and bypass LEDs.



Use the following table to understand link and activity LEDs of the fiber interfaces.

Table 2-16 Fiber Link/Activity LEDs

Status	Description
Top	For an inline or passive interface: • A blinking light indicates the interface has activity. • No light indicates there is no activity.
Bottom	For an inline interface: • A light indicates the interface has activity. • No light indicates there is no activity. For a passive interface, the light is always on.

Use the following tables to understand the bypass LEDs on the fiber interfaces.

Table 2-17 Fiber Bypass LEDs

Status	Description
Off	The interface does not have link and is not in bypass mode.
Steady green	The interface has link and is passing traffic.
Steady amber	The interface has been intentionally brought down.
Blinking amber	The interface is in bypass mode; that is, it has failed open.

Use the following table to understand the optical parameters of the fiber interfaces.

Table 2-18 10GBASE MMSR and SMLR NetMod Optical Parameters

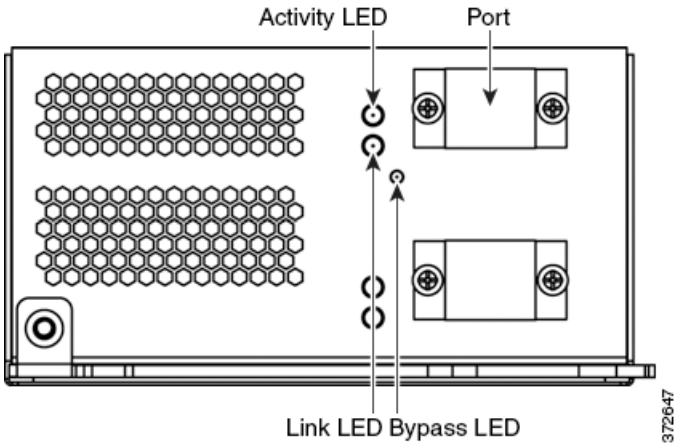
Parameter	10GBASE MMSR	10GBASE SMLR
Optical connectors	LC duplex	LC duplex
Bit rate	10.000Gbps	10.000Gbps
Baud rate/encoding/tolerance	10.3125Gbps 64/66b encoding +/- 100 ppm	10.3125Gbps 64/166b encoding +/- 100 ppm

Table 2-18 10GBASE MMSR and SMLR NetMod Optical Parameters (continued)

Parameter	10GBASE MMSR	10GBASE SMLR
Optical interface	Multimode	Single mode only
Operating distance	840-860 nm (850 nm typical) 85 ft (26 m) to 108 ft (33 m) for 62.5 µm/125 µm fiber (modal BW 160 to 200 respectively) 216 ft (66 m) to 269 ft (82 m) for 50 µm/125 µm fiber (modal BW 400 to 500 respectively) Distances to 980 ft (300 m) are available with higher quality (OM3) fiber. Minimum distances (all): 6ft (2 m)	1270-1355 nm (1310 nm typical) 6 ft to 6.2 miles (2 m to 10 km) for 9 µm/125 µm fiber
Transmitter wavelength	840-860 nm (850 nm typical)	1270-1355 nm (1310 nm typical)
Maximum average launch power	-1 dBm	-0.5 dBm
Minimum average launch power	-7.3 dBm	-8.2 dBm
Maximum average power at receiver	-1 dBm	-0.5 dBm
Receiver sensitivity	-9.9 dBm	-14.4 dBm

Dual-Port 40GBASE-SR4 Fiber Configurable Bypass NetMod

The dual-port 40GBASE-SR4 fiber configurable bypass NetMod contains two fiber ports and link, activity, and bypass LEDs.



You can use the 40G NetMod in the following 8000 Series models:

- Firepower 8270 and 8290
- Firepower and AMP 8360, 8370 and 8390
- Firepower 8250 and 8260 (must be 40G-capable)

- Firepower and AMP 8350 (must be 40G-capable)

Caution If you attempt to create a 40G interface on a device that is not 40G-capable, the 40G interface screen on its managing Firepower Management Center web interface displays red. A 40G-capable 8250 displays "8250-40G" on the LCD Panel and a 40G-capable 8350 displays "8350-40G" on the LCD Panel. See Firepower 8000 Series Modules, page 3-4 for placement information.

Use the following table to understand link and activity LEDs of the fiber interfaces.

Table 2-19 Fiber Link/Activity LEDs

Status	Description
Top (activity)	The light flashes when the interface has activity. If dark, there is no activity.
Bottom (link)	The light is on when the interface has link. If dark, there is no link.

