

SC-DAS

Installation and Operation Manual



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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 repeater, including this repeater, will generate radio signals and thereby give rise to electromagnetic fields that may be hazardous to the health of any person who is extensively exposed to the signals at the immediate proximity of the repeater and the repeater antennas.
- 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 and 90
 - 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
- For PLUGGABLE EQUIPMENT, the socket-outlet shall be installed near the equipment and shall be easily accessible.

Section2

System Overview

-
- 2.1 General overview
 - 2.2 System overview

2.1 General overview

SC-DAS 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 SC-DAS system supports communication standards and public interface protocols in worldwide use.

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

SC-DAS is in modular structure per frequency. To provide desired frequency in a building, all you need to do is to insert a corresponding frequency module into each unit. As it delivers multiple signals with one optical strand 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 or 60(using OEU)
 - Clustering multiple-buildings (campus) as one coverage
- Modular structures
 - Modular frequency upgrade
 - Plug-in type module
- Multi-Band, Single operator

- Signals with a plurality of service provider transmit simultaneously
- Support multi-operator in a band(Max 2operator)
- Low OPEX / CAPEX
 - Compact design
 - Upgradable design
 - Easy installation and maintenance
 - Adopt auto ID scheme

SC-DAS platform will serve two primary segments; the first will be as a carrier deployed coverage enhancement product for their frequencies only and the second is as a low cost public safety and single carrier combination product.

2.2 System overview

SC-DAS is composed of devices given below.

Basically, the system consists of BIU (BTS Interface Unit), ODU (Optic distribution Unit) and ROU (Remote Optic Unit). For addition of more ROUs, it has OEU (Optic Expansion Unit).

BIU has two layer which supports both SISO and MIMO configuration using separate optical fiber cable. Fig2.1 shows basic system topology for SISO

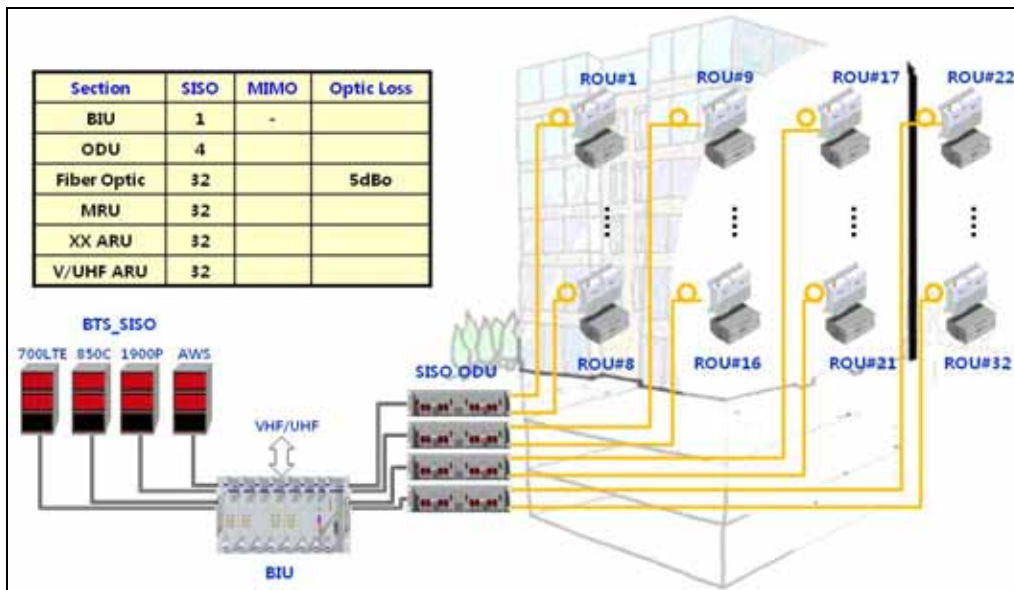


Figure 2.1 – Basic system topology supporting SISO configuration

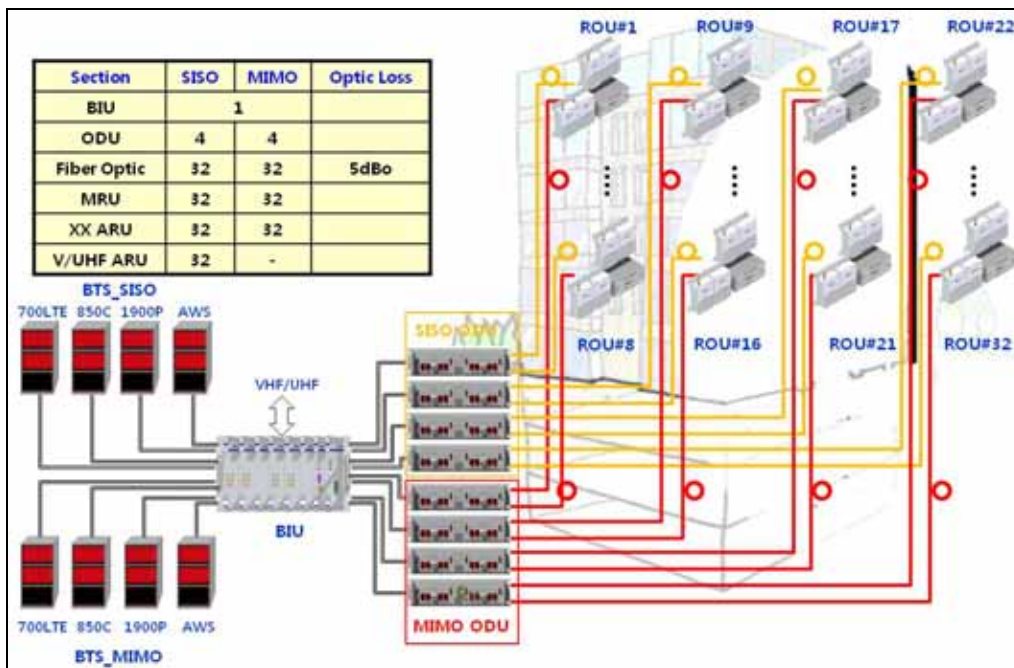


Figure 2.2 – Basic system topology supporting MIMO configuration

As shown at Fig2.1 and 2.2, one optical cable needs for SISO configuration but two optical cable needs for MIMO configuration when it connected with ROU. A site requirement for a SISO application even though more optical cable needs, we can expand more ROUs using MIMO slot up to 64 ROUs Without addtive BIU for expanding MIMO, it supports both SISO and MIMO configuration usign one BIU. For configuration of MIMO, it needs ODU's for MIMO path only.

To reduce number of optical cables between building or support campus cluster application, we can utilize the OEU(Optical Expansion Unit)

