

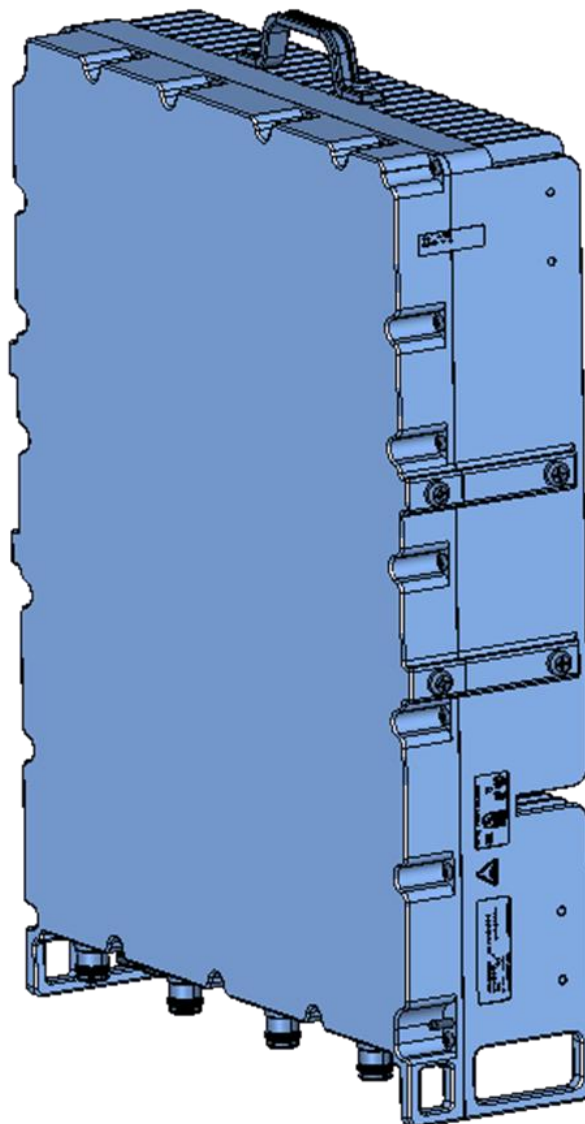


Radio

Installation Guide

MR44MOA

Version: January 2024



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Introduction

Document description

This document describes installation of the Mavenir Macro Remote Radio Unit and is intended for approved installation personnel.

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About the product

Product description

The product is a Macro Remote Radio Unit for wireless networks. The product has 4G LTE/5G NR technology and operates as a radio transceiver that connects to an operator at Network Operations Centre.

Symbols in the manual



Warning

If you do not obey these instructions, there is a risk of death or injury.



Caution

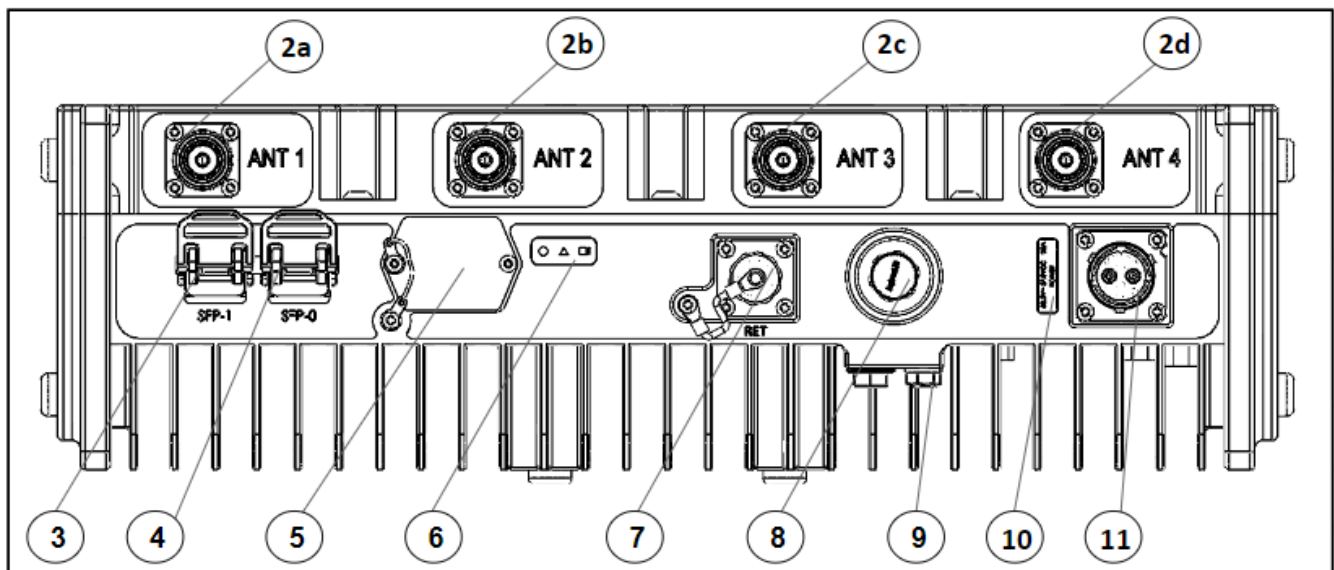
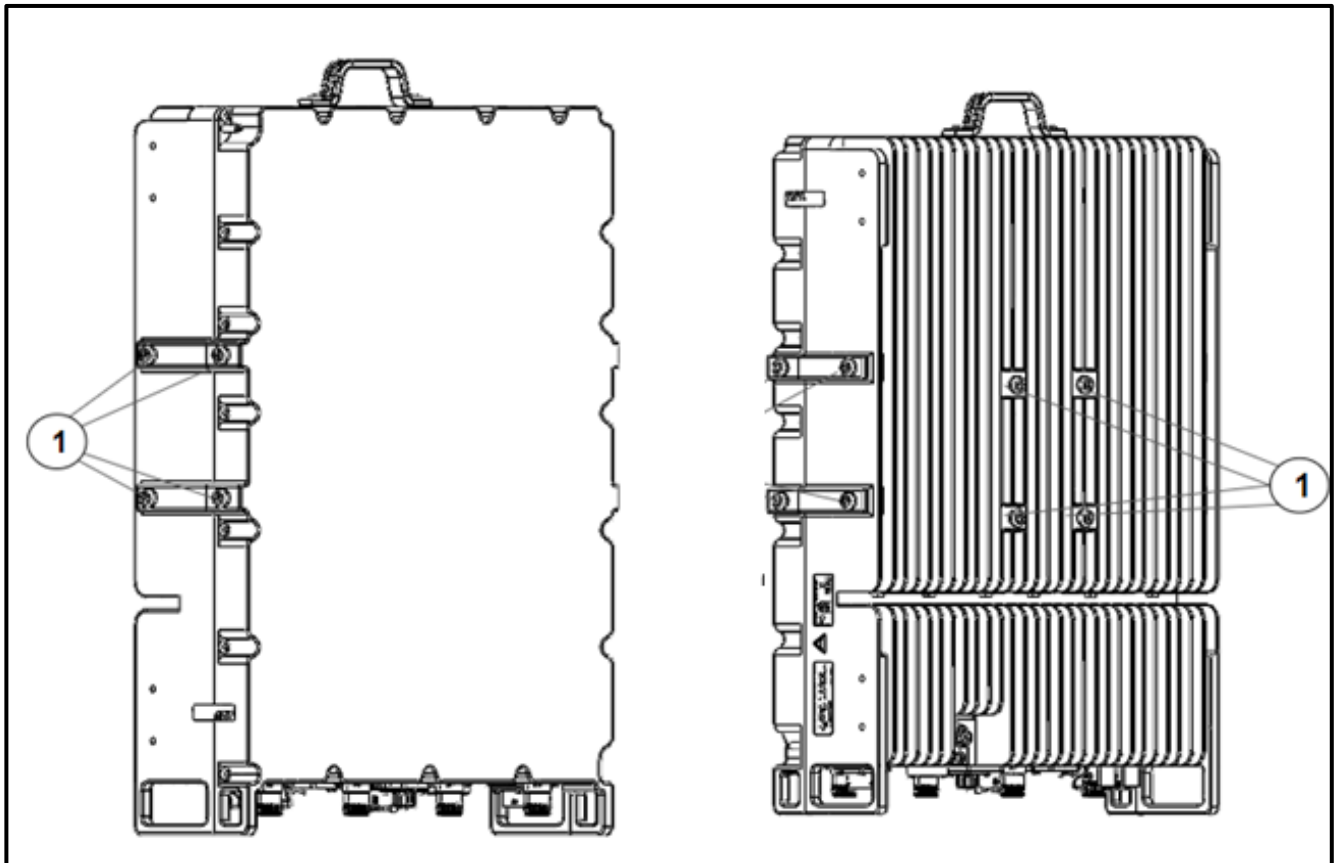
If you do not obey these instructions, there is a risk of damage to the product, other materials, or the adjacent area.

Note

Information that is necessary in a given situation.

Overviews

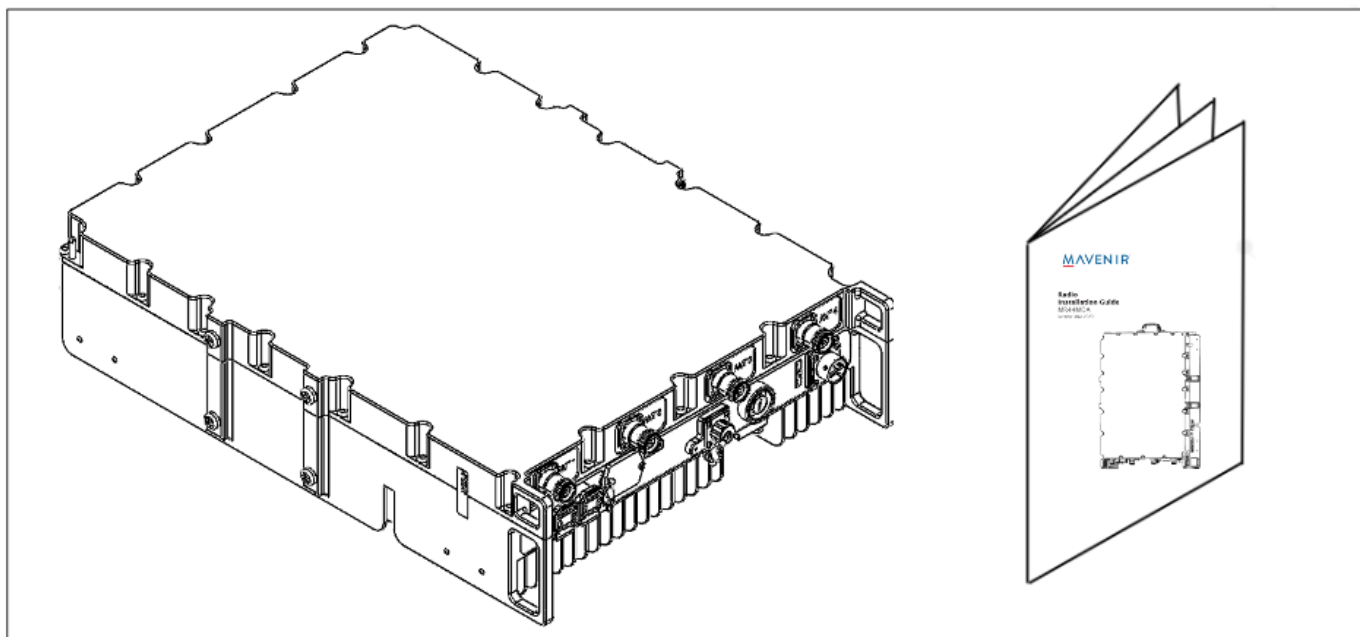
Product overview



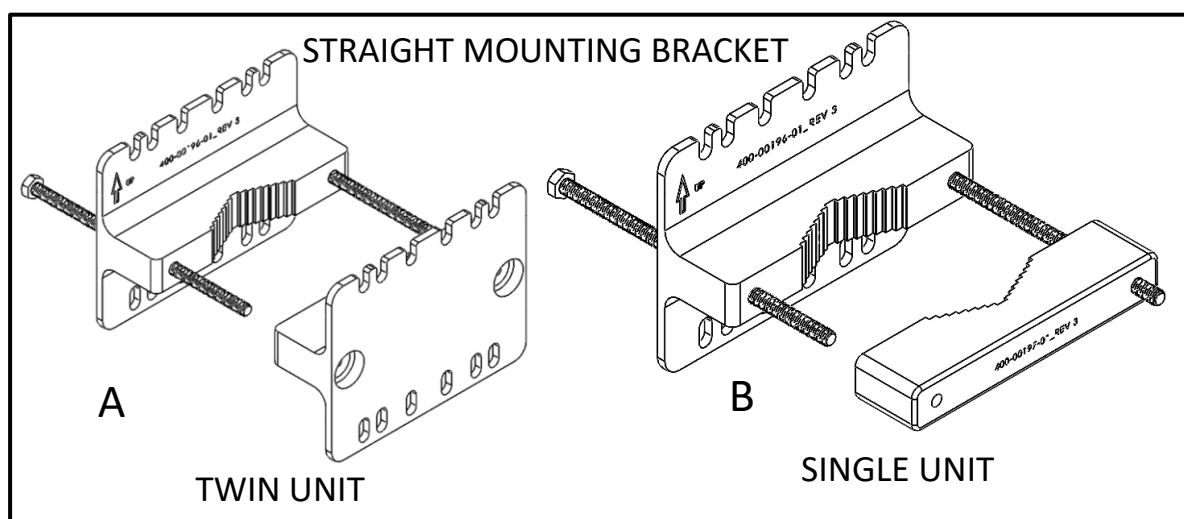
Interface panel overview

1.Attachment holes	8. Air Vent
2. 4.3-10 antenna ports (a, b, c, d) Female type	9. Earth Cable Connector
3. SFP1 (Reserved - Not in use)	10. Power Label
4. SFP0 (In use)	11. Power Connector
5. Maintenance ports cover (Do not remove the cover.)	
6. LED indicator	
7. RET Connector	

