



Installation Guide

DeltaStream Chassis Optical Line Terminal-X2

About this Installation Guide

This Installation Guide describes the hardware characteristics, installation methods and the points that should be attended to during the installation. This Installation Guide is structured as follows:

Chapter 1 Introduction

This chapter describes the external components of the device.

Chapter 2 Installation

This chapter illustrates how to install the device.

Chapter 3 Connection

This chapter illustrates how to do the physical connection of the device.

Chapter 4 Configuration

This chapter illustrates how to configure the device.

Appendix A Troubleshooting

Appendix B Hardware Specifications

Appendix C Explanations of The Symbols

Audience

The installation and operation of this equipment must be performed by professionals.

This Installation Guide is for:

Network Engineer

Network Administrator

Hardware Installation Engineer

Conventions

- Some models featured in this guide may be unavailable in your country or region. For local sales information, visit <https://www.tp-link.com>.
- The figures in this guide are for demonstration purposes only. Your device may differ in appearance from that depicted.
- This guide uses the specific formats to highlight special messages. The following table lists the notice icons that are used throughout this guide.



Remind to be careful. A caution indicates a potential which may result in personal injury or device damage.



Remind to take notice. The note contains the helpful information for a better use of the product.

Related Document

The related documents of the product are provided on Download Center. To obtain the latest product information, visit the official website: <https://www.tp-link.com>.

Contents

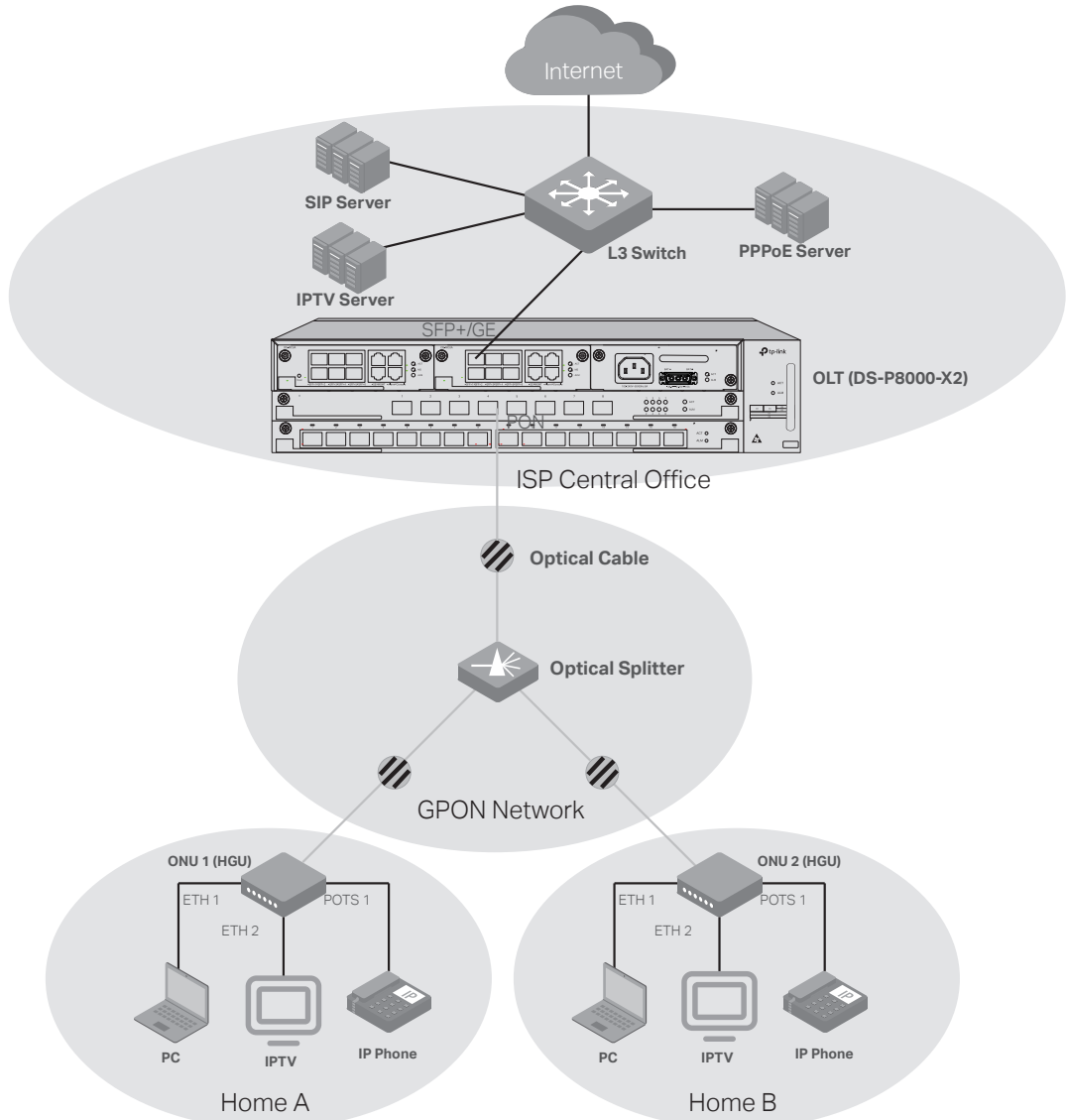
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Chapter 1 Introduction

