Cisco Provider Connectivity Assurance Sensor GT Hardware Installation Guide

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Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

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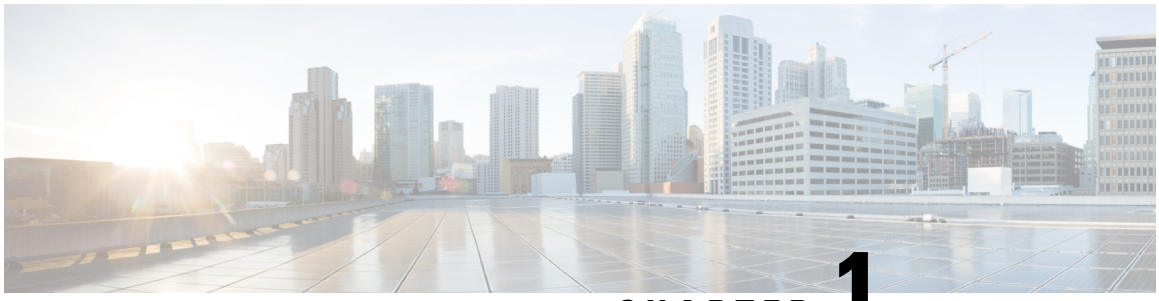

CHAPTER 1

Overview

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Features

The Cisco Provider Connectivity Assurance Sensor GT (formerly Skylight element: GT) is a GbE platform with a feature set for high capacity MEF User Network Interface (UNI) and External Network-to-Network Interfaces (ENNI)—it supports a variety of mobile backhaul and business services applications.

It can provide centralized coverage for all locations throughout the network, providing end-to-end performance assurance and visibility with advanced functionality for aggregation and critical enterprise locations, the Cisco Provider Connectivity Assurance Sensor GT fits into MSC, co-location hand-offs and demanding 1G business customer sites, assuring QoS without impacting it in any way.

Figure 1: Cisco Provider Connectivity Assurance Sensor GT

The following table lists the features of the Cisco Provider Connectivity Assurance Sensor GT.

Table 1: Cisco Provider Connectivity Assurance Sensor GT Features

Feature	Description
Form factor	1RU
Rack mount	Standard 19-inch (48.3 cm) or 23-in (58.42 cm) rack
Airflow	Front to rear
Management port	Built-in One RJ-45 connector (10/100BASE-T)
Traffic ports	GT: two fixed SFP connectors, four fixed RJ-45 connectors GT-S: two fixed SFP connectors
Serial console port	One RJ-45 serial connector (RS-232 or two dry contacts)
Fans	Two fans for front-to-rear cooling

The following table lists the regulation and standard compliance features of the Cisco Provider Connectivity Assurance Sensor GT.

Table 2: Regulation and Standard Compliance (Model: NID4)

Feature	Description
Safety	IEC 62368-1, EN IEC 62368-1, AS/NZS 62368.1, CSA/UL 62368-1, GB 4943.1, J62368-1, SASO-IEC 62368-1

Feature	Description
EMC - Emission (Class A)	CISPR 32, IEC 61000-3-2, IEC 61000-3-3, EN 55032, EN 61000-3-2, EN 61000-3-3, FCC Part 15 (CFR 47), ICES-003, AS/NZS CISPR 32, VCCI-CISPR 32, KS C 9832
EMC - Immunity	CISPR 35, EN 55035, KS C 9835
EMC - Radio	ETSI EN 301 489-19
Telco	NEBS Level-3: GR-63, GR-1089
RoHS	IEC 63000, EN IEC 63000

Package Contents

Package contents for the Cisco Provider Connectivity Assurance Sensor GT include the following:

- Assurance Sensor GT (1)
- Rubber feet (4)
- *Cisco Provider Connectivity Assurance Sensor GT*

  This document contains URLs that point to the hardware installation guide, regulatory compliance and safety information guide, warranty, and licensing pages, and a QR code that points to the management center Documentation Portal.

Note The package can contain other ordering options. See the Ordering Guide for more details.

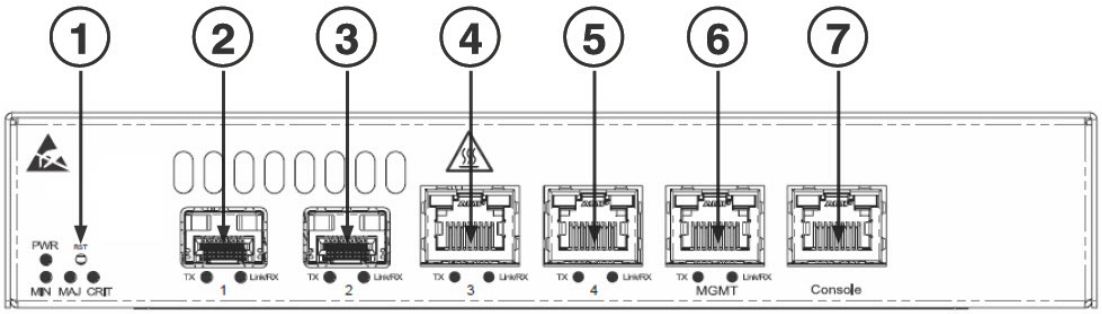
Serial Number Locations

The Serial Number (SN) and the Media Access Control (MAC) address are located at the bottom of the Cisco Provider Connectivity Assurance Sensor GT.

Front Panel

The following figure shows the front panel features of the Cisco Provider Connectivity Assurance Sensor GT. See Front Panel LEDs, on page 6 for a description of the LEDs.

