MICROWAVE HUAWEI OptiX RTN900

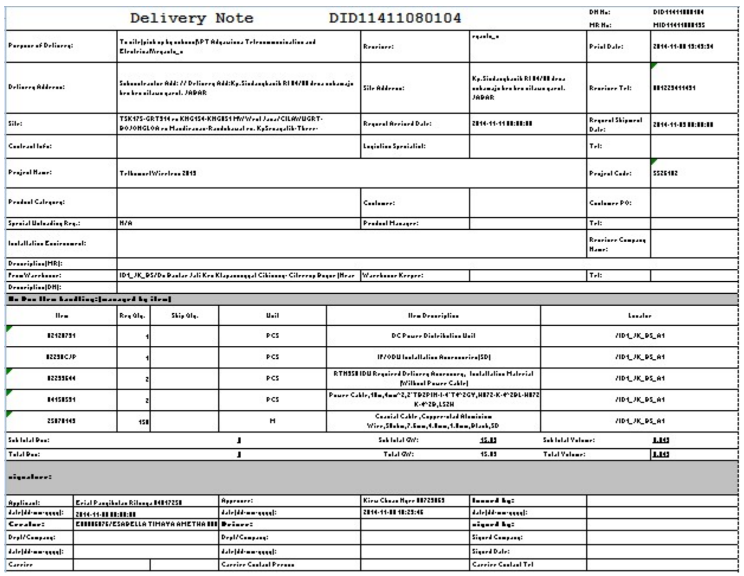
D00738162

General Installation Guidelines

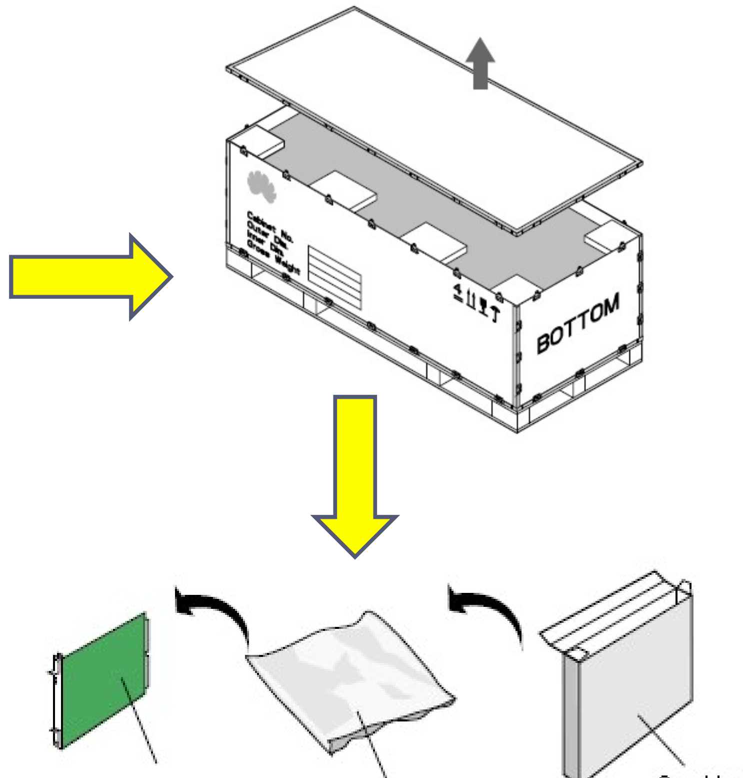
A. **Material On Site**
B. **IDU Installation**
C. **ODU Installation**
D. **Cabling Installation**
E. **Labeling**
F. **Alignment**
G. **Installation Tools**
H. **Boards**

A. Material On site

1. **Checking the materials according to DN/BoQ**
2. **Unpacking (Crates, Cartoons, and Boards)**



Delivery Note DID11411080104



B. IDU Installation

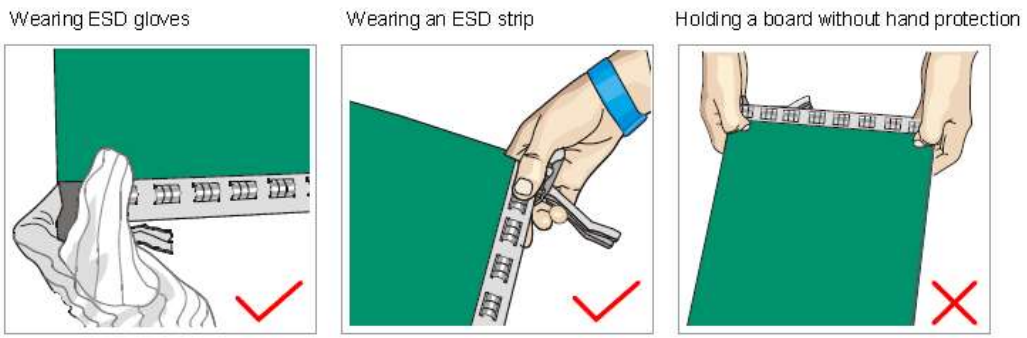
OptiX RTN Series

Product Name	IDU Appearance	Characteristic
OptiX RTN 905		● 1 U high IDU. ● Three types of integrated chassis. ● One or two microwave links.
OptiX RTN 910		● 1 U high IDU. ● Boards pluggable. ● Integrated service ports on system control, switching, and timing boards. ● One or two IF boards.
OptiX RTN 950		● 2 U high IDU. ● Boards pluggable. ● 1+1 protection for system control, switching, and timing boards. ● A maximum of six IF boards.
OptiX RTN 950A		● 2 U high IDU. ● Boards pluggable. ● Integrated service ports on system control, switching, and timing boards. ● A maximum of six IF boards.
OptiX RTN 980		● 5 U high IDU. ● Boards pluggable. ● 1+1 protection for system control, switching, and timing boards. ● Integrated service ports on system control, switching, and timing boards. ● A maximum of fourteen IF boards.

