



# Safety Information and Preinstallation Tasks

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This chapter describes safety information and procedures that should be performed prior to installation of hardware.

This chapter contains the following major sections:

- [Safety Information, page 1-1](#)
- [Required Equipment, page 1-4](#)
- [Before Installing, page 1-5](#)
- [Performing Fiber Plant Characterization, page 1-7](#)



Note

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Before you install, operate, or service the system, read the *Regulatory Compliance and Safety Information for the Cisco ONS 15500 Series* for important safety information you should know before working with the system.

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For more information on hardware, refer to the *Cisco ONS 15530 Hardware Installation Guide*.

For more information on software, refer to the *Cisco ONS 15530 Configuration Guide* and the *Cisco ONS 15530 Command Reference*.

## Safety Information

This section describes safety considerations for operating the Cisco ONS 15530. This section includes critical safety warnings, precautions, and ESD guidelines.

## Critical Safety Warnings

This section includes warnings that may appear in the Cisco ONS 15530 product documents.

### Wrist Strap Warning



Warning

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During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.

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## Restricted Area Warning



Warning

This unit is intended for installation in restricted access areas. A restricted access area is where access can only be gained by service personnel through the use of a special tool, lock and key, or other means of security, and is controlled by the authority responsible for the location.

## Qualified Personnel Warning



Warning

Only trained and qualified personnel should be allowed to install or replace this equipment.

## Card Handling Warning



Warning

High-performance devices on this card can get hot during operation. To remove the card, hold it by the faceplate and bottom edge. Allow the card to cool before touching any other part of it or before placing it in an antistatic bag.

## Warning Definition



Warning

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. To see translations of the warnings that appear in this publication, refer to the Regulatory Compliance and Safety Information document that accompanied this device.

## Disconnect Device Warning



Warning

A readily accessible disconnect device must be incorporated in the building's installation wiring.

## DC Protection



Warning

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a Listed and Certified fuse or circuit breaker 25A, minimum 60VDC, is used on all current-carrying conductors.

## Laser Radiation Warning



Warning

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.

## General Safety Precautions

General safety precautions are not related to any specific procedures and do not appear elsewhere in this publication. Personnel must understand and apply the following precautions during installation and testing of the Cisco ONS 15530.

- Know standard electrical safety and electrical wiring and connection practices.
- Be familiar with cardio-pulmonary resuscitation (CPR). Obtain this information through the appropriate national authority (such as the Red Cross or the local equivalent). This knowledge is imperative for personnel working with or near voltages with levels capable of causing injury or death.

## Recommended Safety Precautions

We recommend the following precautions when working on the Cisco ONS 15530:

- Do not lift an object alone that could be too heavy for one individual.
- Keep your work area tidy and free of obstructing objects at all times.
- Do not wear loose clothing, jewelry, or other items that could be caught in the components during installation or use.
- Use the equipment only in accordance with the electrical power rating.
- Do not work alone if hazardous conditions may exist in your workplace.
- Install the Cisco ONS 15530 components in compliance with the following local and national electrical codes:
  - In the United States: National Fire Protection Association (NFPA) 70; US National Electrical Code
  - In Canada: Canadian Electrical Code, part I, CSA C22.1
  - In other countries: International Electrotechnical Commission (IEC) 364, part 1-7
- Properly ground the equipment.
- Connect only a DC power source that complies with the safety extra-low voltage (SELV) requirements in UL60950, CSA 60950, EN 60950, and IEC60950 to Cisco ONS 15530 DC power supply input.
- Terminate all laser outputs properly before connecting laser inputs.
- Disconnect the input end of an optical fiber jumper cable before disconnecting the output end.
- Handle glass fiber with care. Glass fiber can be broken if mishandled. Using broken fiber can result in permanent equipment damage.
- Protect skin from exposed glass fiber. It can penetrate the skin.
- Limit the number of personnel that have access to lightwave transmission systems. Personnel should be authorized and properly trained if access to laser emissions is required.
- Limit the use of laser test equipment to authorized, trained personnel during installation and service. This precaution includes using optical loss test (OLT) set, optical spectrum analyzer, and optical time domain reflectometer (OTDR) equipment.

- Exclude any unauthorized personnel from the immediate laser radiation area during service and installation when there is a possibility that the system may become energized. Consider the immediate service area to be a temporary laser-controlled area.
- The Cisco ONS 15530 operates in the 1310 to 1550 nm window, which is considered invisible radiation. You cannot see the laser light being emitted by a fiber, a pigtail, or a bulkhead connector. Use appropriate eye protection during fiber-optic system installation or maintenance whenever there is potential for laser radiation exposure, as recommended by the company's health and safety procedures. Observe this precaution whether or not warning labels have been posted.

## Preventing ESD Damage

Electrostatic discharge (ESD) damage occurs when electronic cards or components are mishandled and can result in complete or intermittent failures. Note the following guidelines before you install or service the system:

- Always wear an ESD-preventive wrist or ankle strap when handling electronic components. Connect one end of the strap to an ESD jack or an unpainted metal component on the system (such as a captive installation screw).
- Handle cards by the faceplates and edges only; avoid touching the printed circuit board and connector pins.
- Place any removed component on an antistatic surface or in a static shielding bag.
- Avoid contact between the cards and clothing. The wrist strap only protects the card from ESD voltages on the body; ESD voltages on clothing can still cause damage.

