

MA5821/MA5822
Multi-service Access Equipment
Installation Guide



1 Precautions

To use the device properly and safely, read the precautions carefully before using the device and strictly observe these precautions when using the device.

Security warning and Precautions:

- Do not look directly into the optical port without eye protection.
- Keep the device out of the reach of children as the components or accessories may be swallowed.
- Install the device in strict compliance with the requirements of the supplier. Reserve a space of at least 10 cm above and around the device for heat dissipation. During the installation, keep the device away from electric appliances that generate strong magnetic or electric fields, such as microwave ovens, refrigerators, and mobile phones.
- The power supply voltage of the device must meet the requirements on the input voltage of the device.
- Do not use any power adapters that are not in the standard configuration. Otherwise, the device may be abnormal or unsafe.
- Dry your hands before connecting or disconnecting cables. Stop the device and switch off the power before connecting or disconnecting cables.
- Do not place any object on the device, so that the device will not be damaged due to overheating or deformation.
- Prevent objects, such as metal, from entering the device through the heat dissipation hole.
- Switch off the power and disconnect all cables, including the power cable, optical fiber, and network cable, during periods of lightning activities.
- Do not lead the strength member of the optical fiber or other metal parts indoors. Do not install telephone lines, network cables, power adapters or power adapter cables outdoors. Adopting these measures will help prevent device damage and bodily injuries which are especially prone during thunderstorms.
- If an abnormality occurs, for example, liquid entering the device, smoke, unusual sound, and smell, stop the device immediately, switch off the power, disconnect all cables (such as the power cable, optical cable, and network cable) to the device, and contact the authorized service center.
- Do not disassemble the device without permission. In the case of a device fault, contact the authorized service center.
- Dispose of the packing materials, expired batteries, and old or abandoned devices in accordance to local laws and regulations (recycling them is strongly recommended).
- Do not change the structure, safety design, or performance design of the device without prior authorization.

Fire Warning and Precautions:







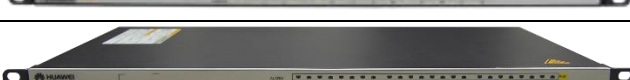


- The equipment needed to be far away from the large heat source, naked fire, and large power equipment, such as electric heater, candles, hair dryer, avoid introducing safety risk.
- Near power lines - equipment or equipment, such as aging or aging cable plug board and other facilities, please timely replacement, to avoid the introduction of safety risk.





2 Appearance

The MA5821/MA5822 is a box-type device 1U (1U = 44.45mm) high. The appearances of devices using different modes are different.

Table 2-1 shows the appearances of the MA5821/MA5822.

Table 2-1 MA5821/MA5822 appearances

Configuration	Appearances
MA5821 8FE	
MA5821 16FE	
MA5821 24FE	
MA5821 8GE	
MA5821 16GE	
MA5821 24GE	
MA5821 24GE, PoE	
MA5822 8FE+8POTS	
MA5822 16FE+16POTS	

Configuration	Appearances
MA5822 24FE+24POTS	
MA5822 8GE+8POTS	
MA5822 16GE+16POTS	
MA5822 24GE+24POTS	



CAUTION

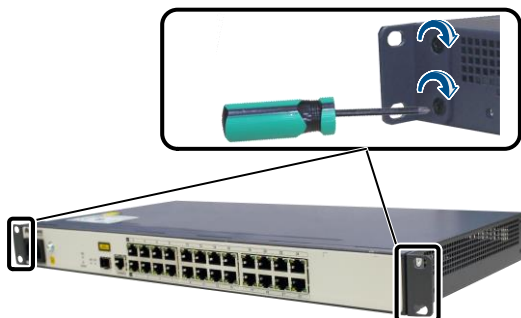
This is a Class A product. This product may cause radio interference, in which case the user may be required to take practical precautions interference.

3 Installing the MA5821/MA5822

The configuration of MA5821/MA5822 can be installation in the 19-inch cabinet, chassis and network cabinet.