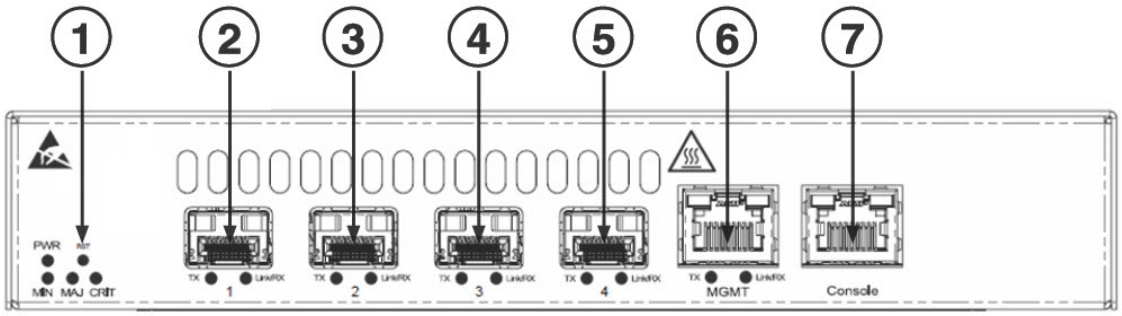
Figure 2: Font Panel - 2 SFP and 4 RJ-45 (GT)



1	RST System reset button **Note** Press the RST button for more than five seconds to reset the unit to factory defaults. **Warning** Service-affecting	**2**	Traffic port 1 SFP connector (10/100/1000BASE-X)
3	Traffic port 2 SFP connector (10/100/1000BASE-X)	**4**	Traffic port 3 RJ-45 connector (10/100/1000BASE-T)
5	Traffic port 4 RJ-45 connector (10/100/1000BASE-T)	**6**	Management port RJ-45 connector (10/100BASE-T)
7	Console / dry contacts RJ-45 connector (RS-232 or two dry contacts) See *Dry-contact Inputs* for information. **Note** Cannot be used at the same time. **Caution** The Dry Contacts Interface is strictly Safety Extra Low Voltage (SELV).		—

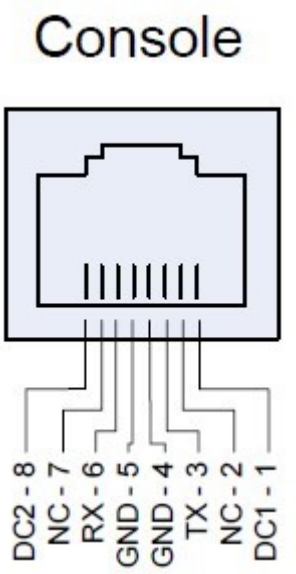
The following figure shows the front panel features of the Cisco Provider Connectivity Assurance Sensor GT-S. See Front Panel LEDs, on page 6 for a description of the LEDs.

Figure 3: Font Panel - 4 SFP and 2 RJ-45 (GT-S)



1	RST System reset button **Note** Press the RST button for more than five seconds to reset the unit to factory defaults. **Warning** Service-affecting	**2**	Traffic port 1 SFP connector (10/100/1000BASE-X)
3	Traffic port 2 SFP connector (10/100/1000BASE-X)	**4**	Traffic port 3 SFP connector (10/100/1000BASE-X)
5	Traffic port 4 SFP connector (10/100/1000BASE-X)	**6**	Management port RJ-45 connector (10/100BASE-T)
7	Console / dry contacts RJ-45 connector (RS-232 or two dry contacts) See *Dry-contact Inputs* for information. **Note** Cannot be used at the same time. **Caution** The Dry Contacts Interface is strictly Safety Extra Low Voltage (SELV).		—

Figure 4: Dry-contact Inputs

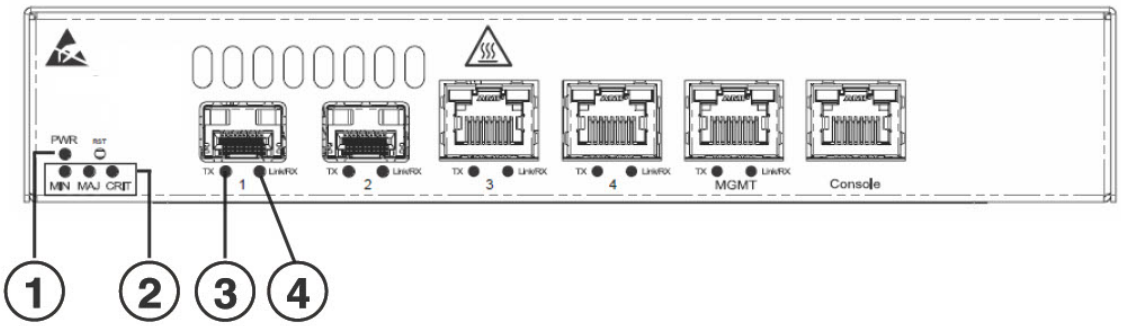


1	Dry contact 1	**2**	Not connected
3	TX data	**4**	Ground
5	Ground	**6**	RX data
7	Not connected	**8**	Dry contact 2

Front Panel LEDs

The following figure shows the front panel LEDs and describes their states.

Figure 5: Front Panel LEDs and Their States



1	PWR LED • Off—The device is unpowered. • Green—The device is powered.	**2**	MIN MAJ CRIT LEDs • MIN Yellow—A minor alarm condition is present. • MAJ Red—A major alarm condition is present. • CRIT Red—A critical alarm condition is present.
3	TX LED • Off—The port is not transmitting data. • Green, flashing—The port is transmitting data.	**4**	Link/RX LED • Off—The link is inactive. • Green—The link is active. • Green, flashing—The port is receiving data.

Rear Panel

The Cisco Provider Connectivity Assurance Sensor GT can be ordered in these rear panel configurations:

- Single AC Power
- Dual AC Power
- DC Power

The following figure shows the rear panel of the Cisco Provider Connectivity Assurance Sensor GT.

