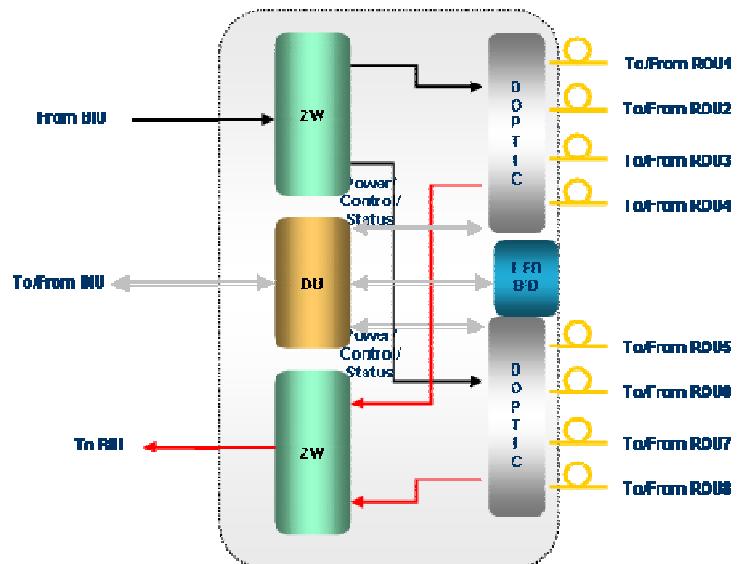


#### 4.2.2 Block Diagram of ODU



#### 4.2.3 ODU parts

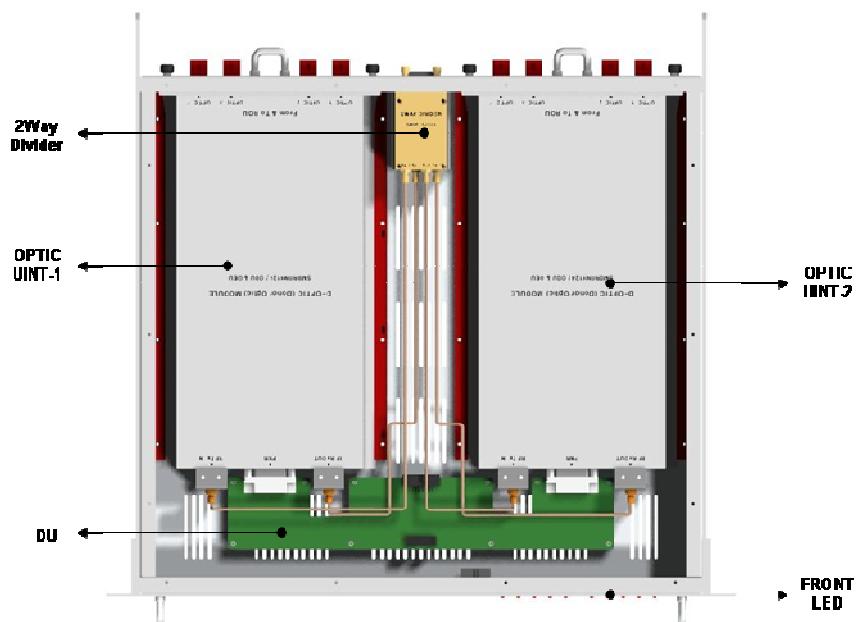


Figure 4.10 – ODU Inner Look

No.	Unit	Description	Remark
1	DOU	<b>DOU</b>  Convert TX RF signals into optical signals; Convert RX optical signals into RF signals; Provide up to four optical ports per DOU	Max 2ea
2	2W	<b>2Way Divider</b>  Divide TX RF signals into two; Combine two RX RF signals into one	
3	DU	<b>Distribution Unit</b>  Distribute power and signals to DOU	
4	Shelf	19" rack, 1U	
5	Accessories	15PIN DSUB, Male to female 1pcs RF Coaxial Cable Assembly 2pcs	

#### 4.2.4 Function by unit

##### 1) Donor Optic Unit (DOU)

DOU makes electronic-optical conversion of TX signals and makes optical-electronic conversion of RX signals.

