

EOC Master CD7944N Product User Manual

--- Device Install Guide

Version: V1.0

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1 Introduction

1.1 Product Description

The EOC system is a "last 100 meters" solution for network operators to provide broadband access. Coaxial cable is used as the physical layer transmission medium to provide symmetrical Ethernet transmission channels.

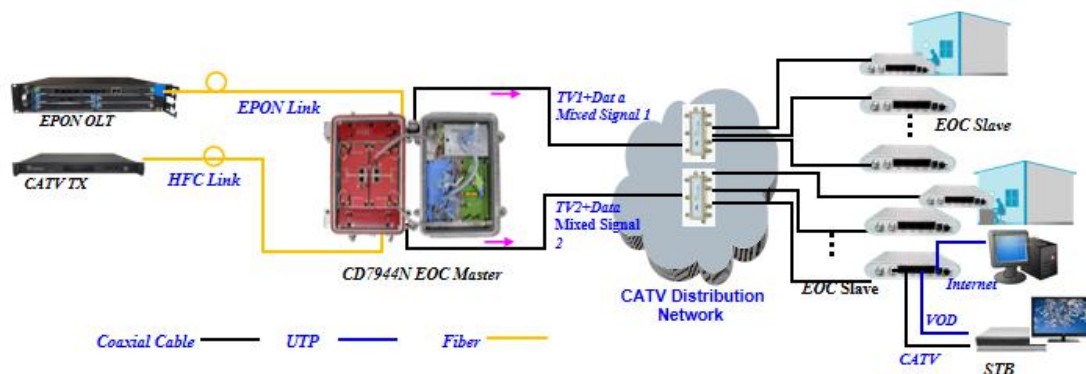
EOC series products have many advantages such as flexible deployment, high bandwidth, high security, good reliability, convenient management, and simple maintenance.

EOC technology theory: EOC system uses coaxial lines to transmit data signals at below 65 MHz. When transmitting, the user data is modulated using GMSK or OFDM modulation technology, and then transmitted on the coaxial cable. At the receiving end, the modem can demodulate the signal to obtain the original communication signal.

1.2 Networking Introduction

The EPON ONU network signal is transmitted to the CD7944N EOC master. The coaxial cable is used as the physical layer transmission medium to send the signal to each user's home. Users only need to connect the EOC slave on the coaxial cable at home to use.

The networking diagram is shown below:



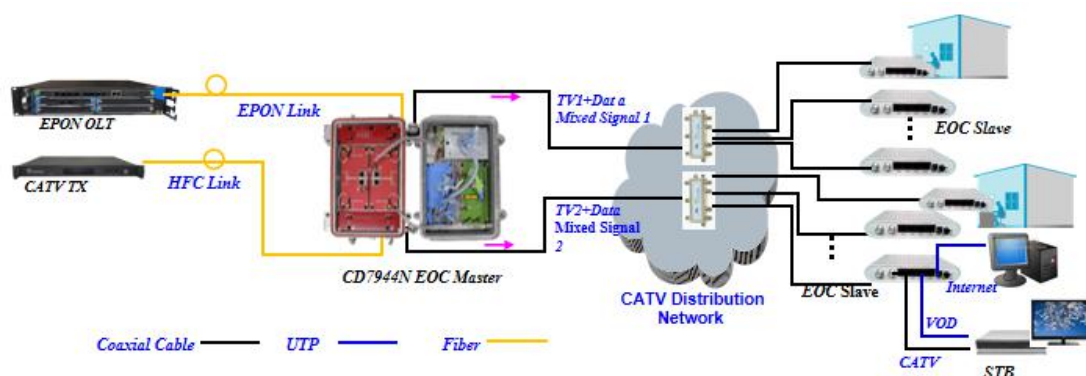
2 Service Configuration

2.1 Device Installation Instruction

The actual networking mainly includes EOC master CD7944N installation, EOC slave device installation, and EOC accessories installation.

2.1.1 Typical Networking

Typical networking application is shown in Figure 1.



2.1.2 Device Installation Step

Reference sequence: EOC Master installation → coaxial cable connection → EOC slave installation → verification

It is recommended that network planning and equipment configuration operations be completed in advance of the project.