Figure 6: Single AC Power

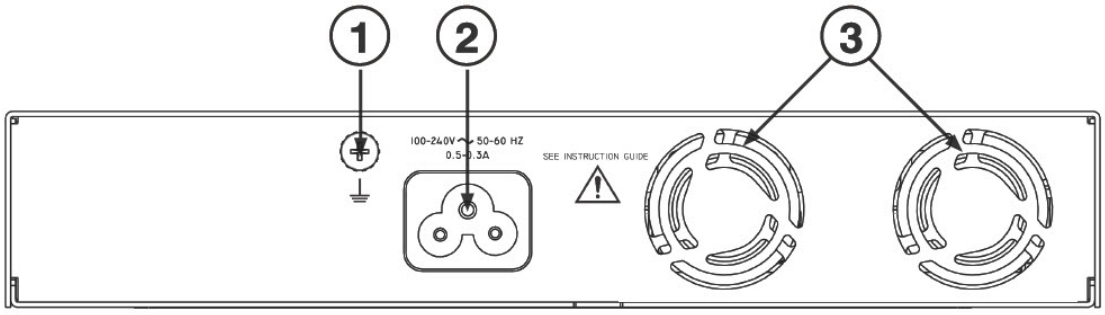


Figure 7: Dual AC Power

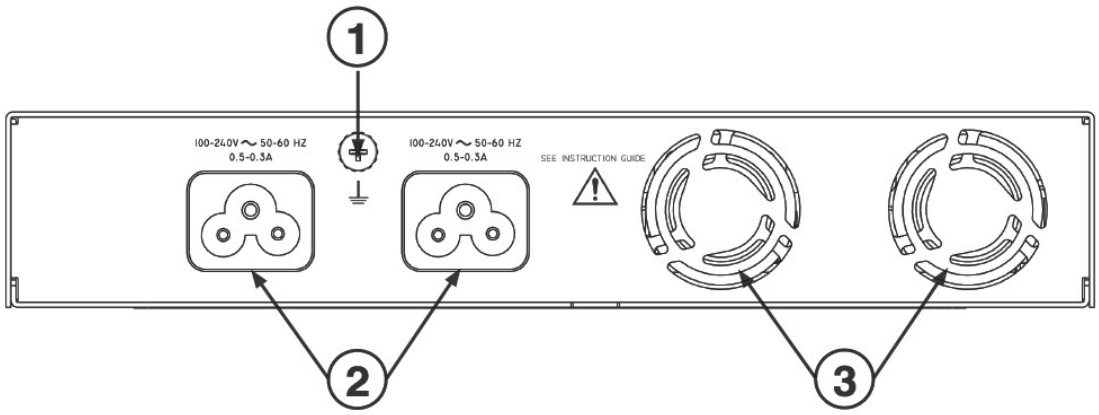
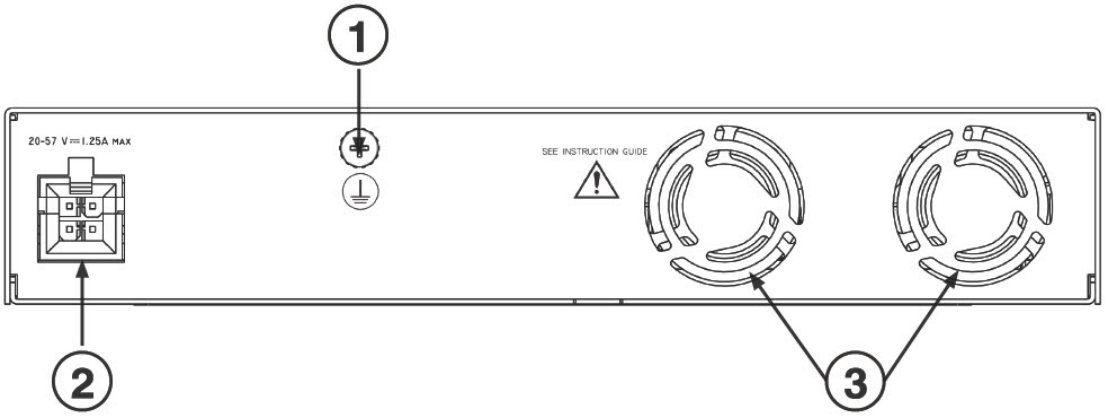


Figure 8: DC Power



1	Ground lug Unit protective or functional ground point	**2**	Power input(s) AC (single or dual) or DC (dual feeds)
3	System fans Airflow outtake		—

Power Supply

The following table lists the specifications for each power supply used in the Cisco Provider Connectivity Assurance Sensor GT.

Table 3: Power Supply Specifications

Description	Specification
Input power ratings	AC: 100 to 240 V AC, 50 to 60 Hz, 0.5 to 0.3 A_{Max} DC: 20 to 57 V DC, 1.25 A_{Max}
Output power ratings	SFP: 1.5 W_{Max} per port, up to 5 $W_{(Max)}$ total for all the ports
Power consumption	22 W_{Max} (75 BTU/hr_{Max})

Hardware Specifications

The following table contains hardware specifications for the Cisco Provider Connectivity Assurance Sensor GT.

Dimensions (H x W x D)	1.5 x 7.9 x 6.8 inches (3.8 x 20.0 x 17.2 cm)
Weight	3 lb (1.35 kg)
Temperature	Operating: • Commercial: 32 to 122°F (0 to 50°C) • Hardened: -40 to 149°F (-40 to 65°C) Storage: -40 to 158°F (-40 to 70°C)
Humidity	Operating: 5 to 85% RH, noncondensing Storage: 5 to 95% RH, noncondensing
Altitude	Maximum: 6600 ft (2000 m), above sea level

Product ID Numbers

The following table lists the field-replaceable PIDs associated with the Cisco Provider Connectivity Assurance Sensor GT. If any internal components fail, you must get a return material authorization (RMA). See the Cisco Returns Portal for more information.

Table 4: Cisco Provider Connectivity Assurance Sensor GT PIDs

PID	Description
SKY-GT-A	2xRJ-45 + 2xSFP - Single Internal AC Power Supply
SKY-GT-AA	2xRJ-45 + 2xSFP - Dual Internal AC Power Supply
SKY-GT-H-DD	2xRJ-45 + 2xSFP - Dual DC Power Supply - Hardened

PID	Description
SKY-GTS-A	4xSFP - Single Internal AC Power Supply
SKY-GTS-AA	4xSFP - Dual Internal AC Power Supply
SKY-GTS-H-DD	4xSFP - Dual DC Power Supply - Hardened

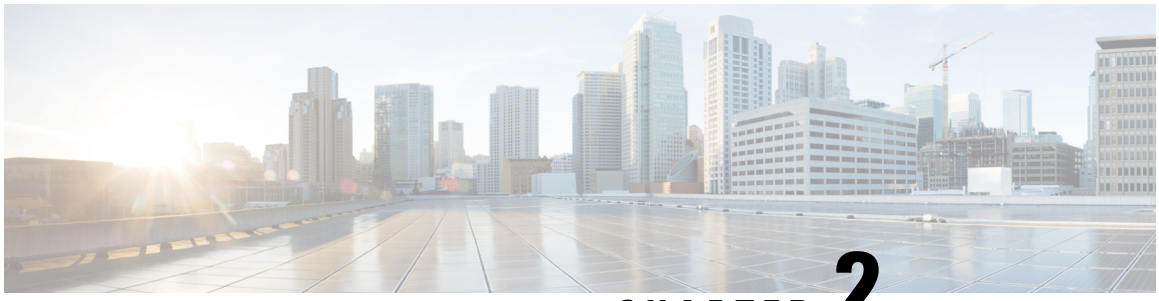
Power Cord Specifications

Each AC power input requires a separate power cord. Power cords are available for connection to the Cisco Provider Connectivity Assurance Sensor GT.

