Installation Safety and Site Preparation

This section contains safety and site preparation information.

Note: Read this entire section before installing the router.

These topics are discussed:

Safety Recommendations

To ensure general safety, follow these guidelines:

- 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:

- Read all warnings in Safety Warnings, page 4.
- Locate the emergency power-off switch for your installation location. 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 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.

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, ground yourself by touching a metal part of the chassis.

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).

Safety Warnings

This section contains important safety warnings for the installation and use of the router.

Translated versions of all safety warnings are available in the safety warnings document that shipped with your router, and which is available on Cisco.com.

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

Warning: In order to comply with FCC radio frequency (RF) exposure limits, antennas for this product should be located a minimum of 7.9 in. (20 cm) or more from the body of all persons. Statement 332

Warning: Do not operate the unit near unshielded blasting caps or in an explosive environment unless the device has been modified to be especially qualified for such use. Statement 364

Warning: This equipment must be externally grounded using a customer-supplied ground wire before power is applied. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 366

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

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

Warning: This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than 20 A. Statement 1005

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

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.

Pole-Top Installation Requirements

These installation steps (see Installing the Router, page 85) require that the router mounting and installation locations, usually at the top of a power or other utility pole, have the following connections available for basic router installation:

- AC power connection
- Fast Ethernet connection, as described in Ethernet Connections, page 6

Environmental Requirements

The location of your router is an important consideration for proper operation. Equipment placed too close together, inadequate ventilation, and inaccessible panels can cause malfunctions and shutdowns, and can make maintenance difficult. Plan for access to both power supply side and cable side panels of the router.

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.

- Always follow ESD-prevention procedures described in Preventing Electrostatic Discharge Damage, page 4 to avoid damage to equipment. Damage from static discharge can cause immediate or intermittent equipment failure.
- Ensure that the chassis door closes securely and that all empty module slots and have filler panels installed.
- When other equipment is installed on or connected to the router, try operating the router by itself, if possible. Power off other equipment (such as USB devices and installed third-party modules) to allow the router under test a maximum of cooling air and clean power.

FCC Safety Compliance Statements

The FCC, with its action in ET Docket 9608, has adopted a safety standard for human exposure to RF electromagnetic energy emitted by FCC-certified equipment. When used with approved Cisco antennas, Cisco products meet the uncontrolled environmental limits found in OET-65 and ANSI C95.1, 1991. Proper operation of this radio device according to the instructions in this publication results in user exposure substantially below the FCC recommended limits.

1. Two or more modular transmitters with FCC ID: N7NMC8705, only one (1) of which may transmit simultaneously with other transmitters types.
2. Two or more modular transmitters with FCC ID: SK9ITR9002, only one (1) of which may transmit simultaneously with all other transmitters types.
3. Based on the FCC limits and operational parameters of the CGR1240, the CGR can safely be operated without any minimum distance restrictions under normal operational parameters. The FCC limits and analysis utilizes the worst case -i.e. 100% RF transmit duty cycle. Therefore based on normal operational parameters the actual duty cycle calculations the RF exposure is much lower and negligible.

Power Guidelines and Requirements

- Check the power at your site to ensure that you are receiving power that is free of spikes and noise.
- Install a power conditioner if necessary.
- Confirm that the AC input power supply has a 110 VAC nominal, 1.0 A rms or 220 VAC nominal 0.5 A rms output sourcing capability.

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 6
- Serial Connections, page 7

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

For more information about Ethernet connections and cables, see:

- For cable and connector pinouts, see Connector and Cable Specifications, page 195.
- For cabling guidelines, see Installing the Router, page 85.

Serial Connections

RS232 and RS485 serial connections are provided by router serial ports, as described in Router Hardware Description, page 9.

Exterior 10/100BASE-T Fast Ethernet Port

The router exterior Ethernet connector is compliant with Open DeviceNet Vendor Association (ODVA) standards. Cables used with this port must also comply with the ODVA standards. ODVA-compliant cables and connectors meet IP 67 ratings.

Required Tools and Equipment for Installation and Maintenance

These sections list tools and materials that you must supply to perform the following procedures:

- Mounting the Router, page 45
- Installing the Router, page 85
- Opening and Closing the Router Chassis, page 75
- Installing Battery Backup Units (BBUs), page 141
- Installing External Non-Cisco Modules, page 173

See the Cisco Connected Grid modules installation and configuration guides for the tools and equipment you must supply to install modules, at: www.cisco.com/go/cg-modules