1.1 Product Overview

TP-Link GPON OLT (Optical Line Terminal) products are designed to provide business-class solutions for ISP's access networks, and they are scalable and reliable for deploying services to meet various demands of ISP's customers.

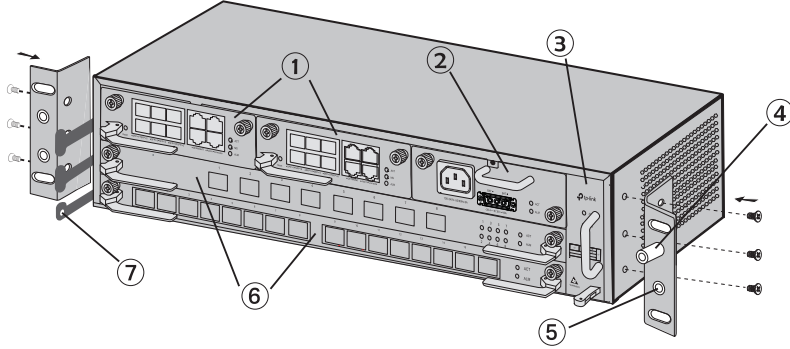
A simplified network topology is shown as the following figure. We take DS-P8000-X2 as an example of OLT devices.



1.2 Appearance

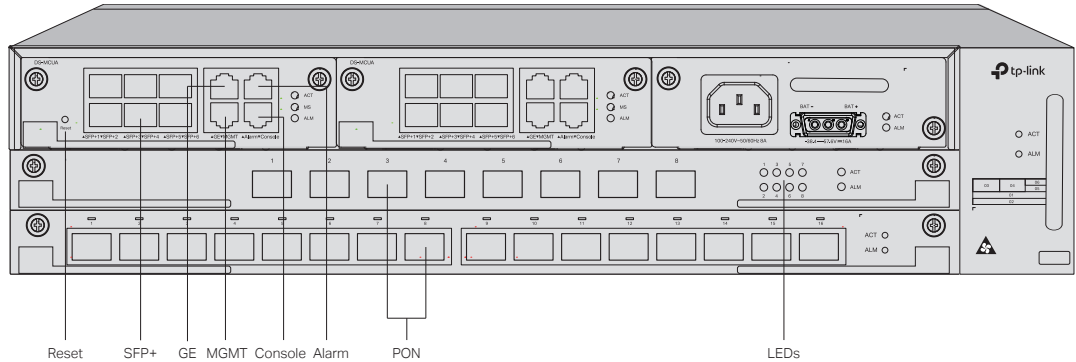
■ Front Panel

The front panel of DS-P8000-X2 is shown as the following figure. The figure is for demonstration purposes only. Your device may differ in appearance from the depicted.



| Number | Name | Main Functions |
|--------|------------------------|---|
| ① | Main Control Unit | As the main control board used in conjunction with DS-P8000-X2, it is used to realize the control and service management of OLT equipment, and ensure the normal use of rack-type OLT products. |
| ② | Power Supply Unit | As a power board used in conjunction with DS-P8000-X2, it is used to supply power to equipment and ensure the normal use of rack-mounted OLT products. Its dual power input design greatly improves the stability and continuity of the customer network. |
| ③ | FAN Unit | As a fan board used in conjunction with DS-P8000-X2, it is used to achieve heat dissipation and cooling of equipment, and ensure the normal use and working stability of rack-mounted OLT products. |
| ④ | ESD-preventive Jack | It is used to connect antistatic devices. |
| ⑤ | Equipment Ground Point | It is used to connect the protective ground wire of the chassis. |
| ⑥ | Service Board | As a service board used in conjunction with the DS-P8000-X2, it is used in conjunction with a chassis to meet the needs of small and medium ISPs for network deployment and scale improvement. |
| ⑦ | Fiber Manager | It is used for business optical fiber routing, which is convenient for optical fiber sorting. |

| Type of Rack | Dimensions (H×W×D) |
|--------------------------------|--------------------------|
| EIA standard-size 19-inch rack | 88mm × 485.4mm × 276.8mm |



PON

The PON port connects to the PON network via an OLT SFP module and an optical cable. PON networks are extended from the PON ports of OLT, and oriented to the locations of ISP's end users.