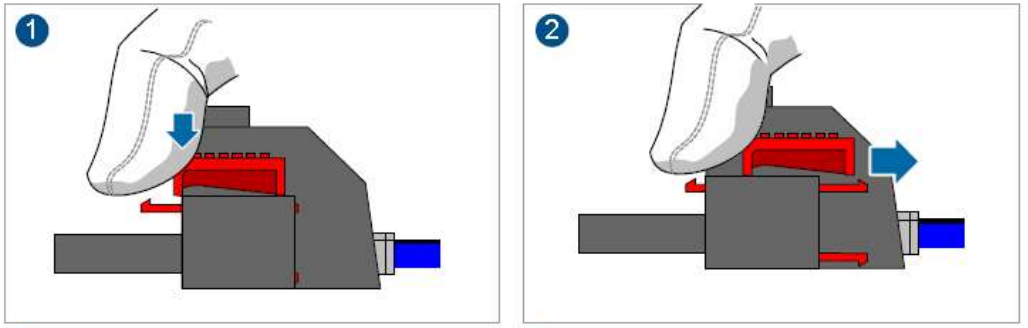
B. IDU Installation

Instructions and Precautions

Handling Boards



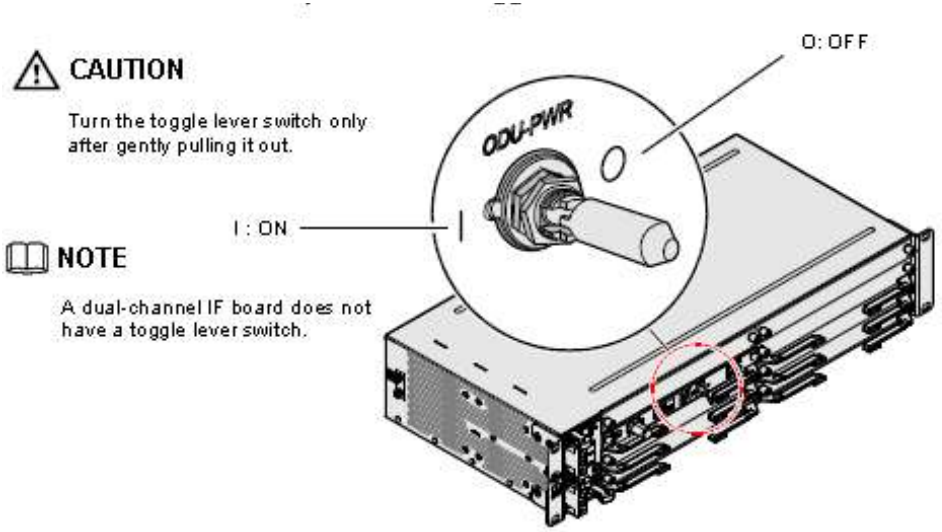
Handling Power Cable



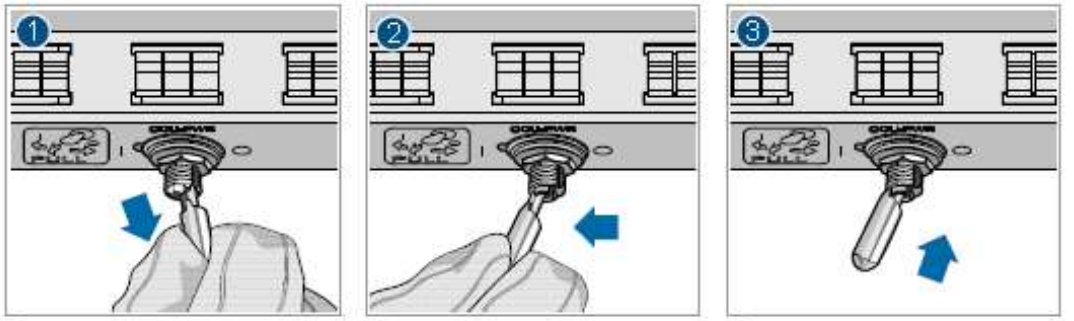
B. IDU Installation

Instructions and Precautions

Toggle Lever Switch



·Turning on the switch

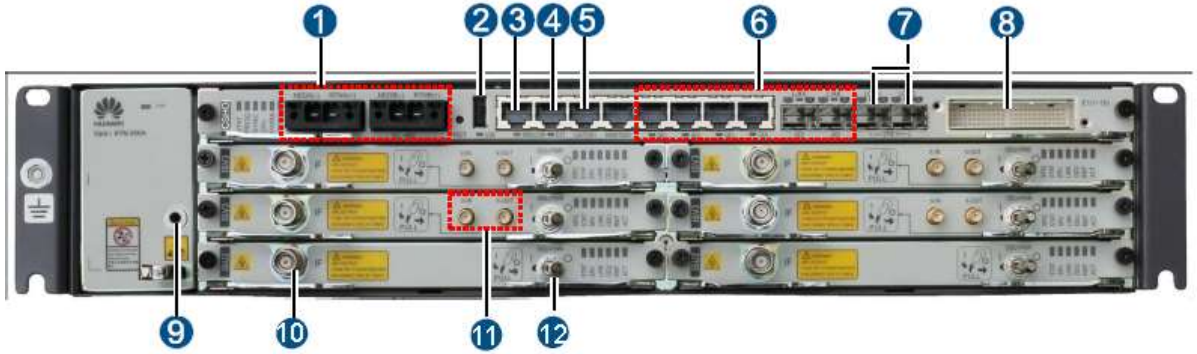


B. IDU Installation

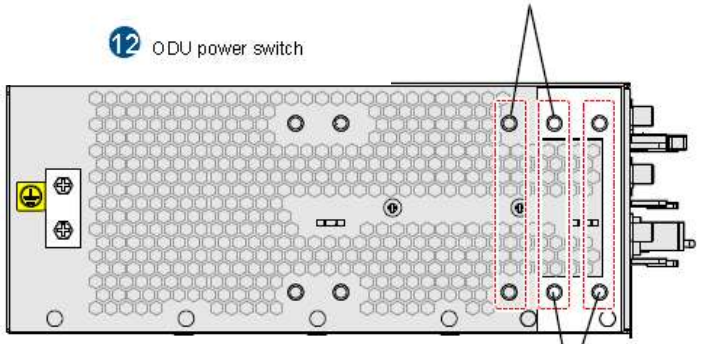
Tools for Installation

B. IDU Installation

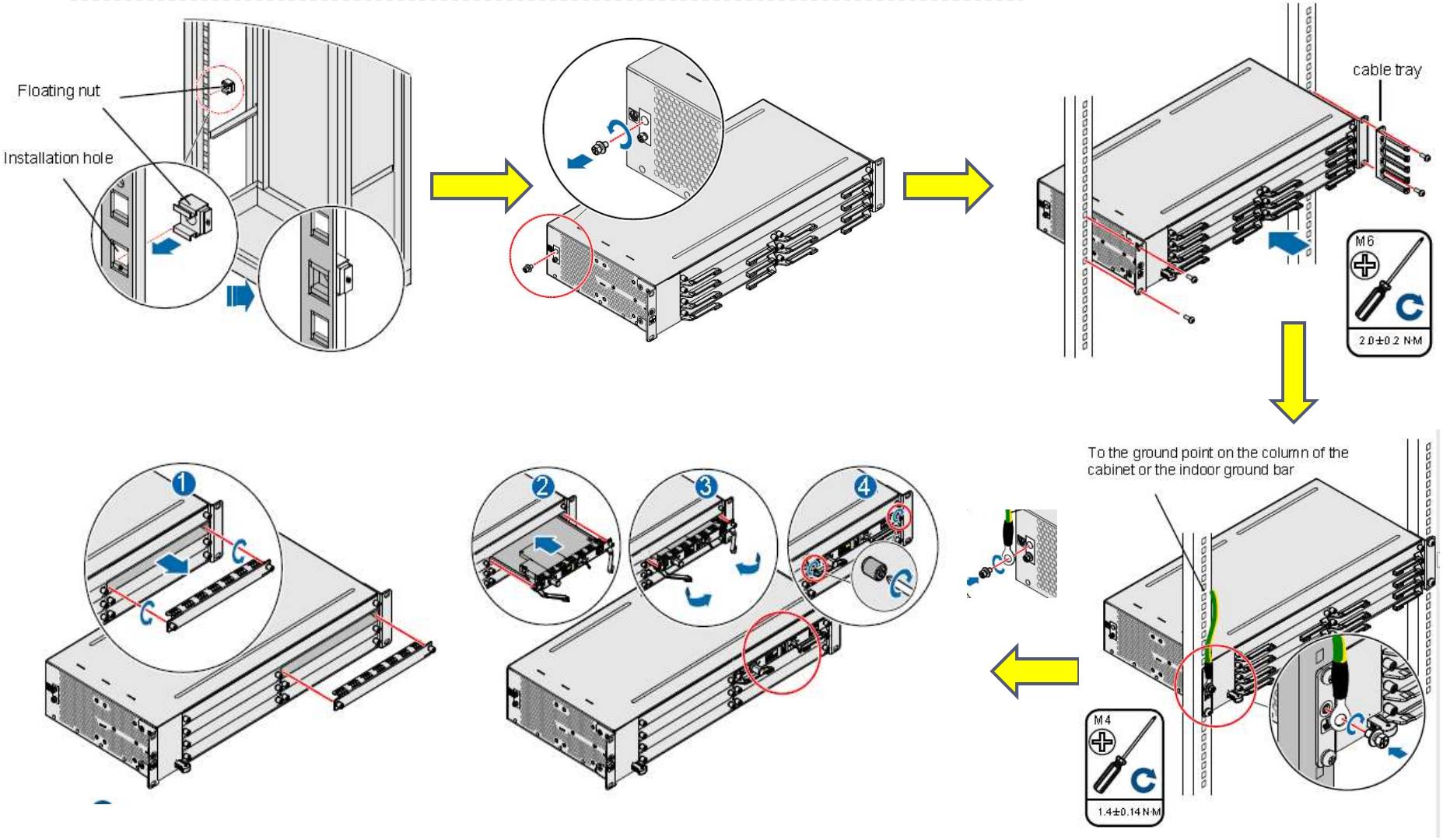
IDU OptiX RTN950A



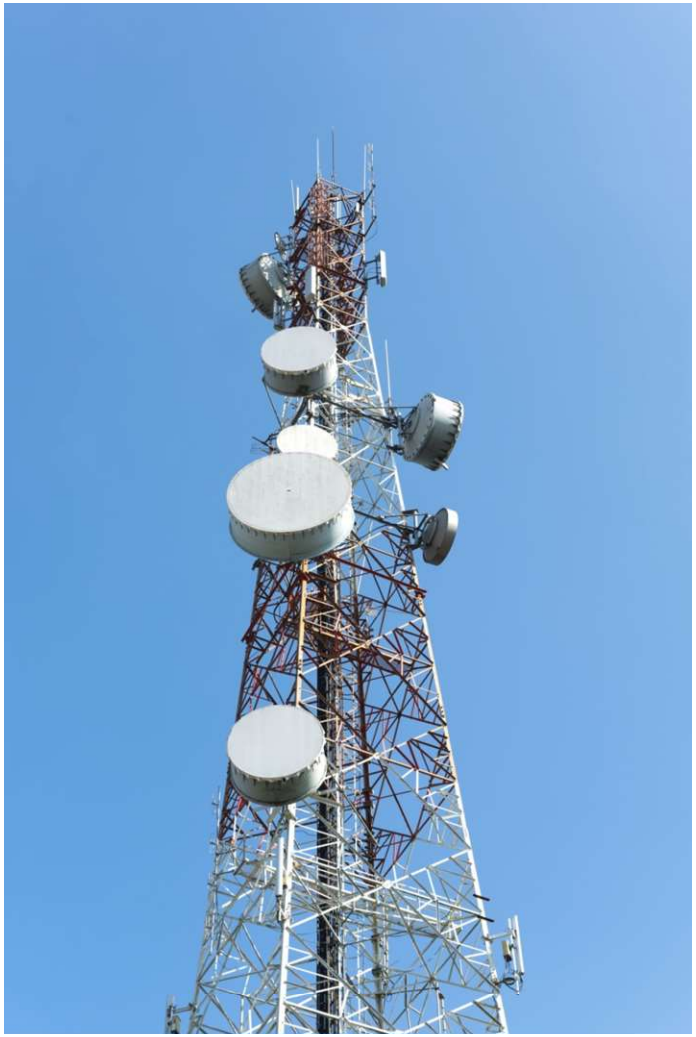
1 Input power port
2 USB port
3 NM/COM port
4 NE concatenation port
5 External clock port/External time port 1/Bypass E1 port
6 Ethernet service port
7 STM-1 service port
8 E1 port
9 ESD port
10 IF port
11 XPIC input/output ports
12 ODU power switch



B. IDU Installation

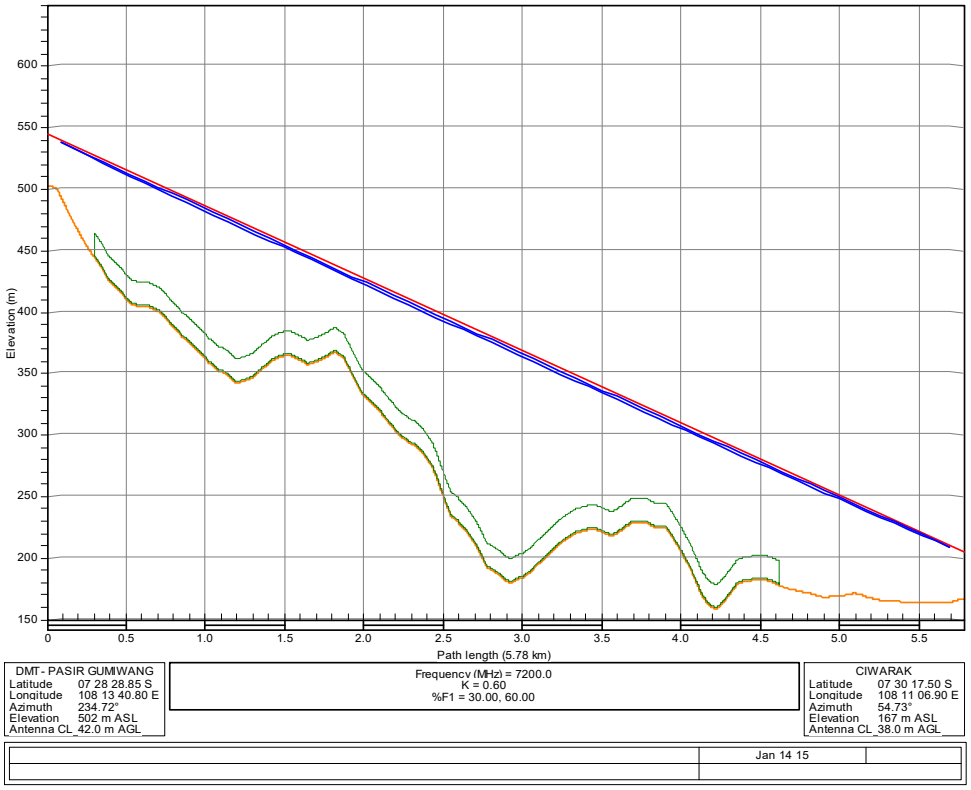


C. ODU Installation



C. ODU Installation

	DMT- PASIR GUMIWANG	CIWARAK
Elevation (m)	502.47	166.93
Latitude	07 28 28.85 S	07 30 17.50 S
Longitude	108 13 40.80 E	108 11 06.90 E
True azimuth (°)	234.72	54.73
Vertical angle (°)	-3.38	3.34
Antenna model	A07S06HAC	A07S06HAC
Antenna height (m)	42.00	38.00
Antenna gain (dBi)	31.20	31.20
Frequency (MHz)	7200.00	
Polarization	Vertical	
Path length (km)	5.78	
Free space loss (dB)	124.85	
Atmospheric absorption loss (dB)	0.06	
Net path loss (dB)	62.51	62.51
Radio model	7G_XMC2_32Q_28M_108M	7G_XMC2_32Q_28M_108M
TX power (watts)	0.20	0.20
TX power (dBm)	23.00	23.00
EIRP (dBm)	54.20	54.20
Emission designator	28M0D7W	28M0D7W
TX Channels	7H 7338.0000V	7L 7177.0000V
RX threshold criteria	BER 10-6	BER 10-6
RX threshold level (dBm)	-76.50	-76.50
Maximum receive signal (dBm)	-20.00	-20.00
RX signal (dBm)	-39.51	-39.51
Thermal fade margin (dB)	36.99	36.99
Geoclimatic factor	8.22E-05	
Path inclination (mr)	58.68	
Fade occurrence factor (Po)	8.60E-06	
Average annual temperature (°C)	10.00	
Worst month - multipath (%)	100.00000	100.00000
(sec)	4.61e-03	4.61e-03
Annual - multipath (%)	100.00000	100.00000
(sec)	0.01	0.01
(% - sec)	100.00000 - 0.03	
0.01% rain rate (mm/hr)	145.00	
Flat fade margin - rain (dB)	36.99	
Rain attenuation (dB)	36.99	
Annual rain (%-sec)	99.99999 - 2.16	
Annual multipath + rain (%-sec)	99.99999 - 2.19	



Wed, Jan 14 2015
DMT- PASIR GUMIWANG-CIWARAK.pl4
Reliability Method - ITU-R P.530-7/8
Rain - ITU-R P530-7

