

4.3.5 Front/rear panels of OEU

1) Front panel

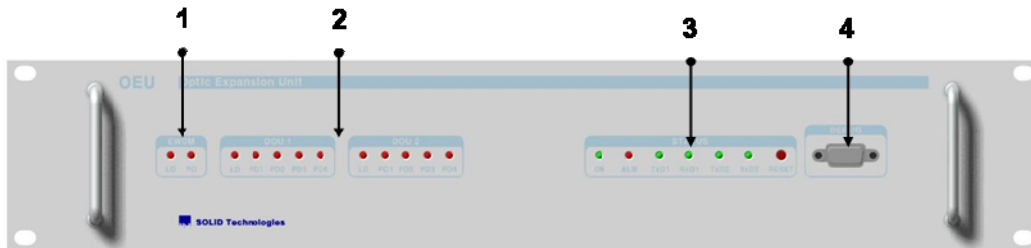


Figure 4.23 – OEU front panel Outer Look

Item	Description
1.EWDM LED	LED indicator to check EWDM state to see if it is abnormal
2.DOUE LED	LED indicator to check DOU module state to see if it is abnormal
3.System LED and Reset	Communication state with devices, alarm status of the system and reset switch
4. NMS(RS-232C port)	RS-232C port for communication and diagnosis of devices through PC/laptop. This equipment is indoor use and all the communication wirings are limited to inside of the building

2) Rear panel

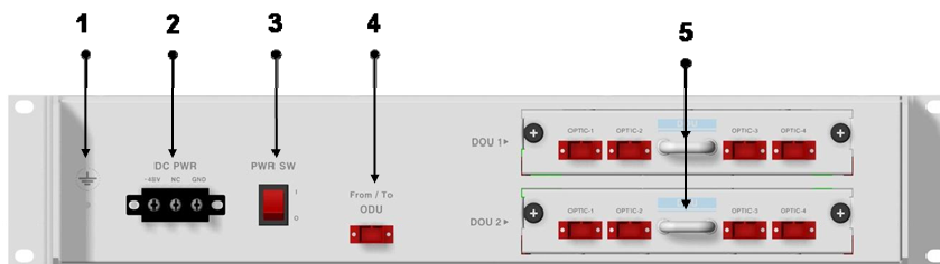


Figure 4.24 – Rear panel Outer Look

Item	Description
1. GND Port	Terminal for system ground
2. DC Input Port	Input terminal for DC -48V
3.power switch	Power ON/OFF switch
4. To/From ODU Optic Port	SC/APC optical connector terminal
5. To/From ROU Optic Port	SC/APC optical connector terminal; use one optical cable per ROU.

4.4 ROU (Remote Optic Unit)

ROU 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 RDU, 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 RDU 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. ROU can be equipped with up to three RDUs (Remote Drive Unit) and the module is composed of maximal Dual Band.