SFP+

The SFP+ port connects to the uplink network of ISP's central office via a 10 Gbps SFP+ module and an optical cable.

GE

The GE port connects to the uplink network of ISP's central office via an Ethernet cable.

MGMT

The MGMT port connects to a management terminal like a PC via an Ethernet cable, and then the network manager can configure and monitor the device via the management webpage.

Console

The Console port connects to a management terminal like a PC via an RJ45 console cable, and then the network manager can configure and monitor the device via the CLI (Command Line Interface).

Alarm

The Alarm port connects to a monitoring device, sending alarm messages.

Reset

If you want to reset the the device, press and hold the reset button for more than 5 seconds.

LEDs For DS-MCUA/DS-FANA/DS-LGPA



Note:

For fan module DS-FANA, the LEDs of ACT only have On/Off status.

For service boards DS-LGPA, the LED of ACT only has On/Off/ Flashing Quickly status

| LED | Indication |
|-----------|--|
| ACT | <p>Green On: The unit works properly.</p> <p>Green Flashing Slowly and then Quickly: The device is being reset to the default settings.</p> <p>Green Flashing Quickly: The device is upgrading.</p> <p>Off: The unit is powered off or power supply is abnormal.</p> |
| ALM | <p>Red On: The unit has an alarm.</p> <p>For the main control unit: It is detected that the fan unit is pulled out, or the temperature of the main control unit/power supply exceeds the standard, or the ALM port is detected to be triggered.</p> <p>For the fan unit: The fan rotates abnormally due to aging, stall, etc.</p> <p>For the service board: The connection with the main control unit is disconnected, or the temperature of the service board chip exceeds the standard.</p> <p>Off: There is no alarm.</p> |
| MS | <p>Green On: This unit is in the main state.</p> <p>Off: This unit is in the backup state.</p> |
| PON | <p>Green On: The PON port is registered with ONU and the connection is normal.</p> <p>Green Flashing: Running and transmitting or receiving data.</p> <p>Off: The PON port has no ONU registration.</p> |
| SFP+ | <p>Green On: Running at 10 Gbps, but no activity.</p> <p>Green Flashing: Running at 10 Gbps and transmitting or receiving data.</p> <p>Yellow On: Running at 1 Gbps, but no activity.</p> <p>Yellow Flashing: Running at 1 Gbps and transmitting or receiving data.</p> <p>Off: No device is linked to the corresponding port.</p> |
| GE / MGMT | <p>Green On: Running at 1 Gbps, but no activity.</p> <p>Green Flashing: Running at 1 Gbps and transmitting or receiving data.</p> <p>Yellow On: Running at 10/100 Mbps, but no activity.</p> <p>Yellow Flashing: Running at 10/100 Mbps and transmitting or receiving data.</p> <p>Off: No device is linked to the corresponding port.</p> |

LEDs For DS-PSUA

| LED | Indication |
|-----|--|
| ACT | <p>Green On: The power supply module is powered by AC and the output voltage is within the normal range (38.4V~57.6V).</p> <p>Off: The power supply is abnormal.</p> |
| ALM | <p>Red On: The power supply module is powered by DC and the output voltage is within the normal range (38.4V~57.6V).</p> <p>Red Flashing: The power supply has warnings, which may be due to: power module over-temperature warning, DC under-voltage warning, DC over-voltage warning, DC over-current warning, communication failure between the power supply and the main control board, etc.</p> <p>Off: There is no alarm.</p> |

Grounding Terminal

- Connection of grounding points: Before powering on the device, make sure to use the 12AWG protective ground wire in the accessories to connect the ground point of rack-mounting brackets to the ground point of the cabinet.
- The device already comes with lightning protection mechanism. You can also ground the device through the PE (Protecting Earth) cable of AC cord or with Ground Cable. For detailed lightning protection measures, refer to the **Lightning Protection Guide** from the website: https://www.tp-link.com/us/configuration-guides/lightning_protection_guide/.

AC Power Socket

Plug the negative connector of the power cord directly into the AC power socket and plug the positive connector into an AC power outlet. Make sure that the voltage of the power supply meets the requirement of the input (100-240V~ 50/60Hz).