C. ODU Installation

Figure 1-4 Direct mounting mode

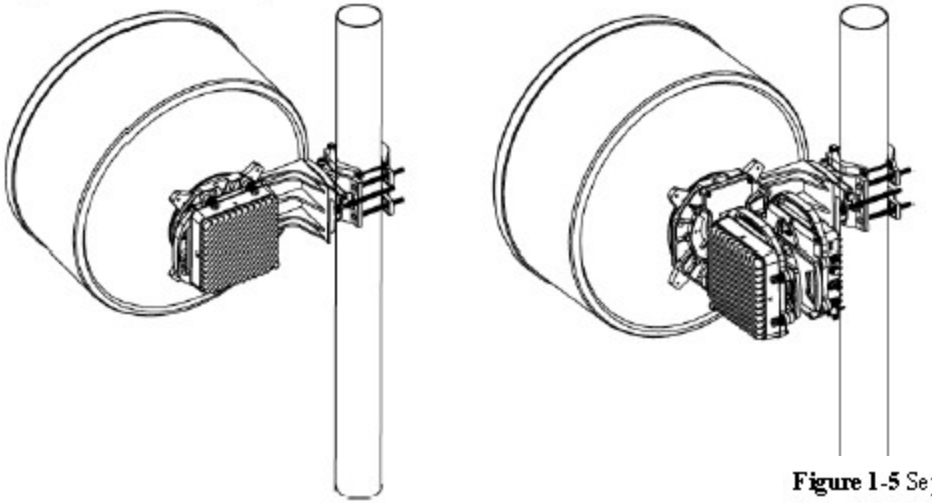
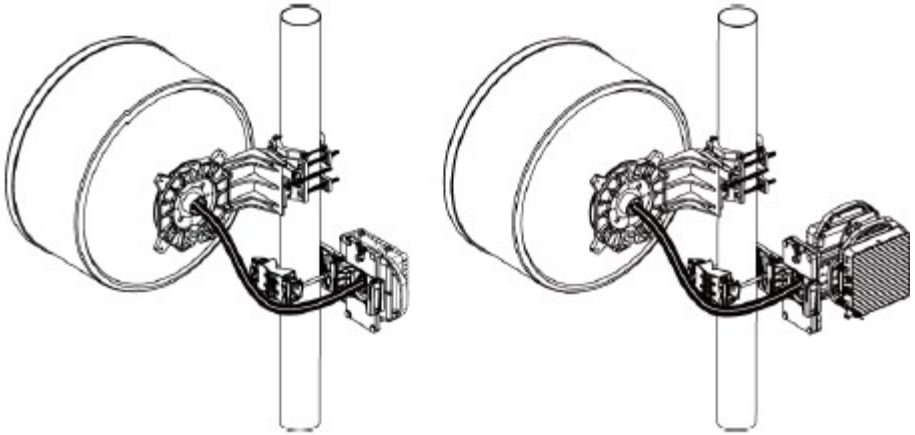


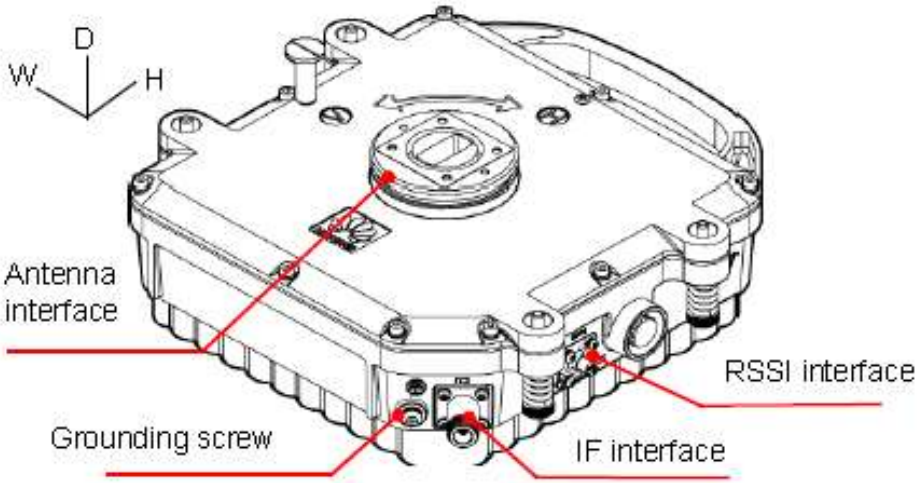
Figure 1-5 Separate mounting mode using a single-polarized antenna

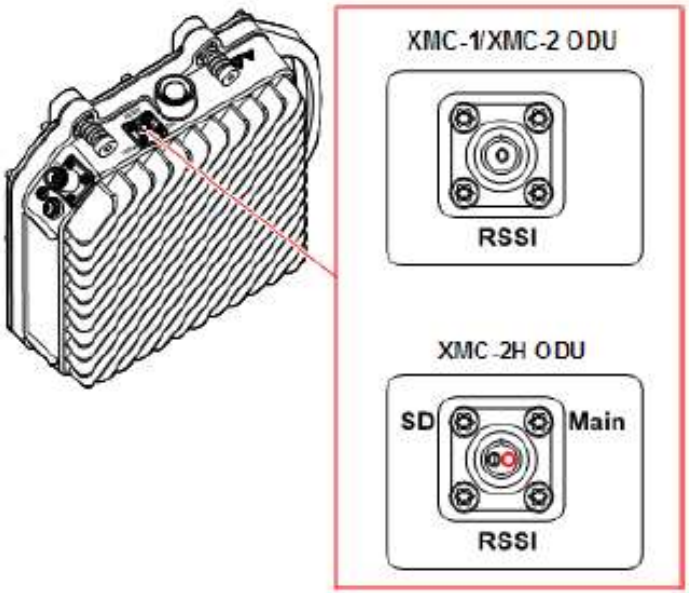


C. ODU Installation

XMC-2 ODU

A microwave RF unit, has the function of frequency conversion and power amplification.





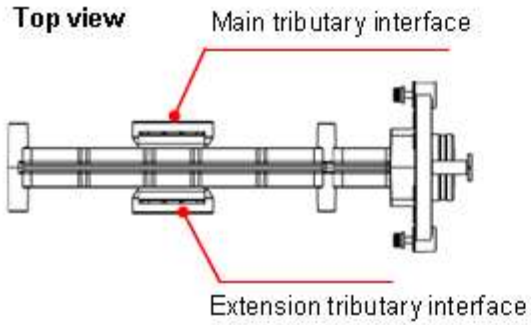
Dimensions (width x depth x height)

- XMC-1/XMC-2: ≤ 228 mm x 75 mm x 228 mm
- XMC-2H: ≤ 228 mm x 91 mm x 228 mm

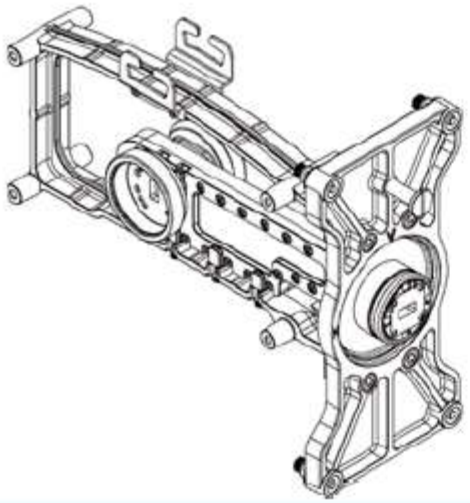
C. ODU Installation

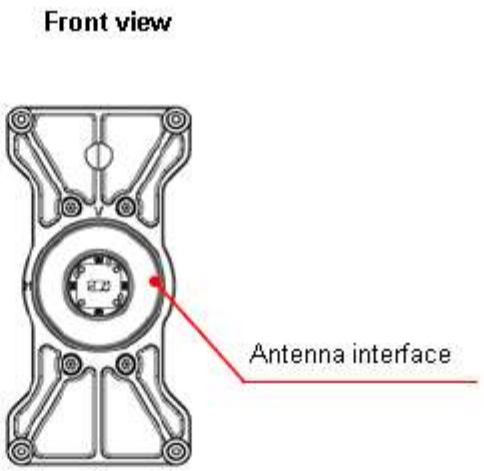
Hybrid coupler

The hybrid coupler is used to combine and divide RF signals



Interface Name	Interface Label
Main tributary interface	MAIN
Extension tributary interface	STD BY

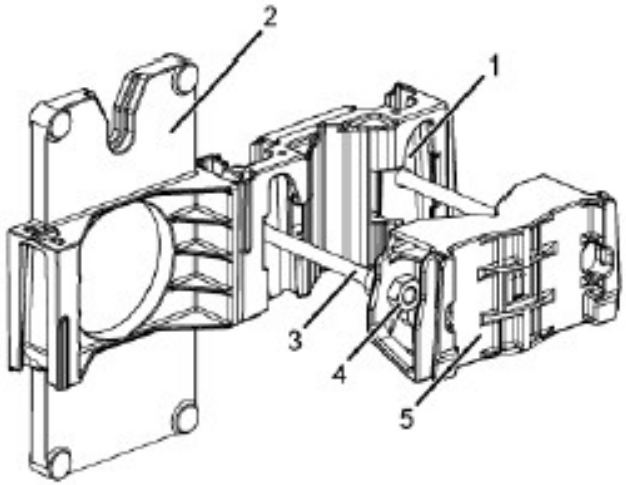




C. ODU Installation

ODU Separate Mounting Bracket

When the ODU or hybrid coupler is installed with the antenna separately, the ODU separate mounting bracket can be used to fix the ODU or hybrid coupler on the pole.



1. Main bracket 2. Transfer component 3. Long bolt 4. Dual-port nut 5. Auxiliary bracket

C. ODU Installation

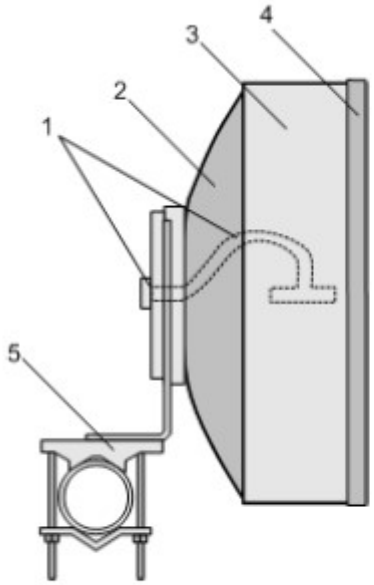
Flexible Waveguide

It is used to connect the flange interface of the ODU or hybrid coupler with the flange interface of the antenna

C. ODU Installation

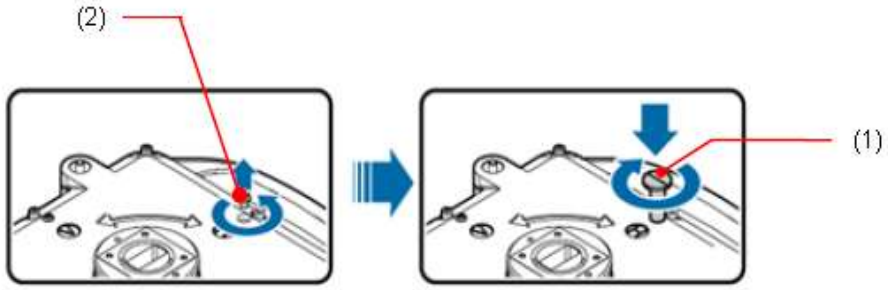
Antenna

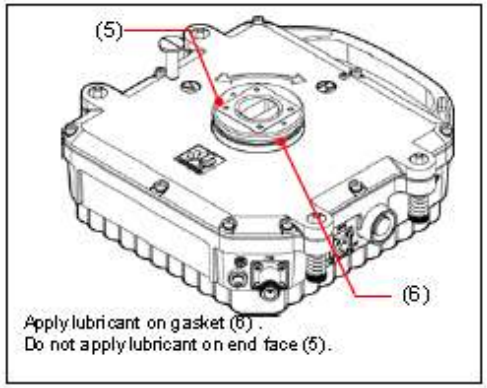
The microwave antenna is used to convert between the RF signals transmitted from the ODU and electromagnetic waves radiated in the air.