In the box

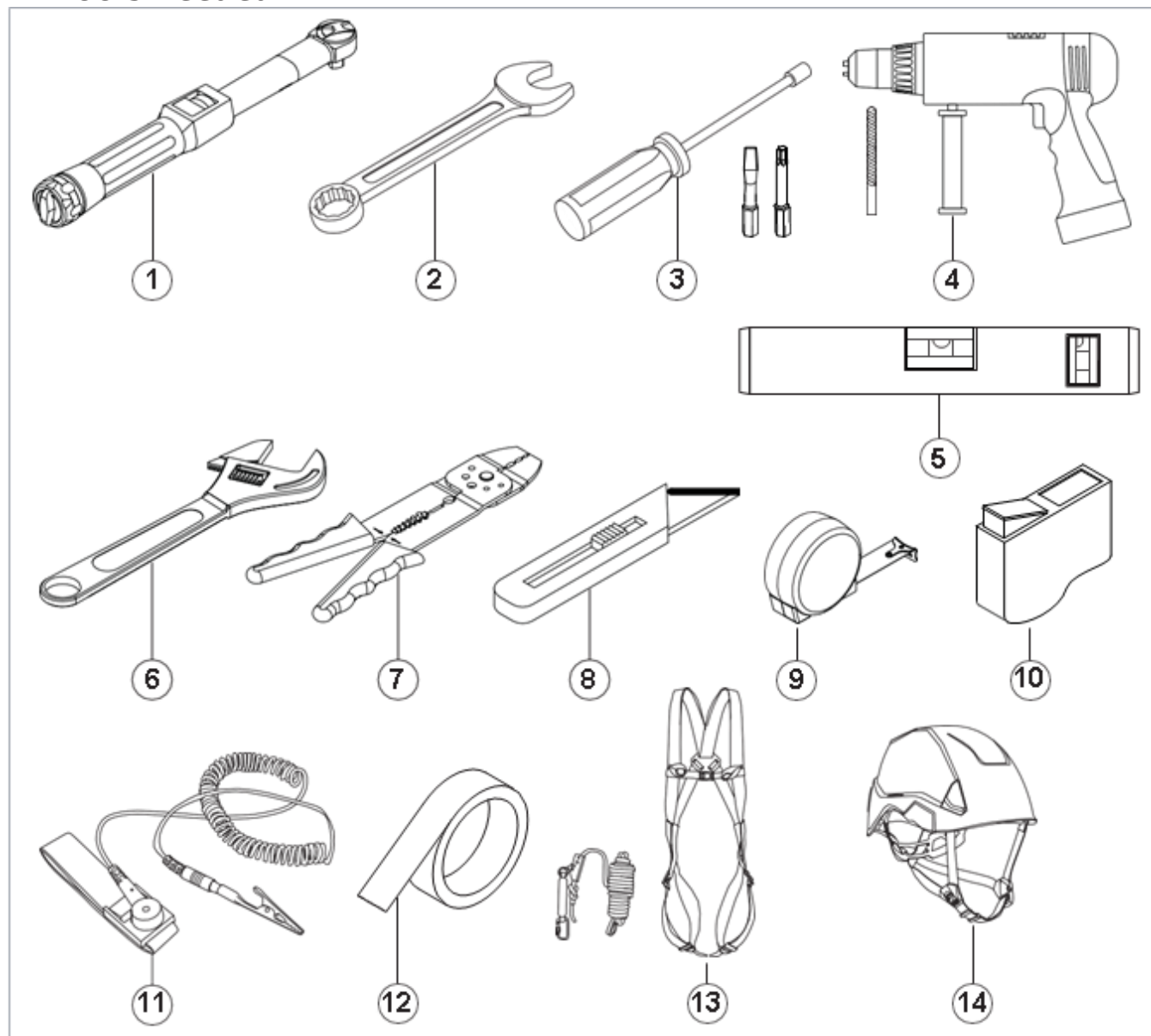


Brackets suitable for MR44MOA.



Pos.	Mavenir part Number	Description	Max no. of radio units mounted at the same time
A	921-00098-A13	Straight Mounting Bracket, Twin Unit	2
B	921-00097-A13	Straight Mounting bracket, single unit	1

Tools needed.



Item	Tools	Used for
1	Torque wrench M6 8Nm, Torx T30	Mounting bracket
	Torque wrench M6 8 Nm, socket 10 mm	Mounting bracket
2	Wrench - 10 mm, 13 mm, 16 mm, 18 mm hex key	Miscellaneous
3	Screwdrivers (Flat and Torx)	Miscellaneous
4	Power drill	Drilling holes in walls
5	Level bar	Attach the bracket to a wall
6	Adjustable wrench	Miscellaneous
7	Wire stripper	Cables
8	Knife	Miscellaneous
9	Steel tape measure	Miscellaneous
10	Optical connection cleaner	SFP cable
11	ESD Wrist Strap	Handling cables
12	Tape	Miscellaneous
13	Safety harness	Climbing
14	Safety helmet	Site safety

Accessories

Accessories	Mavenir Part No.	Manufacturer and P/N	Qty
Straight Mounting Bracket, Twin Unit OR Straight Mounting bracket. single unit	921-00098-A13 OR 921-00097-A13	921-00098-A13 OR 921-00097-A13	1
External Optical connector	FTLX1475D3BTL for 10G FTLF1436W5BTD for 25G		1
SFP Boot Plug Kit	125-00024-01	Radiall OCT1117500	1
External Power Connector	125-00177-01	JONHON CT48C-2T-11 Amphenol ICC (FCI) C10-761296-Z2S	1
External RET Connector	125-00213-01	Amphenol ICC (FCI) C091 31H008 101 2 U Lumberg 033200 08-1	1
Ground Kit, Universal, for 3/8" - 3" cable with 5' lead and unattached (1) 1/4" and (1) 3/8" (2) hole lugs	650-00274-01	Ground Kit, Universal, for 3/8" - 3" cable with 5' lead and unattached (1) 1/4" and (1) 3/8" (2) hole lugs	1

Safety

General safety

- Make sure that the workers know all installation methods and safety precautions before they start work.
- Before you install the product, you must first know all the components of the device and know how to do the installation.
- Before you start the installation, put up warning signs
- Before working on equipment that is connected to power, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.
- Read the installation manual carefully and understand the instructions before you install the product.
- The information in this installation manual is not a replacement for professional knowledge and experience. If you do not feel safe in the situation that you are in, stop the installation. Turn to your Network Operation Centre.
- The product can be hot. Wait for the unit to cool down before you do maintenance work. Always use protective gloves.



- **Note: "CAUTION" and "Hot surface" or equivalent "Do not touch" or equivalent "ATTENTION" and "Surface chaude" or equivalent "Ne pas toucher" or equivalent**
- Do not install the product if you are tired, while under the influence of alcohol or drugs, medicine or anything that could have a negative effect on your vision, alertness, coordination, or judgment.
- Hazardous voltages can be present when the system is in operation. Use caution when you remove or install the product.
- Observe all local and national electrical, environmental and workplace codes.

Safety instructions for installation

- Do not keep the product outdoors or remove the product from the box before you do the installation.
- Stay alert, monitor what you are doing and use common sense when you install the product. A moment of inattention may result in serious personal injury.
- A fall hazard is present when installation of this equipment requires working on towers, poles or at elevated work sites. All personnel who perform tower work or work at elevation must be qualified to perform this type of work.
- Do not install the product during bad weather.
- When you do work at a high location, make sure your tools are safe and do not fall. A tool that falls can cause injury or death.
- When you drill holes, you must put on approved protection equipment to keep out the dust from your eyes and lungs.

Electrical safety

- Do not touch uninsulated wiring or terminals unless the power to the lines have been disconnected at the source. Use an approved voltage meter to make sure that there is no power.
- To prevent electrical shock, never remove the cover or disassemble the equipment. There are no user serviceable components in the product.
- Risk of electrical shock or short circuit if the safety instructions are not obeyed.
- Only use approved cables when you install the product.
- Grounding and circuit integrity is vital to a safe operating environment. Grounding conductors must be in place before installing the equipment. Never operate equipment when the grounding or bonding conductor has been removed.
- When you install the power cable of the product, you must first connect the cable to the product and then to the power device. If you install the cable the other way around, it can cause damage to the device or personal injury.

FCC Warning:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. Shielded interface cables shall be used.

IC Warning:

This equipment digital apparatus complies with ICES-003.

CAN ICES-003(A) / NMB-003(A)

RF Exposure Compliance:

The equipment complies with RF radiation exposure limits set forth for an uncontrolled environment. The equipment should be installed and operated with a minimum distance of 25 meters between the radiator and your body.

L'équipement est conforme aux limites d'exposition aux rayonnements RF fixées pour un environnement non contrôlé. L'équipement doit être installé et utilisé avec une distance minimale de 25 mètres entre le radiateur et votre corps.

Personal protective equipment

Use The personal protective equipment that follow during installation and commissioning.

- Approved head protection
- Protective shoes
- Protective gloves
- Approved safety straps for work on high locations.
- High visibility vest



Maintenance

- Special training is necessary for all servicing and repair work of the product.
- Maintenance port remains for design Debug and should not be used on site. Do not open.

Labels on the product

Description	Label
Hot Surface. Warning for hot surfaces. Keep hands and feet away. Risk of Burn.	
Warranty Security Label	MAVENIR WARRANTY VOID IF SEAL BROKEN OR REMOVED
Unit Label	MAVENIR™ OpenBeam™ M/N: MR44MOA P/N: 901-00094-A11 S/N: XXYYWWMR44MOAxxxxxR -38.5V to -57.5V DC, 35 A Made in India
FCC & UL Label	FCC ID : 2AWAS-901-00094B IC : 31827-90100094
Power Label	-38.5V~-57.5VDC, 35A POWER

Storage - Before installation

- Keep the product in the original packaging.
- Keep the product indoors in a clean, dry, and frost-free location.
- Make sure that there is no risk of fire in the storage location.

To install the product

Skills and requirements for personnel

Installation and commissioning personnel must fulfill local and national regulations.

"The radio unit will be installed and serviced by trained persons only. This is not normal user equipment".

To transport the product to the installation site

- Keep the product in the original packaging.
- Use straps or other equipment to fasten the product if it is necessary. Make sure that the product cannot move.
- Make sure that the transportation is dry and free from dust, frost, or static electricity.

To unpack the product

1. Examine the original packaging for damages.
2. Carefully remove the product from the original packaging. Make sure that no sharp edges can damage the product.
3. Make sure that no parts are missing.
4. Make sure that no parts of the product are damaged.

Minimum clearance distance

The illustration below shows the minimum clearance distance between the radio and other objects.