Fig 2.3 shows expansion system topology supporting SISO configuration using OEU

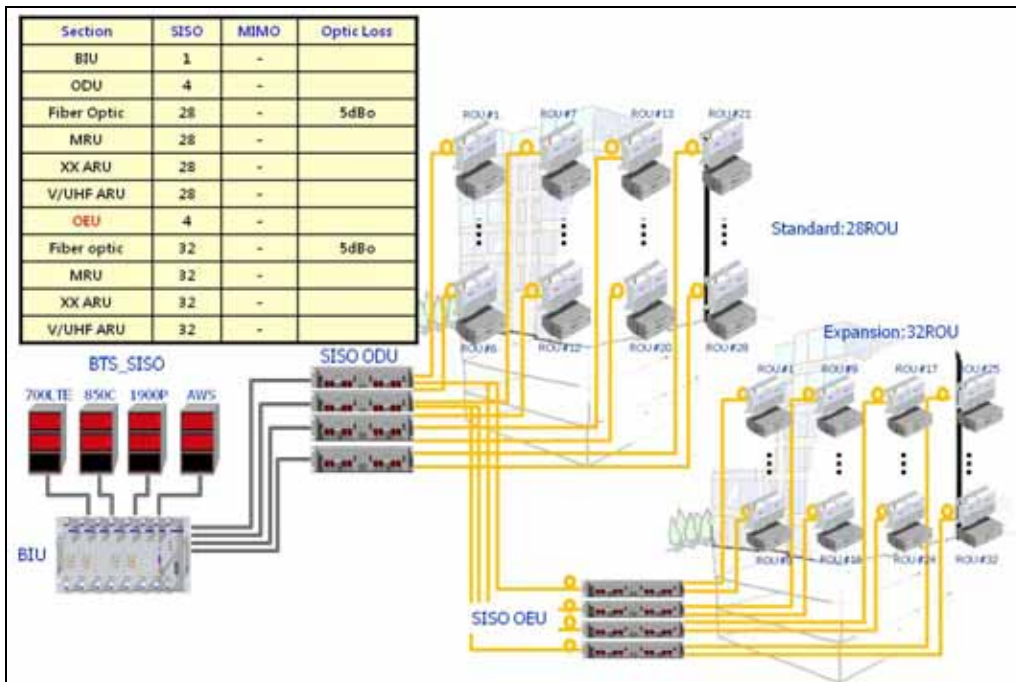


Figure 2.3 – Expansion system topology supporting SISO configuration

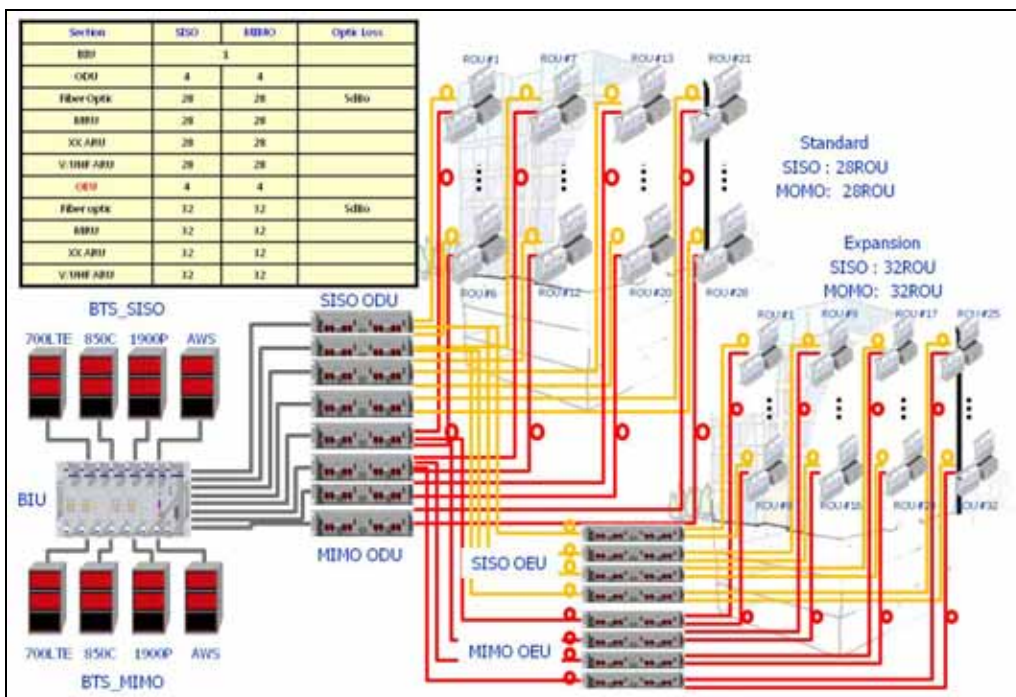


Figure 2.4 – Expansion system topology supporting MIMO configuration

Fig 2.4 shows expansion system topology supporting MIMO configuration using OEU

Section3

System Specifications

- 3.1 System specifications**
 - 3.1.1 Physical Specifications**
 - 3.1.2 Optic wavelength and Laser power**
 - 3.1.3 Environmental specifications**
 - 3.1.4 Operating Frequencies range**
 - 3.1.5 Specifications Per band**

3.1 System specifications

3.1.1 Physical Specifications

Parameter	BIU	ODU	OEU	MRU	ARU
RF Connectors	4 SMA pairs(TX,RX) per MDBU	2 SMA	-	1 N-type 2SMA :optical 2SMA :RF	2SMA :optical 2SMA :RF
External Alarm connector (Dry contacts)	TB: 4pcs for output TB: 3pcs for input	-	-	-	-
Serial Interface connector	1 USB(B) type		1 USB(B) type	1 USB(B) type	1 USB(B) type
Fiber connector	-	8pcs, SC/APC for ROU	1 SC/APC for ODU 8 SC/APC for ROU	1 SC/APC for ODU	-
LED Alarm and Status Indicator	<p>MDBU Status</p> <ul style="list-style-type: none"> ● Power status ● ALM status <p>MCPU</p> <ul style="list-style-type: none"> ● Power status ● TX Comm ● RX Comm ● ALM status <p>MPSU</p> <ul style="list-style-type: none"> ● Power status ● DC ALM status 	<p>DOU1 Status</p> <ul style="list-style-type: none"> ● LD status ● PD1/2/3/4 status <p>DOU2 Status</p> <ul style="list-style-type: none"> ● LD status ● PD1/2/3/4 status 	<p>EWDM Status</p> <ul style="list-style-type: none"> ● LD status ● PD status <p>DOU1 Status</p> <ul style="list-style-type: none"> ● LD status ● PD1/2/3/4 status <p>DOU2 Status</p> <ul style="list-style-type: none"> ● LD status ● PD1/2/3/4 status <p>System status</p> <ul style="list-style-type: none"> ● Power status ● TX1 Comm ● RX1 Comm ● TX2 Comm ● RX2 Comm ● ALM status 	<p>System status</p> <ul style="list-style-type: none"> ● Power status ● TX Comm ● RX Comm ● ALM status ● Opt status 	<p>System status</p> <ul style="list-style-type: none"> ● Power status ● TX Comm ● RX Comm ● ALM status
AC Power	-	-		Normal Range: 120VAC 50/60Hz Operating range 108~132VAC,50/60Hz	Same left side
DC Power	Normal range: -48 VDC Operating range: -40.8 ~ -57.6VDC	Be provided by BIU		Normal: -48 VDC Operating range: -40.8 ~ -57.6VDC	Same to left side
Power consumption	SISO Mode : 162W (Including SISO ODU 4EA) MIMO Mode : 315W (Including SISO ODU 4EA+MIMO ODU 4EA)	28W (Including DOU2EA)	40W (Including DOU2EA)	50W for dual band	40W for dual band
Enclosure Dimensions	482.6(19") x 221.5(5U) x 450	482.6(19") x 43.6(1U) x 450	482.6(19") x 88.1(2U) x 450	300 x 200 x 258	300 x 200 x 258
Weight[Full Load]	26.2Kg	6Kg	9.6Kg	6.6Kg	6.8Kg

3.1.2 Optical wavelength and Laser power

Parameter	ODU	OEU	ROU
Optical Wavelength	TX: 1310nm RX: 1550nm	West optic TX: 1550nm, RX: 1310nm East optic TX: 1310nm, RX: 1550nm	TX: 1550nm RX: 1310nm
Output power	1.5dBm±1dBm to ROU,OEU	1dBm±1dBm to ROU 7dBm±1dBm to ODU	7dBm±1dBm to ODU
Return loss	<45dB	<45dB	<45dB

3.1.3 Environmental specifications

Parameter	BIU, ODU, OEU	ROU/AOR
Operating Temperature	-10 to +50° C	-10 to +50° C
Operating Humidity, non condensing	-	5% to 90%

