Aruba Networks
MSR4000 Installation Guide

0510871-04

Statement of Conditions

In the interest of improving internal design, operation function, and/or reliability, Aruba Networks reserves the right to make changes to products described in this document without notice. Aruba Networks does not assume any liability that may occur due to the use or application of the product(s) described herein.

DISCLAIMER: LIMITATION OF LIABILITY

1. Before installation, it's strongly recommended and requested that users pay particular attention to the safety warnings in the sequentially detailed operation procedures within the manual. If there's any uncertainty or incapability of solving problems, contact the company's customer support center. Please DO NOT incur any risk or try to verify situations by yourself. Otherwise, any consequence caused by the attempt shall be completely due to the user himself.

2. Please periodically check whether the installed MSR4000 is damaged, worn-out or poses any danger. Any actual proof, sign or phenomenon of the afore-mentioned situations should be brought to the attention of the company at point of sale. Please DO NOT attempt to repair the product or replace any component. Otherwise, for any consequence arising out of or relating to the users' attempt repair the product, including but not limited to damages, disuse, short circuit, fire, bodily injury, etc., the company shall not be liable.

3. Users shall purchase or use the company's MSR4000 voluntarily. Users shall understand on their own initiative and abide voluntarily by policies, regulations or laws of their respective nation or local territories. The consequence arising out of or relating to any violation of the local laws or regulations by the user, shall be solely imputed to the user himself, and the company shall not be liable.

4. The company disclaims any and all warranties and guarantees, express, implied or otherwise, arising, with respect to the MSR4000 products or services, including but not limited to the warranty of merchandisability, the warranty of fitness for a particular purpose, and any warranty of non-infringement of the intellectual property rights of any third party. Liability of the company for loss is limited to the total amount paid to the company by the customer during the previous calendar year. The company will have no obligation or liability, whether arising in contract (including Warranty), tort (including active, passive or imputed negligence, strict liability or product liability) or otherwise for any special, incidental, consequential or indirect damages including but not limited to loss of use, loss of data, business interruption, loss of revenue, loss of business or other financial loss arising out of or in connection with any of the products or other goods or services furnished by the company under this manual, even if advised of the possibility of such damages.

5. It shall never be understood that the manual expresses or implies to any customer or any third party authorize or transfer any rights. The company reserves fully the final interpretation of the MSR4000 and this manual.

Safety Warnings

The MSR4000 must be installed by trained professional installation technicians. All warnings below must be read and understood before installation.

General Safety Warnings

 You can be killed or injured if performing antenna installation near electrical power lines. Carefully read and follow all instructions in this guide. Please be sure there are no high voltage and electronic fields nearby.

Working Aloft Warning

 When working on tower or roof, individuals must wear safety belts. Tools

must be tied to the individual using them. Workers below must wear safety helmets.

Lightning Activity Warning

 Make sure not to connect or disconnect cables during periods of lightning activity.

A surge protective device should be installed to prevent potential damage from very high surges, for instance, the peak surges caused by lightning.

Explosive Device Proximity Warning

 Do not operate wireless network devices close to explosive merchandise or in explosive environments if devices are not certified for operation in such an environment, for example, in the vicinity of a gas station.

Antenna Placement Warning

 Do not install any antenna near overhead power lines or other electric light, or where the antenna can come into contact with such circuits.

Antenna Selection Warning

 Please use DC grounding antenna with lightning protection to prevent surge and static electricity.

Grounding Warning

 Please always remember to protect your MSR4000 system by installation of

grounding lines. The ground connection must be complete before connecting power to the MSR4000 enclosure. The requirement of grounding is to make sure the resistance must be less than 5 ohm between the ground termination point to grounding tier.

Power Installation Warning

 The installation of the power switch must be performed by a trained professional technician.

The power switch is not supplied with the MSR4000. The power cord must be assembled by a professional installer, and the final assembly must comply with related requirements.

Solar Irradiation and High Temperature Protection

 Pay attention to level of sunlight, which can increase the working temperature of MSR4000 to higher than specifications allow.

A solar shield is provided in the Aruba standard package and should be installed to protect any outdoor MSR4000. The Aruba Warrantee policy does not cover those outdoor products for which Solar shields are not installed. Please contact Aruba technical support engineers for detailed information.

RF Device Protection

 Before powering up the MSR4000, the RF port must be connected to an antenna or a valid load (not included in the standard accessories for MSR4000). Otherwise, the RF module may be burned out. Aruba will not take any responsibility for such damage. For RF module with power less than 100mW, in test environment, it is allowed worked without load but should be within 30 minutes.

 Protection on unused RF module

The unused RF interface must be closed via configuration command and its protective cap must be wrapped up by waterproof PVC tape to prevent from falling off. Otherwise, the RF module may be damaged. Aruba will not take any responsibility for such damage.

FCC Certificate

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

REMINDER

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTICE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

Precautions

The radiated output power of this device is below the FCC radio frequency exposure limits based on that human proximity to the antenna shall not be less than 40 cm during normal operation.

IC notice

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Gain of antenna: 15dBi, 14dBi, 9dBi, 8dBi
Type of antenna: Directional Panel, Dual slant, Omni-directional, Omni-directional
Impedance of antenna: 50ohm

Proper Disposal of Aruba Equipment

For the most current information about Global Environmental Compliance and Aruba products, see our website at www.arubanetworks.com.

Waste of Electrical and Electronic Equipment

Aruba products at end of life are subject to separate collection and treatment in the EU Member States, Norway, and Switzerland and therefore are marked with the symbol shown at the left (crossed-out wheelie bin). The treatment applied at end of life of these products in these countries shall comply with the applicable national laws of countries implementing Directive 2002/96EC on Waste of Electrical and Electronic Equipment (WEEE).

European Union RoHS

Aruba products also comply with the EU Restriction of Hazardous Substances Directive 2002/95/EC (RoHS). EU RoHS restricts the use of specific hazardous materials in the manufacture of electrical and electronic equipment. Specifically, restricted materials under the RoHS Directive are Lead (including Solder used in printed circuit assemblies), Cadmium, Mercury, Hexavalent Chromium, and Bromine. Some Aruba products are subject to the exemptions listed in RoHS Directive Annex 7 (Lead in solder used in printed circuit assemblies). Products and packaging will be marked with the "RoHS" label shown at the left indicating conformance to this Directive.

China RoHS

Aruba products also comply with China environmental declaration requirements and are labeled with the "EFUP 25" label shown at the left.

MSR4K43N0

有毒有害物質聲明 Hazardous Materials Declaration						
部件名称 (Parts)	有毒有害物質或元素(Hazardous Substances)					
	铅 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Chromium VI Compounds (Cr6+)	多溴联 苯 Polybrominated Biphenyls (PBB)	多溴 二苯醚 Polybrominated Diphenyl Ether (PBDE)
电 路板 PCA Board	X	O	O	O	O	O
机械组 件 Mechanical Subassembly	O	O	O	O	O	O
O: 表示该 有毒有害物质 在该 部件所有均质 材料中的含量均在SJ/T11363-2006标 准规 定的限量要求以下。 This component does not contain this hazardous substance above the maximum concentration values in homogeneous materials specified in the SJ/T11363-2006 Industry Standard.						
X: 表示该 有毒有害物质 至少在该 部件的某一均质 材料中的含量超出SJ/T11363-2006标 准规 定的限量要求。 This component does contain this hazardous substance above the maximum concentration values in homogeneous materials specified in the SJ/T11363-2006 Industry Standard.						
对销售之日的所售产品,本表显示,供应链的电子信息产品可能包含这些物质。 This table shows where these substances may be found in the supply chain of electronic information products, as of the date of sale of the enclosed product.						
此标志为针对所涉及产品的环保使用期标志. 某些零部件会有一个不同的环保使用期(例如,电池单元模块)贴在其产品上. 此环保使用期限只适用于产品是在产品手册中所规定的条件下工作. The Environment- Friendly Use Period (EFUP) for all enclosed products and their parts are per the symbol shown here. The Environment- Friendly Use Period is valid only when the product is operated under the conditions defined in the product manual.						

MSR4K43N3

ARUBA networks

有毒有害物質聲明
Hazardous Materials Declaration

部件名称 (Parts)	有毒有害物質或元素(Hazardous Substances)					
	铅 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Chromium VI Compounds (Cr6+)	多溴联苯 Polybrominated Biphenyls (PBB)	多溴二苯醚 Polybrominated Diphenyl Ether (PBDE)
电路板 PCA Board	X	O	O	O	O	O
机械组件 Mechanical Subassembly	X	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006标准规定的限量要求以下。
This component does not contain this hazardous substance above the maximum concentration values in homogeneous materials specified in the SJ/T11363-2006 Industry Standard.

