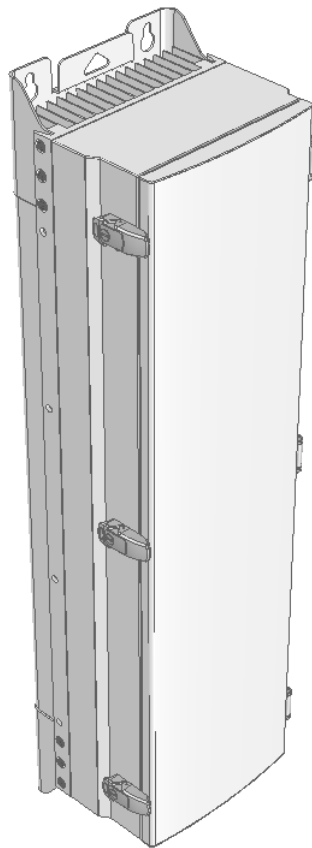


THOR (Total Hybrid Optical Repeater)

HMRU / HARU

Installation and Operation Manual



REVISION HISTORY

Version	Issue Date	No. of Pages	Initials	Details of Revision Changes
V 1.0	SEP.01 , 2014		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 kiyoo@solid.co.kr

Contents

Section1	<i>Safety & Certification Notice</i>	7
Section2	<i>System Overview</i>	11
2.1	Purpose	12
2.2	System overview	13
Section3	<i>System Configuration and Functions</i>	14
3.1	HROU (High power Remote Optic Unit)	15
3.1.2	Specifications of HROU	16
3.1.3	Block Diagram of HROU	16
3.1.3.1	HMRU block diagram	16
3.1.3.2	HARU block diagram	17
3.1.4	HROU parts	18
3.1.4.1	HROU inner look	18
3.1.4.2	HROU part list	19
3.1.5	Function by unit	20
3.1.6	Bottom of HROU	24
Section4	<i>System Installation</i>	25
4.1	HROU Installation.....	26
4.1.1	Tools.....	26
4.2	HROU Enclosure installation	27
4.3	How to expand HARU at the HMRU	31
4.4	HROU Power Cabling	33
4.5	HROU Ground cabling.....	34
4.6	Mounting of HRDU	36
Section5	<i>Operation</i> <i>오류! 책갈피가 정의되어 있지 않습니다.</i>	
5.1	HROU Operation..... <i>오류! 책갈피가 정의되어 있지 않습니다.</i>	
5.2	HROU Operation..... <i>오류! 책갈피가 정의되어 있지 않습니다.</i>	
Section6	<i>Specification</i>	39
6.1	General Specification	40
6.2	Electrical Specification.....	41
6.3	Optical Specification	41
6.4	Regulatory Conformity..... <i>오류! 책갈피가 정의되어 있지 않습니다.</i>	

6.5 Marking plate..... 오류! 책갈피가 정의되어 있지 않습니다.

Contents of Figure

Figure 2.1 – Basic system topology.....	13
Figure 4.1 – HROU Outer Look.....	15
Figure 4.2 – HMRU Block diagram	16
Figure 4.3 – HARU Block diagram	17
Figure 4.4 – HROU Inner Look	18
Figure 4.5 – HRDU Outer Look.....	20
Figure 4.6 – RPSU Outer Look.....	22
Figure 4.7 – R OPTIC Outer Look.....	23
Figure 4.8 – RCPU Outer Look	23
Figure 4.10 – HROU Bottom Look.....	24
Figure 5.1 – How to install HROU	27
Figure 5.2 – Dimension used to install HROU on the WALL	28
Figure 5.3 – Procedures of installation	29
Figure 5.4 – Connection diagram between HMRU and HARU.....	32
Figure 5.5 – Location of Ground Terminal	34
Figure 5.6 – Information of Terminal.....	34
Figure 5.7 – How to install Ground Terminal.....	35
Figure 5.9 – How to mount HRDU	36
Figure 5.10 – The Guide bar	37
Figure 5.11 – Correct installed HRDU	38
Figure 5.12 – Connection diagram of HRDU2	38
Figure 6.1 – Level diagram..... 오류! 책갈피가 정의되어 있지 않습니다.	
Figure 6.2 – Information HROU and HRDU ID	오류! 책갈피가 정의되어 있지 않습니다.

Figure 6.3 – HRDU Setting window..... 오류! 책갈피가 정의되어 있지 않습니다.



Section 1

Safety & Certification Notice

“Only qualified personnel are allowed to handle this unit. Read and obey all the warning labels attached in this user manual”

Any personnel involved in installation, operation or service of the SOLiD Technology repeaters must understand and obey the following:

- *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.*
- *The repeater cover should be (door) securely fastened in open position, e.g. by tying it up, at outdoor work in order to prevent door from slamming due to wind causing bodily harm or damage.*
- *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 500cm minimum clearance from the antenna while the system is operating.*
- *Due to power dissipation, repeater may reach a very high temperature. Do not operate this unit on or close to flammable materials.*
- *Do not use any solvents, chemicals, or cleaning solutions containing alcohol, ammonia, or abrasives.*
- *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, Subchapter J, Part 1040*
- *A readily accessible disconnect device shall be incorporated external to the equipment*
- *This power of this system shall be supplied throughwiring installed in a normal building.If powered directly from the mains distribution system, it shall be used additional protection, such as overvoltage protection device.*
- *This equipment is classified as Pollution degree 2*
- *Round terminals located on the rear of a 1.0mm²(16AWG) or more wires using permanently connected to earth.*

- 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 controlled by the authority responsible for the location.

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

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

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which cause the user may be required to take adequate measures.

Caution



Do Not Open Except at Approved Field Force Protective Work Station

- 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.

- Signal booster 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.

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 fonctionner avec 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 des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas 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 500 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 500 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.

Section2

System Overview

2.1 Purpose

2.2 System overview

2.1 Purpose

THOR is a coverage system for outdoor 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. The system covers general public institutions and private facilities.

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

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

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

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

- Frequencies: 700MHz, 800MHz,850MHz 900MHz, 1800MHz, 1900MHz,2100MHz, 2600MHz etc.
- Voice protocols: AMPS,TDMA, CDMA,GSM,IDEN, etc.
- Data protocols: LTE,EDGE,GPRS,WCDMA,CDMA2000,Paging, etc.

THOR is in modular structure per frequency band. To provide desired frequency in the outdoor, all you need to do is to insert a corresponding frequency module into each unit. As it delivers multiple signals with one optical cable, the system, in one-body type, does not require additional facilities whenever new frequency is added.

The system is featured with the following:

- Flexibility & Scalability
 - Support fiber-optic ports up to 32
 - Clustering multiple-buildings (campus) as one coverage
- Modular structures
 - Modular frequency upgrade
 - Plug-in type module
- Multi-Band, Multi Operator
 - Signals with a plurality of service provider transmit simultaneously
 - Support multi-operator in a band

- Low OPEX / CAPEX
 - Compact design
 - Upgradable design
 - Easy installation and maintenance

2.2 System overview

THOR is composed of devices given below.

- HMRU(High power Main Unit)
- HARU(High power Add-on Unit)

A HMRU can support up to one HARU. HMRU transmits/receives optical signal from/to ODU . The budget of optical link is maximum 10dBo with OM1 supported 1optical port and can support up to 5dBo with existing OM4 supported 4optical port. System topology is like below.

