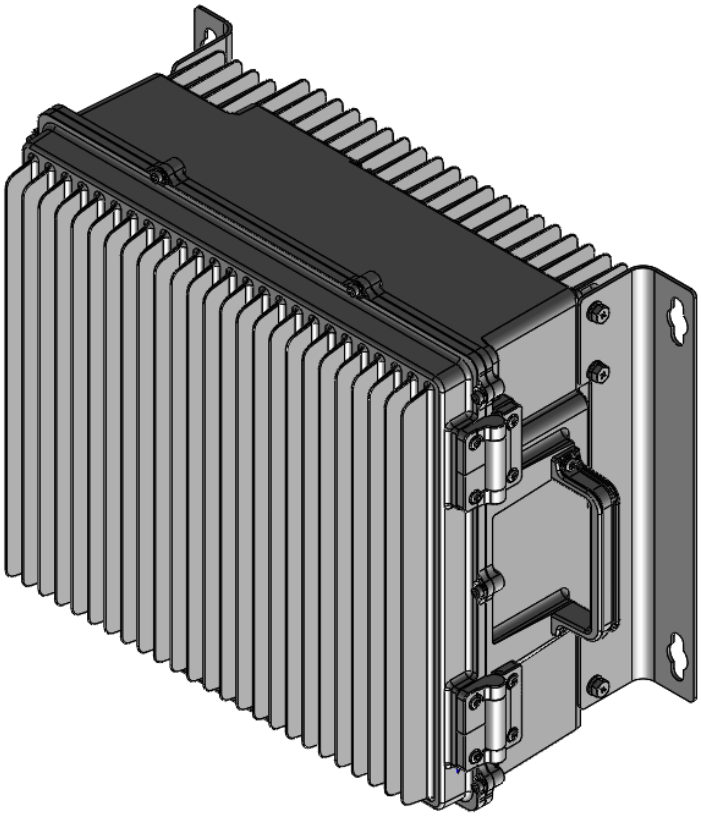
Alliance_N2ROU

User Manual



SOLiD, Inc.

10,9th Floor, SOLiD Space220 Pangyoyeok-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea 393-400

Tel : +82-31-627-6290 Fax : +82-31-627-6209

REVISION HISTORY

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V 1.0	August. 18, 2018		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.st.co.kr or send email at sjkim@st.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."

- Obey all general and regional installation and 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.

- To prevent electrical shock, switch the main power supply off prior to working with the DAS System or Fiber BDA. Never install or use electrical equipment in a wet location or during a lightning storm.

- When working with units outdoors, make sure to securely fasten the door or cover in an open position to prevent the door from slamming shut in windy conditions..

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

- Any DAS system or Fiber BDA will generate radio (RF) signals and continuously emit RF energy. Avoid prolonged exposure to the antennas. SOLiD recommends maintaining a 3-foot minimum clearance from the antenna while the system is operating.

- 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.

- For pluggable equipment, make sure to install the socket outlet near the equipment so that it is easily accessible.

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

- Certification
  - FCC: This equipment complies with the applicable sections of Title 47 CFR Parts 15,22,24,27 and 90(Class B)
  - 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

- This 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 1 mm2 (16 AWG) or more wires Using permanently connected to earth.(green/yellow color)

- 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."

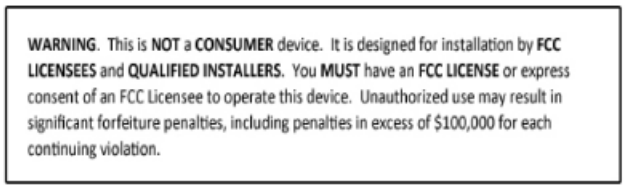
- Prior to equipment use the service must be registered with the FCC. This can be done through the FCC’s website at https://signalboosters.fcc.gov/signal-boosters/.

- 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.

- Notice! Be careful not to touch the Heat-sink part due to high temperature.

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

- Signal booster warning label message should include



WARNING: This is NOT a CONSUMER device. It is designed for installation by an installer approved by an ISED licensee. You MUST have an ISED LICENCE or the express consent of an ISED licensee to operate this device.

Section2

System Overview

2.1 Purpose

2.2 SMDR-NH124

2.1 Purpose

Alliance_N2ROU is a coverage system for in-building services delivering voice and data in high quality and for seamlessly.