DC Power Input

The DC power input can only be powered by the battery. We recommend that you use the 12AWG wire provided in the package content. Connect the positive pole of the DC power supply to the "BAT+" end, and the negative pole to the "BAT-" end. Make sure the power supply meets the requirement of the input (-38.4— -57.6V). An all-pole mains switch in accordance with EN 62368-1 2014 Annex L shall be incorporated in the electrical installation of the building. And the disconnect device shall have a contact separation at least 1.5mm.

Main Power Supply / Backup Power Supply

There is a power supply module on DS-P8000-X2, which supports AC and DC inputs simultaneously, with AC as the main and DC as the backup. The main power supply takes priority over the backup one. If the main one works normally, the backup one does not work. If the main one fails, the backup one starts to work.



Caution:

It is strictly forbidden to plug or unplug the power module with power on, as this may cause personal injury.



Note:

For detailed information about power supply modules, refer to the Installation Guide of Power Supply Modules, which can be found on the Support page of the product at our website.



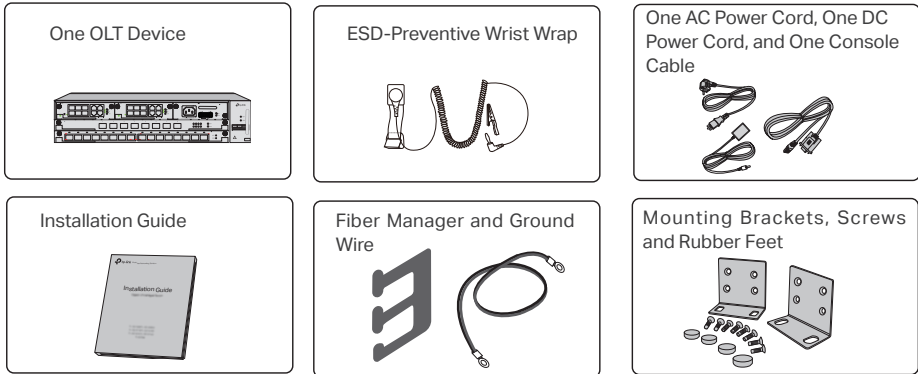
Rotating fan blades!

Cut fingers when operating the fan board!
After pulling out the fan board, wait four seconds
to make it down to MS1 level before operating!

Chapter 2 Installation

2.1 Package Contents

Make sure that the package contains the following items. Please contact your distributor, if any of the listed items is damaged or missing. The figures are for demonstration only. The actual items may differ in appearance and quantity from the depicted.



2.2 Safety Precautions

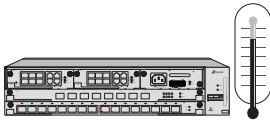
To avoid any device damage and bodily injury caused by improper use, you should observe the following rules.

■ Safety Precautions

- When the fan board is running, do not touch the fan blades; after the fan board is pulled out, the fan blades will still rotate for a period of time, and it is forbidden to touch immediately after pulling out.
- It is forbidden to touch the board with bare hands. When operating the board, you must wear anti-static gloves or an ESD-preventive wrist wrap (which needs to be connected to the ESD-preventive jack of the chassis).
- Keep the power off during the installation.
- Wear an ESD-preventive wrist strap, and make sure that the wrist strap has a good skin contact and is well grounded.
- Use only the power cord provided with the device.
- Make sure that the supply voltage matches the specifications indicated on the rear panel of the device.
- Ensure that the device is installed in a well-ventilated environment and its ventilation hole is not blocked.
- Do not open or remove the cover of the device.
- Before cleaning the device, cut off the power supply. Do not clean it by the waterish cloth, and never use any other liquid cleaning method.
- Place the device with its bottom surface downward.

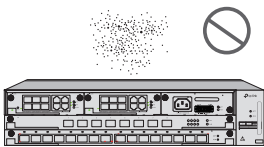
Site Requirements

Temperature/Humidity



Keep the equipment room at an appropriate level of temperature and humidity. Too much or too little humidity may lead to bad insulation, leakage of electricity, mechanical property changes, and corrosion. High temperatures may accelerate aging of the insulation materials, significantly shortening the service life of the device. To find out the best temperature and humidity conditions for the device, check the Appendix B Specifications.

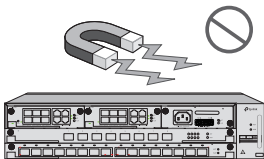
Clearness



The dust accumulated on the device can be absorbed by static electricity and result in poor contact of metal contact points. Some measures have been taken for the device to prevent static electricity, but too strong static electricity can cause deadly damage to the electronic elements on the internal circuit board. To avoid the effect of static electricity on the operation of the device, attach much importance to the following items:

- Dust the device regularly, and keep the indoor air clean.
- Keep the device well grounded and ensure that the static electricity has been transferred.