2.1.3 Preparations Before Installation

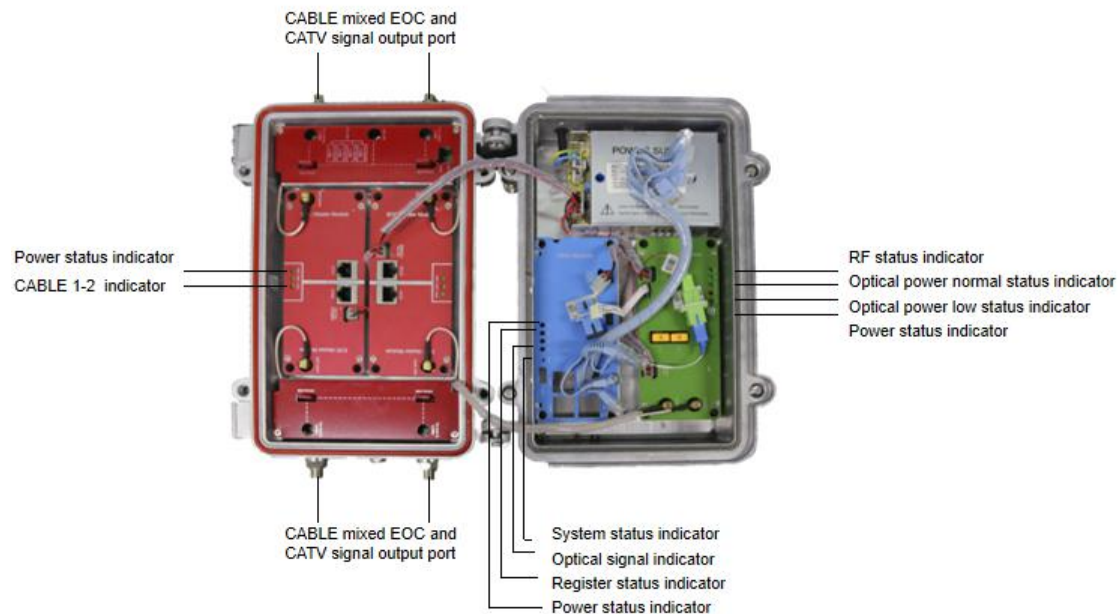
Check whether the uplink Ethernet line is installed and confirm whether it can communicate with the EOC master normally. It is recommended that after the reconstruction and installation of the uplink network is completed, the EOC master device be retrofitted and installed.

2.1.4 Network Device Installation

2.1.4.1 EOC Master Installation

The network equipment installation at the optical node mainly includes: EOC master CD7944N , installation accessories (hanging buckle, etc.).

2.1.4.2 CD7944N Panel Interface and Indicators



2.1.4.3 CD7944N Panel Definition

- EOC partial panel (Including two EOC modules)

Interface	Description	Usage
Ethernet port	4*10/100/1000Mbps adaptive ports	Uplink connect MAN
COM port	4 *Cable mixed signal output ports	User-to-Home cable connects to EOC master COM port

- EOC partial panel indicator definition (Including two EOC modules)

Indicator	Panel Label	Status	Description
Power led	PWR	On	Power is normal
		Off	Power is off or power failure
CABLE signal led	CAB1-2	On	Terminal link established
		Blinking	There is terminal communication in the link

- Built-in ONU module panel

Interface	Description	Usage
PON port	1*GPON port, FSAN G.984.2 standard, support for backward compatibility with EPON SC/UPC single mode single fiber	Uplink connect MAN optical network port
LAN port	4*10/100/1000Mbps adaptive ports Full/half duplex mode RJ45 connector Auto MDI/MDI-X	The optical signal received by the ONU is converted into Electrical signal and transmitted to the EOC module

- Built-in ONU module panel indicator definition

Indicator	Panel Label	Status	Description
Power led	PWR	On	Power is normal
		Off	Power is off or power failure
ONU Register led	PON	On	ONU register successfully
		Off	No ONU registration
Optical signal led	LOS	On	Optical power is abnormal
		Off	Optical power is normal
System led	SYS	On	System is working
		Off	System works abnormally

- Built-in optical receiver module panel

Interface	Description	Usage
PON port	1*SC/APC optical port	Uplink connect MAN optical network port

- Built-in optical receiver module panel indicator definition

Indicator	Panel Label	Status	Description
Power led	PWR	On	Power is normal
		Off	Power is off or power failure
Optical power normal led	OPT-M	On	Optical power is normal
Optical power low led	OPT_L	On	Optical power is low
RF led	TV1-2	Red led on	System RF is abnormal
		On	System runs normally

