SC-MRU2500T

User Manual

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REVISION HISTORY

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V 1.0	April. 13, 2015		Original	

Technical Support

SOLiD serial numbers must be available to authorize technical support and/or to establish a return authorization for defective units. The serial numbers are located on the back of the unit, as well as on the box in which they were delivered. Additional support information may be obtained by accessing the SOLiD Tehcnology, Inc. website at www.solid.co.kr or send email at sjkim@solid.co.kr

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Section1

Safety & Certification Notice

"Only qualified personnel should handle the DAS equipment. Any person involved in installation or service of the DAS should understand and follow these safety guidelines."

-The head end unit must always be connected to the Base Station using a direct cabled connection. This system has not been approved for use with a wireless connection via server antenna to the base station.

- Obey all general and regional safety regulations relating to work on high voltage installations, as well as regulations covering correct use of tools and personal protective equipment.

- The power supply unit in repeaters contains dangerous voltage level, which can cause electric shock. Switch the mains off prior to any work in such a repeater. Any local regulations are to be followed when servicing repeaters.

- Use this unit only for the purpose specified by the manufacturer. Do not modify or fit any spare parts that are not sold or recommended by the manufacturer. This could cause fires, electric shock or other injuries.

- Actual separation distance is determined upon gain of antenna used. We recommned that the maximum antenna gain should not be exeed 17 dBi for 2496~2690 MHz.
- RF exposure compliance should be addressed at the time of licensing.
-

- Use of unauthorized antennas, cables, and/or coupling devices not conforming with ERP/EIRP and/or indoor-only restrictions is prohibited

- Do not operate this unit on or close to flammable materials, as the unit may reach high temperatures due to power dissipation.

- Do not use any solvents, chemicals, or cleaning solutions containing alcohol, ammonia, or abrasives on the DAS equipment. Alcohol may be used to clean fiber optic cabling ends and connectors.

- Do not look into the ends of any optical fiber or directly into the optical transceiver of any digital unit. Use an optical spectrum analyzer to verify active fibers. Place a protective cap over any radiating transceiver or optical fiber connector to avoid the potential of radiation exposure.

- Allow sufficient fiber length to permit routing without severe bends.

- A readyily accessible disconnect device shall be incorporated external to the equipment.

- The following notice: "The Manufacturer's rated output power of this equipment is for single carrier operation. For situations when multiple carrier signals are present, the rating would have to be reduced by 3.5 dB, especially where the output signal is re-radiated and can cause interference to adjacent band

users. This power reduction is to be by means of input power or gain reduction and not by an attenuator at the output of the device."

- The power of this system shall be supplied through wiring installed in a normal building.
If powered directly from the mains distribution system, it shall be used additional protection, such as overvoltage protection device

- Only 50 ohm rated antennas, cables and passive equipment shall be used with this remote. Any equipment attached to this device not meeting this standard may cause degradation and unwanted signals in the bi-directional system. All components connected to this device must operate in the frequency range of this device.

- Only 50 ohm rated antennas, cables and passive components operating from 150 - 3 GHz shall be used with this device.

- The head end unit must always be connected to the Base Station using a direct cabled connection. This system has not been approved for use with a wireless connection via server antenna to the base station.

- Round terminals located on the side of a 12 AWG or more wires Using permanently connected to earth.(green/yellow color)

- This is only to be used with BTS devices supporting licensed cellular operations

- Access can only be gained by SERVICE PERSONS or by USERS who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken; and
- Access is through the use of a TOOL or lock and key, or other means of security, and is on trolled by the authority responsible for the location.

- Certification
  - FCC: This equipment complies with the applicable sections of Title 47 CFR Parts 15,22,24,27 and 90
  - UL/CUL: This equipment complies with UL and CUL 1950-1 Standard for safety for information technology equipment,including electrical business equipment
  - FDA/CDRH: This equipment uses a Class 1 LASER according to FDA/CDRH Rules.This product conforms to all applicable standards of 21 CFR Chapter 1, Subchaper J, Part 1040

- Repeater warning label message should include

WARNING. This is **NOT** a **CONSUMER** device. It is designed for installation by **FCC LICENSEES** and **QUALIFIED INSTALLERS**. You **MUST** have an **FCC LICENSE** or express consent of an FCC Licensee to operate this device. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of $100,000 for each continuing violation.

Section2 System Overview

2.1 General overview

SC-DAS platform is a coverage system for in-building services delivering seamless, high quality voice and data As a distributed antenna system, it provides analog and digital phone services in multiple

bands through one antenna.