3.1.4 Operating Frequencies range

Standard	Unit naming	Description	Frequency range	
			TX(MHz)	RX(MHz)
iDEN	700PS	Public safety	764 to 776	794 to 806
iDEN	800PS	Public safety	851 to 869	806 to 824
Cellular	850C	Cellular	869 to 894	824 to 849
iDEN	900I	SMR	929 to 940	896 to 902
Paging	900 PA	Paging	929 to 930	896 to 902
PCS	1900P	PCS	1930 to 1995	1850 to 1915
AWS-1	AWS-1	AWS-1	2110 to 2155	1710 to 1755
-	VHF	Public safety	136 to 174	136 to 174
-	UHF	Public safety(Band1)	396 to 450	396 to 450
			450 to 512	450 to 512
		Public safety(Band2)	380 to 434	380 to 434
			434 to 496	434 to 496
LTE	700LTE	Long Term Evolution	728 to 756	698 to 716 777 to 787

3.1.5 Specifications Per band

SC-DAS has a lot of band combination as application and different output power even though same band uses. TableXX shows Output power level as follow band combination

1) Output power level

Band Combinations		700PS	700LTE	800PS/I	850C	900I	1900P	AWS	VHF	UHF
MRU	ARU									
1900P+850C	700LTE+AWS	-	24dBm	-	24dBm	-	28dBm	28dBm	24dBm	24dBm
1900P+AWS	-	-	-	-	-	-	30dBm	30dBm		
1900P	900I+800I	-	-	25dBm	-	25dBm	30dBm	-		
1900P	-	-	-	-	-	-	30dBm	-		
1900P+850C	700PS+800PS	21dBm	-	21dBm	21dBm	-	30dBm	-		
700PS+800PS	900I+800I	21dBm	-	21dBm	-	21dBm	-	-		

2) General Specifications

Parameter		Specifications	Remark
Gain Control range	TX	25dB/step 1dB	ROU
	RX	20dB/step 1dB	BIU
TX input power		-20dBm~+10dBm	
Spurious Emission		< -13dBm	
Optical Link AGC		>10dB	
VSWR		1.8:1	
Pass-band Ripple		4dBp-p	
Max optical Loss		5dBo	
Optical wavelength		1310nm/1550nm with WDM	
RX output power		0dBm	
RX input power		-50dBm Max	
Noise Figure		< 8dB	Excluding 700PS, 800PS

Section4

System Configuration and Functions

- 4.1 BIU (BTS Interface Unit)**
- 4.2 ODU (Optic distribution Unit)**
- 4.3 OEU (Optic Expansion Unit)**
- 4.4 ROU (Remote Optic Unit)**

4.1 BIU (BTS Interface Unit)

BIU is provided signals from BTS or BDA through coaxial cable and transmit it to four ODUs (Optic Distribution Unit).and This unit separates RX signals given from ODUs from each other per frequency band.

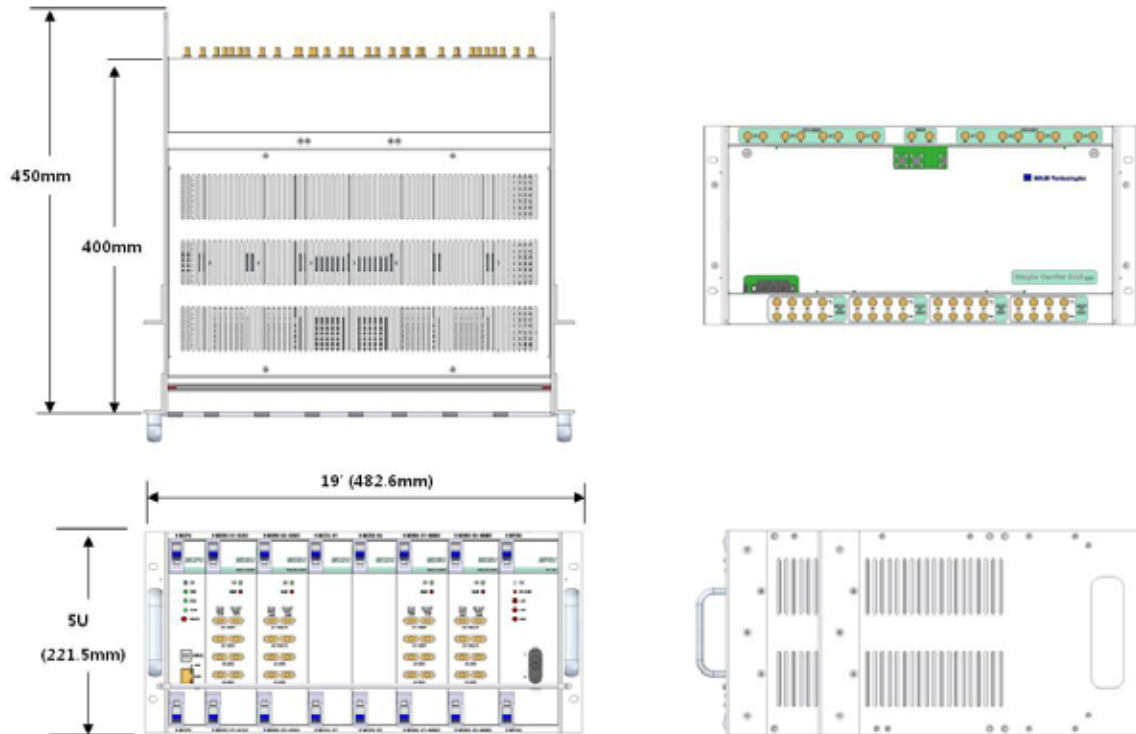


Figure 4.1 – BIU outer view

4.1.1 Specifications of BIU

Item	Spec.	Remark
Size	482.6(19") x 221.5(5U) x 450	mm
Weight	26 Kg	
Power consumption	SISO Mode : 168 W(Including SISO ODU 4EA) MIMO Mode : 315W(Including SISO ODU 4EA+MIMO ODU 4EA)	Full Load

