



Connecting the Switch to the Network

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Setting Up the Management Interface

The management port (MGMT ETH) provides out-of-band management, which enables you to use the command-line interface (CLI) to manage the switch by its IP address. This port uses a 10/100/1000 Ethernet connection with an RJ-45 interface.

Before you begin

The switch must be powered on.

Step 1 Connect the RJ-45, UTP cable to the MGMT ETH port on the switch.

Step 2 Connect the other end of the cable to a 10/100/1000 Ethernet port on a network device.

What to do next

You are ready to connect the interface ports on each of the line cards to the network.

Uplink Connections

The switch has an uplink module with 12 or six 40-Gigabit optical ports or four 100-Gigabit optical ports. For a list of transceivers and cables used by this switch for uplink connections, see <http://www.cisco.com/c/en/us/support/interfaces-modules/transceiver-modules/products-device-support-tables-list.html>.

By default, the 40-Gigabit uplink ports operate at 40 Gbps, but you can use the **speed-group 10000** command to change the administrative speed to 10 Gbps. If you change the speed, you must also use a QSFP-to-SFP adapter and a supported SFP+ transceiver in each of the converted SFP+ ports. All of the ports in a group of

ports must operate at the same speed or you will see an error with a "check speed-group config" message. The 12-port uplink module has two port groups (ports 1 through 6 [2/1-6], and ports 7 through 12 [2/7-12], the six-port uplink module has six active ports (ports 1 through 6), and the four-port uplink module has four active ports (ports 1 through 4). To return the administrative speed to 40 Gigabits, use the **no speed-group 10000** command.



Note The M12PQ uplink module ports connected with copper cables do not autonegotiate their speeds so you must set the speed for each port at the connected device by using the **speed 40000** command.



Warning **Statement 1051**—Laser Radiation

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

Downlink Connections

For a listing of the transceivers and cables that the optical downlink ports support, see <http://www.cisco.com/c/en/us/support/interfaces-modules/transceiver-modules/products-device-support-tables-list.html>

For the 10GBASE-T cables, you use RJ-45 connectors on cables that conform to the specifications in the following table.

Table 1: Supported 10GBASE-T Cables

Cable Type	Supported Length
Category 6	180 feet (55 m)
Category 6a	328 feet (100 m)
Category 7	328 feet (100 m)
Category 7a	328 feet (100 m)

Guidelines for Connecting Ports

You can use Quad Small Form-Factor Pluggable Plus (QSFP+) transceivers for uplink connections to other network devices. You can use RJ-45 connectors for downlink connections to other network devices.

For information about the transceivers currently being used with the switch, use the **show inventory all** command.

Prevent damage to the fiber-optic cables that can separate from their cables. Keep the transceivers disconnected from their fiber-optic cables when installing the transceiver in the line card. Before removing such a transceiver from the switch, remove the cable from the transceiver.

To maximize the effectiveness and life of your transceivers and optical cables, do the following:

- Wear an ESD-preventative wrist strap that is connected to an earth ground whenever handling transceivers. The switch is typically grounded during installation and provides an ESD port to which you can connect your wrist strap.
- Do not remove and insert a transceiver more often than is necessary. Repeated removals and insertions can shorten its useful life.
- Keep the transceivers and fiber-optic cables clean and dust free to maintain high signal accuracy and to prevent damage to the connectors. Contamination causes increased attenuation (loss of light), and should be kept below 0.35 dB.
 - Clean these parts before installation to prevent dust from scratching the fiber-optic cable ends.
 - Clean the connectors regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors if they are exposed to dust or accidentally touched. Both wet and dry cleaning techniques can be effective; refer to your site's fiber-optic connection cleaning procedures.
 - Do not touch the ends of connectors. Touching the ends can leave fingerprints and cause other contamination.
- Inspect routinely for dust and damage. If you suspect damage, clean and then inspect fiber ends under a microscope to determine if damage has occurred.
- To minimize the chance of damaging transceivers when installing them, slide them gently into their switch slots. Never force transceivers all the way into the slots. If the transceiver stops part way into the slot, it might be upside down. Remove the transceiver before turning it over and reinstalling it. If positioned correctly, the transceiver slides all the way into the slot and clicks when fully installed.



Warning Statement 1051—Laser Radiation

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Warning Statement 1055—Class 1/1M Laser

Warning – Invisible Laser Radiation. Do not expose users of telescopic optics. Class 1/1M Laser Products.



Warning Statement 1056—Unterminated Fiber Cable

Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not view directly with optical instruments. Viewing the laser output with certain optical instruments (for example, eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard.

Maintaining Transceivers and Optical Cables

Transceivers and fiber-optic cables must be kept clean and dust free to maintain high signal accuracy and prevent damage to the connectors. Contamination increases attenuation (loss of light) and should be below 0.35 dB.

Consider the following maintenance guidelines:

- Transceivers are static sensitive. To prevent ESD damage, wear an ESD-preventative wrist strap that is connected to the grounded chassis.
- Do not remove and insert a transceiver more often than is necessary. Repeated removals and insertions can shorten its useful life.
- Keep all optical connections covered when not in use. Clean them before using to prevent dust from scratching the fiber-optic cable ends.
- Do not touch the ends of connectors. Touching the ends can leave fingerprints and cause other contamination.
- Clean the connectors regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors if they are exposed to dust or accidentally touched. Both wet and dry cleaning techniques can be effective; refer to the fiber-optic connection cleaning procedures for your site.
- Inspect routinely for dust and damage. If you suspect damage, clean and then inspect fiber ends under a microscope to determine if damage has occurred.