The system covers public and private venues such as:

- Shopping malls
- Hotels
- Campus areas
- Airports
- Clinics
- Subways
- Multi-use stadiums, convention centers, etc.

The system enhances in-building radio environments that lack signal quality by improving the RSSI and Ec/Io. By providing communication services throughout the building, the system enables users to make a calls anywhere in the coverage area.

The system uses both analog (AMPS) and digital (TDMA, CDMA,WCDMA and LTE) methods.

The SC-DAS system supports communication standards and public interface protocols in worldwide use.

- Frequencies: VHF,UHF, 700MHz, 800MHz,850MHz 900MHz,1900MHz,2100MHz, 2500MHz etc.
- Voice protocols: AMPS,TDMA, CDMA,GSM,IDEN, etc.
- Data protocols: EDGE,GPRS,WCDMA,CDMA2000,Paging,LTE, etc.

SC-DAS comprises frequency specific modules. Coverage for a specific frequency band is accomplished by inserting a corresponding frequency module into each unit. Because it delivers multiple signals with one strand of single mode fiber, the system, requires no additional hardware modifications whenever a new frequency is added.

The system is featured with the following:

- Flexibiltiy & Scalabiltiy
  - Supports fiber-optic ports up to 32 or 60(using OEU)
  - Connects multiple-buildings (campus) as one DAS
- Modular structures
  - Modular frequency upgrade
  - Plug-in type modules
- Multi-Band, Single operator
  - Supports multiple services from one WSP
  - Support multi-operator in a band(Max. 2 operator)
- Low OPEX / CAPEX

- Compact design
- Upgradable design
- Easy installation and maintenance
- Adopts auto ID scheme

The SC-DAS platform will serve two primary segments; first as a carrier deployed coverage enhancement product for their specific frequencies and second as a low cost, public safety / single carrier product.

2.2 ROU Dimension

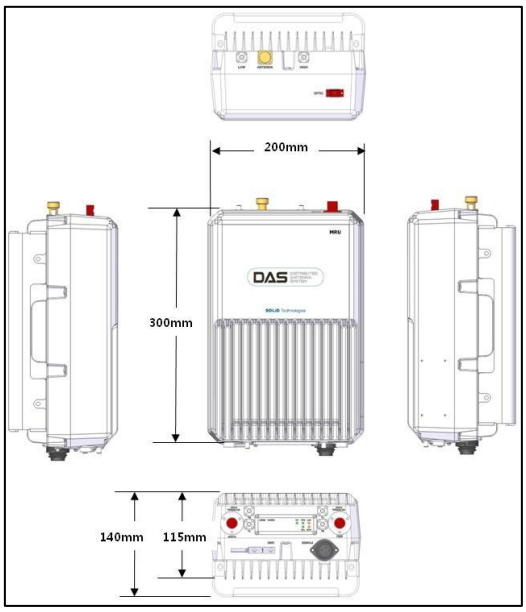


Figure 2.1 – Remote Unit dimension

ITEM	SPECIFICATION	REMARK
Size(Width, Height, Depth)	200 x 300 x 140mm	Including Bracket
Weight	6.8kg	Fully loaded
Power Consumption	52W	Fully loaded
Operating Temperature	-10 to +50°C	Ambient Temperature
Operating Humidity	0 to 90%, non-condensing	

Section3

ROU Installation

This chapter describes how to install each unit and corresponding fiber cables, along with power cabling method.

In detail, the chapter describes how to install shelves or enclosures of each unit, Power Cabling method , Optic Cabling and RF Interface. Furthermore, by showing power consumption of modules installed in each unit, a the Power Cabling budget is easily determined. Last, it describes the quantity of components of modules to be installed in each unit along with an expansion method.

3.1 ROU Installation

3.1.1 ROU Enclosure installation

The ROU enclosure has two options. One meets NEMA4 standard and the other is not waterproof or dirtproof. The ROU can be mounted on a Wall easily. Rack mounting is also possibleusing special frame. There are 3 different types and they will be explained later in this chapter. The ROU consists of anMRU and anARU. Their dimensions are thesame.

The following shows the dimension of the mounting holes for the Wall Mount Bracket.

