

#### 4.3.5 Front/rear panels of OEU

##### 1) Front panel

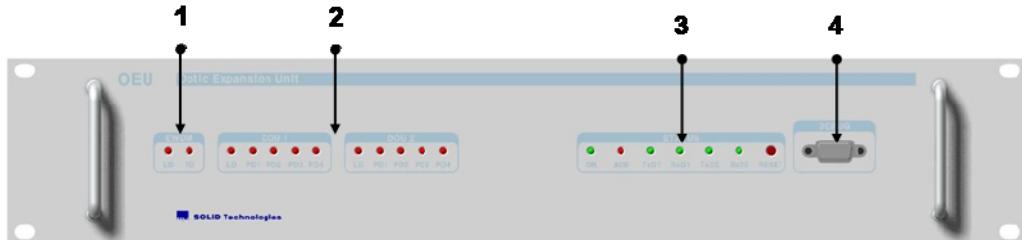


Figure 4.23 – OEU front panel Outer Look

| Item                   | Description   |
|------------------------|---|
| 1.EWDM LED             | LED indicator to check EWDM state to see if it is abnormal  |
| 2.DOU 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

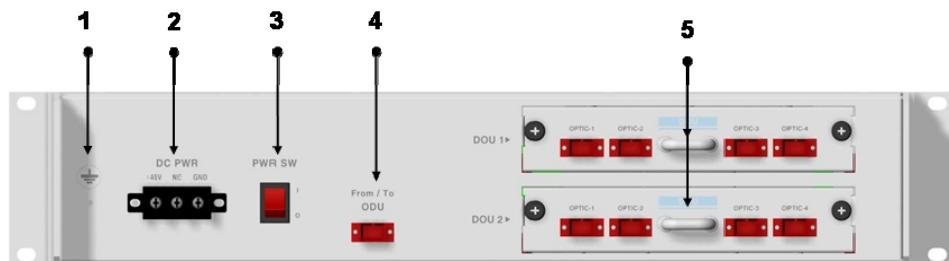


Figure 4.24 – Rear panel Outer Look

| 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.

