

Lysora L7Pro Access Point

Installation Guide

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Preface

Intended Audience

This document is intended for:

- Network engineers
- Technical support and servicing engineers
- Network administrators

Technical Support

- Official website: <https://www.lysoratech.com/support>
- Community: <https://community.lysoratech.com>
- Technical support email: support@lysoratech.com

Conventions

1. Symbols

The symbols that may be found in this document are described as follows:

Danger

An alert that calls attention to critical guidelines which, if not understood or followed, can result in personal injury.

Warning

An alert that calls attention to important information which, if not understood or followed, can result in data loss or equipment damage.

Caution

An alert that calls attention to essential information which, if not understood or followed, can result in functional failure or performance degradation.

Note

An alert that indicates additional or supplementary information.

 Specification

An alert that indicates a description of product or version support.

2. Notes

This document provides installation steps, troubleshooting, technical specifications, and usage guidelines about cables and connectors. It is intended for users who want to understand the above and have extensive experience in network deployment and management, and assume that users are familiar with related terms and concepts.

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1 Product Overview

1.1 About the L7Pro

The L7Pro (HVIN: L2538) is a tri-band IEEE 802.11be-compliant Wi-Fi 7 wireless access point (AP) launched by Lysora for general education, higher education, government, finance, business, and other indoor high density scenarios. Supporting 2.4 GHz, 5 GHz and 6 GHz frequency bands, it delivers a data rate of up to 13.346 Gbps.

1.1 Product Appearance

1.1.1 Front Panel

Figure 1-1 Front Panel



1.1.2 Rear Panel

Figure 1-2 Rear Panel

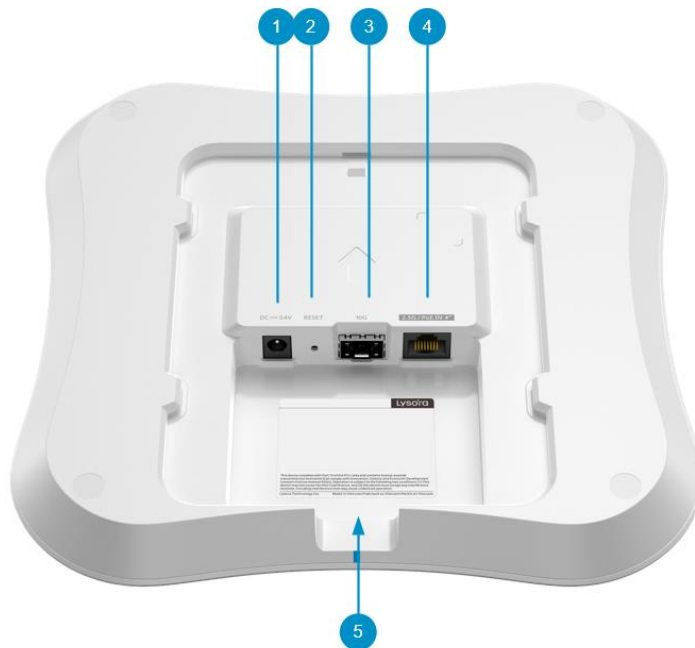


Table 1-1 Ports, Buttons, and Label on the Rear Panel

No.	Item	Description
1	DC power connector	Supplies power to the AP, with a power supply specification of DC 54 V
2	Reset button	Press and hold for less than 2 seconds: Restart the device.
		Press and hold for more than 5 seconds: Restore the device to factory settings.
3	SFP+ port	1G/10G BASE-X SFP+ optical port (SFP+ optical transceiver module is optional)
4	LAN/2.5G/PoE port	100/1000/2500 BASE-T port with auto-negotiation, supporting PoE input
5	Label	The label is at the bottom of the device.

1.1.3 LED

Figure 1-3 L7Pro Access Point LED



Table 1-2 LEDs

No.	Status	Description
1	Solid blue	The device is working properly.
	Off	The device is not receiving power.
	Fast blinking blue	The device is starting up.
	Blinking blue (one blink per 2 seconds)	The device is not connected to the Internet.
	Blinking blue twice	Possible cases: ● The device is resetting. ● The device is recovering.  Caution Do not power off the device when the LED is in this state.

No.	Status	Description
	Solid blue (one long blink and three short blinks)	Other faults have occurred.

1.2 Technical Specifications

Table 1-3 Technical Specifications

Category	Item	Description
Wi-Fi Radio	Radio design	Tri-radio 8 spatial streams ● 2.4 GHz: 2 x 2, MU-MIMO ● 5 GHz: 3 x 3, MU-MIMO ● 6 GHz: 3 x 3, MU-MIMO
	5 GHz Wi-Fi	Wi-Fi 4 (IEEE 802.11a/n) Wi-Fi 5 (IEEE 802.11ac) Wi-Fi 6 (IEEE 802.11ax) Wi-Fi 7 (IEEE 802.11be)
	2.4 GHz Wi-Fi	Wi-Fi 4 (IEEE 802.11b/g/n) Wi-Fi 6 (IEEE 802.11ax) Wi-Fi 7 (IEEE 802.11be)
	Operating band	IEEE 802.11b/g/n/ax/be, 2.400 GHz to 2.4835 GHz IEEE 802.11a/n/ac/ax/be, 5.150 GHz to 5.350 GHz, 5.470 GHz to 5.725 GHz, 5.725 GHz to 5.850 GHz IEEE 802.11a/ax/be, 5.925 GHz to 7.125 GHz