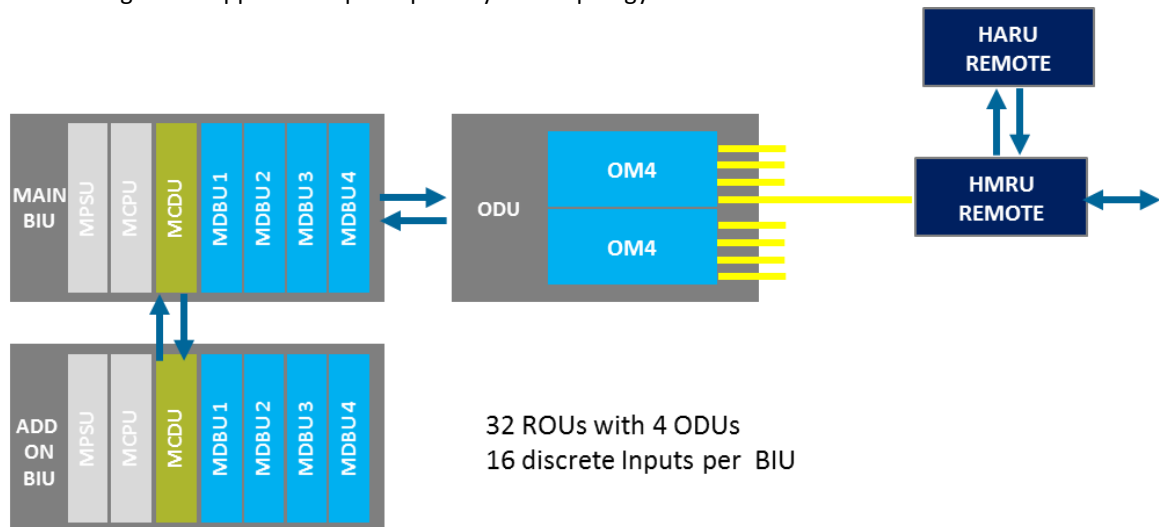


Figure 2.1 – Basic system topology

THOR have 20W composite output power every band. HHRDU that is integrated on package with Duplexer, Power Amplifier and RF unit can be mounuted up to 4 in the enclosure.

THOR transports signals that multiple operators and multiple technologies are moved at a same time from Base station to a remote location over the same fiber.

It is available in single and multi-band configuration supporting , 700MHz, 800MHz,850MHz 900MHz, 1800MHz, 1900MHz,2100MHz, 2600MHz etc in parallel.

It has been specifcilly tested under a various air interfaces such as iDEN, GSM, CDMA2000, EV-DO, WCDMA, LTE etc.

Section 3

System Configuration and Functions

4.1 HROU (High power Remote Optic Unit)

3.1 HROU (High power Remote Optic Unit)

HROU consists of two unit, one is HMRU(High power Main Remote Unit) and the other is HARU(High power Add-on Remote Unit).

The biggest difference between HMRU and HARU is whether R-OPTIC module exist or not in the enclosure.

HMRU receives TX optical signals from ODU and converts them into RF signals. The converted RF signals are amplified through High Power Amp in a corresponding HRDU band combined with UDCU, PAU and Cavity duplexer, 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 HRDU and sends the results to R-OPTIC to make electronic-optical conversion of them. After converted, the signals are sent to a upper device of ODU. HMRU can be equipped with up to four HHRDUs (High Remote Drive Unit) and the module supports single band only.

HARU receives TX RF signal from HMRU and amplifies through High Power Amp in a corresponding HHRDU combined with UDCU, PAU and Cavity duplexer, and then radiated to the CU(Combining Unit)

When receiving RX signals through the antenna port, HHRDU filters out-of band signal in a corresponding HHRDU and sends the results to MHRU through RF cable.

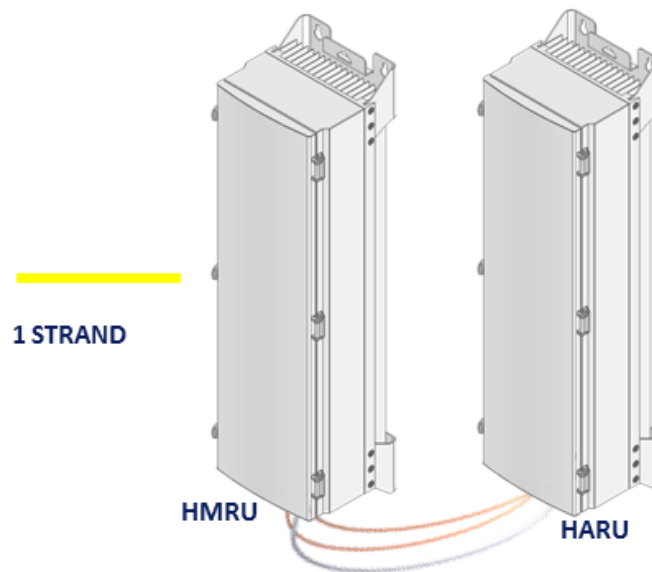


Figure 4.1 – HROU Outer Look

3.1.2 Specifications of HROU

Item	Spec.		Remark
	HMRU	HARU	
Size(mm)	320 x 1165 x260		Including Bracket
Weight	39 Kg	37kg	Common Part
Power consumption	50W	40W	