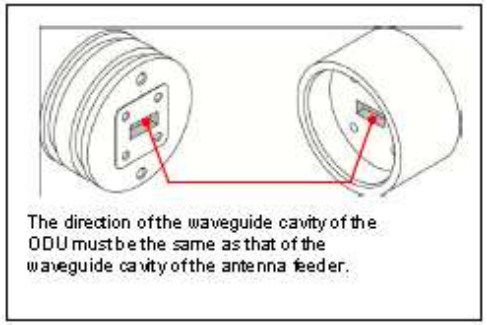


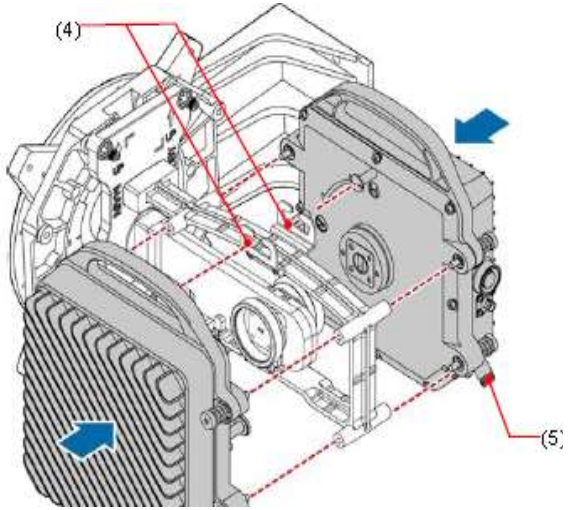
1. Feed boom
2. Reflector
3. Shield
4. Radome
5. Mounting bracket