Category	Item	Description
		 Note Available bands vary with countries and regions. To use the preceding frequency bands, ensure that your country or region supports these frequency bands.
	Wireless data rate	2.4 GHz: 688 Mbps 5 GHz: 4323 Mbps 6 GHz: 8646 Mbps Maximum wireless data rate: 13657 Mbps
	Modulation	OFDM: BPSK @ 6/9 Mbps, QPSK @ 12/18 Mbps, 16-QAM @ 24 Mbps, and 64-QAM @ 48/54 Mbps DSSS: DBPSK @ 1 Mbps, DQPSK @ 2 Mbps, and CCK @ 5.5/11 Mbps MIMO-OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM, and 4096-QAM OFDMA
	Receive sensitivity	11b: -91 dBm (1 Mbps), -88 dBm (5.5 Mbps), -85 dBm (11 Mbps) 11a/g: -89 dBm (6 Mbps), -80 dBm (24 Mbps), -76 dBm (36 Mbps), -71 dBm (54 Mbps) 11n: -83 dBm (MCS0), -65 dBm (MCS7), -83 dBm (MCS8), -65 dBm (MCS15) 11ac: 20 MHz: -83 dBm (MCS0), -57 dBm (MCS9) 11ac: 40 MHz: -79 dBm (MCS0), -57 dBm (MCS9) 11ac: 80 MHz: -76 dBm (MCS0), -51 dBm (MCS9) 11ac: 160 MHz: -76 dBm (MCS0), -50 dBm (MCS9) 11ax: 20 MHz: -85 dBm (MCS0), -58 dBm (MCS11)

Category	Item	Description
		11ax: 40 MHz: -82 dBm (MCS0), -54 dBm (MCS11) 11ax: 80 MHz: -79 dBm (MCS0), -52 dBm (MCS11) 11ax: 160 MHz: -76 dBm (MCS0), -49 dBm (MCS11) 11be: 20 MHz: -85 dBm (MCS0), -52 dBm (MCS13) 11be: 40 MHz: -82 dBm (MCS0), -49 dBm (MCS13) 11be: 80 MHz: -82 dBm (MCS0), -46 dBm (MCS13) 11be: 160 MHz: -79 dBm (MCS0), -44 dBm (MCS13) 11be: 320 MHz: -76 dBm (MCS0), -41 dBm (MCS13)
	Maximum transmit power	Frequency bands and maximum Effective Isotropic Radiated Power (EIRP):  Note Country specific restrictions apply. ● European Union & United Kingdom ○ 2400 – 2483.5 MHz, EIRP ≤ 20 dBm ○ 5150 – 5350 MHz, EIRP ≤ 23 dBm ○ 5470 – 5725 MHz, EIRP ≤ 30 dBm ○ 5945 – 6425 MHz, EIRP ≤ 23 dBm ● United States: ○ 2400 – 2483.5 MHz, max output power ≤ 30 dBm & EIRP ≤ 36 dBm ○ 5150 – 5250 MHz, max output power ≤ 30 dBm & EIRP ≤ 36 dBm ○ 5250 – 5350 MHz, max output power < 24 dBm & EIRP ≤ 30 dBm

Category	Item	Description
		○ 5470 – 5725 MHz, max output power < 24 dBm & EIRP ≤ 30 dBm ○ 5725 – 5850 MHz, max output power ≤ 30 dBm & EIRP ≤ 36 dBm ○ 5925 – 7125 MHz, EIRP ≤ 30 dBm ● Thailand: ○ 2400 – 2483.5 MHz, EIRP ≤ 20 dBm ○ 5150 – 5350 MHz, EIRP ≤ 23 dBm ○ 5470 – 5725 MHz, EIRP ≤ 30 dBm ○ 5725 – 5825 MHz, EIRP ≤ 30 dBm ○ 5945 – 6425 MHz, EIRP ≤ 23 dBm
Antenna	Antenna	2.4 GHz: 2 built-in omnidirectional antennas 5 GHz: 3 built-in omnidirectional antennas 6 GHz: 3 built-in omnidirectional antennas
	Antenna gain	2.4 GHz: ● ANT1: 3.99dBi ● ANT2: 3.99dBi 5 GHz: ● ANT1: 6.98dBi ● ANT2: 6.98dBi ● ANT3: 6.98dBi 6 GHz: ● ANT1: 6.99dBi ● ANT2: 6.99dBi ● ANT3: 6.99dBi
Dimensions and Weight	Product dimensions (W x D x H)	220 mm x 220 mm x 45 mm (8.66 in. x 8.66 in. x 1.77 in.) (excluding the mounting bracket)

Category	Item	Description
	Weight	≤ 1.1 kg (2.43 lbs.) (without packaging materials)
	Shipping weight	≤ 1.44 kg (3.17 lbs.)
	Color	White
Interface Specifications	Service Ports	● 1 x 10/100/1000/2500BASE-T port ● 1x 10GE SFP+ port
	LEDs	1 x system status LED
Power Supply and Consumption	Power Supply	● DC power adapter ● PoE+/PoE++ Note: If both the DC power adapter and PoE+/PoE++ are available for power supply, the DC power adapter is preferred.
	PoE In standard	● IEEE 802.3at (PoE+) ● IEEE 802.3bt (PoE++)
	Maximum power consumption	30 W
Environment and Reliability	Operating temperature	0°C to +40°C (32°F to +104°F)
	Storage temperature	-40°C to +70°C (-40°F to +158°F)
	Operating humidity	5% RH to 95% RH (non-condensing)
	Storage humidity	5%RH to 95% RH (non-condensing)

Category	Item	Description
	Mounting options	Ceiling/Wall
	Surge protection	Ethernet port: ± 2 kV for common mode
	Cooling	Natural cooling
	MTBF	400,000 hours
Certification and Regulatory Compliance	RoHS	Yes
	Certification	FCC, IC

1.3 Power Supply Technical Specifications

The L7Pro can be powered by the DC power supply or PoE.