4.1.2 Block diagram of BIU

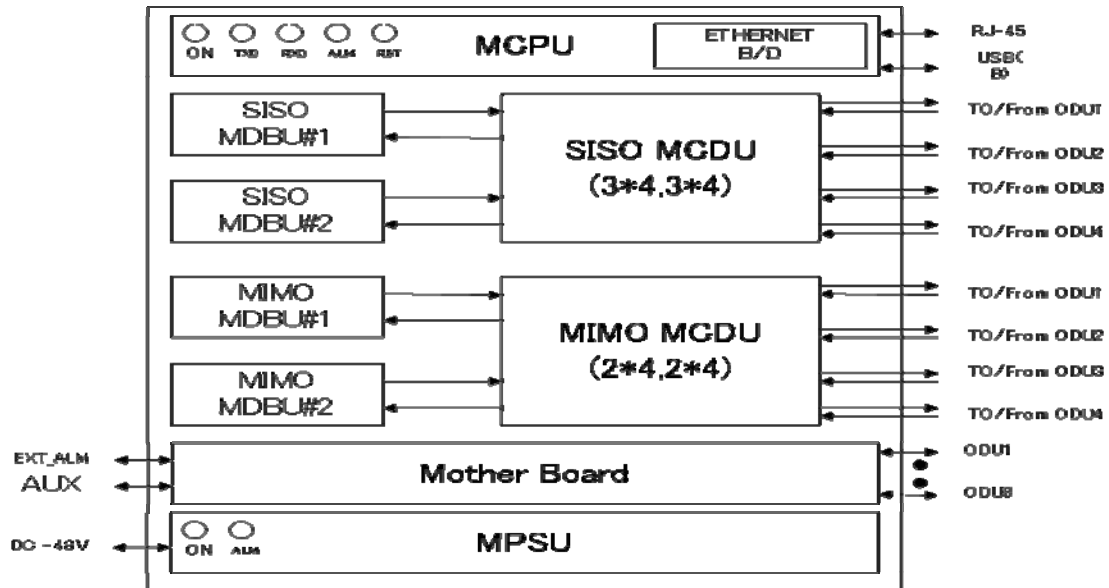


Figure 4.2 – BIU block diagram

4.1.3 BIU parts

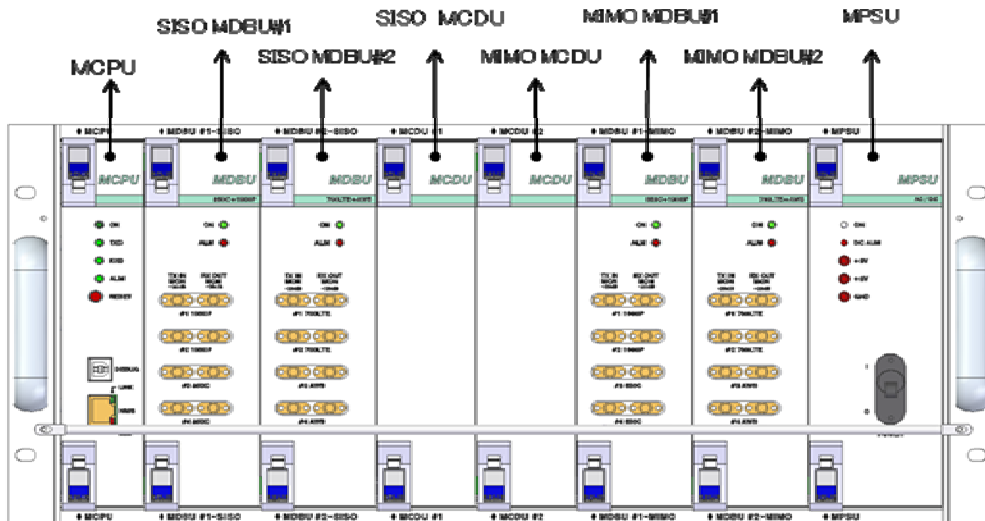


Figure 4.3 – BIU mounting diagram

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

1	MDBU	Main Drive BTS Unit Amplify & adjust downlink RF signal Amplify & adjust uplink RF signal	Max 4EA
2	MCDU	Main Com/Div Unit Combine 3EA downlink signal and divide 4EA signal to ODU Combine 4EA uplink signal and divide 3EA signal to MDBU Support VHF/UHF interface port	
3	MCPU	Main Central Processor Unit Control and monitoring system status Control and monitoring with USB(B) Have an access to upper-level network through GSM or Ethernet	
4	MPSU	Main Power Supply Unit Input power: DC -48V, Output power: 9V, 6V	
5	M/B	Mother Board Provide signal interface and power for each unit Provide four ports for dry contact output Provide three ports for input Provide two Aux ports for future usage	
6	Shelf	19 inch, 5U	

4.1.4 Function by unit

1) Main Drive BTS Unit (MDBU)

MDBU delivers TX signals of BTS or BDA to related devices and then delivers RX signals of the devices to BTS or BDA. This unit can monitor TX input level. Using input AGC function, it automatically adjusts input ATT according to input power. It also has ATT to adjust RX gain. MDBU is varied per frequency band including the following:

No	Unit naming	Description	In/out RF Port	
			TX	RX
1	1900P+850C	Dual Band	4 Port	4 Port
2	700LTE+AWS-1	Dual Band	4 Port	4 Port
3	1900P	Single Band	2 Port	2 Port
4	1900P+AWS-1	Dual Band	4 Port	4 Port
5	700PS+800PS	Dual Band	4 Port	4 Port
6	900I+800I	Dual Band	4 Port	4 Port
7	900I	Dual Band	2 Port	2 Port



Figure 4.4 – MDBU Outer Look

2) Main Com/Div Unit (MCDU)

MCDU combines TX signals that are delivered from MDBU per frequency band and delivers the signals to four ODUs. It also combines RX signals from up to four ODUs and sends them to up to four MDBUs. The unit has a port to interface with VHF&UHF signals. It has ATT for input monitoring and input control.

The unit has reserved port for future usage such as LMU interface, additive MDBU interface and so on

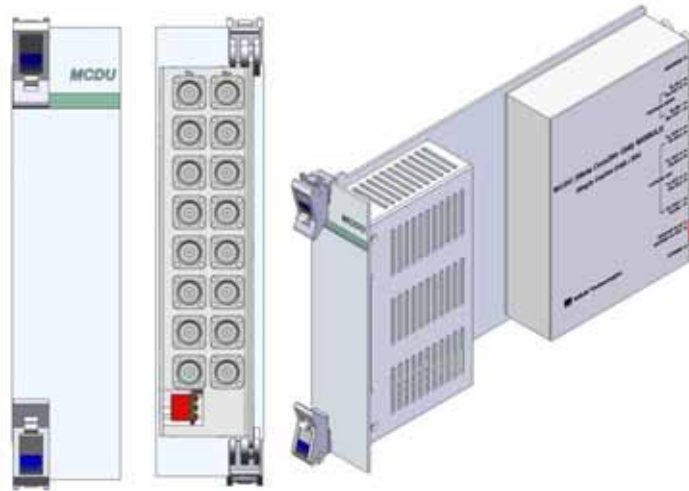


Figure 4.5 – MCDU Outer Look

VHF+UHF frequency band including the following:

No	Unit naming	Description	In/out RF Port	
			TX	RX
1	VHF+UHF	Dual Band	1 Port	1 Port

3) Main Central Processor Unit (MCPU)

MCPU can inquire and control state of modules that are installed in BIU.

This unit can inquire and control state of four ODUs in total. Through communication, it also can inquire and control ROU that is connected with lower parts.

In addition, the unit has USB(B) port for local monitoring so that it can inquire and control state of devices through PC. On the front panel, it has communication LED indicator to check communication state with ROU. It also has ALM LED indicator to show whether a device gets faulty.

For access to upper network, it has a port to insert Ethernet port and GSM modem in it.

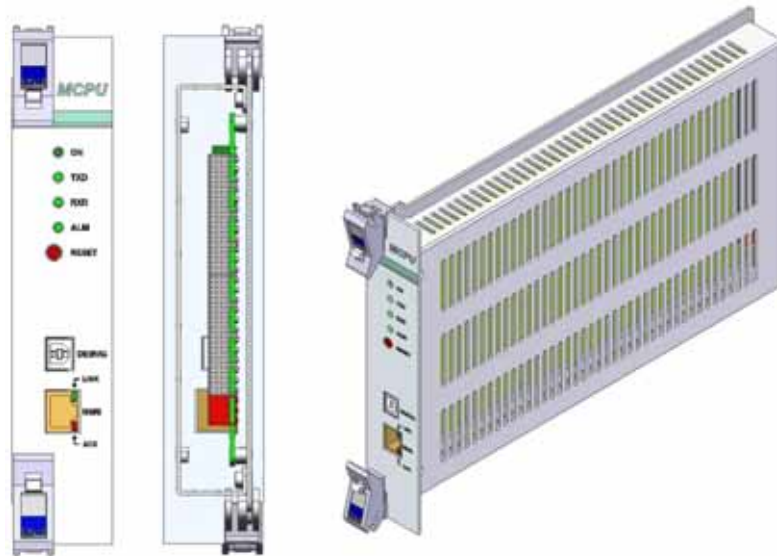


Figure 4.6 – MCPU Outer Look

In the Main Central Processor Unit, a lithium battery is installed for RTC (Real Time Control) function.



CAUTION

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE

DIPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS

[INSTRUCTION]

The equipment and accessories including inner lithium battery are to be disposed of safely after the life span of them and national regulation must be observed. Do not attempt to replace the lithium battery unless service personnel confirmation has first been obtained, to avoid any risk of explosion.

4) Main Power Supply Unit (MPSU)

MPSU receives $-48V$ of input and outputs $+6V$ and $+9V$ of DC power.

On the front panel, this unit has an output test port and it also has DC ALM LED Indicator to show whether output gets faulty.