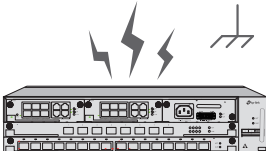
Electromagnetic Interference



Electronic elements including capacitance and inductance on the device can be affected by external interferences, such as conducted emission by capacitance coupling, inductance coupling, and impedance coupling. To decrease the interferences, make sure to take the following measures:

- Use the power supply that can effectively filter interference from the power grid.
- Keep the device far from high-frequency and strong-current devices such as radio transmitting station.
- Use electromagnetic shielding when necessary.

Lightning Protection



Extremely high voltage currents can be produced instantly when lightning occurs and the air in the electric discharge path can be instantly heated up to 20,000 °C. As this instant current is strong enough to damage electronic devices, more effective lightning protection measures should be taken.

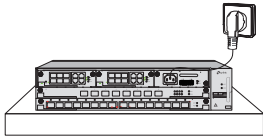
- Ensure that the rack and the device are well earthed.
- Make sure the power socket has a good contact with the ground.
- Keep a reasonable cabling system and avoid induced lightning.
- Use the signal SPD (Surge Protective Device) when wiring outdoor.



Note:

For detailed lightning protection measures, refer to the **Lightning Protection Guide** from the website:
https://www.tp-link.com/us/configuration-guides/lightning_protection_guide/.

Installation Site



When installing the device on a rack or a flat workbench, attach much importance to the following items:

- The rack or workbench is flat, stable, and sturdy enough to support the weight of 10 kg at least.
- The rack or workbench has a good ventilation system. The equipment room is well ventilated.
- The rack is well grounded. Keep the device less than 1.5 meters away from the power socket.

2.3 Installation Tools

- Phillips screwdriver
- ESD-preventive wrist wrap
- Cables



Note:

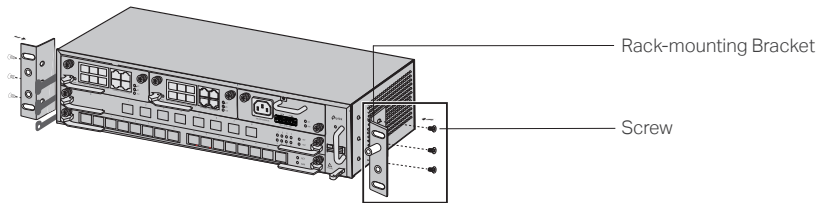
The Phillips screwdriver and cables are not included with our product. If needed, you can purchase them separately.

2.4 Product Installation

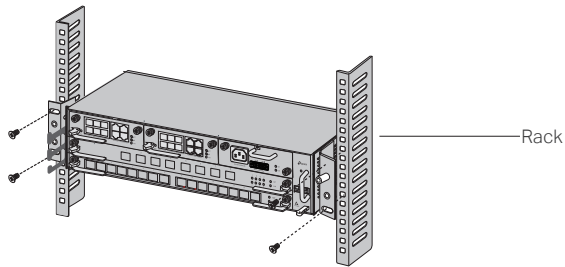
To install the device in an EIA standard-sized, 19-inch rack, follow the instructions described below:

1. Check the efficiency of the grounding system and the stability of the rack.

2. Before installing the brackets, you need to install the fiber manager.
3. Secure the supplied rack-mounting brackets to each side of the device with supplied screws, as illustrated in the following figure.



4. Since the product is heavy, it is necessary to install joists on the rack first, so that the brackets and product can be secured later. After the brackets are attached to the device, use suitable screws to secure the brackets to the rack, as illustrated in the following figure.



5. After installing the product, you need to install the protective grounding wire. Use the 12AWG protective grounding wire in the accessories to connect the grounding point of the brackets to the grounding point of the cabinet.



