

**PF54A0-rb480-85  
PF54A0-mb480-85**

## ***SAFETY INFORMATION***



**GGS-001383-001**

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**Printed in Japan**

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# Foreword

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Thank you very much for purchasing the equipment.

In order to use properly the equipment by taking advantage of the performance, please read this instruction manual to the end before use. If you perform work that is not specified in this instruction manual, specific performance may not be available. After reading this manual, be sure to keep it in a place where you can refer to it at any time.

The contents of this instruction manual have been checked thoroughly. However, if you have any questions, or find errors or omissions, please contact our company. Please note that we are not responsible for any operation results notwithstanding the preceding paragraph. We have the right to make changes to this instruction manual and its contents without notice and are not responsible for the results caused by those changes.

## ◆Note on copyright

Reproduction of any part or all of the contents of this instruction manual without permission is prohibited. Please note that our company shall not be liable for any infringement of patent rights and other rights of third parties caused by the use of data in the manual.

## ◆Note on the FCC

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.

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.

### **CAUTION:**

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

### **RF exposure compliance:**

- 1) To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons.
- 2) This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

## **◆Condition for storage**

If you store this product in a warehouse before installation, store it in a packing box.

## **◆Condition for transportation**

Be careful not to give excessive force such as dropping or hitting. In the unlikely event that you drop the equipment or parts are damaged, please contact our company.

## **◆Note on disposal**

Disposal of NEC equipment should comply with regulations implemented by the local authorities or the agreement with NEC.

For more details, please refer to the information provided on the following website.

<https://www.necam.com/ElectronicWasteRecycling/>

## **◆Please note in advance**

Please note that our company shall not be liable for any pure economic loss caused by missed communication opportunities due to failure, malfunction, or defect of the product, or external factors such as power outage.

# ***Safety Information***

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This safety information defines precautions and instructions for the safe installation, operation, and maintenance of the equipment. To prevent device damage and personal injury, please familiarize yourself with this document and the instruction manual before installing and operating the equipment.

The following marks are used for attention.

## **General**

 <b>Danger</b>	This mark indicates an imminent danger. If unavoidable, death or serious injury may occur.
 <b>Warning</b>	This mark indicates an imminent danger. If unavoidable, serious injury or material damage may occur.
 <b>Caution</b>	This mark indicates a potentially dangerous situation. If unavoidable, minor or moderate injury or material damage may occur. This mark is also used to warn against inappropriate behavior.

The system should be installed, powered on, operated, and maintained by a fully skilled and appropriate operator who is aware of the hazards to which the operator is exposed during operation and the means to minimize risk to the operator or others.

## Labels

The following marks that are printed on the equipment indicate caution and warning.

**PF54A0-mb480-05  
(NWA-A14522)**

**DATE OF MANUF. 2023-03**

**SER. No. 123456**

**-48V DC/1.46A (PoE:41V-57V DC)**

**IP65**

**NEC Corporation**



FCC ID:2BHMSA1452201



**MADE IN JAPAN**



### ***Electric shock risk***

This system uses a high voltage. Caution is necessary especially in humid conditions in outdoor environments.



### ***The surface is hot. Do not touch the equipment.***

The surface of an energized equipment may be hot. Do not touch the energized equipment.



### ***Protective Earthing***

Devices and equipment with this label must be grounded using the earth terminal.

## Warning

### (1) Electric shock risk

		<b>Warning</b>
<p>O-RU is designated to use -48 V DC power supply in an outdoor environment. Due to the risk of electric shock, special attention should be necessary during rain or in humid conditions.</p>		

### (2) Microwave radiation

		<b>Warning</b>
<p>Do not stand in front of the antenna while the transmitter is operating. Microwave or millimeter wave power density increases along the antenna beam. For more details, refer to the notes and the safety guidelines in this document.</p>		

**(3) Class 1 laser product****Warning**

For systems using optical module, do not stare directly at the laser beam while using optical equipment. It can damage your eyes and skin.