As a distributed antenna system, it provides analog and digital phone systems that are served in multiple bands through one antenna.

The system covers general public institutions and private facilities.

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

The system helps improve in-building radio environments in poor condition and make better poor RSSI and Ec/Io. By providing communication services at every corner of buildings, the system enables users to make a call at any site of buildings.

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

The Alliance_N2ROU system supports communication standards and public interface protocols in worldwide use.

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

2.2 Alliance_N2ROU

N2ROU receives TX optical signals from ODU or OEU and converts them into RF signals. The converted RF signals are amplified through High Power Amp in a corresponding N2RDU, combined with Multiplexer module and then radiated to the antenna port.

When receiving RX signals through the antenna port, this unit filters out-of-band signals in a corresponding N2RDU and sends the results to Remote Optic Module to make electronic-optical conversion of them. After converted, the signals are sent to a upper device of ODU or OEU. N2ROU can be equipped with up to four N2RDUs (Remote Drive Unit)

2.3 Dimension

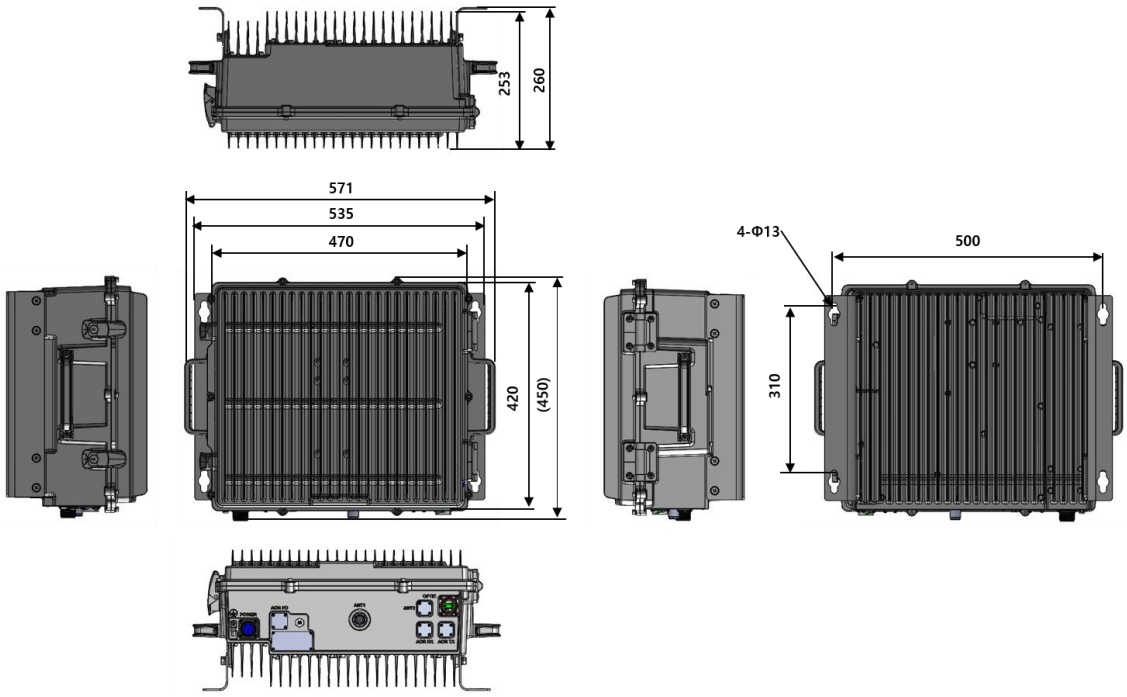


Figure 3.1 – N2ROU Outer Look

ROU is designed in a cabinet, and provides the following functions and features.

Item	Spec.	Remark
Size(mm)	571 x 450 x260,	Including Bracket
Weight	39 Kg	Full Load
Power consumption	260 W	
Operating Temperature	-10 to +50℃	Ambient Temperature

Section3

System Installation

3.1 N2ROU Installation

3.1.1 N2ROU Enclosure installation

N2ROU is designed to be water- and dirt-proof. The unit has the structure of One-Body enclosure. It satisfies water-proof and quake-proof standards equivalent of NEMA4.