2.2 Requirements Before Construction

2.2.1 EOC Master Requirements Before Construction

2.2.1.1 EOC Master Installation Requirements

1. The device should not be installed near large power transmission and transformation equipment, radio signal transmission towers and other facilities.
2. The equipment should not be placed in a humid environment such as a basement.
3. It is strictly prohibited to stack flammable, explosive, strong corrosive and other dangerous goods around the equipment.
4. The design of the internal equipment installation location should consider the long-term development needs of the project, and appropriately leave room for hardware expansion and installation.
5. The interior of the equipment room should be reasonably installed and arranged so that the equipment and installation accessories are arranged as neatly as possible to facilitate maintenance.
6. The installation of the EOC master should adopt reliable seismic reinforcement measures to prevent hardware damage caused by accidental drop.
7. The equipment installation environment should provide a stable grounding condition, and its design should meet the specification requirements.
8. AC power line should be made of flame-retardant materials and sheathed.

2.2.1.2 EOC Master Operating Environment Requirements

1. Temperature and humidity requirements:

- Temperature: -10~55℃
- Humidity: 20~85%(Non-condensing)

2. Cleanliness requirements:

Dust particles must not be conductive, ferromagnetic, or corrosive. The concentration of dust particles with a diameter greater than 0.5 μ m is less than 3500 particles/L. The concentration of dust particles with a diameter greater than 5 μ m is less than 30 particles/L.

2.2.1.3 EOC Master Grounding Requirements

Index	Item	Specifications
1	Equipment grounding protection	<p>When there is a ground bar in the installation environment of the device, which uses a yellow-green two-color protective ground cable to directly connect to the ground bar. If you need to make a protective ground cable on site, the cross-sectional area is not less than 6 m², and the length should not exceed 3m.</p> <p>When there is no grounding bar in the installation environment where the equipment is located, angle steel or steel pipe with a length of not less than 0.5m can be directly driven into the ground. The yellow-green two-color protective grounding cable of the equipment should be connected to the angle steel by electric welding, and the welding points shall be anti-corrosive. The cross-sectional area of the protective ground cable is not less than 6 m². The cable should be as short as possible during project construction and cannot be coiled.</p>
2	Grounding resistance	<p>The grounding resistance value should be less than 5 Ω, but for areas where the annual thunderstorm day is less than 20 days or for angle steel that penetrates into the ground, the grounding resistance can be less than 10 Ω. For places with high soil resistivity, it is advisable to sprinkle some saline or drag reducing agent around the earth to reduce the resistivity of the soil.</p> <p>The upper end of the grounding body should be not less than 0.7m from the ground. In cold areas, the grounding body should be buried below the frozen soil layer.</p>
3	Earthing connection	<p>The ground lead is a metal conductor that connects the ground grid to the ground bar. The length of the ground lead-in wire does not exceed 30m, and its material should be galvanized flat steel with a cross-sectional area of 40mm*4mm or 50mm*5mm. The ground bar of the equipment and the grounding lead-in should be</p>

		connected together by a 35 m ² yellow-green two-color protective grounding cable or directly welded together. The welding points should be anti-corrosive.
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2.2.1.4 EOC Master Power Requirements

- Voltage: Support AC220V power supply or AC60V coaxial feed power, and allowable change range is + 10% ~ -10%.
- Frequency: 50Hz. Change range less than 5%.
- Power waveform: Sine wave distortion is not more than 3%.

2.2.1.5 EOC Slave Requirements Before Construction

2.2.1.5.1 EOC Slave Installation Requirements

1. EOC slave should not be installed in high temperature, dusty, harmful gas, flammable, explosive, susceptible to electromagnetic interference (transmitting stations, substations) and unstable voltage, large vibration or strong noise.
2. EOC slave installation environment should be kept dry, and there should be no stagnant water, seepage, dripping, condensation, etc.
3. EOC slave are usually installed in home users.

2.2.1.5.2 EOC Slave Operating Environment Requirements

Temperature and humidity requirements:

Item	Range	Typical Value
Operating Temperature	0℃~40℃	25℃
Storage Temperature	-10℃~70℃	25℃
Operating Humidity(Non-condensing)	20%~85%	—

2.2.1.5.3 EOC Slave Power Requirements

- Voltage: Support AC220V power supply, and allowable change range is + 10% ~ -10%.
- Frequency: 50Hz. Change range less than 5%.

- Power waveform: Sine wave distortion is not more than 3%.