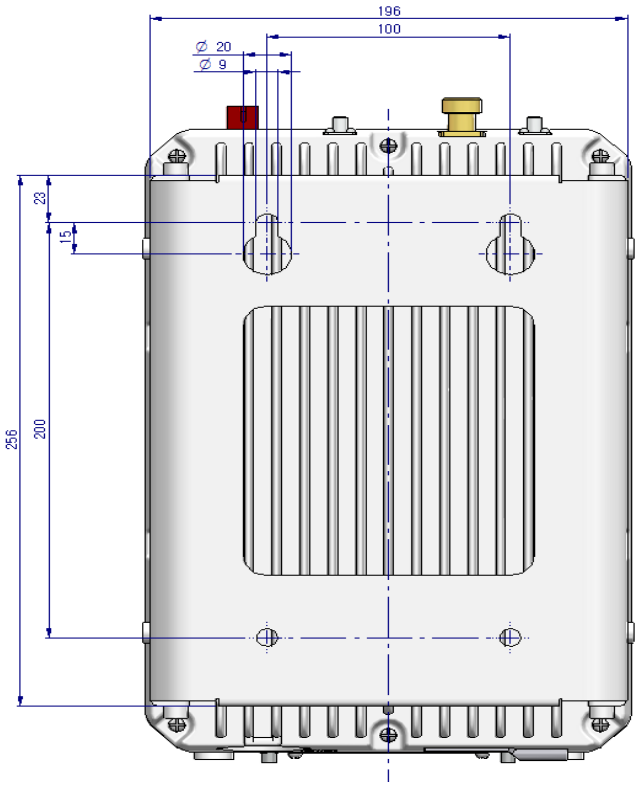


Figure 3.1 – Wall mount dimensions for the ROU

ROU Wall Mount Installation

There are two way to install the ROU on the wall. One is to install ROUs on the wall side by side, the other is stack the ARU above the MRU.

Type1 : Side by Side installation

Install M8 mounting Screws roughly half way in, insert the wall mount bracket over the 2 screws and secure it with the last 2 screws.

For convenience, the Wall Mount Bracket has mounting holes to let you easily mount an enclosure. Screw the M6 Wrench Bolts by half at each side of the Heatsink enclosure.