- When a DC power adapter is used for power supply, the power adapter with a voltage of 54 V and a current of 0.55 A or higher provided by Lysora needs to be used, which needs to be purchased separately from Lysora.
- When the AP is powered by PoE, the Ethernet cable must be connected to the LAN/2.5G/PoE port of the AP, and the other end of the Ethernet cable must be connected to the PoE-capable switch port or a PoE power sourcing equipment. Ensure that the power sourcing equipment supports IEEE 802.3at.

1.4 Cooling

The L7Pro adopts a fanless design.

 Caution

Ensure that there is sufficient space around the AP for heat dissipation.

2 Preparing for Installation

2.1 Safety Precautions

Note

- To avoid personal injury and device damage, review the safety guidelines in this chapter before you begin the installation.
 - The following safety precautions may not include all the potentially hazardous situations.
-

2.1.1 Safety Precautions

- Do not expose the AP to high temperature, dusts, or harmful gases. Do not install the AP in an inflammable or explosive environment. Keep the AP away from Electro-Magnetic Interference (EMI) sources such as large radar stations, radio stations, and substations. Do not subject the AP to unstable voltage, vibration, and noises.
- The installation site should be dry. You are not advised to install the AP in a place near the sea. Keep the device at least 500 meters (1,640.41 ft.) away from the ocean and do not face it towards the sea breeze.
- The installation site should be free from water flooding, seepage, dripping, or condensation. The installation site should be selected according to communication network planning and technical requirements for communication equipment, and considerations such as climate, hydrology, geology, earthquake, electrical power, and transportation.
- The product and power supply equipment can only be installed and used in the same building.

Caution

Follow the installation instructions in the user manual to correctly install or remove the AP.

2.1.2 Handling Safety

- After the AP is installed, avoid handling it frequently.
- Turn off all power supplies and unplug all power cables before you handle the AP.

2.1.3 Electrical Safety

Warning

- Improper or incorrect electric operations may cause a fire, electric shock, and other accidents, and lead to severe and fatal personal injury and device damage.
 - Direct or indirect contact through wet objects with high voltage or mains power supply may be fatal.
-

- Always observe the local regulations and standards. Only trained and qualified personnel should be allowed to operate the AP.
- Check potential risks in the work area, such as wet floor.
- Find out the position of the indoor emergency power switch before installation. Cut off the power supply in case of accidents.
- Make sure that the AP is powered off when you cut off the power supply.
- Do not place the AP in a wet position, and keep it away from liquid.
- Keep the AP far away from grounding or lightning protection devices for power equipment.
- Keep the AP away from radio stations, radar stations, high-frequency and high-current devices, microwave ovens, and other high-power wireless devices.

2.1.4 Laser Safety

A device with an optical port usually supports multiple types of optical transceivers, all of which are Class I laser products. Pay attention to the following during the use of optical transceivers:

- When an optical transceiver is in operation, ensure that its port is connected to an optical fiber or covered by a dust cap to keep out dust and prevent it from burning your eyes.
- When an optical transceiver is in operation, do not look into its port after removing the

optical fiber. Doing so may result in eye injury.

Figure 2-1 Laser Product Warning



Warning

Do not approach or look directly into any optical port under any circumstances. This may cause permanent damage to your eyes.

2.2 Installation Site Requirements

The L7Pro must be used indoors. For normal operation and prolonged service life of the access point, the installation site must meet the following requirements.

2.2.1 Bearing

Ensure that the installation site is firm enough to support the weight of the L7Pro and its accessories.

2.2.2 Space

- The AP should be installed in an open environment if possible. If the AP is to be installed in an enclosed environment, ensure that a good ventilation and heat dissipation system is available.
- Ensure that the installation site has sufficient space for heat dissipation.

2.2.3 Ventilation

The L7Pro adopts natural cooling. When installing the AP, ensure that there is sufficient space in front, back, left, and right of the AP for heat dissipation.

2.2.4 Temperature and Humidity

To ensure that the L7Pro works properly and has a long service life, maintain a proper temperature and humidity in the working environment. Improper room temperature and humidity can cause damage to the AP.

- High relative humidity may affect insulation materials, resulting in poor insulation and even electrical leakage. Sometimes it may lead to changes in the mechanical properties of materials and corrosion of metal parts.
- Low relative humidity can dry and shrink insulation sheets and cause static electricity that can damage the circuitry.
- High temperatures greatly reduce device reliability and shorten service life.

2.2.5 Cleanliness

Dust poses a major threat to the device. The indoor dust can cause electrostatic adhesion when falling on the device, causing poor contact of the metallic joint. Such electrostatic adhesion occurs more easily when the indoor relative humidity is low, not only affecting the service life of the device, but also causing communication failure easily. The following table lists the requirements on the dust content and diameter in the equipment room.