ROU can be mounted into either of on a Wall.

Basically, N2ROU has both of a Wall Mount Bracket.

Depending on the use of the Rack Mount Bracket, the bracket can be removed.

N2ROU component

N2ROU has the following components:

No.	Unit	Description	Remark
Common Part	Enclosure	Including Wall cradle	1EA
	RCPU	-	1EA
	R_OPTIC	With SC/ACP adaptor	1EA
	RPSU	Alternative DC-48V or AC 120V	1EA
	Multi-Plexer	5Band or 7Band	1EA
	Power Cable	- AC 120 power cable - DC -48V power cable	1EA

Optional Part	R-OPTIC	Optical Cable Assembly Connector	1EA

Basically, the common part of N2ROU should have an enclosure and it is equipped with RCPU to inquire and control state of each module, R_OPTIC to make both of electronic-optical and optical-electronic conversions, RPSU to supply power for N2ROU and a Multi-Plexer to help share multiple TX/RX signals through one antenna. It should have Power Cable for external rectifier or to supply required power.

In addition,N2RDU can be inserted and removed to provide service for desired band (Optional).

3.1.2 N2ROU Power Cabling

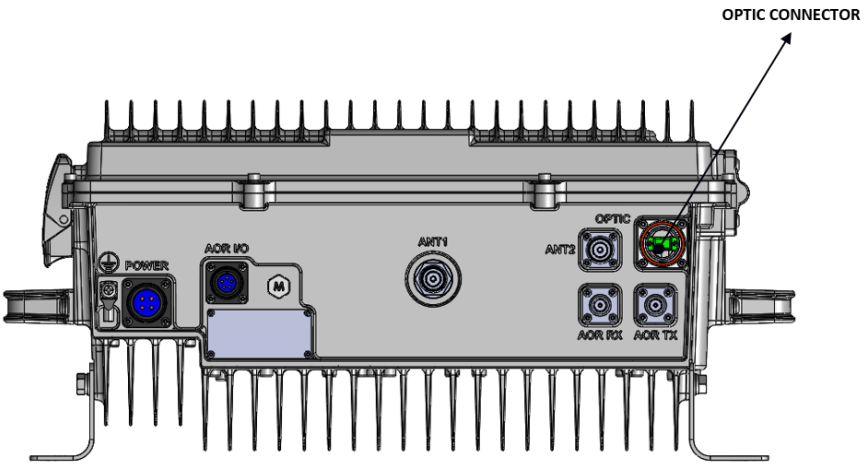
N2ROU supports both of DC-48V and AC120V of input power. As RPSU for DC-48 and RPSU for AC120V are separated from each other, you need to select one of them in case of purchase order.

RPSU for DC -48V and RSPU for AC 120V have the same configuration and capacity while each of the units uses different input voltage from each other.

3.1.3 Optical Cabling

N2ROU makes optical-electronic conversion of TX signals from upper ODU and OEU and makes electronic- optical conversion of RX signals. N2ROU has one optical module in it. As WDM is installed in the R_OPTIC module, two pieces of wavelength (TX:1310nm, RX:1550nm) can be sent/received with one optical core at the same time. N2ROU has SC/APC of optical adaptor type.

For optical adaptor, SC/APC type can be used. To prevent the optical access part from being marred with dirt, it should be covered with a cap during move. When devices are connected through optical cables, you need to clear them using alcohocol to remove dirt.