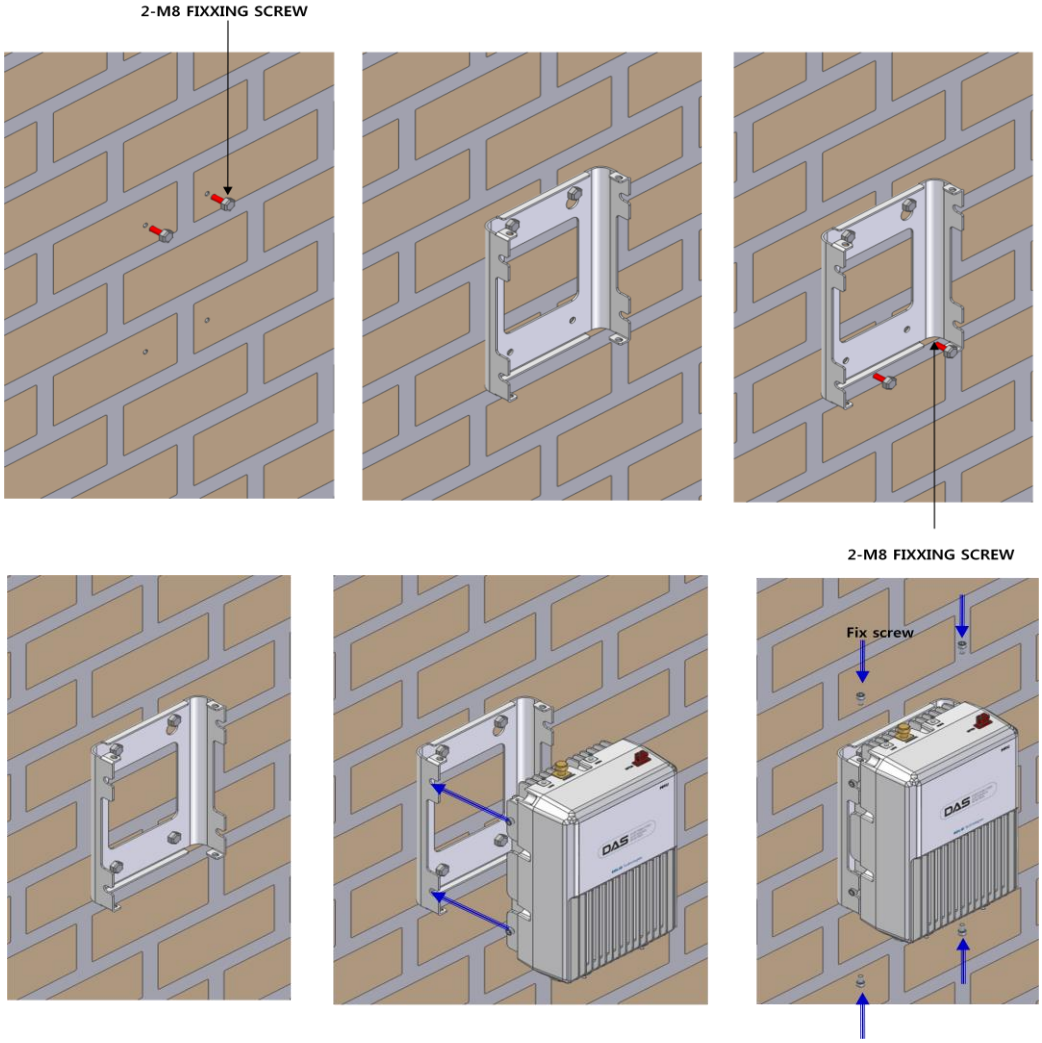


Figure 3.2 – ROU installation procedure side by side

Place the enclosure with the M6 Bolt on the mounting groove and mount the M6 Wrench Bolts into the remaining mounting holes.

In this case, you will use 4 M6 Wrench Bolts.

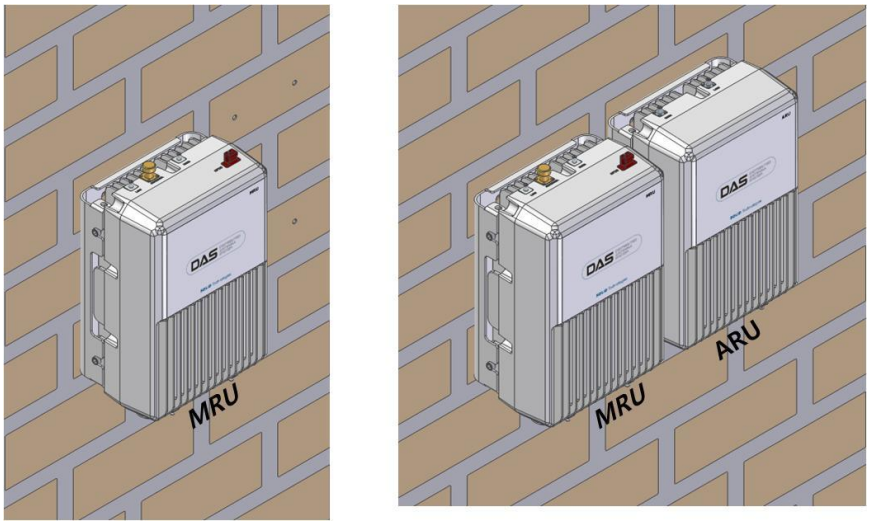


Figure 3.3 – ROU installation diagram side by side

For connecting cables between MRU and ARU easily, the MRU should install on left side of ARU.

Type2 : stacked installation

If space prohibits the MRU and ARU from being mounted side by side, the units can be installed in a stacked configuration.

Stacking the unit requires a special baracket for stacked installation

First, install the MRU on the wall , then install the bracket for stacked installation on the MRU. Finally install the ARU on the bracket.

Completed installation diagram is as follows

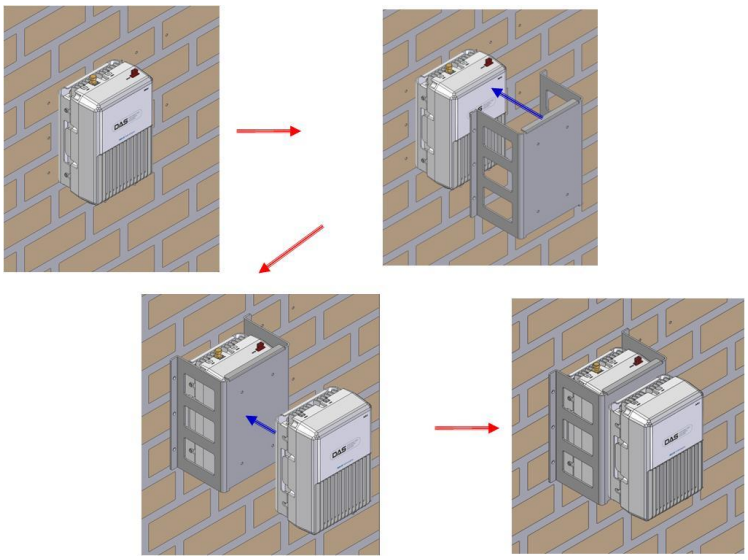


Figure 3.4 – ROU installation procedure for stacked mounting

The following shows dimension of the mounting point for the stacked bracket.