If you do not order the optional power cord with the system, you are responsible for selecting the appropriate power cord for the product. Using a incompatible power cord with this product may result in electrical safety hazard.

PID	Description
SKY-PC-NA	North America - C5 termination
SKY-PC-EUR	Europe – C5 termination
SKY-PC-UK	United Kingdom – C5 termination
SKY-PC-JPN	Japan – C5 termination
SKY-PC-IND	India – C5 termination
SKY-PC-SIN	Singapore – C5 termination
SKY-PC-AUS	Australia / New Zeland – C5 termination
SKY-PC-SWI	Switzerland – C5 termination
SKY-PC-ITA	Italy – C5 termination
SKY-PC-ISL	Israel – C5 termination
SKY-PC-TWN	Taiwan – C5 termination
SKY-PC-ARG	Argentina – C5 termination
SKY-PC-BRZ	Brazil – C5 termination
SKY-PC-C20	C20 – C5 termination
SKY-PC-C14	C14 – C5 termination
SKY-PC-CHN	China – C5 termination

Note Only the approved power cords for the Cisco Provider Connectivity Assurance Sensor GT are supported.



CHAPTER 2

Installation Preparation

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- Maintain Safety with Electricity, on page 15
- Prevent ESD Damage, on page 15
- Power Supply Considerations, on page 15
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- Site Environment, on page 17

Installation Warnings

Read the Regulatory Compliance and Safety Information document before installing the Cisco Provider Connectivity Assurance Sensor GT.

Caution Do *not* open the appliance except under direction from TAC.

Take note of the following warnings:

Warning

Statement 1071—Warning Definition

IMPORTANT SAFETY INSTRUCTIONS

Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Read the installation instructions before using, installing, or connecting the system to the power source. Use the statement number at the beginning of each warning statement to locate its translation in the translated safety warnings for this device.

SAVE THESE INSTRUCTIONS

Note **Statement 407—**Japanese Safety Instruction

You are strongly advised to read the safety instruction before using the product.

https://www.cisco.com/web/JP/techdoc/pldoc/pldoc.html

When installing the product, use the provided or designated connection cables/power cables/AC adapters.

〈製品仕様における安全上の注意〉
www.cisco.com/web/JP/techdoc/index.html

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Warning **Statement 1005**—Circuit Breaker

This product relies on the building's installation for short-circuit (overcurrent) protection. To reduce risk of electric shock or fire, ensure that the protective device is rated not greater than: AC 20 A/DC 40 A

Warning **Statement 1073—**No User-Serviceable Parts

There are no serviceable parts inside. To avoid risk of electric shock, do not open.

Warning **Statement 1074—**Comply with Local and National Electrical Codes

To reduce risk of electric shock or fire, installation of the equipment must comply with local and national electrical codes.

Warning **Statement 1089—**Instructed and Skilled Person Definitions

An instructed person is someone who has been instructed and trained by a skilled person and takes the necessary precautions when working with equipment.

A skilled person or qualified personnel is someone who has training or experience in the equipment technology and understands potential hazards when working with equipment.

There are no serviceable parts inside. To avoid risk of electric shock, do not open.

Warning **Statement 1091—**Installation by an Instructed Person

Only an instructed person or skilled person should be allowed to install, replace, or service this equipment. See statement 1089 for the definition of an instructed or skilled person.

There are no serviceable parts inside. To avoid risk of electric shock, do not open.

Warning **Statement 9001—**Product Disposal

Ultimate disposal of this product should be handled according to all national laws and regulations.

Maintain Safety with Electricity

Warning Before working on a chassis, be sure the power cord is unplugged.

Read the Regulatory and Compliance Information document before installing the chassis.

Follow these guidelines when working on equipment powered by electricity:

- Do not work alone if potentially hazardous conditions exist anywhere in your work space.
- Never assume that power is disconnected; always check.
- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, frayed power cords, and missing safety grounds.
- Use the chassis within its marked electrical ratings and product usage instructions.
- The chassis is equipped with an AC-input power supply, which is shipped with a three-wire electrical cord with a grounding-type plug that fits into a grounding-type power outlet only. Do not circumvent this safety feature. Equipment grounding should comply with local and national electrical codes.

Prevent ESD Damage

ESD occurs when electronic components are improperly handled, and it can damage equipment and impair electrical circuitry, which can result in intermittent or complete failure of your equipment.

Always follow ESD-prevention procedures when removing and replacing components. Ensure that the chassis is electrically connected to an earth ground. Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the grounding clip to an unpainted surface of the chassis frame to safely ground ESD voltages. To properly guard against ESD damage and shocks, the wrist strap and cord must operate effectively. If no wrist strap is available, ground yourself by touching the metal part of the chassis.

For safety, periodically check the resistance value of the antistatic strap, which should be between one and 10 megohms.

Power Supply Considerations

See Power Supply, on page 8 for more detailed information about the power supply in the chassis.

When installing the chassis, consider the following:

- Check the power at the site before installing the chassis to ensure that it is free of spikes and noise. Install a power conditioner, if necessary, to ensure proper voltages and power levels in the appliance-input voltage.
- Install proper grounding for the site to avoid damage from lightning and power surges.
- The chassis does not have a user-selectable operating range. Refer to the label on the chassis for the correct appliance input-power requirement.
- Several styles of AC-input power supply cords are available for the chassis; make sure that you have the correct style for your site.
- If you are using dual redundant (1+1) power supplies, we recommend that you use independent electrical circuits for each power supply.
- Install an uninterruptible power source for your site, if possible.