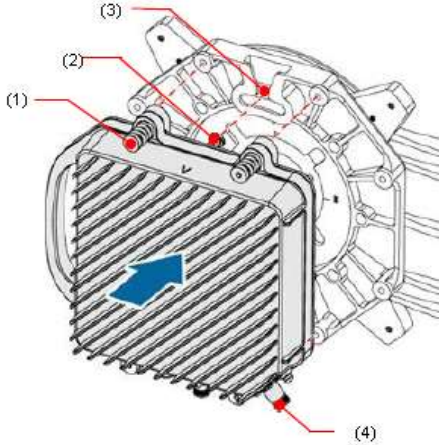
C. ODU Installation



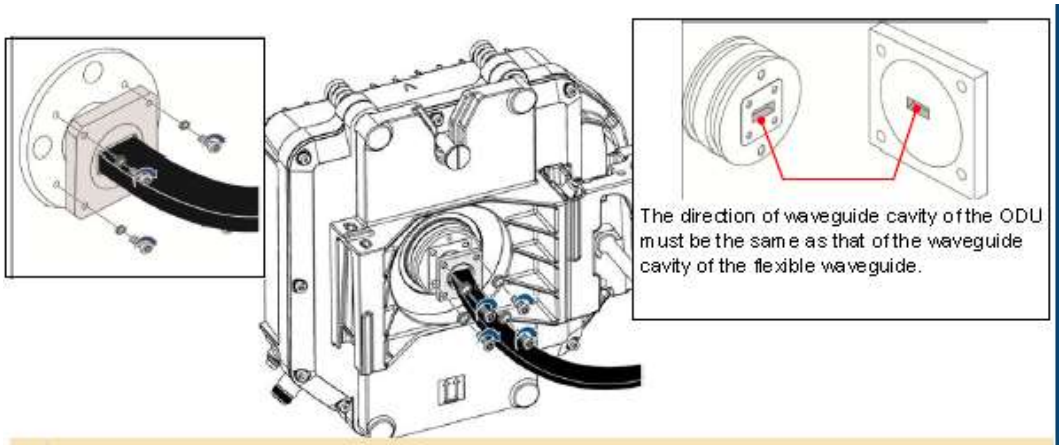


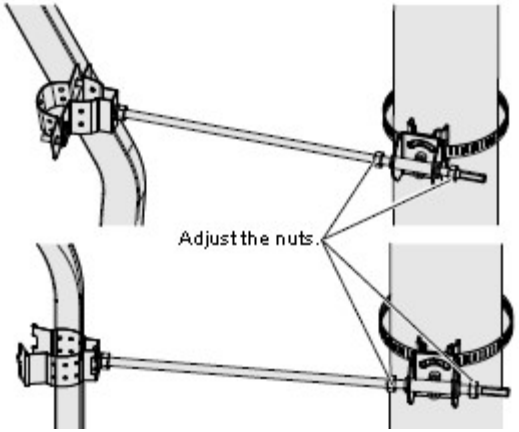


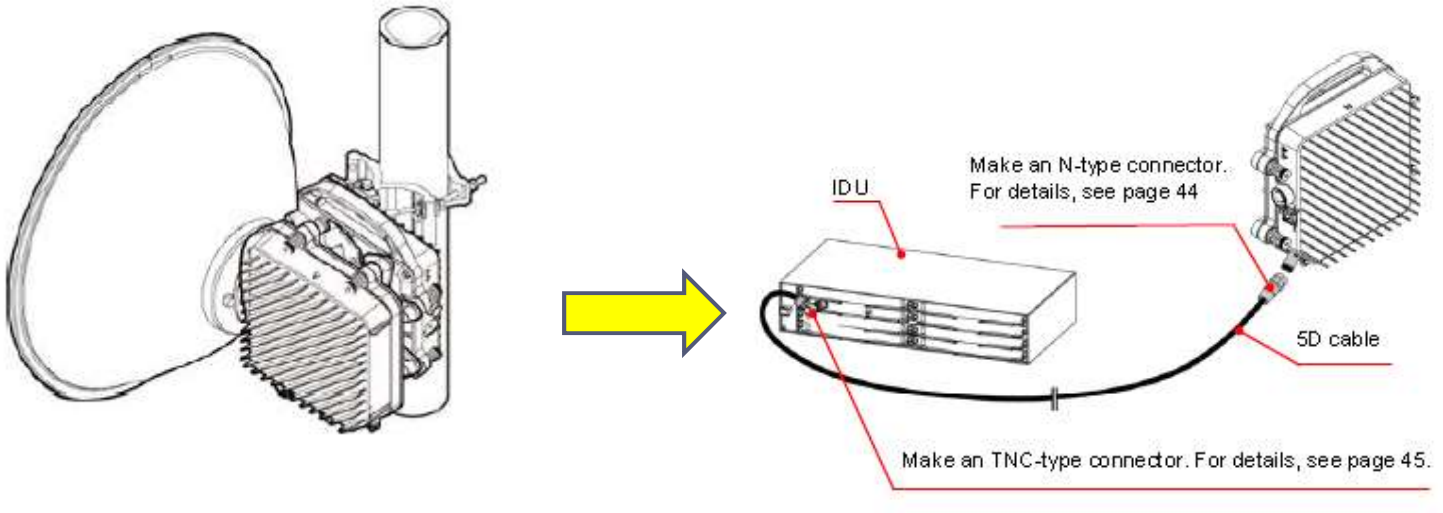




C. ODU Installation





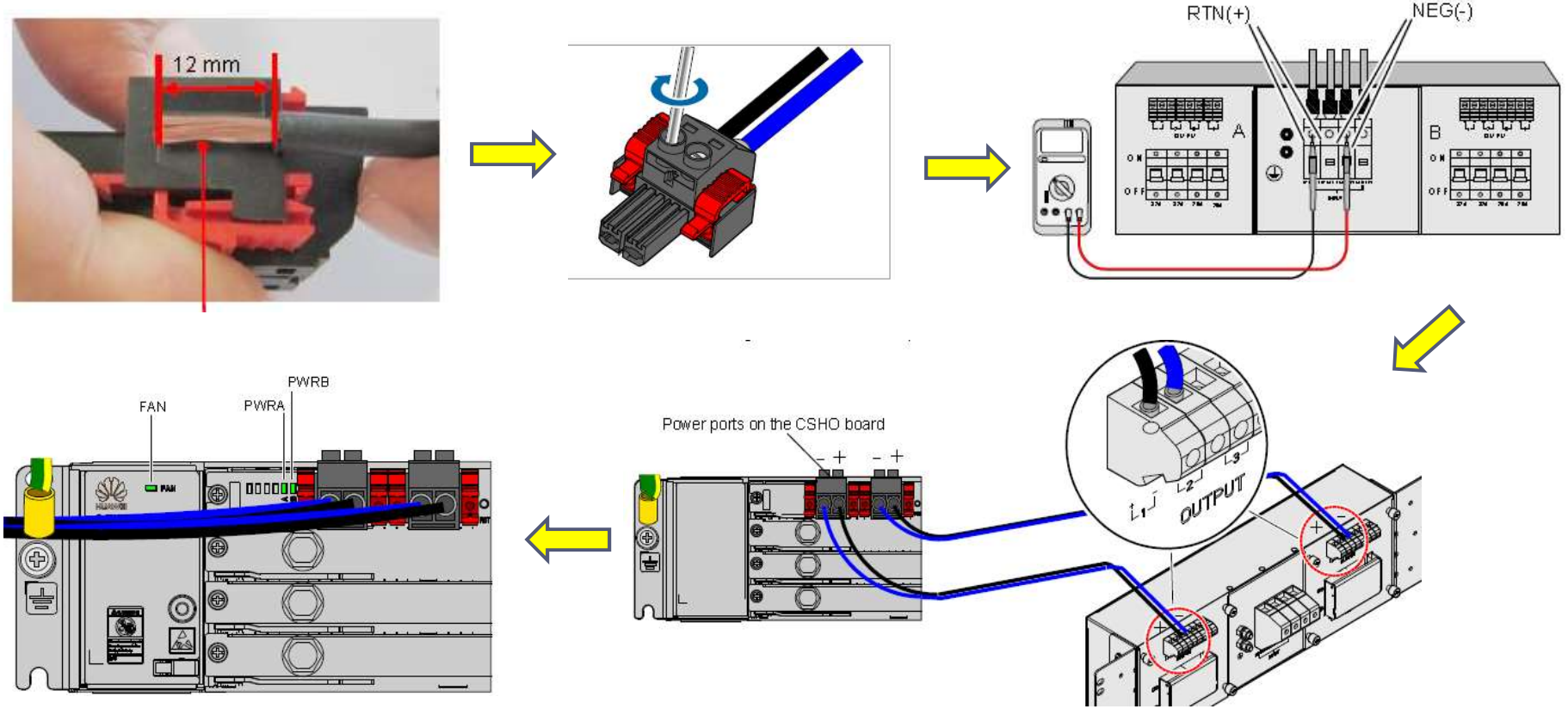


D. Cabling Installation

Installing Power Cables

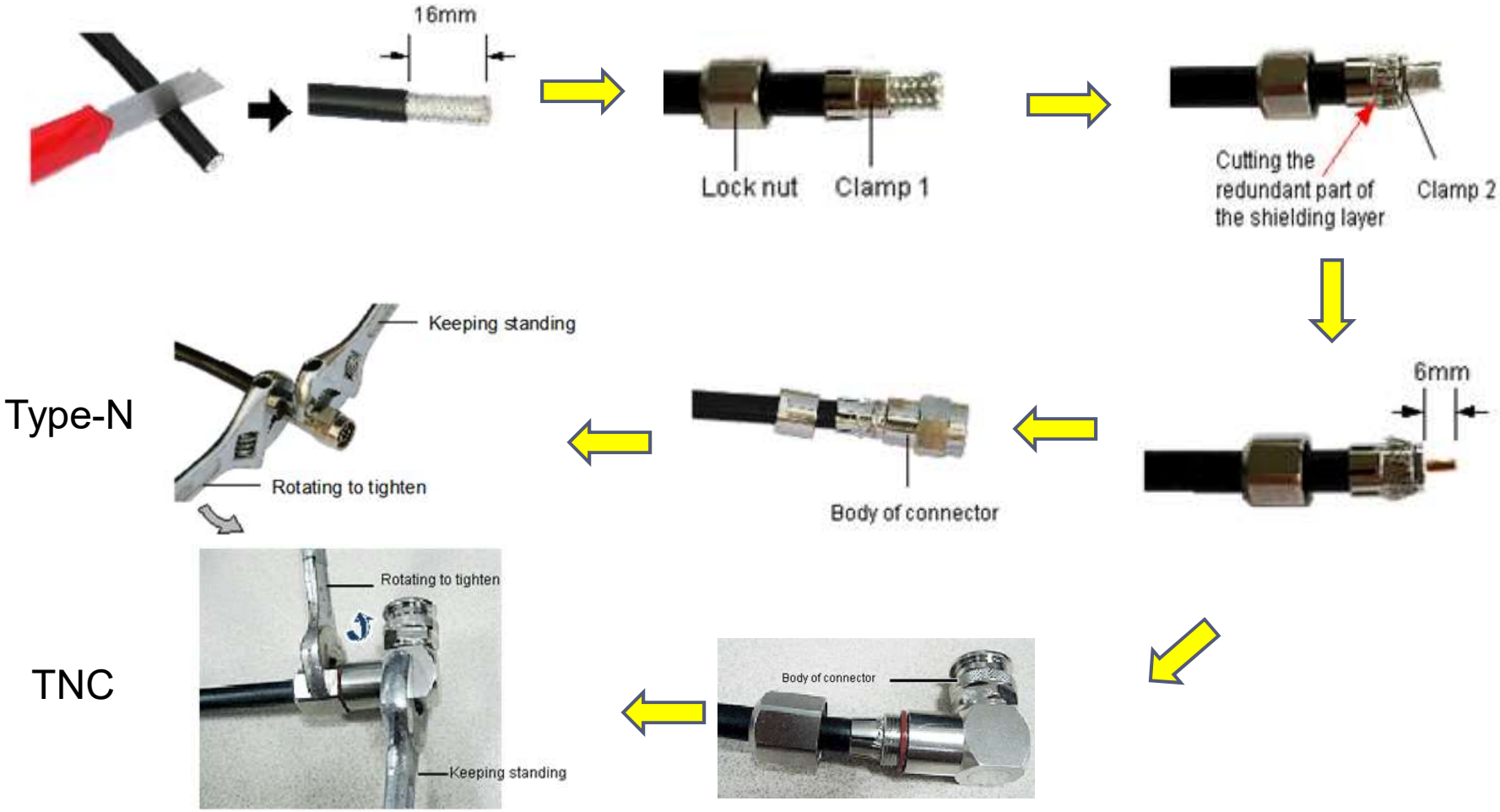
Rated Voltage of the Input Power	Allowable Voltage Range
–48 V	–38.4 V to –57.6 V

Power Cable Connector Terminal	Cable
-	-48 V power cable (blue)
+	0 V ground cable (black)



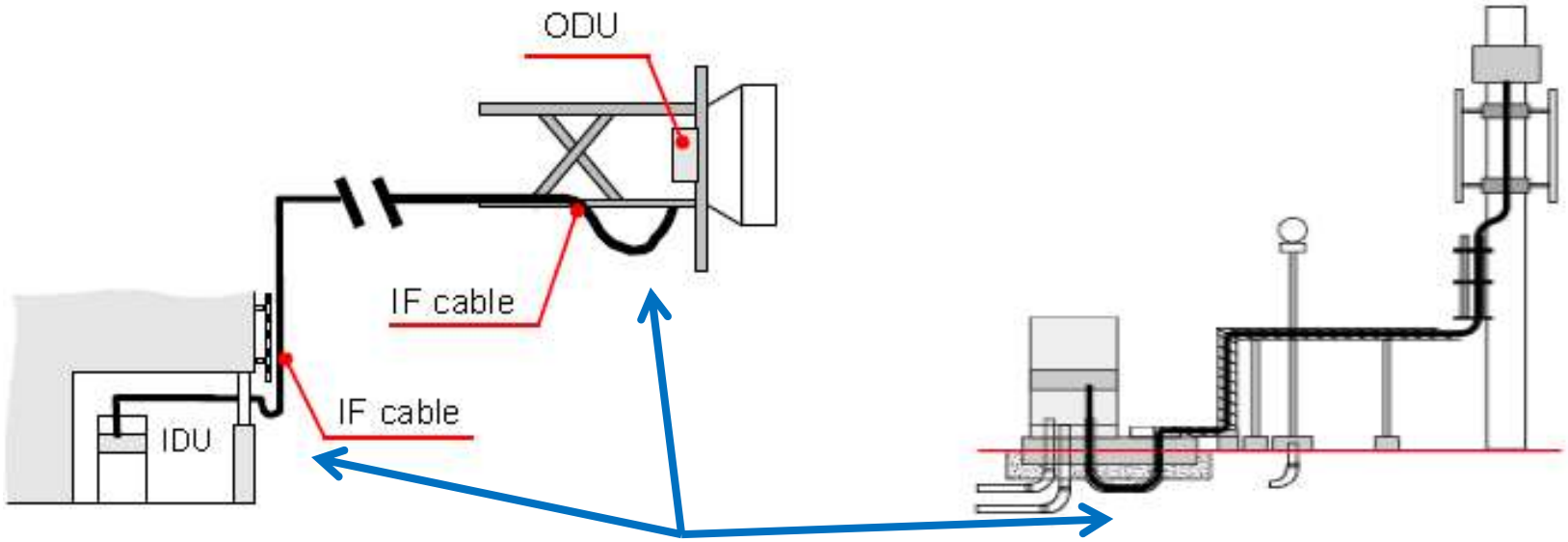
D. Cabling Installation

Installing IF Cables to Type-N & TNC Connectors



D. Cabling Installation

Installing IF Cable

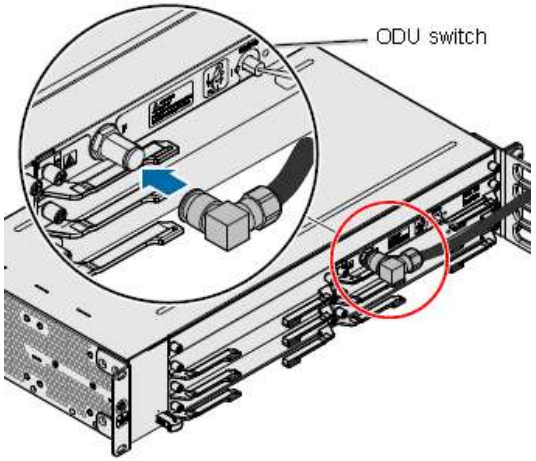


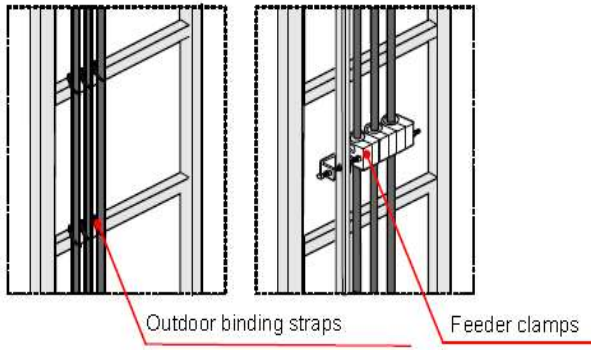
The bending radius of the IF cable should be larger than 40 cm(16 inch).