3.1.3 Block Diagram of HROU

3.1.3.1 HMRU block diagram

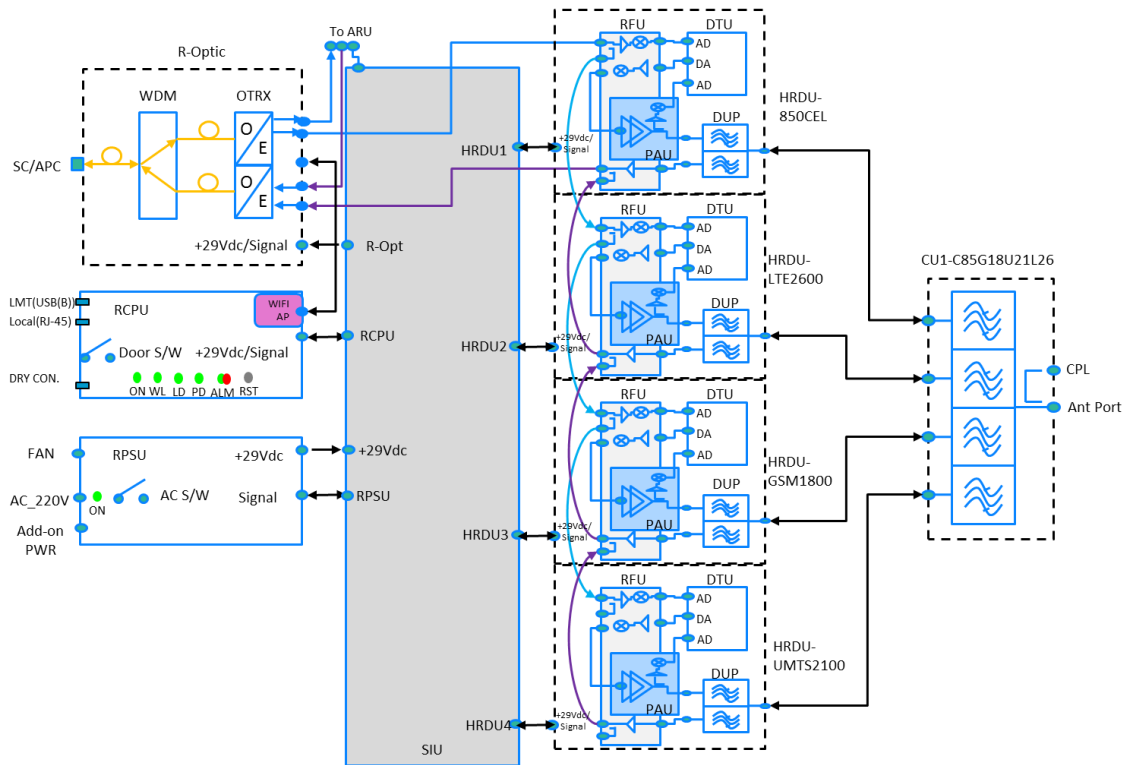


Figure 4.2 – HMRU Block diagram

3.1.3.2 HARU block diagram

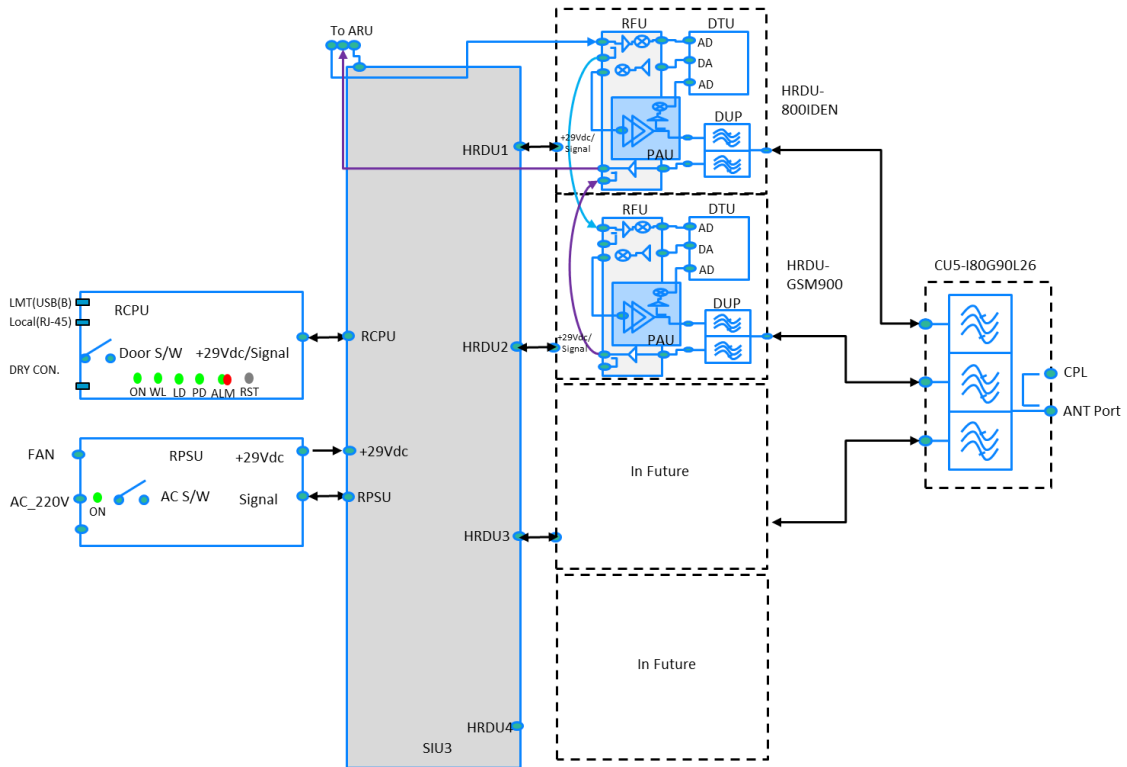


Figure 4.3 – HARU Block diagram

3.1.4 HROU parts

3.1.4.1 HROU inner look

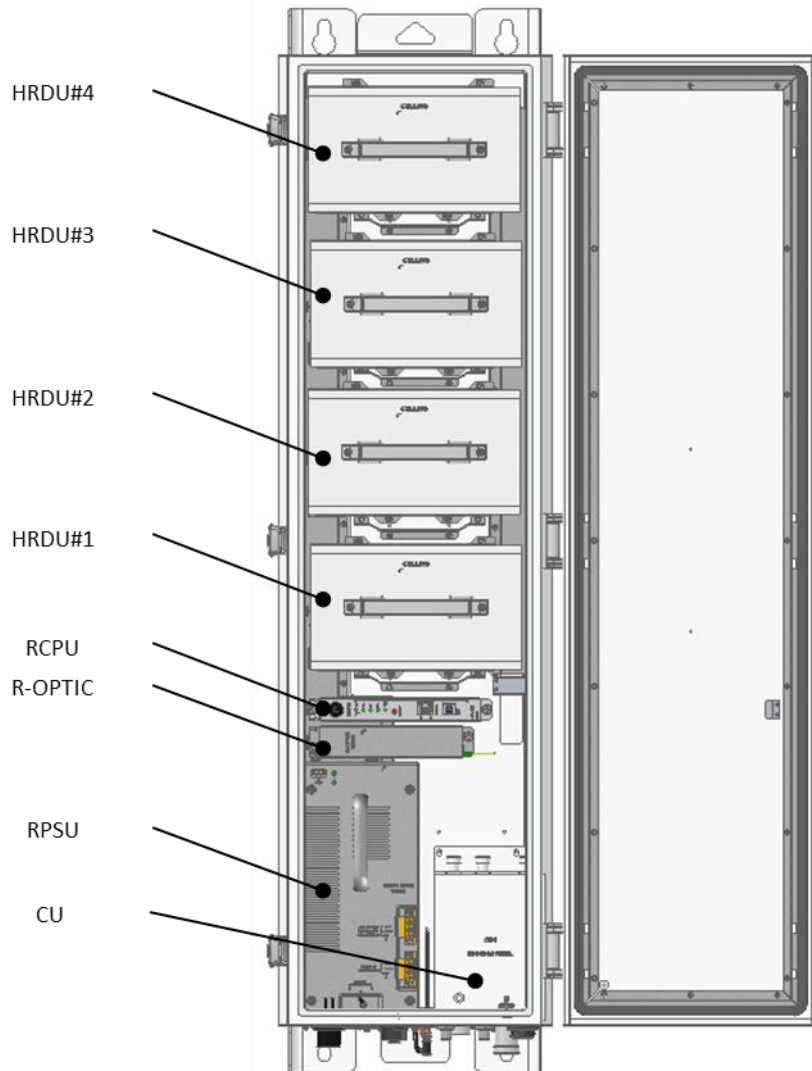


Figure 4.4 – HROU Inner Look

3.1.4.2 HROU part list

No.	Unit	Description	Remark
1	R-OPTIC	Remote Optic Make RF conversion of <i>TX optical signals</i> ; Convert RX RF signals into optical signals; Compensates optical loss Communicates with BIU/OEU though the FSK modem	Optional Only HMRU
2	RCPU	Remote Central Processor Unit Monitoring status of each unit Communicating with BIU/ODU Support LED indicators on it to check alarm	Common
3	RPSU	Remote Power Supply Unit Input power: 90~230V, Output power: 29V single voltage	Common
4	HRDU X4	High Remote Drive Unit Consist of UDCU, PAU and cavity filter Filter and high amplify TX signals; Filter and amplify RX signals in low noise amplifier; Remove out-of signals through cavity duplexer	Optional Max 4
5	Enclosure	Enclosure to satisfy IP66; Enable Wall/Rack Mount	Common

3.1.5 Function by unit

1) High Remote Drive Unit (HRDU)