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006标准规定的限量要求。
This component does contain this hazardous substance above the maximum concentration values in homogeneous materials specified in the SJ/T11363-2006 Industry Standard.

对销售之日的所售产品,本表显示,供应链的电子信息产品可能包含这些物质。
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Table of Contents

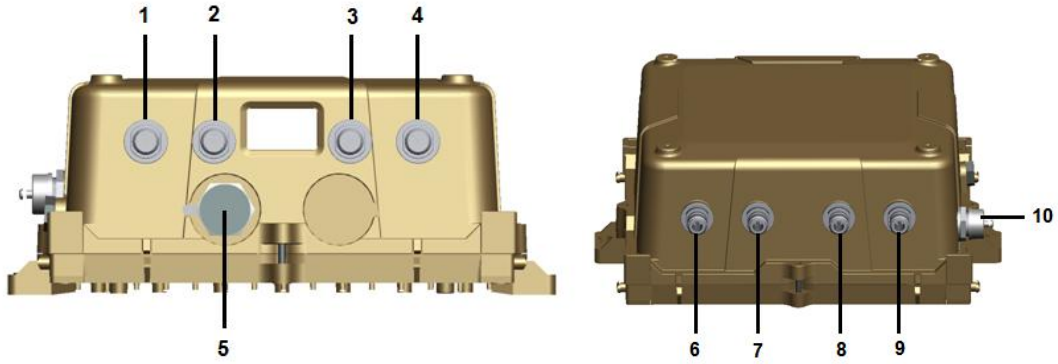
1 Product Overview

There are two versions of the MSR4000, which mainly differ in the way they receive power.

- MSR4K43N0: PoE powered
- MSR4K43N3: AC powered (100-240VAC)

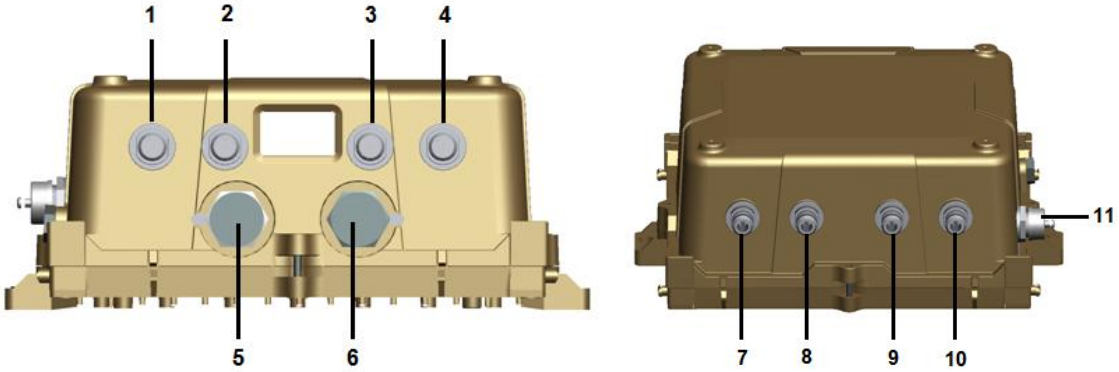
1.1 Interfaces

Figure 1-1 Interfaces on MSR4K43N0



1	Antenna 2 (Radio 0)	6	Antenna 1 (Radio 2)
2	Antenna 2 (Radio 3)	7	Antenna 1 (Radio 1)
3	Antenna 2 (Radio 1)	8	Antenna 1 (Radio 3)
4	Antenna 2 (Radio 2)	9	Antenna 1 (Radio 0)
5	Ethernet Interface	10	Console Interface

Figure 1-2 Interfaces on MSR4K43N3



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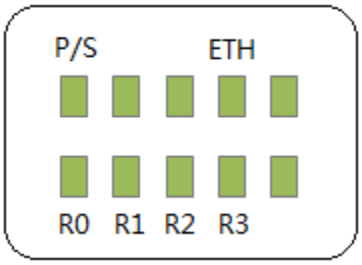
2	Antenna 2 (Radio 3)	8	Antenna 1 (Radio 1)
3	Antenna 2 (Radio 1)	9	Antenna 1 (Radio 3)
4	Antenna 2 (Radio 2)	10	Antenna 1 (Radio 0)
5	Ethernet Interface	11	Console Interface
6	AC Power Interface		

1.2 LED Status Indicators

The MSR4000 include visual indicators for power, link and radio status.

Figure 1-3 MSR4K43N0 LED layout



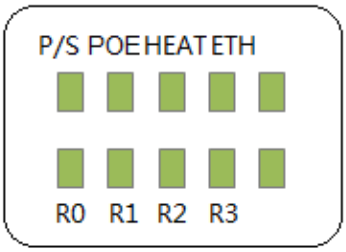
The table below lists the meanings of the LEDs on the MSR4K43N0.

Table 1-1 MSR4K43N0 LED status indicators

LED	Function	Indicator	Status
P/S	Power	Off	No power to device
		On (Amber)	Device has power but does not yet have a mesh network routing path to a gateway (portal) node
		On (Green)	Device has power and has found a mesh network routing path to a gateway (portal) node
ETH	Network Link Status	Off	No uplink on the Ethernet port
		On (Amber)	10/100 Mbps Ethernet link negotiated
		On (Green)	1000 Mbps Ethernet link negotiated
		Blinking	Traffic on Ethernet link
R0	Radio 0 Status	Off	Radio 0 is not providing either access (SSID) or backhaul (mesh)

			service
		On (Blue)	Radio 0 is providing access (SSID) service or backhaul (mesh) service
R1	Radio 1 Status	Off	Radio 1 is not providing either access (SSID) or backhaul (mesh) service
		On (Blue)	Radio 1 is providing access (SSID) service or backhaul (mesh) service
R2	Radio 2 Status	Off	Radio 2 is not providing either access (SSID) or backhaul (mesh) service
		On (Blue)	Radio 2 is providing access (SSID) service or backhaul (mesh) service
R3	Radio 3 Status	Off	Radio 3 is not providing either access (SSID) or backhaul (mesh) service
		On (Blue)	Radio 3 is providing access (SSID) service or backhaul (mesh) service

Figure 1-4 MSR4K43N3 LED layout



The table below lists the meanings of the LEDs on the MSR4K43N3.

Table 1-2 MSR4K43N3 LED status indicators

LED	Function	Indicator	Status
P/S	Power	Off	No power to device
		On (Amber)	Device has power but does not yet have a mesh network routing path to a gateway (portal) node
		On (Green)	Device has power and has found a mesh network routing path to a gateway (portal) node
POE	Displays PSE power output status	Off	Non-powered device (0Ω<Rport<200Ω) or Port open (Rport>1MΩ)

		Green	Port on (25kΩ) • 1 Flash: Low signature resistance (300Ω<Rport<15kΩ) • 2 Flashes: High signature resistance (33kΩ<Rport<500kΩ) • 5 Flashes: Port overload fault • 9 Flashes: Power management allocation exceeded
HEAT	Displays the heating status of low temperature	Off	Device is not in heating status
		Blinking (Blue)	Device is heating
ETH	Network Link Status	Off	No uplink on the Ethernet port
		On (Yellow)	10/100 Mbps Ethernet link negotiated
		On (Green)	1000 Mbps Ethernet link negotiated
		Blinking	Traffic on Ethernet link
R0	Radio 0 Status	Off	Radio 0 is not providing either access (SSID) or backhaul (mesh) service
		On (Blue)	Radio 0 is providing access (SSID) service or backhaul (mesh) service
R1	Radio 1 Status	Off	Radio 1 is not providing either access (SSID) or backhaul (mesh) service
		On (Blue)	Radio 1 is providing access (SSID) service or backhaul (mesh) service
R2	Radio 2 Status	Off	Radio 2 is not providing either access (SSID) or backhaul (mesh) service
		On (Blue)	Radio 2 is providing access (SSID) service or backhaul (mesh) service
R3	Radio 3 Status	Off	Radio 3 is not providing either access (SSID) or backhaul (mesh) service
		On (Blue)	Radio 3 is providing access (SSID) service or backhaul (mesh) service

2 Installation Preparations

This chapter describes the preparations for MSR4000 installation, including checking package contents, preparing installation tools and selection of installation sites.

2.1 Package Contents

- Aruba MSR4000 AirMesh Router
- MSR4000 Mounting Bracket x1
- Solar Shield x1
- Pole Anchors x 4
- M4 x 16 bolts, flat washers, and spring washers x4
- M4 x 16 bolts x2
- M6 x 30 bolts, flat washers, and spring washers x2
- M4 x 12 bolt, external-tooth washer, and OT copper lug x1
- M8 x 110 bolt, flat washers, spring washers, and nuts x4
- Metal Weatherproof Caps x2 for use on unused antenna interfaces
- RJ-45 Connector Kit with metal RJ-45
- USB Console Cable
- Installation Guide

Note

Inform your supplier if there are any incorrect, missing, or damaged parts. If possible, retain the carton, including the original packing materials. Use these materials to repack and return the unit to the supplier if needed.