D. Cabling Installation

Installing IF Cable

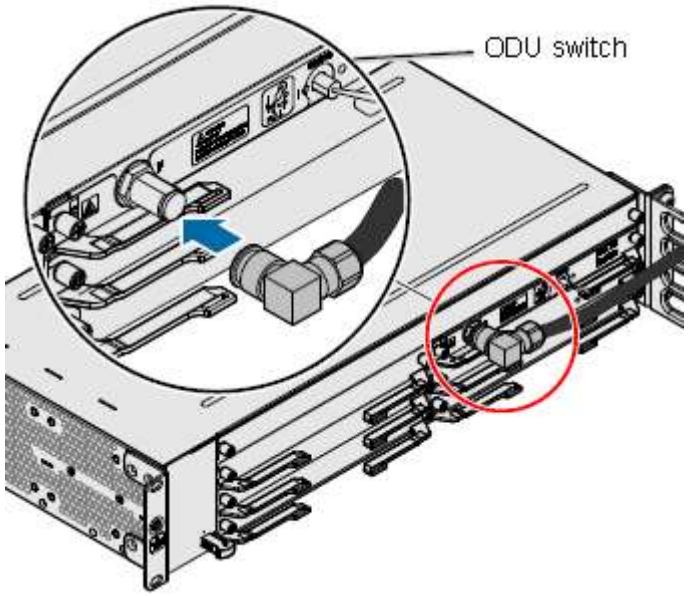
Isolator – Rubber - Isolator





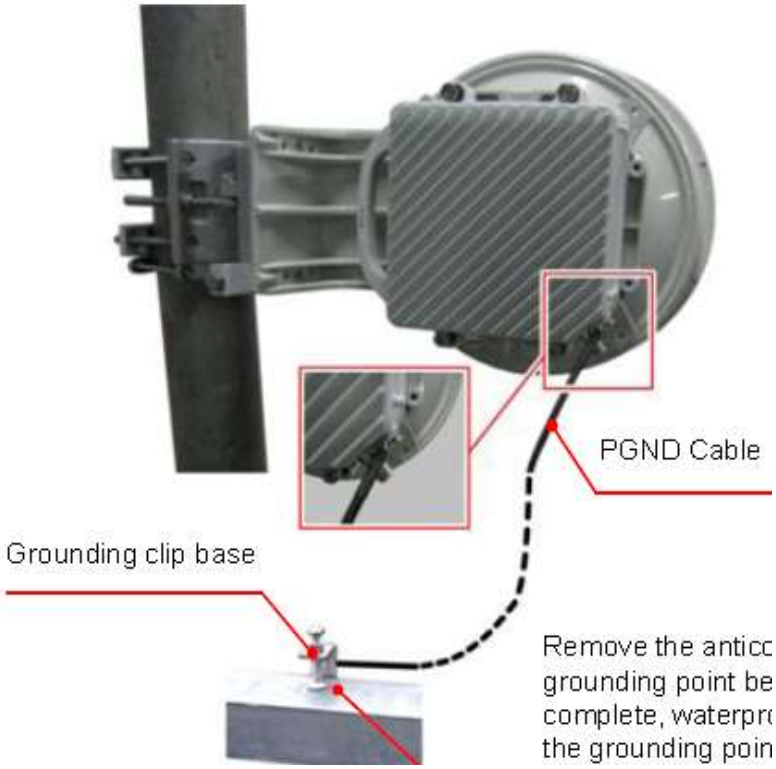
D. Cabling Installation

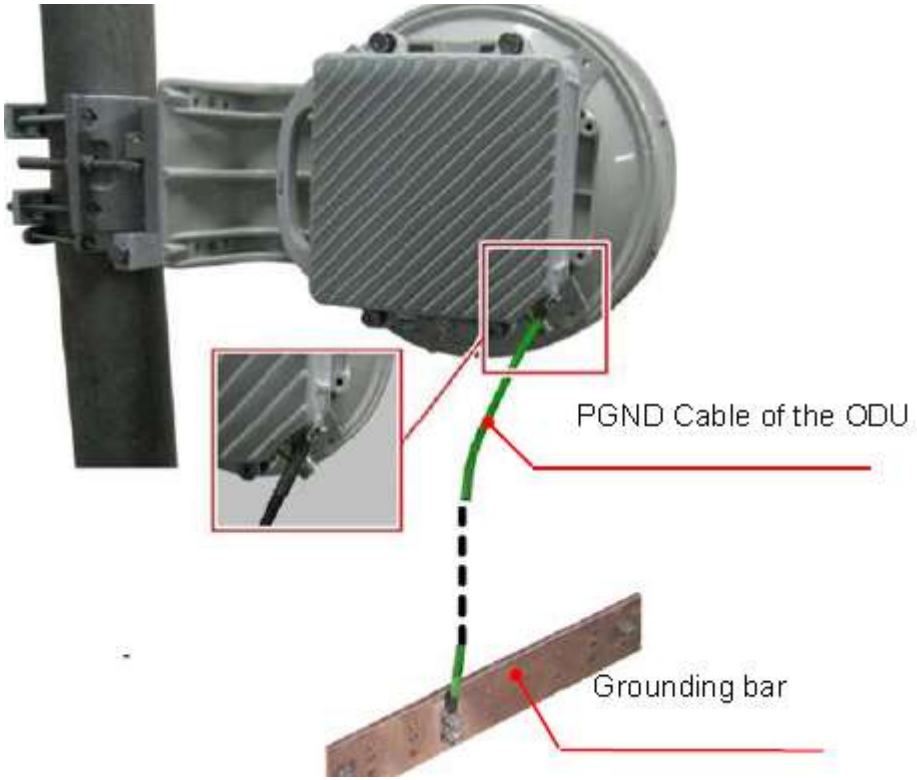
Installing IF Cable



D. Cabling Installation

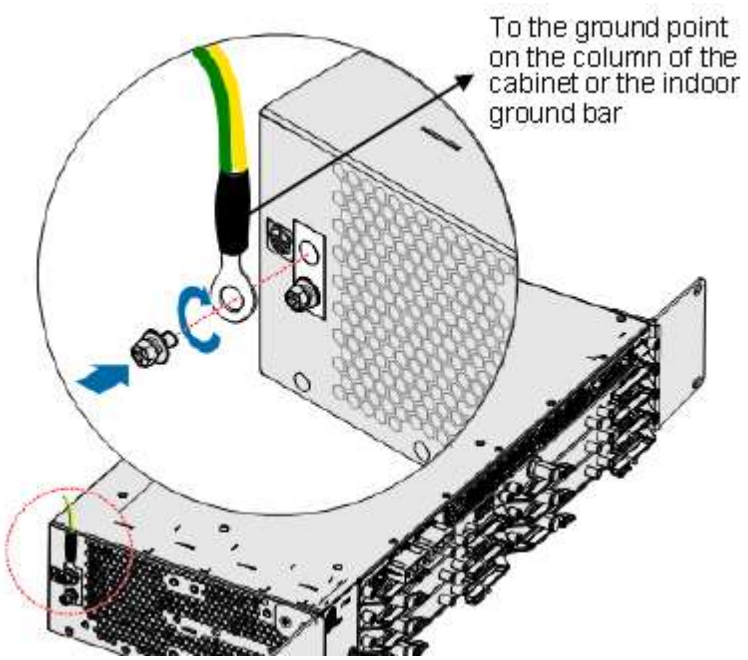
Installing the PGND Cable of the ODU

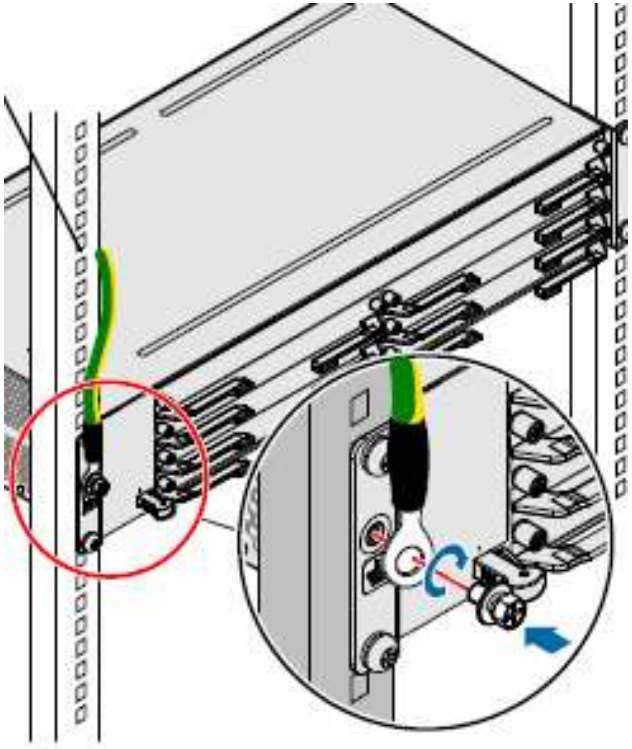




D. Cabling Installation

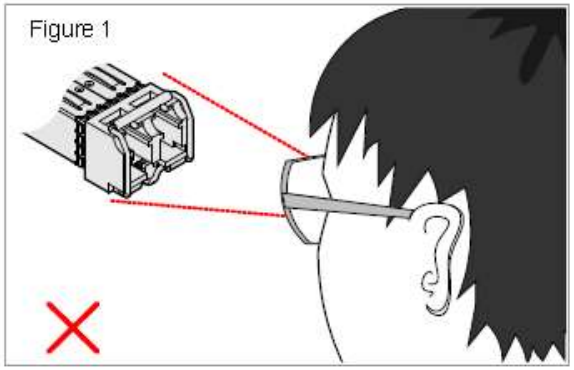
Installing the PGND Cable

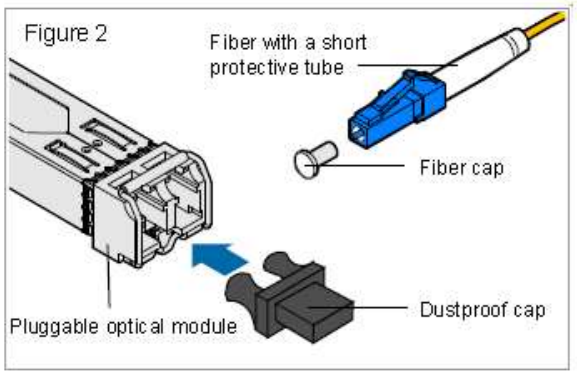


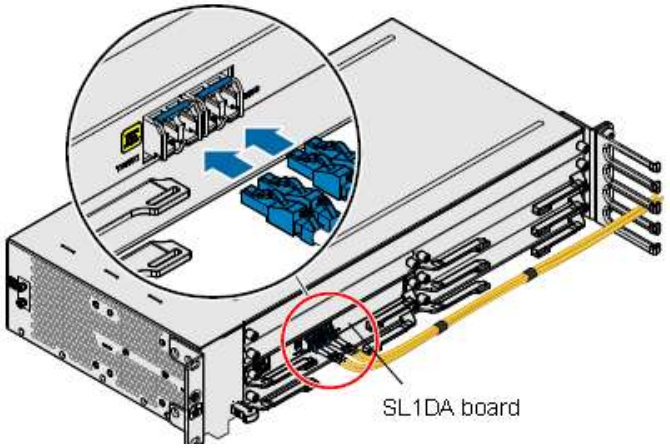


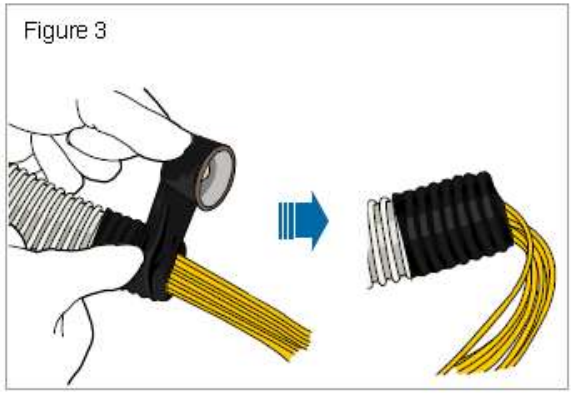
D. Cabling Installation

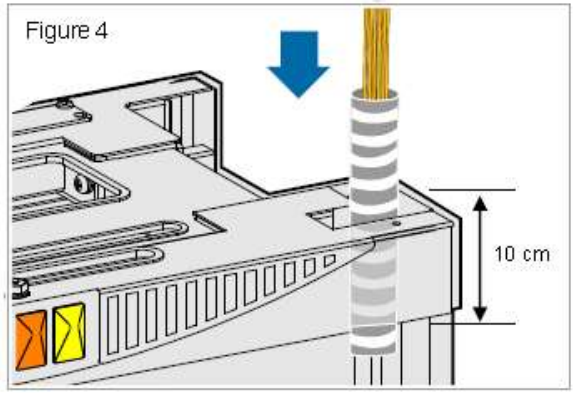
Installing the Fiber





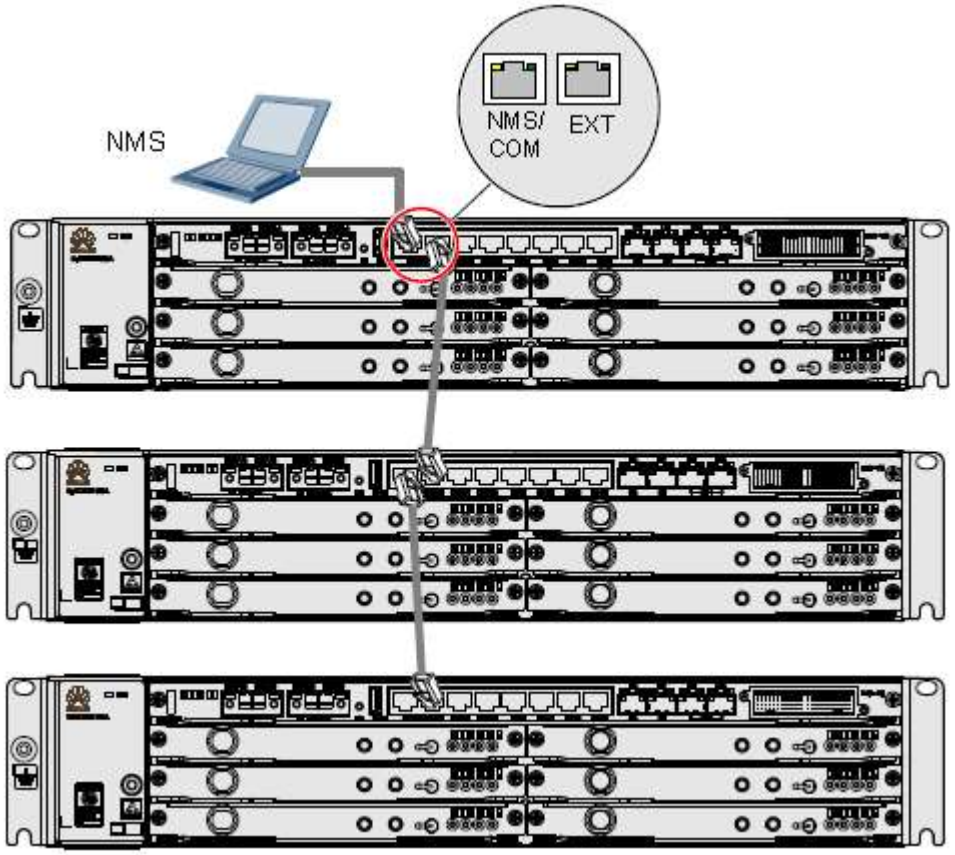






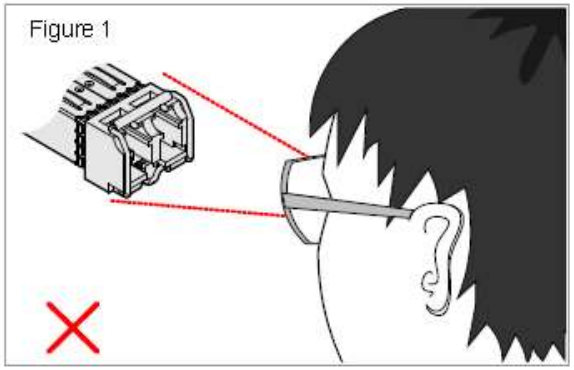
D. Cabling Installation

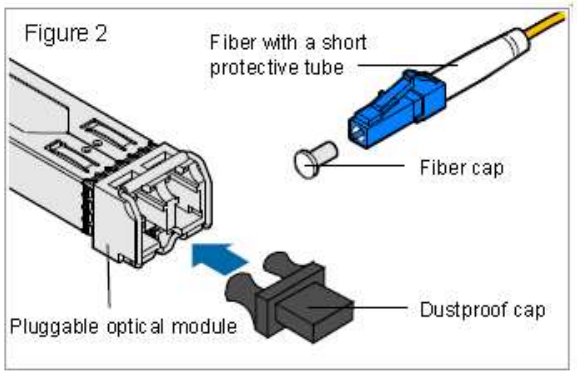
Installing the NMS Cable

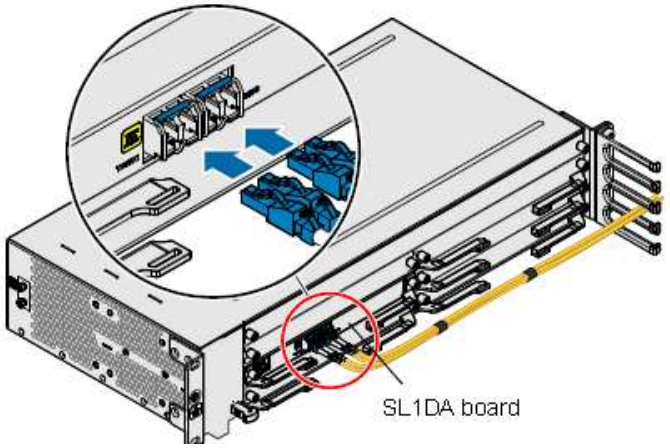


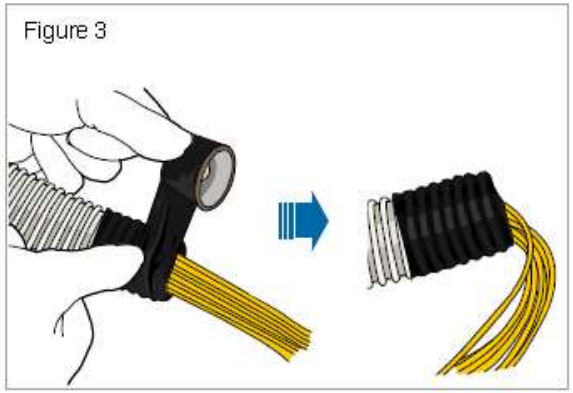
D. Cabling Installation

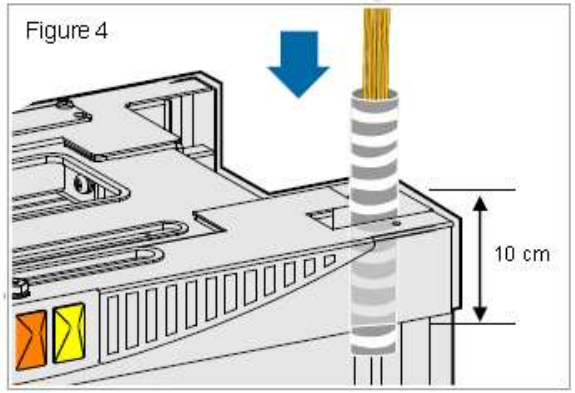
Installing the Fiber





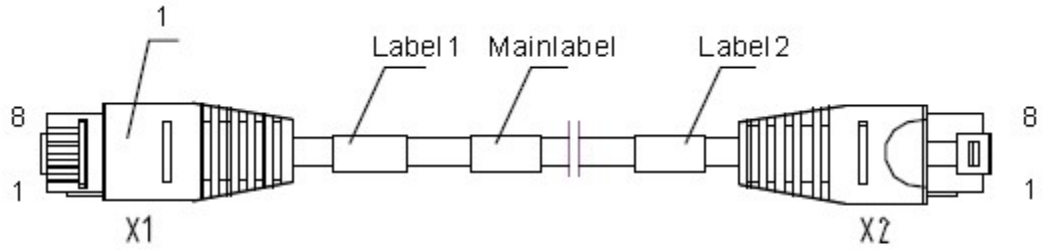