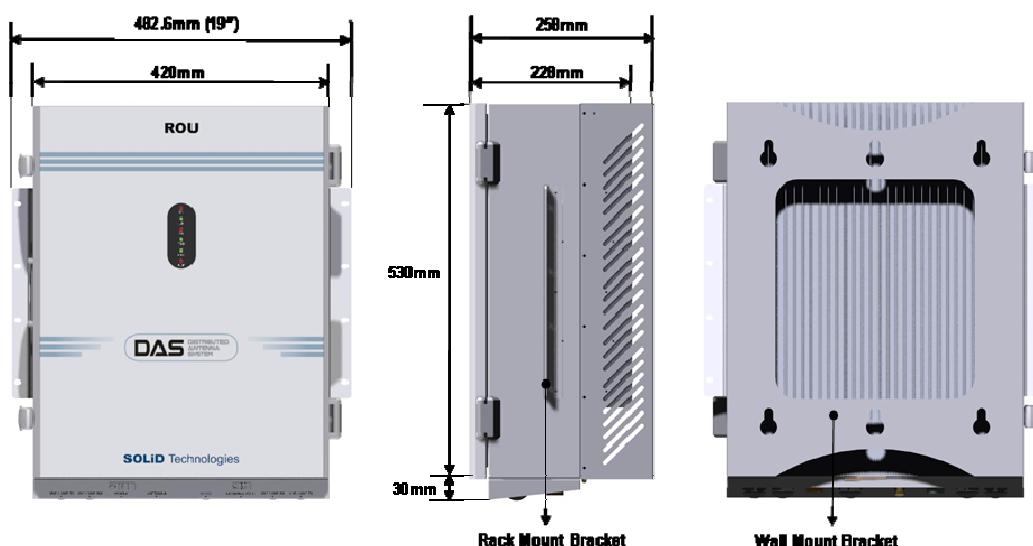


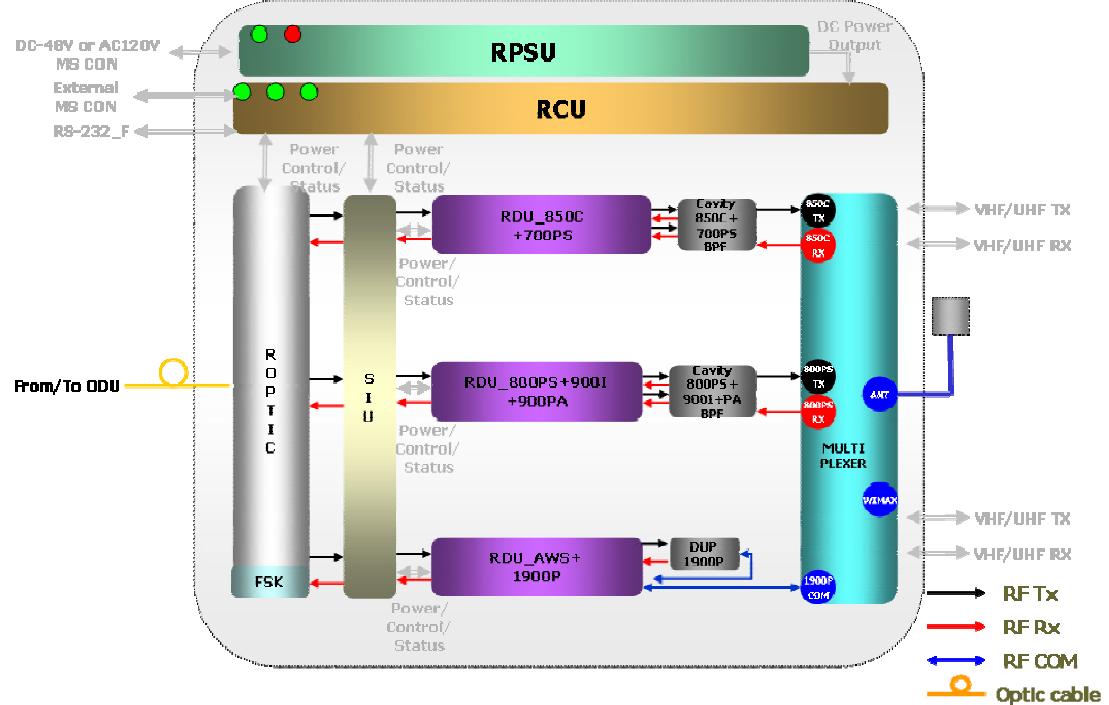
Figure 4.25 – ROU Outer Look

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

### 4.4.1 Specifications of ROU

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

#### 4.4.2 Block Diagram of ROU



#### 4.4.3 ROU parts

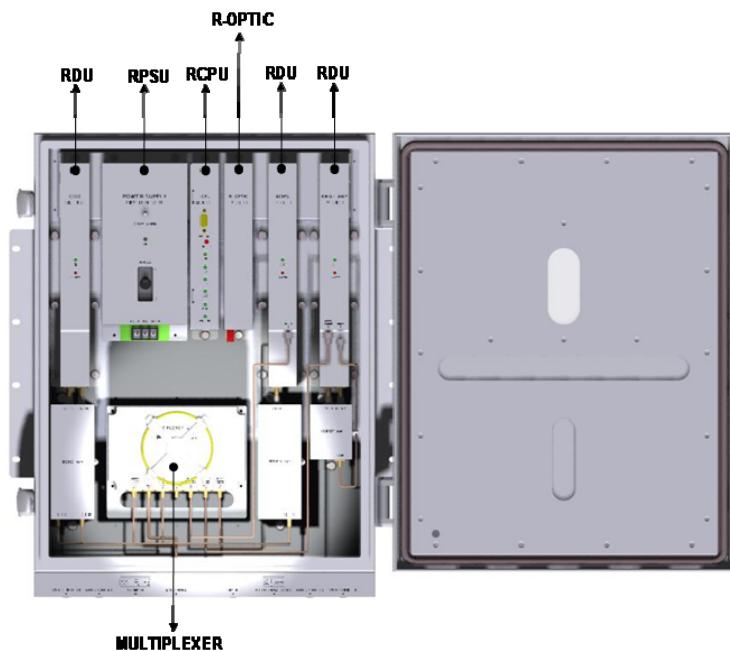


Figure 4.26 – ROU Inner Look

| No. | Unit | Description | Remark |
|-----|------|-------------|--------|
|-----|------|-------------|--------|

|   |             |   |  |
|---|-------------|---|--|
| 1 | RDU+BPF     | <b>Remote Drive Unit</b><br>Filter and high amplify TX signals;<br>Filter and amplify RX signals;<br>Remove other signals through BPF<br>BPF is exclude from VHF+UHF module                   |  |
| 2 | RPSU        | <b>Remote Power Supply Unit</b><br>Input power: DC -48V, Output power: 27V,9V, 6V<br>For 120V input of AC/DC;<br>For -48V input of DC/DC  |  |
| 3 | R-OPTIC     | <b>Remote Optic</b><br>Make RF conversion of TX optical signals;<br>Convert RX RF signals into optical signals;<br>Compensates optical loss<br>Communicates with BIU/OEU though the FSK modem |  |
| 4 | RCPU        | <b>Remote Central Processor Unit</b><br>Controls signal of each unit<br>Monitors BIU/ODU/OEU status through FSK modem communication   |  |
| 5 | Multiplexer | <b>Multiplexer</b><br>Combine TX signals from 3 RDUs;<br>Distribute RX signals to 3 RDUs;<br>Enable you to use a single antenna port  |  |
| 6 | Enclosure   | Enclosure to satisfy NEMA4;<br>Enable Wall/Rack Mount;<br>Check if the system is normal, through the front panel LED  |  |
| 7 | SIU         | <b>System Interface Unit</b><br>Distribute power and signals of each module   |  |