With an optic splitter in it, this unit divides optical signals from Laser Diode into four and then distributes them to each optical port. With a total of four Photo Diodes in RX, DOU makes optical-electronic conversion of signals received from each optical port. In addition, the unit is equipped with ATT for optical compensation made in case of optical cable loss.

With internal WDM, it uses only one optical cable to be connected with ROU.

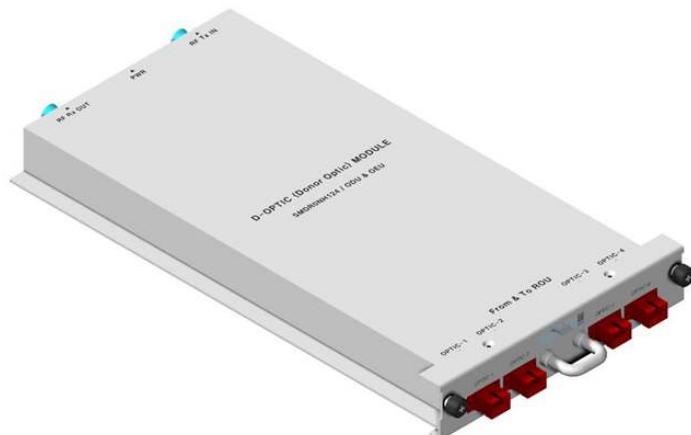
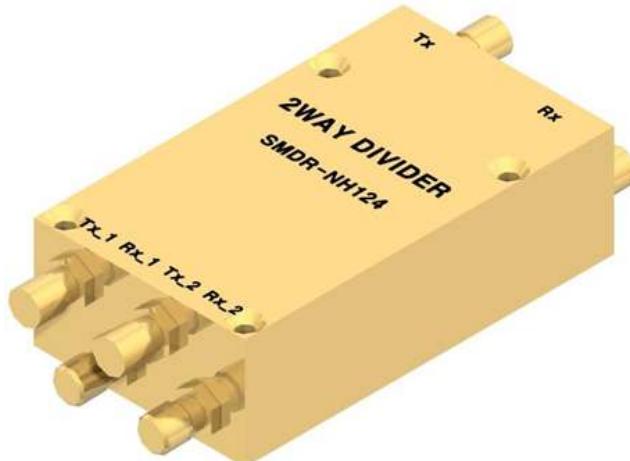


Figure 4.11 – MDBU Outer Look

## 2) 2Way Divider (2W)

2W is equipped with two 2-way splitters in a one-module form and the splitters work for TX/RX signals, respectively.

Designed in broadband type, the divider combines and divides 2GHz or higher of signals from FSK modem signals.



**Figure 4.12 – 2Way Divider Outer Look**

### 4.2.5 Front/rear panels of ODU

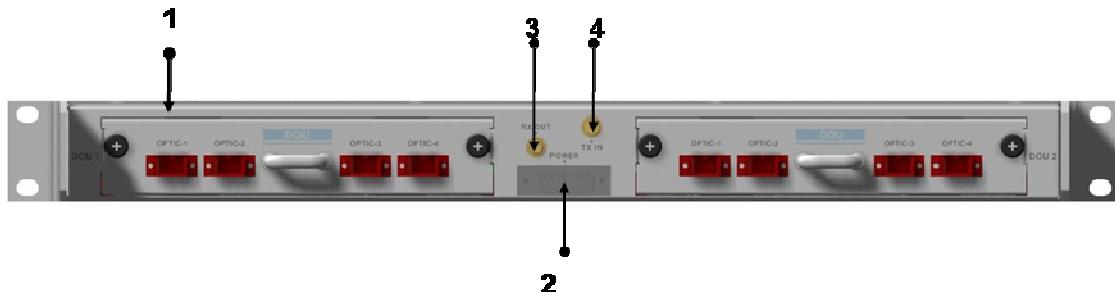
#### 1) Front panel



**Figure 4.13 – ODU front panel Outer Look**

Item	Description
1,2	LED indicator to check DOU module state to see if it is abnormal