Table 2-1 Dust and Particles

Particle Size	Unit	Content
$\geq 0.5 \mu\text{m}$	Particles/ m^3	$\leq 1.4 \times 10^7$
$\geq 1 \mu\text{m}$	Particles/ m^3	$\leq 7 \times 10^5$
$\geq 3 \mu\text{m}$	Particles/ m^3	$\leq 2.4 \times 10^5$
$\geq 5 \mu\text{m}$	Particles/ m^3	$\leq 1.3 \times 10^5$

Apart from dust, the salt, acid, and sulfide in the air of the equipment room must meet strict requirement. These harmful substances will accelerate metal corrosion and component aging. The equipment room should be protected from harmful gases (such as sulfur dioxide, hydrogen sulfide, nitrogen dioxide, ammonia, and chlorine). The following table lists the limits of harmful gases in the equipment room.

Table 2-2 Hazardous Gases

Gas	Average (mg/m ³)	Maximum (mg/m ³)
Sulfur dioxide (SO ₂)	0.2	1.5
Hydrogen sulfide (H ₂ S)	0.006	0.03
Nitrogen dioxide (NO ₂)	0.04	0.15
Ammonia gas (NH ₃)	0.05	0.15
Chlorine gas (Cl ₂)	0.01	0.3

 Note

The average value is measured over one week. The maximum value is the upper limit of the harmful gas measured in one week for up to 30 minutes every day.

2.2.6 EMI

- Keep the AP as far away from the grounding equipment of the power device and the lightning prevention equipment as possible.
- Keep the device away from radio stations, radar stations, high-frequency and high-current devices, microwave ovens, and other high-power wireless devices.

2.3 Tools

Table 2-3 Tools

Common Tools	Phillips screwdriver, cables, fastening bolts, diagonal plier, cable ties
Special Tools	ESD gloves, wire stripper, crimping plier, RJ45 crimping plier, wire cutter, and waterproof adhesive tape
Meters	Multimeter and bit error rate tester (BERT)

 Note

A tool kit is not supplied. You need to prepare the tools by yourself.

3 Installing the AP

The L7Pro must be installed indoors, and used in a fixed place.

 Caution

Before installing the AP, make sure that you have carefully read the requirements described in Chapter 2.

3.1 Before You Begin

Before installing the L7Pro, carefully plan and arrange the installation location, networking mode, power supply, and cabling. Confirm the following requirements before installation:

- The installation site should provide sufficient space for heat dissipation.
- The installation site meets the temperature and humidity requirements of the AP.
- The power supply and required current are available in the installation site.
- The selected power supply modules meet the system power requirements.
- The installation site meets the cabling requirements of the AP.
- The installation site meets the site requirements of the AP.
- The customized AP meets the client-specific requirements.

3.2 Safety Precautions During Installation

To ensure the normal operation and prolonged service life of the AP, observe the following safety precautions:

- Do not power on the AP during installation.
- Place the AP in a well-ventilated environment.
- Do not expose the AP to high temperature.
- Keep the AP away from high-voltage power cables.
- Install the AP indoors.

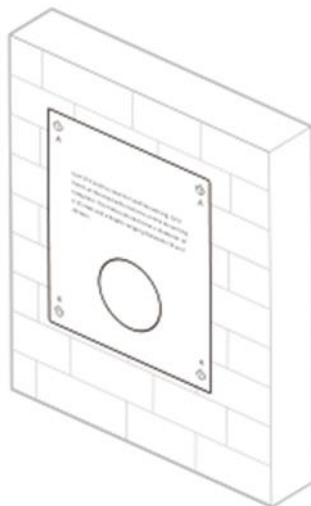
- Do not expose the AP to a thunderstorm or strong electric field.
- Keep the AP clean and dust-free.
- Cut off the power supply before cleaning the AP.
- Do not wipe the AP with a damp cloth.
- Do not wash the AP with liquid.
- Do not open the enclosure when the AP is working.
- Secure the AP properly.

3.3 Installing the AP

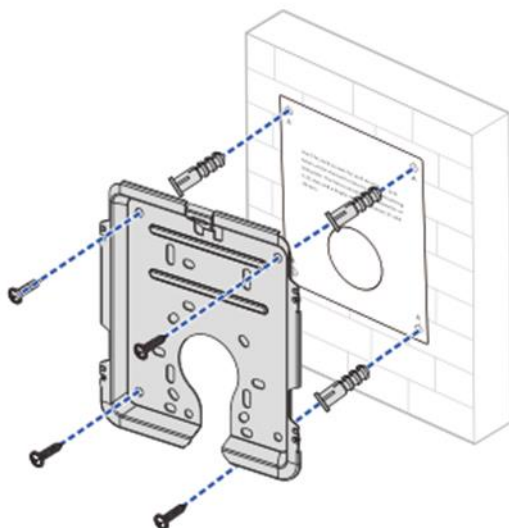
Note

- In an indoor environment, a ceiling-mounted AP offer broader antenna radiation coverage compared to a wall-mounted one. Hence, ceiling mounting is the preferred option.
 - The schematic diagram provided is for reference purposes only. The actual product should be installed based on its physical specifications and design.
-

(1) Drill holes on the ceiling or wall using the mounting template.



(2) Use four Phillips head screws to secure the mounting plate to the ceiling or wall.



⚠ Caution

The plane deviation of the wall in a specific area should be within 2 mm, and the recommended torque for installation is 4 kgf.cm. In case of uneven installation site, please mount the AP on a protruding wall.

