ASCENT
Communication Technology

CWDM Optical Passives

Installation Manual

Revision 1B

ACT CWDM Optical Passives Installation Manual

ACT Document Number: ACT Optical_Passive_CWDM_Installation_Manual

Manual Revision 1B

This document is produced to assist professional and properly trained personnel with installation and maintenance issues for the product. The capabilities, system requirements and/or compatibility with third-party products described herein are subject to change without notice.

For more information, contact ACT: support@ascentcomtec.com

Revision History

Revision	Date	Reason for Change
1A	03/02/2024	Initial release
1B	04/14/2026	Update Format

Contents

Precautions

Warning

The device's transmitting port outputs invisible laser radiation. When the device is connected to work, the connector end face should not be directly viewed under any circumstances to avoid burning eyes and skin.

Caution

The device contains precision optics to avoid damage caused by severe impact. Avoid arranging vibrations and collisions. The pigtail is easily broken, please be careful.

Caution

The device contains static sensitive components.

Caution

If you have any problems, please contact us. Do not disassemble the equipment. Otherwise, it may cause irreparable damage. We will treat the unauthorized removal of the equipment as automatically waive warranty rights.

1. Preparation Before Equipment Installation

1.1. Preparation For Installation Engineering

To ensure the smooth progress of the entire equipment installation, the following relevant technical materials and tools need to be prepared.

1.1.1 Construction Technical Documents

(1) Design documents

(2) <<Passive Wavelength Division Multiplexing Equipment Installation Manual>>

1.1.2 The Tools And Instruments Used For Engineering Installation Are Prepared And Provided By The Installation Personnel

The list of tools and instruments used for engineering installation is shown in.

Classification	Tool
Fastening Tool	Straight screwdriver, Phillips screwdriver
Fitter's Tools	Long nose pliers, diagonal pliers
Auxiliary Tool	Ladder
Instrument	Bit error rate tester, optical power meter

Instruments must undergo rigorous calibration and be proven to be qualified before they can be used.

1.1.3 Environment and Equipment Inspection

A. Inspection of the computer room environment

A good computer room environment is the foundation for the stable operation of transmission equipment. It is recommended to carefully read the equipment's operational environment requirements before construction and inspect the computer room environment according to the content therein.

B. Unboxing

- The construction party, the first party, and the supplier's personnel shall be present simultaneously during the unpacking. Before unpacking, the outer packaging shall be inspected:
- If there is severe damage to the outer packaging, water immersion of the outer packaging box, or rusting or water immersion of the equipment, unpacking should be stopped. The cause of the damage should be identified and reported to Party A and the supplier.
- If any goods are found to be omitted, insufficient, or incorrect, please report to Party A and the supplier.

C. Equipment inspection before installation

Before installing the equipment, it is necessary to inspect the chassis, sub-racks, boards, and optical fibers to ensure they meet the requirements for equipment installation. The inspection items are shown in below table

Check the Major Categories	Inspection Items	Requirement
Chassis	Appearance	Clean, no scratches, no loose structural parts, no damage
	Internal Situation	There are no foreign objects or water stains inside
	Silk-Screen Marking	Perfect clarity
	Connector	The installation is neat and well- organized, with straight pins
Snowboard	Appearance	Clean, no scratches, no loose structural parts, no damage
	Quantity	Consistent with the number of boards listed on the shipping invoice
	Software	The corresponding configuration software is complete
Optical Cable Inspection	Appearance	The wiring is reasonable and neat, with no shortage of wiring
	Joint	The connectors are secure, without misconnection or loose connection

1.1.4 Precautions Before Installation

When installing equipment, the following items should be noted:

- The equipment contains precision optical components inside, so strong vibration should be avoided during transportation and installation.
- When installing the optical fiber expansion device in the outdoor cabinet, it should be fixed using non-stick adhesive or binding tape as much as possible.
- The selection of fiber optic connectors should be based on the type of fiber end face of the equipment's optical port, as different fiber end faces can affect transmission performance.
- When connecting or disconnecting optical fibers, laser safety must be taken into account. It is strictly prohibited to directly view the optical port or fiber end with eyes or instruments to prevent laser damage to the eyes.
- Before connecting optical fibers, it is essential to clean the end faces of the fiber optic jumpers. Using contaminated optical fibers can increase link loss, affect transmission quality, and may even cause permanent damage to the optical ports. Strong reflected light will form at the physical contact point between the two fiber end faces, which can severely interfere with the transmission of useful signals.
- When coiling optical fibers, ensure smooth coiling and avoid tangling, as this can increase loss or damage to the fibers.