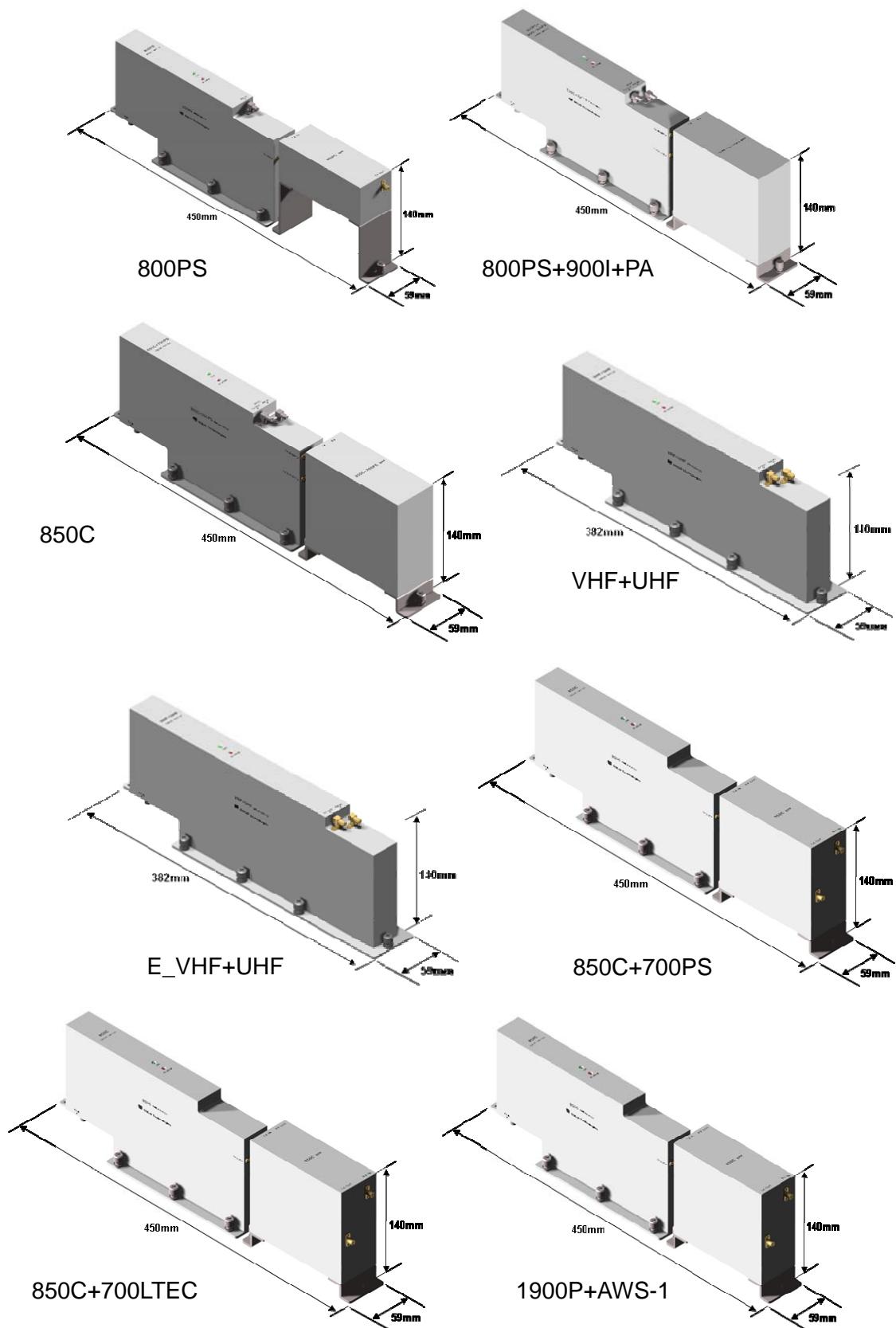
#### 4.4.4 Function by unit

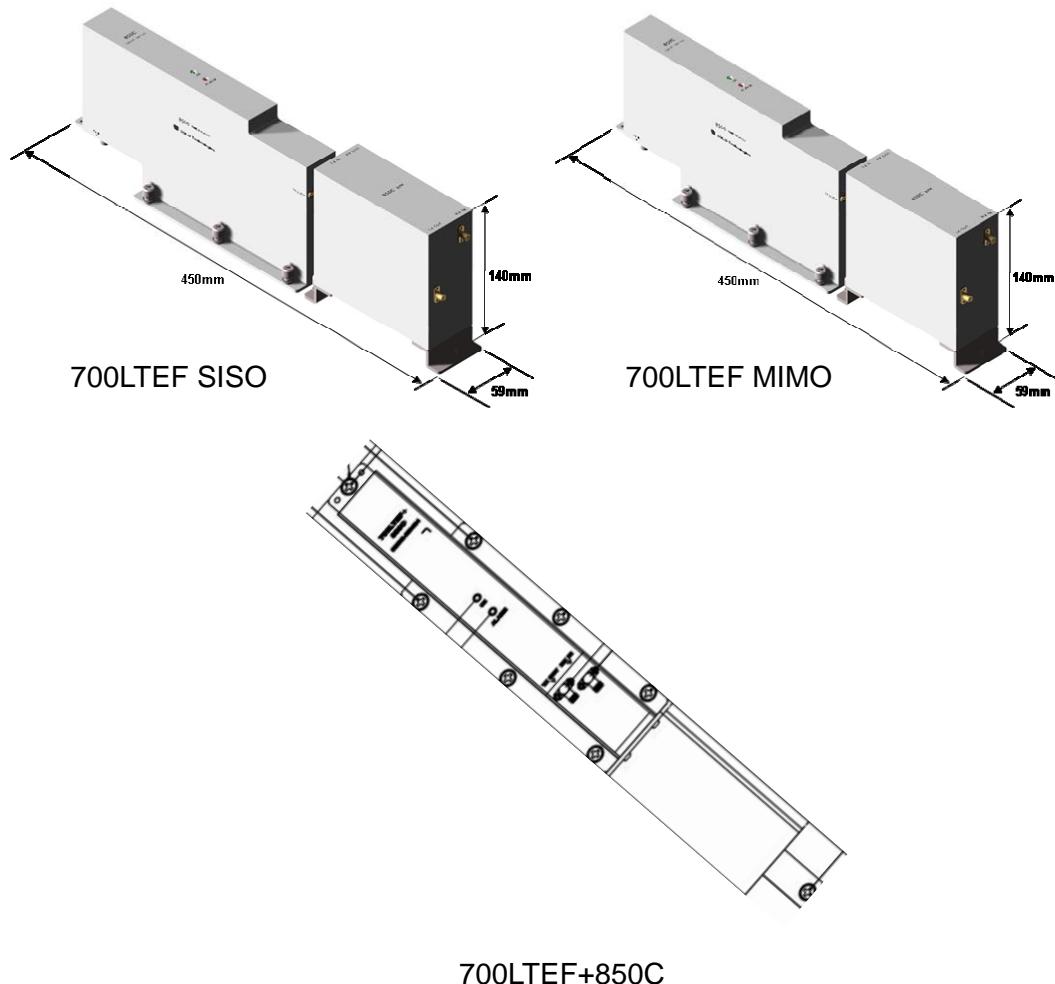
##### 1) Remote Drive Unit (RDU)

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)<br>Internal BPF(AWS-1)   | External BPF(1900P)<br>Internal BPF(AWS-1)   |
| 4  | RDU 800PS+900I+PA | Dual,       | External BPF(800PS)<br>Internal BPF(900I+PA) | Internal BPF(800PS)<br>External BPF(900I+PA) |
| 5  | RDU 850C+700PS    | Dual,       | External BPF(850C)<br>Internal BPF(700PS)    | External BPF(850C)<br>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)<br>Internal BPF(700LTEC)  | External BPF(850C)<br>Internal BPF(LTEC)     |
| 9  | RDU 700LTEF SISO  | Single,     | Internal BPF                                 | External BPF(SISO)<br>Internal BPF(MIMO)     |
| 10 | RDU 700LTEF MIMO  | Single,     | Internal BPF                                 | External BPF(SISO)<br>Internal BPF(MIMO)     |
| 11 | RDU 700LTEF+850C  | Dual,       | External BPF(850C)<br>Internal BPF(700LTEF)  | External BPF(850C)<br>Internal BPF(LTEF)     |