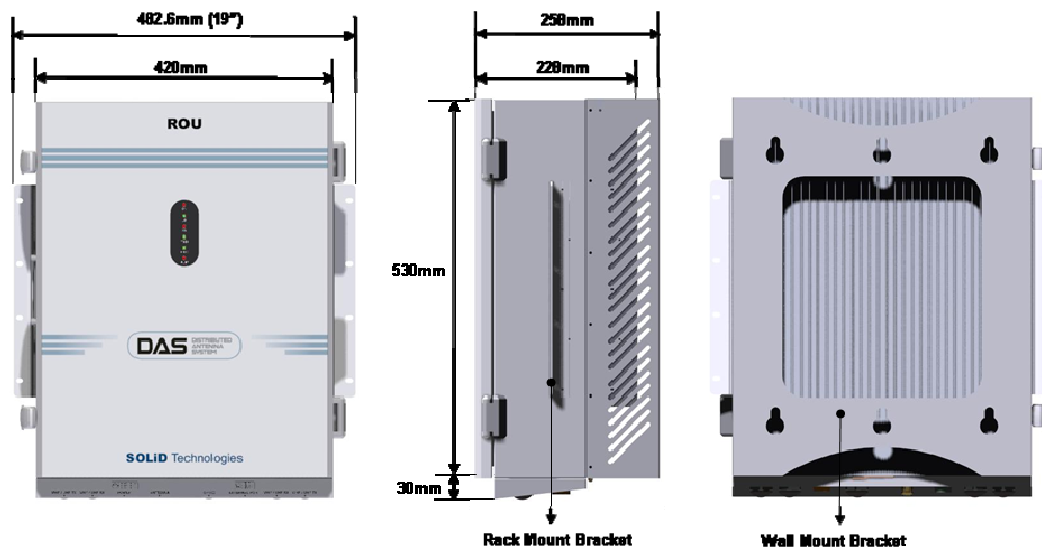


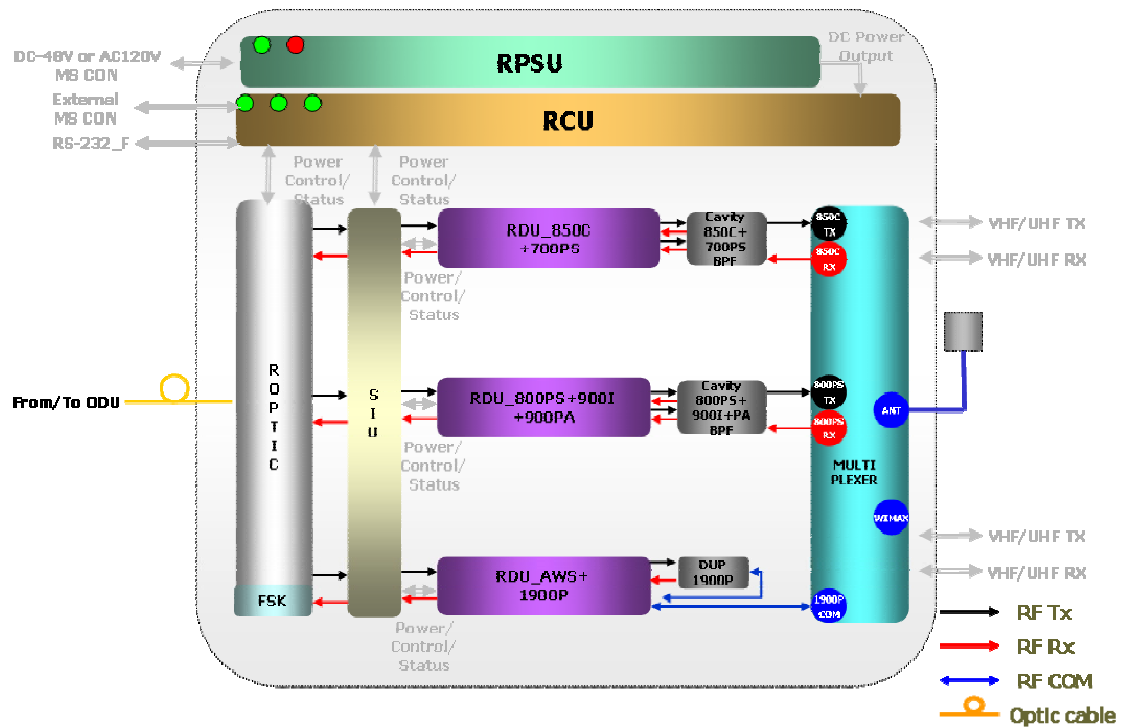
Figure 4.25 – ROU Outer Look

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

4.4.1 Specifications of ROU

Item	Spec.	Remark
Size(mm)	482.6(19") x 258 x560,	Including Bracket
Weight	35.45 Kg	Full Load
Power consumption	265 W	

4.4.2 Block Diagram of ROU



4.4.3 ROU parts

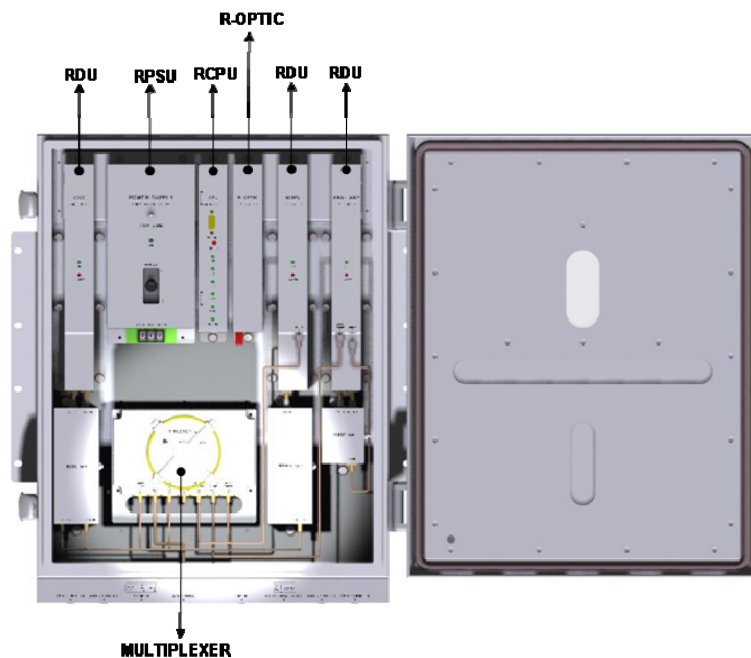


Figure 4.26 – ROU Inner Look

No.	Unit	Description	Remark
1	RDU+BPF	Remote Drive Unit Filter and high amplify TX signals; Filter and amplify RX signals; Remove other signals through BPF BPF is exclude from VHF+UHF module	
2	RPSU	Remote Power Supply Unit Input power: DC -48V, Output power: 27V,9V, 6V For 120V input of AC/DC; For -48V input of DC/DC	
3	R-OPTIC	Remote Optic Make RF conversion of TX optical signals; Convert RX RF signals into optical signals; Compensates optical loss Communicates with BIU/OEU though the FSK modem	
4	RCPU	Remote Central Processor Unit Controls signal of each unit Monitors BIU/ODU/OEU status through FSK modem communication	
5	Multiplexer	Multiplexer Combine TX signals from 3 RDUs; Distribute RX signals to 3 RDUs; Enable you to use a single antenna port	
6	Enclosure	Enclosure to satisfy NEMA4; Enable Wall/Rack Mount; Check if the system is normal, through the front panel LED	
7	SIU	System Interface Unit Distribute power and signals of each module	