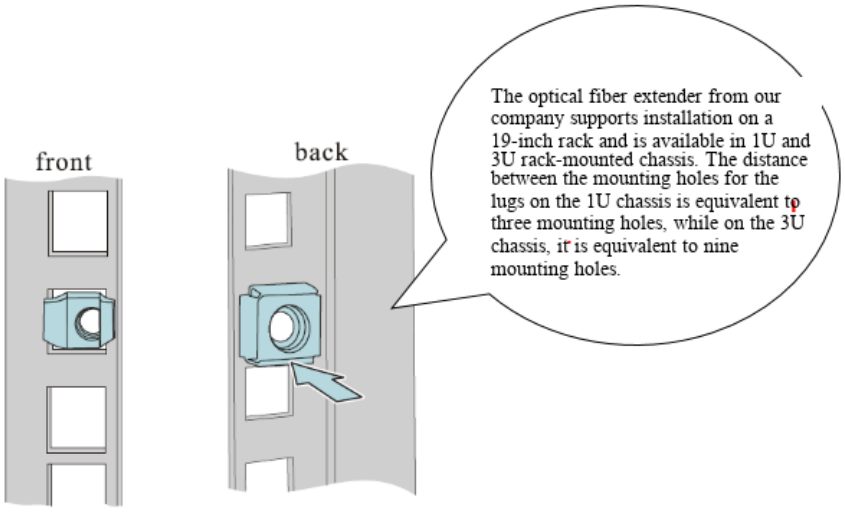
- Optical ports that are not in use should be fitted with dust covers to prevent dust from entering and to avoid laser leakage.
- Attention should be paid to measuring the value of received optical power.
- If the received optical power is too low, the signal cannot be transmitted normally. It is necessary to consider the link loss and the insertion loss of the connector to ensure that the received optical power is within an appropriate range, so as to maintain normal signal transmission.
- If the received optical power is too high (especially during short-distance direct fiber connections), it may damage the optical module/flange receiver or equipment, resulting in losses. In such cases, consideration can be given to adding an attenuator.

2. Equipment Installation Guidance

2.1. Installation Steps And Requirements For Indoor Chassis

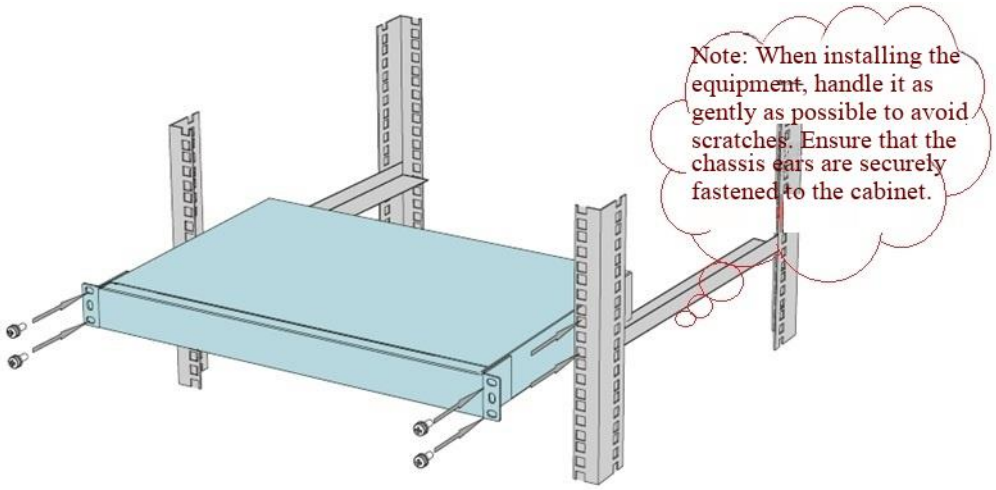
Step 1: Determine the position where the equipment should be installed in the cabinet. Compare the installation holes of the hanging ears to determine the position where the nut on the square hole strip of the cabinet column should be installed, and make a mark.