Installation in the 19-inch cabinet

Step1 Install mounting ears



Step2 Install the chassis



Installation in the network cabinet

NOTE

- 1.The air intake vent and the air exhaust vent of the network cabinet should keep expedite for the MDU heat dissipation.
- 2.If the network cabinet is installed indoors or in a corridor that is out of rain, the network cabinet must meet the requirements of IP31 class protection.(The first number "3" means the solid particle with a diameter equal to or larger than 2.5 mm can be prevented from entering the cabinet. The second number "1" means the drips fallen vertically cannot damage the device.)
- 3.If the network cabinet is installed outdoors or in a corridor that is exposed to rain, the network cabinet must meet the requirements of IP55 class protection. ("IP" refers to International Protection. The first number "5" refers to the class for preventing the solid particle from entering the device. That is, the network cabinet cannot completely prevent

dust from entering the device, but the amount of dust that enters the network cabinet does not damage the device. The second number "5" refers to the class for preventing water from entering the network cabinet. That is, the water sprayed from different directions to the network cabinet does not damage the device.)

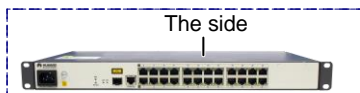
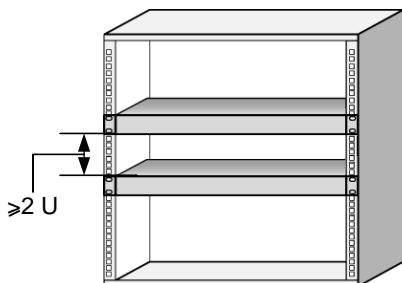


CAUTION

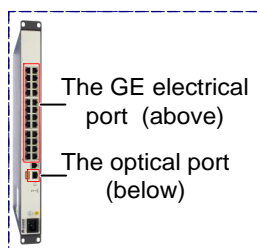
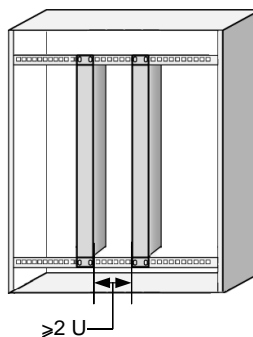
Don't stack installation of the MA5821/MA5822.

The modes of installing the MDU in the network cabinet of the customer vary with the specifications for the network cabinet of the customer. The following section describes the common modes to be taken for installing the MDU in the natural heat dissipation network cabinet (The network cabinet is without fan) of the customer. This can serve as a guide for hardware engineers to install the MDU (fix the rack-mounting ears on the front, side or back).

1. MA5821/MA5822 horizontally installed (with the panel facing the front)

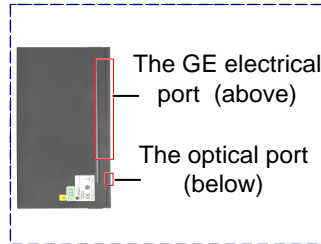
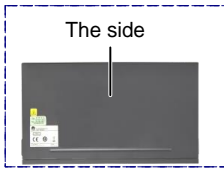
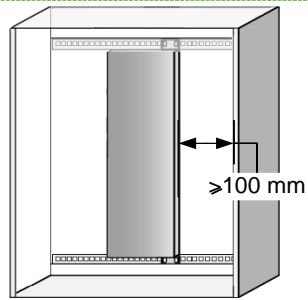
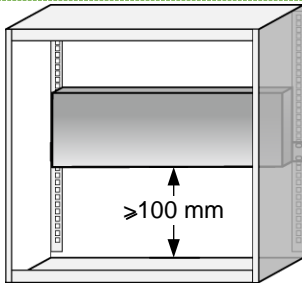