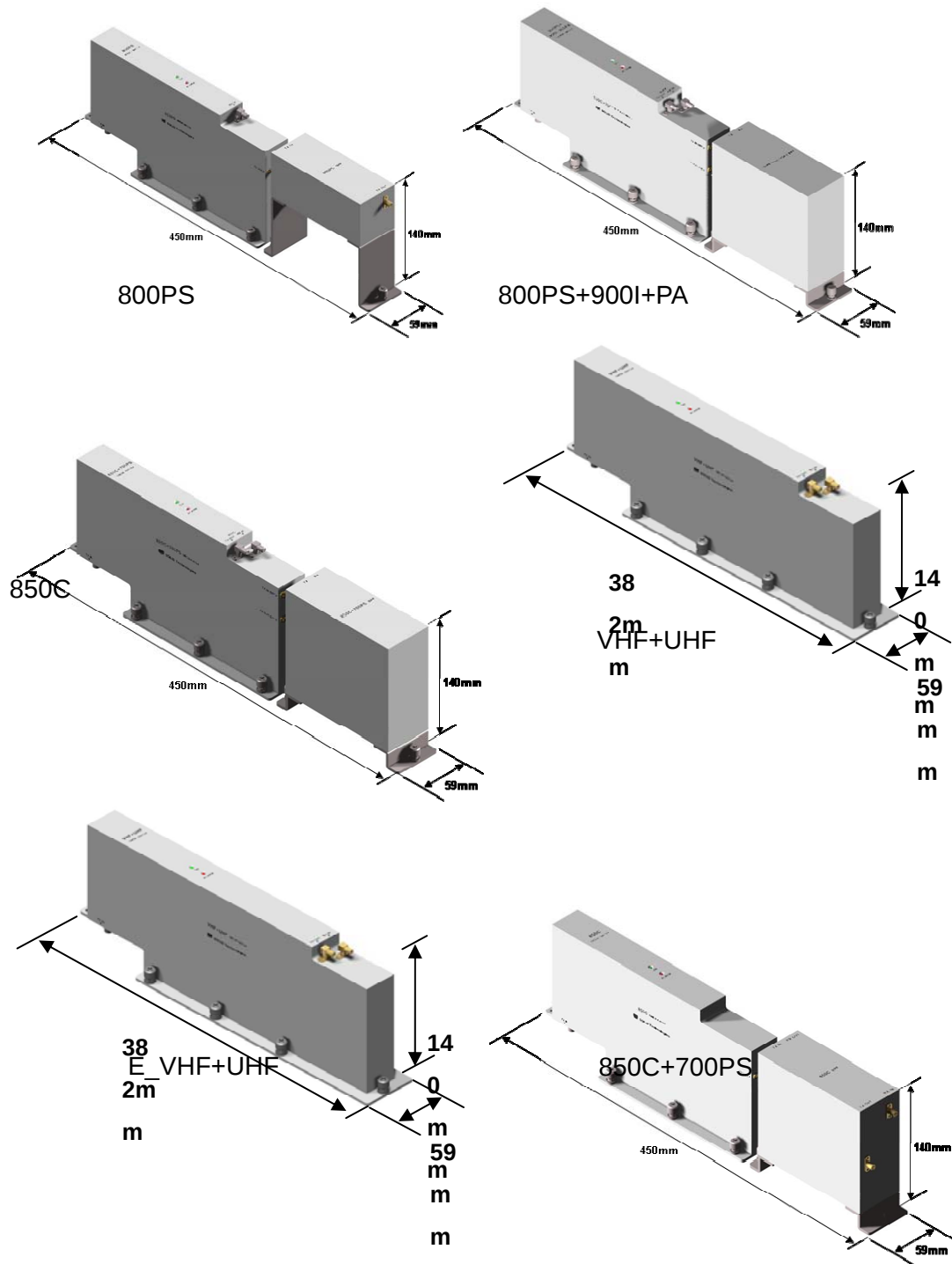
4.4.4 Function by unit

1) Remote Drive Unit (RDU)

When receiving TX signals from each band through Remote Optic, RDU filters the signals and amplifies them with High Power Amplifier. The unit also filters RX signals given through Multiplexer and amplifies them to send the signals to Remote Optic.