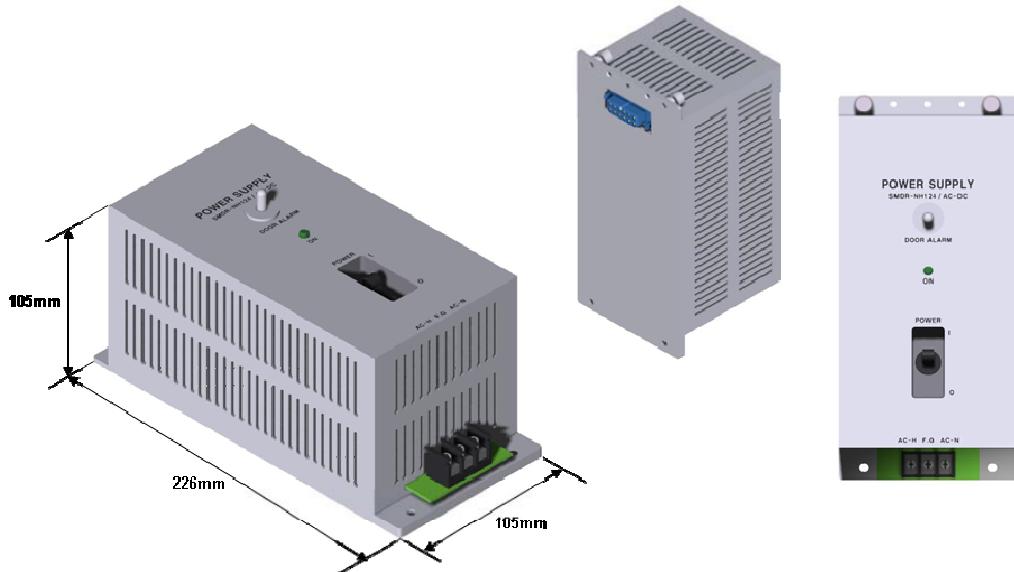
**Figure 4.27 – RDU Outer Look**

## 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.

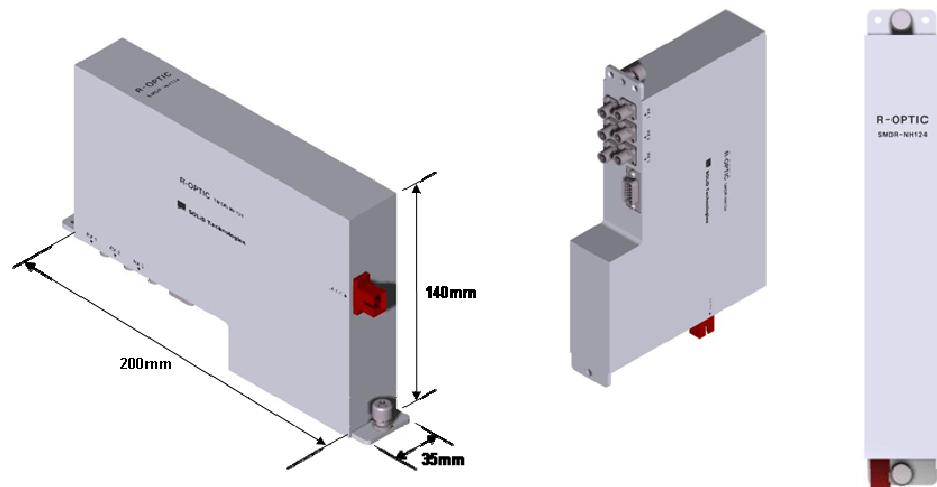
RPSU has a circuit brake to turn the power ON/OFF and has LED indicator at the top to check if input power is normally supplied.



## 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.

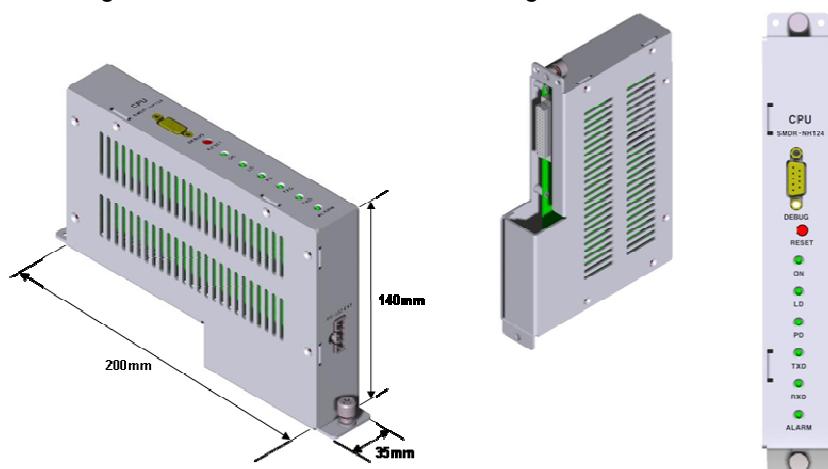
It also has internal ATT for optical compensation to compensate for optical cable loss, if any.