To do before the installation

- Make sure that the site is prepared according to the Customer Site documentation.
- Make sure that the power supply for the radio is installed and tested on site.
- Make sure that the grounding system is installed and tested.
- Make sure that a main switch/circuit breaker with an external fuse is installed and tested.

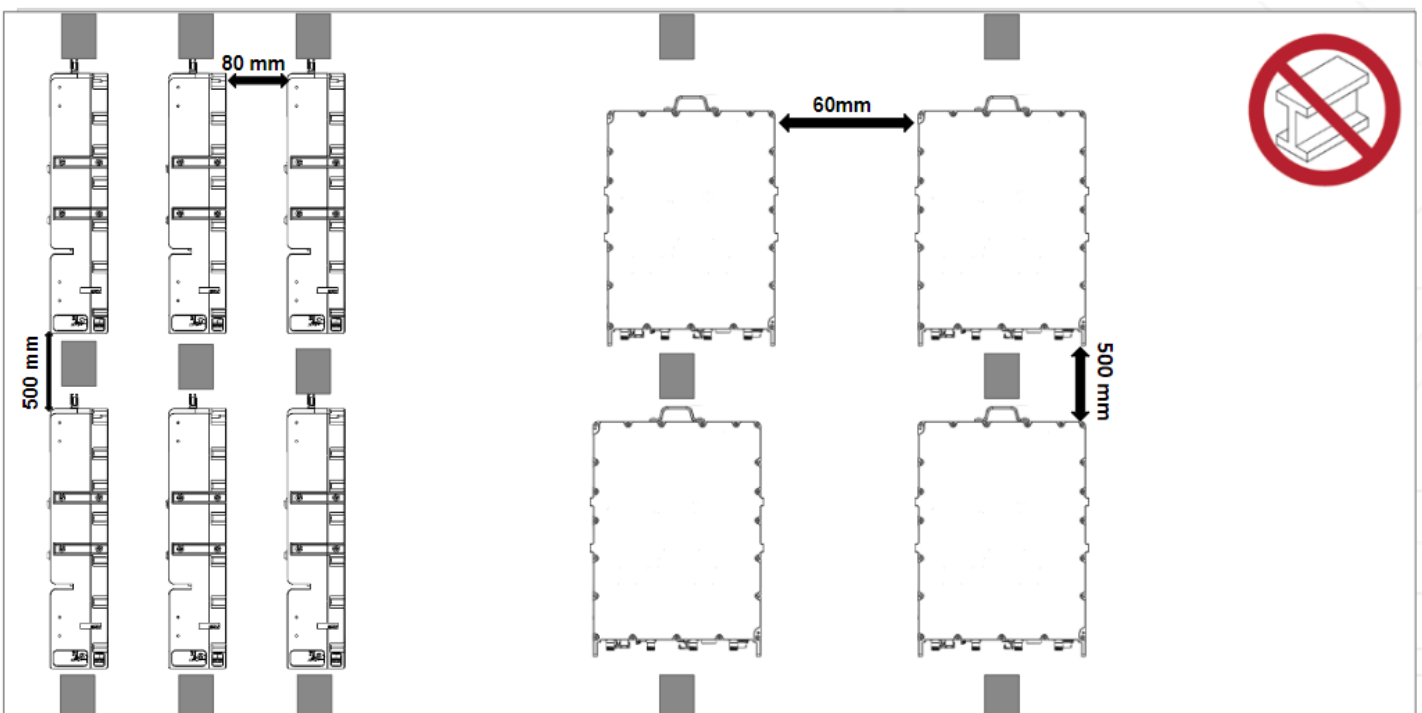
Cables

- If you mount the unit on a hollow pole, thread the cables inside the pole. Make sure that a civil engineer or a structural engineer approves the cable route.
- If you mount the unit on a solid pole, attach the cables to the outside of the pole using metal straps. Make sure that a civil engineer or a structural engineer approves the cable route.
- A civil engineer or structural engineer must approve the attachment method if you mount the unit on a wall.

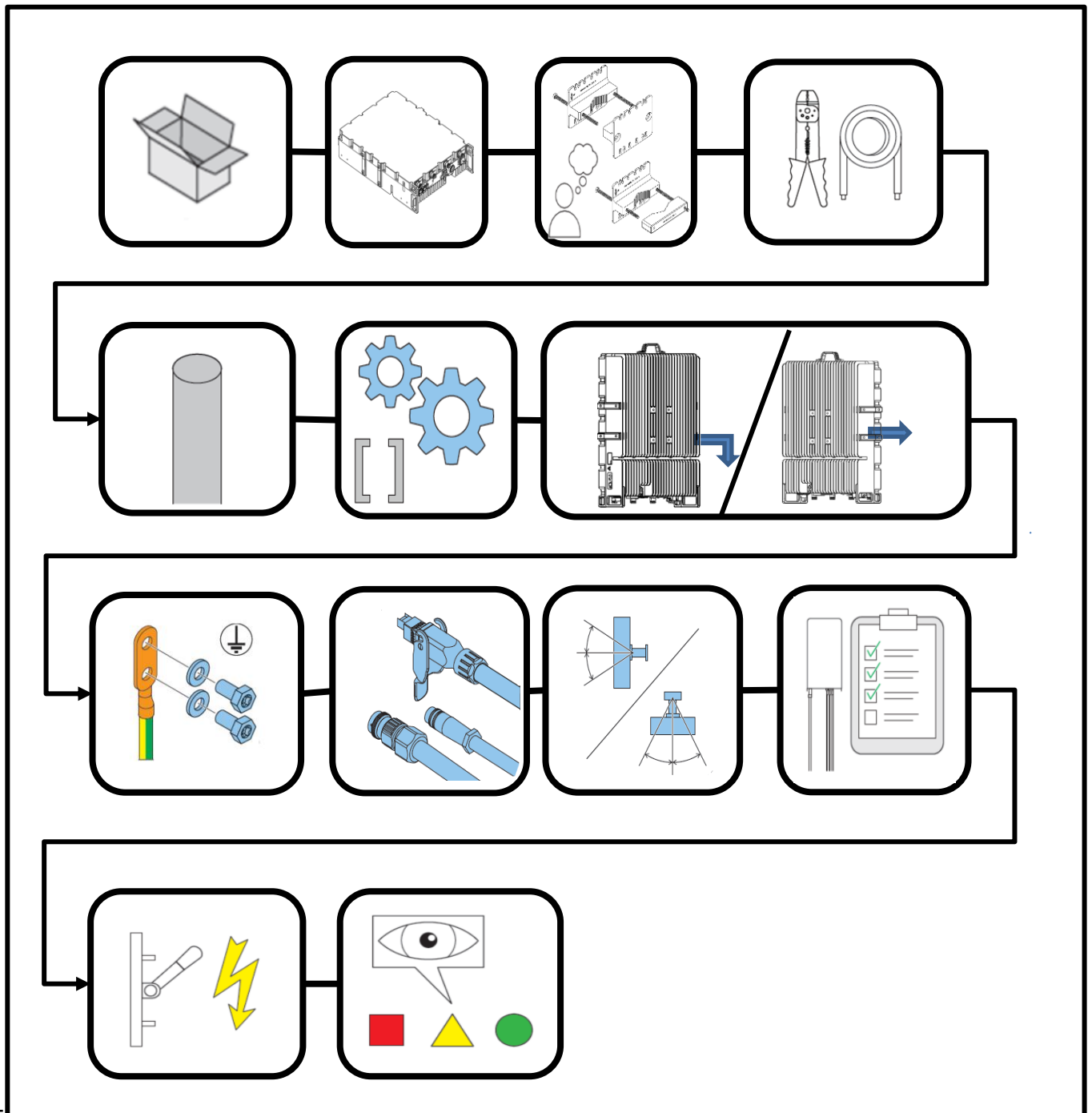
Environment requirement

Make sure that you avoid the following when you install the product.

- Heat source (caused by heat radiation, reflection, ventilation system outlets, etc.)
- Equipment generating electromagnetic field.
- Metal surfaces or objects (ladders, poles, railing, etc). Metal barriers will reduce the coverage area and performance of the radio. Make sure that there are no metal objects in the space: $\pm 30^\circ$ at vertical direction and $\pm 60^\circ$ in horizontal direction.

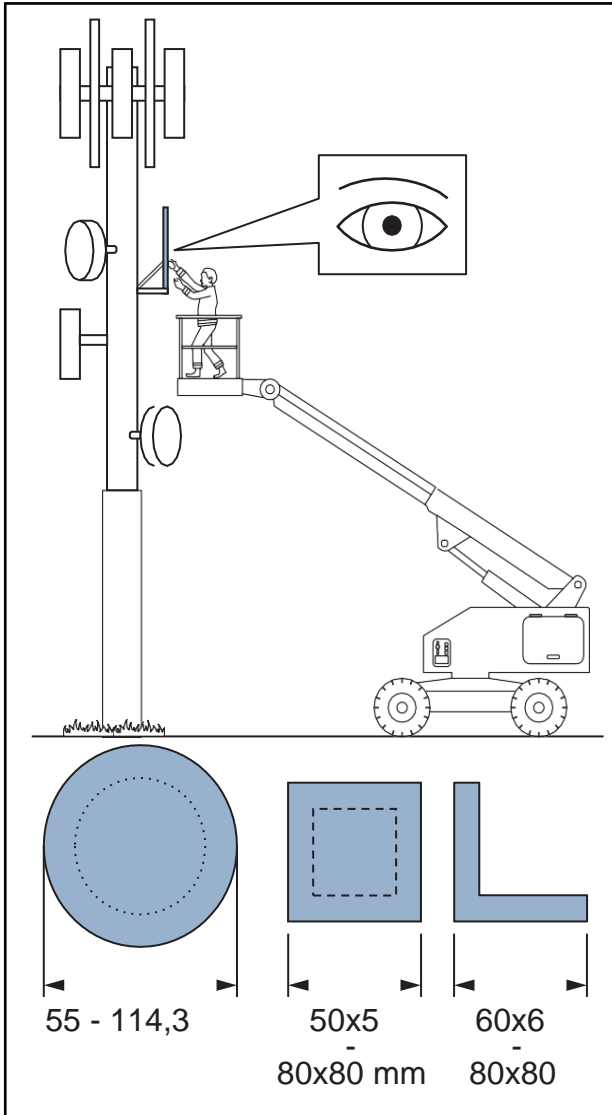


Installation process

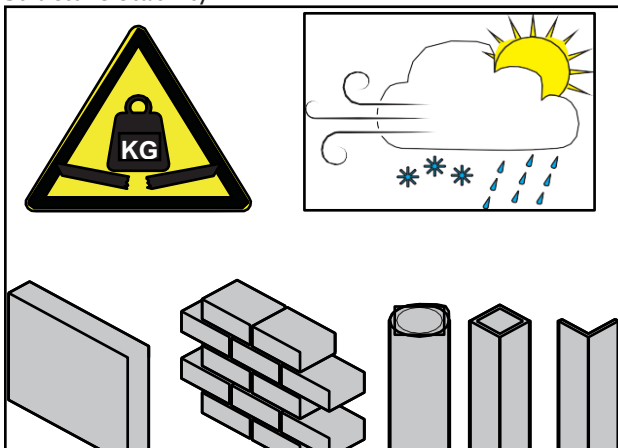


Installation requirements

Pole width



Note: Use a Cherry picker if no ladder is available
Structure stability

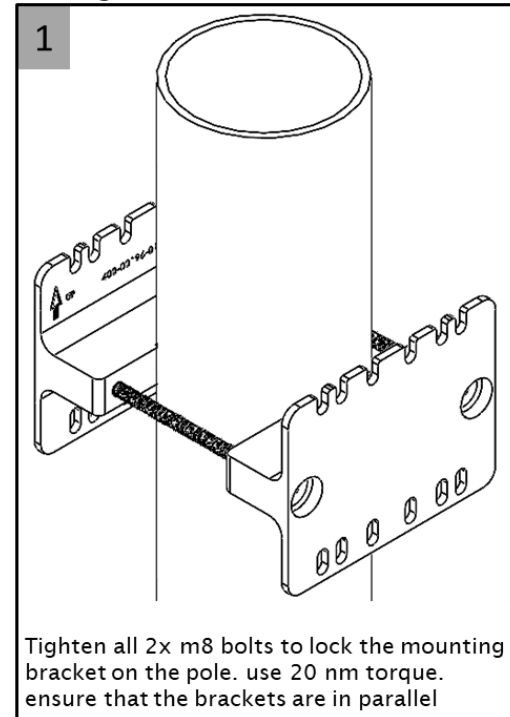


Note: Make sure that the structure that the unit will be mounted on can support the weight of the unit at all environmental conditions.