In the unit, there is ATT to adjust gain. RDU devices are varied for each frequency band, including the following:

No	Unit naming	Description	BPF	
			TX	RX
1	RDU 800PS	Single,	External BPF	Internal BPF
2	RDU 850C	Single,	External BPF	External BPF
3	RDU 1900P+AWS-1	Dual,	External BPF(1900P) Internal BPF(AWS-1)	External BPF(1900P) Internal BPF(AWS-1)
4	RDU 800PS+900I+PA	Dual,	External BPF(800PS) Internal BPF(900I+PA)	Internal BPF(800PS) External BPF(900I+PA)
5	RDU 850C+700PS	Dual,	External BPF(850C) Internal BPF(700PS)	External BPF(850C) Internal BPF(700PS)
6	RDU VHF+UHF	Dual	Internal BPF(VHF,UHF)	Internal BPF(VHF,UHF)
7	RDU E-VHF+UHF	Dual	Internal BPF(VHF,UHF)	Internal BPF(VHF,UHF)
8	RDU 850C+700LTEC	Dual,	External BPF(850C) Internal BPF(700LTEC)	External BPF(850C) Internal BPF(LTEC)
9	RDU 700LTEF SISO	Single,	Internal BPF	External BPF(SISO) Internal BPF(MIMO)
10	RDU 700LTEF MIMO	Single,	Internal BPF	External BPF(SISO) Internal BPF(MIMO)
11	RDU 700LTEF+850C	Dual,	External BPF(850C) Internal BPF(700LTEF)	External BPF(850C) Internal BPF(LTEF)