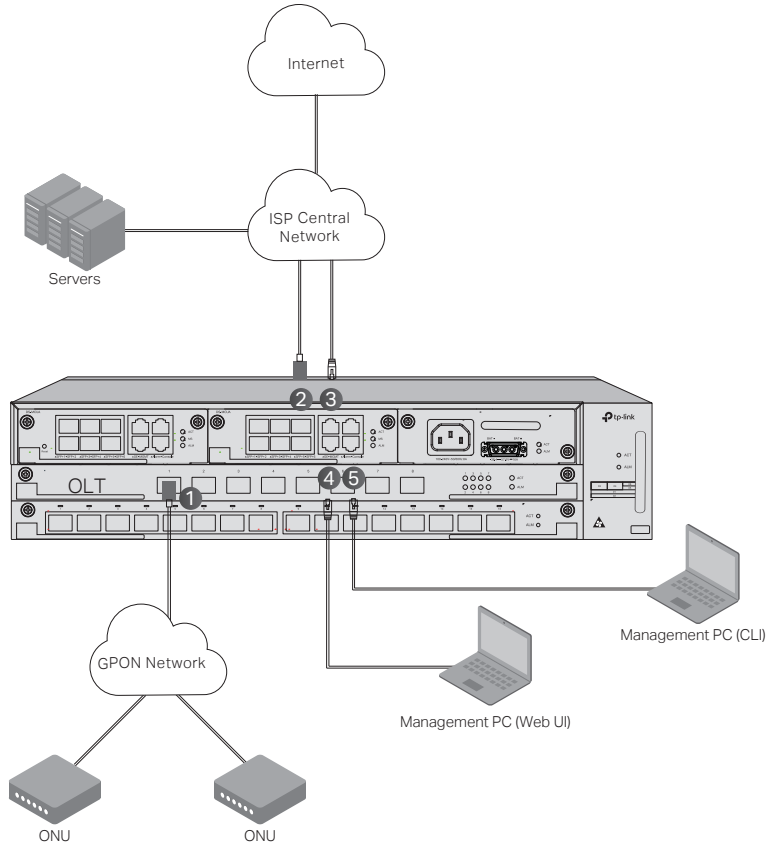
Caution:

- Leave 5 to 10 cm gaps around the devices for air circulation.
- Avoid placing heavy things on the device.
- Place the device with its bottom facing downwards.
- Mount devices in sequence from the bottom to top of the rack and ensure a certain clearance between devices for the purpose of heat dissipation.

Chapter 3 Connection

3.1 Port Connection

Connect the ports of OLT to the devices and networks according to your needs. Some options for port connection are demonstrated in the following figure. We take DS-P8000-X2 as an example of OLT devices.



- ❶ Install the OLT SFP module to the PON port and connect it to the PON network using an optical cable.
- ❷ Install the 10 Gbps SFP+ module to the SFP+ port and connect it to the ISP central network using an optical cable.
- ❸ Connect the GE port to the ISP central network using an Ethernet cable.
- ❹ Connect the MGMT port to the management PC using an Ethernet cable in order to configure and monitor the device via the web UI.
- ❺ Connect the Console port to the management PC using an RJ45 console cable in order to configure and monitor the device via the CLI.

3.2 Verify Installation

After completing the installation, verify the following items:

- There should be 5 to 10 cm of clearance around the device for ventilation and make sure the air flow is adequate.
- The voltage of the power supply meets the requirement of the input voltage of the device.
- The power socket, device and rack are well grounded.
- The device is correctly connected to other network devices.
- A dummy panel must be installed in the empty slot. After the dummy panel is pulled out, if the board is not inserted in the corresponding slot, it should be inserted back in time.

3.3 Power On

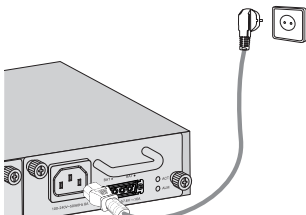


Note:

- You can use either AC or DC power supply to power the device. However, it is recommended to use both AC and DC power supply simultaneously as backup for each other in case of power failure.
- For DS-P8000-X2, the AC power supply takes priority over the DC power supply. If the AC power supply works normally, the DC power supply does not work. If the AC power supply fails, the DC power supply starts to work.

Using AC Power Supply

Plug the female connector of the provided power cord into the power socket of the device, and the male connector into a power outlet with earthing connection. Make sure that the voltage of the power supply meets the requirement of the input (100-240V~ 50/60Hz). In the following figure, we take DS-P8000-X2 as an example. Your device may differ in appearance from the depicted.



Caution:

For AC power supply, please use the provided AC power cord.

Using DC Power Supply

Connect the power cord

The DC side of the power module is powered by the battery instead of the DC power grid, and cannot be connected to the DC power grid (DC Mains). It is recommended to use an 12 AWG power cord to connect the power supply equipment and the DC power input of the device, and make sure that the connection is reliable. When connecting, make sure that the positive and negative poles of the power supply equipment correspond to the positive and negative poles of the device, and that the power supply meets the requirement of the input. An all-pole mains switch in accordance with EN 62368-1 2014 Annex L shall be incorporated in the electrical installation of the building. And the disconnect device shall have a contact separation at least 1.5mm.