Step 2: Install the nut in the correspondingposition. As shown in below figure.

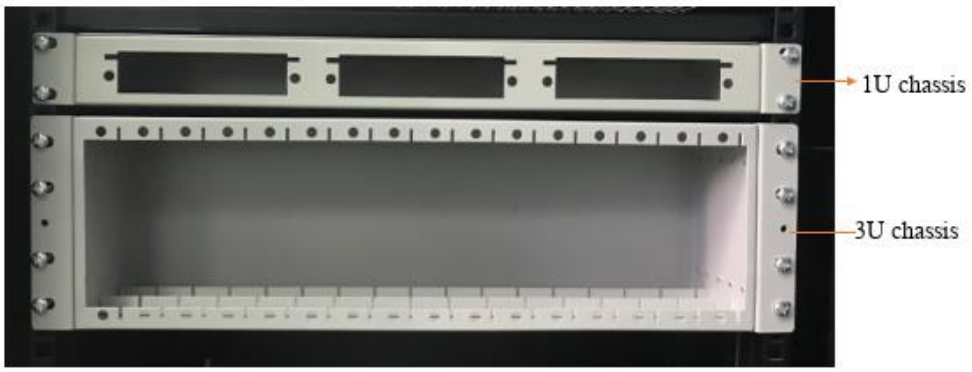


Step 3: Install a tray or guide rail below the marked position to support the equipment before reinforcing the hanging ears and square hole strips. (If auxiliary tools such as trays or guide rails are not available in the machine room, it may be necessary to manually support the equipment until the screws are tightened for reinforcement.)

Step 4: Push the equipment slowly into the cabinet from the front along the tray or guide rail, align the mounting holes of the hanging ears with the previously installed nuts, and then use the matching screws to lock them together. As shown in below figure.

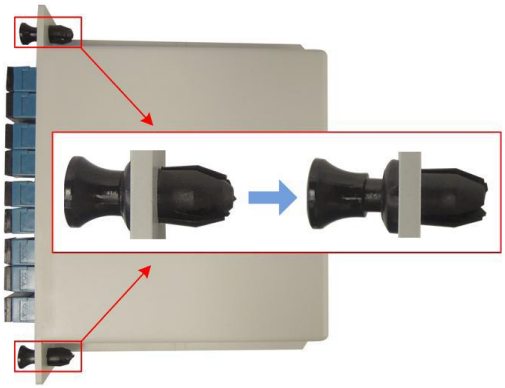


Completed installation effect diagram:



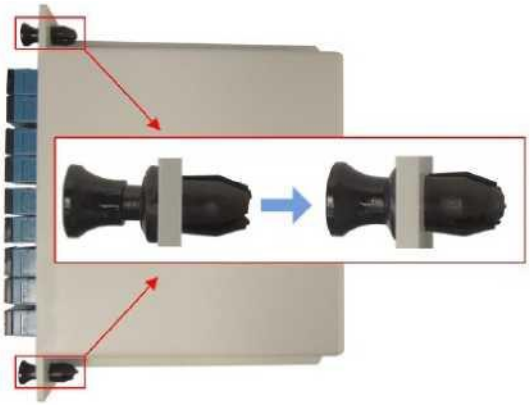
Step 5: Confirm the slot position in the chassis where the fiber optic amplifier should be installed.

Step 6: Pull out the two tension pins located above and below the fiber optic expander. As shown in below figure.



Step 7: Smoothly insert the fiber optic amplifier into the chassis along the guide rail of the slot, until the front panel of the fiber optic amplifier is tightly attached to the chassis. As shown in below figure.

Step 8: Slowly and steadily press down the two upper and lower latches to engage them in the corresponding holes on the chassis. This is to secure the fiber optic container "Device". As shown in below figure.



Completed installation effect diagram:

2.2. Installation Steps And Requirements For Optical Modules On The BBU Side And RRU Side

Confirm the correspondence between the optical modules used on the BBU side and the RRU side. When replacing the optical modules on the BBU side/RRU side of the central office, the existing optical modules on the BBU side/RRU side should be replaced according to the usage requirements for the optical modules on the BBU side/RRU side confirmed by the same central office, and ensure that the optical fiber connections on the BBU side/RRU side are correct.