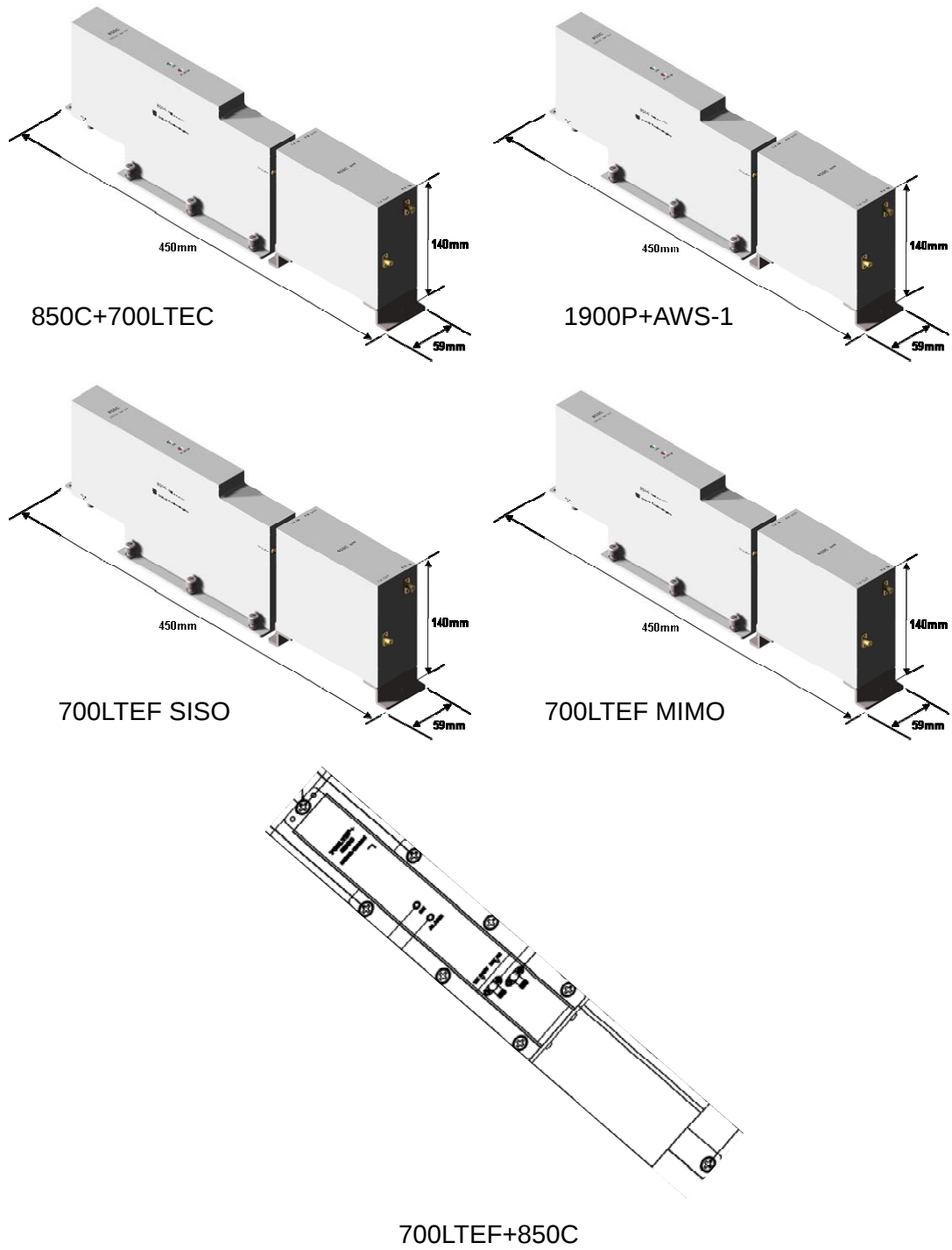


Figure 4.27 – RDU Outer Look

No	Unit naming	Nominal Pass Gain (dB)	Nominal Bandwidth			Rate Mean Output Power (dBm)	Input and Output Impedances(Ω)
1	RDU 1900P+AWS-1	45	1900P	GSM	400kHz	34	50
				EDGE	400kHz		
				CDMA	1.5MHz		
				1xEVDO	1.5MHz		
				WCDMA	5MHz		
				LTE	5MHz		
			AWS-1	GSM	400kHz		
				EDGE	400kHz		
				CDMA	1.5MHz		
				1xEVDO	1.5MHz		
				WCDMA	5MHz		
				LTE	5MHz		
2	RDU 800PS+900I+PA	45	800PS	iDEN	25kHz	34	50
				SMR	25kHz		
				LTE	5MHz		
			900I+PA	iDEN	25kHz		
				SMR	25kHz		
3	RDU 700LTEF+850C	45	700LTEF	LTE(5MHz)	5MHz	34	50
				LTE(10MHz)	10MHz		
			850C	GSM	400kHz		
				EDGE	400kHz		
				CDMA	1.5MHz		
				1xEVDO	1.5MHz		
				WCDMA	5MHz		

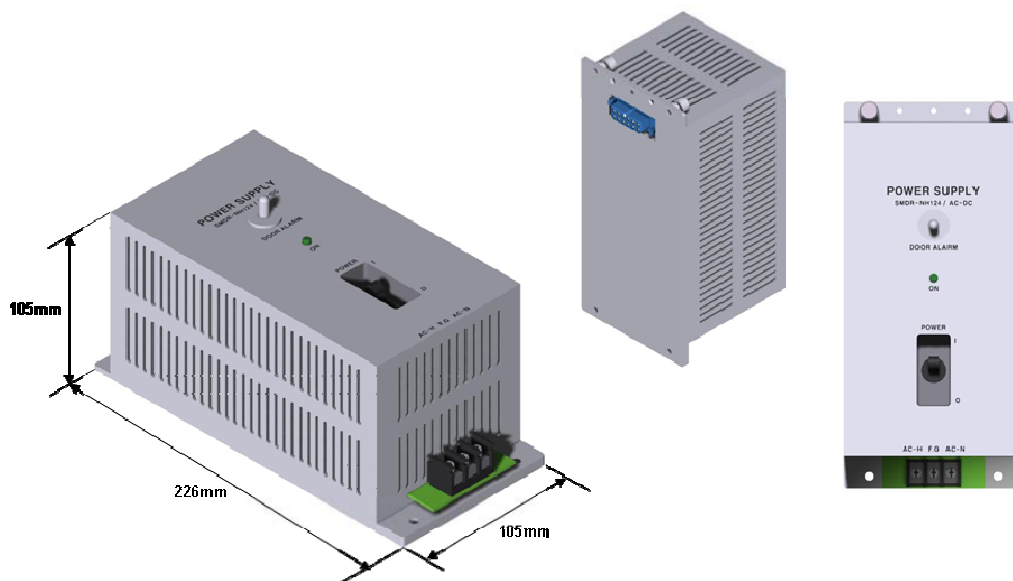
The following notice: "The Manufacturer's rated output power of this equipment is for single carrier operation. For situations when multiple carrier signals are present, the rating would have to be reduced by 3.5 dB, especially where the output signal is re-radiated and can cause interference to adjacent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

2) Remote Power Supply Unit (RPSU)

RPSU receives -48V of input. This unit is divided into DC/DC type to output +6V, +9V and +27V of DC power and AC/DC type to receive 120V of AC input and to output +6V, +9V and +27V of DC power.

Upon order, either of the two types should be decided. MS Connector, which uses ports to receive inputs, is designed to accept any of AC and DC. Only in this case, the input cable is different.

RPSU has a circuit brake to turn the power ON/OFF and has LED indicator at the top to check if input power is normally supplied.



3) Remote Optic(R OPTIC)

Remote Optic converts optical signals into RF signals and performs vice versa. With an FSK modem in it, the unit communicates with upper devices.

It also has internal ATT for optical compensation to compensate for optical cable loss, if any.