**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.

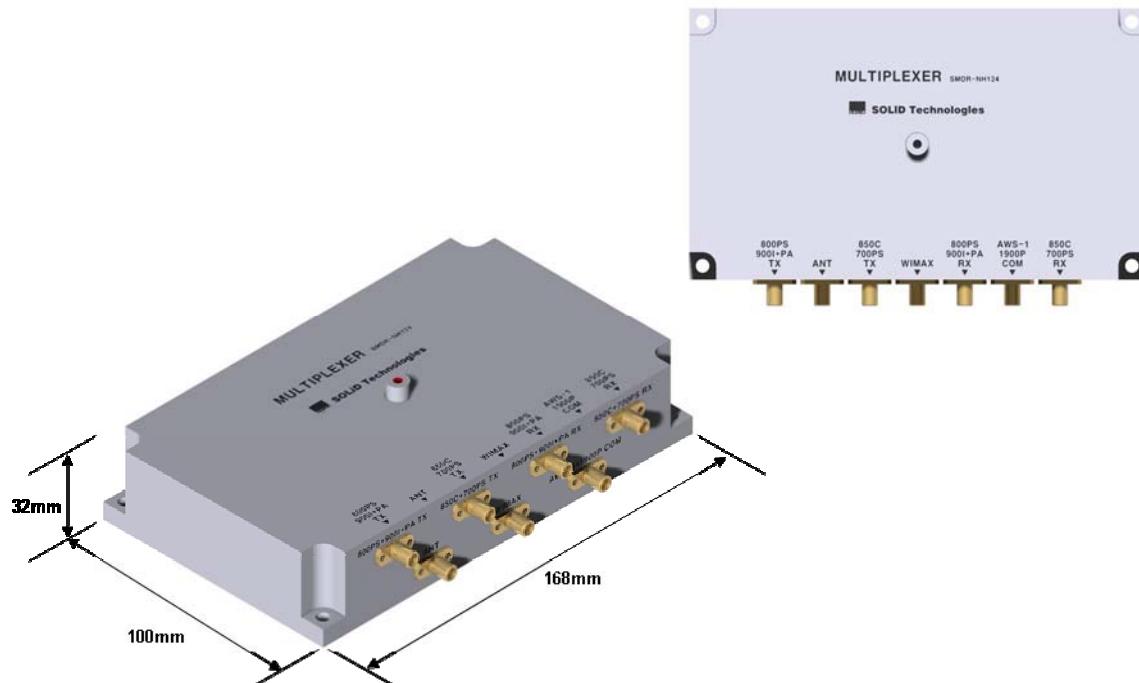


**Figure 4.29 – RCPU Outer Look**

#### 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

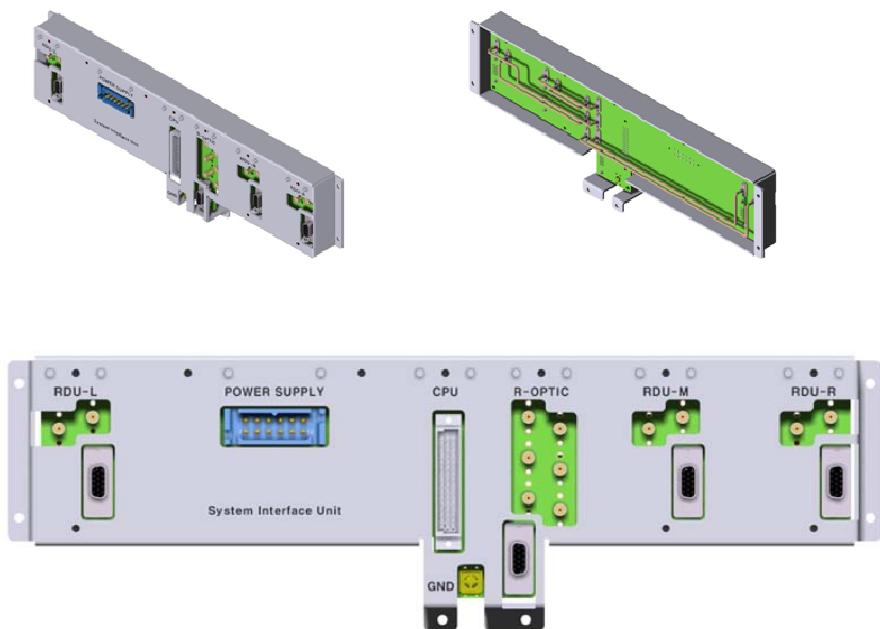
of RDU through a corresponding port.



**Figure 4.30 – Multiplexer Outer Look**

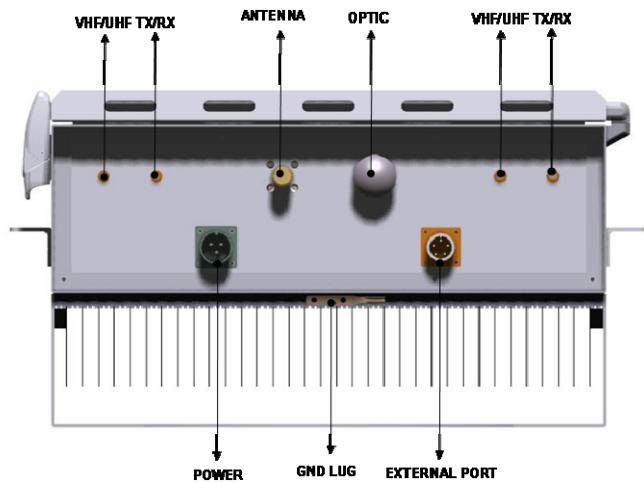
## 6) System Interface Unit(SIU)

SIU distributes power and signals to each module.