Rack Configuration Considerations

See Rack-Mount the Chassis, on page 21 for the procedure for rack-mounting the chassis.

Consider the following when planning a rack configuration:

- Standard 19-inch (48.3 cm) 4-post EIA rack with mounting rails that conform to English universal hole spacing according to section 1 of ANSI/EIA-310-D-1992.
- The rack-mounting posts need to be 2 to 3.5 mm thick to work with the slide rail rack mounting.
- If you are mounting a chassis in an open rack, make sure that the rack frame does not block the intake or exhaust ports.
- If your rack includes closing front and rear doors, the doors must have 65 percent open perforated area evenly distributed from top to bottom to permit adequate airflow.
- Be sure enclosed racks have adequate ventilation. Make sure that the rack is not overly congested as each chassis generates heat. An enclosed rack should have louvered sides and a fan to provide cooling air.
- In an enclosed rack with a ventilation fan in the top, heat generated by equipment near the bottom of the rack can be drawn upward and into the intake ports of the equipment above it in the rack. Ensure that you provide adequate ventilation for equipment at the bottom of the rack.
- Baffles can help to isolate exhaust air from intake air, which also helps to draw cooling air through the chassis. The best placement of the baffles depends on the airflow patterns in the rack. Experiment with different arrangements to position the baffles effectively.

Safety Recommendations

Observe these safety guidelines:

- Keep the area clear and dust free before, during, and after installation.
- Keep tools away from walkways, where you and others might trip over them.

- Do not wear loose clothing or jewelry, such as earrings, bracelets, or chains that could get caught in the chassis.
- Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Never attempt to lift an object that is too heavy for one person.

Site Considerations

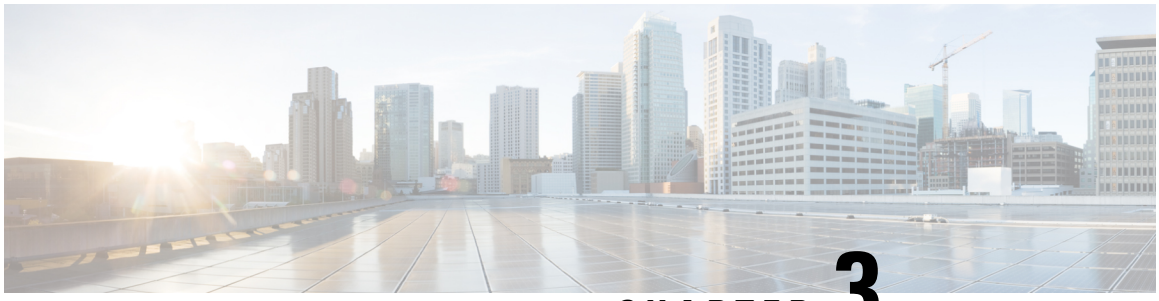
Considering the following helps you plan an acceptable operating environment for the chassis, and avoid environmentally-caused equipment failures.

- Electrical equipment generates heat. Ambient air temperature might not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Make sure that the room in which you operate your system has adequate air circulation.
- Always follow ESD prevention procedures to avoid damage to equipment. Damage from static discharge can cause immediate or intermittent equipment failure.

Site Environment

See Hardware Specifications, on page 9 for information about physical specifications.

To avoid equipment failures and reduce the possibility of environmentally caused shutdowns, plan the site layout and equipment locations carefully. If you are currently experiencing shutdowns or unusually high error rates with your existing equipment, these considerations may help you isolate the cause of failures and prevent future problems.



CHAPTER 3

Mount the Chassis

- Unpack and Inspect the Chassis, on page 19
- Desktop-Mount the Chassis, on page 20
- Wall-Mount the Chassis, on page 20
- Rack-Mount the Chassis, on page 21
- Ground the Chassis, on page 22

Unpack and Inspect the Chassis

Note The chassis is thoroughly inspected before shipment. If any damage occurred during transportation or any items are missing, contact your customer service representative immediately. Keep the shipping container in case you need to send the chassis back due to damage.

See Package Contents, on page 3 for a list of what shipped with the chassis.

Note Mounting kits are ordered separately. See the Ordering Guide for more details.

Warning You must install the unit in a restricted access location in the following cases:

- If you are using a DC power connection and the ambient temperature is more than 50°C.
- If you are using a centralized DC power connection.

Step 1 Remove the chassis from its cardboard container and save all packaging material.

Step 2 Compare the shipment to the equipment list provided by your customer service representative. Verify that you have all items.

Step 3 Check for damage and report any discrepancies or damage to your customer service representative. Have the following information ready:

- Invoice number of shipper (see the packing slip)
- Model and serial number of the damaged unit
- Description of damage
- Effect of damage on the installation

Desktop-Mount the Chassis

Attach the included rubber feet to the bottom of the unit for added stability when placing on a desktop or other flat surface. Ensure that the fan airflow is not blocked by any obstacles.

Caution Do not stack one chassis on top of another chassis. If you stack the units, they overheat, which causes the units to power cycle.

Wall-Mount the Chassis

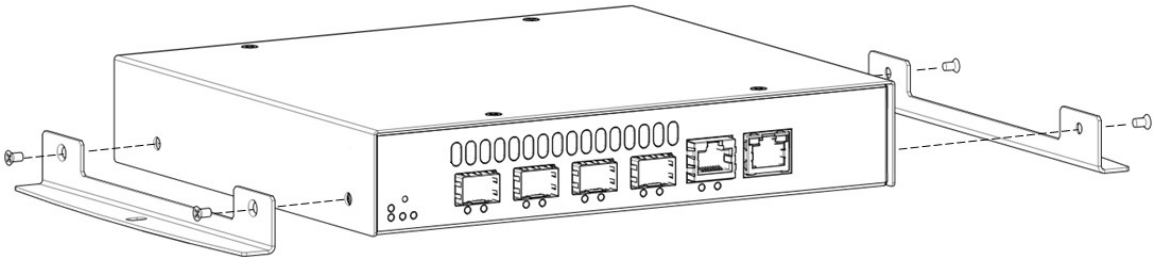
The Adapter Wallmount Kit is required for wallmount installations. When mounting a unit on a wall, ensure that:.