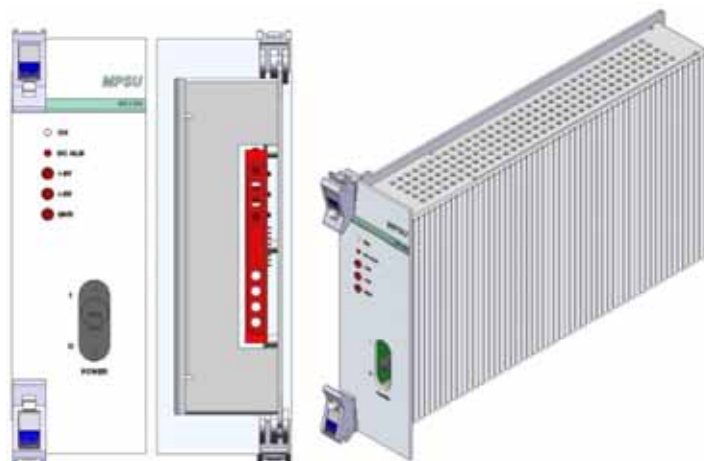


Figure 4.7 – MPSU Outer Look

4.1.5 Front/Rear panels of BIU

- 1) Front panel

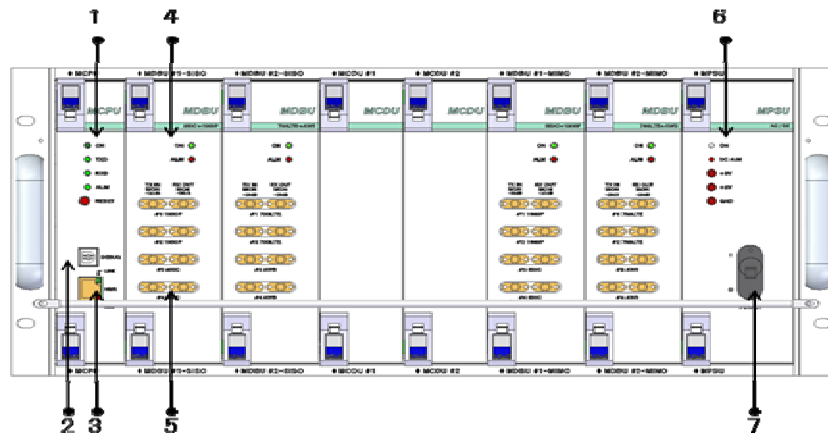


Figure 4.8 – BIU front panel Outer Look

Item	Description
1. Alarm LED & Reset	Communication state with devices, alarm status of the system and reset switch
2. DEBUG (USB B)	USB 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
3. NMS(Ethernet port)	Ethernet port for upper network The supporting network mode is UDP protocol
4. MDBU LED	LED to show whether MDBU is installed and gets faulty
5. RF Monitor Port	20dB Coupling compared with TX Input Level 20dB Coupling compared with RX Output Level
6. Pwr Test Port & ALM	Output DC power test port and ALM LED to show abnormal state, if any
7. Power switch	Power ON/OFF switch

2) Rear panel

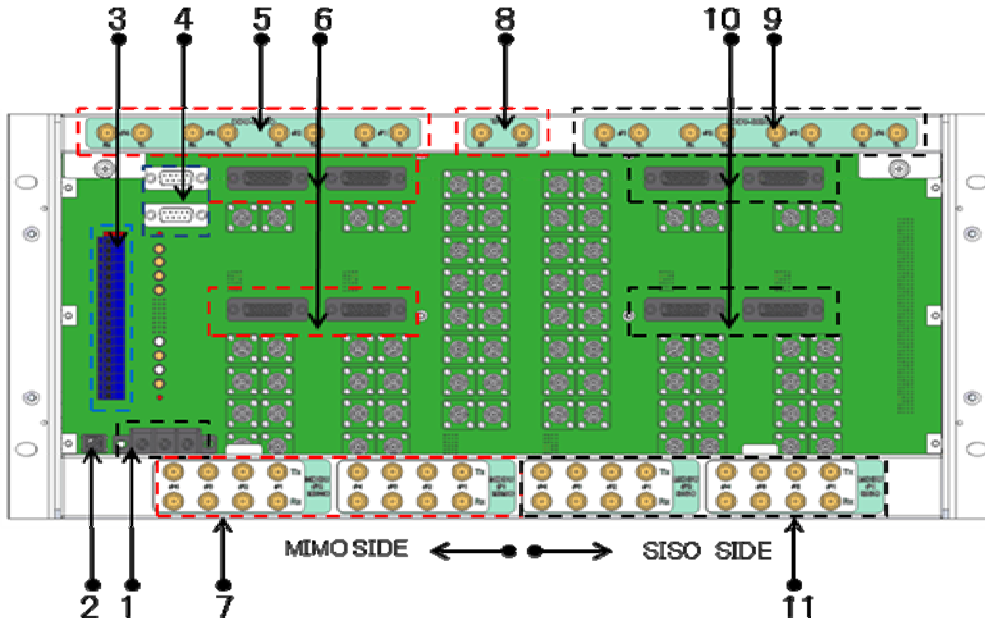


Figure 4.9 – Rear panel Outer Look

Item	Description
1. DC Input Port	Input terminal for DC -48V
2. External ALM Port	Input/output terminal for dry contact
3. GND Port	System ground terminal
4. AUX I/O Port	Reserved Port for future uses
5. MIMO ODU I/O Port	RF signal interface terminal for ODU
6. MIMO ODU signal Port	Power and signal interface terminal for ODU
7. MIMO BTS/BDA I/O Port	Input/output interface terminal of BTS/BDA
8. V/UHF I/O Port	RF signal interface terminal of VHF&UHF
9. SISO ODU I/O Port	RF signal interface terminal for ODU
10. SISO ODU signal Port	Power and signal interface terminal for ODU
11. SISO BTS/BDA I/O Port	Input/output interface terminal of BTS/BDA

4.2 ODU (Optic distribution Unit)

ODU receives TX RF signals from upper BIU and converts them into optical signals. The optical signals are sent to ROU through optical cables. This unit converts optical signals from ROU into RF signals and sends the converted signals to BIU.

For each shelf of the ODU, up to two DOUs (Donor Optic Unit) can be installed in it.

One DOU is supported with four optical ports. Therefore, one ODU can be connected with eight ROUs.

Up to four ODUs can be connected with BIU each SISO and MIMO path

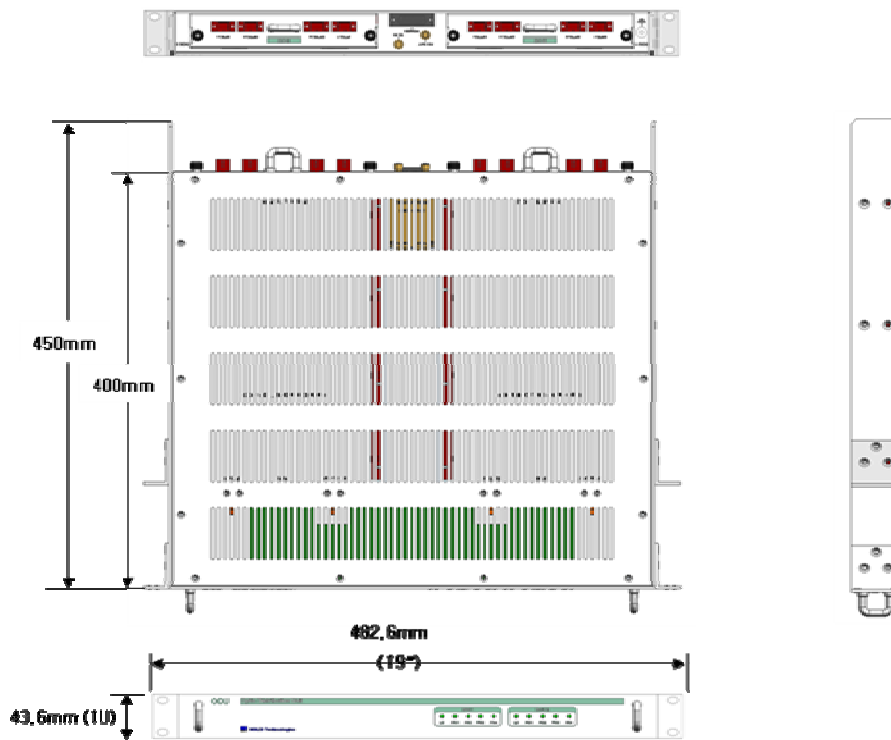


Figure 4.10 – ODU Outer Look

4.2.1 Specifications of ODU

Item	Spec.	Remark
Size	482.6(19") x 43.6(1U) x 450	Mm
Weight	6 Kg	Full Load
Power consumption	27 W	