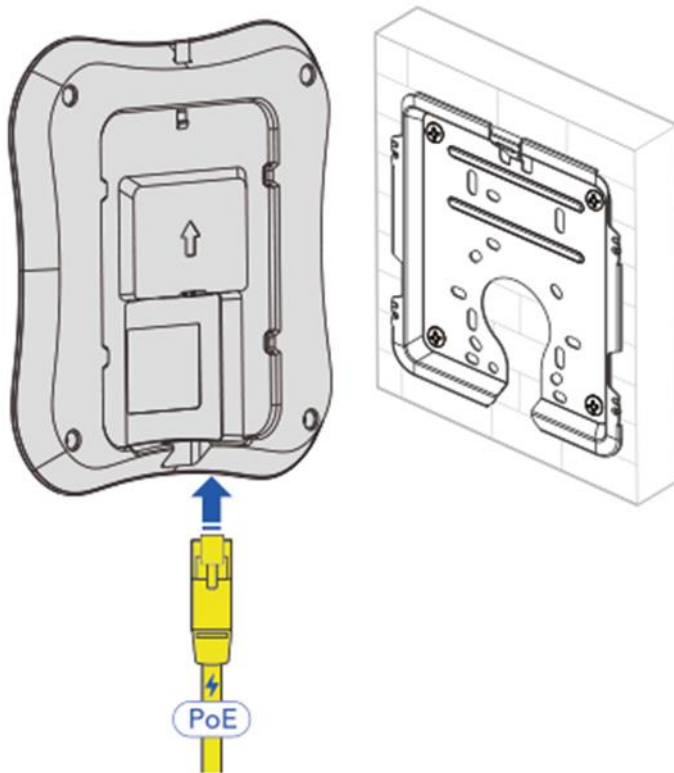
(3) Connect cables according to the actual networking. The following describes how to connect cables on the AP side.

- Ethernet cable: Connect one end of the Ethernet cable to the LAN/2.5G/PoE port on the back of the AP.
- Optical cable: Connect one end of the optical cable to the SFP+ port on the back of the AP.
- DC power cord: When DC power supply is used, connect one end of the power cord to the DC 54 V connector on the back of the AP.

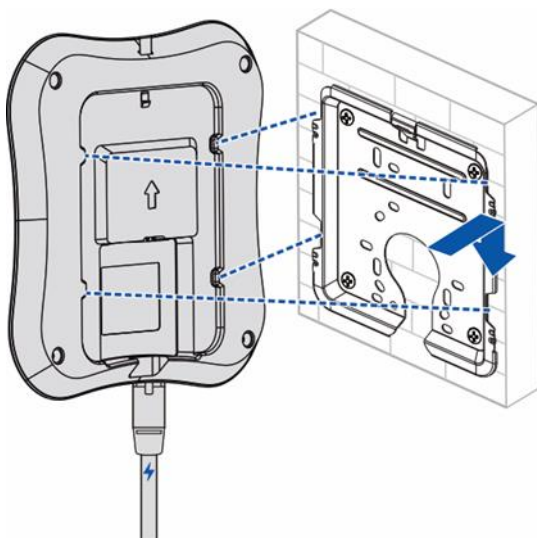
⚠ Caution

- Avoid a small bend radius at the connector.
- It is not recommended to use Ethernet cables with a protective sheath as it can hinder the assembly of Ethernet cables.
- When using an optical cable for data transmission, insert and remove the optical cable gently. If you pull the optical cable too hard, the fiber core may be displaced,

affecting the optical communication quality. Do not bend or coil the optical cable excessively, as this will increase the attenuation of light during transmission.



- (4) Align the slots on the back of the AP with the square feet on the mounting plate, and slide the AP into the mounting plate slowly to ensure that the AP is securely fixed.

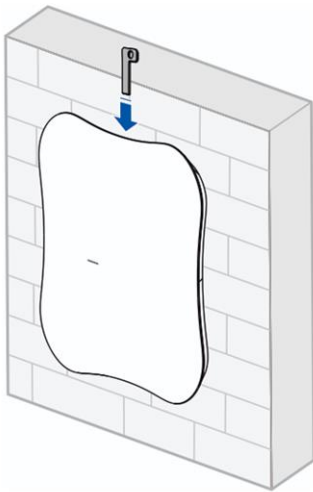


⚠ Caution

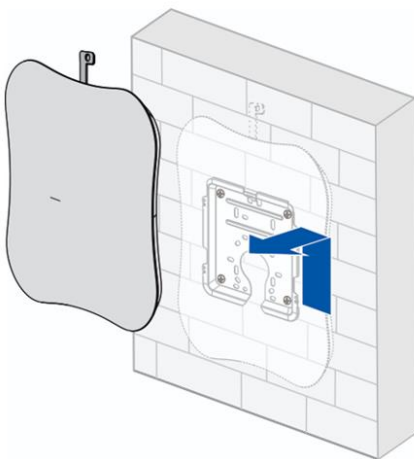
- Before securing the AP to the mounting plate, connect the cables first.
 - The slots on the back of the AP must be aligned with and slid into the square feet on the mounting plate. Do not press the slots into the square feet by force.
 - After installation, check whether the AP is secured.
-

3.4 Removing the AP

(1) Insert the latch into the reserved slot.



(2) Slide down the AP as indicated by the arrow.



3.5 Bundling Cables

 Caution

- Bundle the cable in a visually pleasing way.
 - Make sure that the fibers at the connectors have natural bends or bends of large radius.
 - Do not bundle the cables too tightly, as this may reduce the cable service life and transmission performance.
-

The steps of cable bundling are as follows:

- (1) Bundle the drooping part of the cables and place the bundle as near the ports as possible.
- (2) Route the cables under the AP and run them in straight line.

