Hardware Installation Guide for Cisco Routed XGS-PON ONT

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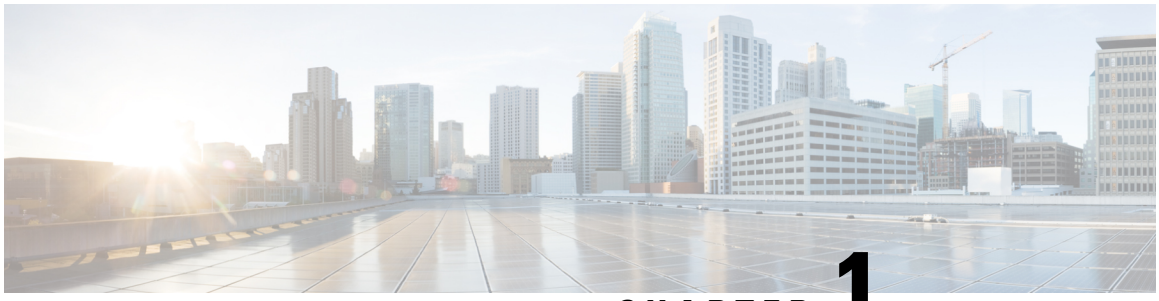


CHAPTER 1

Cisco XGS-PON ONT Overview

This document is intended to direct network technicians and system administrators in the installation of the Cisco XGS-PON Optical Network Terminal (ONT).

Intended audience

This document is intended for network technicians and system administrators who will install the Cisco XGS-PON ONT.

It assumes that the intended users possess basic knowledge of, but not limited to:

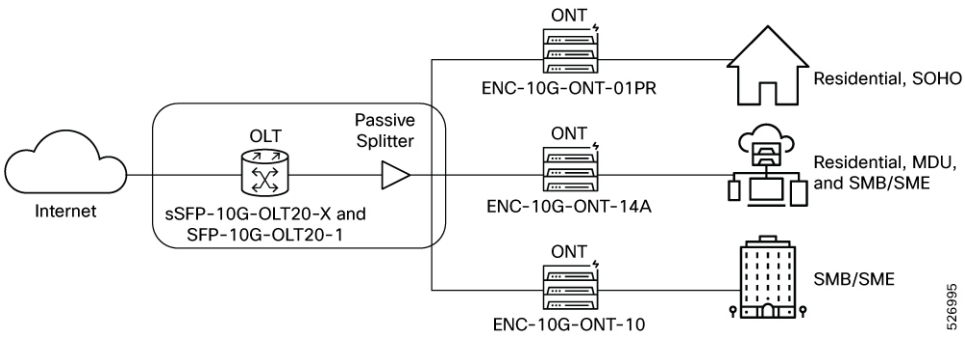
- Proper hardware installation
- Proper hardware diagnostics
- Ethernet concepts
- IEEE standards
- IETF standards
- ITU-T standards
- Open Systems Interconnection (OSI) Seven Layer Model
- Local Area Networks (LANs)
- Virtual Local Area Networks (VLANs)
- Passive Optical Networks (PONs)

- Cisco Routed PON ONT, on page 1

Cisco Routed PON ONT

Cisco 10G Routed PON ONTs are fully compliant with the XGS-PON ITU-T G.9807.1 standard, supporting symmetrical 10-Gbps downstream and upstream optical connectivity via an SC/APC optical connector to meet current and future networking needs. With integrated XGS-PON optics, MAC, and Ethernet switching capabilities, these ONTs help network operators optimize Total Cost of Ownership by reducing edge transport, switching, and routing costs, as well as minimizing footprint and power consumption. Used with Cisco routed PON modules, Cisco PON ONTs provide an ideal end-to-end solution for cost-effective, agile, and diverse networking requirements.

Figure 1: Example of a Passive Optical Network (PON)



Supported Cisco 10G Routed XGS-PON ONT

- ENC-10G-ONT-10 XGS-PON ONT
- ENC-10G-ONT-14A XGS-PON ONT
- ENC-10G-ONT-01PR XGS-PON ONT

ENC-10G-ONT-10 XGS-PON ONT

The ENC-10G-ONT-10 XGS-PON Optical Network Unit (ONT) is a Carrier Class Ethernet ONT hardware system designed for business services.

The system provides:

- ITU-T G.9807.1 XGS PON uplink port with embedded Ethernet-to-PON Media Access Control (MAC) bridge and optics
- 1 x 10/100/1000/2500 MbE Ethernet RJ-45 port
- 1 x 1G/10G SFP/SFP+ port

ENC-10G-ONT-14A XGS-PON ONT

ENC-10G-ONT-14A XGS-PON ONT is purpose-built for residential, multi-dwelling unit (MDU), and small/home office (SOHO) applications.

Thesystem provides:

- ITU-TG.9807.1 (XGS-PON) with built-in XGS-PON optics and Media Access Control (MAC)
- 1x1/2.5/5/10 GbE Ethernet RJ-45
- 4x10/100/1000 MbE Ethernet RJ-45
- 1xRJ-11 with FXS capability
- UPS powering option

ENC-10G-ONT-01PR XGS-PON ONT

The ENC-10G-ONT-01PR is a temperature-hardened XGS-PON ONT with Ethernet port(s), designed for residential and Small Office or Home Office (SOHO) applications. It is typically wall mounted vertically in weatherproof clamshell on the outside wall of a home or SOHO.

The ENC-10G-ONT-01PR XGS-PON ONT is a Power over Ethernet (PoE) Powered Device (PD), compliant to IEEE 802.3af. The ONT can also power up from 12V DC using 2-pin Phoenix connector or 2x4 Molex connector.

The system provides:

- ITU-T G.9807.1 (XGS-PON) with built-in XGS-PON optics and Media
- Access Control (MAC)
- 1 x 10/100/1000/2500 MbE RJ-45 port

Ports

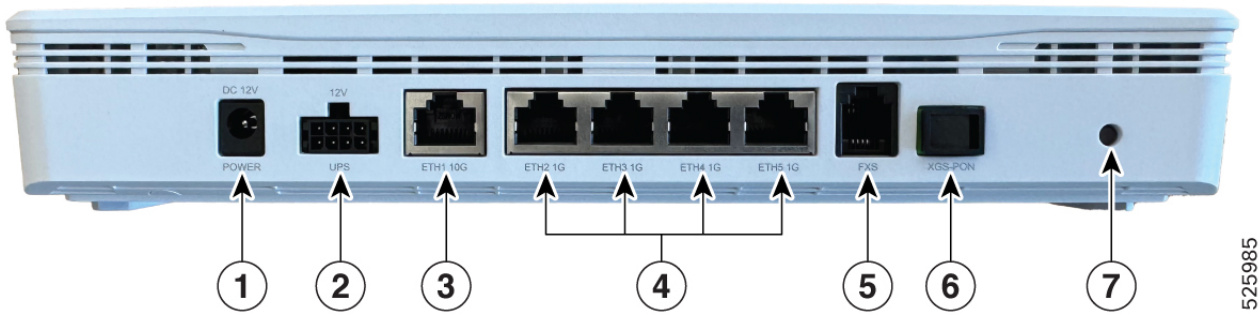
Connect the ports available in the system to appropriate cables. The following figure shows the ports available in the system.

Figure 2: ENC-10G-ONT-10 XSG-PON ONT Ports

The available ports are summarized below:

- XGS-PON
- 10GE LAN
- Power

Figure 3: ENC-10G-ONT-14A XSG-PON ONT Ports



Port label	Description
1	DC 12V
2	UPS 12V
3	10G Ethernet LAN
4	1G Ethernet LANs
5	FXS
6	SC/APC, XGS-PON
7	Reset

ENC-10G-ONT-01PR XSG-PON ONT Ports

Connect the ports available in the system to appropriate cables.