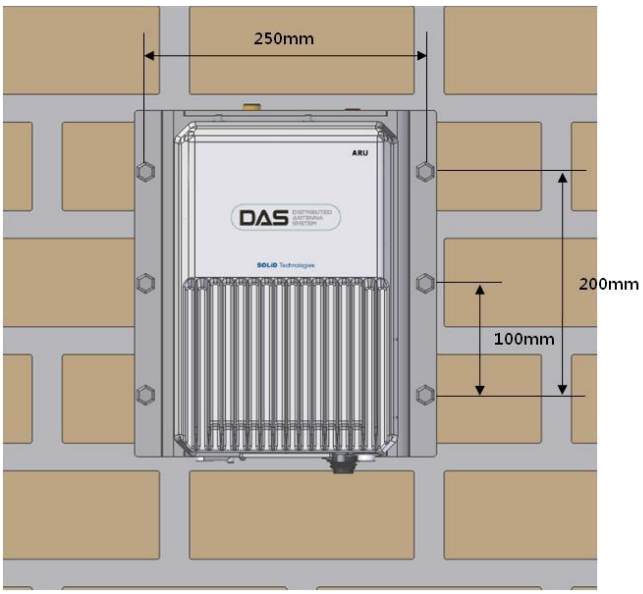


Figure 3.5 – ROU installation diagram for stacked mounting

ROU Rack Mount Installation

There are two ways to install rack mount. One is to install ROUs on the rack vertically: the other is to install ROUs on the rack horizontally

Type1 : Vertical installation on the rack

For vertcal installation, a vertical bracket is needed.