**2) Rear panel**



**Figure 4.14 – ODU Rear panel Outer Look**

Item	Description
1. Optic Port	SC/APC optical connector terminal; use one optical cable per ROU.
2. DC I/O Port	Terminal to deliver power and state values
3. RX RF Port	RX RF signal interface terminal
4. TX RF Port	TX RF signal interface terminal

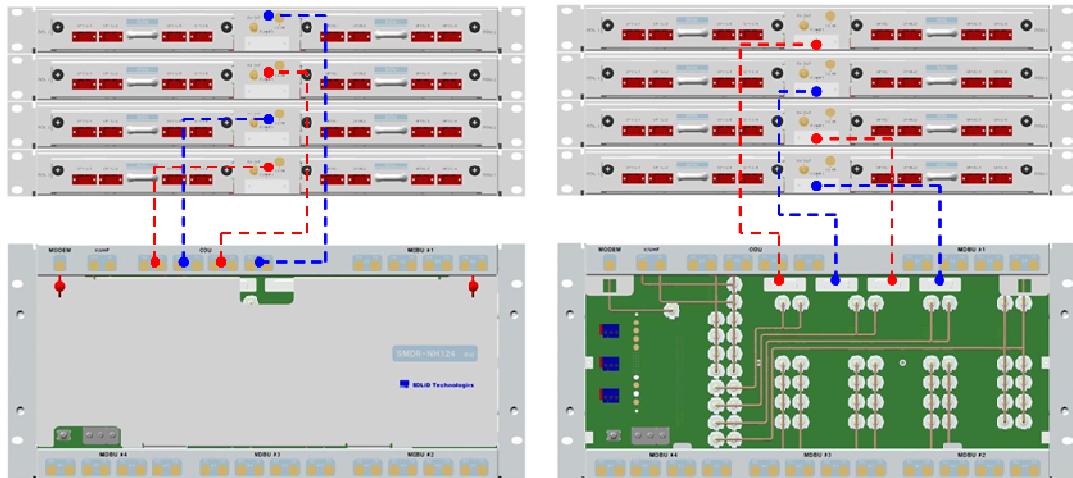
**4.2.6 Interface with BIU**



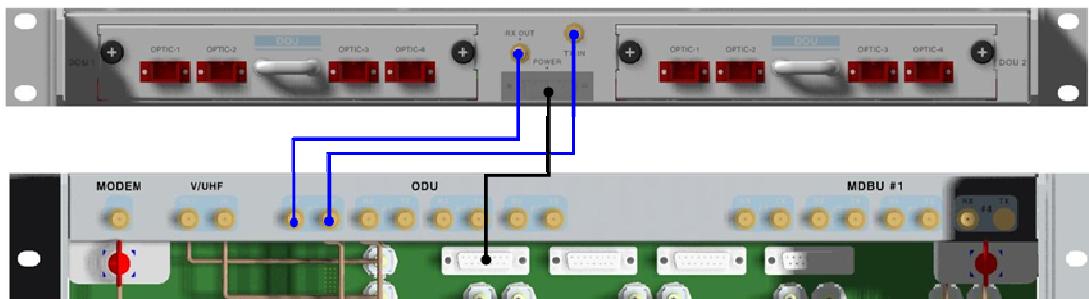
**Figure 4.15 – Interface between BIU and ODU**

On the top of BIU, up to four ODUs can be stacked.

In this case, it is recommended to stack the units at least 1U of an interval between BIU, for heat from BIU may climb up to ODU, which may cause flame.



As seen in the figure below, connect the coaxial cable for TX and another coaxial cable for RX with corresponding ports at the rear of BIU. For power supply and communication, connect 15Pin D-Sub Connector cable with a corresponding port.