2.2.1 Pre-Installation Preparation

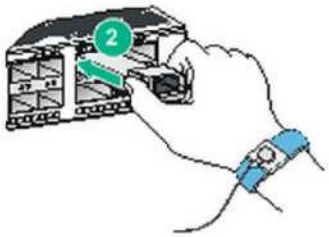
To prevent damage to electronic components in optical modules, cables, or equipment caused by static electricity generated during installation, please wear an anti-static wrist strap on your wrist before installing or removing optical modules or cables. Tighten the buckle to ensure good contact between the anti-static wrist strap and your skin, and confirm that the anti-static wrist strap is properly grounded.

Ensure the information of the optical module is correct, including the center wavelength, module rate, transmission distance, and other relevant information.

2.2.2 Installation And Disassembly Of Optical Modules

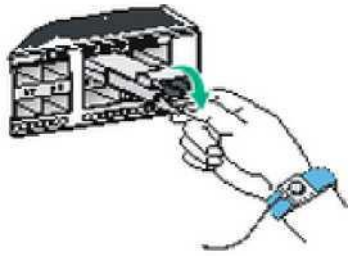
Step 1: Flipthe metal handle upvertically

Step 2: As shown in the diagram, ensure that the optical module is installed in the correct direction. Gently push the optical module into the slot along the horizontal direction until it is in tight contact with the slot.



Dismantling Steps:

Step 1: First, pull down the metal handle to its horizontal position, and then pull the handle to horizontally extract the optical module.

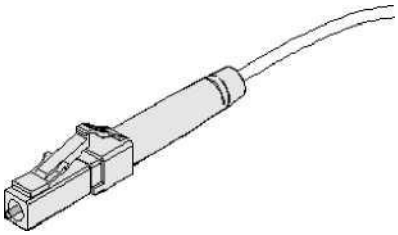


2.2.3 Post-Installation Check

Use an optical power meter to test whether the emission optical power of the color light module is normal, and make records (refer to the above technical specifications of the optical module as the judgment criteria).

2.3. Fiber Optic Installation Process

In passive wavelength division devices, the interfaces of fiber optic expanders are LC interfaces, and all optical module interfaces are also LC interfaces. The appearance of LC-type connectors is shown in the figure below.



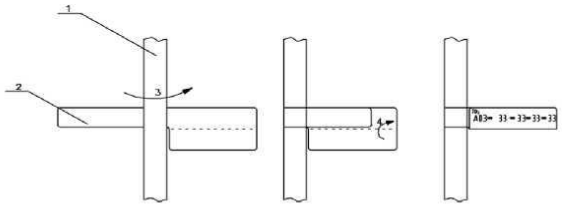
Label Pasting:

Before connecting system cables, affix labels to all pigtails.

The pasting steps and methods are as follows:

Step 1: Please attach two labels from each pair to the two ends of the cable. The two labels from the same pair can be undifferentiated to avoid confusion.

Step 2: Attach a label at a distance of 2cm from the pigtail interface. Once the label is affixed to the pigtail, the long text area should face to the right or downwards. The schematic diagram for label attachment is shown below.



1. Pigtail 2. Label 3. Fold to the right 4. Fold up

Fiber Optic Connection:

When plugging or unplugging an LC-type fiber optic connector, only axial operation is required, without any rotational operation. The specific process is as follows:

Step 1: When inserting the fiber, align the fiber head with the optical interface and insert it with moderate force.

Step 2: When pulling out the fiber, first press the clamping piece, push the fiber plug slightly inward, and then pull out the fiber.