4.2.2 Block Diagram of ODU

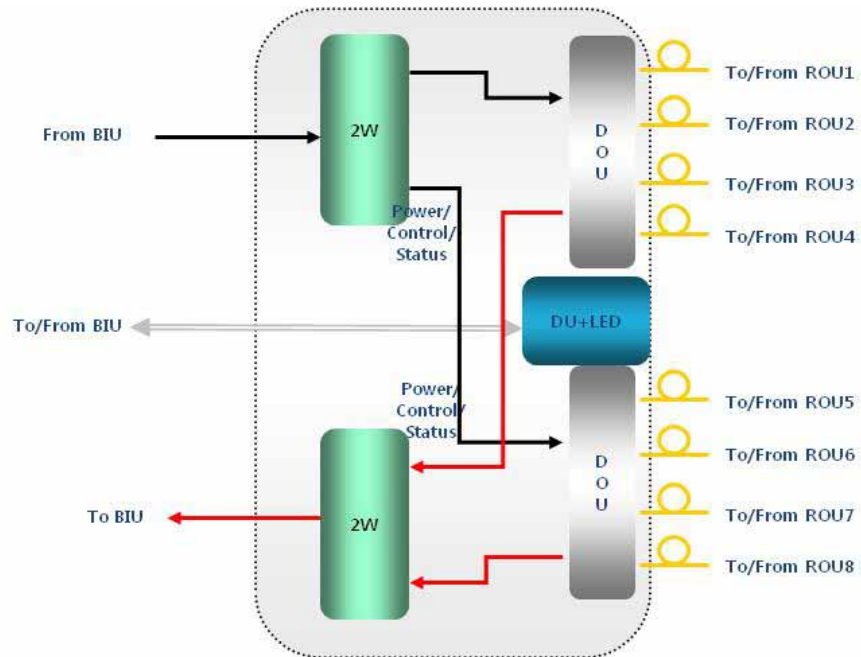


Figure 4.11 – ODU block diagram

4.2.3 ODU parts

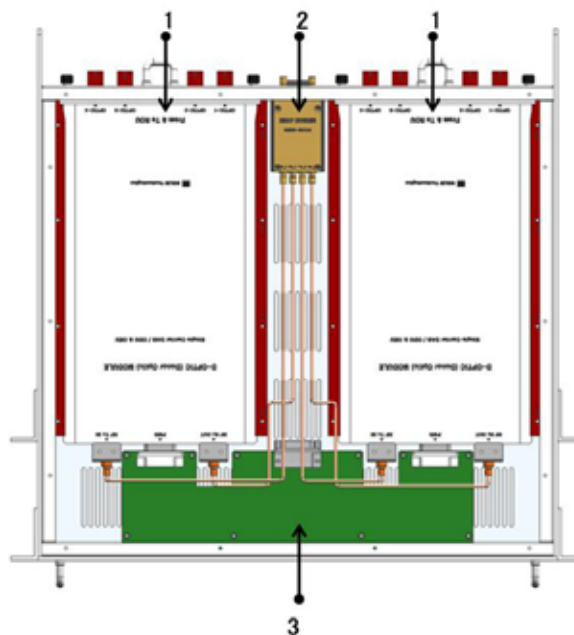


Figure 4.12 – ODU Inner Look

No.	Unit	Description	Remark
1	DOU	Donor Optic Unit 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	2Way Divider Divide TX RF signals into two; Combine two RX RF signals into one	
3	DU	Distribution Unit Distribute power and signals to DOU	
4	Shelf	19" rack, 1U	
5	Accessories	25PIN DSUB, Male to female 1pcs RF Coaxial Cable Assembly 2pcs	

4.2.4 Function by unit

1) Donor Optic Unit (DOU)

DOU operates electronic-optical conversion of TX signals and operates 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

With internal FSK modem, it can be operated automatical ID allocation.



Figure 4.13 – DOU 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 signals from/to BIU