**Caution:**

For DC power supply, please use the provided DC power cord.

3.4 Initialization

After the device is powered on, it begins the Power-On Self-Test. A series of tests run automatically to ensure the device functions properly. During this time, its LED indicators will respond as follows:

1. For DS-MCUA: When the device is powered on, the ACT LED is always on, and all other LEDs are briefly on and then off. After the initial process succeeds, the MS LED of one of the DS MCUAs keeps on.
2. For DS-LGPA: When the device is powered on, the ACT LED is always on, and all other LEDs are briefly on and then off. After the initial process succeeds, the ALM LED will light up according to the actual situation. (If the main control unit is not inserted or the service board is not inserted in place, etc., the ALM LED will light up.)
3. For DS-FANA / DS-PSUA: When the device is powered on, the ACT LED is always on, and the ALM LED is briefly on and then off.

Chapter 4 Configuration

The device supports three configuration options:

- Via the MGMT Port
- Via the SFP+/GE Port
- Via the Console Port

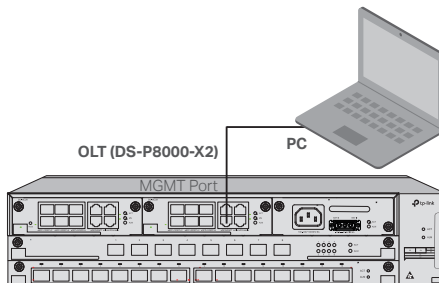


Note:

For the detailed configurations, refer to the User Guide of the device. We take DS-P8000-X2 as an example of OLT devices in the following figures.

4.1 Via the MGMT Port

1. Connect the MGMT port of OLT to the management PC using an Ethernet cable.



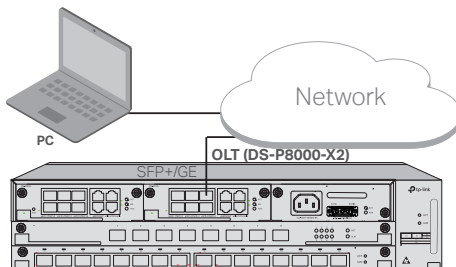
2. Set the IP address of the PC as **192.168.1.x/24** (x is a number between 2 and 254).

3. You can access the device using the Web UI or the CLI.

- **Using the Web UI:** Open the web browser on the PC. Enter **192.168.1.1** in the address bar to open the web UI of the device. Log in to the web UI. The default username and password are both **admin**. The first time you log in, you are required to change the password for security purposes.
- **Using the CLI:** Use a telnet or SSH terminal to access **192.168.1.1** to open the CLI of the device. Log in to the CLI. The default username and password are both **admin**. The first time you log in, you are required to change the password for security purposes.

4.2 Via the SFP+/GE Port

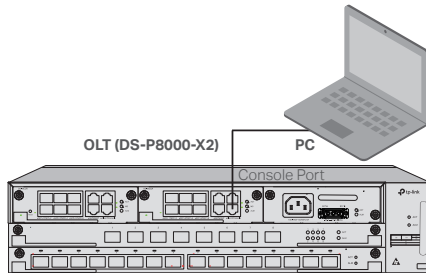
1. Make sure your PC has network access to the SFP+/GE port of OLT.



2. Set the IP address of the PC as **192.168.0.x/24** (x is a number between 2 and 254).
3. You can access the device using the Web UI or the CLI.
 - **Using the Web UI:** Open the web browser on the PC. Enter **192.168.0.1** in the address bar to open the web UI of the device. Log in to the web UI. The default username and password are both **admin**. The first time you log in, you are required to change the password for security purposes.
 - **Using the CLI:** Use a telnet or SSH terminal to access **192.168.0.1** to open the CLI of the device. Log in to the CLI. The default username and password are both **admin**. The first time you log in, you are required to change the password for security purposes.

4.3 Via the Console Port

1. Connect the Console port of OLT to the management PC using an RJ45 console cable.



2. Start the terminal emulation program (such as the Hyper Terminal) on the PC and configure the terminal emulation program as follows:

| Baud Rate | Data Bits | Parity | Stop Bits | Flow Control |
|-----------|-----------|--------|-----------|--------------|
| 38400 bps | 8 | None | 1 | None |

Appendix A Troubleshooting

Q1. What could I do if I forgot the username and password of the device?

You can reset the device by holding the reset button for more than 5 seconds. Note that all the configurations will be lost after resetting the device.