2. MA5821/MA5822 vertically installed (with the panel facing the front)



3. MA5821/MA5822 vertically installed (with the panel facing downwards, fix the rack-mounting ears on the side)

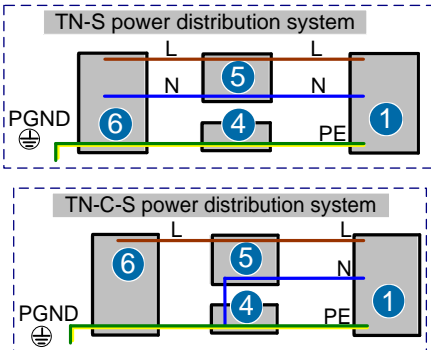
4. MA5821/MA5822 vertically installed (with the panel facing the right, fix the rack-mounting ears on the side)



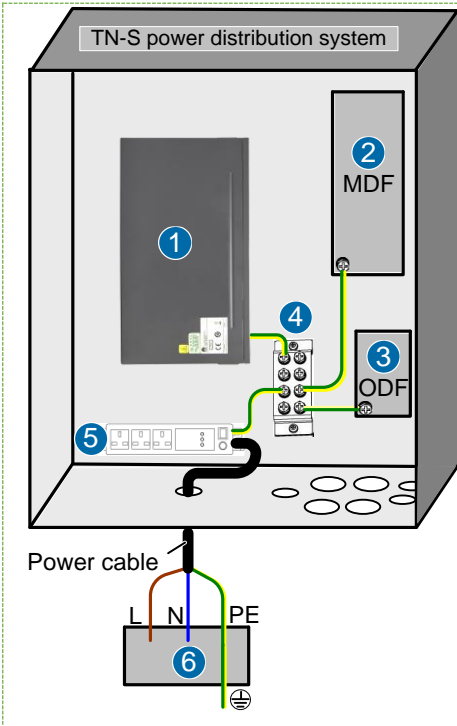
CAUTION

For better heat dissipation, avoid using the installation mode of placing the MDU vertically (with the panel facing upwards) in the network cabinet.

Guide for grounding the network cabinet



1. MA5821/MA5822
 2. MDF
 3. ODF
 4. Grounding bat
 5. AC lightning protection bar
 6. AC power distribution cabinet
- In the case of the TN-C-S and TN-S AC power distribution systems, it is recommended that you use the PE wire of the AC power cable for the MA5821/MA5822 grounding connection. The prerequisite is that the PE wire of the AC power cable for the corridor of the building is already grounded properly.
 - Use the ground cable (the cross-sectional area of the ground cable



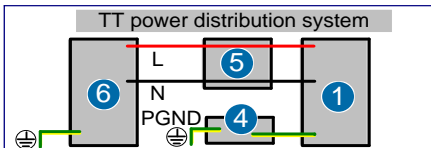
should be equal to or greater than 6 mm²) to connect the grounding bar and all the internal devices, and the grounding bar to the network cabinet in an equipotential manner through a metallic structure.

- Connect the grounding point of the reinforcing rib of the optical fiber to the ground bar through a ground cable, or connect this grounding point to the network cabinet in an equipotential manner through a metallic structure.



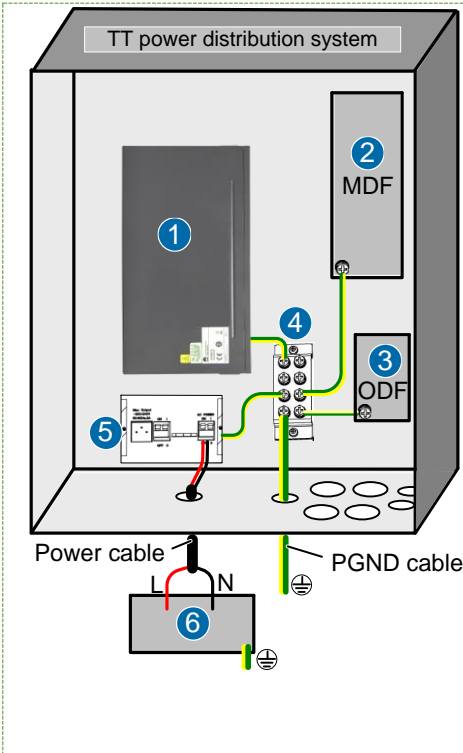
CAUTION

1. The network cabinet must be grounded through an external ground cable (PGND cable).
2. The network cabinet must be grounded through an external ground cable (PGND cable).
3. A power cable with 3-5 m must be used for decoupling between the surge protector and ONU power supply.



