Installation Safety and Site Preparation

This document provides information you should be aware of before installing the Cisco 1120 Connected Grid Router, such as safety information, installation recommendations, and site requirements.

These topics are discussed:

Note: To see translated warnings that appear in this publication, see the Regulatory Compliance and Safety Information document that came with the router.

Warning: Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030

Warning: Ultimate disposal of this product should be handled according to all national laws and regulations. Statement 1040

Warning: This unit might have more than one power supply connection. All connections must be removed to de-energize the unit. Statement 1028

Warning: This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: Maximum 15 A, 120 Vac or Maximum 10 A, 230 Vac Statement 1005

Warning: Take care when connecting units to the supply circuit so that wiring is not overloaded. Statement 1018

Warning: Installation of the equipment must comply with local and national electrical codes. Statement 1074

Warning: This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. Statement 1017

Warning: Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place. Statement 1029

Warning: Read the installation instructions before connecting the system to the power source. Statement 1004

Warning: **IMPORTANT SAFETY INSTRUCTIONS. This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.** Statement 1071

SAVE THESE INSTRUCTIONS

Warning: **Hot Surface**

Note: **Power Supply Heatsink may be hot to the touch**

47-25392-01
Rev. A0   DPC

Safety Recommendations

Follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free during and after installation.

- Keep tools and chassis components away from walk areas.

- Do not wear loose clothing that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.

- Wear safety glasses when working under conditions that might be hazardous to your eyes.

- Do not perform any action that creates a hazard to people or makes the equipment unsafe.

Safety with Electricity

Follow these guidelines when working on equipment powered by electricity:

- Locate the emergency power-off switch in the room in which you are working. If an electrical accident occurs, you can quickly turn off the power.

- Disconnect all power before doing the following:

  - Installing or removing a chassis

  - Working near power supplies

- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, frayed power cords, and missing safety grounds.

- Do not work alone if hazardous conditions exist.

- Never assume that power is disconnected from a circuit. Always check.

- Never open the enclosure of the router's internal power supply.

- If an electrical accident occurs, proceed as follows:

  - Use caution; do not become a victim yourself.

  - Turn off power to the device.

  - If possible, send another person to get medical aid. Otherwise, assess the victim's condition and then call for help.

  - Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action.

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

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. It can occur if electronic printed circuit cards are improperly handled and can cause complete or intermittent failures. Always follow ESD prevention procedures when removing and replacing modules:

- Ensure that the router chassis is electrically connected to earth ground.

- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted surface of the chassis frame to channel unwanted ESD voltages safely to ground. To guard against ESD damage and shocks, the wrist strap and cord must operate effectively.

- If no wrist strap is available, touch a metal part of the chassis to discharge any electromagnetic build up.

Caution: For the safety of your equipment, periodically check the resistance value of the antistatic strap. It should be between 1 and 10 megohms (Mohm).

General Site Requirements

This section describes the requirements your site must meet for safe installation and operation of your router. Ensure that the site is properly prepared before beginning installation. If you are experiencing shutdowns or unusually high errors with your existing equipment, this section can also help you isolate the cause of failures and prevent future problems.

Rack Mounting

The router is designed for mounting on a DIN rail, or a wall. Cisco recommends that the router not be rack mounted. However, if you install the router in a rack, follow these guidelines:

- Allow clearance around the rack for maintenance.

- Allow at least one rack unit of vertical space between routers.

- Enclosed racks must have adequate ventilation. Ensure that the rack is not congested, because each router generates heat. An enclosed rack should have louvered sides and a fan to provide cooling air. Heat generated by equipment near the bottom of the rack can be drawn upward into the intake ports of the equipment above.

Router Environmental Requirements

The location of your router and the layout of the substation environment are important considerations for proper router operation. Equipment placed too close together, inadequate ventilation, and inaccessible panels can cause malfunctions and shutdowns, and can make maintenance difficult.

Install the router so that you can access both the module-side and the cable-side panels.

When planning your site layout and equipment locations, refer to the General Site Requirements, page 7. If you are currently experiencing shutdowns or an unusually high number of errors with your existing equipment, these precautions and recommendations may help you isolate the cause of failure and prevent future problems.