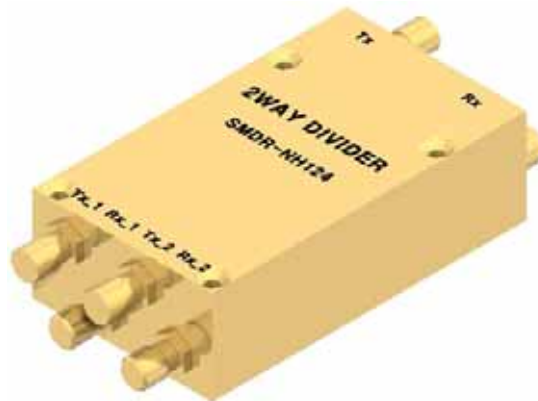


Figure 4.14 – 2Way Divider Outer Look

4.2.5 Front/rear panels of ODU

1) **Front panel**

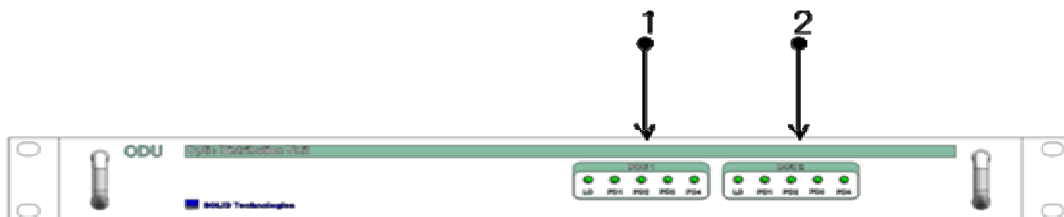


Figure 4.15 – ODU front panel Outer Look

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

2) Rear panel

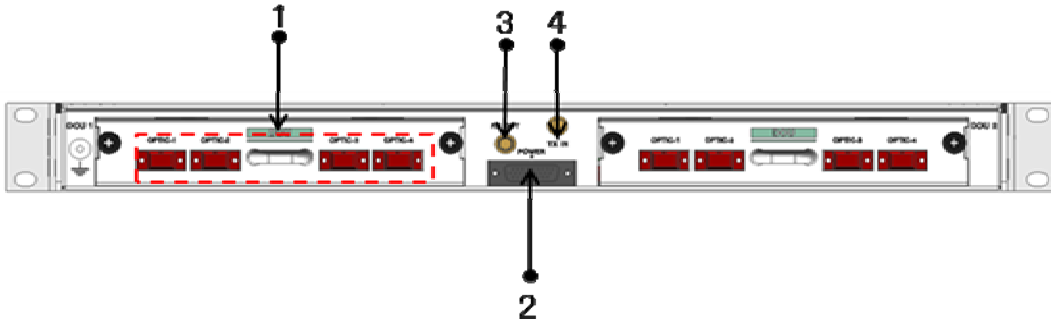


Figure 4.16 – ODU Rear panel Outer Look

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

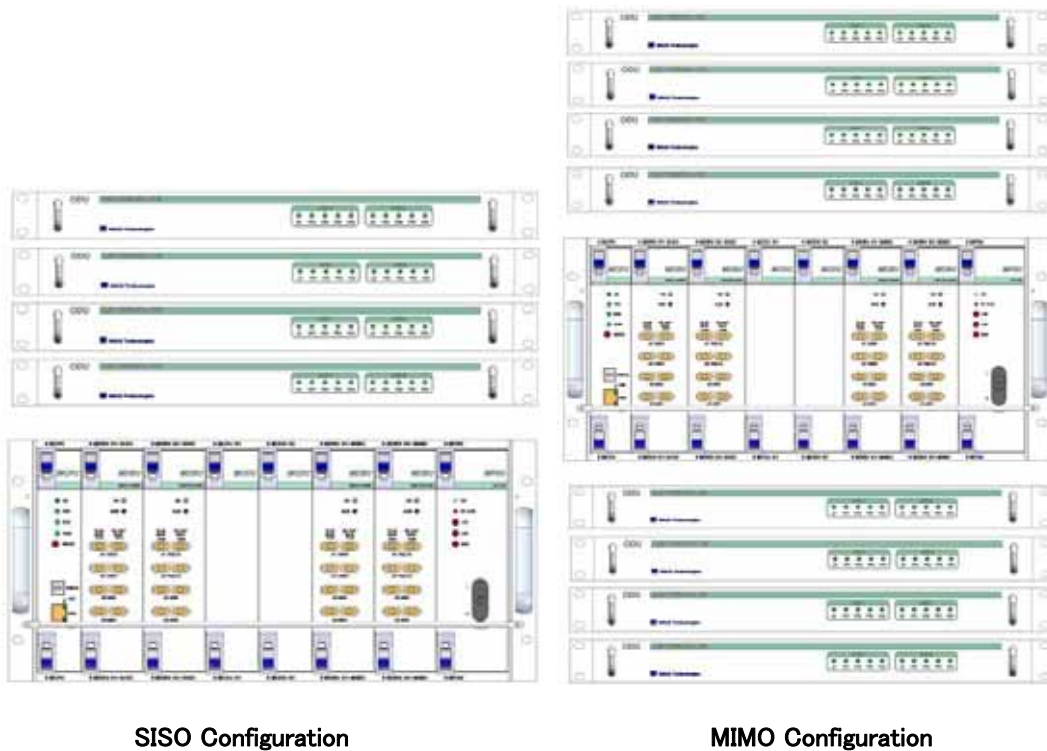


Figure 4.17 – Interface between BIU and ODU

For SISO configuration, up to four ODUs can be stacked above the top of BIU

For MIMO configuration, up to eight ODUs can be stacked above/below BIU

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 degradation of equipment

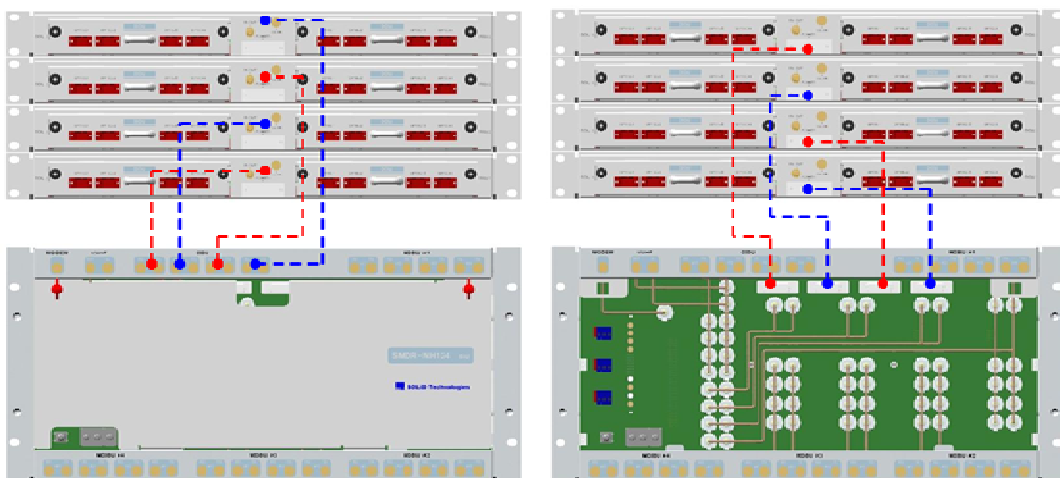


Figure 4.18 – Interface between BIU and ODU at the back

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 25Pin D-Sub Connector cable with a corresponding port.

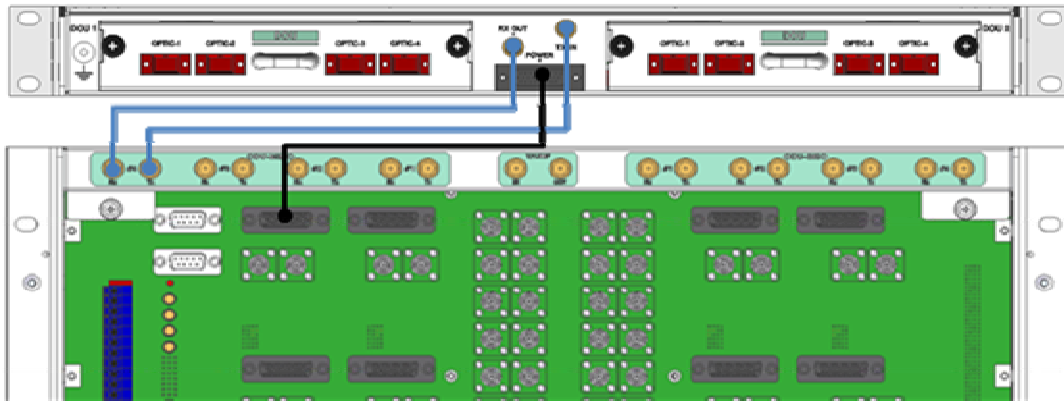


Figure 4.19 – Interface between BIU and ODU more detail

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 SNR 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 four OEUs can be connected with ODU.

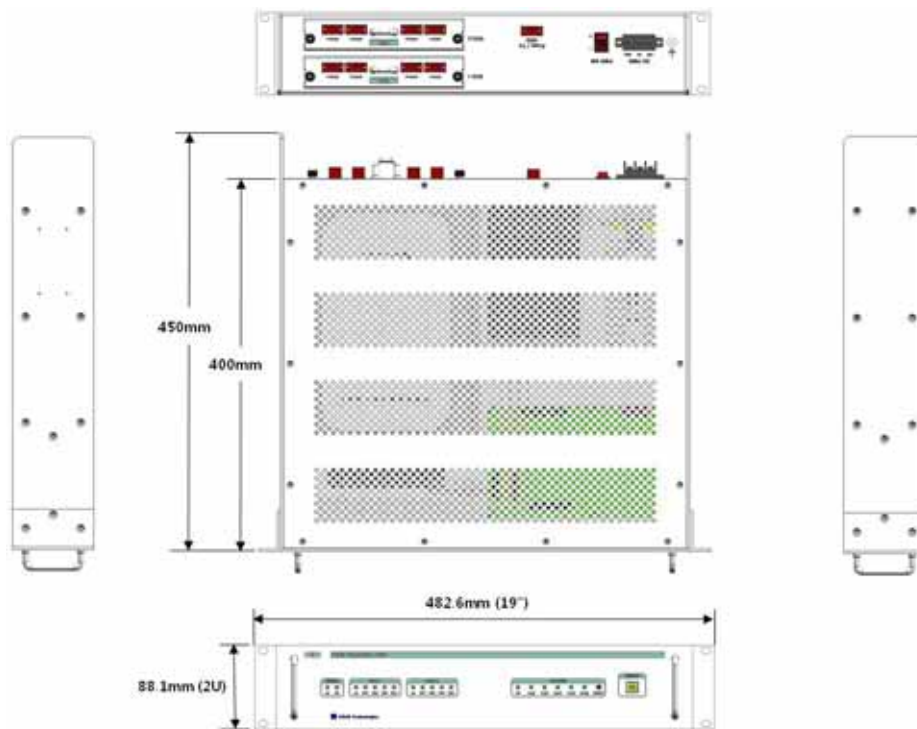


Figure 4.20 – OEU Outer Look

4.3.1 Specifications of OEU

Item	Spec.	Remark
Size	482.6(19") x 88.1(2U) x 450	mm
Weight	9.5 Kg	Full Load
Power consumption	40 W	