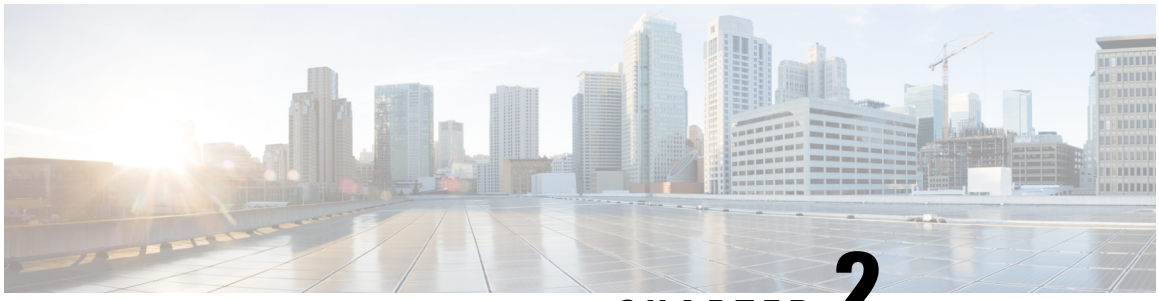
The following figure shows the ports available in the system.

Figure 4: ENC-10G-ONT-01PR XSG-PON ONT Ports

The available ports are summarized below:

- SC/APC, XGS-PON
- 2.5G Ethernet LAN
- UPS 12V

- DC 12V



CHAPTER 2

Prepare for installation

This chapter provides details about the requirements that you must complete prior to installation.

This chapter:

- lists the documents to review prior to installation.
- reviews the ONT requirements.
- reviews the clearances required for proper ventilation.
- describes proper handling procedures for the ONT.

- Required documents, on page 7
- Proper handling, on page 8
- Required tools and equipment, on page 8

Required documents

Prior to installation, review the latest versions of supporting documentation as applicable to the intended installation.

Required documents are:

- Installation Specification (IS) and Bill of Materials (BOM)
- Regional, customer, and site-specific regulatory, installation, and safety requirements
- Optical Connector Inspection and Cleaning
- Installation Workmanship Standards
- Telcordia Electromagnetic Compatibility and Electrical Safety GR-1089- CORE
- Telcordia Generic Installation Standards GR-1275 CORE
- European Telecommunications Standards Institute (ETSI) 300 119 Equipment Engineering
- European Telecommunication Standard for equipment practice

Proper handling

Improper handling of sensitive components can have the following consequences:

- Damage to equipment such that the equipment does not function properly when in use
- Misdiagnosed failure analysis report for a returned (RMA) unit

Equipment containing integrated circuits can be damaged by static electricity that builds up on work surfaces and personnel. The effect of ESD damage may be immediate failure or it may manifest itself as a latent failure affecting the reliability of the equipment.

Observethe following precautions to avoid static charges and discharges:

- When handling the equipment (for example, storing, installing, or removing),always wear a grounded wrist strap or wear a heel strap and stand on a grounded, static-dissipating floor mat.
- Never touch the components, conductors, or connector pins.
- If possible, do not remove the equipment from its packaging until ready for use.
- If possible, open all packaging at a static-safe work station using properly- grounded wrist straps and static-dissipating table mats.
- Always store and transport modules in static-safe packaging.

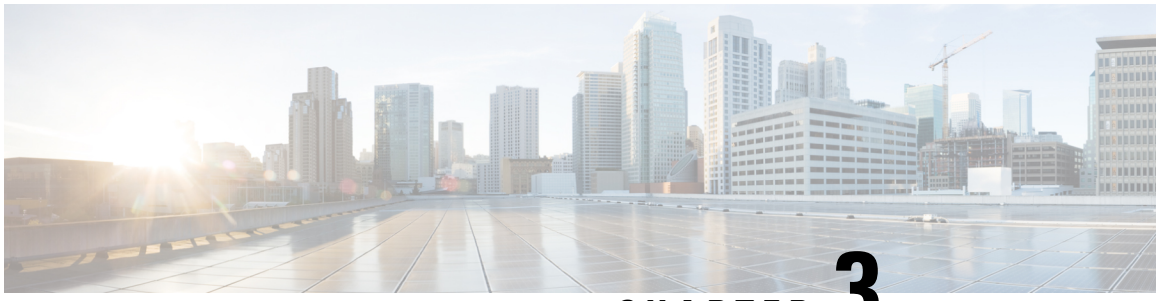
To avoid physical damage to the equipment, store it in the original protective packaging container. Do not stack equipment without the use of the original protective packaging containers.

Required tools and equipment

When handling, installing, or removing the ONT, ensure the ONT is stored in ESD-protective packaging when not installed in an equipment rack.

Thefollowing tools and equipment are required whenever handling the ONT and must be available at the installation site:

- ESD-guard wrist strap
- ESD-guard heel grounders
- A Phillips screwdriver of suitable size to accommodate the rack screws
- Flat head screwdriver
- Anti-staticbag or anti-static box



CHAPTER 3

Unpack and inspect

This chapter describes how to unpack the ONT from the shipping container and inspect the ONT for damage.

- Unpack the ONT, on page 9
- Inspect for damage, on page 10
- Return materials, on page 11

Unpack the ONT

Before you begin

- Personnel involved in the installation must be trained in and have experience with Ciena® product installations.
- Follow site standards regarding system weight when unpacking and maneuvering the ONT.
- Inspect the shipping container for physical damage. If any components are damaged, refer to the instructions in section *Returning materials*.

Thefollowing items are shipped:

- ENC-10G-ONT-14A ONT
- 12V 2A DC power adapter

Procedure

Step 1 Verify the shipping container contents against the shipping invoice.

Step 2 Compare the labels on the shipping containers with the information on the packing list.

Table 1:

If there are	Then
discrepancies or missing components	stop and notify Product Support. Have the following information available: • shipping invoice number • model and serial number of the damaged item • description of the discrepancy • effect of the discrepancy on the installation
no discrepancies or missing components	continue with the procedure

Step 3 Remove the cardboard box and plastic bag from the shipping container.

Step 4 Carefully lift the ONT out of the cardboard box.

Step 5 Remove the foam block from the ONT.

Step 6 Remove the ONT out of the ESD bag.

Step 7 Ensure that the shipping container is empty.

Step 8 Dispose of shipping container and packing materials in accordance with site requirements.

Inspect for damage

Inspect the ONT to ensure that it was not damaged in transit.

Procedure

Step 1 Visually inspect every surface of the ONT.

Look for:

- chipped paint
- cracks
- breaks
- broken connectors
- electronics damage such as bent pins

Step 2 Determine whether there is any damage.

Table 2: Actions to be taken on damage if determined

If	Then
damageis identified	takethe following actions: • photograph and record the damage • report the damage to the shipping courier • notify Product Support about damaged components
no damage is identified	the ONT is ready to be positioned and installed.

Return materials

All returned equipment must have a Ciena return merchandise authorization (RMA) number. Ciena is not responsible for any item returned without this identifier.

Before you begin

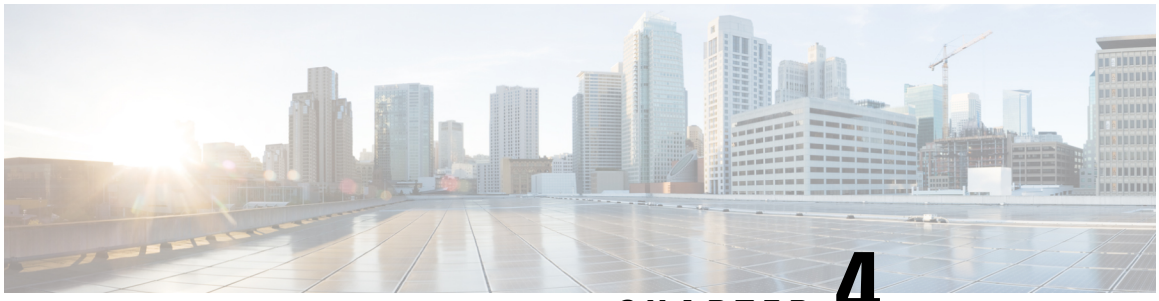
The following information is required to obtain an RMA number:

- Customer Support contact information, located in the copyright statement of this publication
- serial number of item to be returned
- model number of item to be returned
- description of the problem
- return address and phone number
- declaration of emergency or non-emergency condition

Procedure

Contact a Customer Support Representative and provide the required information.