2.2 Preparing Installation Tools

When installing MSR4000, you may need the following tools. You shall select the tools according to the actual situation.

Table 2-1 Installation tools list

Type	Tools
General tools	Screwdriver, adjustable spanner, vice, safety belt, hard hat, power board (220 VAC or as required by local regulation), POE power injector, crimping pliers, electric soldering iron, welding wire, PVC insulation tape, adhesive insulation tape, strap, insulation tools

2.3 Examining the Installation Site

1. The site should be located within at least a 60% range of the 1st fresnel zone without obstacles to provide LOS transmission, increase coverage capacity, and minimize the number of necessary sites.
2. If no LOS secured, area in NLOS area could be covered as well, but the distance of coverage and area of coverage are decreased; more sites are needed to provide coverage for same area than in the LOS scenario.
3. Interference must be considered in site selection. New site should avoid known interference, unless the interference is controllable.
4. Keep the MSR4000 away from places that are susceptible to high temperature, dust, harmful gas, inflammable, explosive, electromagnetic interference (high power radar, radio station and transformer), unstable voltage, heavy vibration, or loud noise. In engineering design, the site should be selected according to the network planning and technical requirements of communications equipment, as well as the considerations such as climate, hydrology, geology, earthquake, electric power, and transportation.

3 Weatherproofing Connections

Weatherproofing your antenna and/or cable connections on your outdoor AP is essential to reliability and longevity of your product. This process prevents water from entering the AP or antennas through the connectors.

A good weatherproofing job consists of three wrappings:
1. electrical tape
2. butyl rubber
3. electrical tape

The first wrapping of tape should be at least two layers, followed by a single wrap of butyl rubber, and four-layer wrap of electrical tape. This provides good protection from water, heat, and other potential hazards that could damage your AP or antennas.

Additionally, wrap your connections such that water is always directed down and away from connections.

3.1 Required Items and Tools

- 3/4” (19 mm) Vinyl Electrical Tape (waterproofing type)
- Butyl Rubber Tape
- Knife or Box Cutter

3.2 Types of Connections

The following sections provide guidance on weatherproofing directly connected antennas (Figure 3-1) and cable connections (Figure 3-2). The same materials are needed for weatherproofing both types of connections but the procedure is slightly different. For weatherproofing directly connected antennas, see

"Weatherproofing Directly Connected Antennas" section. For weatherproofing cable connections, see "Weatherproofing Cable Connections" section.

Figure 3-1 Directly connected antennas

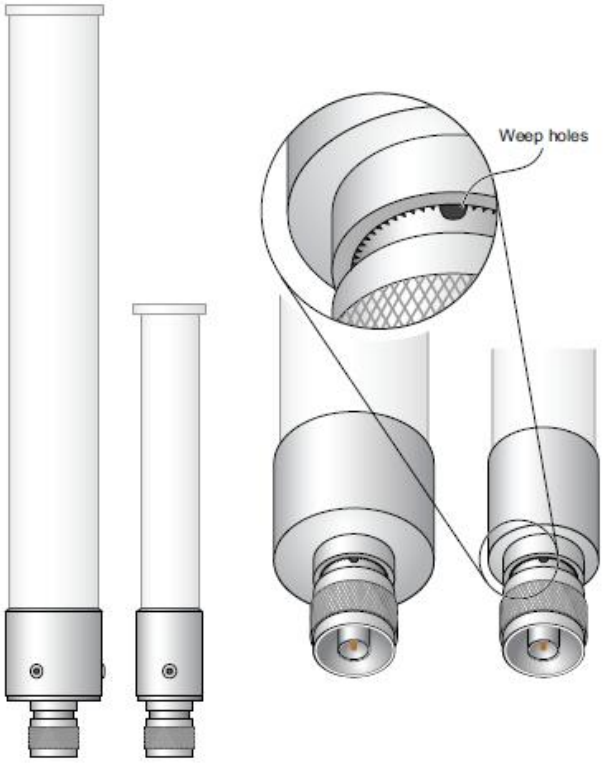
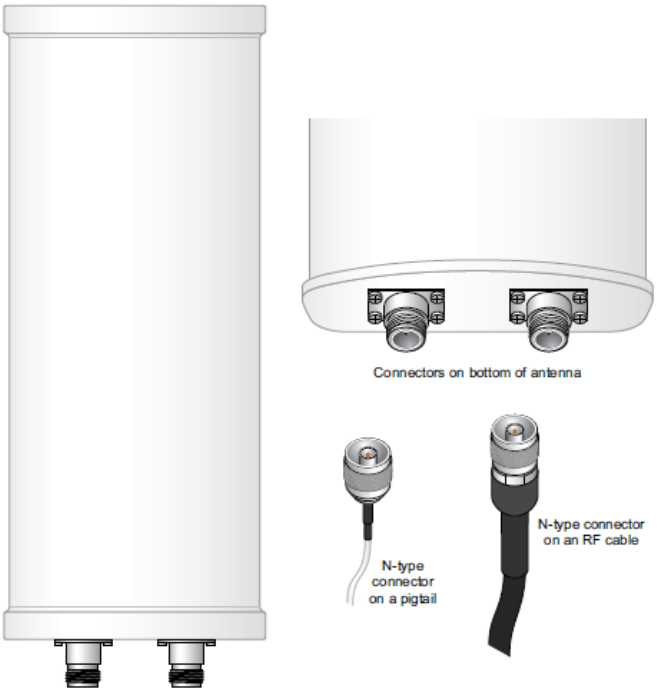


Figure 3-2 Cable connections



3.3 Important Points to Remember

- Do not cover the weep holes on the antennas. Doing so can restrict the release of condensation from the antennas.
- Proper weatherproofing is not a fast process. Set aside ample time to complete the steps outlined below.
- When wrapping, make the each layer of tape as flat as possible. Wrinkles and folds in the tape create places for water and moisture to gather.

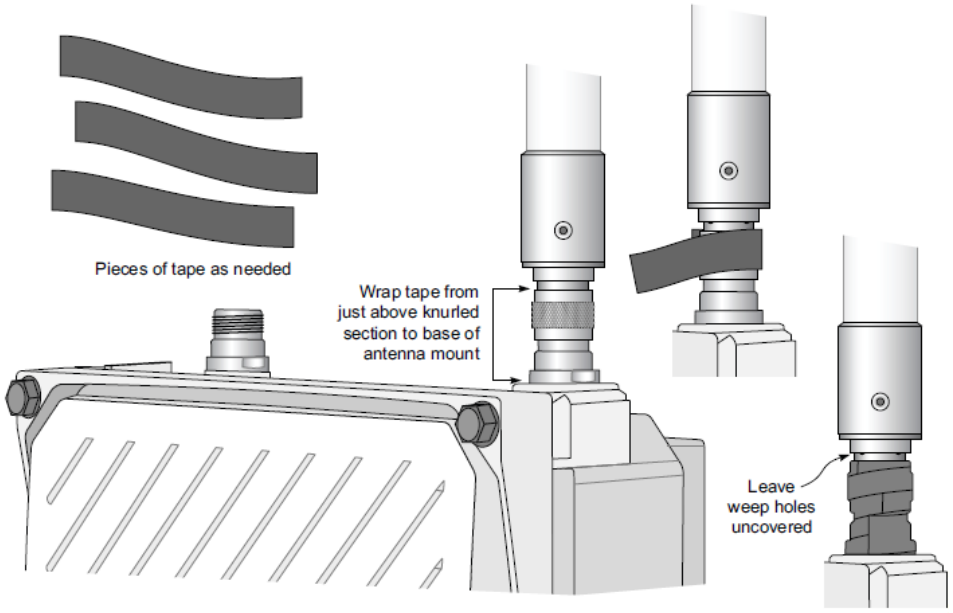
3.4 Weatherproofing Directly Connected Antennas

First Wrapping of Tape

1. Before wrapping the antennas, locate the weep holes (Figure 3-1). Weep holes allow condensation that has built up inside the antenna to escape.
2. Prepare the antenna connector by cleaning and drying it.
3. Cut a 4” (100 mm) strip of electrical tape from the roll. Pre-cutting the tape into strips makes it easier to maneuver the tape around the antennas and other components of the AP’s case.

4. Beginning just below the weep holes, tightly wrap the connection with a layer of the 3/4” (19mm) electrical tape. Overlap the tape to a half-width.
5. Repeat steps 3 and 4 until the wrapping extends all the way to the AP’s case.