3.6 Checklist After Installation

- Checking the AP
 - Verify that the external power supply meets the requirement of the AP.
 - Verify that the AP is securely fastened.
- Checking the Cable Connection
 - Verify that the cable type matches the port type.
 - Verify that the cables are properly bundled.
- Checking the Power Supply
 - Verify that the power cord is properly connected and meets safety requirements.
 - Verify that the AP works properly when powered by the power supply.

4 Debugging

4.1 Setting Up the Configuration Environment

After powering on the AP through a DC power adapter or a PoE power source equipment, ensure that the power cord is properly connected and meets safety requirements.

4.2 Powering on the AP

4.2.1 Checklist Before Power-On

- The power cord is properly connected.
- The input voltage meets the requirement.

4.2.2 Checklist After Power-on

- Verify the LED status.
- After the AP is powered on, check whether the SSID (@Lysora-mXXXX for multiple devices or @Lysora-sXXXX for a single device) can be searched by a mobile phone or other wireless devices.

4.3 Logging in to the Web GUI

(1) Power on the PC and configure the local connection attribute on the PC. Set the IP address of the PC to 10.100.111.XXX (1 to 252).

Open a browser on the PC and enter 10.100.111.254 to log in to the web interface. The default password is admin for the first login. For security purposes, change the default password after login.

5 Monitoring and Maintenance

5.1 Monitoring

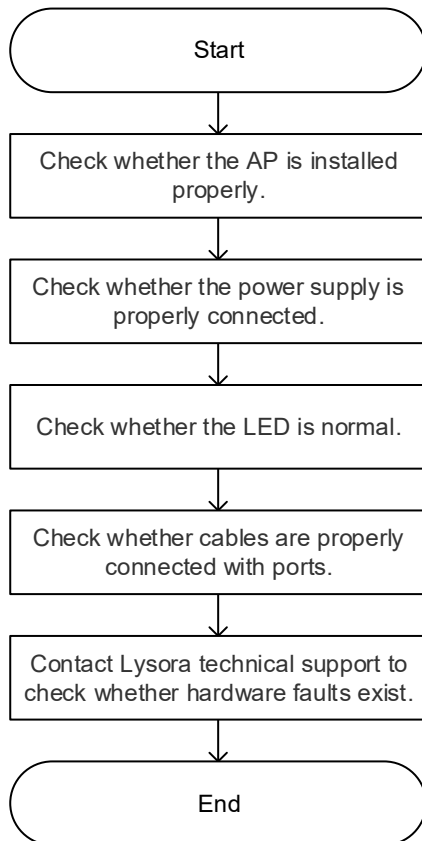
When the L7Pro is operating, you can monitor the device running status by observing the LED.

5.2 Maintenance

If the hardware is faulty, please contact the local distributor.

6 Troubleshooting

6.1 General Troubleshooting Flowchart



6.2 Common Faults

6.2.1 The Status LED Is Off After the AP Is Powered On

- If the AP is powered by PoE, verify that the PSE is 802.3at-compliant and the Ethernet cable is connected properly.
- If the AP is powered by a DC adapter, verify that the adapter has mains input and works properly and the adapter supports 54 V DC output.

6.2.2 After an Ethernet Cable or Optical Cable is Connected, the Ethernet Interface or Optical Port Cannot Be Used

Verify that the device at the other end of the Ethernet cable is working properly. Then, verify that the cable is capable of providing the required data rate and is properly connected.

6.2.3 A Client Cannot Discover the AP

- (1) Verify that the AP is properly powered.
- (2) Verify that the Ethernet port is correctly connected.
- (3) Verify that the AP is correctly configured.
- (4) Move the client device closer to the AP.

7 Appendix

7.1 Ports, Connectors, and Media

7.1.1 2500BASE-T/1000BASE-T/100BASE-TX/10BASE-T Ports

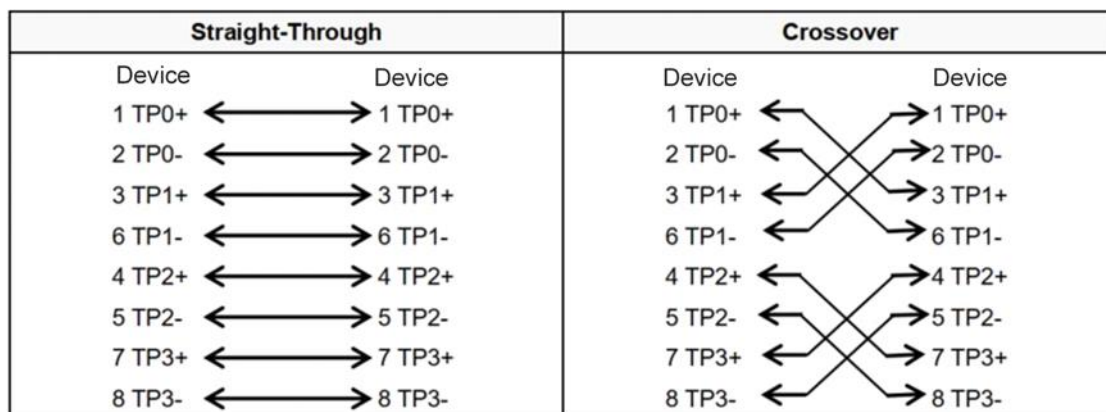
2500BASE-T/1000BASE-T/100BASE-TX/10BASE-T ports are Ethernet ports with auto-negotiation of four data rates: 10 Mbps, 100 Mbps, 1000 Mbps, and 2500 Mbps. They supports auto MDI/MDIX Crossover, and use RJ 45 connectors.