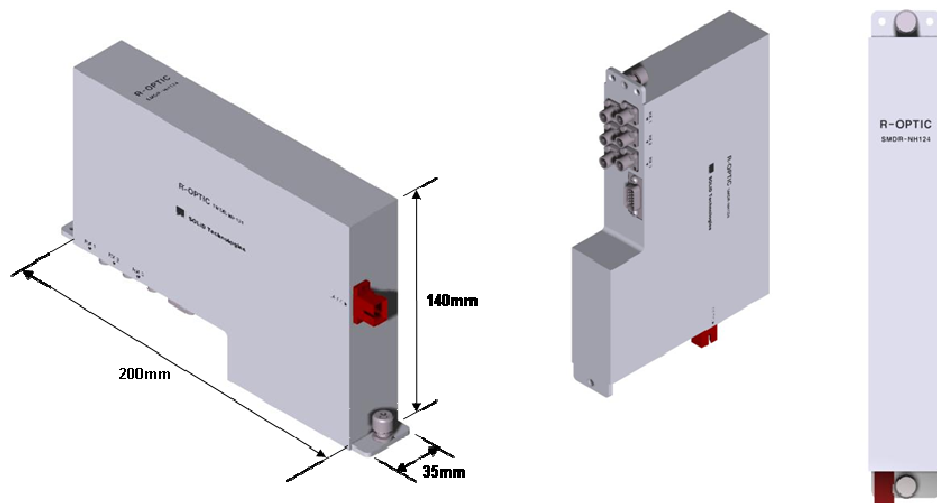


Figure 4.28 – R OPTIC Outer Look

4) Remote Central Processor Unit (RCPU)

RCPU can monitor and control each module of ROU. 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 RS-232C Serial Port, the unit enables you to check and control device status through PC and laptop. This equipment is indoor use and all the communication wirings are limited to inside of the building.

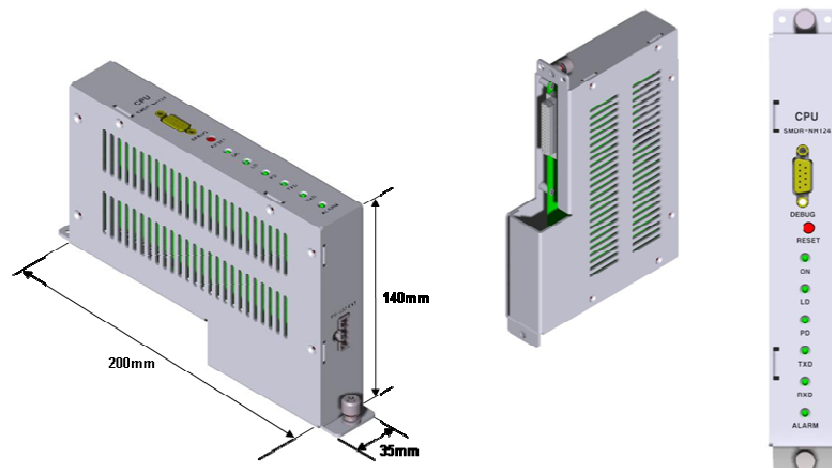


Figure 4.29 – RCPU Outer Look

5) Multiplexer

Multiplexer works as a module to combine or distribute multiple signals into one antenna. This device has a port to combine multiple signals. You need to connect input and output ports

of RDU through a corresponding port.