2.4. Device Connection

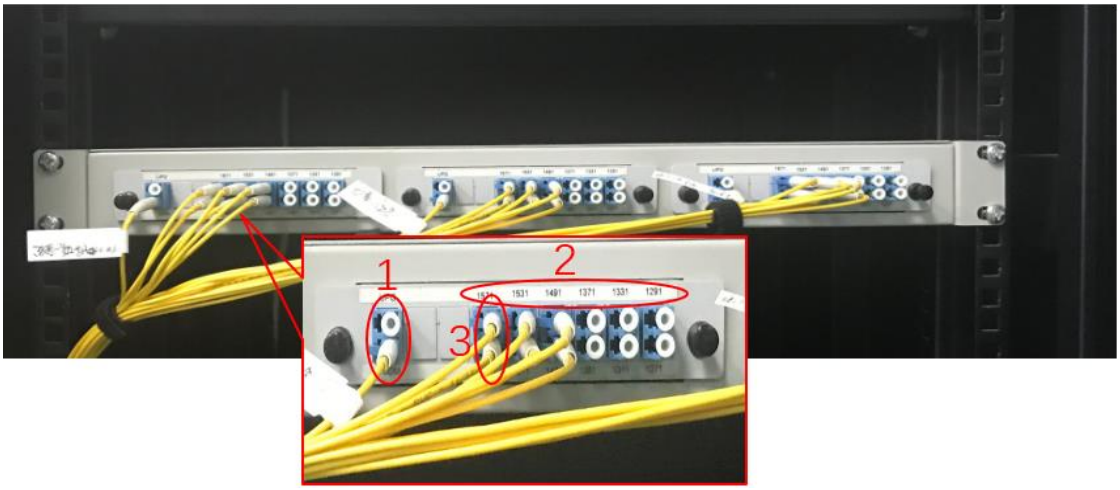
2.4.1 The Following Example Illustrates The Connection Of 3-Channel Single-Fiber Bidirectional Services (OTM)

1. Wiring Rules

BBU Terminal		Fiber Optic Amplifier Port	RRU Terminal		Fiber Optic Amplifier Port
The First Sector 1271 Optical Module	TX	1271	The first Sector 1331 Optical Module	TX	1331
	RX	1331		RX	1271
Second Sector 1291 Optical Module	TX	1291	Second Sector 1351 Optical Module	TX	1351
	RX	1351		RX	1291
Third Sector 1311 Optical Module	TX	1311	Third Sector 1371 Optical Module	TX	1371
	RX	1371		RX	1311

2. Wiring steps

Step 1: Connection Diagram



Port Description

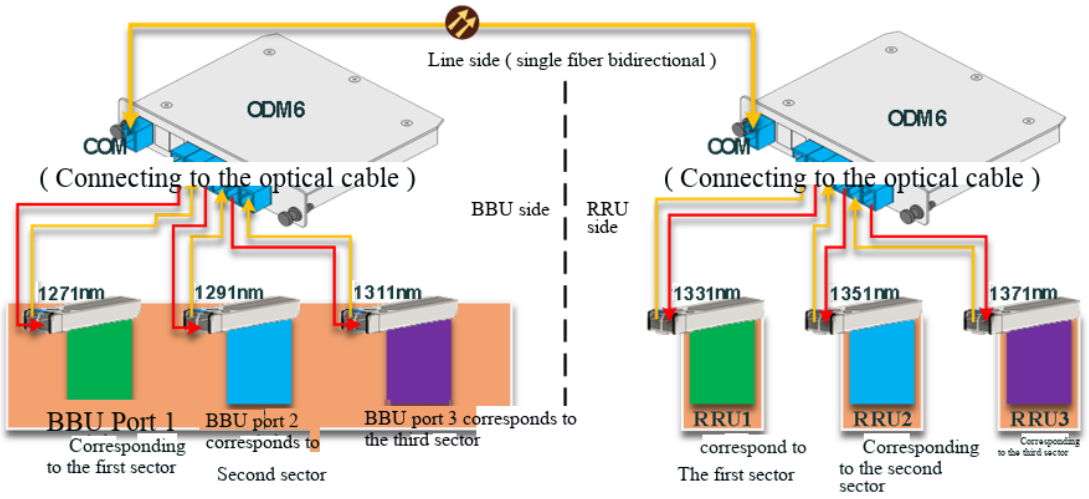
1. COM: corresponds to the external optical cable