First, install bracket for vertical installation on the rack

Second, mount MRU on the left side of the installed bracket

Third, mount ARU on the right side of the installed bracket

Completed installation diagram is as follows

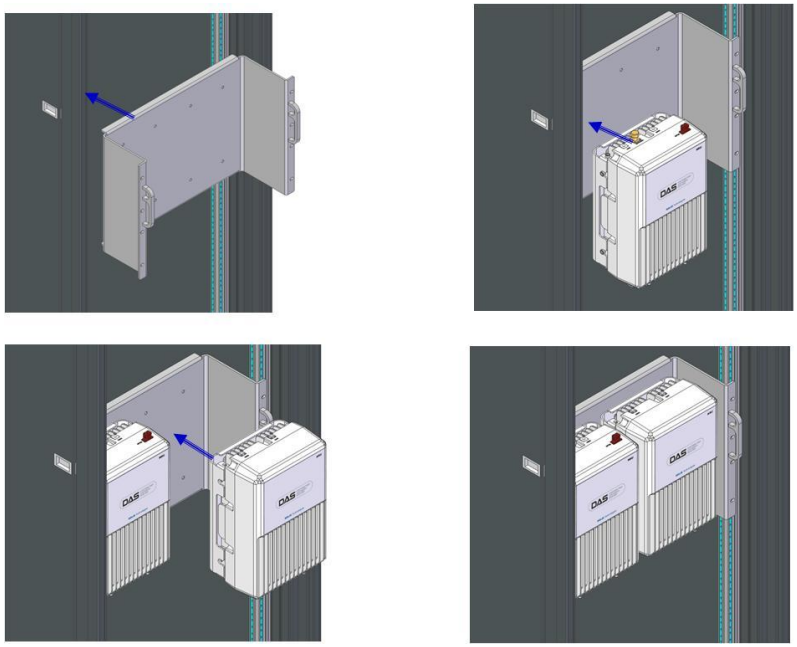


Figure 3.6 – ROU installation procedure for vertical rack

The following shows dimension of the mounting point for vertical installation

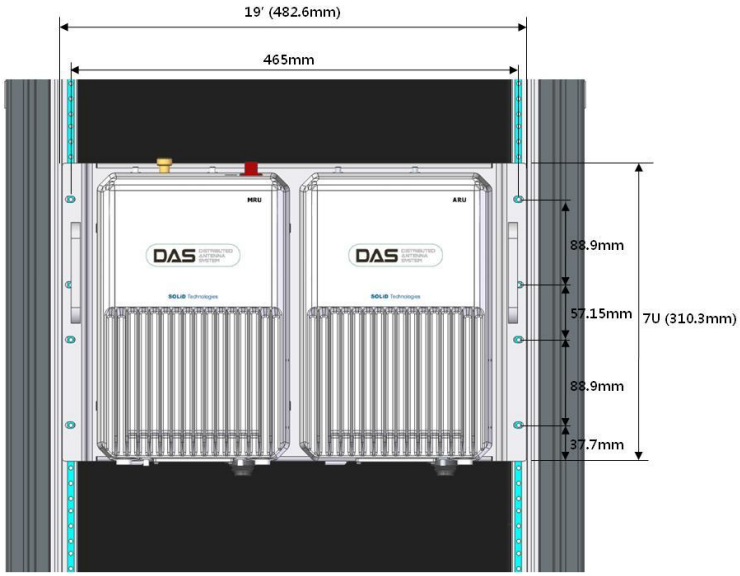


Figure 3.7 – ROU installation diagram for vertical rack

Type2 : Horizontal installation on the rack

For Horizontal installation, horizontal bracket is needed. Unlike vertical installation, the MRU is mounted on the right of the installed bracket first and then ARU is installed to the left of MRU