D. Cabling Installation

Installing LAN Cable



1. Network port connector, RJ45

straight-through cable

Connector X1 Connector X2 Color Relation
X1.1 X2.1 White/Orange
X1.2 X2.2 Orange
X1.3 X2.3 White/Green
X1.6 X2.6 Green
X1.4 X2.4 Blue
X1.5 X2.5 White/Blue
X1.7 X2.7 White/Brown
X1.8 X2.8 Brown

crossover cable

Connector X1 Connector X2 Color Relation
X1.1 X2.3 White/Green Twisted pair
X1.2 X2.6 Green
X1.3 X2.1 White/Orange Twisted pair
X1.6 X2.2 Orange
X1.4 X2.4 Blue Twisted pair
X1.5 X2.5 White/Blue
X1.7 X2.7 White/Brown Twisted pair
X1.8 X2.8 Brown

E. Labeling

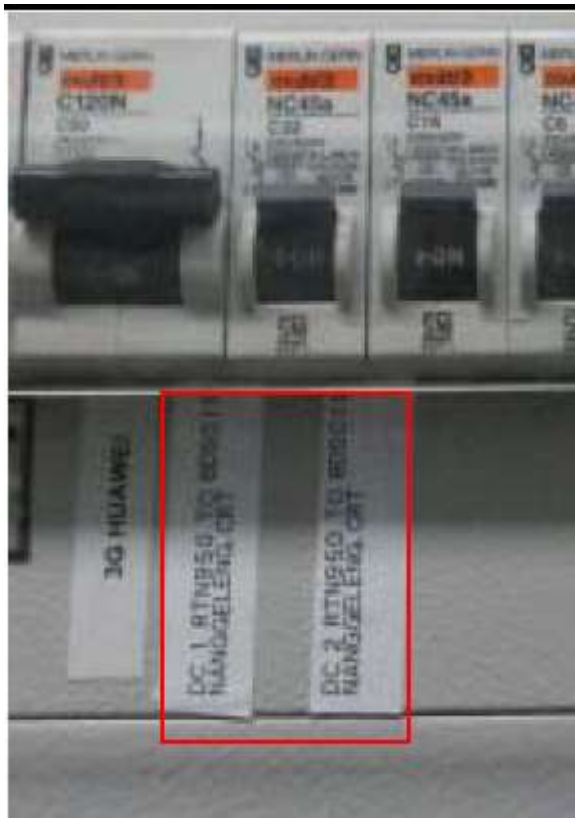
ODU

E. Labeling

IDU

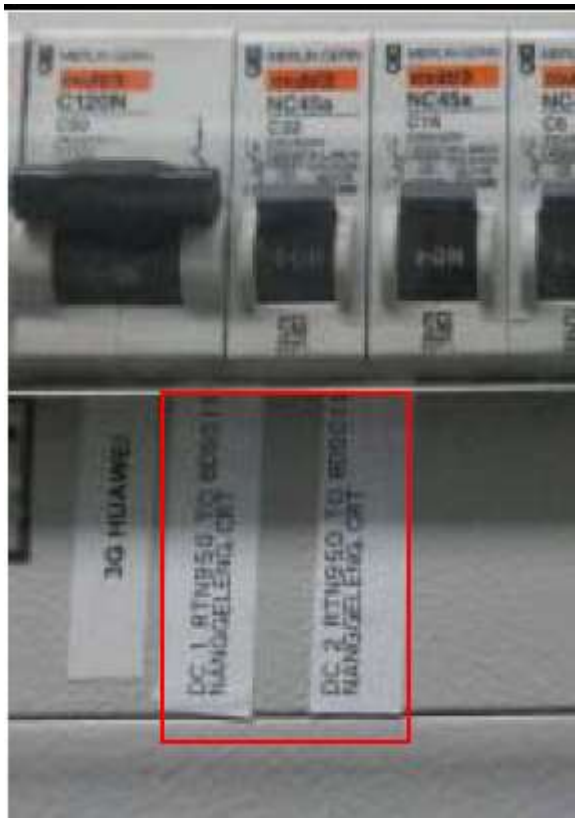
E. Labeling

Power on PDB



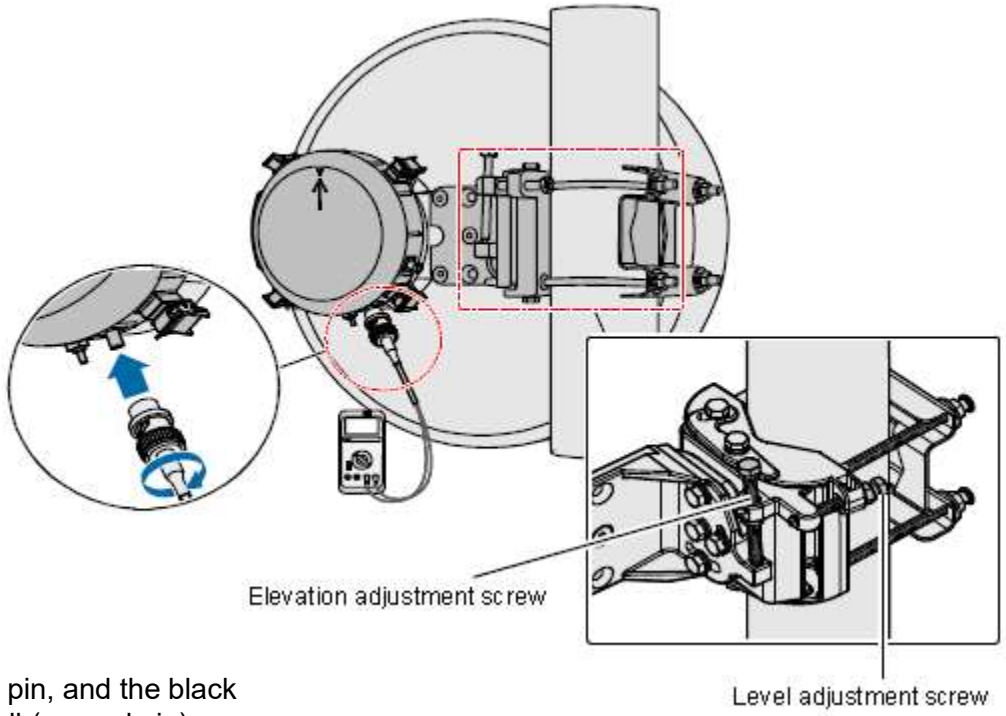
E. Labeling

Power on PDB



F. Alignment

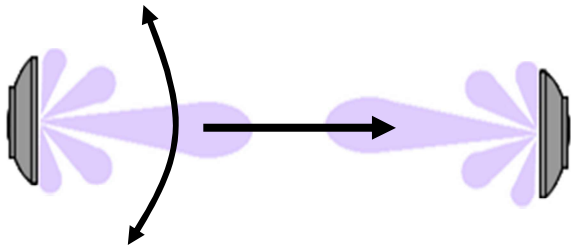
- Determine the azimuth of the antenna according to the installation position and height of the antenna. Adjust the elevation of the antenna to the horizontal position.
- Connect a multimeter to the RSSI port on the ODU at the local end and measure the voltage value VBNC