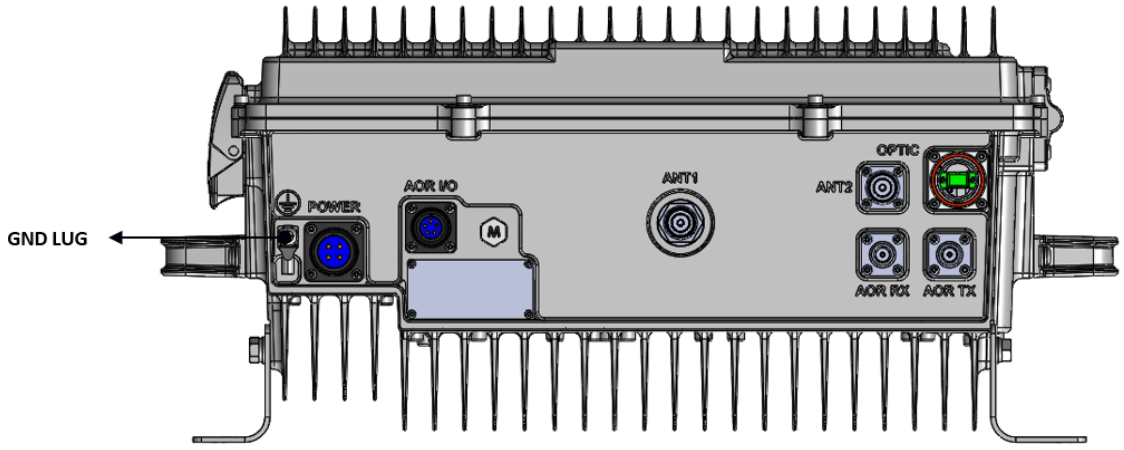


Optical cables should be inserted into Optic Port outside of N2ROU.

Through GUI, check if PD value of ROPTIC is in a tolerable range (+5~1dBm).

3.1.4 GND Terminal Connection

N2ROU has one GND terminal port where is on bottom side, like below



- Take off the GND terminal port from enclosure and connect to ground cable, then fix it the position of enclosure again
- The opposite end of the ground cable should connect to the communication GND of building

3.1.5 Coaxial cable and Antenna Connection

- The coaxial cables which are connected to antenna distribued network connect to antenna port of N2ROU. Before connection, check the VSWR value of coaxial cable whether it is within specification using SITEMASTER .
- At this time, check if the Return loss have above 15dB or VSWR have below 1.5
- The part of antenna connection fasten to port not to be loosed and not to be injected the dusty and insects
- The antenna connected to N2ROU is only serviced in inbuilding

3.1.6 Insertion of N2RDU

N2ROU has slots to enable up to four N2RDU modules to be inserted into the unit.
You can insert a N2RDU into any slot. It is not possible to provide services with a N2RDU module alone; you need to connect the module with Multiplexer in any case.

3.1.7 N2RDU Specifications Per band

Unit naming	Bandwidth (TX/RX)	Output Power (dBm)	Frequency range	
			TX(MHz)	RX(MHz)
700LTEF_FN	39 / 17,21	+33	729~768	699~716(B1) 777~798(B2)
800IDEN+850Cell	32 / 32	+33	862~894	817~849
1900PCS	65 / 65	+33	1930~1995	1850~1915
AWS13	70 / 70	+33	2110~2180	1710~1780
2300WCS	10 / 10	+33	2350~2360	2305~2315
2.5TDD	71.2(LB , UB) 37.8(MB)	+32	2496.8~2568(LB) (For IC, 2500-2568) 2574.1~2611.9(MB) 2618.8~2690(UB)	
2.5TDD_MIMO				

<FCC Warning Statements>

FCC Part 15.105 statement

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.

FCC Part 15.21 statement

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

RF Exposure Statement

The antenna(s) must be installed such that a minimum separation distance of at least 150cm maintained between the radiator (antenna) and all persons at all times. This device must not be co-located or operating in conjunction with any other antenna or transmitter.

RSS-GEN, Sec. 7.1.2 – (transmitters)

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.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionneravec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention desautres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotroperayonnée quivalente (p.i.r.e.) ne dépassepas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

RSS-GEN, Sec. 7.1.2 – (detachable antennas)

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.

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste,ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

RF Radiation Exposure

This equipment complies with RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 150 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. RF exposure will be addressed at time of installation and the use of higher gain antennas may require larger separation distances.

RSS-102 RF Exposure

L'antenne (ou les antennes) doit être installée de façon à maintenir à tout instant une distance minimum de au moins 150 cm entre la source de radiation (l'antenne) et toute personne physique. Cet appareil ne doit pas être installé ou utilisé en conjonction avec une autre antenne ou émetteur.

Part 27.5

Antennas must be installed in accordance with FCC 27.50, Part 24, SRSP 510, SRSP 518 and SRSP 513. With 17dBi gain antennas the height of the antenna above average terrain (HAAT) must not exceed 5830.58m.
For different gain antennas refer to the relevant rules.

FCC notice

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