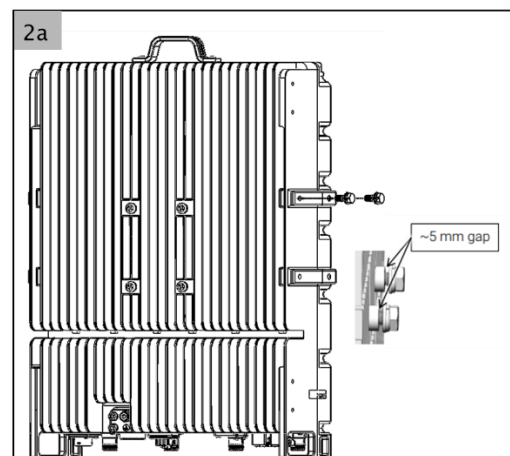
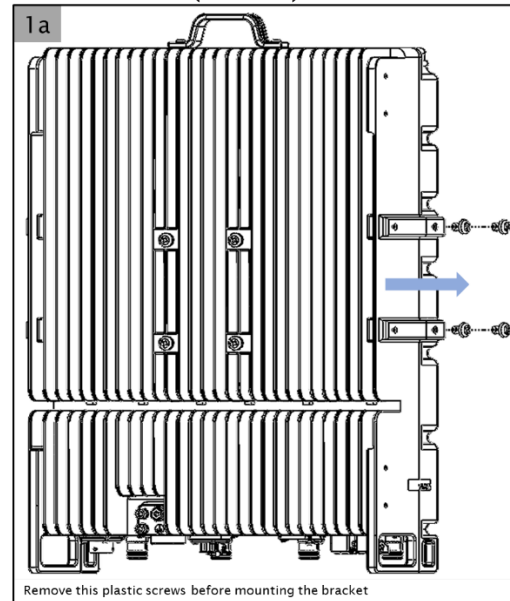
To install the radio on a pole with Straight Mounting Bracket, Twin Unit

The radio can be mounted in portrait or book mode.

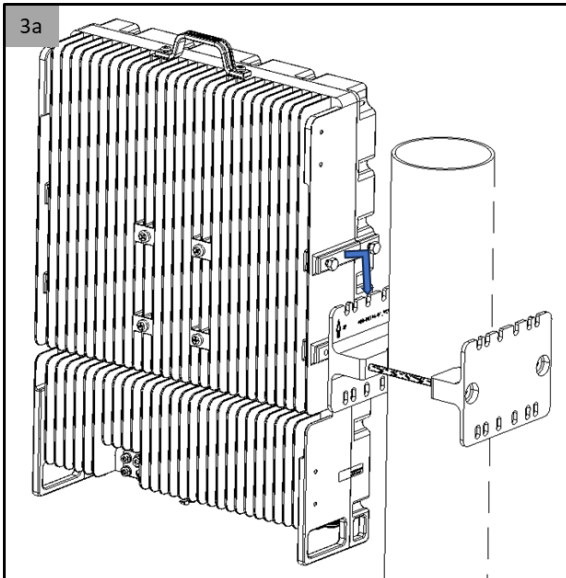
1. Fixing Mount Bracket on Pole:



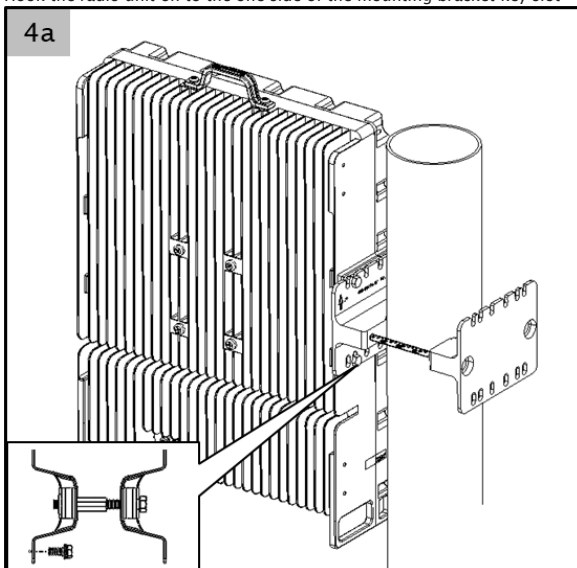
a. Book Mount (on Pole):



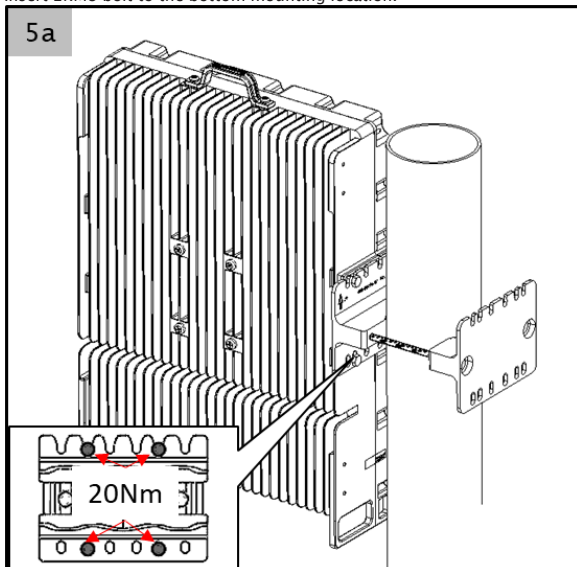
Screw in the 2x M8X20 screws into the top side mounting boss and leave about 4-5 mm gap to accommodate the mounting bracket.



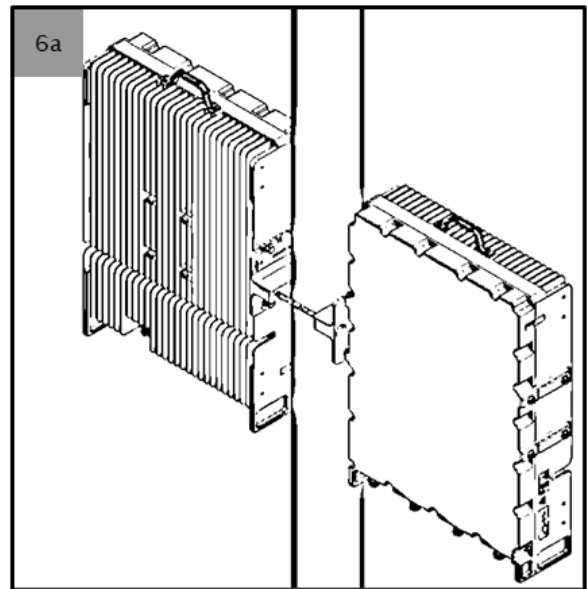
Hook the radio unit on to the one side of the mounting bracket key slot



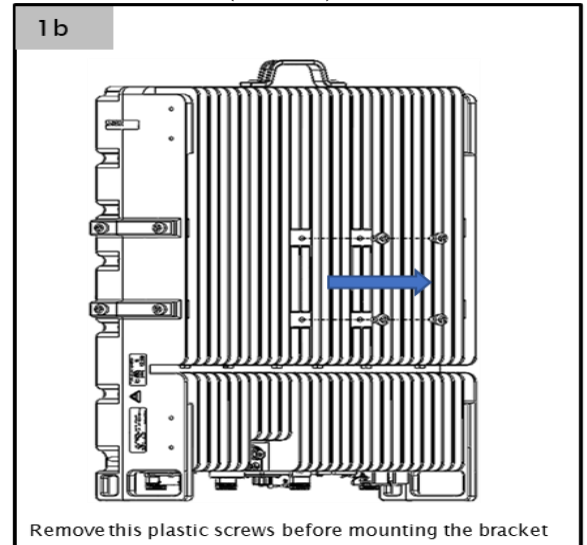
Insert 2xM8 bolt to the bottom mounting location.



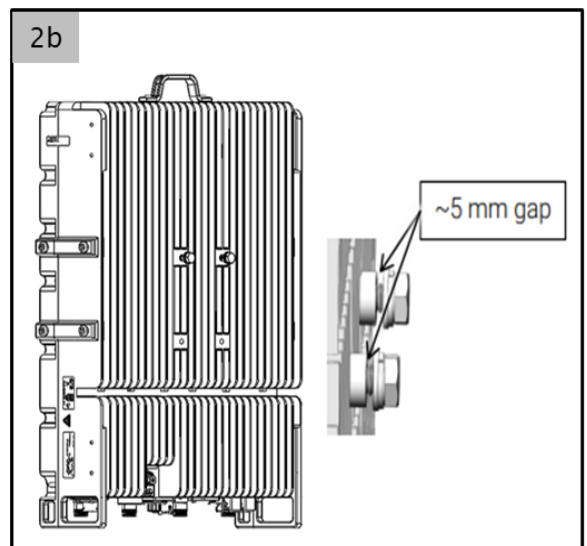
Tighten all 4x bolts to 20 Nm.



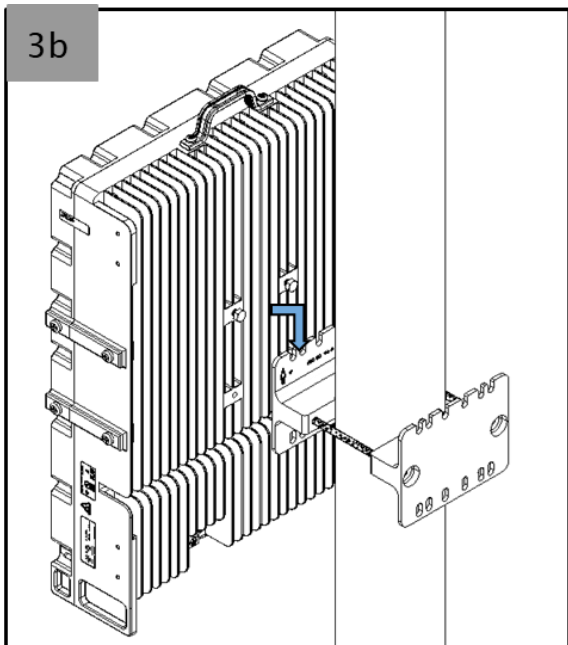
b. Portrait Mount (on Pole):



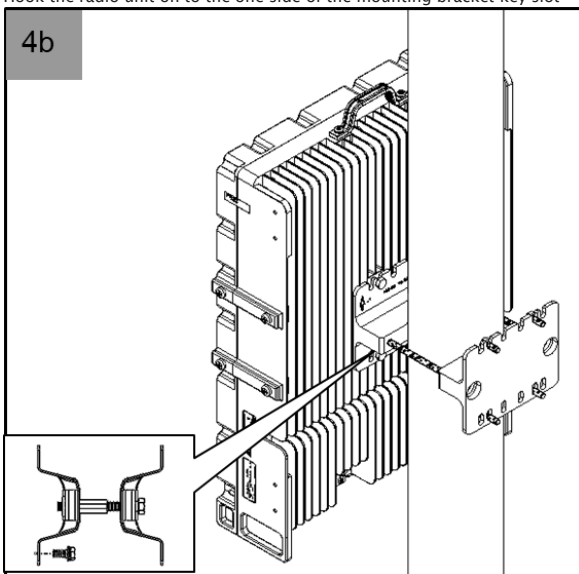
Remove this plastic screws before mounting the bracket



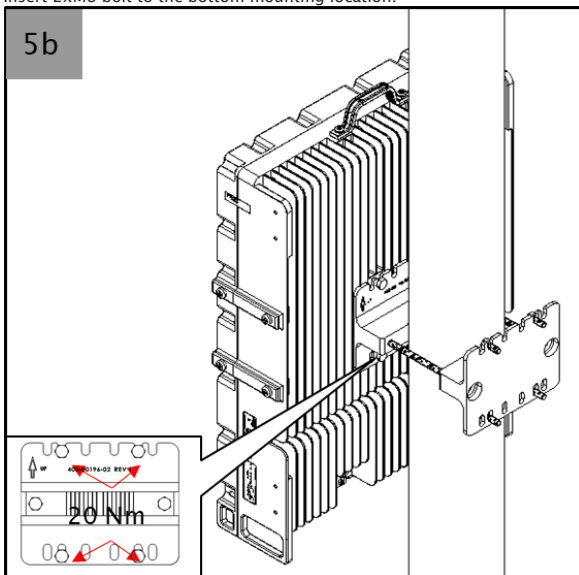
Screw in the 2x M8X20 screws into the top side mounting boss and leave about 4-5 mm gap to accommodate the mounting bracket



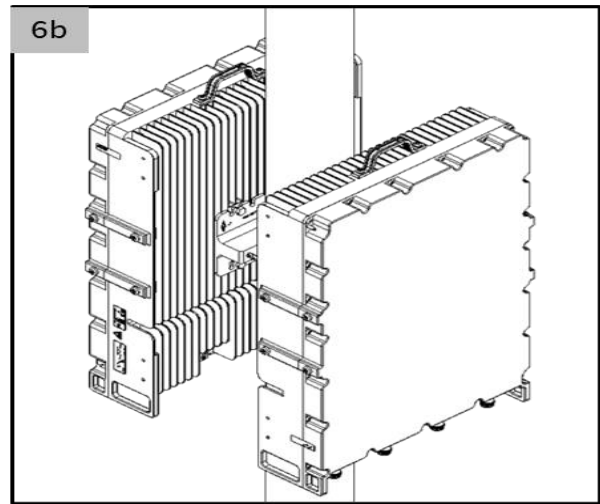
Hook the radio unit on to the one side of the mounting bracket key slot.