1. MA5821/MA5822
2. MDF
3. ODF
4. Grounding bar
5. ACPDU
6. AC power distribution cabinet

- In the case of the TT power distribution system, it is



recommended that an external grounding device be adopted. For example, use the dedicated grounding device of the building (such as the grounding flat steel sheet, grounding stud, and grounding bar) or the base steel bar of the reinforcement concrete of the building, or deploy a new earth screen.

- Use the ground cable (the cross-sectional area of the ground cable should be equal to or greater than 6 mm^2) to connect the grounding bar and all the internal devices, and the grounding bar to the network cabinet in an equipotential manner through a metallic structure.
- Connect the external ground cable (PGND cable) of the network cabinet to the external grounding device. As specified by the national grounding standard, the cross-sectional area of the external ground cable should be equal to or greater than 16 mm^2 .

Guide to ground the strength member

Engineering responsibilities

Optical Cable Provider	Engineering Party	Recommended Solution	Remarks
Huawei	Huawei	Solution 1 is preferred. If solution 1 fails to implement, Huawei is required to communicate with the customer about engineering risks and sign a memorandum with the customer before using solution 2.	<p>If solution 1 is used, the engineering quality must strictly comply with engineering specifications.</p> <p>If solution 2 is used, the network box must be securely grounded. In addition, a metal protective cover must be installed between the fiber strength member and network box fixing points, preventing sparks from spreading if the fiber strength member connects to a heavy-current power line.</p>
	Customer	Solution 1	If the engineering does not comply with solution 1, the customer must take consequences.
Customer	Huawei	<p>Requirements: During engineering, do not route the fiber strength member into the network box. In addition, ground the fiber strength member and the network box separately. Install the network box and MxU based on the instructions provided in this document.</p>	The customer must ensure that the fiber strength member is not be routed inside the network box. Otherwise, the customer must take consequences.
	Customer		

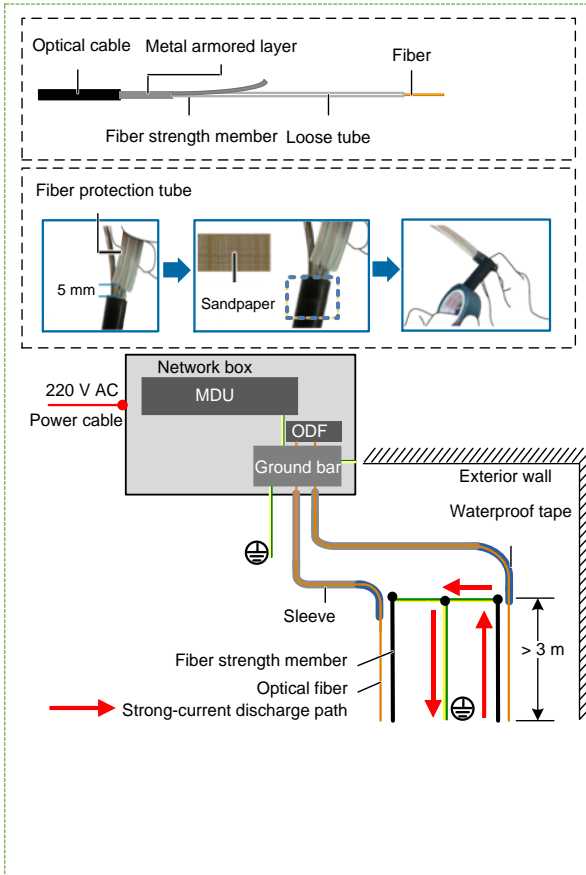
Grounding solution 1: The fiber strength member is isolated from the network box and grounded outside the network box.