**Note**

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For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megaohms (Mohms).

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## Required Equipment

This section lists the required system equipment, cable, and test equipment.

## System Requirements

The following equipment is assumed to be present and installed:

- Cisco ONS 15530 chassis and external AC power supply if needed
- Processor cards (1 or 2)
- Air Inlet
- Fan Tray

## Cable Requirements

This section lists the optical cable requirements for the Cisco ONS 15530.

The Cisco ONS 15530 chassis requires the following optical cables:

- OADM cabling: MU-to-MU cables
  - OADM module to transponder line card or ITU trunk card
  - OADM module to OSC module
  - OADM module to OADM module
  - OADM module to PB-OE module or WB-VOA module, for trunk signal attenuation or per-band attenuation
- Transponder line card to client cables: medium size cable with SC connectors
  - SM transponder line card: SC to SC SM cable or SC to ST SM cable, 1.0 m or 3.0 m
  - MM transponder line card: SC to SC MM cable or SC to ST MM cable, 1.0 m or 3.0 m
  - Y-cables: Multimode or single mode y cable
- Transponder line card or OSC module to WB-VOA module for per-channel attenuation: MU-to-MU cables
- Trunk cables: MU to SC patch cable or MU to ST patch cable, 1.0 m or 3.0 m

## Test Equipment Requirements

The following test equipment is required:

- Optical spectrum analyzer (OSA) capable of reading wavelengths between 1530 nm and 1563 nm
- Optical power meter (OPM)
- Optical time domain reflectometer (OTDR)
- Hand-held optical power meter
- Data test set (Ethernet packet generator or analyzer, BERT)
- Fiber cleaning kit
- Optical fiber scope
- Cable installation tool

## Before Installing

Before you install the shelf, you must complete the following tasks:

- Unpack and inspect the shelf.
- Maintain a network record.



### Caution

Use extreme care when removing or installing connectors so you do not damage the connector housing or scratch the end-face surface of the fiber. Always install protective covers on unused or disconnected components to prevent contamination. Always clean fiber connectors before installing them.

**Warning**

During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.

## NTP-1 Unpacking and Inspecting the Shelf

<b>Purpose</b>	This procedure describes how to unpack and inspect the Cisco ONS 15530 and verify the contents.
<b>Tools/Equipment</b>	None
<b>Prerequisite Procedures</b>	None
<b>Required/As Needed</b>	Required
<b>Onsite/Remote</b>	Onsite
<b>Security Level</b>	None

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- Step 1** Take inventory. Compare the equipment inside with the packing slip and the equipment list provided by customer service. If there are any discrepancies, notify the Customer Service Center.
- Step 2** Check for external damage. Visually check all components and immediately report any shipping damage to your customer service representative. Have the following information ready:
- Invoice number of shipper (see packing slip)
  - Model and serial number of the damaged unit
  - Description of damage
  - Effect of damage on the installation
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## Cleaning the Shelf

Be careful with the airflow system when you clean the chassis. If the cleaning process must be done while the system is running, be aware that the airflow system is in operation. Clean the chassis with a damp cloth only and be careful of the following:

- Do not touch the airflow system while fans are operating.
- Do not use wet tissues for cleaning the chassis.
- Do not use any harsh or abrasive cleaning agents.

**Warning**

Invisible laser radiation might be emitted from the end of the fiber or connector. Do not stare into the beam or view directly with optical instruments.

When installing your optical connectors, consider the following issues:

- Dirty optical connectors are a common source of light loss. Keep the connectors clean at all times and keep the dust cover installed when not in use.

- Before installing any type of cable or connector, use a lint-free alcohol pad from a cleaning kit to clean the ferrule, the protective white tube around the fiber, and the end-face surface of the fiber.
- As a general rule, whenever there is a significant, unexplained loss of light, clean the connectors.

**Caution**

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Use extreme care when removing or installing connectors so you do not damage the connector housing or scratch the end-face surface of the fiber. Always install filler modules on unused or disconnected components to prevent contamination. Always clean fiber connectors before installing them.

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Use a swab saturated with isopropyl alcohol to clean the end-surfaces. Use dry, oil-free compressed air after applying the isopropyl alcohol.

## Performing Fiber Plant Characterization

To verify fiber characteristics to qualify the fiber in the network, proper testing is required.

The test measurement results must be documented and will be referred to during acceptance testing of a network, as described in this guide.

This test measurement data can also be used to determine whether your network can support higher bandwidth services such as OC-192, and can help determine network requirements for dispersion compensator modules or amplifiers.

Fiber-optic testing procedures must be performed to measure the following parameters:

- Link loss (attenuation)
- Optical return loss (ORL)
- Polarization mode dispersion (PMD)
- Chromatic dispersion
- Fiber length

For more information on fiber plant characterization, refer to the *Cisco ONS 15530 Planning Guide*.