Figure 3-3 First Wrapping of Tape



Wrapping of Butyl Rubber

1. Cut a 3/4” (19 mm) strip of butyl rubber.
2. Wrap the strip of rubber around the taped connector (Figure 3-4)
3. Join the two ends by pushing them together until there is no longer a seam (Figure 3-5).

Figure 3-4 Butyl rubber placement

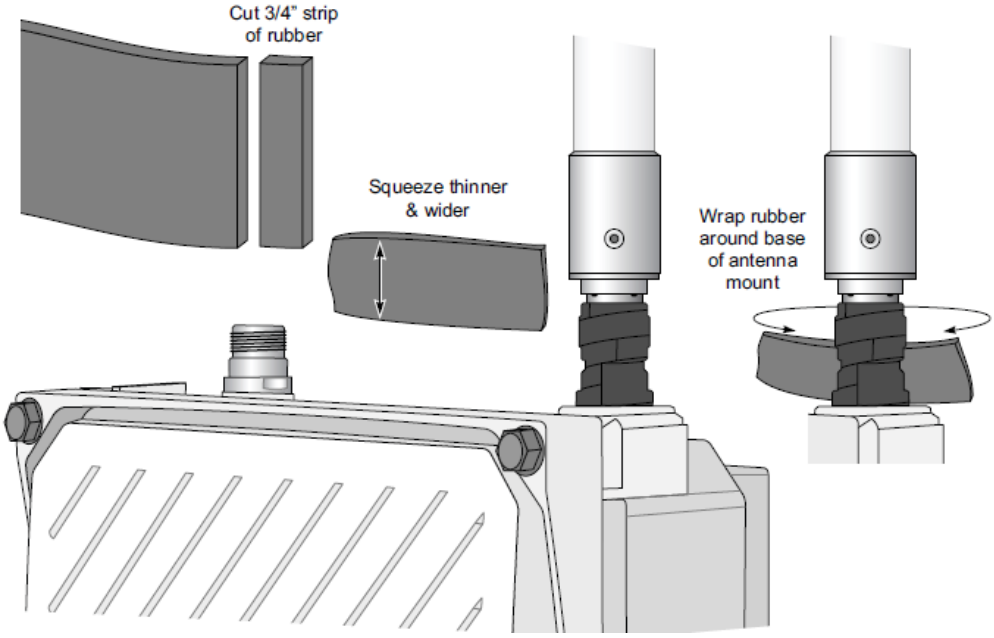
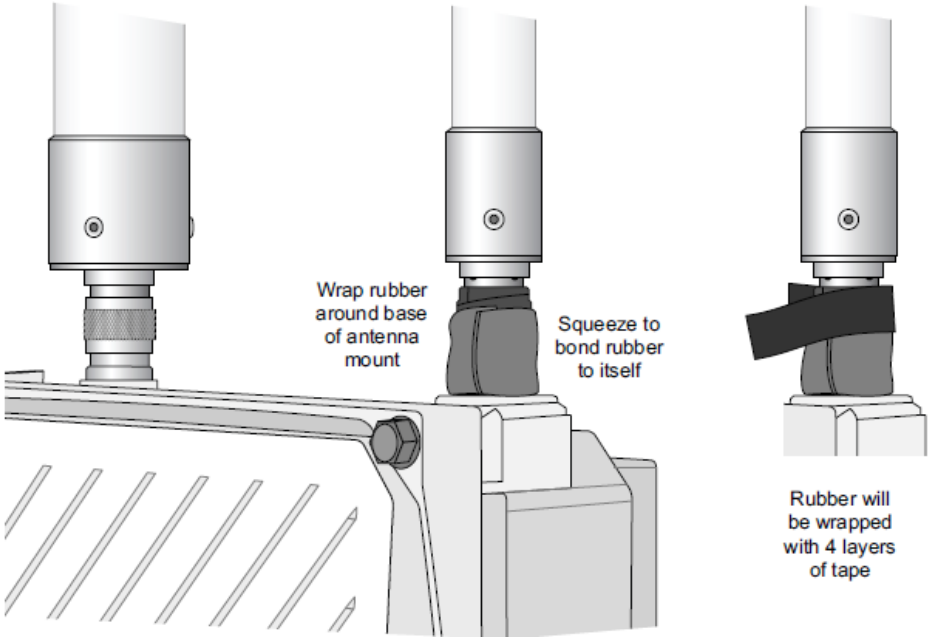


Figure 3-5 Butyl rubber wrap



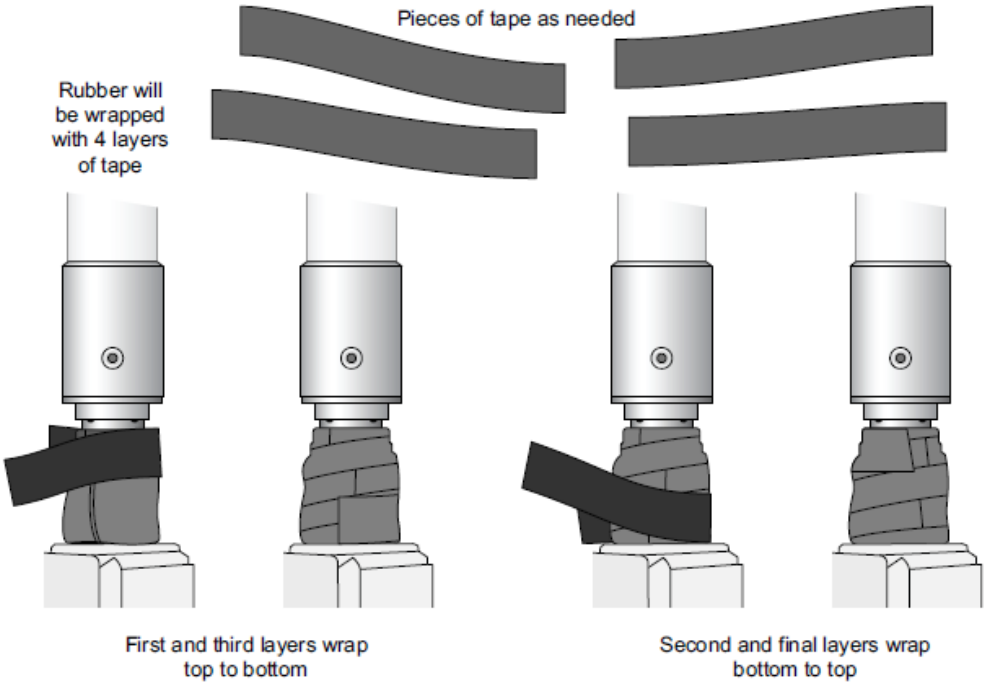
Second Wrapping of Tape

1. Cut a 4” (100 mm) strip of electrical tape from the roll.
2. Where you begin wrapping depends on the orientation of the antenna. Water should flow in the opposite direction of the wrapping to prevent water from

entering the connector between the layers of tape. Therefore, if the antenna is facing up, you should begin wrapping at the AP end of the connector. This will ensure that your fourth and final layer will be layered correctly. Conversely, if your antenna is facing down, you should begin wrapping on the antenna end of the connector.

3. After completing the fourth layer of tape, check your work to ensure there are no places where water can collect. If there are, you must smooth out those areas with additional layers of tape or remove the weatherproofing and begin again.

Figure 3-6 Completed wrapping (antenna on top of AP)



4. Repeat this process for all connectors.

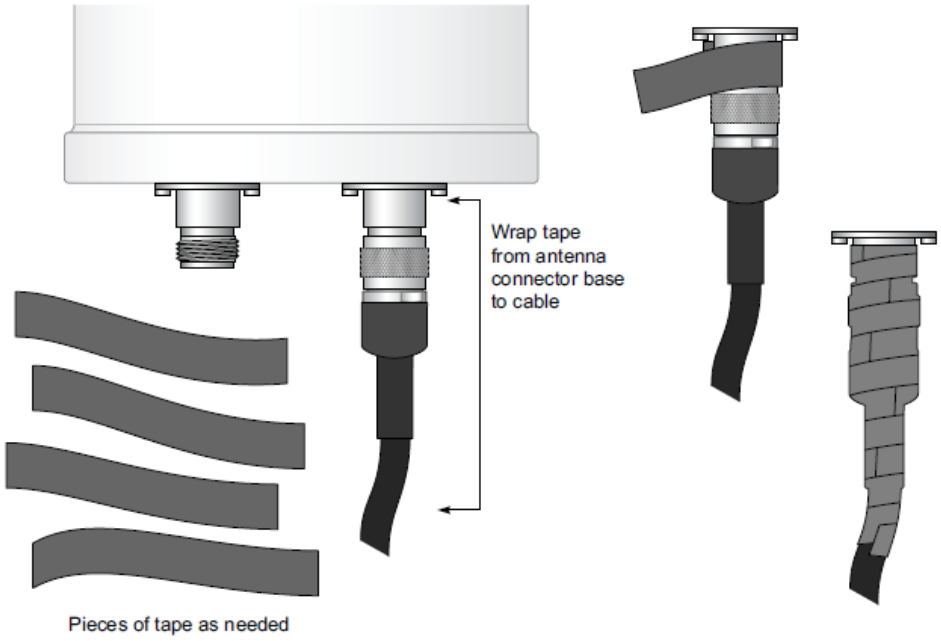
3.5 Weatherproofing Cable Connections

First Wrapping of Tape

1. Prepare the antenna connector by cleaning and drying it.

2. Cut a 4” (100 mm) strip of electrical tape from the roll. Pre-cutting the tape into strips makes it easier to maneuver the tape around the connectors and other components but is not required.
3. Beginning at the top of the connector, tightly wrap the connection with a layer of the 3/4” (19mm) electrical tape. Overlap the tape to a half-width.
4. Repeat steps 3 and 4 until the wrapping extends all the way to the cable’s insulation.