**(4) High-place work****Warning**

When working at heights, be careful not to drop equipment, parts, or tools. Even if it's a small part, it can cause a fatal accident when it falls from a height. To prevent accidents, take appropriate measures such as limiting the area before starting high-place work.

## **Caution**

### **(1) Lifting caution**



### **Caution: heavy load**

Be careful of weight when moving or transporting equipment. A strained back or a fall of equipment can cause injury.

### **(2) Safety extra low voltage**



### **Caution**

Use the Safety Extra Low Voltage (SELV) to supply the -48 VDC power to the equipment.

### **(3) Protection from lightning**



### **Caution**

Install the equipment in an area protected by a lightning rod. To prevent surge current caused by lightning from flowing back through the equipment grounding system, the equipment grounding system should be connected at ground level to the grounding wire of the lightning rod.

**(4) Do not touch the power plug during operation.****Caution**

Do not plug or unplug the equipment while it is energized. The DC-DC converter inside the equipment may be damaged.

When attaching/detaching the -48 V DC power cable or the PoE cable during PoE power supply, first turn off the power supply.

**(5) Use a circuit breaker.****Caution**

O-RU requires an external circuit breaker or breaker function. O-RU does not have a power on/off switch. To safely disconnect the O-RU power supply in an emergency situation, place the O-RU and power supply in the appropriate position.

## (6) When using PoE



### Caution

Do not disconnect the LAN cable while the power is being supplied to the O-RU via PoE. The equipment may be damaged.



### Caution

The O-RU provides PoE (Power over Ethernet) function. However, the -48 V DC power port and the PoE port cannot be enabled at the same time. Check the notification (power supply and circuit breaker) as well.

## (7) Use an STP cable for LAN connection.



### Caution

Use an STP (Shielded Twisted Pair) cable for LAN connection. Using a UTP (Unshielded Twisted Pair) cable can damage the equipment and cause failure. To enable the shielding effectiveness of the radio equipment and the equipment to which they are connected, be sure to ground the equipment and the grounding cable.

**(8) Do not use an electrostatically charged cable****Caution**

Do not use a cable that is electrostatically charged. Using an electrostatically charged cable to connect to equipment can damage the equipment. Before connecting to the equipment, make sure that the cable is not electrostatically charged.

**(9) Stop operation in case of abnormality or malfunction****Caution**

If you notice that the equipment has stopped, abnormal sound, or, burning odor, please immediately turn off the power to the equipment immediately and stop using the equipment. This is necessary to prevent smoke, fire, electrocution, and other potential hazards. (O-RU does not have a power on/off switch and requires an external circuit breaker or breaker function.)

**(10) Do not disassemble****Caution**

Do not overhaul, disassemble, or repair the equipment. Doing so can damage the equipment and cause electric shock or fire.

## Notice (installation of the equipment)

1. O-RU is designated for outdoor use because it produces non-ionizing radiation. If installed indoors, it may cause bodily harm or property damage.
2. O-RU must be installed as follows.

Ensure that the equipment is installed in the proper location. Do not install it in unstable areas. Improper installation can increase the temperature inside and damage the equipment.

*Operations of the equipment should be limited to **well-trained service persons or operators with sufficient skill and knowledge of the required regulations, precautions, and installation sites.***

*The installation site should be protected by the use of lock and key or equivalent security and managed by the responsible site manager.*

*The other end of the grounding cable connected to the grounding terminal must be connected to the grounding point of the wireless station building. For more details, refer to the installation work manual.*

3. Note on cables

*Power cable:*

Use a 2-core double-insulated cable with a diameter of between 5.86 and 10.00 mm.

*Data transmission cable:*

Use a shielded cable for a data transmission cable.