2.3 Construction Specifications

2.3.1 EOC Master Installation

1. The equipment installation position should meet the design requirements. In case of any changes, it must be approved by the design and construction unit and complete change procedures.
2. The equipment installation must be stable and firm. When placed in the air, the buckle sling should be firmly connected to the equipment and fastened.
3. Take measures to prevent dust from entering the equipment and accumulating hardware failure.
4. When installing the EOC master, It's careful to securely install the equipment in the designated location. And take good anti-theft measures.
5. The shell of the EOC master is waterproof. After you have completed the necessary debugging operations during installation, you must adjust the waterproof ring, close the shell properly, and tighten all bolts. For interfaces with inlet-outlet line, the waterproof head must be screwed tightly so that the interface is closely fitted with the cable without leaving a gap. For interfaces without inlet-outlet line, you can use waterproof plugs to seal them directly.

2.3.2 EOC Slave Installation

1. The temperature and humidity of the EOC slave operating environment cannot exceed the required range.
2. The EOC slave needs to be stably installed to avoid sliding and hanging.
3. The EOC slave installation location must have enough space for natural heat dissipation.
4. After the installation is completed, the equipment status indicator should be in a convenient position to facilitate debugging and maintenance.

2.3.3 Cable Laying

1. The specifications, models, and quantities of cables should meet engineering design requirements.
2. The cable must be a whole wire with a complete sheath.
3. The cables should be straight and tidy., and avoid cross-entanglement. The remaining cable length should be uniform,
4. At the same time,wiring locations for equipment expansion.should be reserved.
5. Cable turns should be uniform and smooth.
6. When laying the cables, there should be obvious signs on both ends of each cable for easy connection and inspection.The cable labels should be affixed to the obvious ends of the cables and not easy to fall off.
7. The location, routing and direction of cable laying should meet the design requirements of the construction drawings.

2.3.4 Label

1. Each equipment(EPON, ONU, switch, etc.) involved in the EOC system and the power switch box must be clearly labeled to facilitate future management and maintenance.
2. The labels of the cables are hanging at the both ends for easy reading.
3. The numbering format of the equipment label is implemented according to the relevant naming conventions.
4. The label of the equipment should be affixed to the front of the device where it can be easily seen.
5. The note of the equipment label should be neat and clear, and the labeling method should be consistent with as-built drawing.
6. Attach the equipment list to the as-built file, and note the specific location of each device in the equipment list.

7. The identification of the label should indicate the name, number, and management IP address assignment of the equipment according to the design text. the CAT5, power line and coaxial cable should indicate the direction of the line.

2.4 Installation Method

2.4.1 Installation Preparation

1. Tool preparation

Universal tools: Marker, knife, special hexagon wrench, adjustable wrench, vise, screwdriver, diagonal pliers, waterproof tape.

Auxiliary tools: ladder, rubber hammer, etc.

2. Before preparing for installation, check the installation conditions (location, power supply, grounding, and lightning protection) of the equipment according to the above requirements to ensure that the equipment is in a good operating environment for a long term.
3. Make sure that the EOC master is powered off during the installation process.
4. The installation process is roughly divided into the following steps: unpacking the device-----installing the buckle-----hanging installation-----opening equipment flap-----checking the internal cable connection-connecting the cable signal line-----Power on the device-----End.



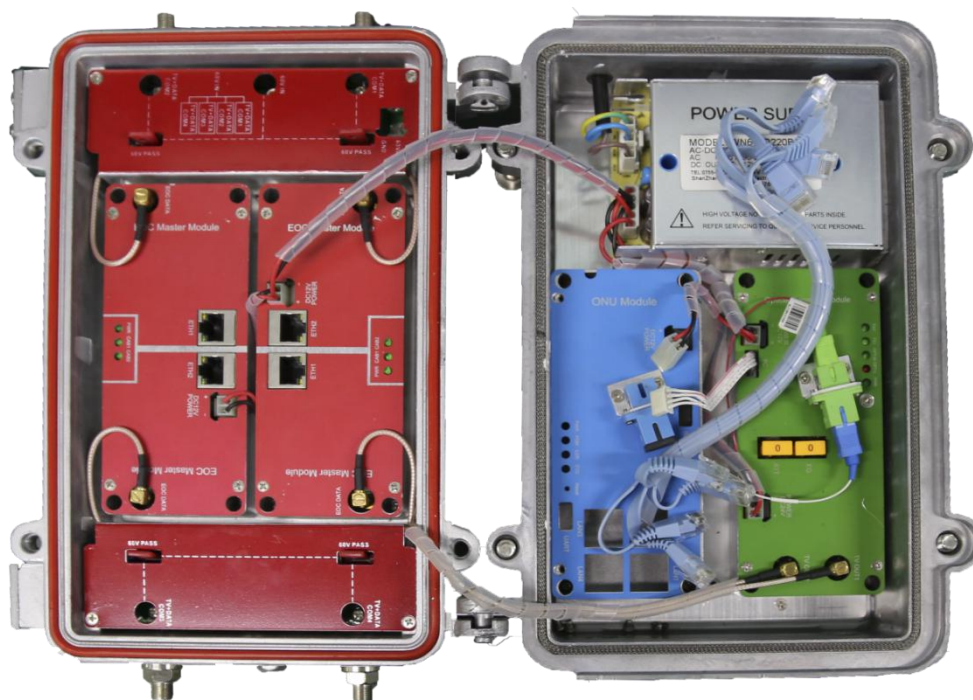
Figure: Unscrew the hex screw at the bottom of the EOC Master