This solution prevents the introduction of sudden heavy currents into the network box, thereby protecting the device inside the network box against heavy currents. (A long-distance armored optical cable may introduce sudden heavy currents into the network box if the outer insulation layer is broken and connects to a heavy-current power line.) Solution 1 is implemented as follows:

1. Strip the outer insulation layer and armored tube from the fiber strength member at the ground point. Then, clean bare optical fibers and use a protection tube to protect them. (Use outdoor tubes in outdoor scenarios and common tubes in indoor or corridor scenarios. Use

waterproof tape produced by 3M or COTRAN.)

2. Use a piece of sandpaper to polish burrs at the stripped position of the optical cable. Then, use insulation tape to wrap the stripped optical cable. When wrapping the waterproof tape, ensure that fiber cores are force-free.
3. Cut excess fiber strength member for grounding.

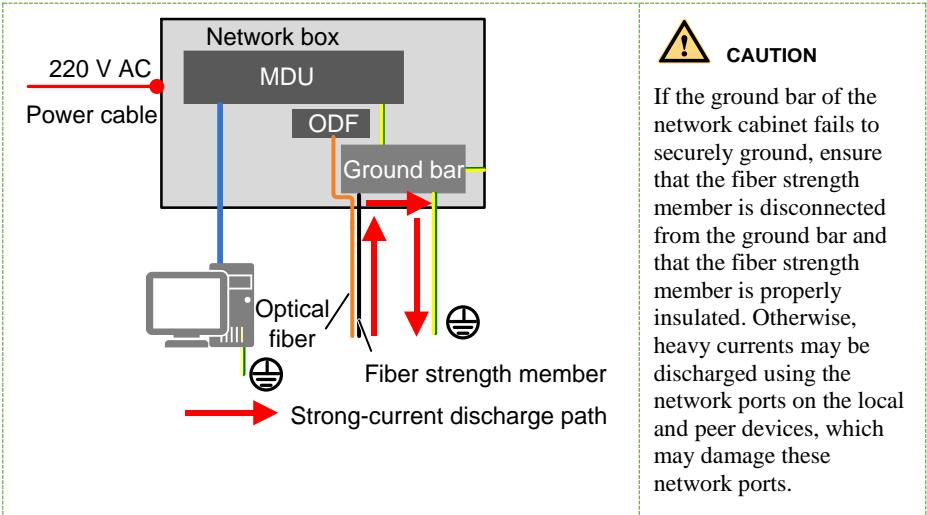


CAUTION

- During onsite operations, ensure that optical fibers are force-free and the bend radius is greater than 40 mm. Otherwise, services may become abnormal or even fail due to degraded signal transmission.
- The fiber strength member must be securely grounded. In addition, the ground point of the fiber strength member must be at least 3 meters above the ground (which prevents manual touching), and no combustible materials are around the ground point within a distance of 0.3 m. If the fiber strength member fails to be securely grounded, it must be insulated. Otherwise, the fiber strength member may introduce heavy currents if it connects to a heavy-current power line, threatening human safety.

Grounding solution 2: The fiber strength member is grounded inside a network box.

The fiber strength member must be connected to a ground bar at the ground point using a ground cable. The ground point can connect to the network box using a metal in an equipotential manner. When the fiber strength member connects to a heavy-current power line, heavy currents may be discharged inside the network box using the ground bar. If this happens, sparks may occur at the contact point between the fiber strength member and the ground bar, which may burn the device and the network box. To prevent this issue from occurring, use solution .