When receiving TX signals from each band through Remote Optic, HRDU filters the signals and amplifies them with High Power Amplifier. The unit also filters RX signals given through cavity filter and amplifies them to send the signals to Remote Optic. In the unit, there is ATT to adjust gain. HRDU consists of UDCU, DTU, PAU and cavity duplexer like below figure and all modules are merged with one package

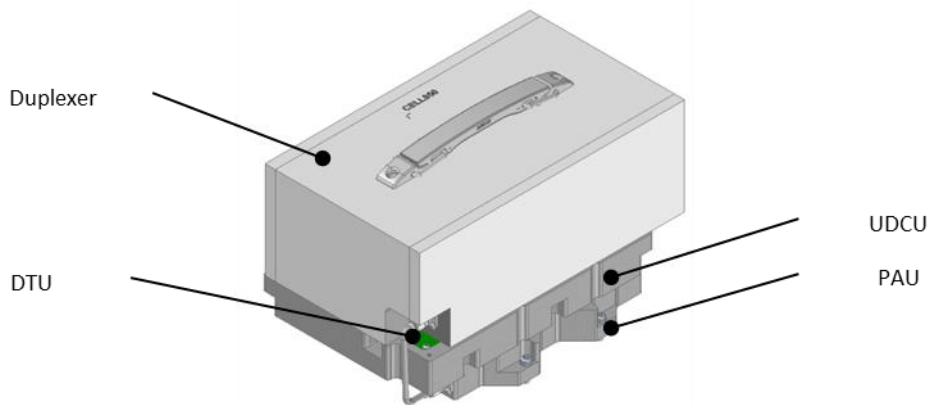
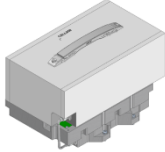


Figure 4.5 – HRDU Outer Look

HRDU devices are varied for each frequency band, including the following:

No	Unit naming	Description	Frequency	
			TX	RX
1	THOR-HRDU-850CEL	Single band	869-894MHz	824-849MHz
2	TBD			

No	Unit naming	Dimension	Weight	Power consumption	Outlook
1	N20-HRDU-850C	233 X 155 X 143	5.6kg	150W	 A 3D perspective view of a white, rectangular industrial unit. It has a handle on top and several ports on the front face, including a green indicator light.

2) Remote Power Supply Unit (RPSU)

RPSU is provided of 110/220Vac at input and provide output +29V only single voltage of DC power basically.

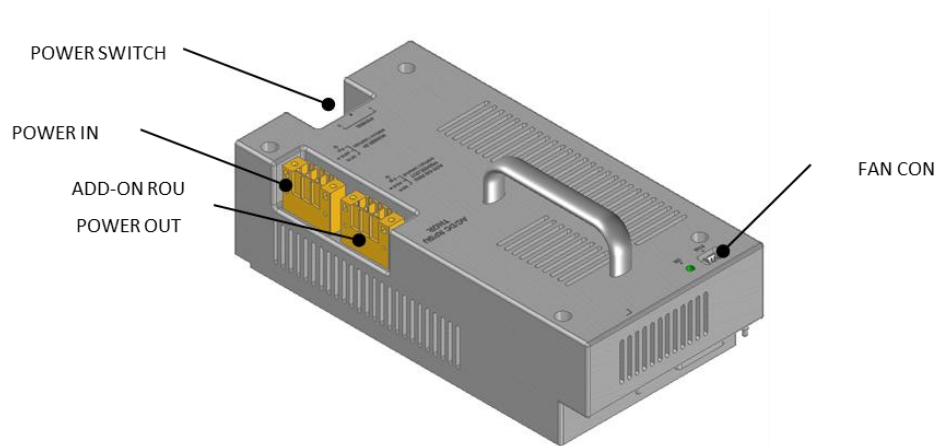


Figure 4.6 – RPSU Outer Look

Functions:

- Providing a circuit breaker to turn AC power ON/OFF
- Providing DC power each HRDU
- Providing DC power and signal to FAN tray
- LED indicators for showing alarm status of PSU



Caution

DOUBLE POLE/NEUTRAL FUSING

3) Remote Optic(R OPTIC)

Remote Optic converts optical signals into RF signals and performs vice versa. It also has internal ATT for optical compensation to compensate for optical cable loss. It provides two path in pairs(TX/RX) to transport RF signal to ARUs

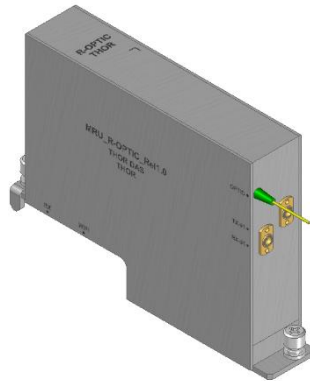


Figure 4.7 – R OPTIC Outer Look

4) Remote Central Processor Unit (RCPU)

RCPU can monitor and control each module of HROU. This unit receives and analyzes upper communication data from Remote Optic and reports the unit's own value to upper devices. At the front of the module, it has LED indicator to show system status, letting you check any abnormalities at a time. At the same front, it also has communication LED Indicators to show communication status with upper devices. Through Local port, the unit enables you to check and control device status through PC and laptop.

It provides three interface port with ARUs to communicate with these. It also provide dry contact port, which is (1) output port and (1) input port

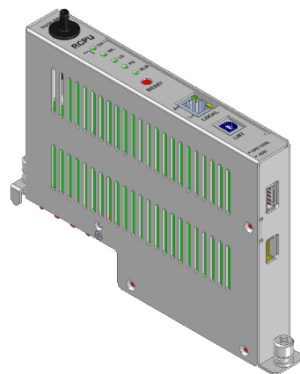


Figure 4.8 – RCPU Outer Look

3.1.6 Bottom of HROU

1) Functions

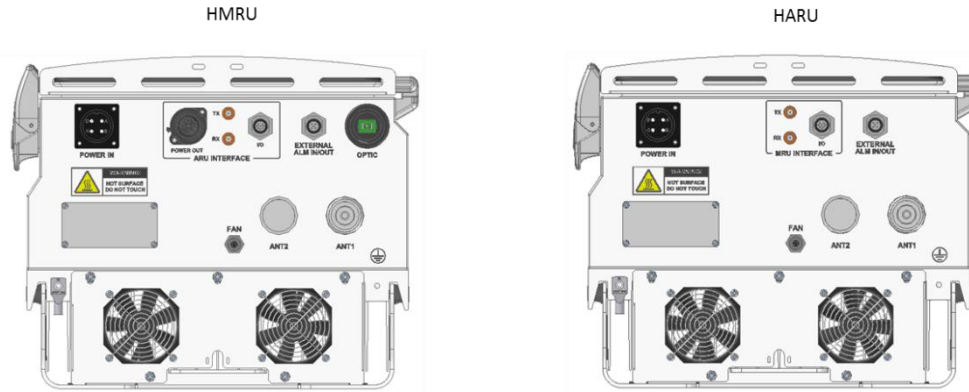


Figure 4.10 – HROU Bottom Look

No	Port	HMRU	HARU	Remark
1	Optical Port	1EA	X	SC/APC, Waterproof
2	ARU Interface	1EA, (1)CON,(2)SMA- Female	1EA, (1)CON,(2)SMA- Female	
3	ANT1	1EA	1EA	DIN-type female
4	ANT2	1EA	1EA	DIN-type female
6	AC Power IN	1EA	1EA	MS-Con, Waterproof
7	AC Power OUT	1EA	-	MS-Con, Waterproof
8	EXT-FAN	1EA	1EA	Waterproof-Con

Section 4

System Installation




5.1 HROU Installation

This chapter describes how to install each unit and optical cables, along with power cabling method. In detail, the chapter describes how to install shelves or enclosures of each unit, Power Cabling method and Optic Cabling and RF Interface. Furthermore, by showing power consumption of modules to be installed in each unit, it presents Power Cabling budget in a simple way. Then, it describes the quantity of components of modules to be installed in each unit and expansion method.