### 4.3 OEU (Optic Expansion Unit)

OEU is mainly used to remotely deliver signals for Campus clusters. At the upper part, this unit combines with ODU and receives TX optical signals to convert them into RF signals. Then, it regenerates the signals to secure S/N feature and converts them into optical signals. The signals are sent to ROU through optical cables. When it receives RX optical signals from ROU, the unit converts them into RF signals to regenerate the signals and then converts them into optical signals to send them to ODU.

In OEU, one shelf can be equipped with up to two DOUs. The DOU is the same as the module used for ODU. Up to two OEUs can be connected with ODU.

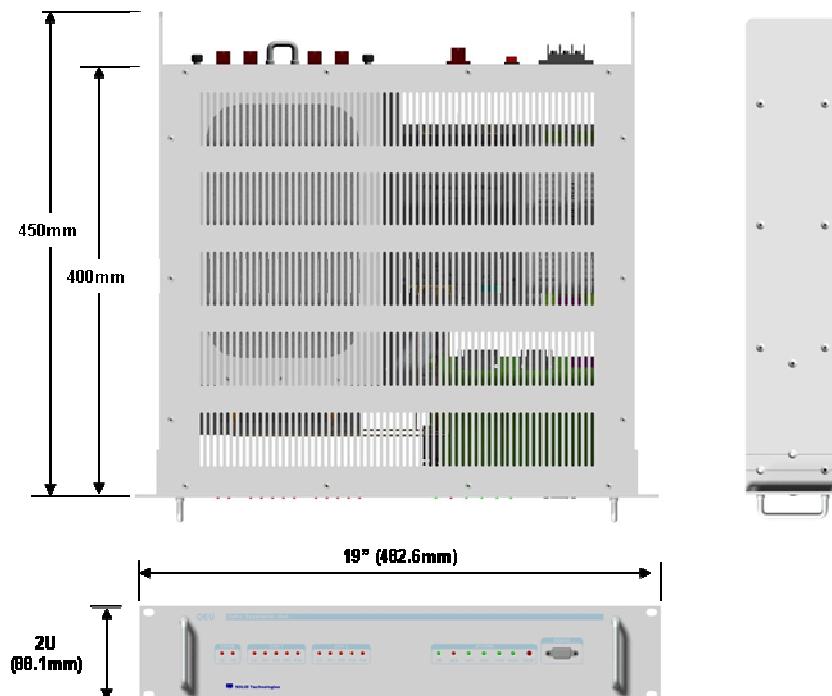
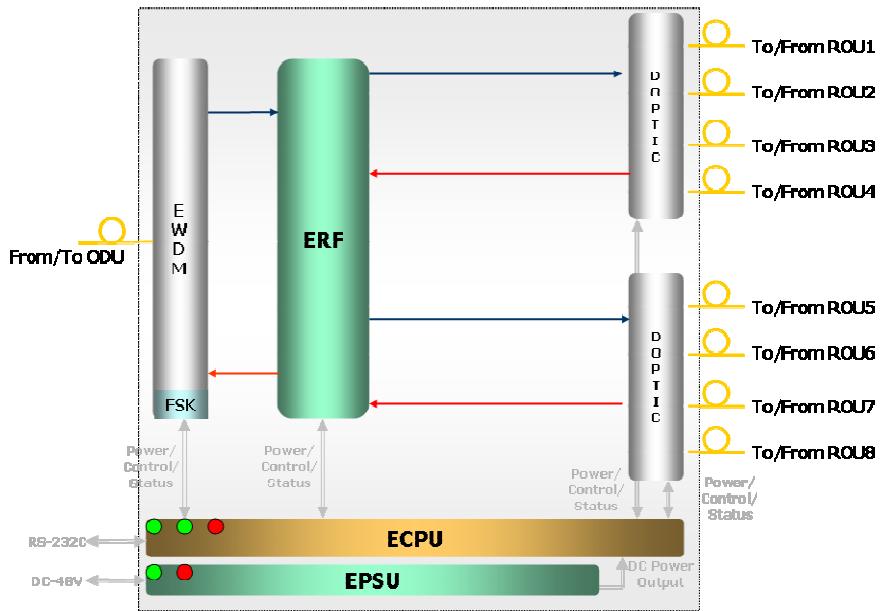