An RMA is created and is used to track the defective item.



CHAPTER 4

Install XGS-PON ONT

This chapter provides installation information for the XGS-PON ONT.

- Safety instructions for installation, on page 13
- Install the device on a desktop, on page 13
- Mount the ONT on a wall, on page 14
- Mount the ONT inside the Primex enclosure, on page 15
- Mount the ONT inside the Corning enclosure, on page 16

Safety instructions for installation

To minimize the risk of explosion or electric shock, ensure that the following safety instructions are met:

- Install and use the ONT in indoor area where the ambient temperature does not exceed the operating temperature range of the hardware. For temperature ranges, refer to the section Technical specifications.
- Connect the ONT to an appropriate power outlet that conforms to the required voltage range indicated on the power supply adapter.
- Disconnect all power sources before moving the ONT.
- Do not look into the ends of the optical fibers as it may expose you to invisible laser radiations.
- Use an optical power meter to check whether the optical source is disabled or not before handling the optical fibers.
- Turn off all power sources when opening the unit.

Install the device on a desktop

Install the device on a desktop as required by the site plan.

Before you begin

Ensure that the device is placed on a non-combustible surface.

Procedure

Place the device on a desktop. Ensure that adequate space is provided for cable management.

Figure 5: ONT desktop placement

Mount the ONT on a wall

Install the ONT on a wall according to the site plan.

Before you begin

Requirements

- Two screws or anchors appropriate for the mounting surface.
  - Head Diameter: 6.0~6.4mm
  - Head Thickness: 2.0~2.5mm
  - Thread Length: >25mm
- Ensure that the hardware used includes proper fasteners and anchors required to support the weight of the ONT.
- The reinforced mounting surface must be capable of supporting combined weight of the ONT and cables.
- Drill machine.

Procedure

Step 1 Select an appropriate flat mounting surface that will support the weight of the ONT when fully loaded.

Step 2 Mark the location of the left and right mounting holes. Holes should be X=7.48 in. (19 cm) apart, center to center.

Step 3 Drill the left and right mounting holes into the mounting surface using a drill bit appropriate for the customer-supplied screws/anchors.

Step 4 Install the customer supplied screws into the mounting holes using appropriate screwdriver. Maintain the gap of ~2.4mm between the wall and the screw head.

Step 5 Align the ONT with ports facing down, to the mounting screws on the wall, ensuring it is appropriately secured to the wall and does not fall. Orient the ONT so that the side with the Ciena logo is facing toward you and the ports are facing to the bottom.

Mount the ONT inside the Primex enclosure

Mount the XGS-PON ONT inside the third-party Primex enclosure using the mounting kit.

Note This procedure is only applicable for ENC-10G-ONT-01PR XGS-PON ONT.

Before you begin

- One of the mounting brackets in mounting kit for Primex P1500FG-RFOG enclosure.
- An appropriate flat, reinforced mounting surface that will support the weight of the enclosure, and all its components.
- The reinforced mounting surface must be capable of supporting the combined weight of the enclosure, ONT, and cables.
- Use cable ties to dress and secure the cables using local practices.

Procedure

Step 1 Secure the mounting bracket to the upper part of the enclosure using the two screws provided to the customer. Tightened them using a size 2 Phillips screwdriver.

Step 2 Align the grooves on the back of ONT to the hooks on the mounting bracket, ensuring the ports appear at the bottom and LEDs at top after mounting.

Step 3 To ensure that the ONT remains intact in its position and does not fall, tighten the screw on the top of the mounting bracket using a Phillips screwdriver.

Note
*Note:*Tounmount the chassis, loosen the screw on the top of the mounting bracket using a Phillips screwdriver followed by pressing the two tabs on the top and moving the ONT upwards.

Mount the ONT inside the Corning enclosure

Mount the XGS-PON ONT inside the third-party Corning enclosure using the mounting kit, which works with Corning FNI enclosures.

Note This procedure is only applicable for ENC-10G-ONT-01PR XGS-PON ONT.

Before you begin

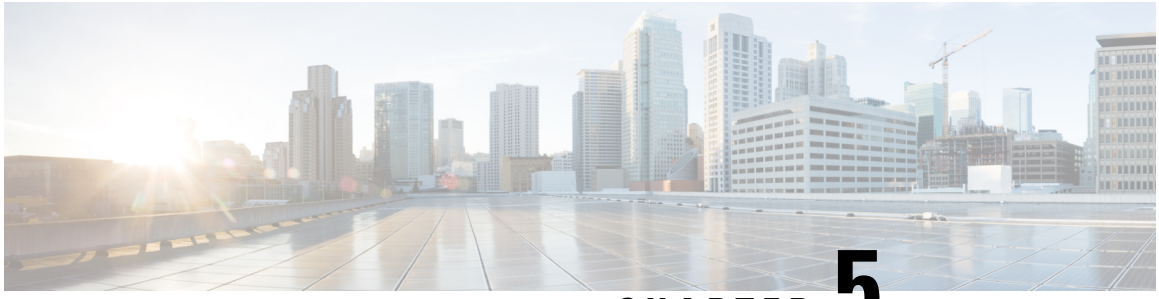
- One of the mounting brackets in 170-0488-900 Ciena 3806 mounting kit for Corning FNI-NG enclosure.
- An appropriate flat, reinforced mounting surface that will support the weight of the enclosure, and all its components.
- The reinforced mounting surface must be capable of supporting the combined weight of the enclosure, ONT, and cables.
- Use cable ties to dress and secure the cables using local practices.

Procedure

Step 1 Secure the mounting bracket to the upper part of the enclosure using the two screws provided to the customer. Tightened them using a size 2 Phillips screwdriver.

Step 2 Align the grooves on the back of ONT to the hooks on the mounting bracket, ensuring the ports appear at the bottom and LEDs at top after mounting.

Step 3 To ensure that the ONT remains intact in its position and does not fall, open the ONT lid and tighten the two screws- one on the top-left and another on the bottom-right of the mounting bracket, using a Phillips screwdriver.



CHAPTER 5

Connect ONT to network

This chapter provides information for cabling the XGS-PON ONT.

- Connect the ONT to Ethernet service, on page 17
- Connect the ONT to a network, on page 18
- Connect the ONT to analog telephone, on page 19
- Connect the ONT to power by means of a UPS device, on page 20
- Install the external power adapter, on page 21

Connect the ONT to Ethernet service

Connect the ONT to Ethernet service to begin data transmission.

Before you begin

Requirements

- Ensure that all the safety instructions are followed before connecting the ONT to a network.
- Ensure that you use a Ciena-recommended Ethernet LAN cable or an equivalent cable.
- Ensure that the ONT must not be connected to a UPS device or DC power interface.

Procedure

Step 1 Locate the power over Ethernet cable.

Step 2 Connect the Ethernet LAN cable into the RJ-45 Ethernet port of the ONT. The following figure shows the Ethernet connection on the ONT.