- The surface you attach the unit to and the fasteners you use are able to support at least 6 kg (13.2 lbs).
- Cable pull (accidental or otherwise) does not exceed the 2 kg (4.4 lbs) limit.

Follow these steps to mount your chassis on a wall.

Step 1 Using a Philips screwdriver, align the Adapter Wallmount Kit brackets with the holes on the side of the unit and attach with four flat head screws provided.

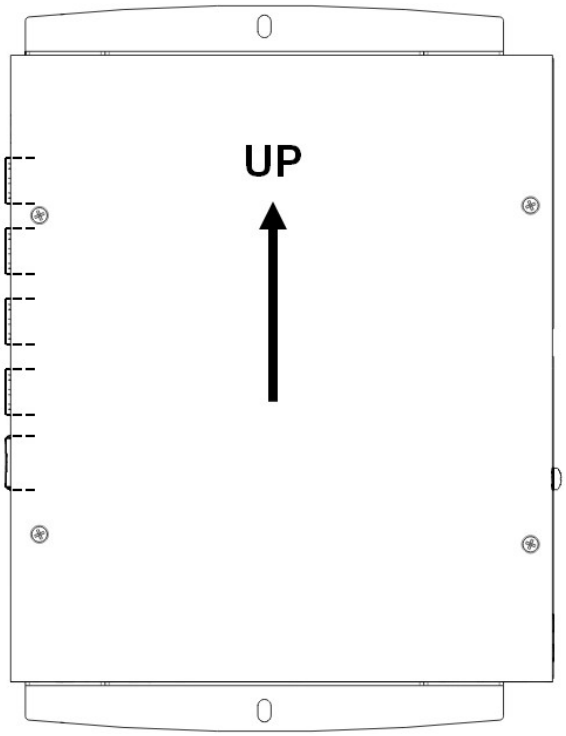
Figure 9: Align and Attach the Adapter Wallmout Kit



Step 2 Secure to the wall using the screws provided.

Warning Ensure to install the unit on the wall in the position shown below to ensure proper ventilation of the unit.

Figure 10: Wall Installation Position



Rack-Mount the Chassis

You can mount the unit in a standard 19-inch or 23-inch rack.

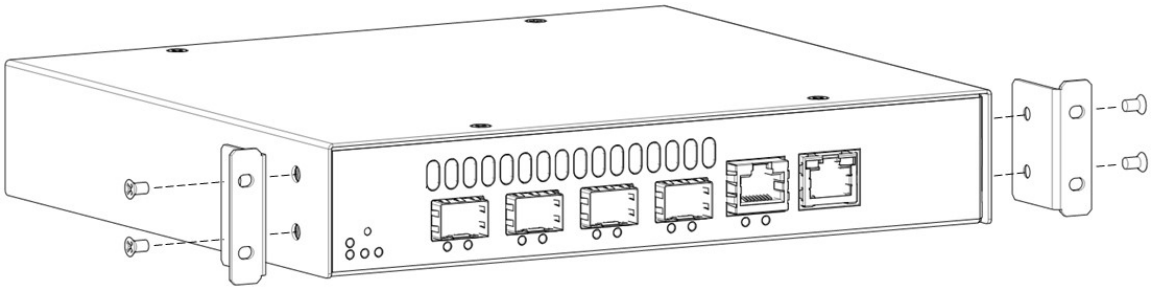
Safety Warnings

Take note of the following warnings:

Warning To conform to the NEBS Seismic Zone 4 requirements, the bracket must be secured, using screws specified by the rack manufacturer, to a NEBS Seismic Zone 4 compliant rack. Such screws are not provided with the bracket kit.

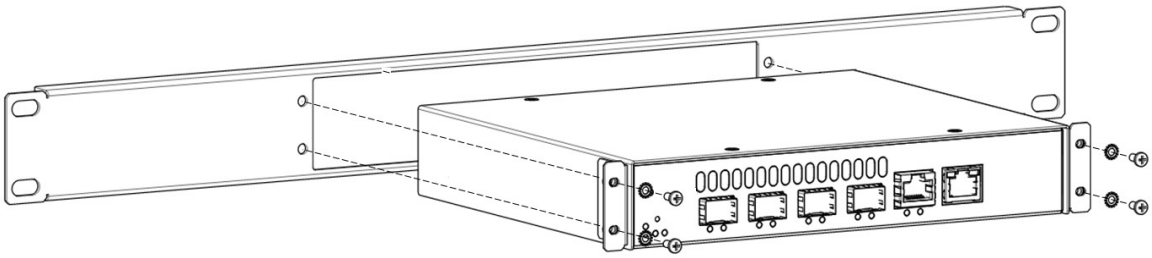
Step 1 Using a Philips screwdriver, align the L-brackets with the holes on the side of the unit and attach with four provided flat head screws.

Figure 11: Align the L-brackets



Step 2 Secure this assembly to the rackmount bracket using four pan head screws provided.

Figure 12: Secure the Assembly



Step 3 Secure to the rack using four pan head screws provided.

Ground the Chassis

Tip This unit is designed for Common Bonding Network (CBN) installations only.

This unit is suitable for installation in network telecommunication facilities and where the National Electrical Code (NEC) applies.

For safety reasons, connect the protective ground lug to a suitable grounding point before applying power, as shown in the following figure.

Safety Warnings

Take note of the following warnings:

Warning **Statement 1101—**Connected To Grounded Outlet

In the Scandinavian countries (Denmark, Finland, Iceland, Norway, and Sweden) the appliance must be connected to a grounded outlet.