4.1 HROU Installation

4.1.1 Tools

Tools needed for installation is table below

No	Tools	Q'ty	Specification	Remark
1		1	+ , 3Ø Length is more than 20mm	For fixing HRDU
2		1	33mm	To tighten antenna port
3		1	19mm	To CU N-type port

4.2 HROU Enclosure installation

HROU 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(IP66). The way to install for both HMRU and ARU has same method. Basically HROU is attached with wall mountable bracket. HROU can be mounted into either of wall or on a pole.

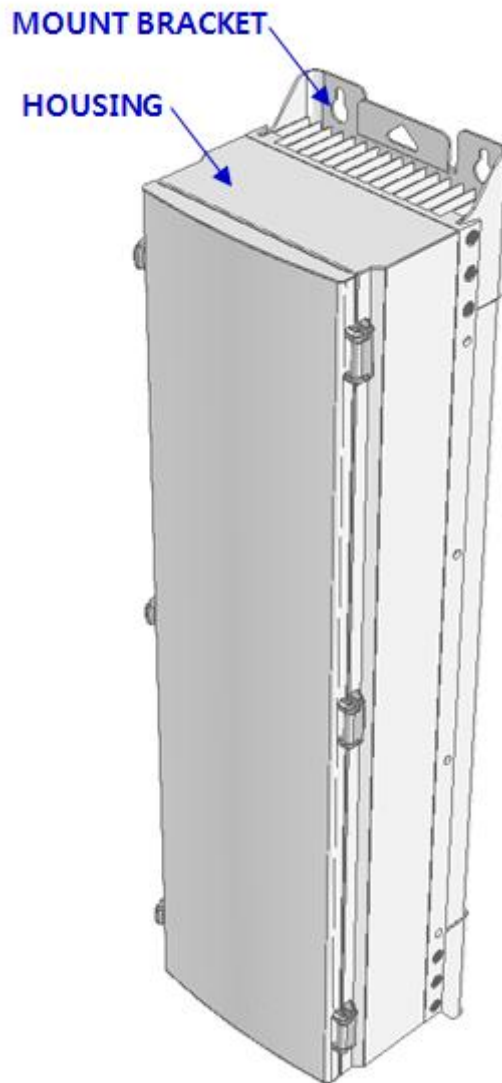


Figure 5.1 – How to install HROU

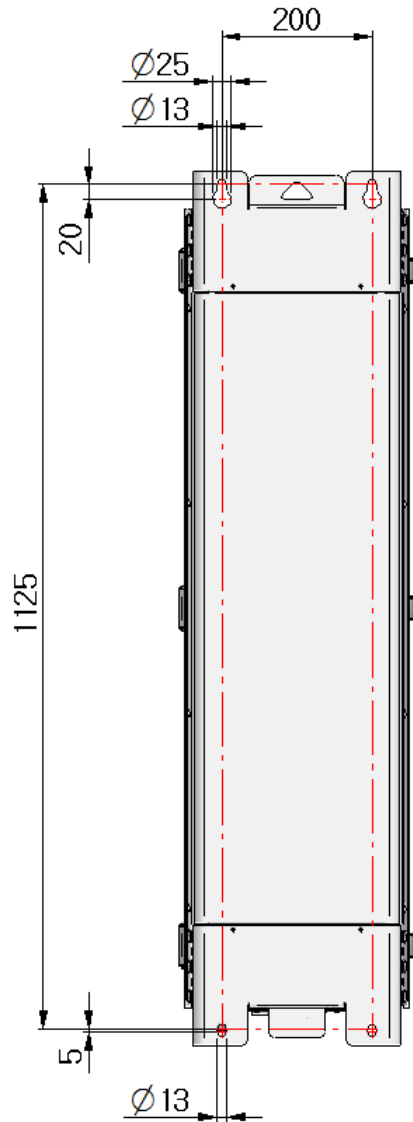


Figure 5.2 – Dimension used to install HROU on the WALL

HROU Wall Mount Installation

HROU's installation bracket is attached on Enclosure when is delivered. It doesn't need to remove bracket to install enclosure. simply after installing 4 of M12 mounting bolts, secure 4 mounting bolts tightly

First, install 2 of M12 mounting bolts roughly half way on the enclosure and install enclosure over the bolts and secure tightly.

Second, install 2 of M12 mounting bolts under the enclosure and secure tightly

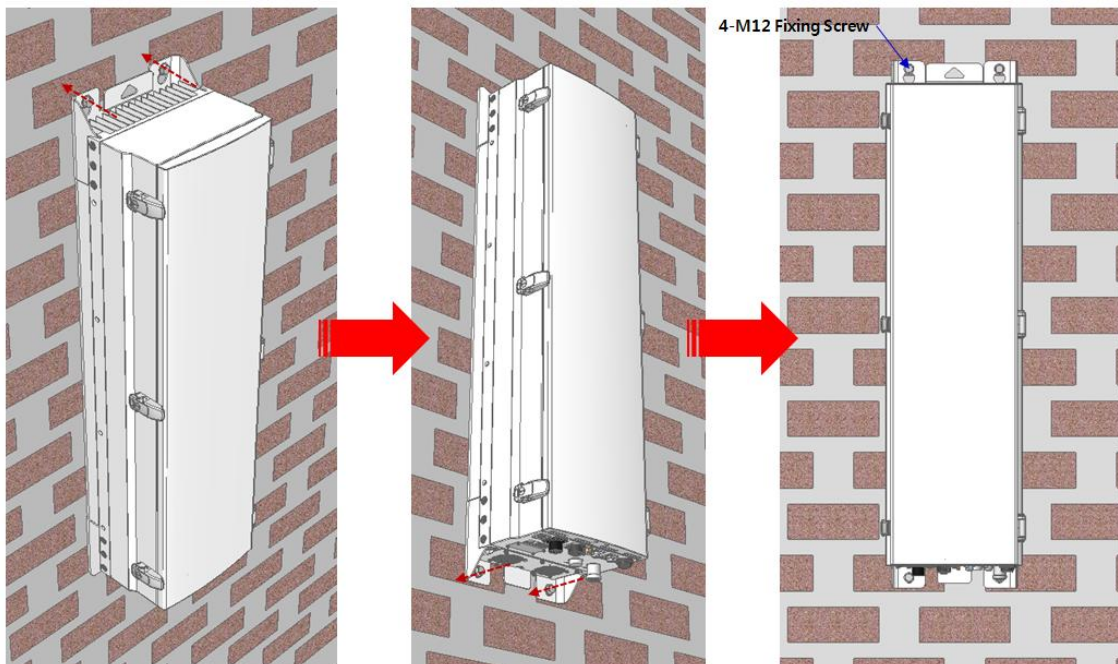


Figure 5.3 – Procedures of installation

HROU components

HROU has the following components:





No.	Unit	Description	Remark
Common Part	Enclosure	Including Wall mounting bracket	1EA
	RCPU	-	1EA
	R_OPTIC	With SC/ACP adaptor(only HMRU)	1EA,optional
	RPSU	AC 110/220V	1EA
	FAN UNIT	2 FANs is inside	1EA
	Power Cable1	- MS Connector with 4 hole(AC)	1EA, HMRU
	Power Cable2	- MS connector for HMRU connection with MS con and Circular connector on the each side of end	1EA, HARU
HMRU	HRDU	THOR-HRDU-850C	CU1- L70C85P191 9A21

Basically, the common part of HROU 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 HROU. It should have Power Cable for external rectifier or to supply required power.