Insert 2xM8 bolt to the bottom mounting location.



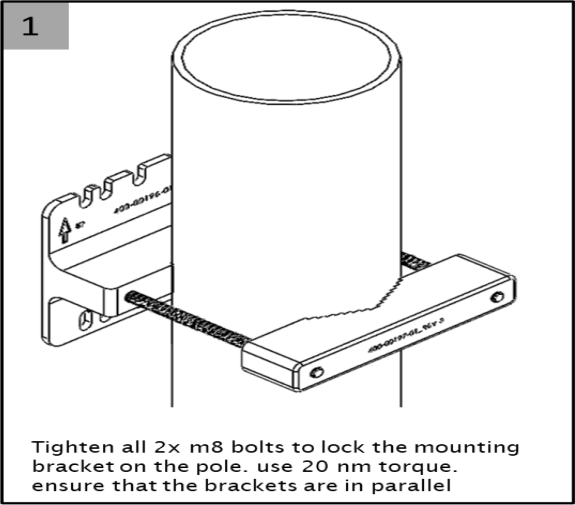
Tighten all 4x bolts to 20 Nm.



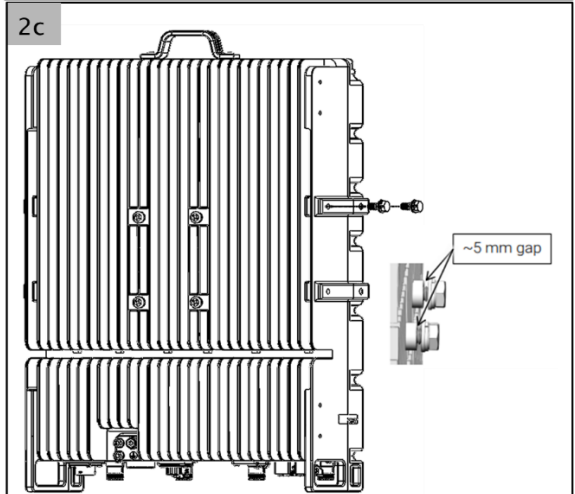
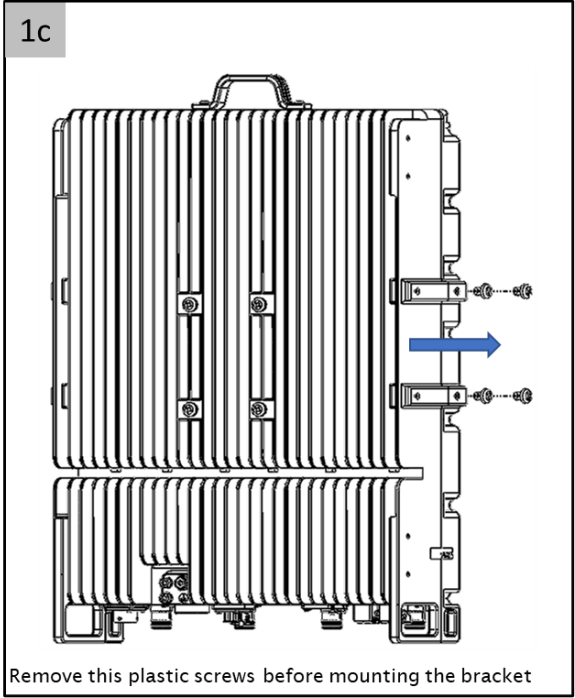
To install the radio on a Pole with straight Mounting bracket, single Unit

The radio can be mounted in portrait or book mode.

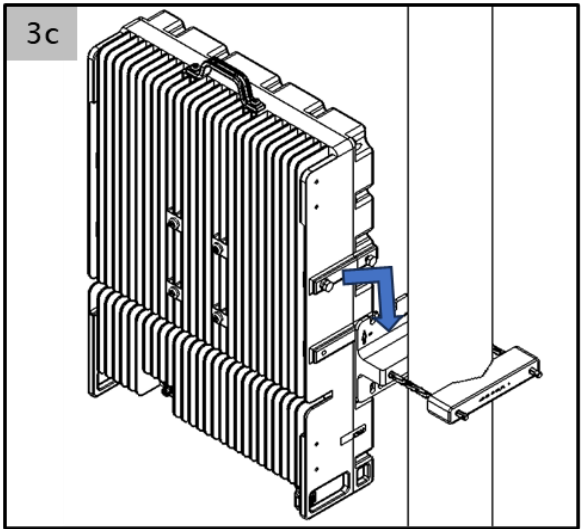
2. Fixing Mount Bracket on Pole:



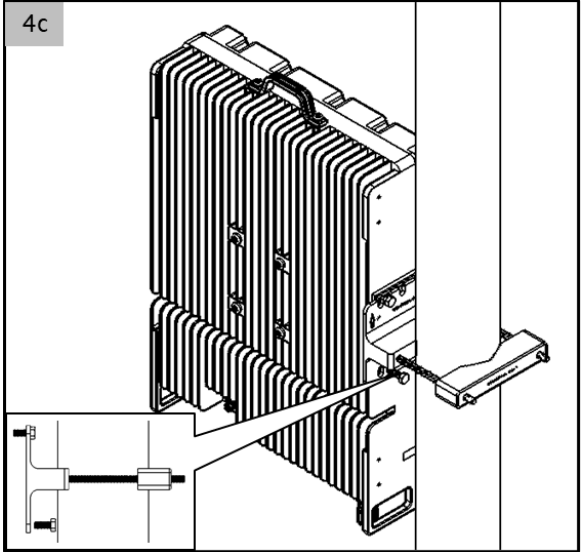
c. Book Mount (on Pole):



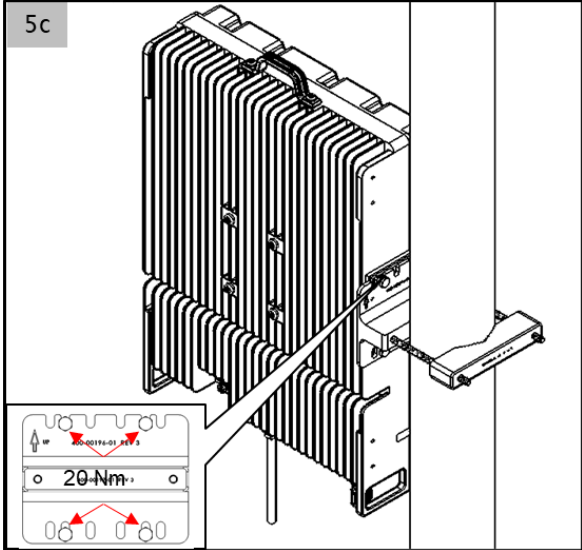
Screw in the 2x M8X20 screws into the top side mounting boss and leave about 4-5 mm gap to accommodate the mounting bracket.



Hook the radio unit on to the one side of the mounting bracket key slot

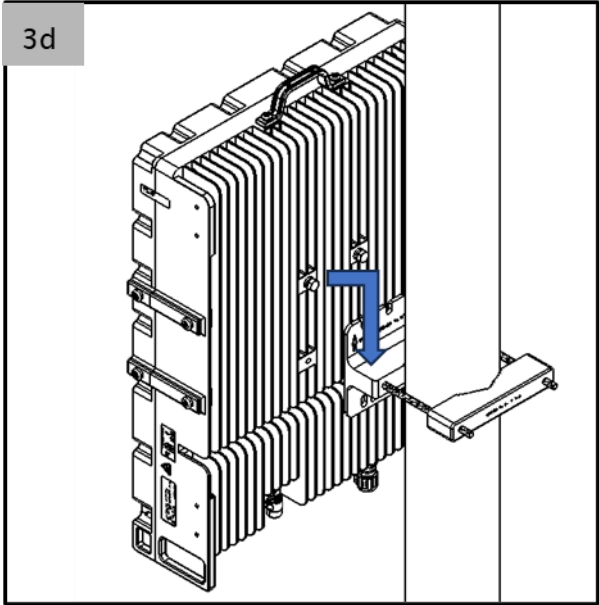
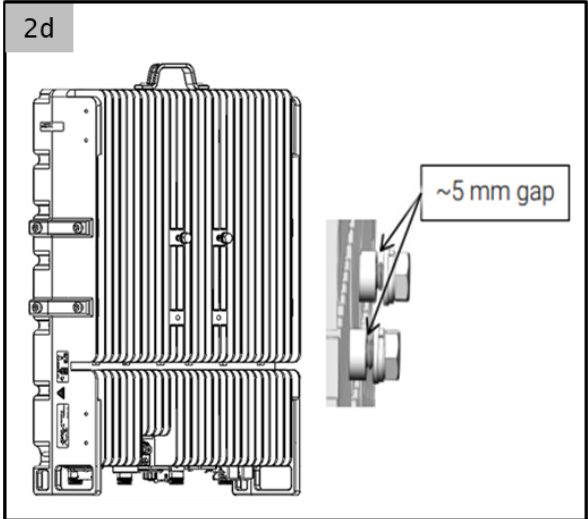
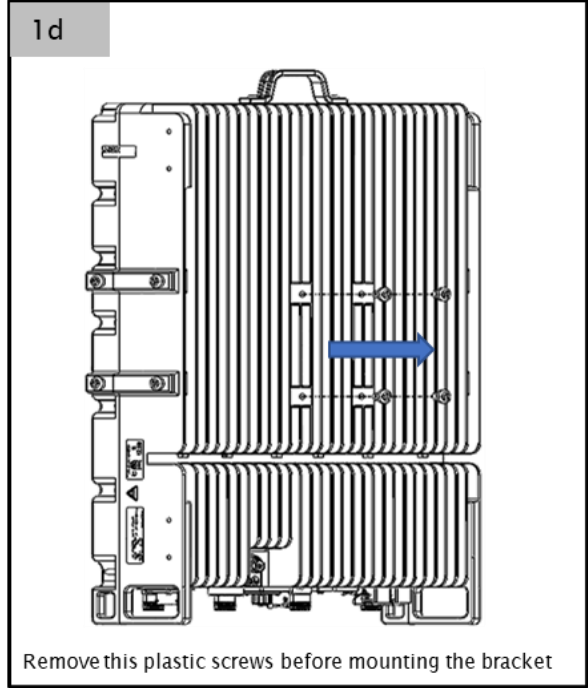


Insert 2xM8 bolt to the bottom mounting location.