Figure 3-7 First wrapping of tape



Wrapping of Butyl Rubber

1. Cut a piece of butyl rubber large enough to wrap around the connector and extended past the first layer of tape.
2. Wrap the strip of rubber around the taped connector (Figure 3-8)
3. Join the two ends by pushing them together until there is no longer a seam (Figure 3-9).

Figure 3-8 Butyl rubber placement

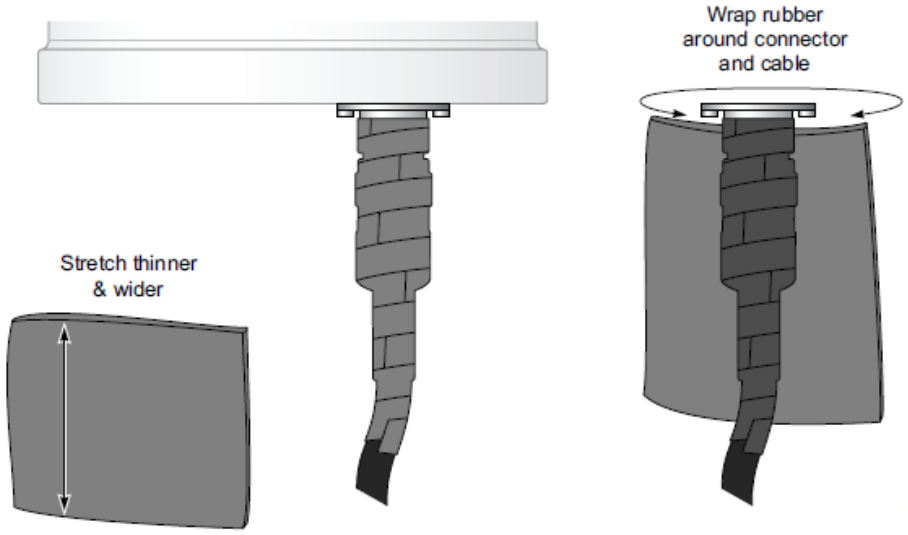
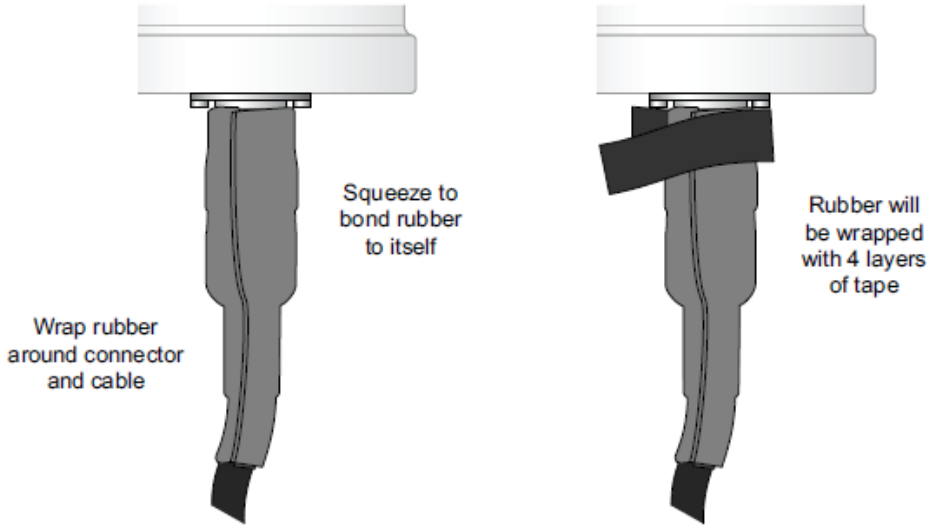


Figure 3-9 Butyl rubber wrap

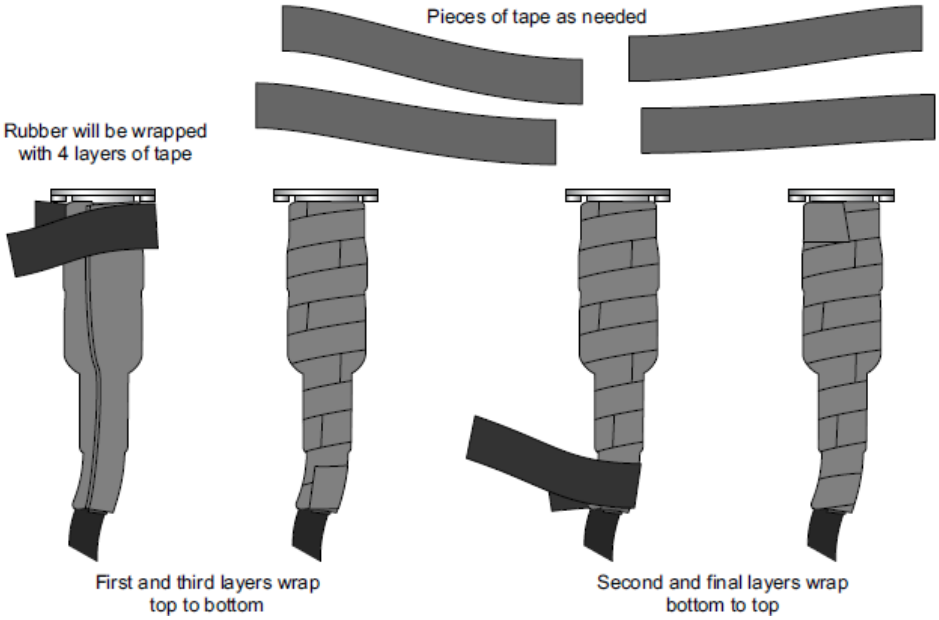


Second Wrapping of Tape

1. Cut a 4” (100 mm) strip of electrical tape from the roll.
2. Using 3/4” (19mm) electrical tape, begin wrapping at the connector and create four layers.
3. After completing the fourth layer of tape, check your work to ensure there are no places where water can collect. If there are, you must smooth out those

areas with additional layers of tape or remove the weatherproofing and begin again.

Figure 3-10 Completed wrapping



4. Repeat this process for all connections.

4 MSR4000 Installation

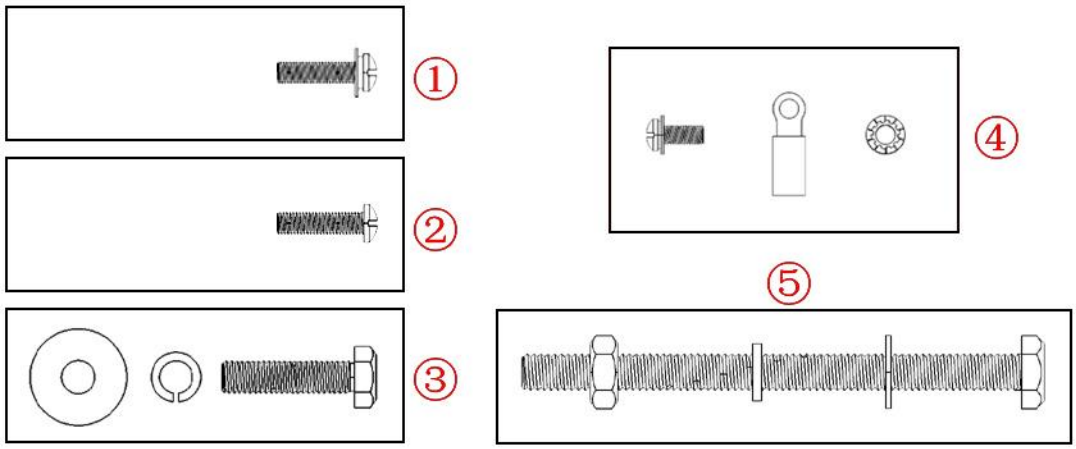
4.1 Installing MSR4000 on a pole

The mounting bracket assembly for installing MSR4000 concludes: solar shield, a pair of pole anchors, a mounting bracket and bolts. MSR4000 can be mounted on a pole or wall. (Pole diameter must be 40 to 60 mm at the position where the MSR4000 will be mounted.)