Figure 4.16 – OEU Outer Look

#### 4.3.1 Specifications of OEU

Item	Spec.	Remark
Size	482.6(19") x 88.1(2U) x 450	mm
Weight	9.3 Kg	
Power consumption	48 W	Full Load

#### 4.3.2 Block Diagram of OEU



#### 4.3.3 OEU parts

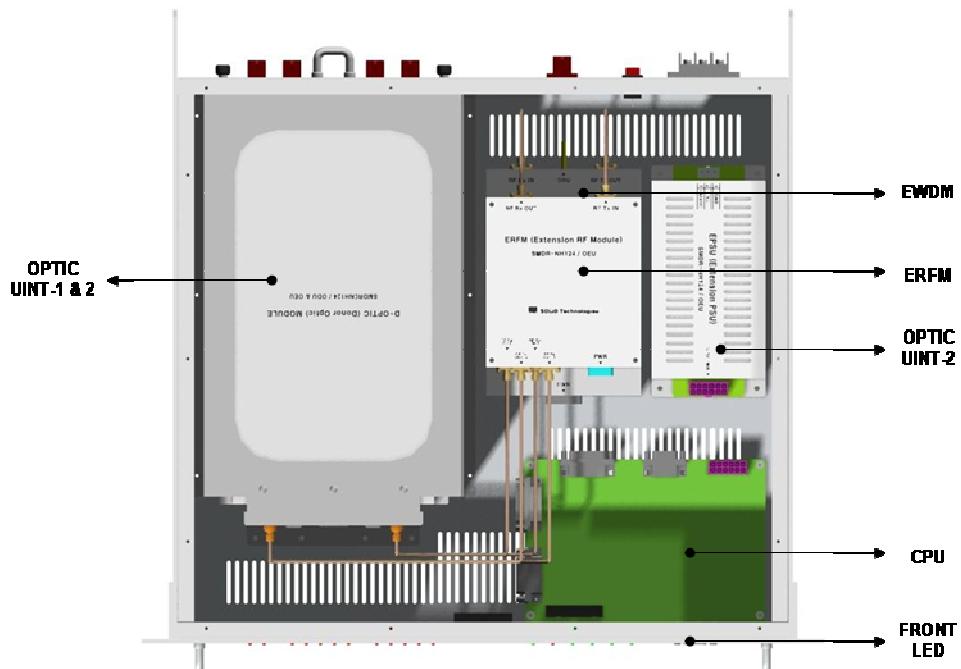


Figure 4.17 – OEU Inner Look

No.	Unit	Description	Remark
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1	DOU	<b>Donor Optic Unit</b> Convert TX RF signals into optical signals; Convert RX optical signals into RF signals; Provide up to four optical ports per DOU	Max 2ea
2	EWDM	<b>Expansion Wavelength Division Multiplexer</b> Convert TX optical signals into RF signals; Convert RX RF signals into optical signals; Compensate for optical cable loss with ODU	
3	ECPU	<b>Expansion Central Processor Unit</b> Control and monitoring system status Control and monitoring with RS232 Relay state values of ROU to BIU	
4	EPSU	<b>Expansion Power Supply Unit</b> Input power: DC -48V, Output power: 9V, 6V	
5	ERFM	<b>Expansion Radio Frequency Module</b> Regenerate TX signals and transmit FSK modem signals; Regenerate RX signals and receive FSK modem signals	
6	Shelf	19" rack, 2U	

#### 4.3.4 Function by unit

- 1) **Donor Optic Unit (DOU)**  
DOU is the same as the module used for ODU.