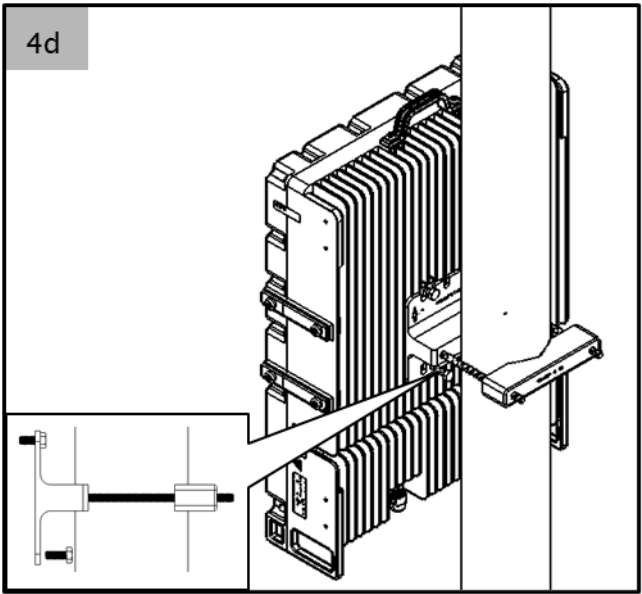


Tighten all 4x bolts to 20 Nm.

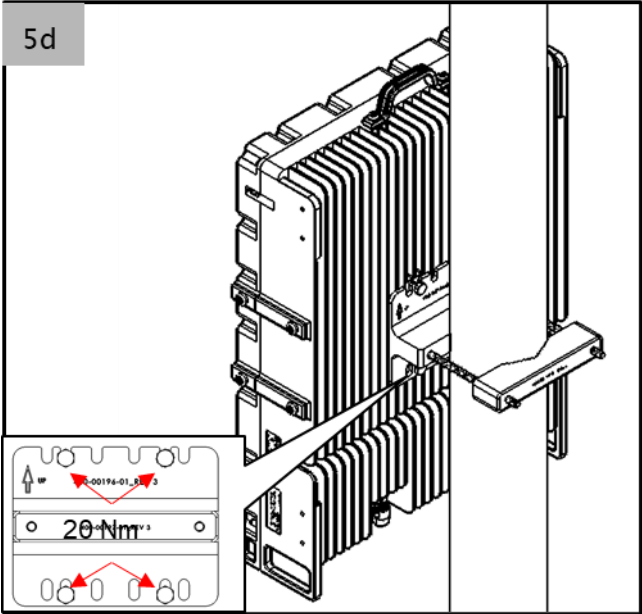
d. Portrait Mount (on Pole):



Hook the radio unit on to the one side of the mounting bracket key slot



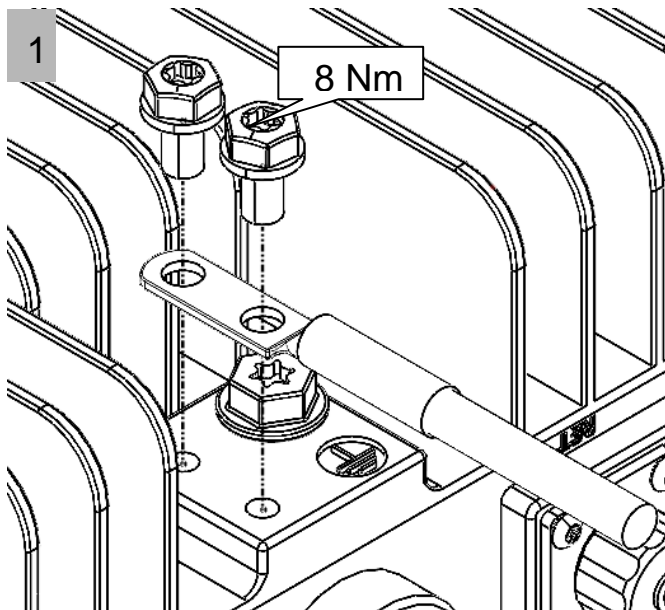
Insert 2xM8 bolt to the bottom mounting location.



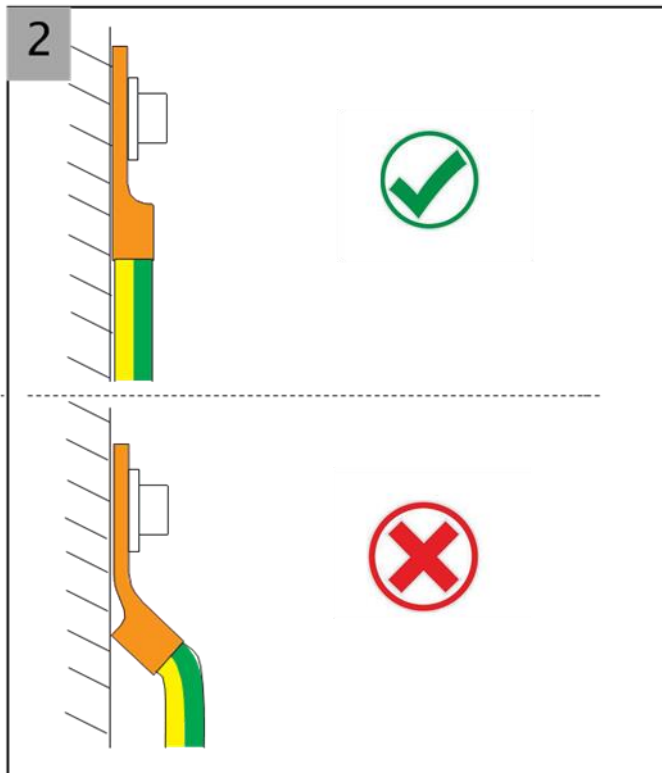
Tighten all 4x bolts to 20

Installation of the cables

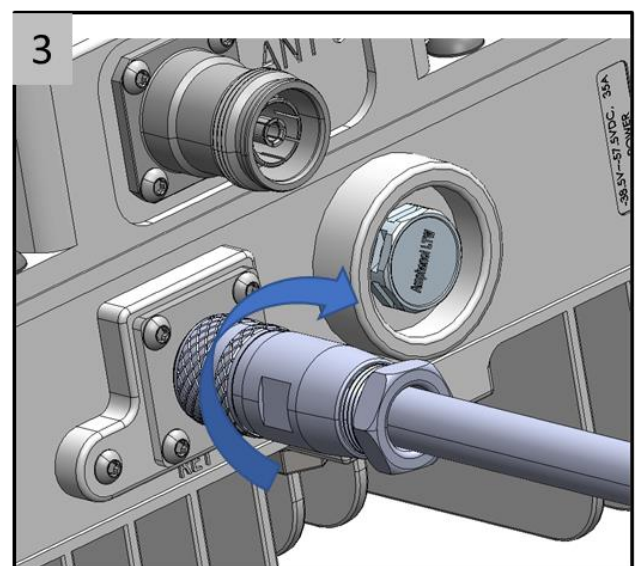
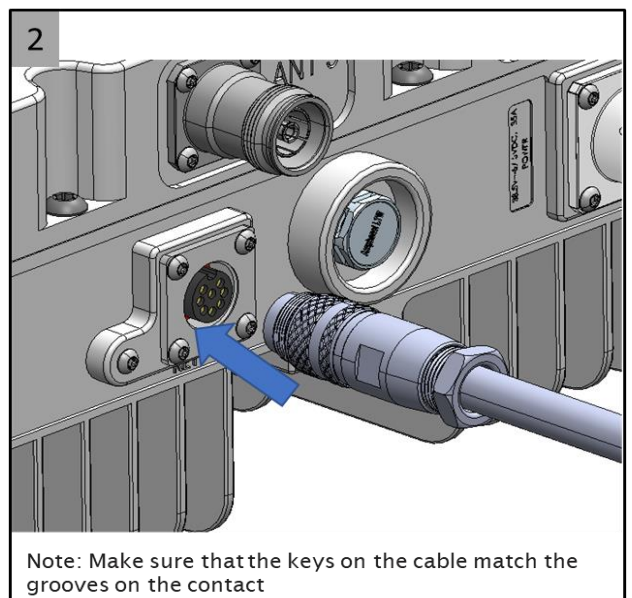
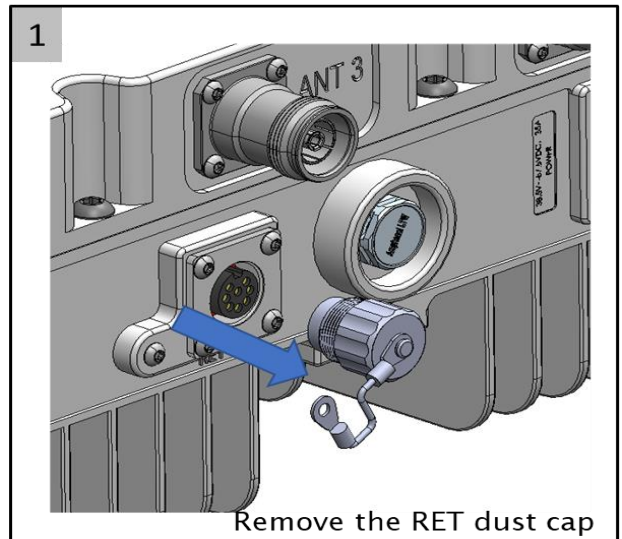
To install the earth cable



Note: The grounding cable size should be greater than 25 square millimeters and the terminal should satisfy 96h neutral salt fog test.



To install the RET cable



Note: Make sure that the connector is properly locked, to avoid bad connection and possible impact from rain or humidity.

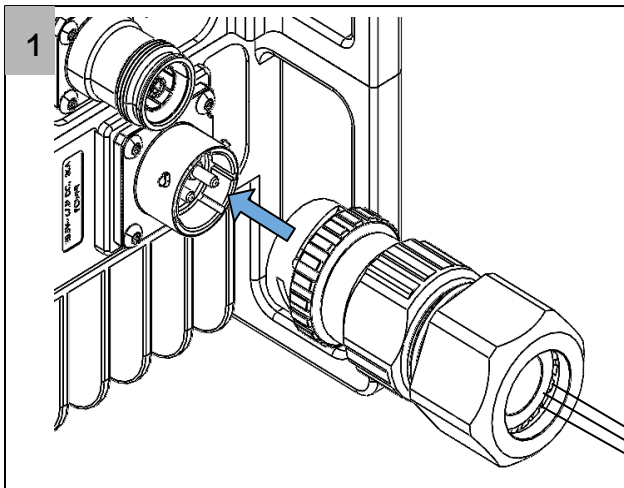
To install the power cable

All cables must be shielded. The shielding must be properly connected both to the power connector and to the grounding interface in the power supply equipment, otherwise the radio overvoltage and lightning protection does not function properly.

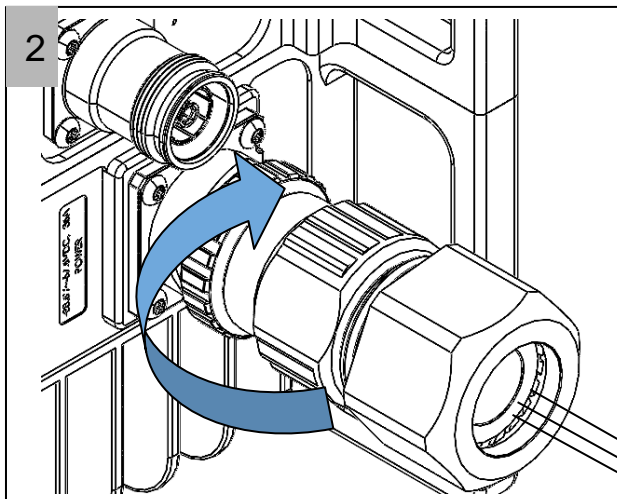
DESCRIPTION	CUSTOMER CONFIGURATOR SELECTIONS
NUMBER OF CONDUCTORS	2
CABLE GAUGE	8AWG (<=70m) 6AWG (>70m)
END 1 CONNECTOR	C10-761296-Z2S OBTS
END 2 CONNECTOR	BLUNT CUT
TOTAL CABLE LENGTH	CUSTOMER SPECIFIED AS PER SITE

The pin assignments of power connector port are:

Connector	Plug kit	Wire Colour
MPN	C10-761296-Z2S	
-48VDC	Pin A	Black
+GND	Pin B	Red