In addition, HRDU can be mounted and removed to provide service for desired band.

4.3 How to expand HARU at the HMRU

HMRU can expand ARU up to 1. The three item is needed for connection between HMRU and HARU. HARU's components additively have 3 item except for enclosure like below

Accessories	Description	Qty	Specification	Remark
1	TX RF Cable	1	SBA(M) ST_1.5M	
2	RX RF Cable	1	SMA(M) ST_1.5M	
3	I/O Cable	1	IEC 61076-2-101(8pin_F) ST_1.5m	
4	Power Cable	1	MIL-5015(18-10_F) ST to Circular(eco mate 3+PE_M) ST_1.5m	

The following picture shows the connection diagram between HMRU and HARUs
For expanding HARU at the HMRU within the proper cable length provided. The cables between HMRU and HARU have each 1.5m length

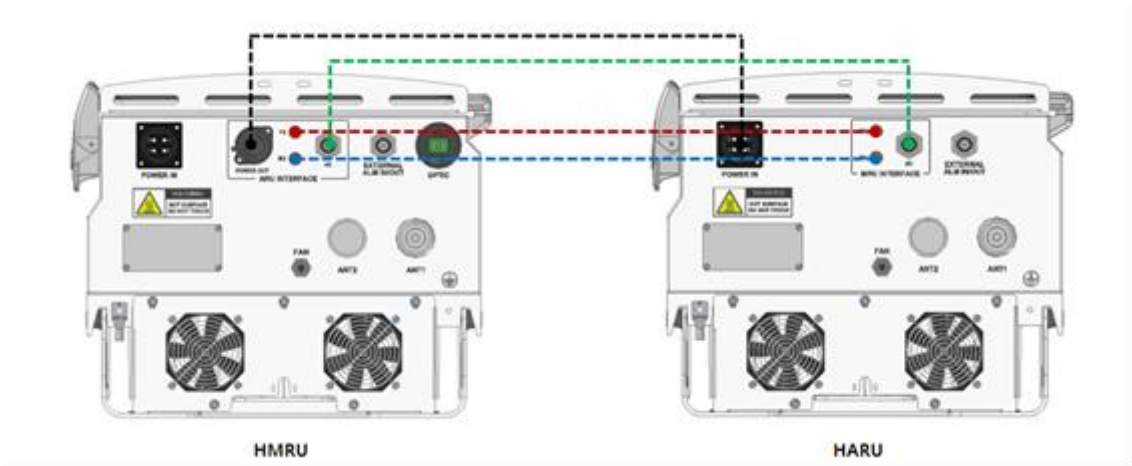
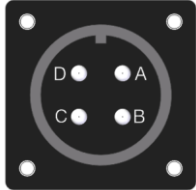


Figure 5.4 – Connection diagram between HMRU and HARU

4.4 HROU Power Cabling

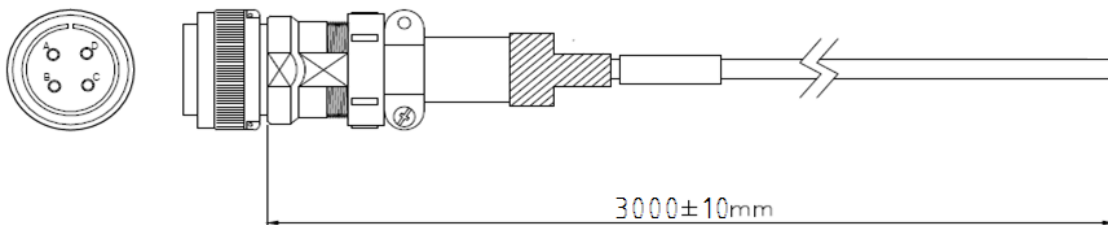
HROU supports AC110V/220V of input power. Provided outside power cable is only one type with AWG#14 3m. Power cable is provided without power plug and it should be attached power plug based on national's power plug type

The pin discription of AC port is below. You should connect exact polarity of AC.

Port outlook	MS Connector numbering	Name	Description
 <p>AC POWER</p> <p>A : AC_H B : AC_N C : N.C D : F.G</p>	A	AC_H	AC Hot
	B	AC_N	AC Neutral
	C	N.C	Not Connected
	D	F.G	Frame Ground

Check if the connection is the same as one seen in the table above and make sure to turn the power ON.

Provided AC power cable's outlook is below



4.5 HROU Ground cabling

The Grounding terminal is located at the bottom of HROU enclosure fixed by M6 screw. Compression terminal is attached already when is delivered. The recommended thickness of cable is AWG#6 copper grounding wire

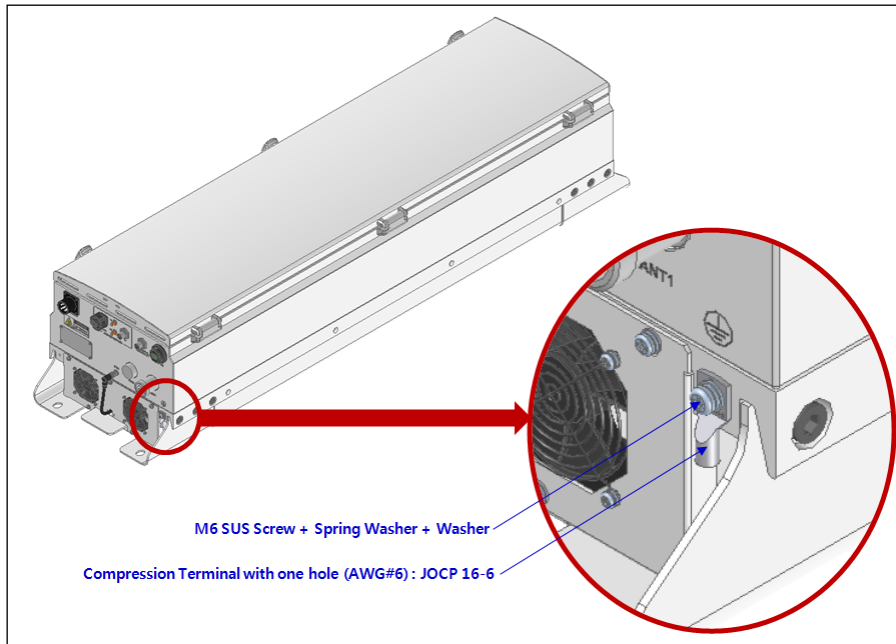
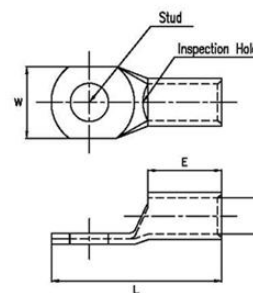


Figure 5.5 – Location of Ground Terminal

The specification of compression terminal is like below

TUBULAR CABLE LUGS, ONE-HOLE, ROUND COMPRESSED TYPE-CP

- Material : Electrolytic Copper (TPC)
- Surface : Tin Plated
- With Inspection Hole to visually assure full Conductor insertion.
- Color Coded to Show Proper Die Number and Color 10 and 70 mm
- To IEC 60228 Class 2 and Class 5
- UL Listed 486A-486B up to 35KV