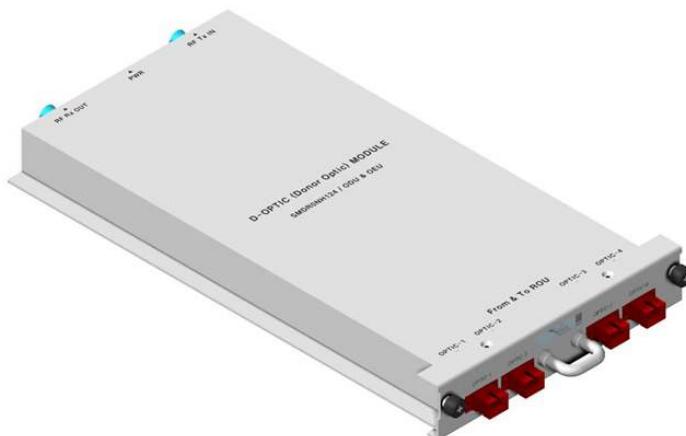
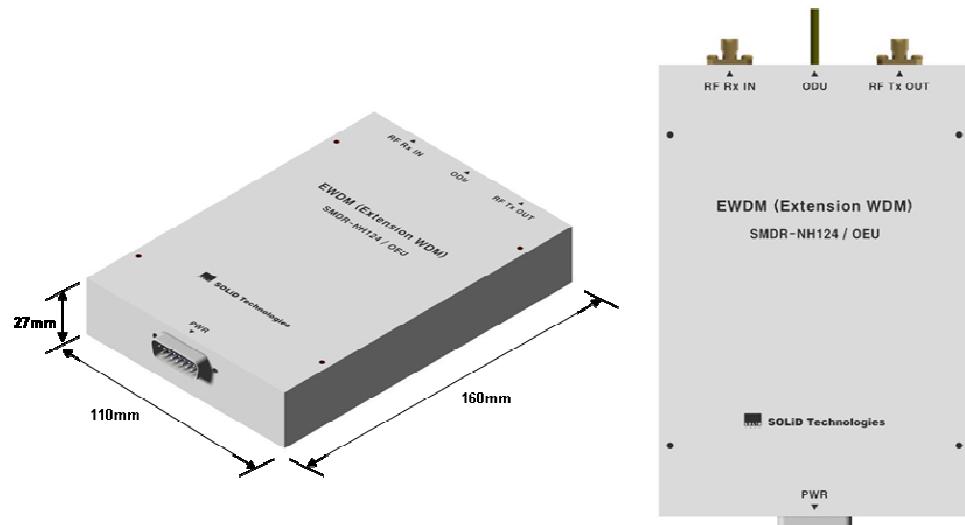


Figure 4.18 – MDBU Outer Look

## 2) Expansion Wavelength Division Multiplexer(EWDM)

EWDM module makes optical-electronic conversion of TX signals and makes electronic-optical conversion of RX signals. With an FSK modem in it, this multiplexer communicates with BIU. It also has ATT for optical compensation to compensate for optical cable loss between ODUs. Furthermore, it has internal WDM, and so, it needs only one optical cable to work with ROU.