#### 4.4.5      Bottom of ROU

##### 1) Functions

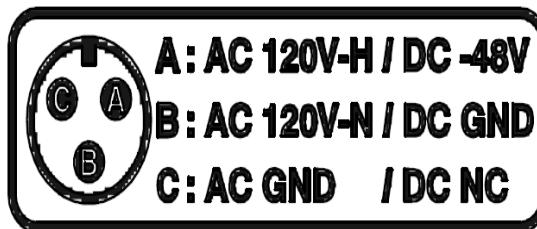


**Figure 4.31 – ROU Bottom Look**

| 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

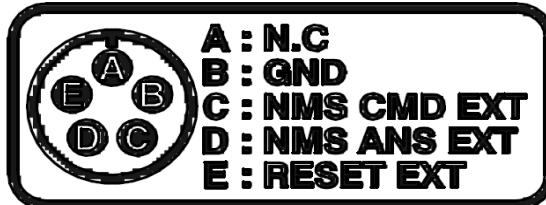
Power ports are used for power-supplying of -48V DC or 120V AC, and specific power cable should be applied to each different types of ROU power supply (AC/DC or DC/DC). Below figure is naming of the power supply by type.



## 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.

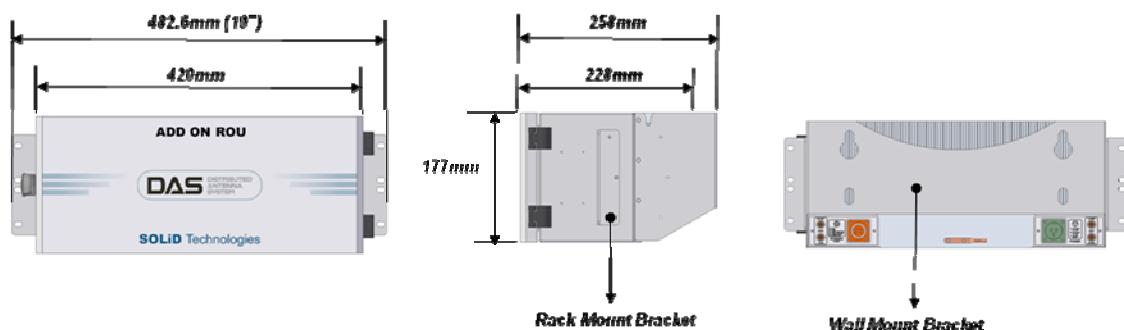


## 4.5 Add on V/UHF ROU

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 existing 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**

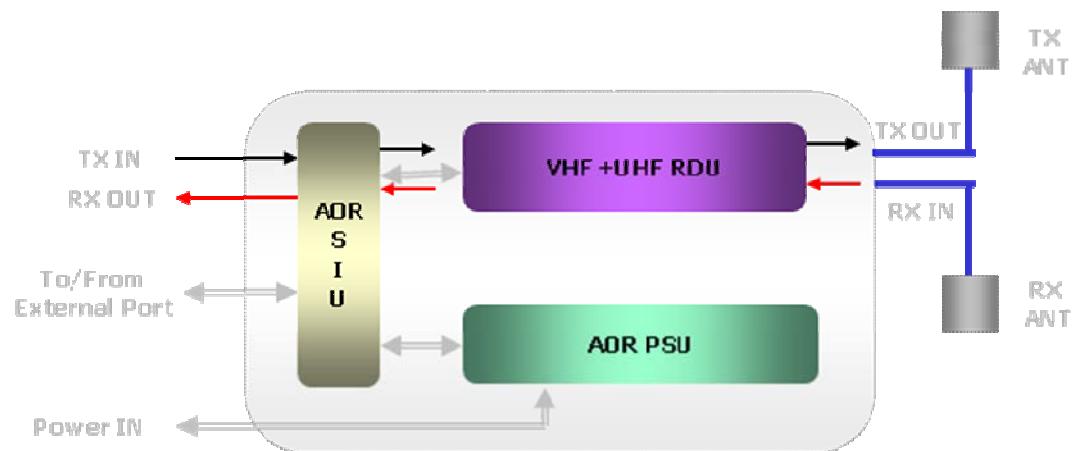
AOR is designed in a cabinet, and provides the following functions and features.

### 4.5.1 Specifications of AOR

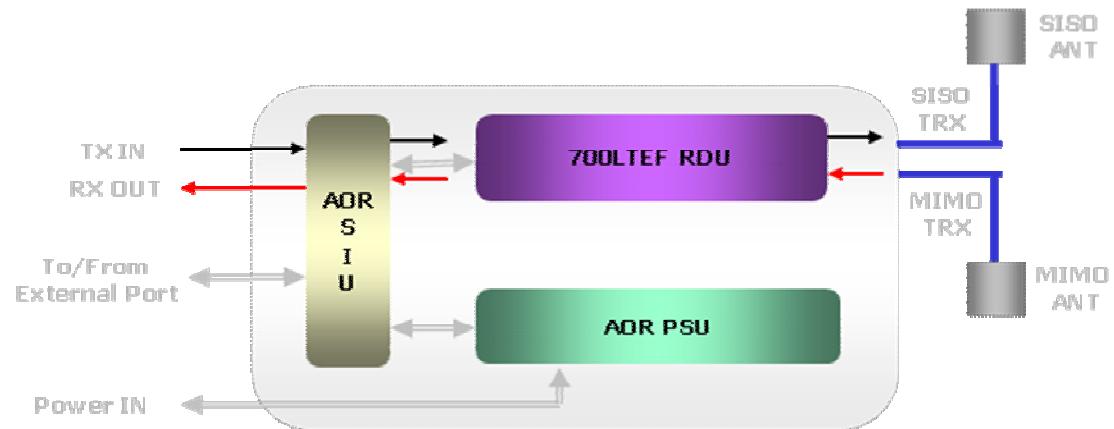
| Item                     | Spec.                  | Remark            |
|--------------------------|------------------------|-------------------|
| <b>Size(mm)</b>          | 482.6(19") x 258 x177, | Including Bracket |
| <b>Weight</b>            | 11 Kg                  |                   |
| <b>Power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