*Grounding cable:*

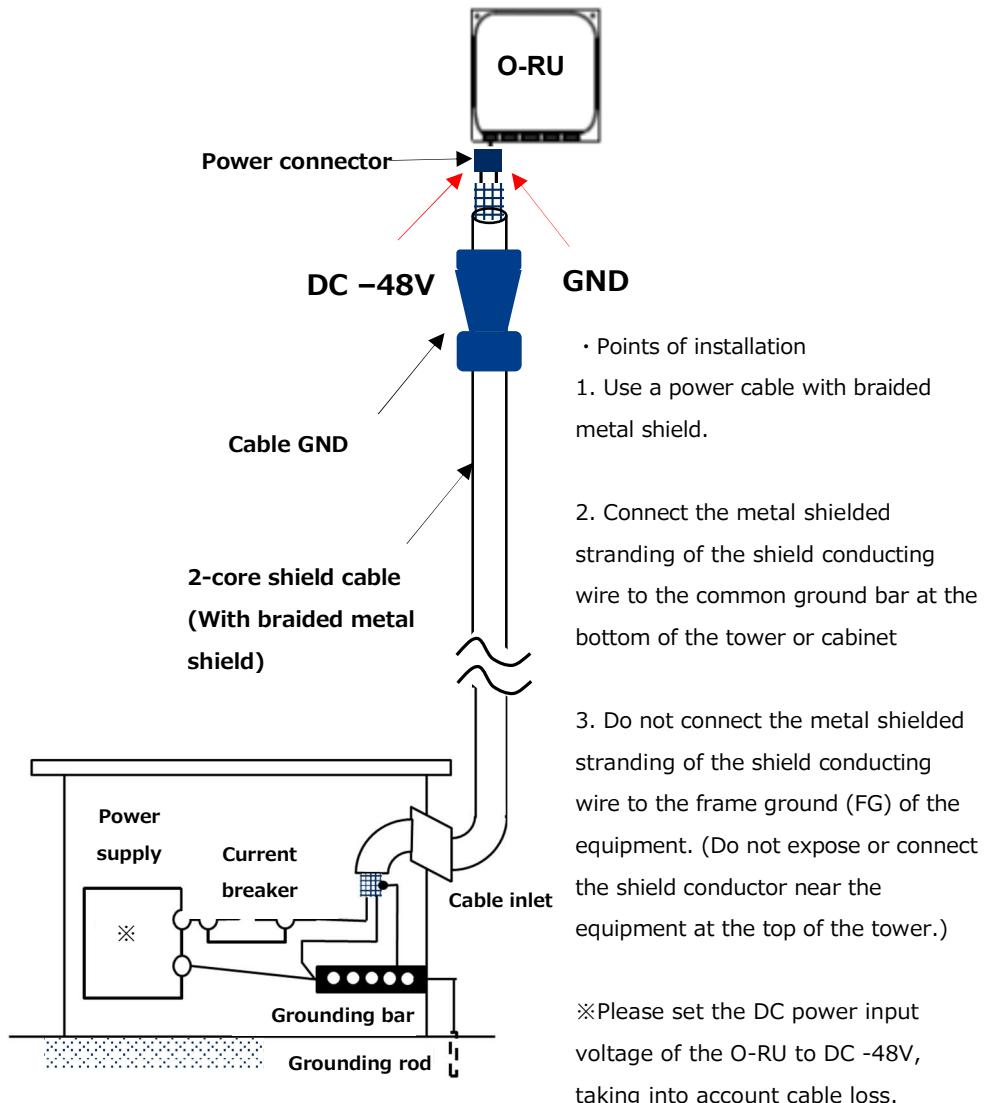
The earth terminal must be connected to a grounding point. For more details, refer to "Grounding O-RU" in the in the installation.