Compliant with the IEEE 802.3bz standard, a 2500BASE-T port requires 100-ohm Category 6 or 5e unshielded twisted pair (UTP), or shielded twisted pair (STP) (recommended) cables, and supports a maximum distance of 100 meters (328 feet). When PoE power supply is used, Category 6 STP cables are recommended, and both the port and the cable should be properly shielded.

Compliant with the IEEE 802.3ab standard, a 1000BASE-T port requires 100-ohm Category 6 or 5e unshielded twisted pair (UTP) or shielded twisted pair (STP) (recommended) cables, and supports a maximum distance of 100 meters (328 feet). When PoE power supply is used, Category 6 STP cables are recommended, and both the port and the cable should be properly shielded.

The 2500BASE-T/1000BASE-T port all four pairs of wires to be connected for data transmission. [Figure 7-1](#) shows the connection of four pairs of wires for the 2500BASE-T/1000BASE-T port.

Figure 7-1 2500BASE-T/1000 BASE-T Twisted Pair Connections



A 100BASE-TX/10BASE-T port can also be connected using 100-ohm Category 5 cables, and supports a maximum distance of 100 meters (328 feet).

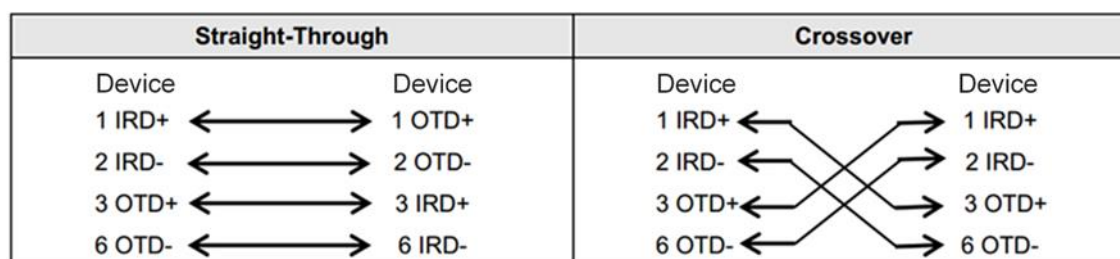
[Table 7-1](#) shows 100BASE-TX/10BASE-T pin assignments.

Table 7-1 100BASE-TX/10BASE-T Pin Assignments

Pin	Socket	Plug
1	Input Receive Data+	Output Transmit Data+
2	Input Receive Data-	Output Transmit Data-
3	Output Transmit Data+	Input Receive Data+
6	Output Transmit Data-	Input Receive Data-
4, 5, 7, 8	Not Used	Not Used

[Figure 7-2](#) shows the connection of straight-through and crossover cables for 100BASE-TX/10BASE-T ports.

Figure 7-2 100BASE-TX/10BASE-T Twisted Pair Connections



7.2 Recommended Cabling

When installing the L7-W, route the cables through the cable management brackets. Top cabling or bottom cabling is adopted according to the actual situation in the equipment room. All conversion connectors should be placed at the bottom of the rack instead of outside the rack that is easily accessible. Power cords are routed beside the cabinet, and top cabling or bottom cabling is adopted according to the actual situation in the equipment room, such as the locations of the DC power distribution box, AC power socket, or surge protection box.

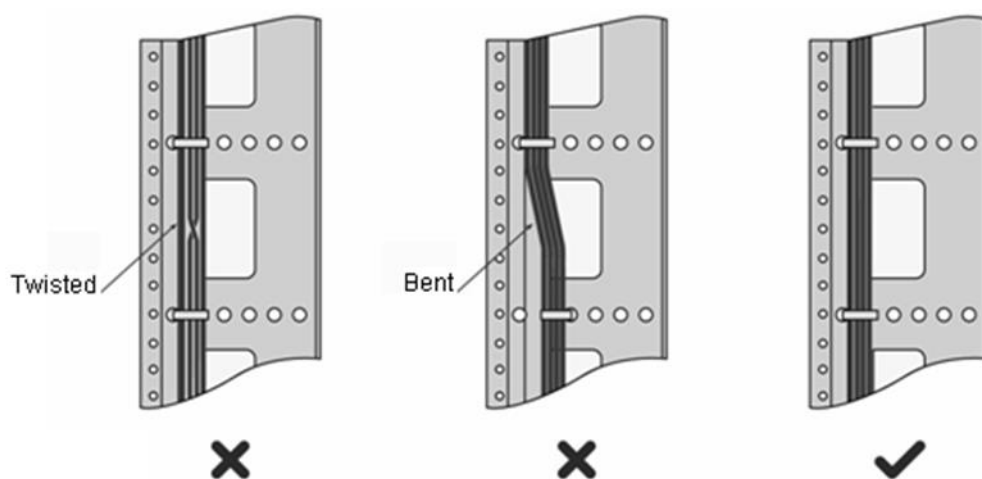
Requirements for the Minimum Bend Radius of an Ethernet Cable

- The bend radius of a fixed power cord, Ethernet cable, or flat cable should be over five times greater than their respective external diameter. The bend radius of these cables that are often bent or plugged should be over seven times greater than their respective external diameter.
- The bend radius of a fixed common coaxial cable should be over seven times greater than its external diameter. The bend radius of the common coaxial cable that is often bent or plugged should be over 10 times greater than its external diameter.
- The bend radius of a fixed high-speed cable (such as SFP+ cable) should be over five times greater than its external diameter. The bend radius of the fixed high-speed cable that is often bent or plugged should be over 10 times greater than its external diameter.