4 Routing cables

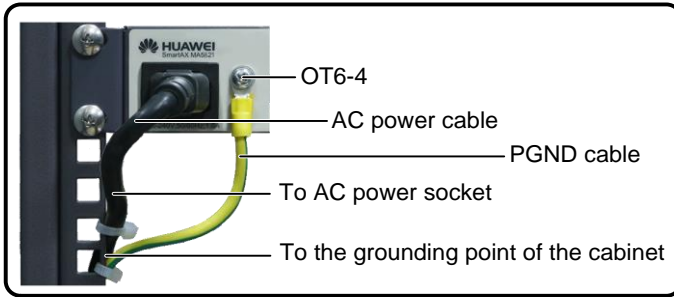
Routing cables



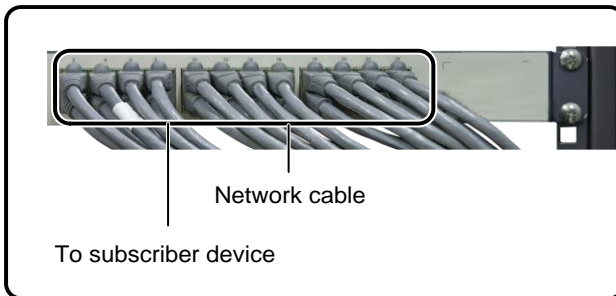
Step1 Routing PGND cable and power cable

CAUTION

Correct ground cable connection ensures surge and interference protection. Therefore, ensure that the device connects to the ground properly. If the device does not connect to the ground properly, the device may be damaged due to lightning strikes, services carried on the device may become abnormal, and even personal safety is threatened.



Step2 Routing network cable



CAUTION

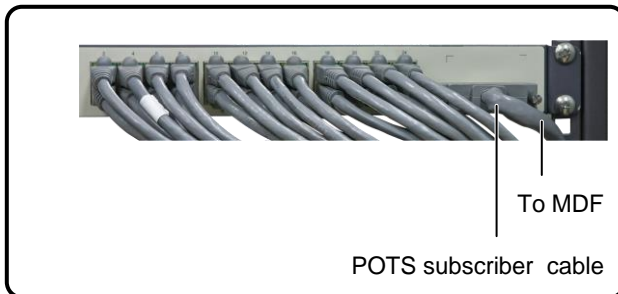
Network cables cannot be directly used to connect FE or GE ports between the MA5821 and MA5822.

If they are directly connected, FE or GE ports will be deactivate when the ring check function is enabled.

If FE or GE ports are deactivated, perform the following to activate them:

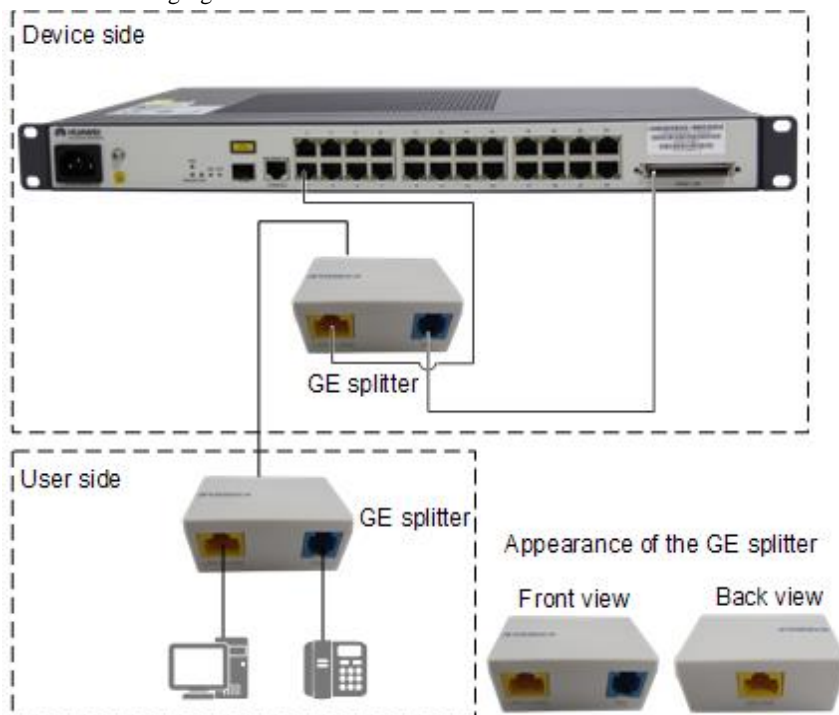
1. Run the **display ring check record** command to query whether a ring network is formed on ports.
2. Disconnect the network cable if a ring network is formed on ports.
3. Run the **undo shutdown** command to activate the port or run the **ring check resume-interval** command to set the automatic port activation time to activate the port.