Figure 6: Power over Ethernet cable - ENC-10G-ONT-14A XGS-PON ONT

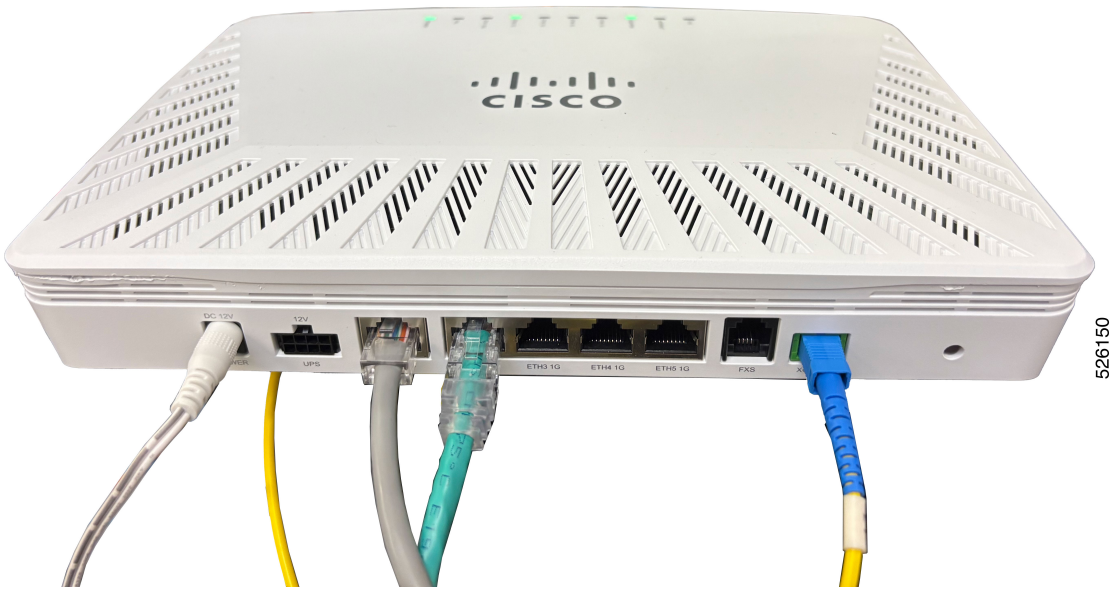
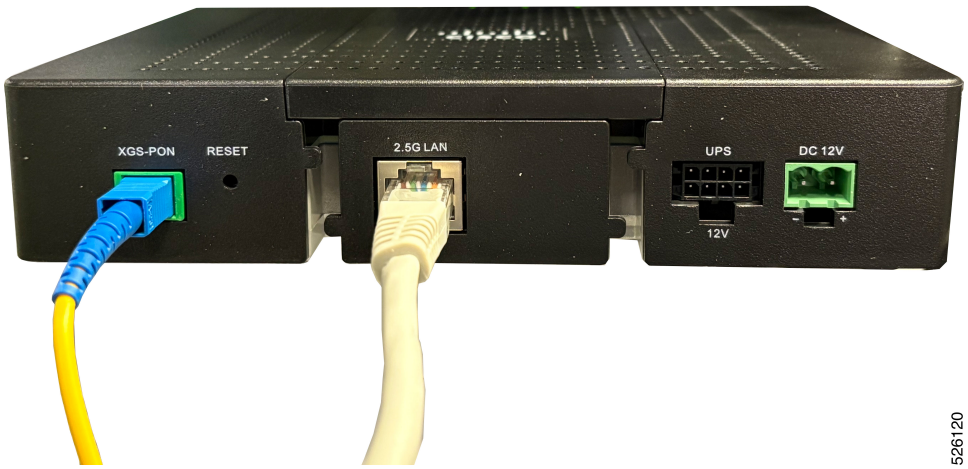


Figure 7: Power over Ethernet cable - ENC-10G-ONT-01PR XGS-PON ONT



Connect the ONT to a network

Requirements

- Ensure that all the safety instructions are followed before connecting the ONT to a network.
- The optical strength of the ONT must be in the range of -8 dBm to -28 dBm for proper functioning.

Before you begin

Connect the XGS-PON ONT to a network before startup.

Procedure

Step 1 Remove the dust covers from the SC/APC optical connector.

Step 2 Clean the connector, if required.

Step 3 Plug in the fiber connector to the XGS-PON port.

Figure 8: Network connection

Connect the ONT to analog telephone

Requirements

- Ensure that all the safety instructions are followed before connecting the ONT to the analog telephone.
- Ensure that you use a Ciena-recommended RJ-11 cable or an equivalent cable.
- Ensure that the ONT must not be connected to a UPS device or DC power interface.

Before you begin

Connect the XGS-PON ONT to the analog telephone.

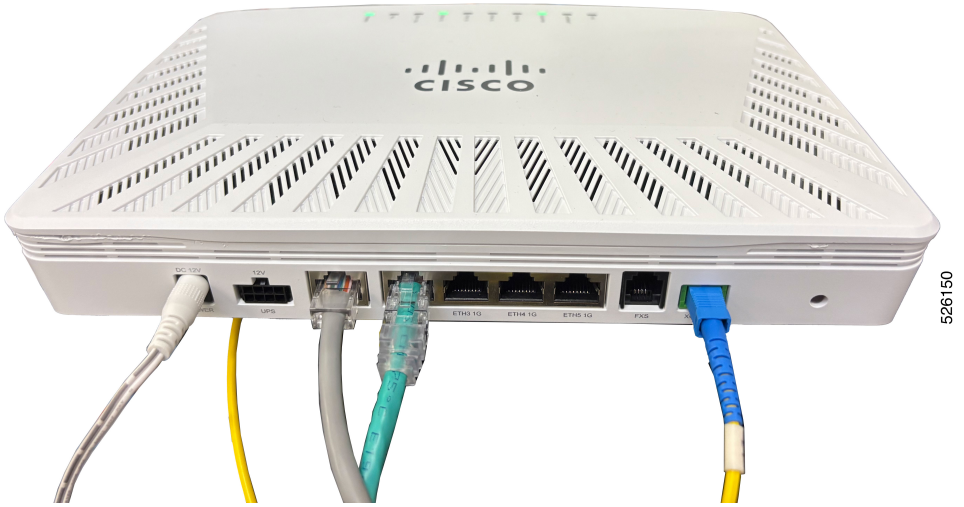
Procedure

Step 1 Locate the analog telephone cable.

Step 2 Connect RJ-11 connector of the analog telephone cable into the FXS port of the ONT and the other end into the analog device.

The following figure shows the analog telephone connection on the ONT.

Figure 9: Analog telephone connection on the ONT



Step 3 Ensure that the FXS LED is green when the voice service is configured and VoIP is registered.

Connect the ONT to power by means of a UPS device

Requirements

- Ensure that the ONT is connected to a network.
- Ensure that the output of the UPS is what the ONT requires.
- Ensure that the ONT must not be connected to a DC power interface.

Overview

The ONT provides an option to connect battery backed power supply (for example, UPS) for uninterrupted operation. A 2x4 Molex connector is provided on the front panel of the unit for the same. We do not intend to supply UPS along with ONT so you need to procure it. Pin-out of the front panel UPS connector is given below. Follow the pin-out to prepare cable and connect UPS with ONT.

The following table lists the UPS pin-out.

Table 3: UPS pin-out

UPS pin-out	Definition
1	Not connected
2	Low battery
3	Replace battery

UPS pin-out	Definition
4	Battery in (ground)
5	Ground
6	Battery missing
7	On battery
8	Battery in (12V)

The UPS connects to the residence's 110/220 V AC; 50/60 Hz power, converts the AC voltage to 12 VDC, and monitors the power source and battery for alarm conditions. The ONT is meant for indoor installation.

The ONT may be used with IEC/ UL certified BATTERY BACKUP (for UPS connector) with Output: 12 VDC, 30 W, complies with Limited Power Source, Tma = 40 degree C, and minimum operating altitude 2000 meters. Support of the UPS requires purchase of a 1m, 3m or 6m cord with 8-pin power connector interface ordered separately in addition to the UPS. There may also be additional UPS options available.

The ONT provides alarm monitoring for AC power failure, battery present, battery charge level, and battery end of life on its UPS connector. These alarms are transported over the PON to the service provider's alarm network.