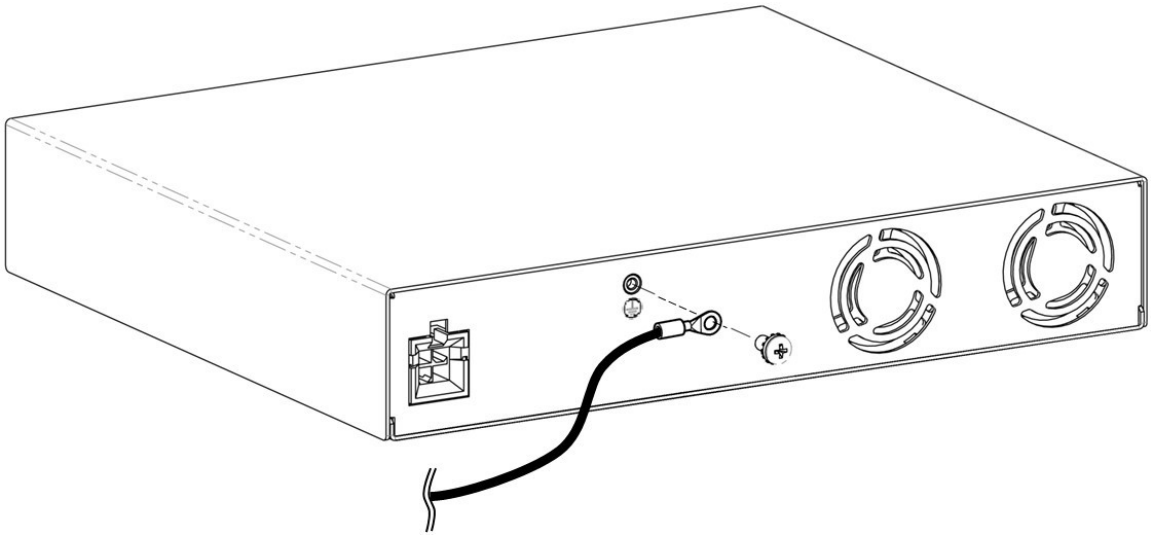
You will need a Phillips #2 screwdriver and a grounding wire with a gauge of 10 to 14 AWG.

Step 1 Expose one end of the grounding wire to approximately 0.75 in. (20 mm).

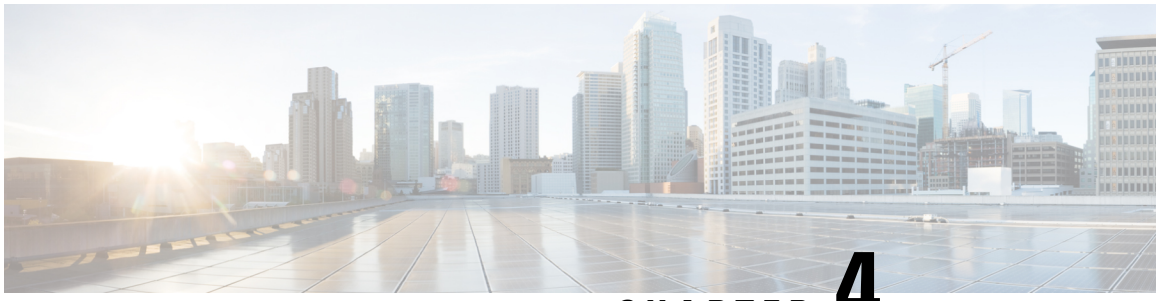
Step 2 Crimp the ground lug around the exposed wire.

Step 3 Use a Phillips #2 screwdriver and the provided screw and washer to fasten the ground lug to the grounding point on the rear side of the unit.

Figure 13: Fasten the Ground Lug



Step 4 Connect the other end of the wire to a grounding point on the rack.



CHAPTER 4

Installation, Maintenance, and Upgrade

- Power the Unit via the AC Power Supply, on page 25
- Power the Unit via DC Power Cable, on page 26
- Power the Unit via DC Terminal Block Adapter, on page 27
- Connect to the Network, on page 28

Power the Unit via the AC Power Supply

Safety Warnings

Take note of the following warning:

Warning Ensure the unit's power source(s) have been turned OFF before servicing.

To power the unit:

Before you begin

- Make sure that the chassis ground is connected on the chassis before you begin installing the AC power supply. See Ground the Chassis, on page 22 for the procedure.

Note Powering Options are ordered separately. See the Ordering Guide for more details.

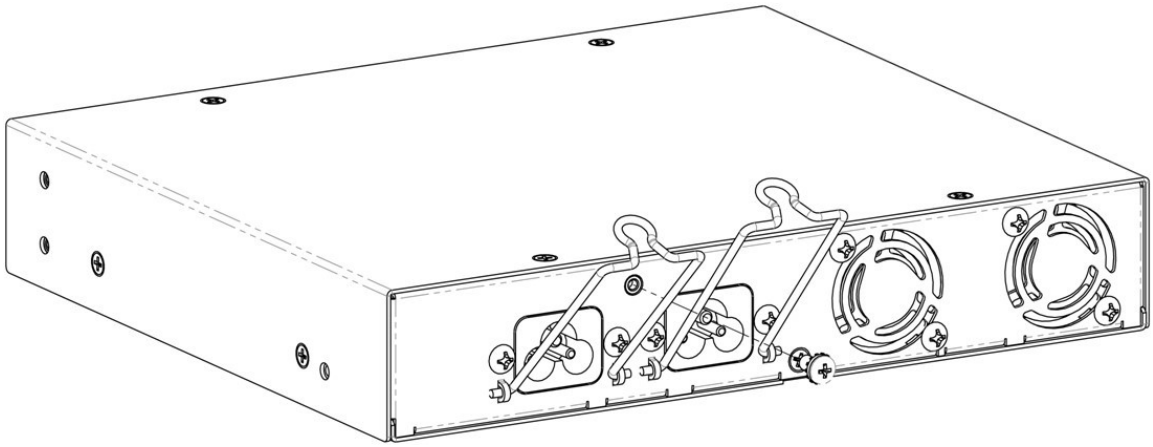
Step 1 Connect the AC plug(s) to the AC appliance coupler.

Step 2 Plug the power cord into a suitable power outlet.

Step 3 Secure the power cord through the retainer clip.

Warning The AC plug must be connected to a properly grounded AC outlet.

Figure 14: Power Cord Retainer Clip



Power the Unit via DC Power Cable

Safety Warnings

Take note of the following warning:

Warning Ensure the unit's power source(s) have been turned OFF before servicing.