- Ensure that the room where your router operates has adequate air circulation. Electrical equipment generates heat. Without adequate air circulation, ambient air temperature may not cool equipment to acceptable operating temperatures.

- Always follow ESD-prevention procedures described in the Preventing Electrostatic Discharge Damage, page 7, to avoid damage to equipment. Damage from static discharge can cause immediate or intermittent equipment failure.

- Ensure that the chassis cover and module cable side panels are secure. All empty module slots and power supply bays must have filler panels installed.

- When equipment installed in a rack (particularly in an enclosed rack) fails, try operating the equipment by itself, if possible. Power off other equipment in the rack (and in adjacent racks) to allow the router under test a maximum of cooling air and clean power.

Power Guidelines and Requirements

Check the power at your site to ensure that you are receiving "clean" power (free of spikes and noise). Install a power conditioner if necessary.

The AC power supply includes the autoselect feature for either 110 V or 220 V operation.

Network Cabling Specifications

The following sections describe the cables needed to install the router:

- Preparing for Network Connections, page 8

- Preparing for Network Connections, page 8

Preparing for Network Connections

When setting up your router, consider distance limitations and potential electromagnetic interference (EMI) as defined by the applicable local and international regulations.

Network connection considerations are provided for several types of network interfaces and are described in the following sections:

- Ethernet Connections, page 8

- Serial Connections, page 9

Ethernet Connections

The IEEE has established Ethernet as standard IEEE 802.3. The router supports the following Ethernet implementations:

- 1000BASE-X—1000 Mb/s full-duplex transmission over a Category 5 or better unshielded twisted-pair (UTP) cable (IEEE 802.3z). Supports the Ethernet maximum length of 328 feet (100 meters).

- 1000BASE-T—1000 Mb/s full-duplex transmission over a Category 5 or better unshielded twisted-pair (UTP) cable (IEEE 802.3ab). Supports the Ethernet maximum length of 328 feet (100 meters).

- 100BASE-TX—100 Mb/s full-duplex transmission over a Category 5 or better unshielded twisted-pair (UTP) cable (IEEE 802.3u). Supports the Ethernet maximum length of 328 feet (100 meters).

Serial Connections

Before you connect a device to a serial port, you need to know the following:

- Type of device, data terminal equipment (DTE) or data communications equipment (DCE)

- Type of connector, male or female, required to connect to the device

- Signaling standard required by the device

These are the most common devices connected to the router serial ports:

Serial Devices	Network Options	Network Protocols	Network Topology
Devices such as RTU or IED with serial asynchronous interface **Note:** No synchronous serial protocol support	CGR 1120 serial interface can connect through DB9 connector devices with RS232 and RS485 asynchronous full-duplex or half-duplex support	- IP over SLIP or PPP asynchronous lines - Raw Socket and SCADA protocol translation (DNP3 to DNP3/IP and IEC 60870-5-101 to IEC 60870-5-104)	Point-to-Point

Connecting

- You must provide or purchase separately the correct serial cable. The cable does not ship with the router. Contact your Cisco reseller to purchase the correct cable from Cisco.

- You can connect a device to this port while the router is operating normally.

- The serial ports are labeled **SER 1/1** and **SER 1/2**.

Related Information

For more information about this port, including supported standards and signaling, see .

Asynchronous Module Baud Rates

Maximum baud rate for asynchronous interfaces is 115.2 kbps.

Required Tools and Equipment for Installation and Maintenance

You need the following tools and equipment to install and upgrade the router and its components:

- ESD-preventive cord and wrist strap

Required Tools and Equipment for Installation and Maintenance

- Number 2 Phillips screwdriver

- Phillips screwdrivers: small, 3/16-in. (4 to 5 mm) and medium, 1/4-in. (6 to 7 mm)

- Screws that fit your rack

In addition, depending on the type of modules you plan to use, you might need the following equipment to connect a port to an external network:

- Cables for connection to the WAN and LAN ports (dependent on configuration).

- Ethernet hub or PC with a network interface card for connection to an Ethernet (LAN) port.

- Console terminal (an ASCII terminal or a PC running HyperTerminal or similar terminal emulation software) configured for 9600 baud, 8 data bits, 1 stop bit, no flow control, and no parity.

- Modem for connection to the auxiliary port for remote administrative access (optional).