4. Electromagnetic interference caused by such as lightning or ESD may temporarily reduce communication quality.

## Notice (Power supply and circuit breaker)

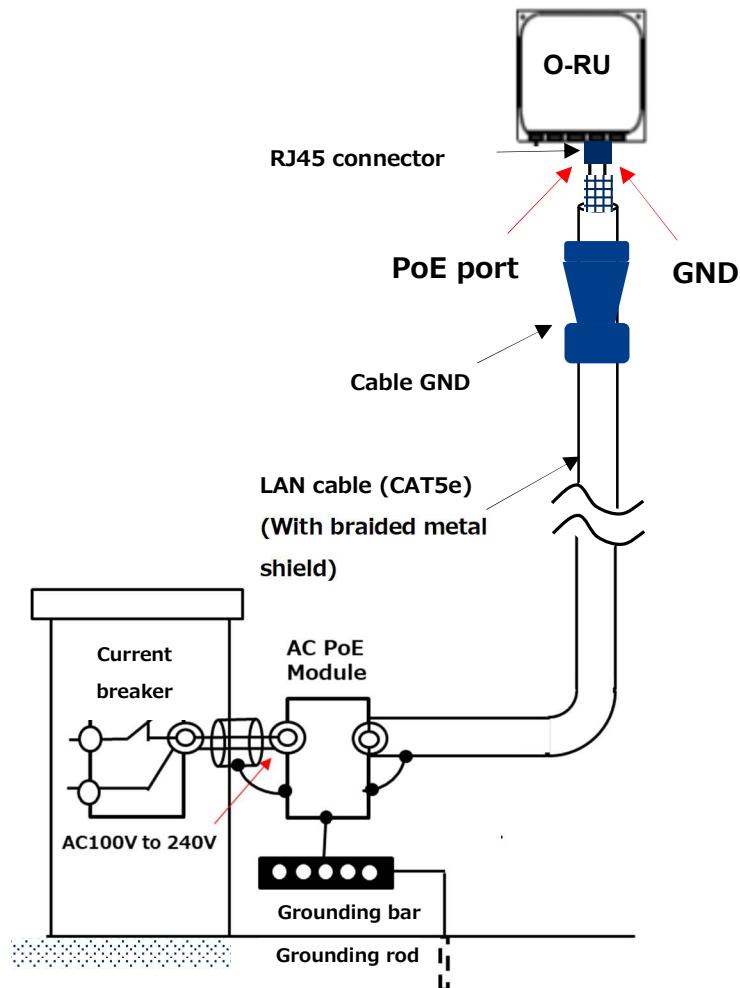
O-RU does not have a power on/off switch and requires an external circuit breaker or breaker function. Please see below.