   UPG: Upgrade Port

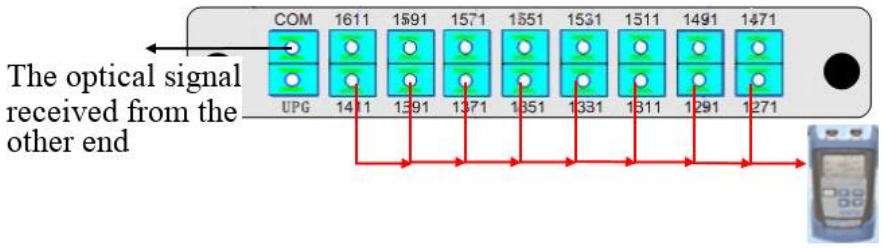
2. Wavelength numbering

3. Optical module corresponding to sector

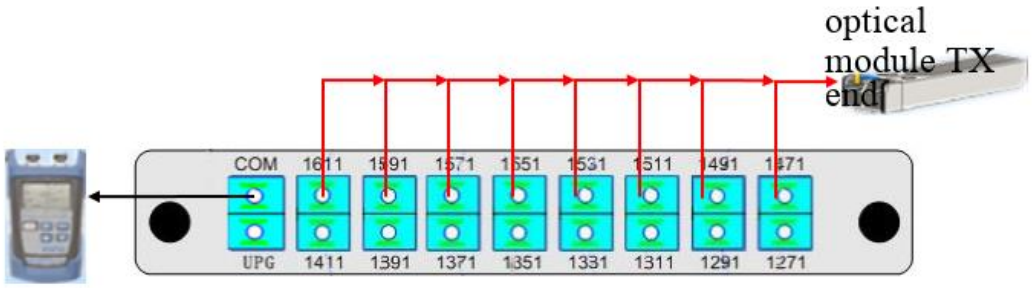
Step 2: Connect the corresponding optical fiber to the optical fiber amplifier (when connecting the color light module at both ends to the optical fiber amplifier, be sure to first connect the color light module for light emission, and do not connect it for light reception initially. If the light is too strong, it may damage the optical module) The connection method is shown in the following figure.



Step 3: Test the optical power received by the equipment to ensure that it is within the normal range. If it is too strong, add an attenuator to the corresponding port. As shown in the figure below:



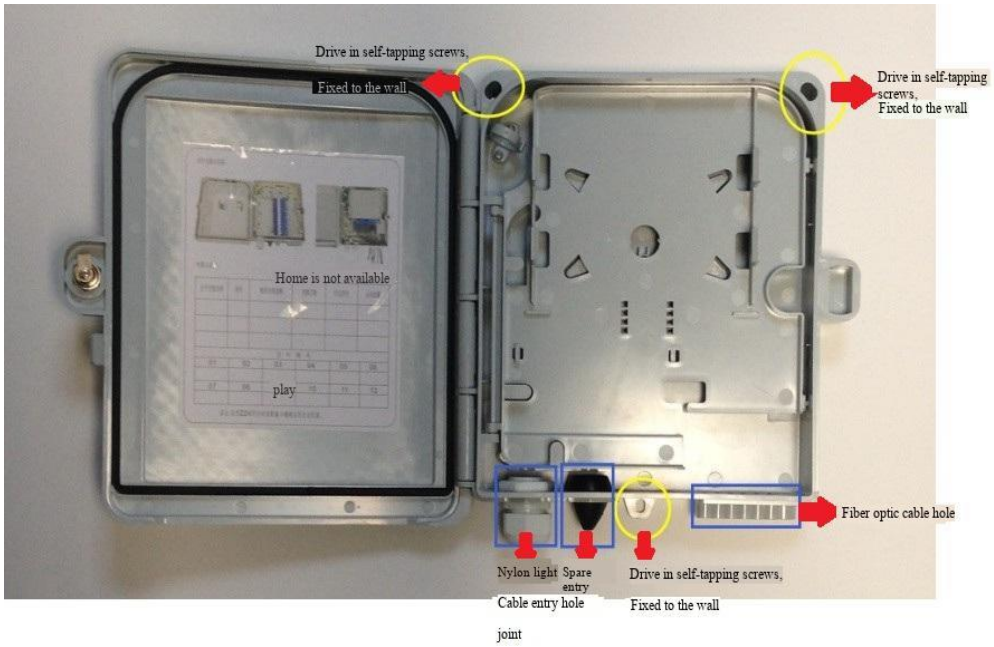
Step 4: After the test is completed, ensure that all internal jumpers of the equipment are properly connected. Test the output optical power at the COM port of the fiber optic expander and record the results.