Note

- If using M8 x150 long bolts (not provided in the box shipped with MSR4000), the MSR4000 can be mounted on a pole with 96mm diameter.

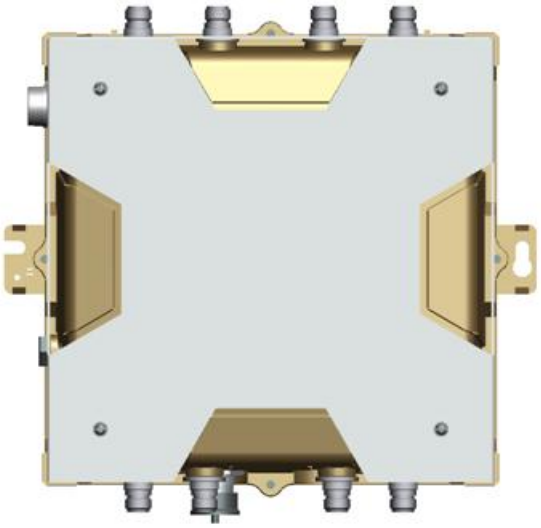
Figure 4-1 Bolts



1	{M4 x16 bolt (flat washer, spring washer)}x4	4	{M4 x12 bolt, external-tooth washer, OT copper lug}x1
2	{M4 x16 bolt}x2	5	{M8 x110 bolt, flat washer, spring washer, nut}x4
3	{M6 x30 bolt, flat washer, spring washer}x2		

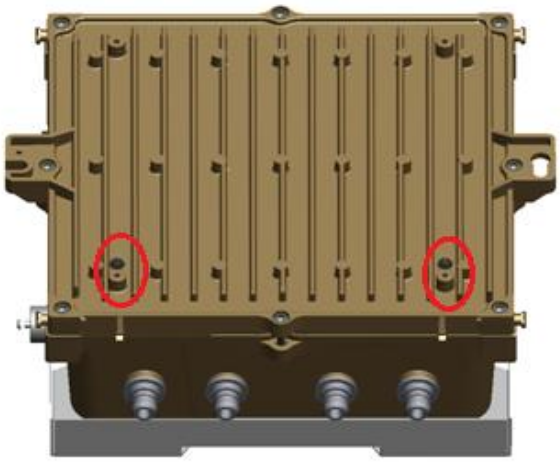
Step 1 Fix the solar shield on MSR4000 using the four M4 x16 bolts (with flat and spring washers) on the four screw holes of the MSR4000. (See figure below)

Figure 4-2 Positions of screw holes on the solar shield



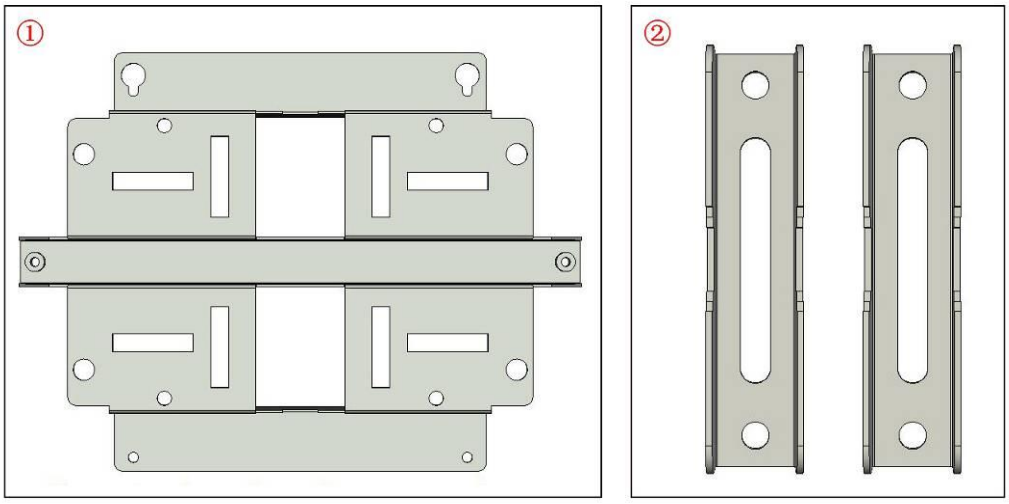
Step 2 Screw the two M4 x16 bolts into the holes on the back of the MSR4000. (See figure below)

Figure 4-3 Positions of screw holes on the back of the MSR4000



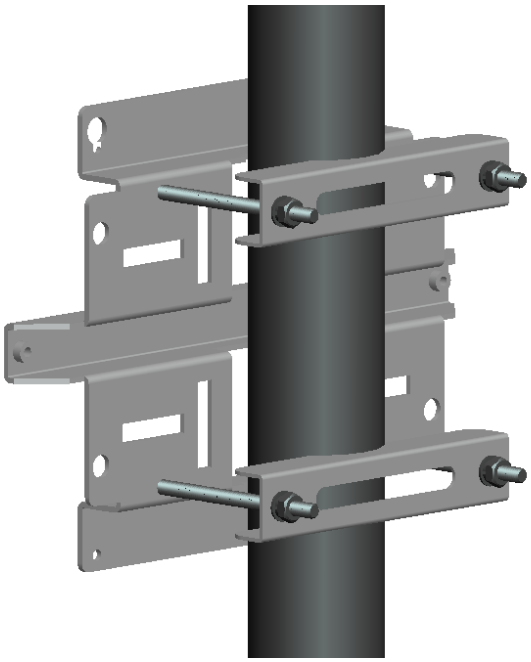
Step 3 Fix the mounting bracket and the pair of pole anchors on the pole using four M8 x110 bolts (with flat washers, spring washers and nuts).

Figure 4-4 the pole anchors and mounting bracket



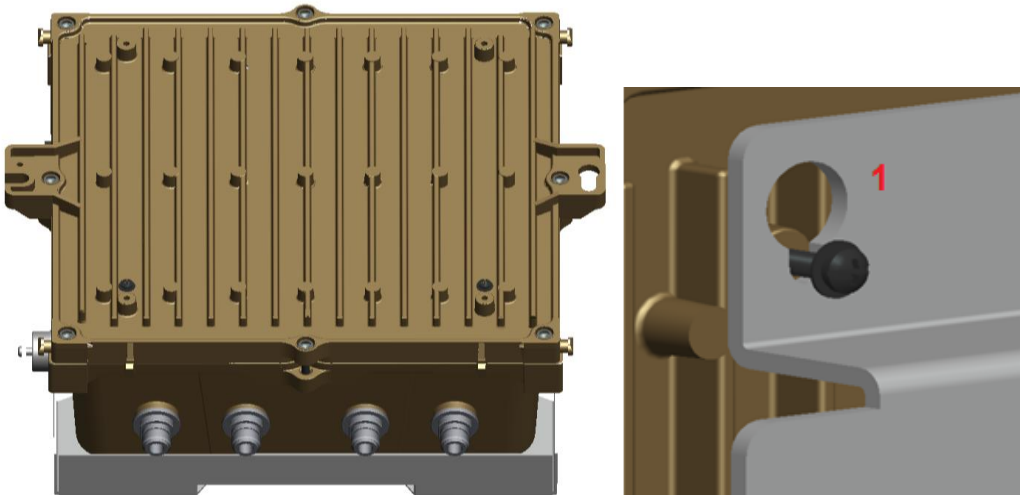
1	A mounting bracket	2	A pair of pole anchors

Figure 4-5 Fix the mounting bracket and the pair of pole anchors on the mounting bracket



Step 4 Align the two M4 x16 bolts on the back of MSR4000 with the holes on the mounting bracket and hang the MSR4000 on the bracket.