Use the following table to understand bypass LED of the fiber interfaces.

Table 2-20 Fiber Bypass LED

Status	Description
Off	The interface pair does not have link and is not in bypass mode, or has no power.
Steady green	The interface pair has link and is passing traffic.
Steady amber	The interface has been intentionally brought down.
Blinking amber	The interface is in bypass mode; that is, it has failed open.

Use the following table to understand optical parameters of the fiber interfaces.

Table 2-21 40GBASE-SR4 NetMod Optical Parameters

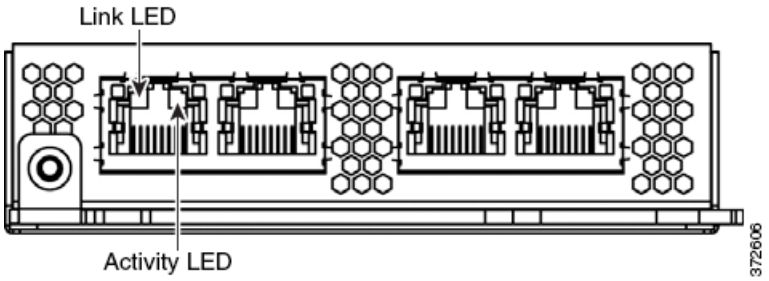
Parameter	40GBASE-SR4
Optical connectors	OTP/MTP single row twelve fiber positions. Only the outer eight fibers are used.
Bit rate	40.000Gbps
Baud rate/encoding/tolerance	10.3125Gbps 64/66b encoding +/- 100 ppm
Optical interface	Multimode
Operating distances	320 ft (100 m) for 50 µm/125 µm fiber (OM3) Minimum distance: 2 ft (0.5 m) 40G optics are carried on eight fiber cables utilizing MPO connectors.
Transmitter wavelength	840-860 nm (850 nm typical)
Maximum average launch power	2.4 dBm

Table 2-21 40GBASE-SR4 NetMod Optical Parameters (continued)

Parameter	40GBASE-SR4
Minimum average launch power	-7.8 dBm
Maximum average power at receiver	2.4 dBm
Receiver sensitivity	-9.5 dBm

Quad-Port 1000BASE-T Copper Non-Bypass NetMod

The quad-port 1000BASE-T copper non-bypass NetMod contains four copper ports, and link and activity LEDs.



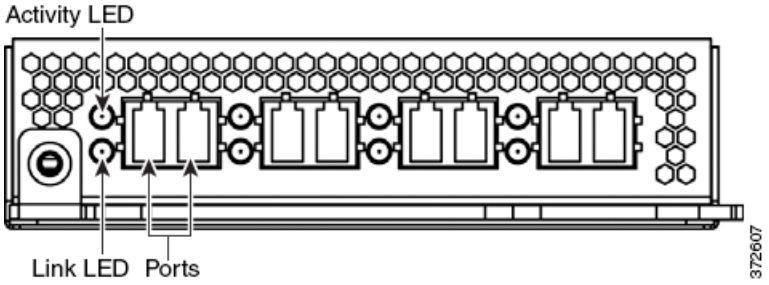
Use the following table to understand copper LEDs.

Table 2-22 Non-Bypass Copper Link/Activity LEDs

Status	Description
Both LEDs Off	The interface does not have link.
Link Amber	The speed of the traffic on the interface is 10Mb or 100Mb.
Link Green	The speed of the traffic on the interface is 1Gb.
Activity Blinking Green	The interface has link and is passing traffic.

Quad-Port 1000BASE-SX Fiber Non-Bypass NetMod

The quad-port 1000BASE-SX fiber non-bypass NetMod contains four fiber ports, and link and activity LEDs.



Use the following table to understand the link and activity LEDs on the fiber interfaces.

Table 2-23 Non-Bypass Fiber Link/Activity LEDs

Status	Description
Top (Activity)	For an inline or passive interface: the light flashes when the interface has activity. If dark, there is no activity.
Bottom (Link)	For an inline interface: the light is on when the interface has link. If dark, there is no link. For a passive interface: the light is always on.

Use the following table to understand the optical parameters of the fiber interfaces.