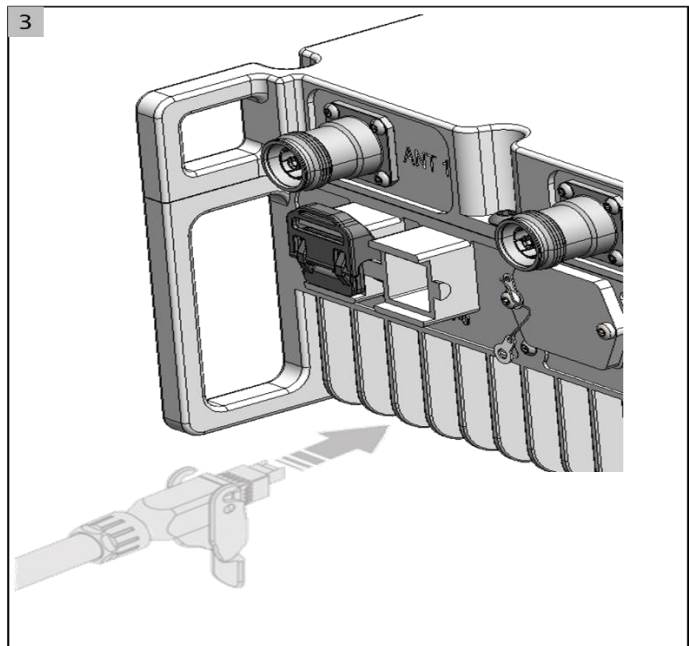
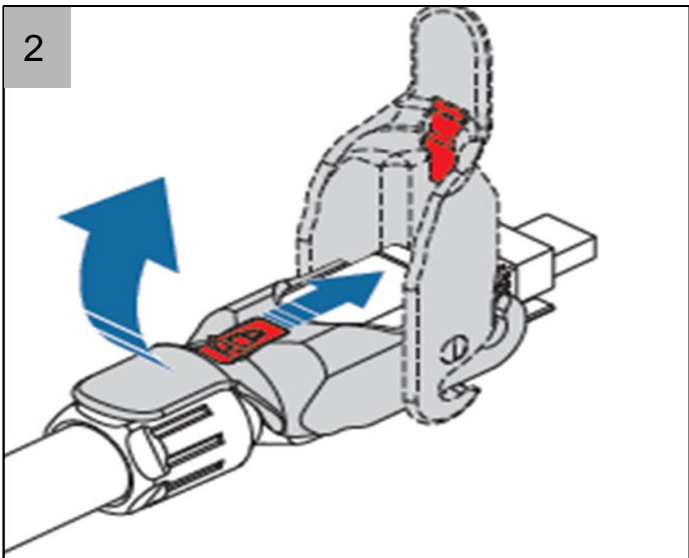
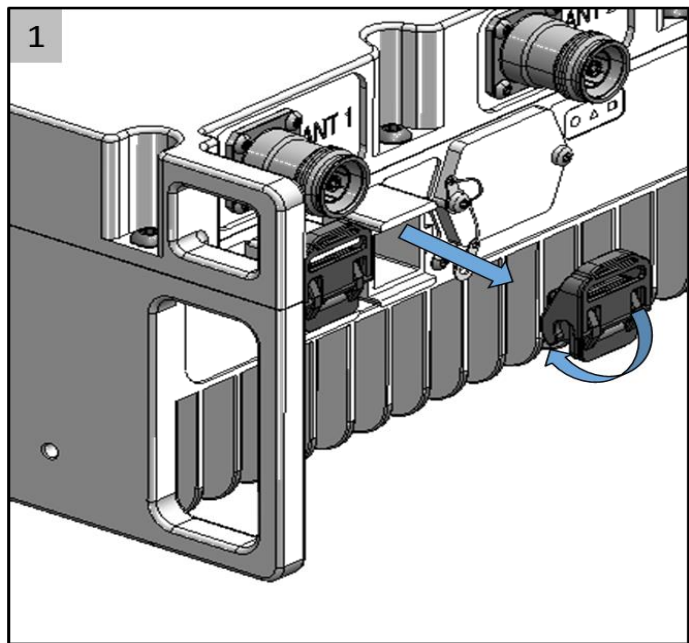


Note: Make sure that the keys on the cable match the grooves on the contact. (Fit A to A, B to B and C to C.)

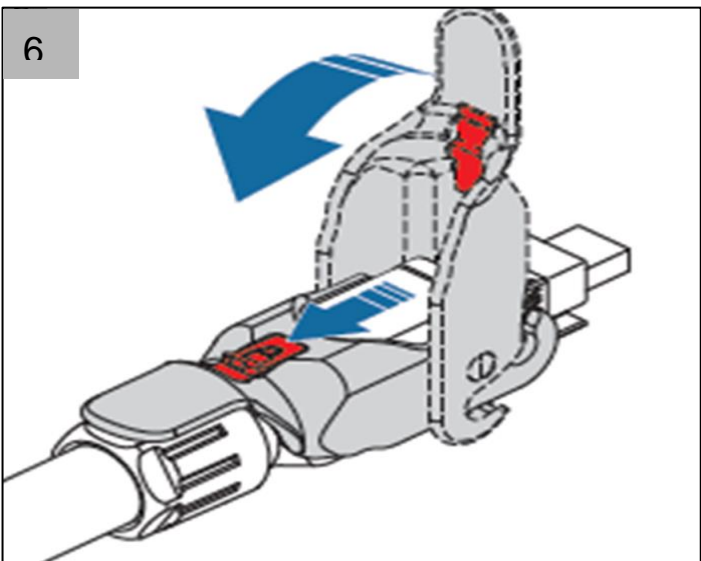
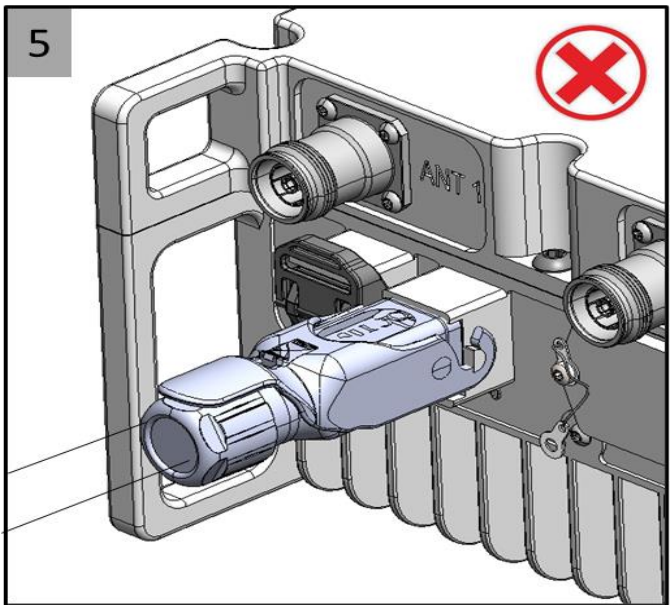
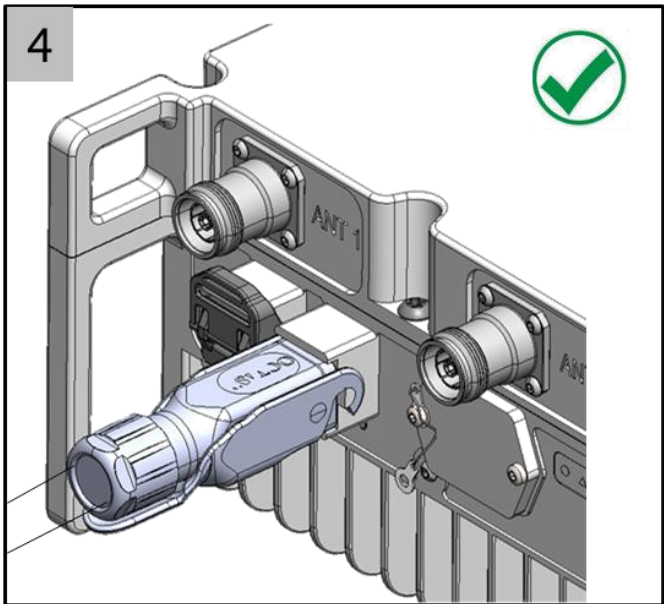


Note: Make sure that the connector is properly locked, to avoid bad connection and possible impact from rain or humidity.

To install the Octis cable (SFP0)

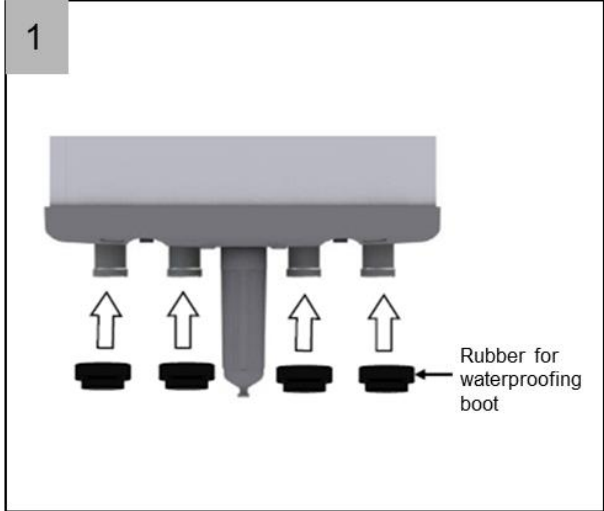


Note: Do not remove the cap from SFP1.

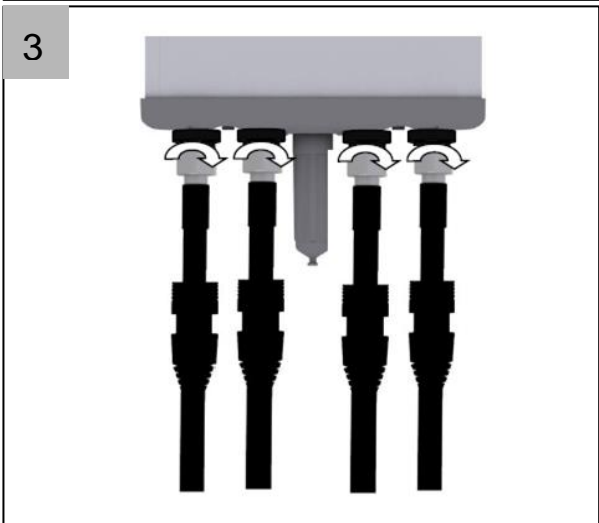
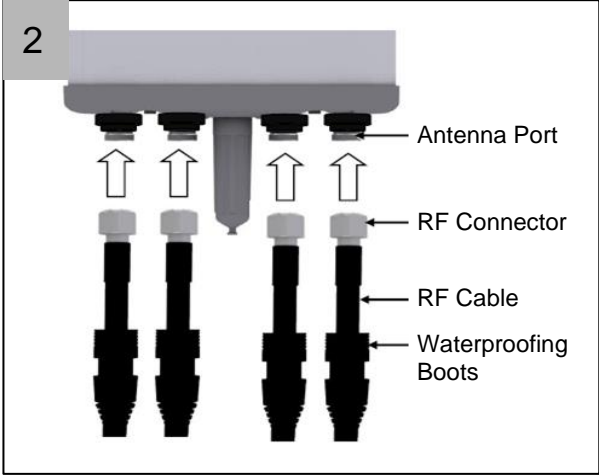


CAUTION: Make sure that a civil engineer or a structural engineer approves the cable route.