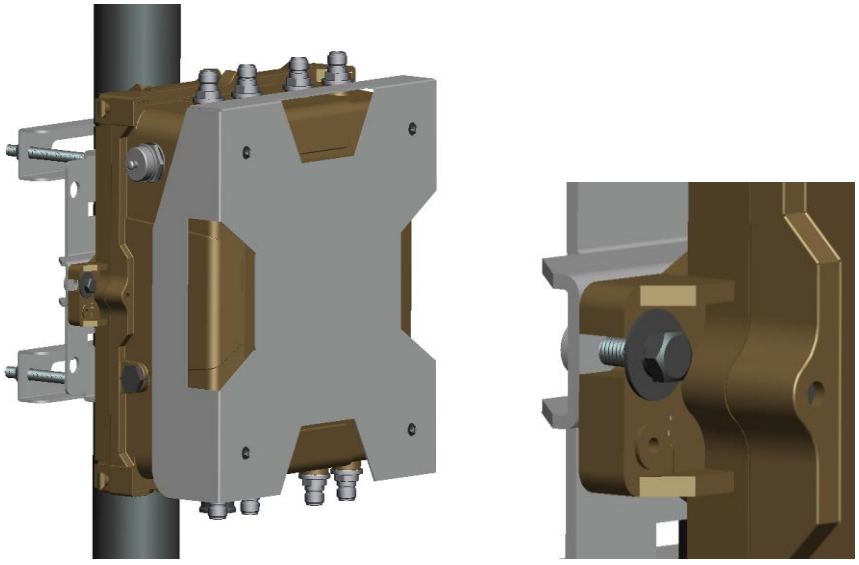
Figure 4-6 Fix the MSR4000 on the bracket



1	Hang the two M4 x16 bolts of the back of the MSR4000 on the two holes of the mounting bracket.

Step 5 Align the two installation holes on the side of the MSR4000 with the corresponding holes on the mounting bracket and then use the two M6 x30 bolts (with flat and spring washers) to fix them. (There is screw thread in the screw hole of the solar shield)

Figure 4-7 Fix MSR4000 on the bracket



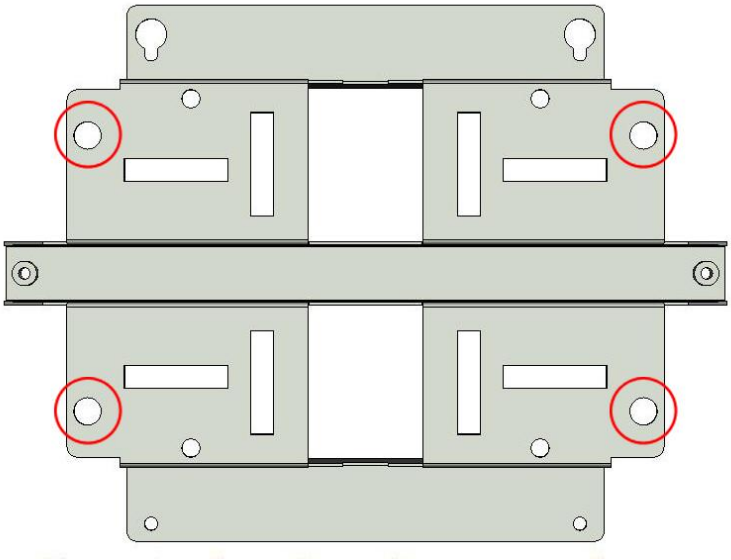
4.2 Installing MSR4000 on a wall

Step 1 Mark

1) Put the mounting bracket on the installation position against the wall.

2) Mark four expansion screw holes on the wall.

Figure 4-8 Positions of screw holes



Step 2 Drill holes

1) Use a percussion drill to drill four holes on the four markings. (Expansion screw size: M8 x 100mm)

Step 3 Install masonry anchors

1) Insert a masonry anchor into each drilled hole vertically.

2) Tap the flat end of the anchor with a rubber hammer until the anchor is flush with the wall surface.

Step 4 Fix the wall-mounting bracket

1) Align the four holes in the wall-mounting bracket with the anchors and insert four expansion screws through the installation holes into the anchors.

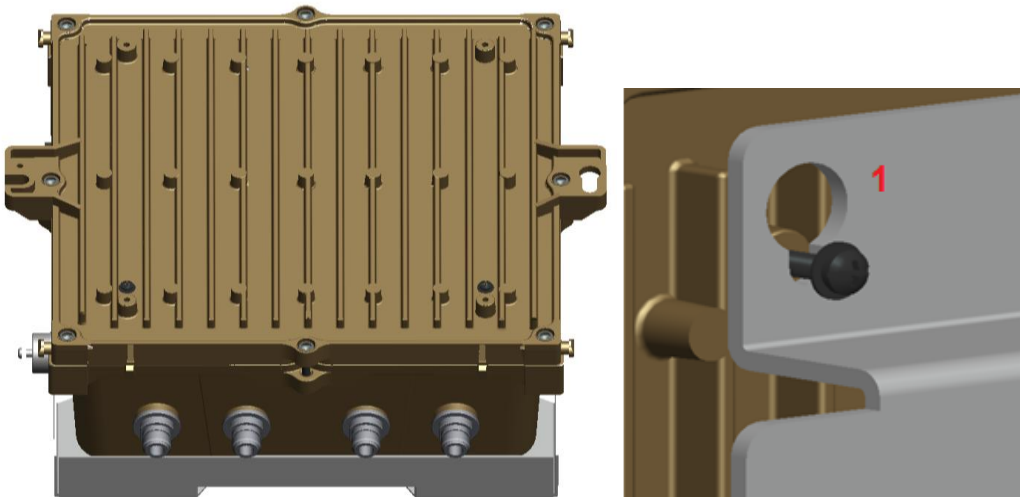
2) Adjust the position of the wall-mounting bracket and tighten the expansion screws.

Step 5 Hang the MSR4000 on the bracket

1) Screw the two M4 x16 bolts into the holes on the back of the MSR4000.

2) Align the two M4 x16 bolts on the back of MSR4000 with the holes on the mounting bracket and hang the MSR4000 on the bracket.

Figure 4-9 Positions of the two M4 x16 bolts and the holes

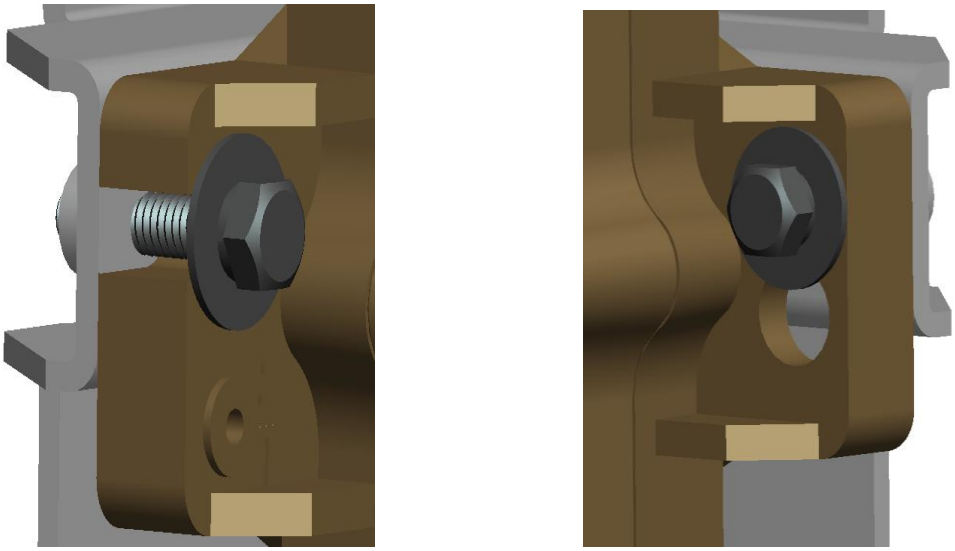


1	Hang the two M4 x16 bolts of the back of the MSR4000 on the two holes of the mounting bracket.

Step 6 Fix MSR4000

1) Align the two installation holes in the MSR4000 with the corresponding holes in the wall-mounting bracket.
2) Insert the two M6 x30 bolts (with flat and spring washers) through the installation holes, and tighten the bolts.

Figure 4-10 Positions of installation holes

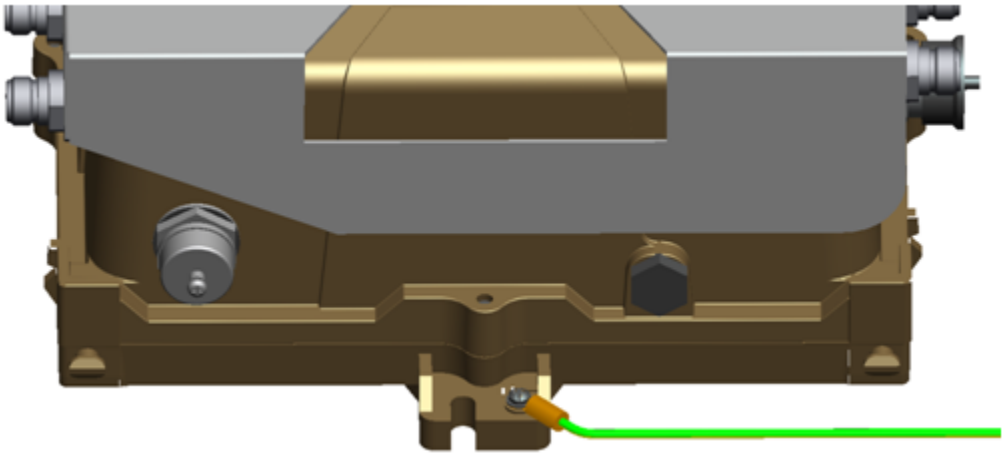


Left side **Right side**

4.3 Grounding the MSR4000

The grounding must be completed before powering up the MSR4000.The residence of grounding wire should be less than 5 ohm and the grounding cable's cross-section area should be no less than 6 mm^2.The grounding hole is at the left side of the MSR4000.