Part Number	Wire Range				Stud Size	Dimension (mm)				Code Cable Die Color & No.	Q'ty/ bag
	CODE		FLEX			W	E	L	d		
	AWG	mm ²	AWG	mm ²							
JOCP 16-5	6	16	6	16	M5	12	13	29	5.4	Blue 24	300
JOCP 16-6					M6						
JOCP 16-8					M8						
JOCP 16-10					M10						

Figure 5.6 – Information of Terminal

The required part number is JOCT 16-6 supporting AWG 6. The way to install the grounding cable comply with below procedures

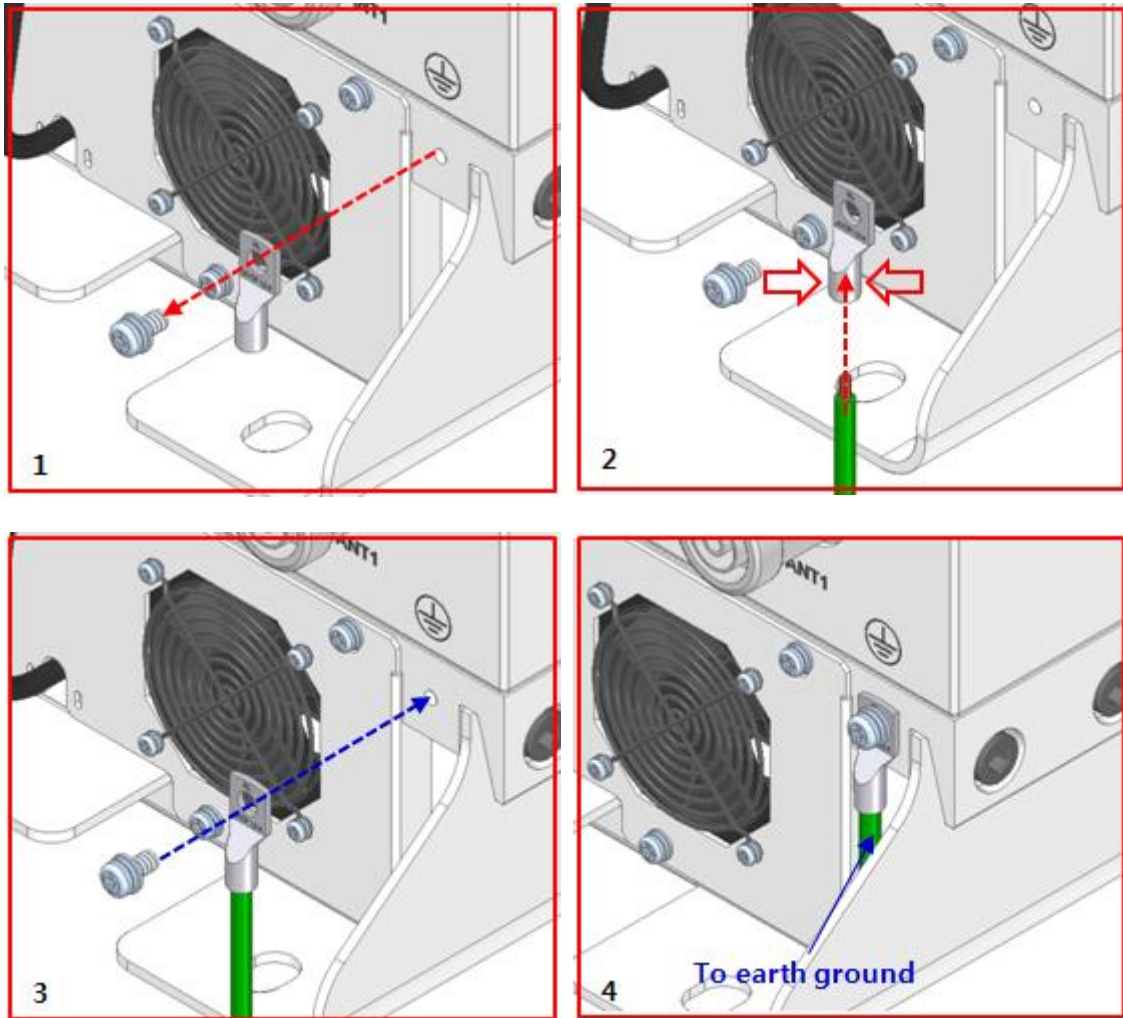


Figure 5.7 – How to install Ground Terminal

The procedures are

1. Loosen a two M6 screws and then take compression terminal off
2. Insert AWG#6 Grounding Wire into terminal and then compress a terminal using tool
3. Assemble the terminal which made in step “2” using 2xM6 screws
4. Cut the ground wire to proper length and connect it to the earth ground source

4.6 Mounting of HRDU

HROU has slots to enable up to four HRDU modules to be mounted in it.

You can mount a HRDU into deginated slot surely. It is not possible to provide services with a HRDU module alone; you need to connect HRDU cavity duplexer antenna port with CU's deginated port.