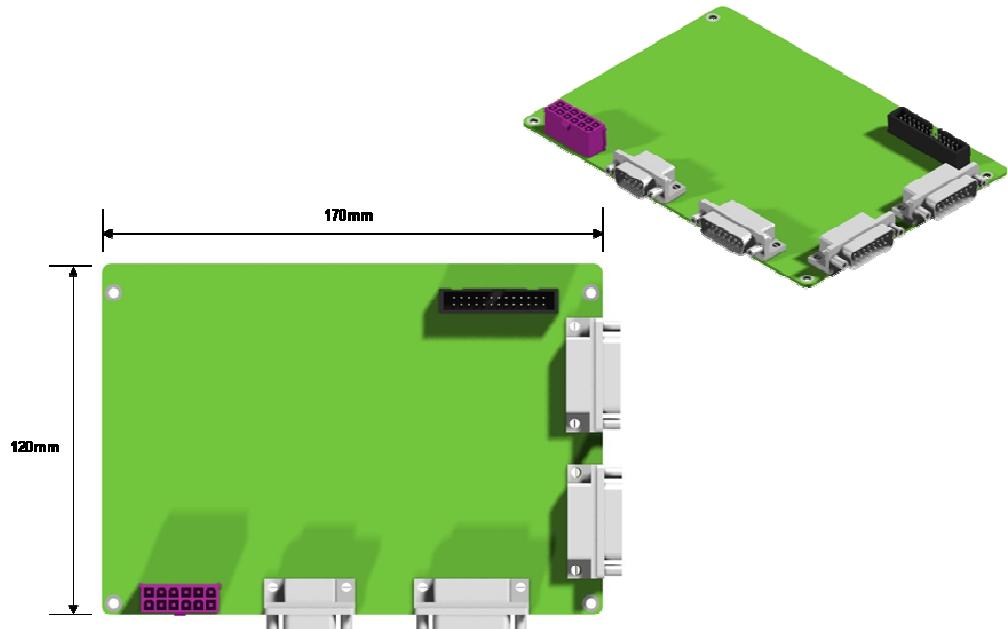


**Figure 4.19 – EWDM Outer Look**

## 3) Expansion Central Processor Unit(ECPU)

ECPU can inquire and control state of modules to be installed into OEU. This unit communicates with upper BIU while communicating with lower ROU. It also acts as communication bridge between BIU and ROU.

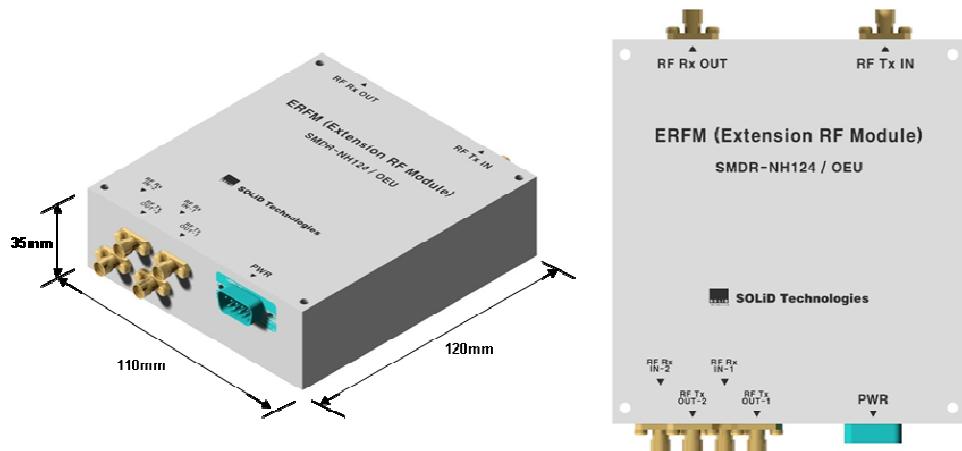
In addition, the unit has RS-232C port for serial communication, which enables inquiry and control of devices through PC. At the front panel, communication LED indicator indicates communication state with upper BIU and lower ROU. It also has ALM LED indicator to show if a device gets faulty.