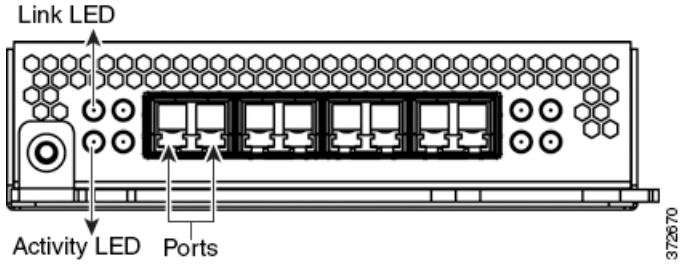
Table 2-24 1000BASE-SX NetMod Optical Parameters

Parameter	1000BASE-SX
Optical connectors	LC duplex
Bit rate	1000Mbps
Baud rate/encoding/tolerance	1250Mbps 8b/10b encoding
Optical interface	Multimode
Operating distances	656 ft (200 m) for 62.5 µm/125 µm fiber 1640 ft (500 m) for 50 µm/125 µm fiber
Transmitter wavelength	770-860 nm (850 nm typical)
Maximum average launch power	0 dBm
Minimum average launch power	-9.5 dBm
Maximum average power at receiver	0 dBm
Receiver sensitivity	-17 dBm

Quad-Port 10GBASE (MMSR or SMLR) Fiber Non-Bypass NetMod

The quad-port 10GBASE (MMSR or SMLR) fiber non-bypass NetMod contains four fiber ports, and link and activity LEDs.

Caution The quad-port 10GBASE non-bypass NetMod contains non-removable SFPs. Any attempt to remove the SFP may damage the module.



Use the following table to understand the link and activity LEDs on fiber interfaces.

Table 2-25 Fiber Link/Activity LEDs

Status	Description
Top	For an inline or passive interface: the light flashes when the interface has activity. If dark, there is no activity.
Bottom	For an inline interface: the light is on when the interface has link. If dark, there is no link. For a passive interface: the light is always on.

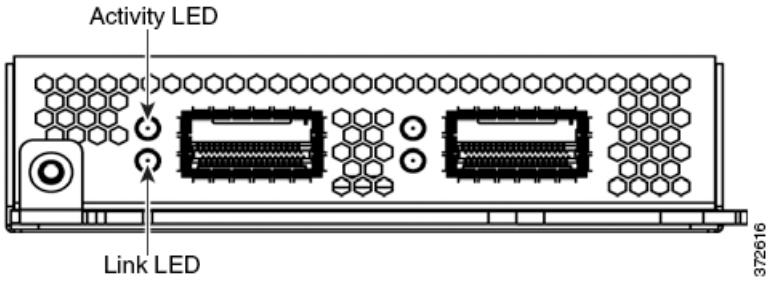
Use the following table to understand the optical parameters of the fiber interfaces.

Table 2-26 10GBASE MMSR and SMLR NetMod Optical Parameters

Parameter	10GBASE MMSR	10GBASE SMLR
Optical connectors	LC duplex	LC duplex
Bit rate	10.000Gbps	10.000Gbps
Baud rate/ encoding/tolerance	10.3125Gbps 64/66b encoding +/- 100 ppm	10.3125Gbps 64/66b encoding +/- 100 ppm
Optical interface	Multimode	Single mode only
Operating distance	840-860 nm (850 nm typical) 85 ft (26 m) to 108 ft (33 m) for 62.5 µm/125 µm fiber (modal BW 160 to 200 respectively) 216 ft (66 m) to 269 ft (82 m) for 50 µm/125 µm fiber (modal BW 400 to 500 respectively) Distances to 980 ft (300 m) are available with higher quality (OM3) fiber. Minimum distances (all): 6ft (2 m)	1270-1355 nm (1310 nm typical) 6 ft to 6.2 miles (2 m to 10 km) for 9 µm/125 µm fiber
Transmitter wavelength	840-860 nm (850 nm typical)	1270-1355 nm (1310 nm typical)
Maximum average launch power	-1 dBm	-0.5 dBm
Minimum average launch power	-7.3 dBm	-8.2 dBm
Maximum average power at receiver	-1 dBm	-0.5 dBm
Receiver sensitivity	-9.9 dBm	-14.4 dBm

Stacking Module

The stacking module contains two connection ports for the 8000 Series stacking cable, and activity and link LEDs.



You can use the stacking module optionally in the following 8000 Series models:

- Firepower 8140 and 8250
- Firepower and AMP 8350

The stacking module is included in the following 8000 Series stacked configurations:

- Firepower 8260, 8270, and 8290
- Firepower and AMP 8360, 8370, and 8390

You can use the following table to understand the stacking LEDs.

Table 2-27 Stacking LEDs

Status	Description
Top	Indicates activity on the interface: • A blinking light indicates there is activity on the interface. • No light indicates there is no activity.
Bottom	Indicates whether the interface has link: • A light indicates the interface has link. • No light indicates there is no link.