



Connecting the Cisco ONS 15540

The Cisco ONS 15540 uses SC and MU connectors on the faceplates of the modules. Fiber optic cables are routed to the cable management guides that are at the top and bottom of the shelf. The Cisco ONS 15540 is powered using -48 VDC power. Positive and negative power terminals are accessible on the backplane.

You can mount the Cisco ONS 15540 in a 19-inch rack. The shelf assembly weighs approximately 153 pounds with all motherboards and modules installed and features a fan tray module for cooling and fiber-management space.

This chapter describes how to connect the Cisco ONS 15540 to the network and contains the following sections:

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Note

For power supply cable and alarm cable connecting information, see the [“Powering Up the Shelf”](#) section on page 2-29.

**Note**

To ensure that your hardware is supported by your release of Cisco IOS software, see the [“New and Changed Information” section on page xii](#). Also refer to the “Hardware Supported” section of the latest release notes for the Cisco ONS 15540 ESP.

Preparing for Network Connections

When preparing your site for network connections to the Cisco ONS 15540 shelf, consider the following for each type of interface:

- Cabling required for each type
- Distance limitations for each signal type
- Additional interface equipment needed

Before installing the component, have all additional external equipment and cables on hand.

Cleaning the Shelf and Connectors

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

Fiber optic connectors are used to connect two fibers together. When these connectors are used in a communication system, proper connection becomes a critical factor. Fiber optic cable connectors can be damaged by improper cleaning and connection procedures. Dirty or damaged fiber optic connectors can result in not repeatable or inaccurate communication.

Fiber optic connectors differ from electrical or microwave connectors. In a fiber optic system, light is transmitted through an extremely small fiber core. Because fiber cores are often 62.5 microns or less in diameter, and dust particles range from a tenth of a micron to several microns in diameter, dust and any contamination at the end of the fiber core can degrade the performance of the connector interface where the two cores meet. Therefore, the connector must be precisely aligned and the connector interface must be absolutely free of trapped foreign material.

Connector, or insertion, loss is a critical performance characteristic of a fiber optic connector. Return loss is also an important factor. It specifies the amount of reflected light; the lower the reflection the better the connection. The best physical contact connectors have return losses better than -40 dB, although -20 to -30 dB is more common.

**Note**

MU terminators are shipped with the system. These are used to terminate the pass through ports of the OADM that are not used. For instance, the pass through in must be terminated if it is unused, otherwise the return loss at Trunk IN will be unacceptably high.

The connection quality depends on two factors: the type of connector and the proper cleaning and connection techniques. Dirty fiber 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.

When cleaning fiber components, procedures must be followed precisely and carefully with the goal of eliminating any dust or contamination. A clean component connects properly; a dirty component may transfer contamination to the connector, or it may even damage the optical contacts. Inspecting, cleaning, and re-inspecting are critical steps that must be done before making any fiber connection.

As a general rule, whenever there is a significant, unexplained loss of light, clean the connectors.

**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 filler modules on unused or disconnected components to prevent contamination. Always clean fiber connectors before installing them.

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

To clean the optical connectors, follow these steps:

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- Step 1** Wipe the ferrules and end-face surfaces of the connector gently with an alcohol pad from the cleaning kit. Be sure that the pad makes full contact with the end-face surfaces. Wait five seconds for the surfaces to dry and repeat.
- Step 2** Blow dry the connectors with canned, dry, oil-free, compressed air.
- Step 3** Use a magnifying glass to inspect the ferrule.
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The connectors used inside the system have been cleaned by the manufacturer and connected to the adapters in the proper manner. The operation of the system should be error free if the customer provides clean connectors on the application side, follows the previous directions, and ensures the following:

- Clean the connectors using lens tissues before connecting to the adapters. Use pure alcohol to remove soil.
- Do not clean the inside of the connector adapters.
- Do not use force or quick movements when connecting the fiber optic connectors in the adapters.
- Cover the connector adapters to avoid soiling or contaminating the inside of the adapters while cleaning the chassis.
- Cover the connectors and adapters to avoid the inside of the adapters or the surface of the connectors from getting dirty when not using the connectors.

**Note**

If the surface is not clean or does not have a uniform shine, repeat the process using a fresh surface of the alcohol pad.

Connecting the Processor Card to a Network

Before connecting the processor card to a network, consider the following types of cable required for each interface:

- Straight-through EIA/TIA for the DB-25 console port
- Aux port cable that ships with the shelf for the auxiliary port
- Straight-through RJ-45 for the NME port



Note The ASE port is not functional.

Connecting the Console Port

The console port is a female, DCE (data communications equipment), DB-25 receptacle used for connection to a console terminal or modem.