2.4.2 Hanging Installation

Before hanging installation, it must be ensured that the strength of the equipment hanging place can meet the load bearing.

2.4.3 Opening EOC Master Flap

Before connecting EOC Master cable, you need to loosen four hex screws on the flap with the special hex wrench, as shown in the figure below:



2.4.4 Connect EOC Master Cable Line

The EOC Master provides 4 cable mixed output interfaces. As shown in the figure below, the user's coaxial cables that need to be covered are connected to the four cable ports on the EOC master, and the cable interfaces are tightened one by one to complete the user signal coverage.

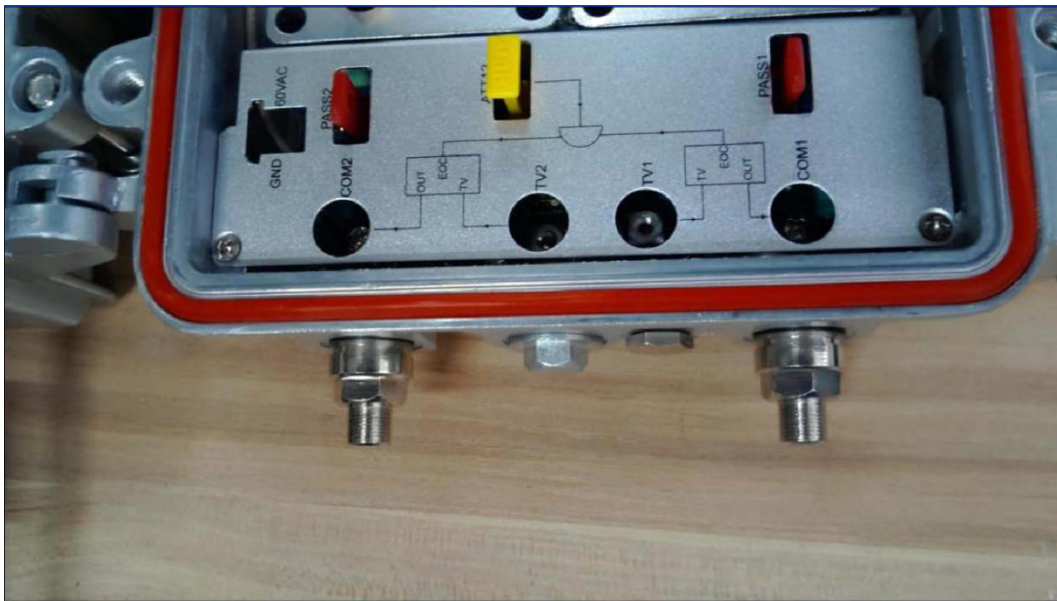


Figure: CD7944N EOC Master cable interface (4 channels)

2.5 Construction Self-Inspection

After the line transformation and equipment installation are completed, before the system is powered on, please check the installation equipment, components and materials, and the installation process referring to the construction specifications. After the system is powered on, you can install the EOC master at the user home. Check whether the EOC slave is registered and online normally, whether the service is normally opened, and whether the performance meets the expected requirements. Under the premise of ensuring that the final test results meet the specifications and requirements on the site, record the final test results truthfully and form a delivery file.