The indoor UPS is rated for indoor installations (up to 40°C/104°F). Units are configured with North American 3-prong Type B power plug. There are two versions available: grounded and floating. The grounded unit is designed to pass ground to the ONT for added protection against power surges and interference. The floating unit does not pass ground across the transformer and is used when service providers prefer to isolate the ground of the ONT from the house ground.

Before you begin

Connect the XGS-PON ONT to a UPS device to provide power to the ONT.

Procedure

Step 1 Plug the UPS connector into the UPS port of the ONT.

The following figure shows the UPS power connection on the ONT.

Step 2 Ensure that the POWER LED is orange.

Install the external power adapter

Requirements

- All DC power cables must meet the requirements of local and national electrical codes.
- Ensure correct prongs are installed on the power adapter, based on the country of installation.

Overview

- Install the DC pin of the external adapter to the power port on the front of the ONT and the adapter to an AC supply socket.
- All cables must run in accordance with cabling plans. Pay particular attention to the site requirements.

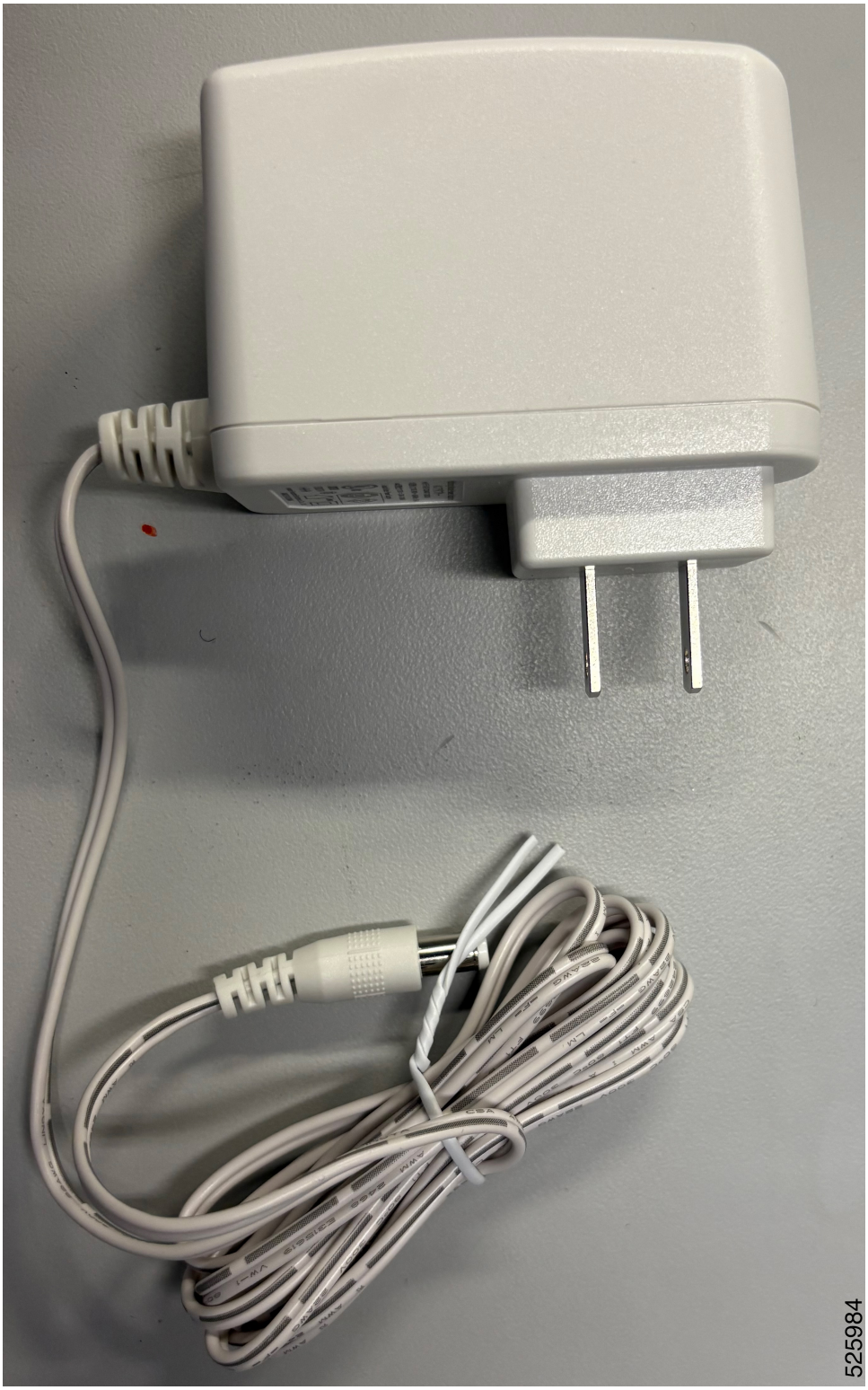
Before you begin

Install the external power adapter. A 3.3 feet (1 meter) external 12V, 24W, AC/ DC adapter is shipped with the ONT.

Procedure

Step 1 Locate the AC/DC power adapter that comes with the ONT. The following figure shows the AC/DC adapter shipped with ONT for NA installation.

Figure 10: AC/DC power adapter



Step 2 For ONT variant applicable for NA installations, go to step 5.

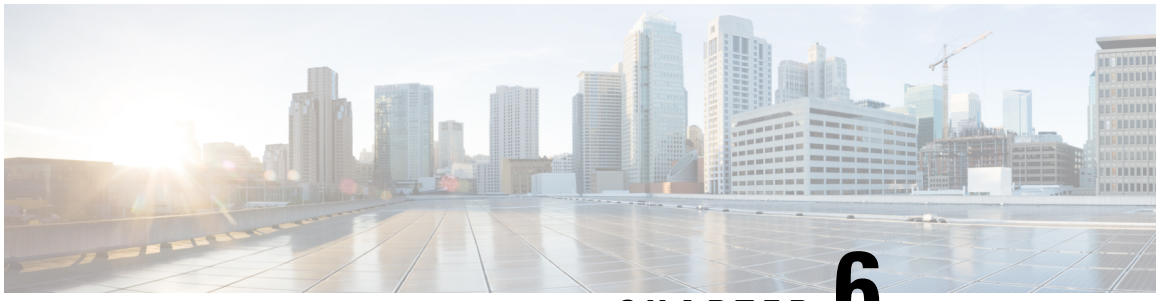
Step 3 For other ONT variant shipped with country specific power adapters, fix the prong on the adapter by placing the prong over the adapter and sliding it downwards. The following figure shows the AC/DC adapter with country specific prongs.

Step 4 To replace the prong for the power adapter, press the PUSH button on the adapter, remove the existing prong, place the required prong.The following figure shows the PUSH button on the adapter.

Step 5 Plug the AC power adapter to the live AC power socket.

Step 6 Plug the other end of the AC power adapter into the ONT.

Step 7 Ensure the POWER LED is steady green.



CHAPTER 6

LEDs

The LEDs on the XGS-PON ONT communicates the operational status of the ONT.

ENC-10G-ONT-14A XGS-PON ONT LEDs

There are ten LEDs to indicate the status.

The following figure shows the location of the LEDs on the ONT.

Figure 11: ENC-10G-ONT-14A XGS-PON ONT LEDs with status

Table 4: ENC-10G-ONT-14A XGS-PON ONT - Status LEDs

LED	Indication	Description
POWER	Steady green	Indicates that the power source is adapter.
	Steady orange	Indicates that the power source is UPS.
	Off	Indicatesthat the power source is removed.
FAIL	Steady red	Indicates that the temperature or optical powercrossed the upper threshold or the ONT is stuck at u-boot.
	Blinking red	Indicates that the ONT is booting.
	Off	Indicates that the ONT is operationaland functional.
ETH110G	Steady orange	Indicates that ETH1 link betweenthe ONT and the CPE router is up at 1G or less.
	Blinking orange	Indicates that the ONT data is passed between the ETH1 and the CPE router(link speed is 1G or less).
	Steady green	Indicates that ETH1 link betweenthe ONT and the CPE router is up at 2.5G or more.
	Blinking green	Indicates that the ONT data is passed between the ETH1 and the CPE router(link speed is 2.5G or more).
	Off	Indicates that ETH1 link betweenthe ONT and the CPE router is down.
ETH21G	Steady green	Indicates that ETH2 link betweenthe ONT and the CPE router is up at 1G or less.
	Blinking green	Indicates that the ONT data is passed between the ETH2 and the CPE router(link speed is 1G or less).
	Off	Indicates that the ETH2 linkbetween the ONT and the CPE router is down.