Step3 Routing POTS cable (Only MA5822 support)



Step4 (Optional) Route the GE splitter cable.

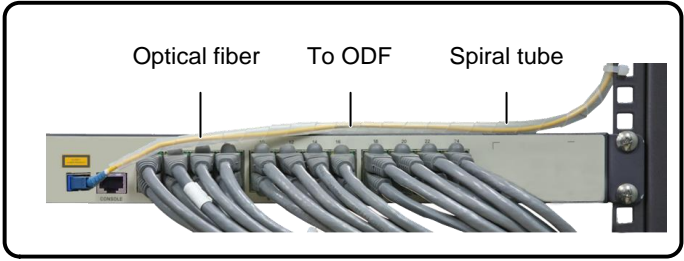
When the MA5822 needs to be used with the GE splitter, connect the cable as shown in the following figure.



 **NOTE**

On the device side, cores of the POTS cable need to be crimped by using the RJ11 connector.

Step5 Routing optical fiber



5 Description of LEDs

The MA5821/MA5822 provides a variety of indicators on its panel to help users learn about the running status of the device.

Table 5-1 Indicators on the MA5821/MA5822

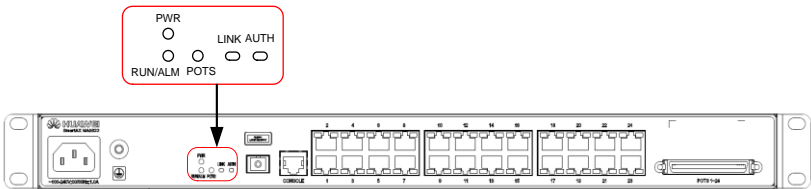



Table 5-1 describes the indicators on the MA5821/MA5822

Indicator	Description	
PWR: power supply status indicator	Green on	The device is powered on.
	Green off	The device is powered off.
RUN/ALARM: running status indicator	Red blinking 0.25s on and 0.25s off	The device is starting up.
	green blinking 1s on and 1s off	The device is functioning properly.
	Green on	The device is faulty.

Indicator	Description	
LINK: uplink status indicator	Green on	The optical port is receiving optical signal.
	green blinking 0.25s on and 0.25s off	The optical port is working in continuous mode.
	Green off	The optical port is not receiving optical signal or no connection is set up.
AUTH: Certification indicator	green blinking 0.25s on and 0.25s off	The device is registering.
	green blinking 1s on and 1s off  NOTE When the LINK and AUTH lights at the same time the green blinking 1s on and 1s off , indicating that the MA5821/MA5822 device is a rogue ONU state.	The mode being used on the port is incorrect.
	Green on	The optical port has successfully registered with the upper layer device.
	Green off	No optical fiber is connected to the device/
GE: Electrical interface status indicator	Green on	A connection is set up on the port.
	Green off	No connection is set up on the port.
	Yellow on	The port is transmitting or receiving data.
	Yellow off	No data is transmitted or received on the port.
Indicators of the POTS port (only the MA5822 supports this port and LED)	Green: on	A minimum of one service port is busy.
	Green: off	All the ports are idle.
PoE: Ethernet power	Green: on	Power over Ethernet is power on.

Indicator	Description	
status indicator(only the MA5821 24GE POE supports this port and LED)	Green: off	Power over Ethernet is power off.