2.6 EOC Master Login Method

This equipment does not have out-band management port. By default, it only supports in-band management. There are two ways to login the device WEB interface. One is to access EOC master WEB from the front-end equipment(such as OLT, server, etc.) of the optical node. The other is to access the EOC master WEB from the EOC slave LAN side. See the following chapters for details:

2.6.1 Default Network Parameters

1. In-band management port default IP address:

- IP address: 192.168.1.6
- Subnet mask: 255.255.255.0

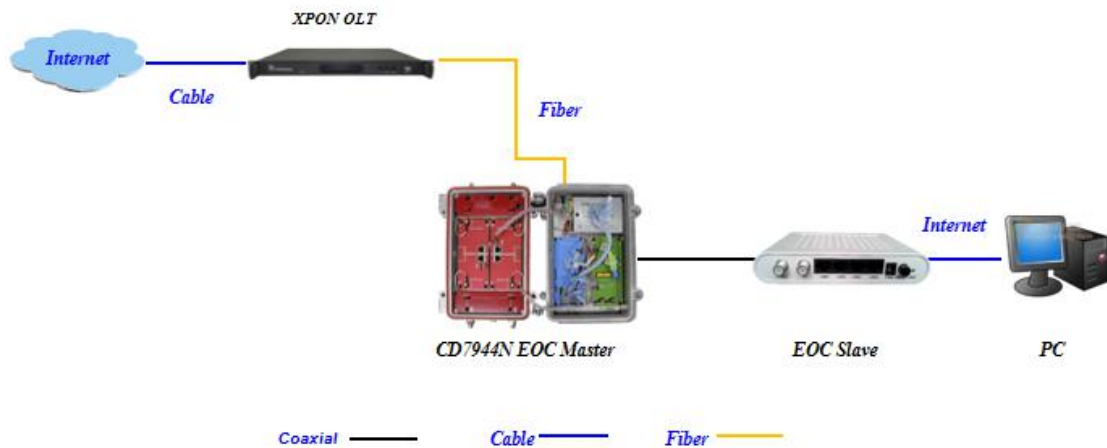
2. WEB default login username and password

- Username: admin
- Password: admin

2.6.2 Access EOC Master WEB Method

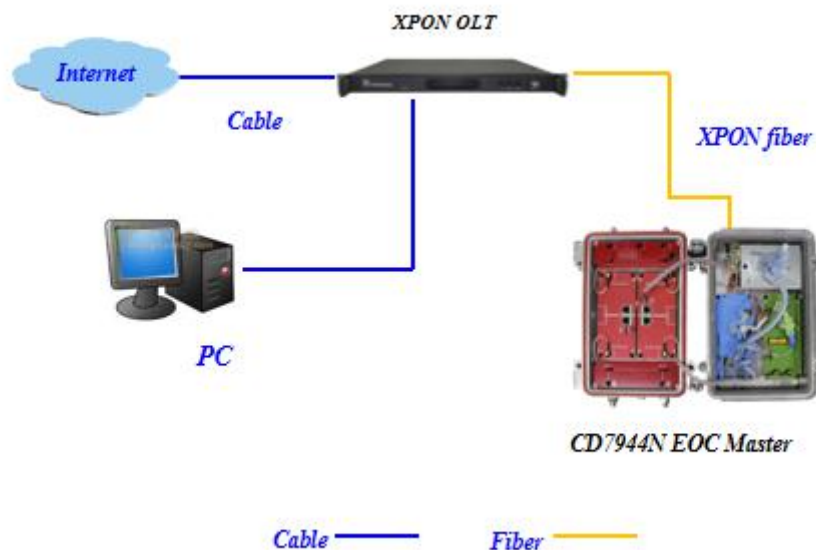
2.6.2.1 From EOC Slave LAN Side Access

The figure below is a networking diagram of accessing EOC master WEB from the LAN side of the EOC slave. According to the diagram, the PC is connected to the LAN port of the EOC slave, and configure the same network segment IP address as in-band management IP of EOC master to ensure that the PC can ping through EOC master. Access the EOC master WEB and make related configurations. This method is mostly used for local management or client side location problem.



2.6.2.2 From EOC Master Front-end Equipment Access

The figure below is a networking diagram of accessing EOC master WEB from front-end equipment. According to the diagram, the PC is connected to the OLT uplink port, and configure the same network segment IP address as in-band management IP of EOC master to ensure that the PC can ping through EOC master. Access the EOC master WEB and make related configurations. This management method is mostly used for remote management and is also a commonly used in-band management method.



Concluding Remarks

Thanks for using products of Shenzhen C-Data Technology Co. Ltd.

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