LED	Indication	Description
ETH31G	Steady green	Indicates that ETH3 link betweenthe ONT and the CPE router is up at 1G or less.
	Blinking green	Indicates that the ONT data is passed between the ETH3 and the CPE router(link speed is 1G or less).
	Off	Indicates that the ETH3 linkbetween the ONT and the CPE router is down.
ETH41G	Steady green	Indicates that ETH4 link betweenthe ONT and the CPE router is up at 1G or less.
	Blinking green	Indicates that the ONT data is passed between the ETH4 and the CPE router(link speed is 1G or less).
	Off	Indicates that the ETH4 linkbetween the ONT and the CPE router is down.
ETH51G	Steady green	Indicates that ETH5 link betweenthe ONT and the CPE router is up at 1G or less.
	Blinking green	Indicates that the ONT data is passed between the ETH5 and the CPE router(link speed is 1G or less).
	Off	Indicates that the ETH5 linkbetween the ONT and the CPE router is down.
XGS-PON	Steady green	Indicates that the ONT is capable of receiving data from the OLT.
	Blinking green	Indicates that the ONT is ranging or synchronizing with the OLT.
	Steady red	Indicates a loss of signal (LOS) is detected on the PON.

LED	Indication	Description
Internet	Steady green	Indicates that the ONT is capable of passing data traffic from ETH ports to WAN port in Routing mode.
	Off	When ONT is in Routing mode - Indicates that the ONT is not capable of passing data traffic from ETHports to WAN port or ONT is in Bridge mode.
FXS	Steady green	Indicates that VoIP is registered.
	Blinking green	Indicates a voice activity.
	Off	Indicates that VoIP is not registered.

ENC-10G-ONT-10 XGS-PON ONT LEDs

There are four LEDs to indicate the status.

The following figure shows the location of the LEDs on the ONT.

Figure 12: ENC-10G-ONT-10 XGS-PON ONT LEDs with status

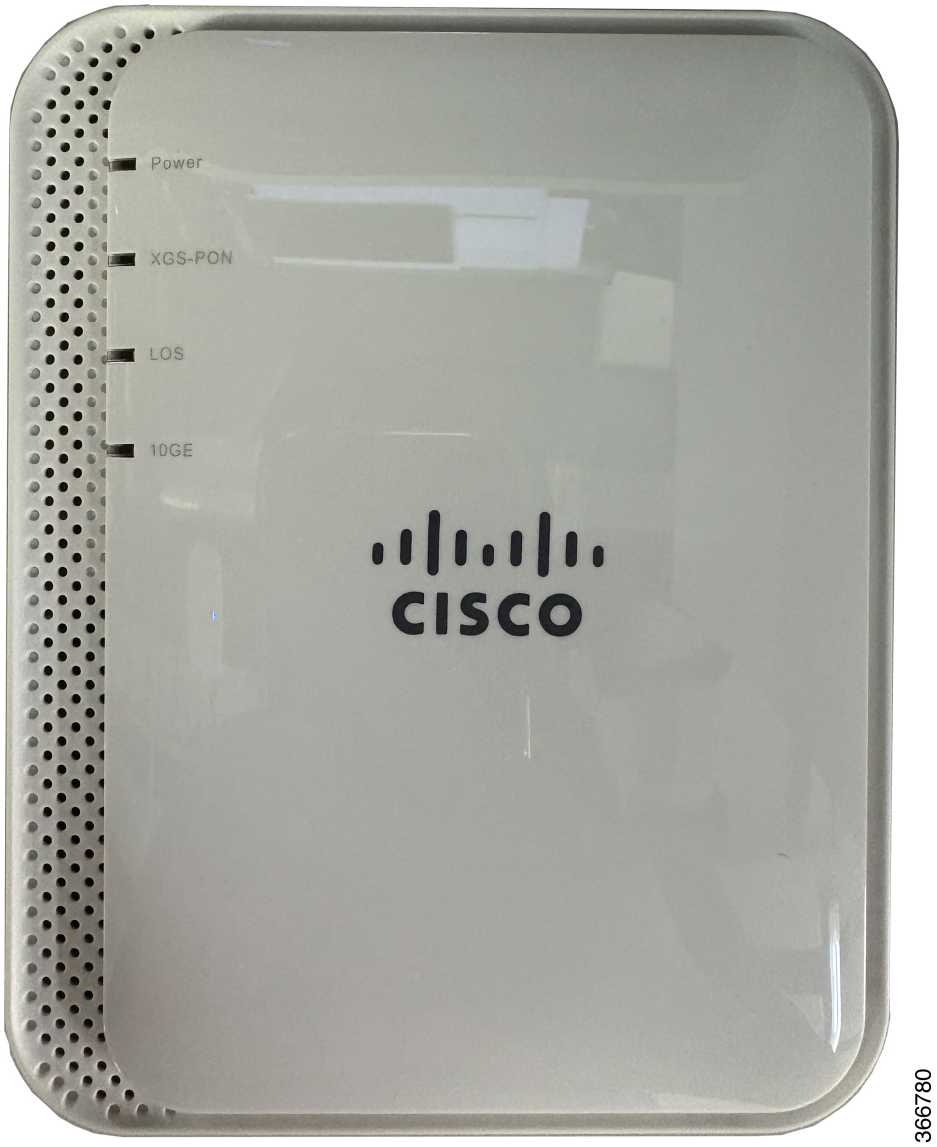


Table 5: ENC-10G-ONT-10 XGS-PON ONT - Status LEDs

LED	Indication	Description
POWER	Blinking green	Indicates that the system is operating from an AC power source.
	Off	Indicates that the power source is removed.

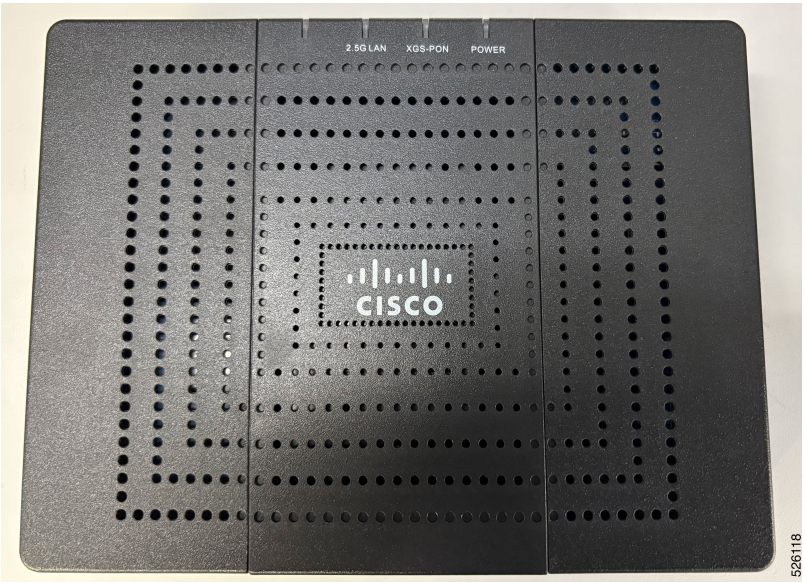
LED	Indication	Description
XGS-PON	Blinking green	Indicates that the system is fully operational.
	Blinking fast at a speed of two blinks per second	Indicates that the system is ranging and activating.
	Blinking slow at a speed of one blink per second	Indicates that the system software is updating.
	Off	Indicates that the system has not started ranging.
LOS	Red	Indicates a loss of signal (LOS) is detected on the system.
	Off	Indicates no LOS signal.
10GE	Green	Indicates that the Ethernet link is active.
	Blinking	Indicates data transmission.
	Off	Indicates that the Ethernet link is down.