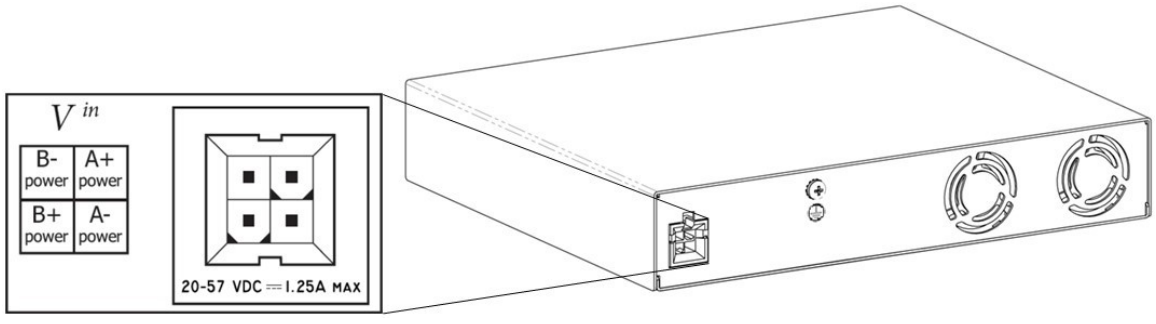
An approved external power supply switch or circuit breaker must be installed in the supply lines and be readily accessible to act as a disconnect device. The switch or circuit breaker must disconnect all poles simultaneously and be rated 5.0A max.

Connect the protective earthing terminal(s) on the power supplie(s) to the same protective earthing point as used to ground the unit.

The DC Battery Return (BR) input terminal(s) of the unit are not connected to the equipment frame or grounding means of the equipment and must be configured as isolated DC Return (DC-I) in compliance with GR-1089-CORE requirements.

For centralized DC power connection, the equipment must be installed in a Restricted Access Location.

Figure 15: DC Power Input



To power the unit via the power cable:

Before you begin

- Make sure that the chassis ground is connected on the chassis before you begin installing the DC power supply. See Ground the Chassis, on page 22 for the procedure.

Note Powering Options are ordered separately. See the Ordering Guide for more details.

Step 1 Establish the proper connections, between the cable end and the power sources.

Step 2 Connect the DC connector to the back of the Module.

Power the Unit via DC Terminal Block Adapter

Safety Warnings

Take note of the following warning:

Warning Ensure the unit's power source(s) have been turned OFF before servicing.

An approved external power supply switch or circuit breaker must be installed in the supply lines and be readily accessible to act as a disconnect device. The switch or circuit breaker must disconnect all poles simultaneously and be rated 5.0A max.

Connect the protective earthing terminal(s) on the power supplie(s) to the same protective earthing point as used to ground the unit.

The DC Battery Return (BR) input terminal(s) of the unit are not connected to the equipment frame or grounding means of the equipment and must be configured as isolated DC Return (DC-I) in compliance with GR-1089-CORE requirements.

For centralized DC power connection, the equipment must be installed in a Restricted Access Location.

In a 1U rackmount bracket installation, it is sometimes preferable to use DC power through directly secured wires as opposed to the DC power adapter.

To power the unit via the terminal block adapter:

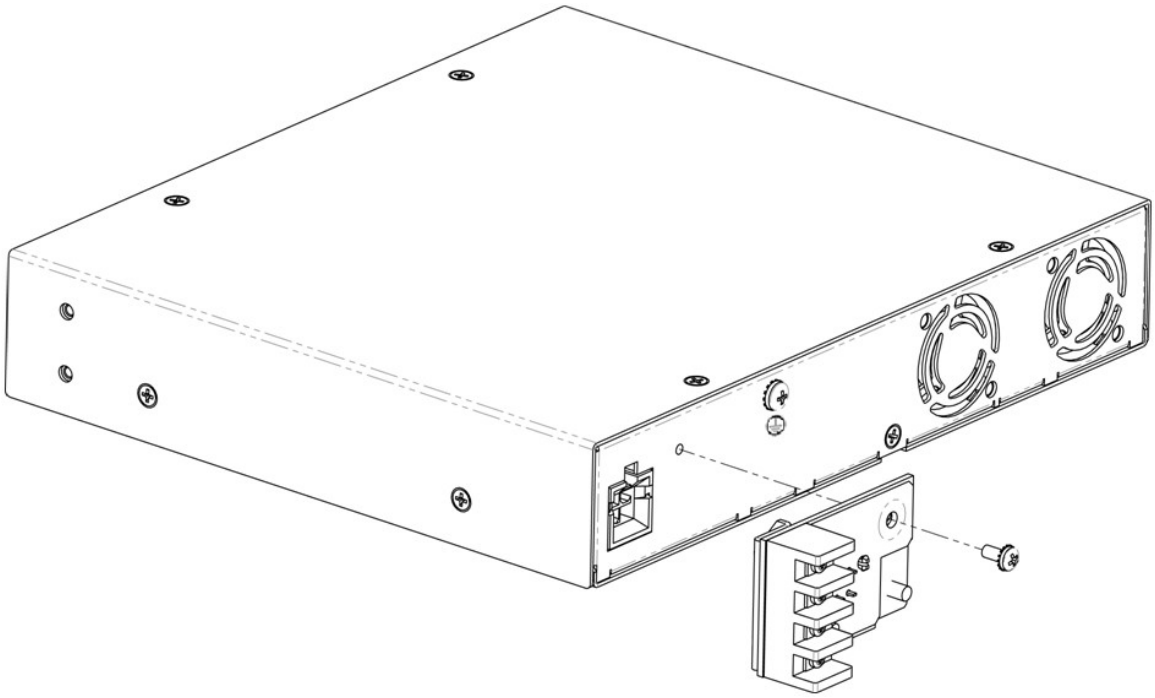
Before you begin

- Make sure that the chassis ground is connected on the chassis before you begin installing the DC power supply. See Ground the Chassis, on page 22 for the procedure.

Note Powering Options are ordered separately. See the Ordering Guide for more details.

Step 1 Fasten the Terminal Block Adapter to the back of the unit.

Figure 16: Fasten the Terminal Block Adapter



Step 2 Connect the two DC inputs to the Terminal Block Adapter.

Connect to the Network

Establish the Ethernet connections to the unit by plugging the appropriate media types to the proper ports of the unit (see the numbered diagram of the Front Panel, on page 3).

Note For more information, refer to the User Material.