Figure 4-11 Grounding the MSR4000



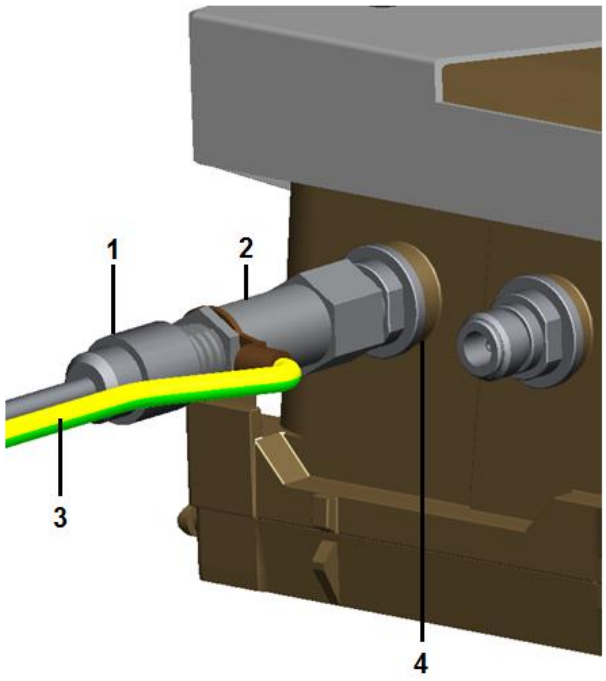
Step 1 Peel the cover of one end of the grounding cable (green or yellow and green grounding cable) and place the bare grounding cable into the copper lug, and press firmly with the crimping pliers.

Step 2 Fasten the copper lug to the grounding hole on the MSR4000 with the M4 x12 bolt and external-tooth washer.

4.4 Connecting the RF cable

The RF cable is used to connect antenna and the MSR4000. (Note: you should install lightning arrester between antenna and the MSR4000.)

Figure 4-12 Connecting the RF cable



1	RF cable	3	Grounding cable for lightning arrester
2	lightning arrester	4	Antenna interface

Step 1 Screw one end of the lightning arrester onto the antenna interface.

Step 2 Connect the RF cable to the other end of the lightning arrester.

Step 3 Water-proof the antenna connection with PVC insulation tape, adhesive insulation tape and strap.

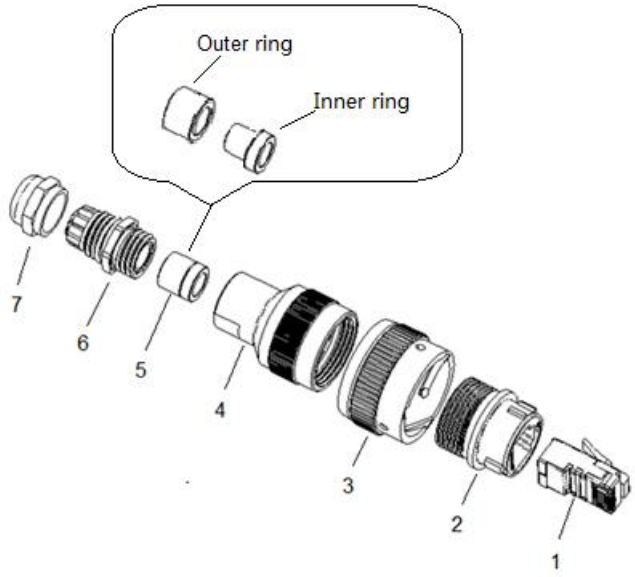
4.5 Connecting the Ethernet cable

To ensure that MSR4000 maintains Ethernet connectivity and Power over Ethernet (PoE), you must use the weatherproof connector kit and install it using the steps below.

Note

- Failure to use the included weatherproof connector kit can lead to connectivity and PoE issues.

Figure 4-13 Weatherproof Connector Kit

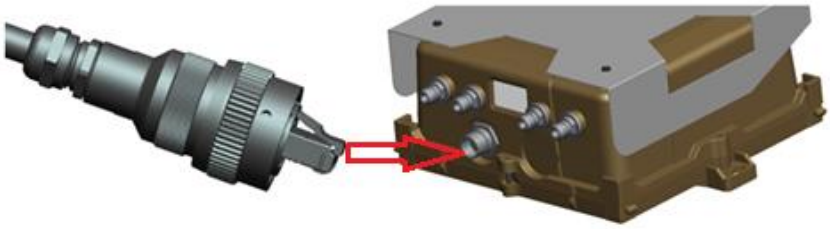


1	Shielded RJ45 connector	5	Shield rings
2	Waterproof connector socket	6	Sealing bolt
3	Locknut	7	Sealing nut
4	Clamp ring		

1. Hold the clamp ring (4) vertically, with the wide end facing up, and place the locknut (3) over it.
2. Drop the waterproof connector socket (2) into the locknut/clamp ring items (3,4), with the RJ45 connector opening facing up, and screw the socket into the threads on the clamp ring.
3. Place the sealing nut (7) over an Ethernet cable (without a connector attached to the end).
4. Place the seal bolt (6) over the Ethernet cable.
5. Strip off about 55mm (2 inches) of the outer Ethernet cable sheath to expose the ground wire and other pair wires.
6. Insert all pair wires into the two shield rings (5).
7. Make the ground wire attach to the narrow end of the inner ring and place the outer ring over the narrow end of the inner ring.
8. Insert the Ethernet cable into the narrow end of the clamp ring and pass it through the opening end of waterproof connector socket.
9. Using a crimping tool, attach the included shielded RJ45 connector.

10. Slide the shield rings up the Ethernet cable and insert it into the narrow end of the clamp ring.
11. Pull the Ethernet cable so the shielded RJ45 connector fits into the RJ45 shaped opening in the wide end of the weatherproof connector socket.
12. Slide the sealing bolt over the narrow end of the clamp ring and hand tighten it.
13. Thread the sealing nut onto the sealing bolt.
14. Insert the Ethernet cable connector into the Ethernet interface and hand-tighten the locknut.
15. Water-proof the Ethernet cable connection with PVC insulation tape and adhesive tape.

Figure 4-14 Connecting Ethernet cable to the Ethernet interface



4.6 Connecting power cable

The MSR4K43N3 version needs an outdoor rated power cable to connect to a compatible AC power source.

Note: The MSR4000 does not ship with any power cables; these are available as accessories and should be ordered separately. In addition to completed power cables, Aruba also offers an outdoor rated AC connector kit that can be used to connect a compatible power cable to the MSR4000.

- AC power source specifications (at MSR4000 interface): 100-240Vac, 100W
- AC power cable specifications (when using CKIT-AC-M connector kit): minimum voltage/current rating 250V/1A, diameter 6-12mm, rated for outdoor use

Cable connection steps:

Step 1 Remove the protective cap on the power interface.

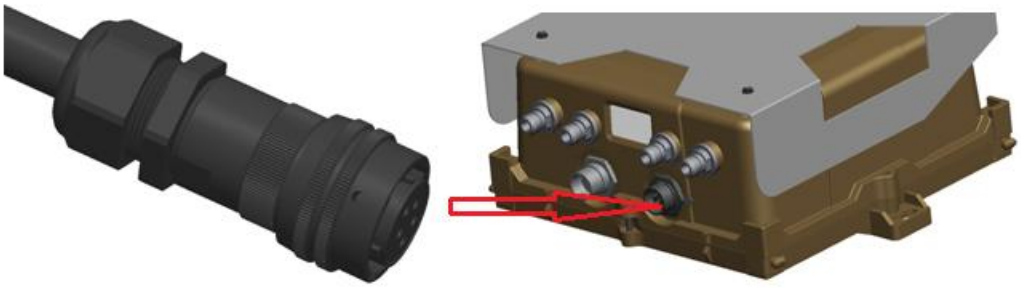
Step 2 Insert the power cable connector into the power interface and hand-fasten the waterproof cover.

Step 3 Water-proof the power cable connection with PVC insulation tape, adhesive insulation tape and strap.

Note

- Cable assembly and installation should be done by a licensed electrician only.

Figure 4-15 Connecting power cable to the power interface



5 Note

- **To log onto the MSR4000 via Console port, use the setting as shown in table below:**

Baud Rate	115200
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None
Default Username and Password	Username: root Password: public