ENC-10G-ONT-01PR XGS-PON ONT LEDs

There are three LEDs to indicate the status.

The following figure shows the location of the LEDs on the ONT.

Figure 13: ENC-10G-ONT-01PR XGS-PON ONT LEDs with status



Note The first LED from the left though indicates lights, it is not used and the light indicators does not have any function.

Table 6: ENC-10G-ONT-01PR XGS-PON ONT - Status LEDs

LED	Indication	Description
POWER	Steady green	Indicates that the ONT is powered on.
	Off	Indicates that the ONT has no power.
XGS-PON	Steady green	Indicates that the ONT is registered.
	Blinking green	Indicates that the ONT is in registering.
	Steady red	Indicates the loss of optical signal.
2.5GLAN	Steady Green	Indicates that the Ethernet link is active.
	Blinking green	Indicates data transmission.
	Off	Indicates that the Ethernet link is down.

- Verify the optical signal, on page 31
- Verify the Ethernet service, on page 32
- Verify the ATA connection, on page 33
- Reboot or reset the ONT, on page 33

Verify the optical signal

Requirements: Keep an optical meter handy to assess the received optical power reading.

Overview: The LOS LED stays red when the ONT does not detect optical signals from the OLT.

Before you begin

You must verify the optical signal to determine the reason for the loss of signal.

Procedure

Step 1 Ensure that the fiber is securely plugged into the ONT.

If	Then
The LOS LED is off.	You have completed this procedure.

If	Then
The LOS LED is not off.	Go to step 2.

Step 2 Remove optical fiber from PON port of ONT and connect it to an Optical power meter to check and fix the received optical power reading.

If	Then
The optical power reading is -40 dBm or less	Check the fiber connection for any cut between the ONT and the OLT.
The optical power reading is less than -28 dBm.	Remove the attenuation between the ONT and the OLT to increase the received optical power reading.
The optical power reading is more than -8 dBm.	Add an attenuation between the ONT and the OLT to decrease the received optical power reading.

The received optical power reading must be in the range of -8 dBm to -28 dBm.

Step 3 Determine whether the LOS LED is off.

If	Then
The LOS LED is off	You have completed this procedure.
The LOS LED is not off.	Go to step 4.

Step 4 Check the optical status of the OLT.

Verify the Ethernet service

Before you begin

Verify the Ethernet service if no service is provided to the ONT despite plugging the available Ethernet service into the LAN port.

Procedure

Step 1 Ensure that there is an uninterrupted power supply to the ONT.

a) Ensure that the POWER LED is on.
b) Ensure that the power supply is plugged into the ONT, and the power supply connections are secure.
c) Ensure that the AC power source is on.

Step 2 Ensure that the ONT is correctly registered with the OLT.

a) Ensure that the PON LED is blinking green.

b) If the LED blinks green for 30 seconds or more, then use the serial number written at the back of the ONT to check its registration status from the OLT.

Step 3 Verify the optical connection. For the procedure, refer to the section Verifying the optical signal.

Verify the ATA connection

Before you begin

Verify the ATA connection if no service is provided to the ONT despite plugging the available ATA connector into the FXS port.

Procedure

Step 1 Ensure that there is an uninterrupted power supply to the ONT.

a) Ensure that the POWER LED is on.
b) Ensure that the power supply is plugged into the ONT, and the power supply connections are secure.
c) Ensure that the AC power source is on.

Step 2 Ensure that the ONT is correctly registered with the OLT.

a) Ensure that the PON LED is blinking green.
b) If the LED blinks green for 30 seconds or more, then use the serial number written at the back of the ONT to check its registration status from the OLT.

Step 3 Ensure that the VoIP service provider is correctly registered with the OLT.

a) Ensure that the FXS LED is steady green.
b) If the LED is off, use the serial number written at the back of the ONT to check its registration status from the OLT.

Step 4 Verify the optical connection. For the procedure, refer to the section Verifying the optical signal.

Reboot or reset the ONT

Requirements: Ensure the ONT is plugged in and powered on.

Overview: A reboot restarts the ONT keeping the configuration intact, while a reset brings the ONT back to its factory settings.

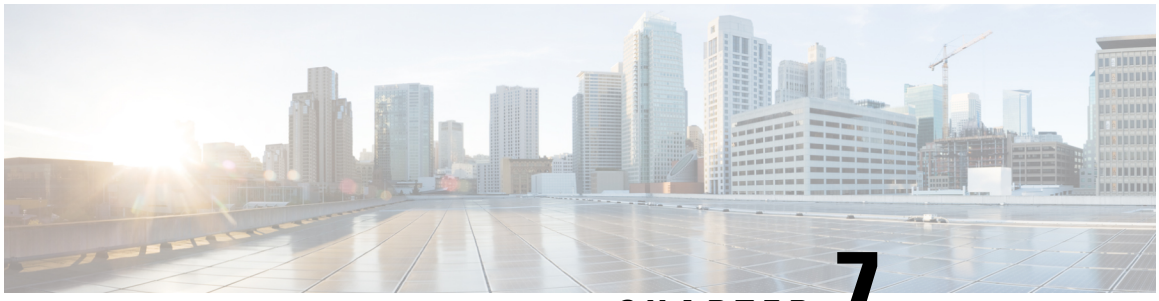
Before you begin

Reboot and reset the ONT manually using the reset button.

Procedure

Step 1 To reboot, press the reset button once using a paper clip or needle and release within ~1 second. All the LEDs except POWER will flash (on then off) once, and then the ONT begins rebooting.

Step 2 To factory-reset, press and hold the reset button using a paper clip or needle for ~10 seconds, then release the button. Once the factory-reset has completed, all LEDs (except POWER) will turn off and the system begins rebooting.



CHAPTER 7

Regulatory compliance

Regulatorycompliance lists agency approval declarations and installation safety notes.

- Health and safety, on page 35
- Standards compliance, on page 35
- Compliance information, on page 36
- Safety information and instructions, on page 37

Health and safety

Thehealth, safety and welfare of engineers and support staff is of paramount importance to Ciena. Implementing a safe system of work with safe people is an integral component of our procedures and an absolute requirement under the provisions of the Health & Safety at Work Act 1974.

Cienarecognizes the importance of all matters of Health & Safety. By suitably addressing Health & Safety issues from the outset, engineers and operatives are able to implement installation contract safely, smoothly and efficiently.

Acomprehensive set of procedures exist to control our activities and define our Health and Safety requirements. These are rigorously adhered to by all Ciena employees.

Reference statements re H&SWA 1974 and Management of H&SWA Regulations 1998. Prior to commencement of installation, Supplier representativesneed to be aware of any site specific risk assessments / processes / evacuation procedures etc.

Standards compliance

The following table lists the standards that the ONT complies with.

Table 7: Regulatory approval declarations

Issue	Approvalor declaration
AgencyMarks	CE (Europe)
	UKCA(UK)
	NRTL(NA)
	RCM(Australia and New Zealand)
	VCCI(Japan)
Emissionsand Immunity (EMC)	CISPR32 Class B
	CISPR35
	EN55032 Class B
	EN 55035
	AS/NZSCISPR 32 Class B
	FCCPart 15B Class B
	ICES-003Class B
	VCCICISPR 32 Class B
	ETSIEN 300 386
Environmental	RoHSDirective 2011/65/EU and 2015/ 863
	WEEE2012/19/EU
LaserSafety	FDA21 CFR subpart (J)
	IEC60825-1
	EN60825-1
	ANSIZ136
	EN 50689
Safety	CAN/CSAC22.2 No. 62368-1
	IEC62368-1
	EN62368-1
	UL62368-1
	AS/NZS 62368-1

Compliance information

Class 1M laser product notice

The ONT, when operating normally with all doors and access covers installed, allenergized fiber cabling connected, and protective caps/covers installed on all unused optical connectors, is a Class 1 laser product.