2.4.2 The Installation Steps For Hanging The Fiber Optic Expansion Box On The Wall Are As Follows:

Step 1: Determine the wall where the optical fiber distribution box is to be installed. Open the cover of the optical fiber distribution box, hold it with your hand to make it closely adhere to the wall, and determine the installation position.

Step 2: Take out the self-tapping screws from the accessories and drive them into three places as shown in the figure below until they are locked securely. This will allow the optical fiber distribution box to be fixed to the wall. As illustrated in below figure.

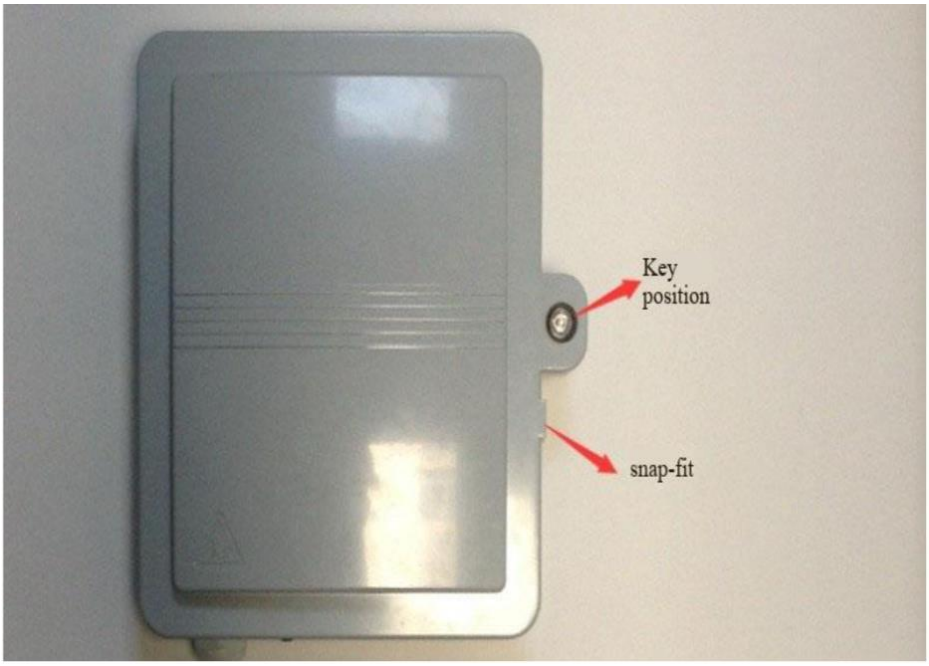


Step 3: Clip the fiber optic expander (patch box) into the optical distribution box and secure it. As shown in below figure.

Step 4: Organize and secure the optical fiber on the fiber optic expander.

Step 5: Connect the optical fiber on the BBU side to the port of the optical fiber amplifier.

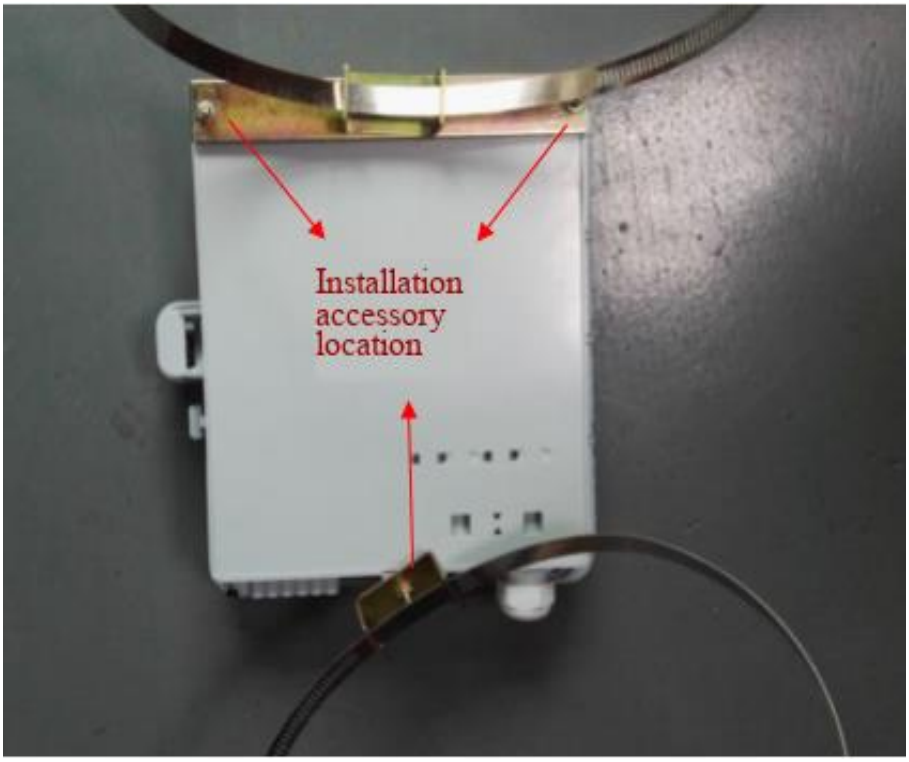
Step 6: After installation, close the cover and ensure the buckle is in place. Then, use the key provided in the accessories to lock the optical fiber distribution box securely.