First, install bracket for horizontal installation on the rack

Second, open the front cover of horizontal bracket

Third, mount MRU on the right side of the installed bracket

Fourth, mount ARU on the left side of the installed bracket

Finally, close the front cover of horizontal bracket

Completed installation diagram is as follows

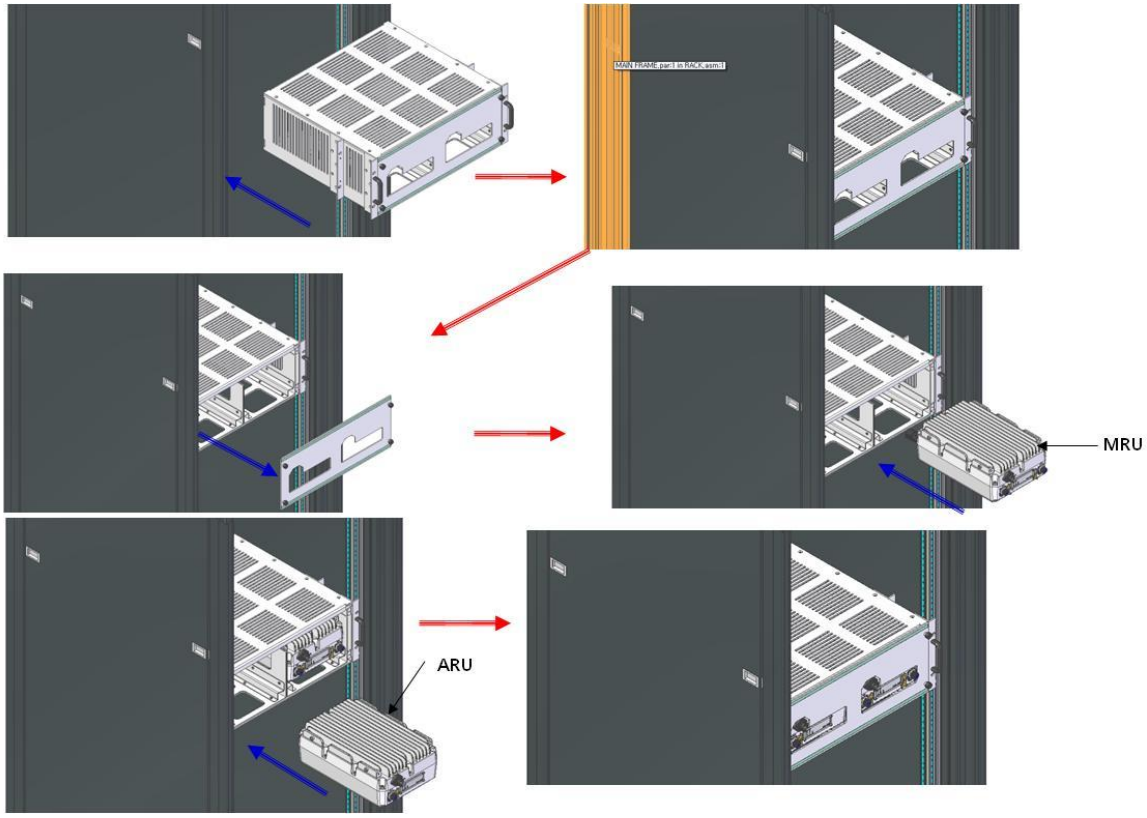


Figure 3.8 – ROU installation procedure for horizontal rack

The following shows dimensions of the mounting point for horizontal installation

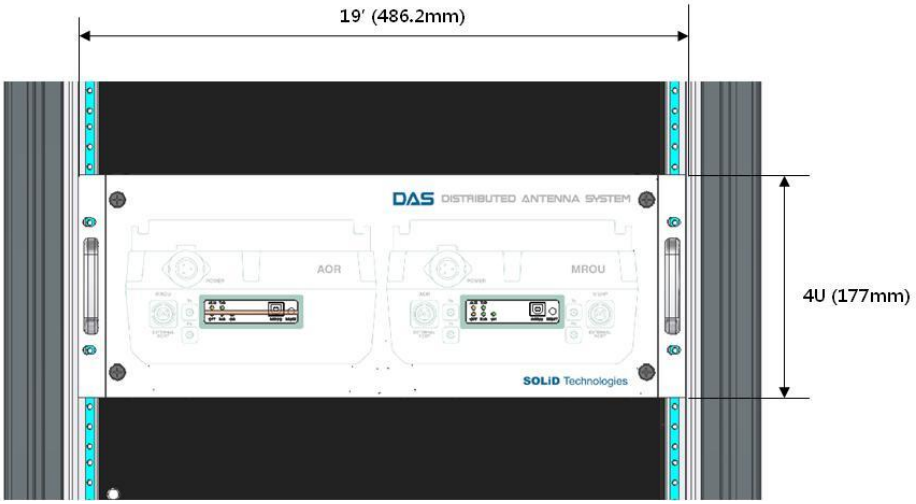
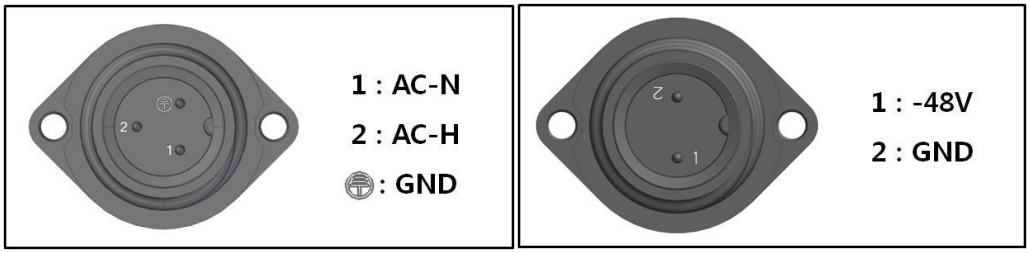


Figure 3.9 – ROU installation diagram for horizontal rack

3.1.2 ROU Power Cabling

The ROU supports both of DC-48V and AC120V input power. The type of input power for the ROU is already determined at the factory. The ROU is shipped with the correct power cable in the package box. See the UL name plate of the ROU to determine the input power type of the ROU or see the power connector in the below picture. You should order the type of input power as your application.



(a)AC/DC **(b)DC/DC**

Figure 3.10 – ROU Power Port view

Check if your power cord connector is the same as one seen in the table above. The ROU does not have power switch to power on/off. Power supply is on when cord is plugged into the AC source.

3.1.3 Optical Cabling

The MRU makes the optical-RF conversion of TX signals from upper the ODU and OEU as well as the RF- optical conversion of RX signals. The MRU has one optical module in it. As WDM is used in the R_OPT module, two separate wavelengths (TX:1310nm, RX:1550nm) can be sent/received with one fiber strand at the same time. The MRU has SC/APC connectors.

To prevent the fiber interface from being marred with dirt, it should be covered with a cap when not installed. Fiber connectors should be cleaned alcohocol to remove dirt before installation .