Environmental impact statement

The equipment contains no hazardous materials as defined by the United States Environmental Protection Agency (USEPA). we recommend that all failed products be returned for failure analysis and proper disposal.

Federal Communications Commission: Interference

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the of the of the Federal Communications Commission (FCC) rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses and can radiate unintentional radio frequency (RF) energy and, if not installed and used in accordance with the instructionmanual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interferencein which case the user will be required to correct the interference at their own expense.

Note This device complies with Part 15 of the FCC Rules. Operation is subject to following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Food and Drug Administration (FDA) laser safety warning

This product contains a laser diode.

We recommend that users and maintenance and service personnel comply with the standards and regulations in the design, modification, operation, maintenance, and service of lasers and fiber-optic devices.

It is further recommended that the owner of this equipment determine and ensure conformance with any specific and applicable local regulations.

Telcordia document standards

The format and structure of this document is derived from the Telcordia Generic Requirements for Supplier-Provided Documentation, GR-454- CORE.

Toxic emissions

The equipment releases no toxic emissions.

Safety information and instructions

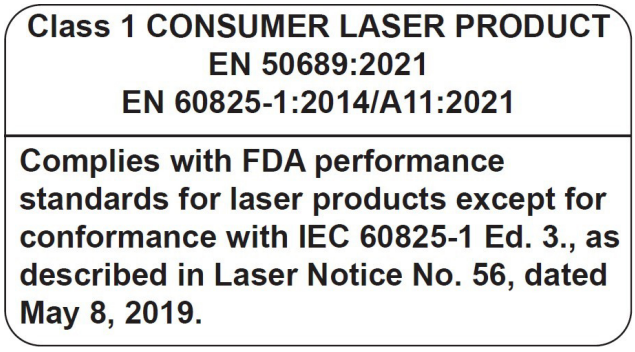
This manual is intended for customers, certified system installation technicians, test engineers, technical support technicians, and other personnel responsible for installing the ONT.

The procedures in this manual require the user to understand and follow the safety practices at your site as well as those identified in this manual. Before applying power and turning up any hardware, check the installation location for adequate temperature, humidity and electrical requirements. This manual describes the electrical, physical and environmental specifications for the ONT. Turn-up and test personnel should work closely with systems integration personnel to ensure a functional installation.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product. When installing,

operating, or maintaining this equipment, basic safety precautions should always be followed to reduce the risk of fire, electrical shock and injury to persons:

- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser radiation exposure.
- Read and understand all instructions before executing any activity.
- Follow all warnings and instructions marked on this product.
- Fori nformation on proper mounting instructions, read the appropriate section of this manual.
- The metallic telecommunications interface should not leave the building premises unless connected to telecommunication devices providing primary and secondary protection as applicable.
- This product should only be operated from the type of power source indicated on the marking label.
- Do not install telecommunications wiring during a lightning storm.
- Do not touch un-insulated wiring or terminals carrying direct current or leavethis wiring exposed. Protect and tape wiring and terminals to avoid risk of fire, electric shock, and injury to service personnel.
- Do not touch un-insulated wires or terminals unless the line has been disconnected at the network interface.
- Tor educe the risk of electrical shock, do not disassemble this product. Trained personnel should only perform service. Opening or removing covers and/or circuit boards can expose dangerous voltages or other risks. Incorrect re-assembly can cause electric shock or fire when the system is subsequently used.
- Ensure that there is no exposed wire when the input power cables are connected to the system.
- Do not stack anything on top of the system.
- At the end of life of the system, it shall be disposed of according to local laws.



Caution Use of controls or adjustments or performance of procedures other that those specified herein may result in hazardous radiation exposure.

CE compliance

The CE mark on the ONT signifies that the system meets all relevant European directives and standards requirements.

FCC statement

This device complies with Part 15 of the FCC Rules.

Operationis subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

If this equipment does cause interference to radio or television reception, the user is encouraged to try to correct the interference using the following measures:

- Reorient the receiving antenna.
- Relocate the equipment with respect to the receiver.
- Move the equipment away from the receiver.
- Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/ television technician for additional suggestions.

Modifications to this product not authorized could void the FCC approval and negate your authority to operate the product.

Fiberbreak and damaged fiber precautions

Ifa fiber break occurs or a damaged fiber is seen, observe the following precautions:

- Power off all laser sources to the fiber or disconnect the fiber end from the laser source.
- Notify the facility manager or supervisor about the damaged or broken fiber.
- Identify where the fiber is damaged or broken.

Be careful when handling damaged or broken optical fibers to avoid eye injuries caused by invisible fiber fragments.

General static electricity precautions

A damaging static electrical charge can be generated by the rubbing and sliding of materials against each other.

Different materials have different potentials of generating and holding a static electric charge. Plastic materials similar to nylon and polyester are capable of generating and holding a potentially large damaging static electricity charge.

Materials similar to cotton do not typically have the potential to generate and hold a charge. The buildup of static electricity can be of a sufficient potential to damage electronic circuitry. When working on equipment or any interconnecting electrical/optical cabling, always wear an approved personnel ground device.

Industry experience has shown that all devices containing integrated circuits can be damaged by static electricity that builds up on work surfaces and personnel. The effect of ESD damage may be immediate failure or it may manifest itself as a latent failure affecting the reliability of the equipment.

The static charges and discharges are produced by various charging effects of movement and contact with other objects. Dry air allows greater static charges to accumulate on a body.

Observe the following precautions to avoid static charges and discharges:

- Assume that all modules contain solid state electronic components that can be damaged by ESD.
- Handle all modules by the faceplate or latch and by the top and bottom outermostedges. Never touch the components, conductors, or connector pins.
- When handling modules (that is, storing, installing, removing, and so forth) orwhen working on the backplane, always wear a grounded wrist strap or wear a heel strap and stand on a grounded, static-dissipating floor mat.
- Observe all warning labels on bags and cartons.
- If possible, do not remove modules from antistatic packaging until they are ready for use.
- If possible, open all module packaging at a static-safe work station using properly grounded wrist straps and static-dissipating table mats.
- Always store and transport modules in static-safe packaging.
- Keep all static-generating material, such as food wrappers, plastics, and styrofoam containers, away from all modules.
- When removing modules from an enclosure, immediately place them in static-safe packages.
- Whenever possible, maintain relative humidity above 20 percent.

Optical fiber handling precautions

When handling or connecting optical fibers, observe the following precautions:

- Always wear safety glasses when handling fibers.
- Avoid indirect eye or direct skin exposure to the ends of optical connectors and fibers, because laser energy may be present.
- Install protective covers or caps on all fiber optical connectors when they are not in use.

Precautions for handling and storing the ONT

When handling, installing, or removing an ONT, observe the following precautions:

- Wear wrist straps or other suitable ESD-grounding devices before touchingand/or removing a ONT from the equipment shelf or ESD- protective packaging.
- Ensure the protective covers or caps are installed on all optical connectors when the connectors are not in use.
- Store all ONT in suitable ESD-protective packaging when they are not installed in an equipment shelf.

Voltage precaution

Personnel should exercise safety precautions when connecting, measuring, and disconnecting all voltage supply lines.

Observe the following precautions to avoid voltage shock:

- Never use both hands when working on or near a voltage source.
- Use the buddy system when working around voltage sources.
- Ensure that rescue and first aid equipment is available and accessible.

- Remove watches, rings, necklaces, and other conductive devices that might come in contact with live voltages or high energy sources.
- Before activating circuits, ensure that other personnel are not in contact with voltage sources.
- Deactivate power whenever possible before performing maintenance on system components.