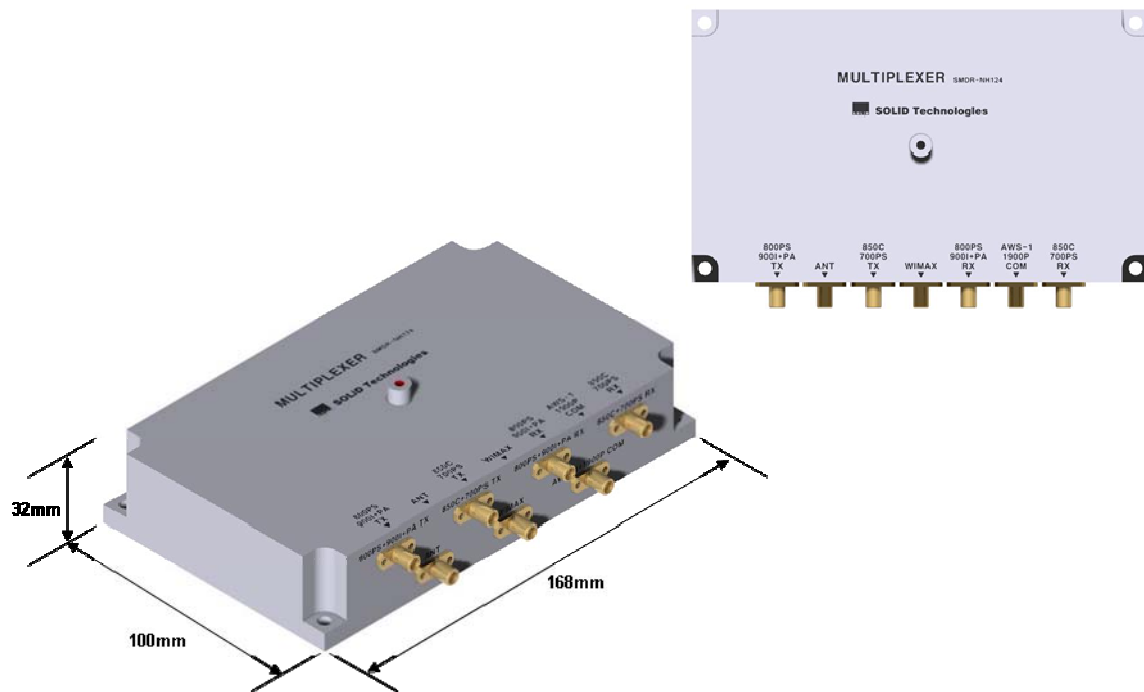
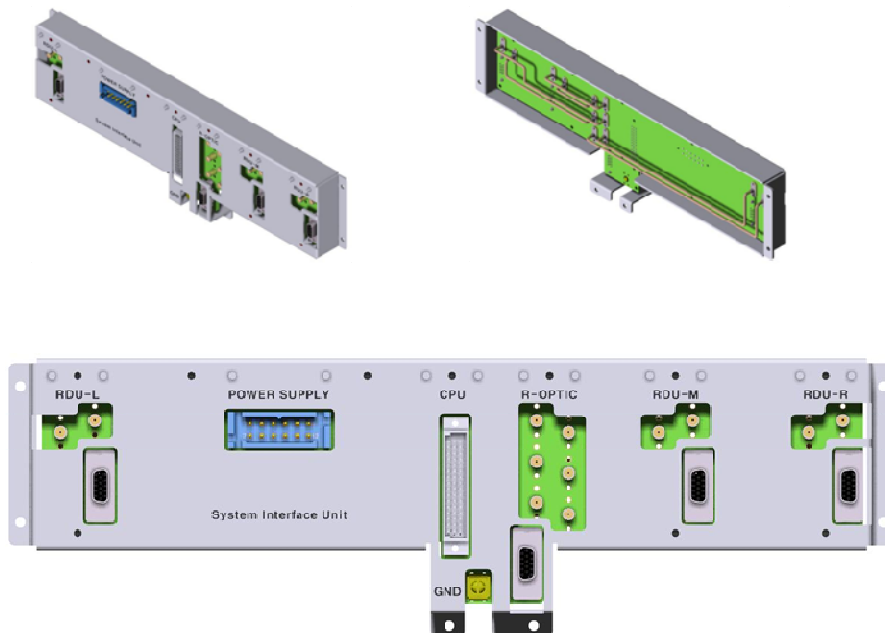


Figure 4.30 – Multiplexer Outer Look

6) System Interface Unit(SIU)

SIU distributes power and signals to each module.



4.4.5 Bottom of ROU

1) Functions

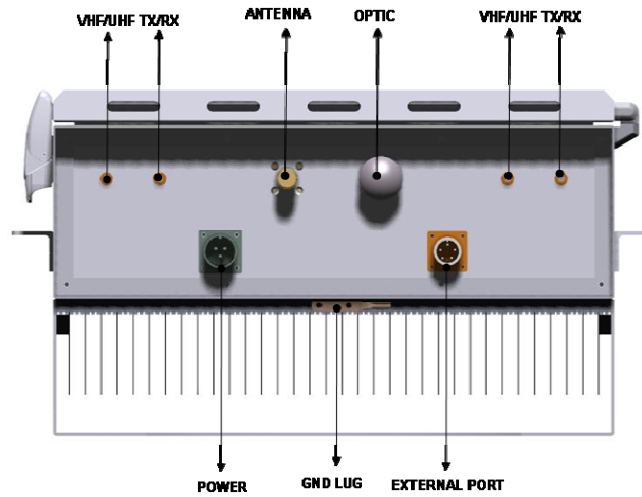
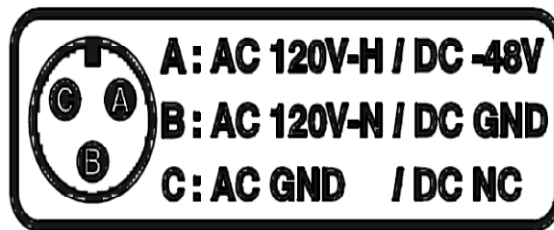


Figure 4.31 – ROU Bottom Look

Item	Description	Remark
1. VHF/UHF TX/RX Port	Terminal for TX and RX antenna ports of VHF and UHF	
2. Antenna Port	System Antenna Port, N-type female	
3. Power Port	AC 120V input port or DC-48V input port	
4. Optic Port	Optical input port	
5. External Port	Port for external devices	
6. GND LUG PORT	Terminal for system ground	

POWER PORT

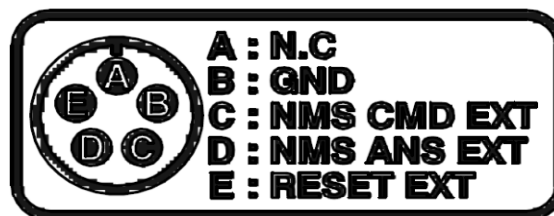
Power ports are used for power-supplying of -48V DC or 120V AC, and specific power cable should be applied to each different types of ROU power supply (AC/DC or DC/DC). Below figure is naming of the power supply by type.