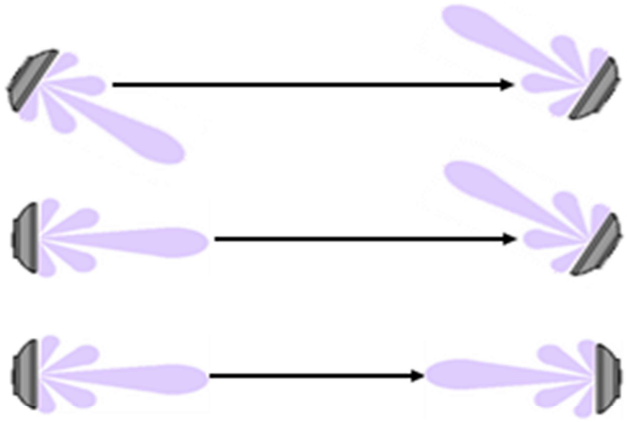


Note:
The red line of the multimeter is connected to the pin, and the black line of the multimeter is connected to the inner wall (ground pin).

F. Alignment

- Retain the remote antenna secure. Adjust the level adjustment screw. At the local end, rotate the antenna widely in the horizontal direction.
- Adjust the elevation adjustment screw. At the local end, gently adjust the elevation and azimuth until the RSL reaches the peak within the tracked range.
- Repeat Steps 3 to 4 to ensure that three signal peaks are tracked in both horizontal and vertical directions.
- When the local RSL reaches the maximum peak value, tighten the local antenna.
- Adjust the remote antenna to ensure that the RSL at the local end and the RSL at the remote end reach the peak value. Check the status of the ODU indicator on the IF board. The ODU indicator on the IF board is off. If the ODU indicator on the IF board is yellow and blinks every 300 ms, continue aligning the antenna.
- Tighten all the screws of the antennas after the alignment is completed.



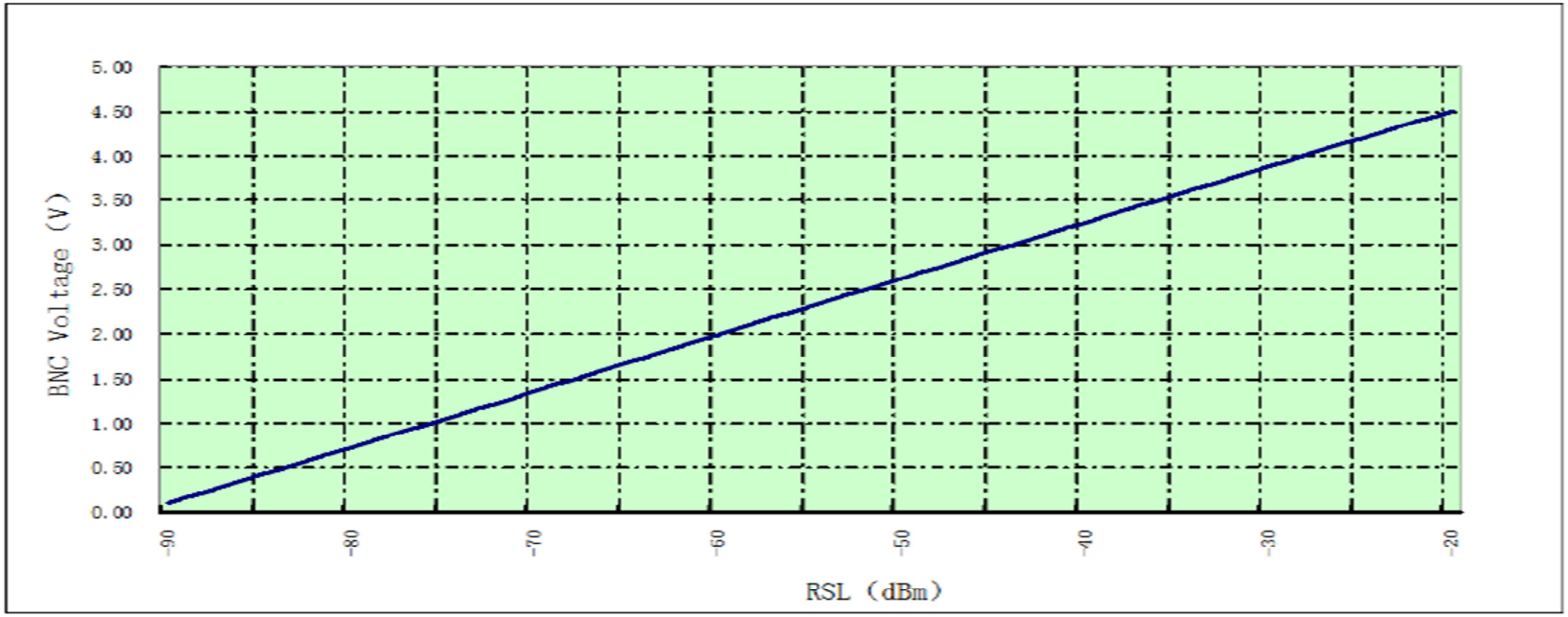


F. Alignment

BNC Voltage (for RSSI) and Receive Signal Level Look Up Table

Part Number: 31070169 Issue: 01 Date: 2010-01-21

RSL(dBm)	-20	-25	-30	-35	-40	-45	-50	-55	-60	-65	-70	-75	-80	-85	-90
BNC Voltage(V)	4.50	4.19	3.87	3.56	3.24	2.93	2.61	2.30	1.99	1.67	1.36	1.04	0.73	0.41	0.10



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Shenzhen 518129
People's Republic of China
www.huawei.com

HUAWEI

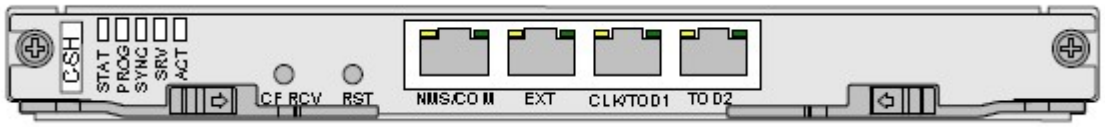
G. Installation Tools

G. Installation Tools

 Hammer drill	 Marker	 Utility knife	 Claw hammer	 ESD gloves
 ESD gloves	 ESD wrist strap	 Ladder	 Soldering iron	 Impact tool
 Vacuum cleaner	 Binding strap	 Insulation tape	 Coax stripper	 Network cable tester

H. Boards

- CSH

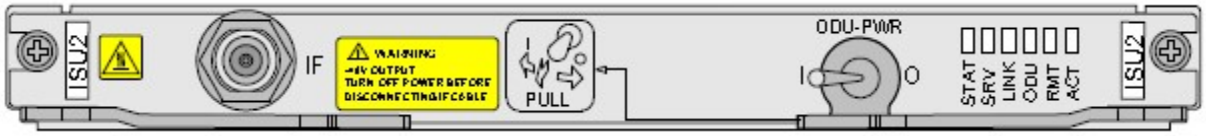


The CSH provides 10 Gbit/s packet switching, full time-division cross-connection, system control and communication, and clock processing functions.

Slot 10 (PIU)	Slot 11 (FAN)	Slot 7 (CSH)	Slot 8 (CSH)
		Slot 5 (EXT)	Slot 6 (EXT)
Slot 9 (PIU)		Slot 3 (EXT)	Slot 4 (EXT)
		Slot 1 (EXT)	Slot 2 (EXT)

H. Boards

- ISU2



The ISU2 receives and transmits one IF signal, provides management channels to the ODU, and supplies the required -48 V power to the ODU.

Slot 10 (PIU)	Slot 11 (FAN)	Slot 7	Slot 8
		Slot 5 (ISU2)	Slot 6 (ISU2)
Slot 9 (PIU)		Slot 3 (ISU2)	Slot 4 (ISU2)
		Slot 1 (ISU2)	Slot 2 (ISU2)

H. Boards

EM6T/EM6F

Figure 3-84 Front panel of the EM6F

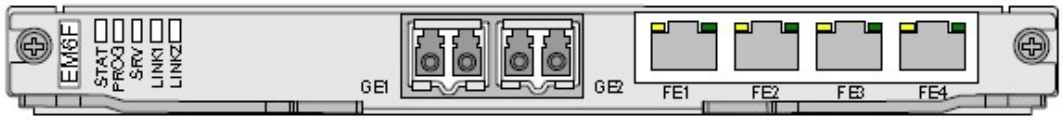


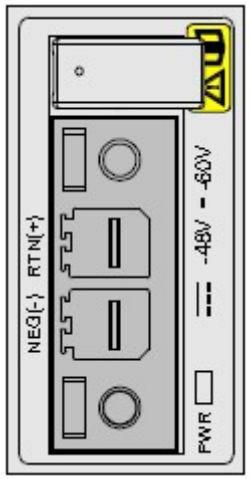
Figure 3-82 Front panel of the EM6T

receives/transmits, processes, and converges four FE signals and two GE signals. The GE port on the EM6F/EM6FA can receive/transmit 2xFE optical signals using FE small form-factor pluggable (SFP) optical modules.

Slot 10 (PIU)	Slot 11 (FAN)	Slot 7	Slot 8
		Slot 5 (EM6T/EM6FA)	Slot 6 (EM6T/EM6FA)
Slot 9 (PIU)		Slot 3 (EM6T/EM6FA)	Slot 4 (EM6T/EM6FA)
		Slot 1 (EM6T/EM6FA)	Slot 2 (EM6T/EM6FA)

H. Boards

- **PIU**

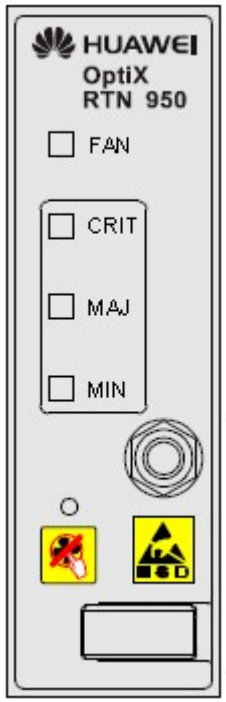


The PIU supports power access, power protection, surge protection status monitoring, and information reporting.

Slot 10 (PIU)	Slot 11	Slot 7	Slot 8
		Slot 5	Slot 6
Slot 9 (PIU)		Slot 3	Slot 4
		Slot 1	Slot 2

H. Boards

- **FAN**



Slot 10	Slot 11 (FAN)	Slot 7	Slot 8
		Slot 5	Slot 6
Slot 9		Slot 3	Slot 4
		Slot 1	Slot 2

The FAN is a fan board that dissipates heat generated in the chassis through air cooling.

Thank You