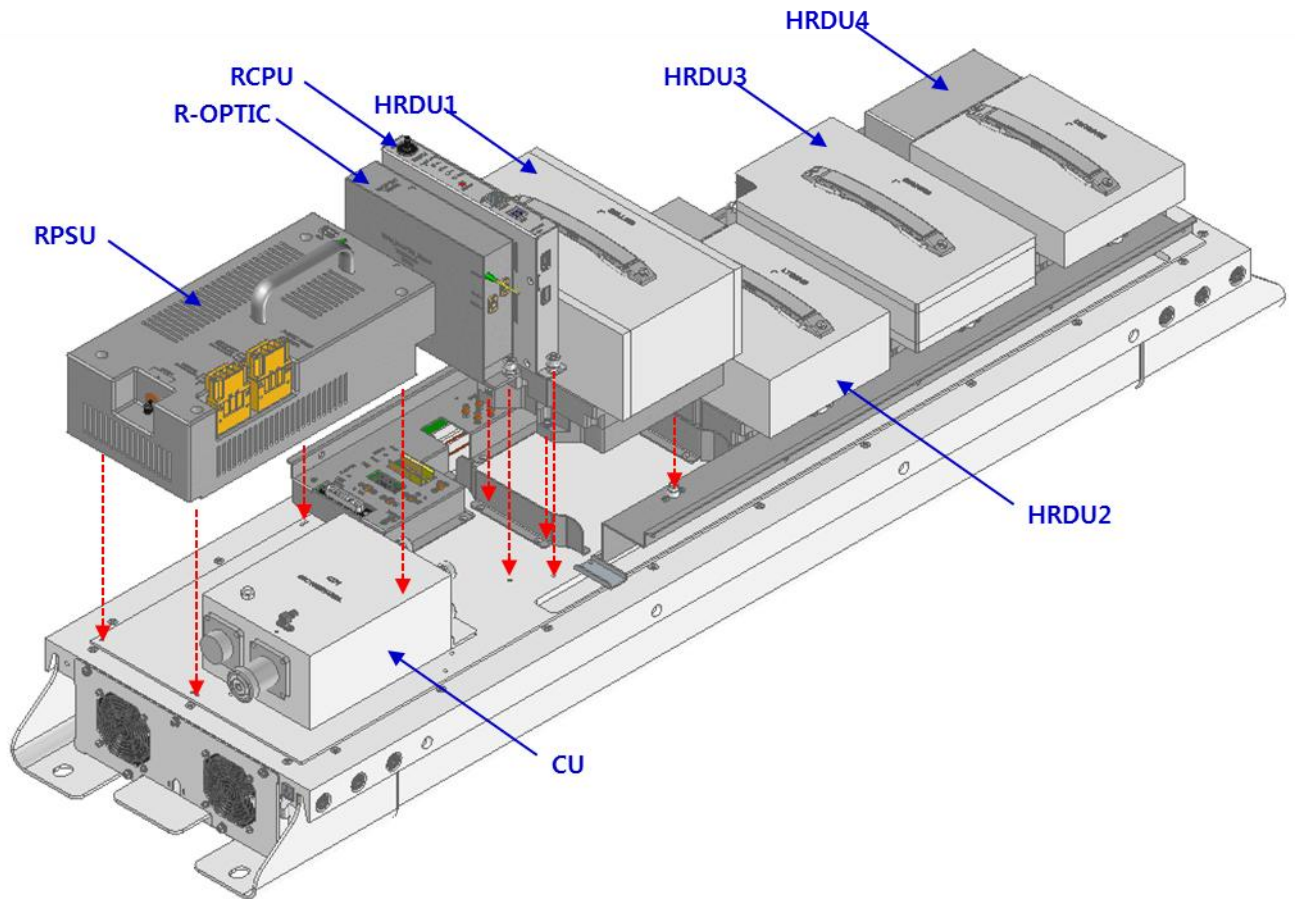


Figure 5.9 – How to mount HRDU

Because there are the guide bracket, it assists HRDU to move exact location. The screw for fixing HRDU on the heat-sink is already attached on HRDU and so you can assemble HRDU easily.

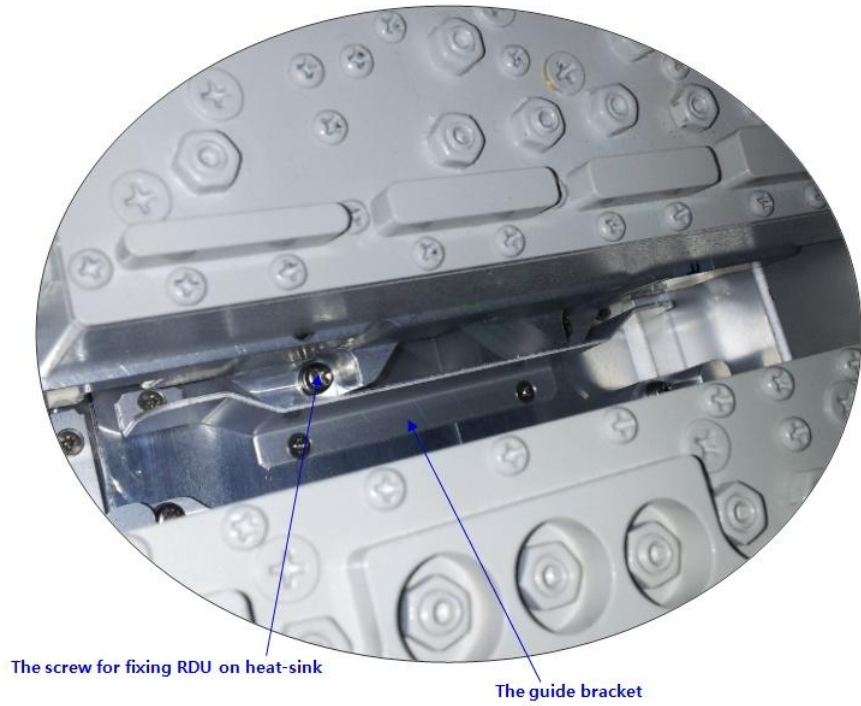


Figure 5.10 – The Guide bar

Insert HRDU at the deginated slot and secure 4 screws tightly using M3screw driver.

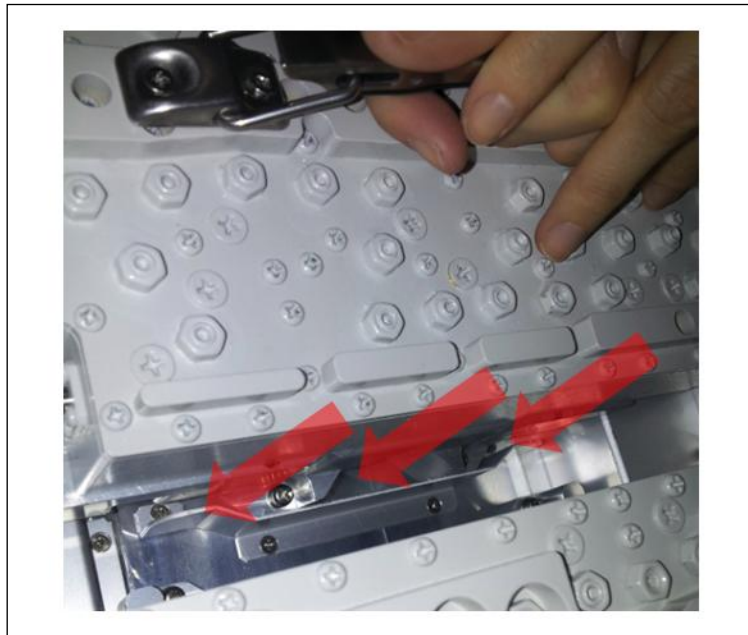




Figure 5.11 – Correct installed HRDU

If there is empty HRDU slot. It need to install RDU Blank Unit like below picture. It can insert/remove for ease by securing/loosing captive screw attached on RDU Blank Unit.



Figure 5.12 – Connection diagram of HRDU2



Section 5 Specification

5.1 General Specification

General Data		
Nominal Impedance		50 ohm
VSWR		1.5:1 at all in& out ports
Mounting Type		Wall Mounting
In & Output Port Type		DIN Female DIN Female (7/16)
Front Panel LED Indicator	ON	Power on: Green, Power OFF : Gray
	ALM	Power ON : Green / Alarm: Red
	LD	Normal : Green, Alarm : Red
	PD	Normal : Green, Alarm : Red
	WL	Green LED flickering: Communication Status
Noise Figure		6dB
Ripple		±2dB
Maximum Power Consumption		630W at full load
MRU Dimension (W x H x D)		320 x 1165 x 260 mm
Total Max Weight		57 kg
Power Supply Range		110/220V ± 10% AC(90V ~ 230V)
Optical Data		
Wavelength TX/RX		1310/1550nm
Maximum Optical Loss		10dBo
Fiber Optic Connector		SC/APC

Environmental Data	
Environmental Condition & IP Rating	IP66
Operating Temperature (°C)	-25° ~ +55°C
Operating Humidity	5~ 90% non-condensing

5.2 Electrical Specification

Part Name	Service Band	Downlink (Tx)			Uplink (Rx)	
		Freq (MHz)	Bandwidth (MHz)	Output Power (dBm)	Freq (MHz)	Bandwidth (MHz)
TR_HRDU_850C	CDMA,LTE,WCDMA	869~894	25	44	824~849	25

5.3 Optical Specification

Unit Name	HR_R-OPTIC		Remark
Connector	RF	SMBL/PDM FEMALE / 50ohm	Analog
	Optic	SC / APC (STEP FERRULE)	
	Power/Signal	D-SUB 3ROW 15P MALE	
Laser Diode	1550nm(Coaxial Type)		
Photo Diode	1310nm		
Optic Loss	1dBo~ 5dBo@ OM4		
	1dBo~10dBo @ OM1		