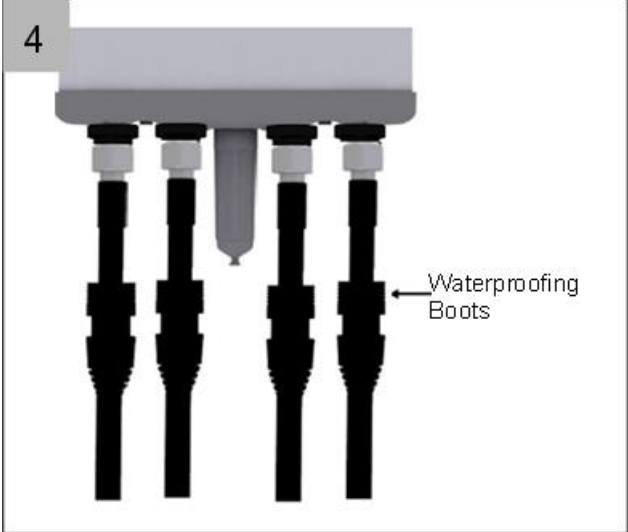
To install the Antenna cables,



Note: Insert the rubber for waterproofing boot to the RF antenna ports



Note: Connect the cables to the RF antenna ports with Torque 5N.m

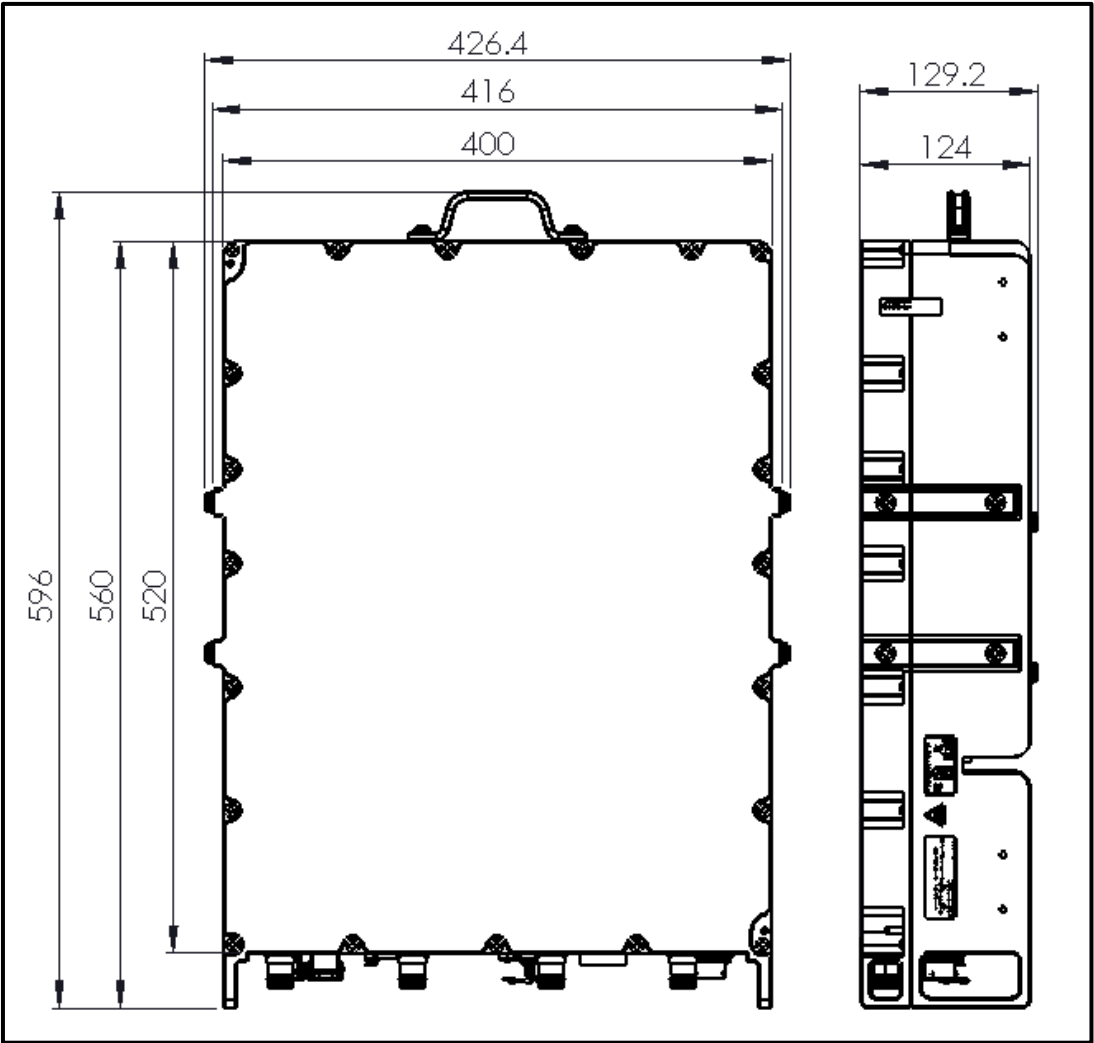


Note: After Connecting the connector push the waterproofing boots up to the connector connection.

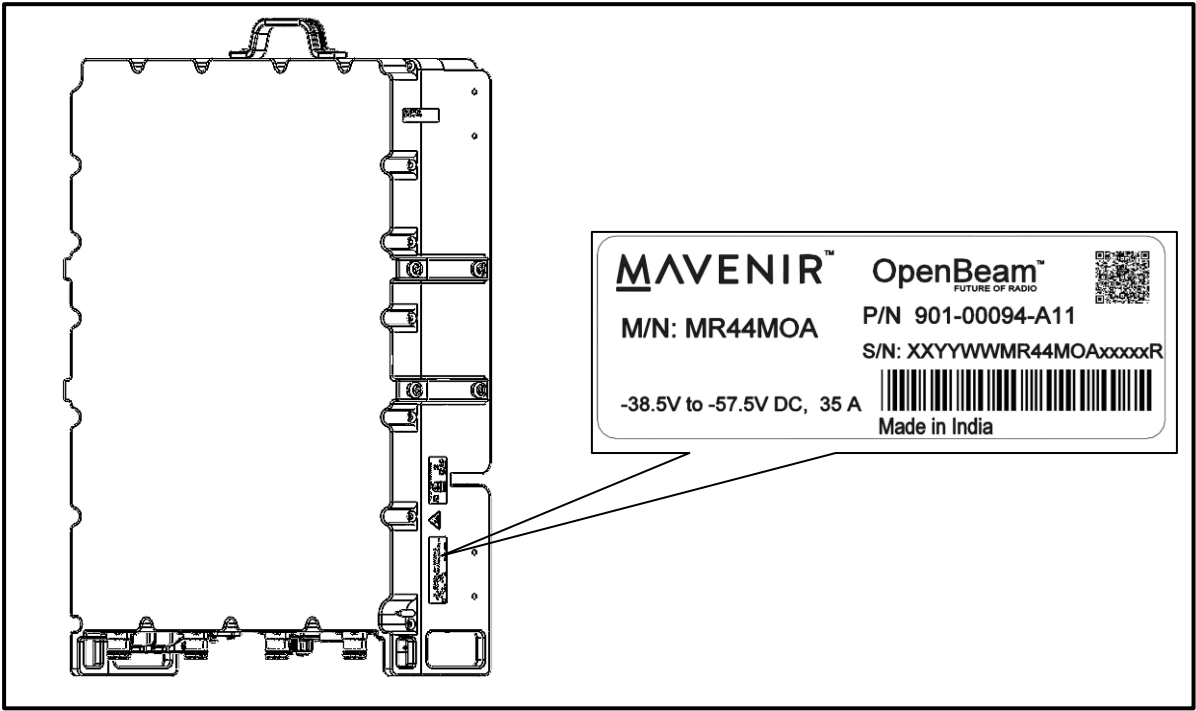
Disposal

Follow local or national regulations when you dispose of the product.

Dimensions



Type plate



To verify the radio installation on site

Examine the grounding system.

No	Item	YES	N/A
1	Is the grounding system installed as specified?		
2	Is the radio grounding installed and connected to site Main Earthing Terminal?		
3	Is the ground cable area enough for copper cable, or equivalent?		
4	Is the Radio System grounded? Are the washers in place and the nuts tightened?		
5	Are the ground lugs, terminals, and cable lugs correctly crimped?		
6	Is there an unstrapped ground cable longer than 1 m?		
7	Are there damage to the insulation of the cables?		
8	Are the equipment undamaged and free from contamination?		
9	Is the protective ground in the power supply box connected to the Main Earthing Terminal of the site?		

Examine the radio.

No	Item	YES	N/A
1	Is the radio installed as specified?		
2	Is the radio clean and undamaged?		
3	Is the radio properly aligned horizontally and vertically?		
4	Are the equipment labeled as required (as specified in the Customer Site Documentation)?		
5	Are protective covers, dust caps, or terminations plugs installed on unused ports?		
6	Are the antenna cables routed correctly and undamaged?		
7	Are the antenna cables tightened correctly?		
8	Is the RET cable routed correctly and undamaged?		
9	Is the RET cable tightened?		
10	Check that power cable collar is tightened		
11	check that all bolts are tightened to stated torque settings		
12	is radio clearance to other objects and radios as per separation requirement		
13	is product type label still visible after mounting		
14	is LED window still visible after mounting		
15	Are cable rain loops/dips Implemented on connectors facing up		

Examine the power system.

No	Item	YES	N/A
1	Is the radio installed as specified?		
2	Radio is terminated in the correct positions and labeled?		
3	Is the ground cable tightened?		
4	Are the power sockets secure and correctly attached to the radio?		

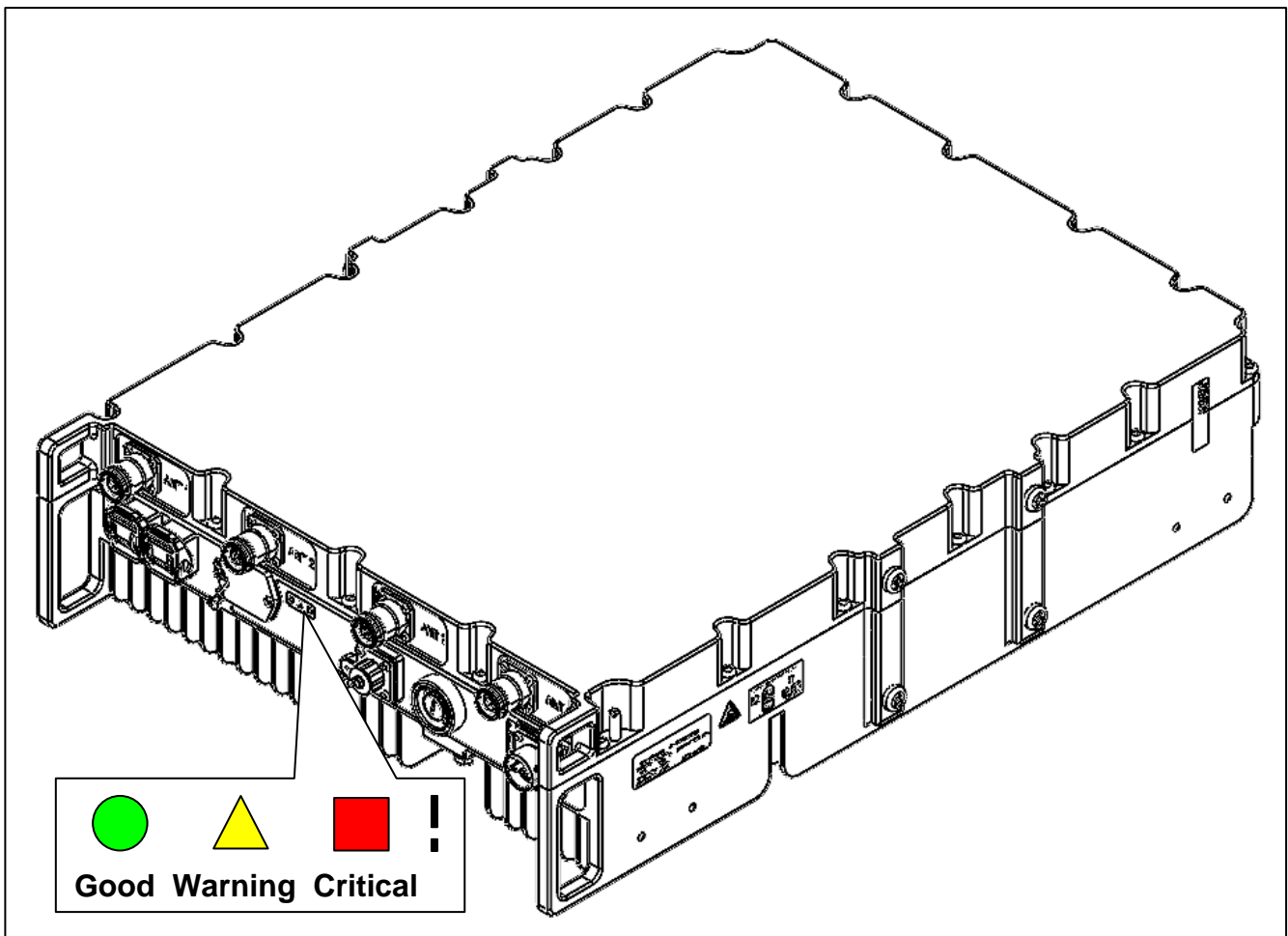
Power up the radio

Make sure the radio is grounded according to instructions. Switch on the external power to the radio on both power feeds.

Note: Products not connected to ground risk damage from overvoltage or overcurrent. Always ground products according to instructions.

Examine the radio after powering up.

Once the power has been switched on, the radio is loaded with the specific software. Optical LED indicators show the status of the radio.



Refer to the Operating manual for explanations of the LED indicator.



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