2.5. Outdoor Holding Pole For Optical Fiber Amplifier

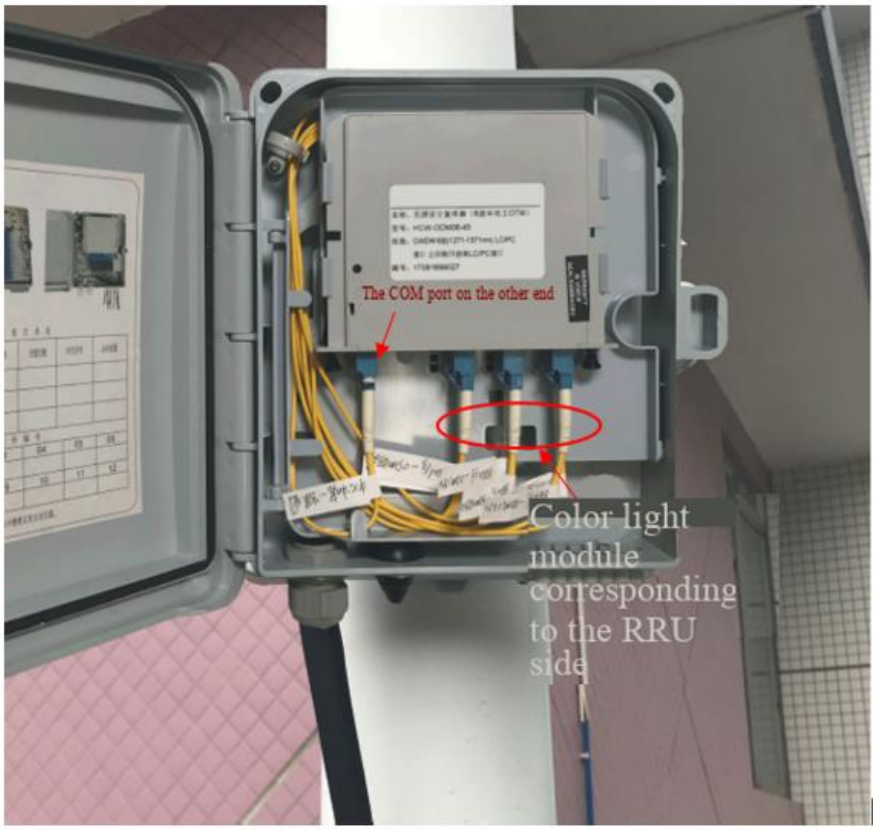
To accommodate outdoor pole-mounted installation, Huixinte Company has enhanced the existing optical fiber distribution box by adding corresponding accessories, enabling it to be installed on outdoor utility poles and other objects, thereby greatly improving the product's adaptability to various environments. The packaging box can accommodate a single optical fiber amplifier inside, and then secure the optical fiber distribution box to the utility pole.

Step 1: Place the accessories at the upper and lower ends of the fiber distribution box



Step 2: Wrap the steel hoop around the rod, then close the hoop (like wearing a belt), adjust it to fit the size of the rod, and tighten it with a screwdriver for reinforcement.

Step 3: Device Connection



Step 4: After installation, close the cover and ensure the buckle is in place. Then, use the key provided in the accessories to lock the optical fiber distribution box securely.

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