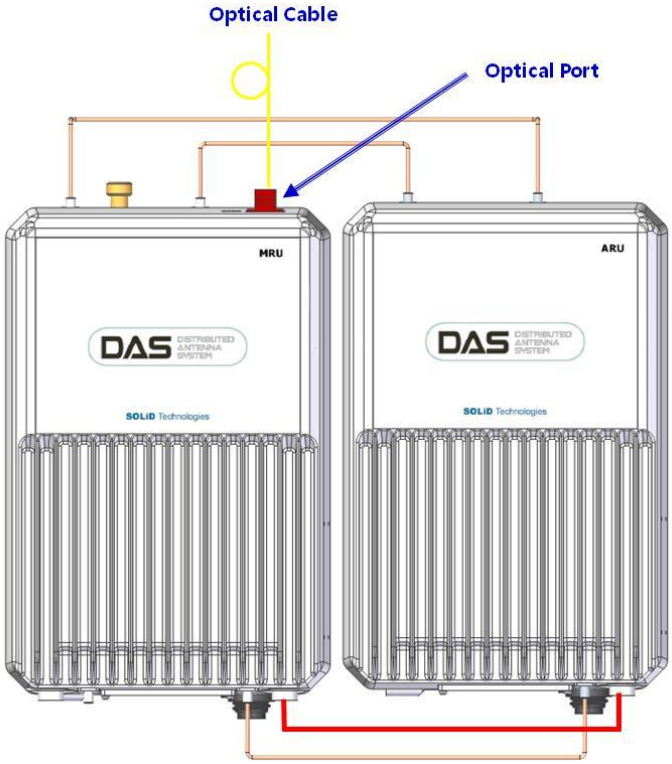


Figure 3.11 – ROU optical Port view

Only the MRU has optical port; there is no optical port on the ARU

3.1.4 GND Terminal Connection

TheROU has one GND terminal port on bottom side, as shown below

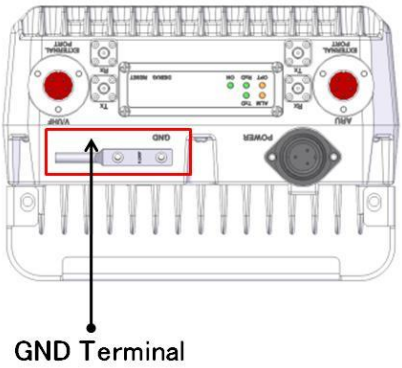


Figure 3.12 – ROU GND Port view

- Take off the GND terminal port from the enclosure and connect to the ground cable. Then reconnect it to the enclosure
- The opposite end of the ground cable should connect to the communication GND of building
- The ground lug is designed meeting the SQ5.5 standard

3.1.5 Coaxial cable and Antenna Connection

- The coaxial cables which are connected to DAS connect to antenna port of the ROU. Before connection, check the VSWR of the coaxial cable using a SiteMaster to verify whether it is within tolerance.
- The Return loss should be better than 15dB or VSWR should be below 1.5: 1.
- Make sure the antenna connector is tightened properly and free of any dirt or insects.
- The antenna connected to the ROU is only for inbuilding use.
- Only the MRU has an antenna port. The ARU transmits its signal through RF cable connected to both the MRU and ARU

Section4

ROU Specification

4.1 Specifications

4.1.1 Optical Specification

Unit Name		SC_OEU_EWDM	Remark
Connector	RF	SMA FEMALE (2-HOLE) / 50ohm	Analog
	Optic	SC / APC (STEP FERRULE)	
	Power/Signal	SMAW200-12C 12PIN MALE	
Laser Diode		1550nm(Coaxial Type)	
Photo Diode		1310nm	
Optic Loss		1dBo~ 5dBo	

4.1.2 Environment Specification

Item	Specification	Remarks
Operating temperature range	-10°C ~ +50°C	
Operation humidity	5% to 90% (non-condensing)	
Cooling	Passive (natural convection)	
Power supply	BIU/OEU : DC -48V(-42~-56)AC(ROU) , ROU : AC 90~264V	
Weight	6.6kg	
Power consumption	52W	
Degree of protection	NEMA4 or Non-nema	
Dimension(H x D x W)	300*140*200mm	

4.1.3 DL RF Specification

Item	Gain(dB)	Bandwidth(MHz)	output power(dBm)	Frequency range
2500T LB	48	67.6	+28	2497.8~2565.4 MHz
2500T UB	48	67.6	+28	2619.8~2687.4 MHz

4.1.4 UL RF Specification

Item	Gain(dB)	Bandwidth(MHz)	output power(dBm)	Frequency range
2500T LB	30	67.6	-20	2497.8~2565.4 MHz
2500T UB	30	67.6	-20	2619.8~2687.4 MHz