Precautions for Bundling Cables

- Before cables are bundled, mark labels and stick the labels to cables wherever appropriate.
- Cables should be neatly and properly bundled in the rack without twisting or bending, as shown in [Figure 7-3](#).

Figure 7-3 Bundling Cables (1)

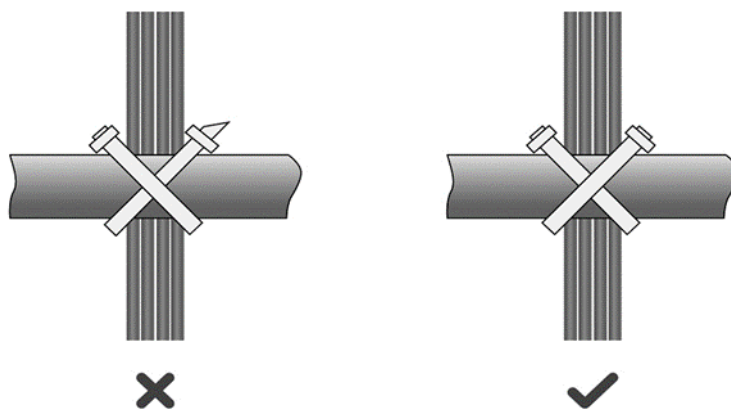


- Cables of different types (such as power cords, signal cables, and ground cables) should be separated in cabling and bundling. Mixed bundling is prohibited. When they are close to each other, you are advised to adopt crossover cabling. In the case of parallel cabling,

maintain a minimum distance of 30 mm (1.18 in.) between power cords and signal cables.

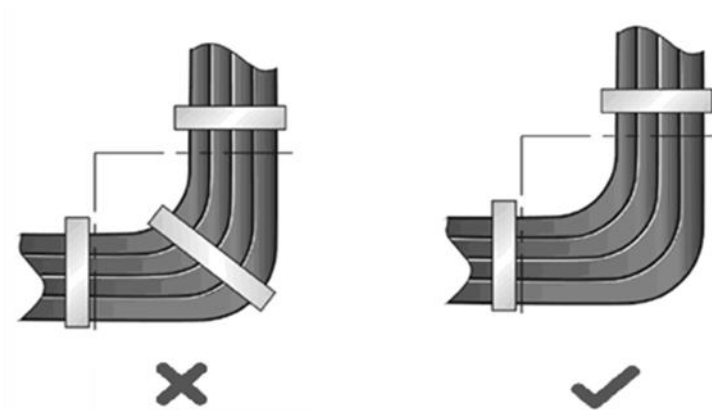
- The cable management brackets and cabling troughs inside and outside the rack should be smooth without sharp corners.
- The metal hole traversed by cables should have a smooth and fully rounding surface or an insulated lining.
- Use cable ties to bundle up cables properly. Please do not connect two or more cable ties to bundle up cables.
- After bundling up cables with cable ties, cut off the remaining part. The cut should be smooth and trim, without sharp corners, as shown in [Figure 7-4](#).

Figure 7-4 Bundling Cables (2)



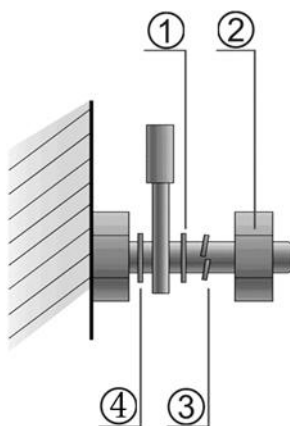
- When cables need to be bent, bundle them up but do not tie them where the cables will be bent, as shown in [Figure 7-5](#).

Figure 7-5 Bundling Cables (3)



- Cables not to be assembled or remaining parts of cables should be folded and placed in a proper position of the rack or cable trough. The proper position refers to a position that does not affect device running or damage the device or cable.
- Do not bind 220V or 48V power cords to the guide rails of moving parts.
- The power cords connecting moving parts such as door grounding cables should be reserved with a margin after being assembled to avoid suffering tension or stress. When the moving part is installed, the remaining cable part should not touch heat sources, sharp corners, or sharp edges. If heat sources cannot be avoided, high-temperature cables should be used.
- When screw threads are used to fasten cable terminals, the anchor or screw must be tightly fastened, as shown in [Figure 7-6](#).

Figure 7-6 Cable Fastening



① Flat washer

② Screw nut

③ Spring washer

④ Flat washer

- Hard power cords should be fastened in the terminal connection area to prevent stress on terminal connection and cable.
- Do not use self-tapping screws to fasten terminals.
- Power cords of the same type and in the same cabling direction should be bundled up into cable bunches, with cables in cable bunches clean and straight.

- Bundle up cables by using cable ties.

Cable Bunch Diameter	Distance Between Every Binding Point
10 mm (0.39 in.)	80 mm to 150 mm (3.15 in. to 5.91 in.)
10 mm to 30 mm (0.39 in. to 1.18 in.)	150 mm to 200 mm (5.91 in. to 7.87 in.)
30 mm (1.18 in.)	200 mm to 300 mm (7.87 in. to 11.81 in.)

- Do not tie cables or bundles in a knot.
- For wiring terminal sockets (such as circuit breakers) with cord end terminals, the metal part of the cord end terminal should not be exposed outside the terminal socket when assembled.