To connect cables to the console port, follow these steps:

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- Step 1** Place the DB-25 connector in front of the console port on the processor card faceplate.
 - Step 2** Align the male DB-25 connector with the female console port.
 - Step 3** Gently push the DB-25 connector into the console port and secure it into place by tightening the side screws on the DB-25 connector.
 - Step 4** Route the cable up into the cable management tray on the top of the shelf.
 - Step 5** Route the fiber cables from the cable management tray out of the right side of the shelf assembly through cutout holes from the cable management tray.
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Connecting the Auxiliary Port

The auxiliary port supports hardware flow control and modem control and uses the aux port cable that is shipped with the Cisco ONS 15540.

To connect cables to the auxiliary port, follow these steps:

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- Step 1** Place the aux port cable connector in front of the auxiliary port on the processor card faceplate.
 - Step 2** Align the keyed ridge of the cable connector with the receiving slot on the faceplate connection point.
 - Step 3** Gently push the cable connector into the faceplate connection point until the connector snaps into place.
 - Step 4** Route the cable up into the cable management tray on the top of the shelf.
 - Step 5** Route the fiber cables from the cable management tray out of the right side of the shelf assembly through cutout holes from the cable management tray.
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Connecting the NME Port

The NME (network management Ethernet) port uses a straight-through RJ-45 cable connector.

To connect cables to the NME port, follow these steps:

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- Step 1** Place the RJ-45 connector in front of the NME port on the processor card.
 - Step 2** Align the keyed ridge of the cable connector with the receiving slot on the processor card connection point.
 - Step 3** Gently push the RJ-45 cable connector into the faceplate connection point until the connector snaps into place.
 - Step 4** Route the cable up into the cable management tray on the top of the shelf.
 - Step 5** Route the fiber cables from the cable management tray out of the right side of the shelf assembly through cutout holes from the cable management tray.
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Connecting Mux/Demux Modules

The Cisco ONS 15540 fiber optic mux/demux modules use MU connectors. To install fiber optic cables in the Cisco ONS 15540, a fiber cable with the corresponding connector type must be connected to the transmit and receive ports on the modules. On Cisco ONS 15540 optical ports, the top connector is Transmit and the bottom connector is Receive. Cisco recommends that the transmit and receive and the working and protection fibers be labeled at each end of the fiber span to avoid confusion with cables that are similar in appearance.



Caution

Follow all directions and warning labels when working with optical fibers. To prevent eye damage, never look directly into a fiber or connector.

To attach and route fiber optic cables to the mux/demux modules, follow these steps:

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- Step 1** Place the MU connector in front of the connection point on the mux/demux faceplate. Each mux/demux module supports at least one transmit and one receive connector to create an optical carrier port.
 - Step 2** Align the keyed ridge of the cable connector with the receiving slot on the faceplate connection point.
 - Step 3** Gently push the cable connector into the faceplate connection point until the connector snaps into place.
 - Step 4** Route the fiber cables through the cable retaining clips on the optical card faceplate into the cable management tray on the bottom of the shelf assembly.
 - Step 5** Route the fiber cables from the cable management tray out of the right side of the shelf assembly through cutout holes from the cable management tray.
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Note

Clean all fiber connectors thoroughly. Dust particles can degrade performance. Put caps on any fiber connectors that are not used.

Connecting Transponder Modules

The Cisco ONS 15540 fiber optic transponder modules use three types of connectors. SM and MM transponders use SC connectors. Type 2 extended range transponders with MT-RJ connector transceivers use MT-RJ connector cables. Type 2 extended range transponders with LC connectors use LC connector cables. To install fiber optic cables in the Cisco ONS 15540, a fiber cable with the corresponding connector type must be connected to the transmit and receive ports on the modules. On Cisco ONS 15540 optical ports, the top connector is Transmit and the bottom connector is Receive. We recommend that the transmit and receive and the working and protection fibers be labeled at each end of the fiber span to avoid confusion with cables that are similar in appearance.

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- Step 1** Place the SC connector in front of the connection point on the transponder module faceplate. Each transponder module supports at least one transmit and one receive connector to create an optical carrier port.
 - Step 2** Align the keyed ridge of the cable connector with the receiving slot on the faceplate connection point.
 - Step 3** Gently push the cable connector into the faceplate connection point until the connector snaps into place.
 - Step 4** Route fiber cables through the cable retaining clips on the optical card faceplate into the cable management tray on the bottom of the shelf assembly.
 - Step 5** Route the fiber cables from the cable management tray out of the right side of the shelf assembly through cutout holes from the cable management tray.
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