**Figure 4.20 – ECPU Outer Look**

#### 4) Expansion Radio Frequency Module(ERFM)

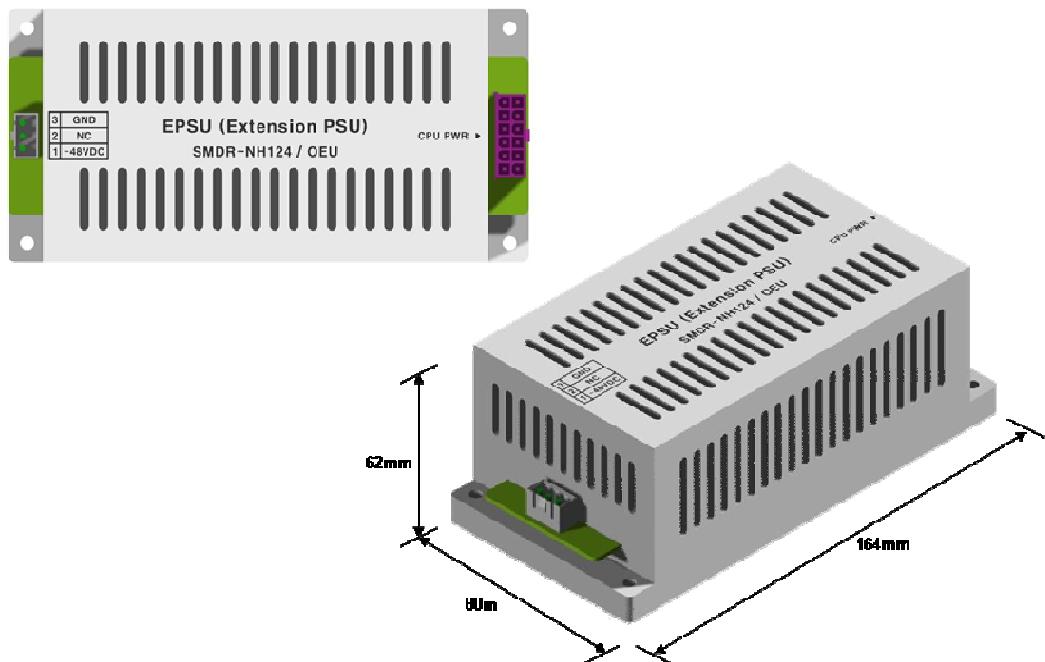
ERFM reconstructs Signal to Noise degraded by optical modules. With an internal FSK modem, this module communicates with ROU.



**Figure 4.21 – ERFM Outer Look**

#### 5) Expansion Power Supply Unit(EPSU)

As DC/DC Converter, EPSU receives -48V of input and provides +9V and +6V of DC power required for OEU.



**Figure 4.22 – ERFM Outer Look**

#### 4.3.5 Front/rear panels of OEU

##### 1) Front panel

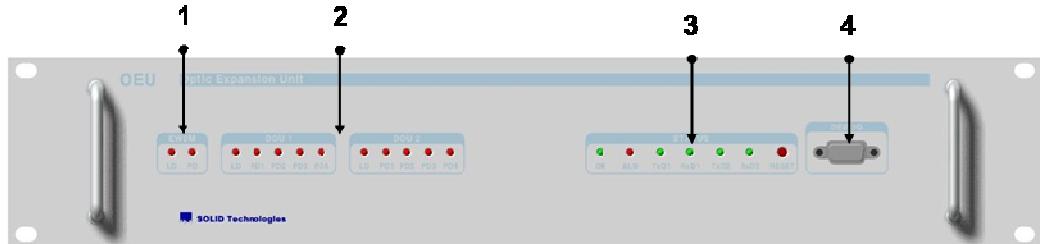


Figure 4.23 – OEU front panel Outer Look

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

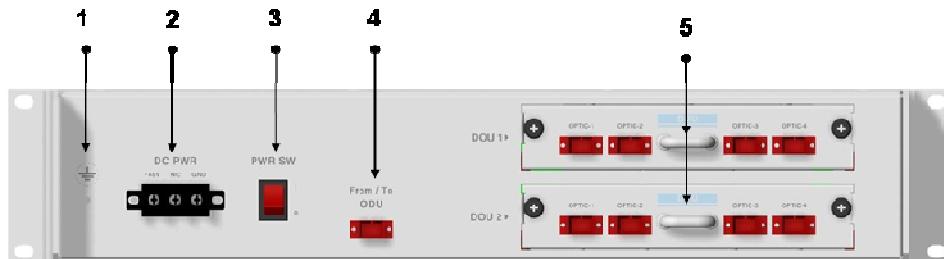


Figure 4.24 – Rear panel Outer Look

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.