Q2. Why does the ACT LED work abnormally?

The ACT LED should be lit up when the power system works normally. If the ACT LED worked abnormally, take the following steps:

1. Make sure that the power cable is connected properly, and the power contact is normal.
2. Make sure the voltage of the power supply meets the requirement of the input voltage of the device.

Q3. What should I do if I cannot access the web management page?

Try the following:









1. Check every port LED on the device and make sure the Ethernet cable is connected properly.
2. Try another port on the device and make sure the Ethernet cable is suitable and works normally.
3. Power off the device and, after a while, power it on again.
4. Make sure the IP address of your PC is set within the subnet of the device.
5. If you still cannot access the configuration page, reset the device to its factory defaults. Note that all the configurations will be lost after resetting the device.

Appendix B Specifications

| Item | Content |
|-----------------------|--|
| Standards | IEEE 802.3, IEEE 802.3i, IEEE 802.3u, IEEE 802.3ab, IEEE 802.3ad, IEEE 802.3ae, IEEE 802.3z, IEEE 802.3x, IEEE 802.1p, IEEE 802.1q, IEEE 802.1d, IEEE 802.1s, IEEE 802.1w, IEEE 802.1ah, ITU G.984, ITU G.988 |
| Transmission Medium | 10BASE-T: UTP category 3 or above cable (maximum 100 m), EIA/TIA-568 100Ω STP (maximum 100 m) 100BASE-TX: UTP category 5 or above cable (maximum 100 m), EIA/TIA-568 100Ω STP (maximum 100 m) 1000BASE-T: UTP category 5e or above cable (maximum 100 m), EIA/TIA-568 100Ω STP (maximum 100 m) 1000BASE-SX/LX/LX10/BX10: MMF, SMF 10GBASE-SR/LR: MMF, SMF 10GSFP+CU SFP+ Direct Attach Cable (TXC432-CU1M, TXC432-CU3M) GPON SFP |
| Operating Temperature | 0 °C to 50 °C (32 °F to 122 °F) |

| | |
|---------------------|------------------------------------|
| Storage Temperature | -40 °C to 70 °C (-40 °F to 158 °F) |
| Operating Humidity | 10% to 90% RH Non-condensing |
| Storage Humidity | 5% to 90% RH Non-condensing |
| Altitude | Sea level to 4,000 m |

Appendix C Explanations of The Symbols

| | |
|---|---|
|  | Indoor use only |
|  | DC voltage |
|  | AC voltage |
|  | <p>RECYCLING</p> <p>This product bears the selective sorting symbol for Waste electrical and electronic equipment (WEEE). This means that this product must be handled pursuant to European directive 2012/19/EU in order to be recycled or dismantled to minimize its impact on the environment.</p> <p>User has the choice to give his product to a competent recycling organization or to the retailer when he buys a new electrical or electronic equipment.</p> |
|  | Caution |
|  | Operator's manual |
|  | Caution, risk of electric shock |
|  | <p>Caution, moving fan blades</p> <p>To indicate the instructional safeguard to keep away from moving fan blades.</p> <p>In case of application as a warning sign the rules according to ISO 3864 shall be adhered to.</p> |

EU Declaration of Conformity

TP-Link hereby declares that the device is in compliance with the essential requirements and other relevant provisions of directives 2014/30/EU, 2014/35/EU, 2011/65/EU and (EU)2015/863.

The original EU Declaration of Conformity may be found at <https://www.tp-link.com/en/support/ce/>

UK Declaration of Conformity

TP-Link hereby declares that the device is in compliance with the essential requirements and other relevant provisions of the Electromagnetic Compatibility Regulations 2016 and Electrical Equipment (Safety) Regulations 2016.

The original UK Declaration of Conformity may be found at <https://www.tp-link.com/support/ukca>

EAC



Продукт сертифіковано згідно з правилами системи УкрСЕПРО на відповідність вимогам нормативних документів та вимогам, що передбачені чинними законодавчими актами України.

Safety Information

- Keep the device away from water, fire, humidity or hot environments.
- Do not attempt to disassemble, repair, or modify the device. If you need service, please contact us.
- Place the device with its bottom surface downward.
- The connector on the power supply cord is used as the disconnect device, the socket-outlet shall be easily accessible.
- To avoid damage to the power supply module and the equipment and bodily injury, the product can only be used by instructed persons.
- The equipment must not be used in locations where children are likely to be present.

Please read and follow the above safety information when operating the device. We cannot guarantee that no accidents or damage will occur due to improper use of the device. Please use this product with care and operate at your own risk.