External PORT

External ports are reserved ports for external equipments for future implementation, and used to monitor the status and control the equipments.

Below figure is naming of the external ports.



4.5 Add on V/UHF ROU

Add on ROU(forward naming“AOR”) is connected existing ROU to service VHF/UHF and LTE band. AOR should support either VHF/UHF or LTE RDU

AOR locates above or under of exisiting ROU. AOR receives TX signals from ROU and then amplify these through High Power Amplifier, filter out of band signals and radiated to the TX antenna port. When receiving RX signals through the RX antenna port, this unit filters out-of-band signals and amplify with Low noise Amlifier and output power is connected existing ROU’s RX port. External BPF should be located between TX/RX antenna and AOR’s IN/OUT ports because the BPF rejects the strong broadcasting signal and etc
AOR body meets to NEMA4 degree.

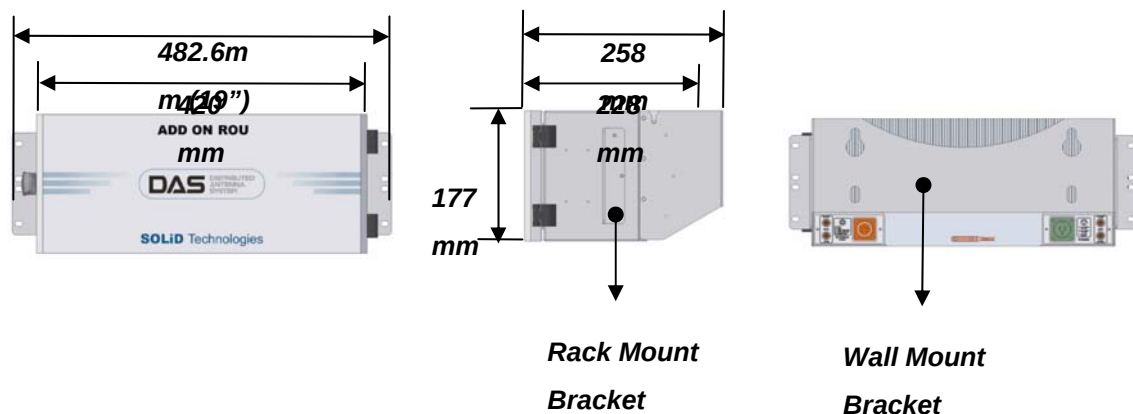


Figure 4.32 – AOR Outer Looks

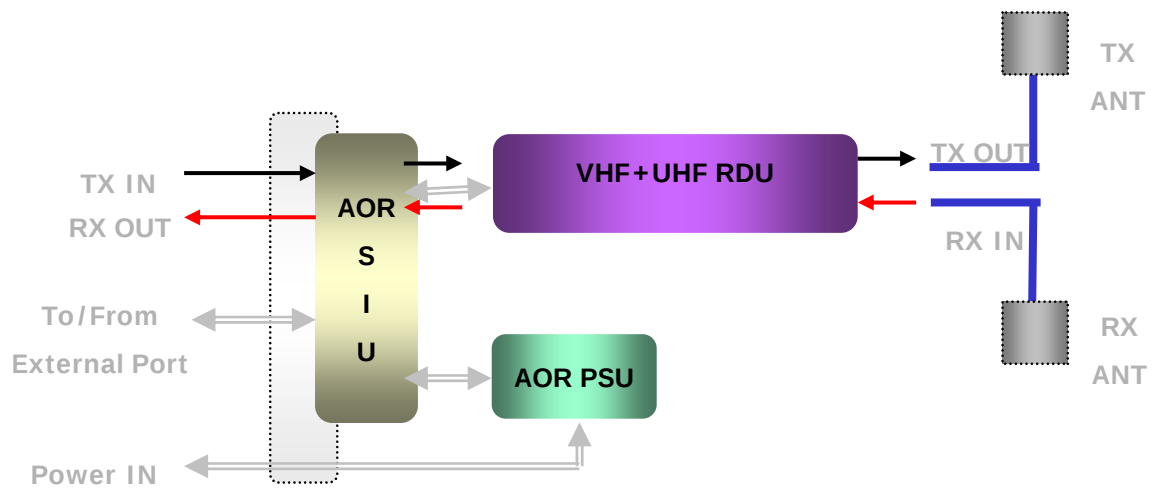
AOR is designed in a cabinet, and provides the following functions and features.

4.5.1 Specifications of AOR

Item	Spec.	Remark
Size(mm)	482.6(19") x 258 x177,	Including Bracket
Weight	11 Kg	
Power consumption	78 W	

4.5.2 Block Diagram of AOR

- VHF+VHF RDU -



- 700LTEF RDU -