### ◆When Using DC power input port



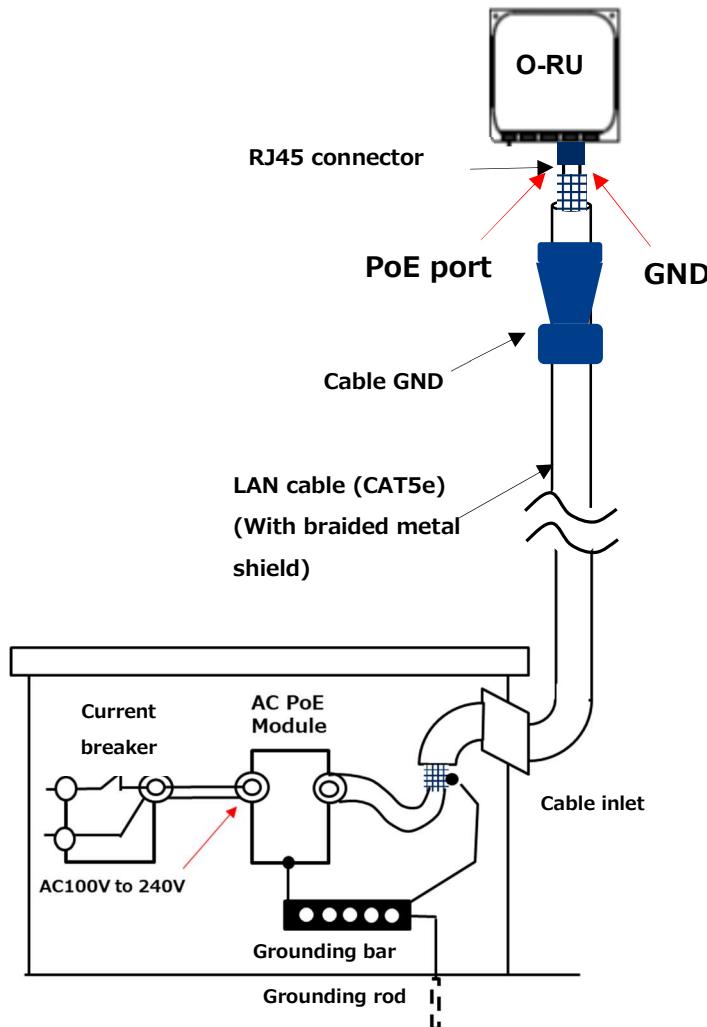
### ◆When Using LAN (PoE) port

- When using AC PoE Module outdoors



The cable must be shielded to maintain operation in accordance with EMC standards.

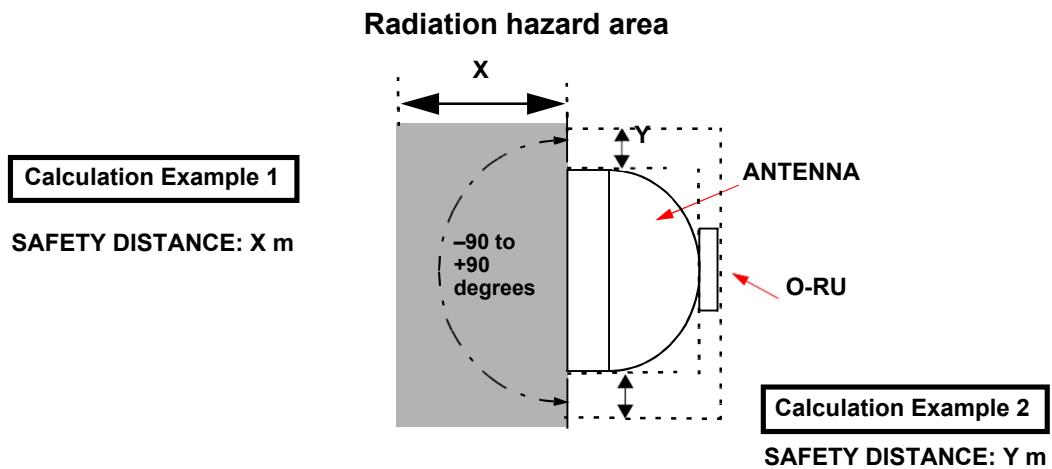
- When using AC PoE Module indoors



## Safety guideline on harmful microwave radiation

O-RU handles very low microwave and millimeter wave radiation levels and any health hazard has not been reported so far. In developed countries in which people are sensitive to health hazards have begun to regulate radiation levels. In EU countries it is regulated by EN 62311. In order to comply with the regulations, workers should not work near the antenna while the transmitter is in operation. Radiation levels are particularly high in certain areas in front of the antenna.

The power density ahead of the antenna increases along the antenna beam. Do not let the antenna beam radiate to the human body.



Power density and field strength levels are obtained by the following formula:

$$\text{Power Density: } S = \frac{P}{4\pi R^2} \text{ (W/m}^2\text{)} = \frac{10 \left( \frac{P' + G - 30}{10} \right)}{40\pi R^2} \text{ (mW/cm}^2\text{)}$$

Where

**P** = Output Power (W),

**P'** = Output Power (dBm),

**G** = Antenna Gain (dBi),

(in condition of angle and range from antenna)

**R** = Distance between human being and antenna (m)

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