#### 4.5.2 Block Diagram of AOR

**- VHF+VHF RDU -**

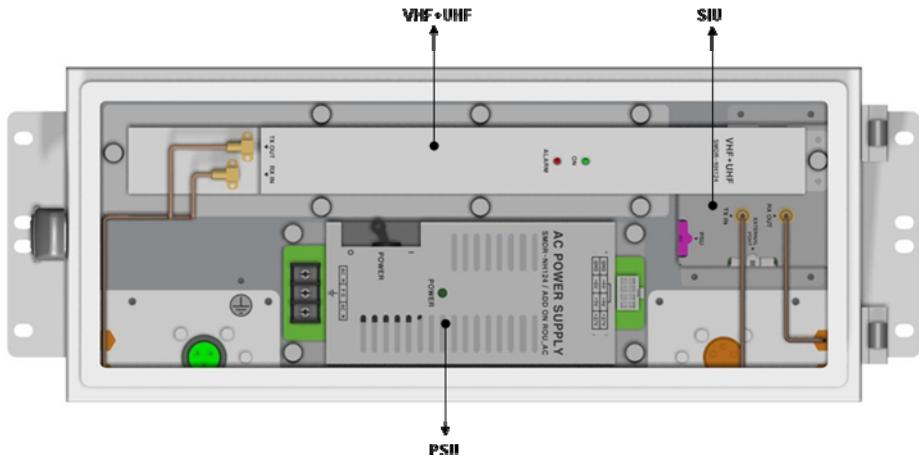


**- 700LTEF RDU -**

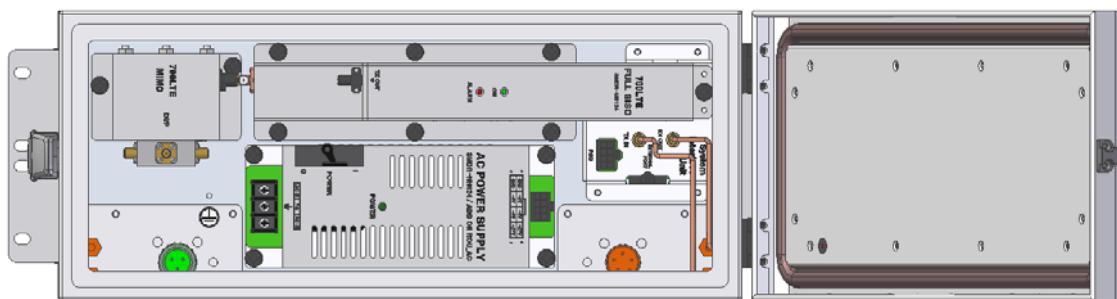


### 4.5.3 AOR parts

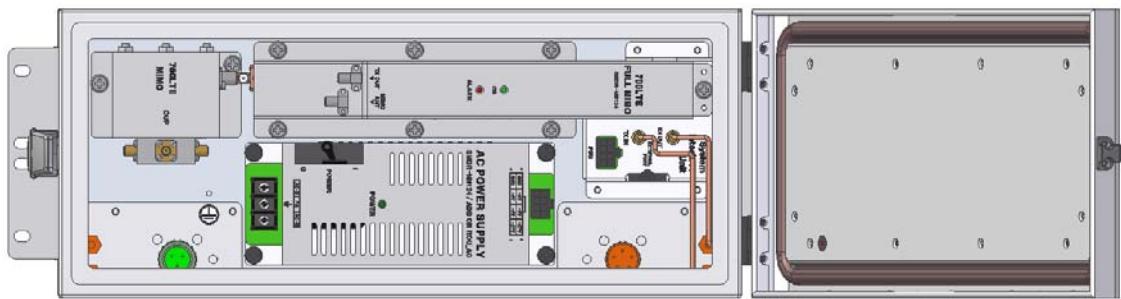
#### - VHF+UHF -



#### - 700LTEF SISO -



#### - 700LTEF MIMO -



**Figure 4.33 – AOR Inner Look**