4.3.2 Block Diagram of OEU

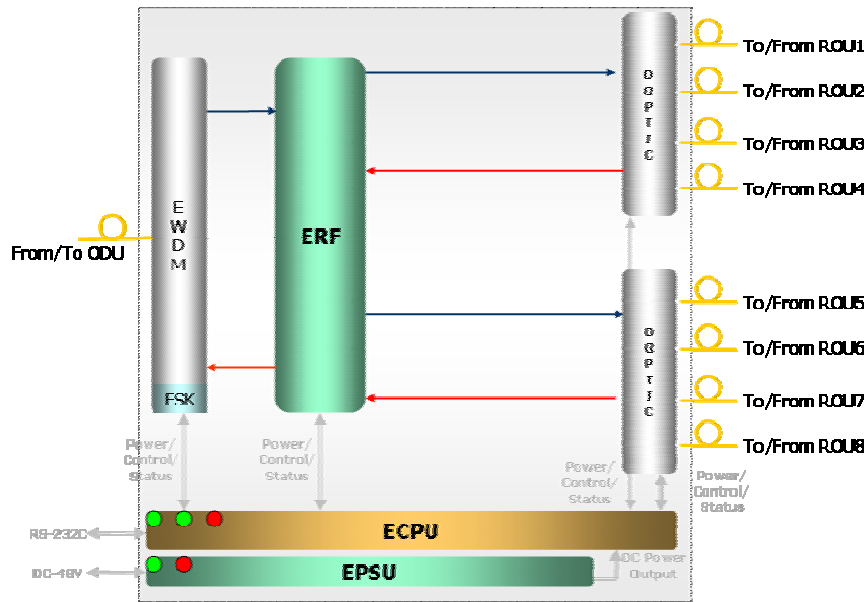


Figure 4.21 – OEU block diagram

4.3.3 OEU parts



Figure 4.22 – OEU Inner Look

No.	Unit	Description	Remark
1	DOU	Donor Optic Unit 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	Expansion Wavelength Division Multiplexer Convert TX optical signals into RF signals; Convert RX RF signals into optical signals; Compensate for optical cable loss with ODU	
3	ECPU	Expansion Central Processor Unit Control and monitoring system status Control and monitoring with RS232 Relay state values of ROU to BIU	
4	EPSU	Expansion Power Supply Unit Input power: DC -48V, Output power: 9V, 6V	
5	ERFM	Expansion Radio Frequency Module 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 4.23 – DOU 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 4.24 – EWDM Outer Look

3) Expansion Central Processor Unit(ECPU)

ECPUs 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 USB port for local 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.

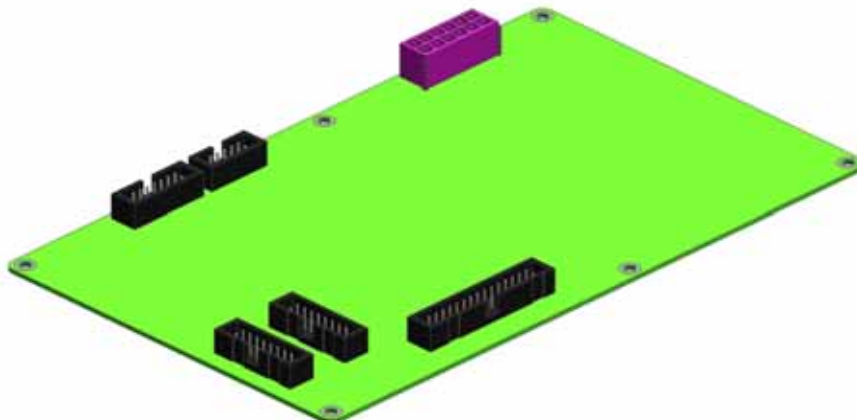


Figure 4.25 – ECPUs Outer Look

4) Expansion Radio Frequency Module(ERFM)

ERFM reconstructs Signal to Noise degraded by optical modules.

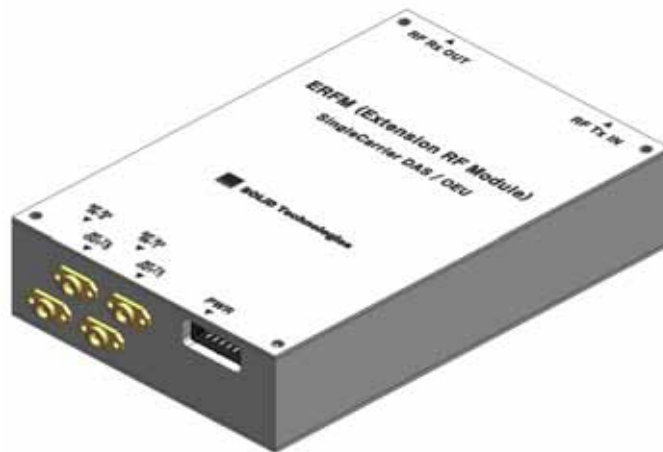


Figure 4.26 – ERFM Outer Look

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.

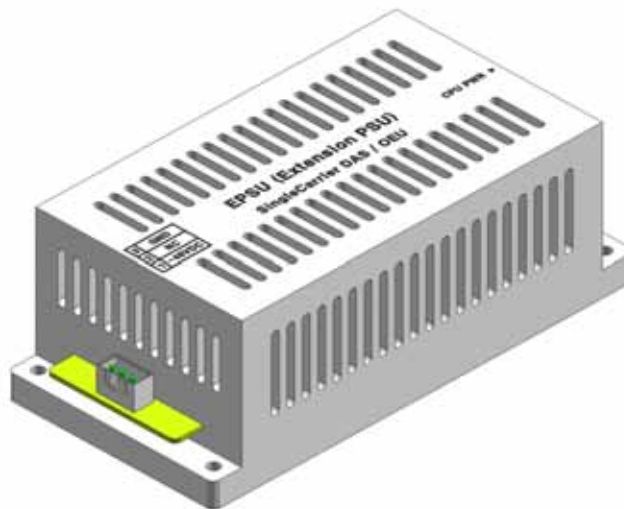


Figure 4.27 – EPSU Outer Look

4.3.5 Front/rear panels of OEU

1) Front panel

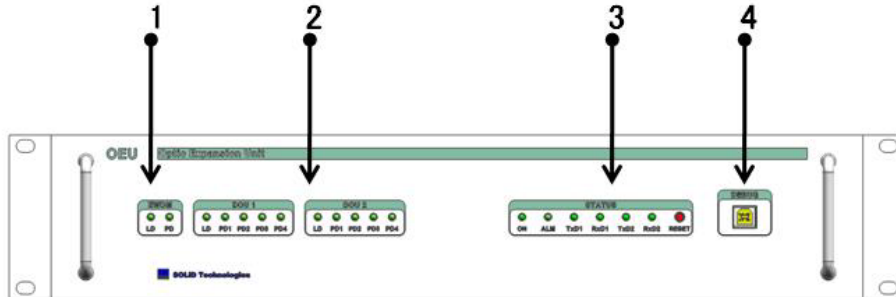


Figure 4.28 – OEU front panel Outer Look

Item	Description
1.EWDM LED	LED indicator to check EWDM state to see if it is abnormal
2.DOI LED	LED indicator to check DOI 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(USB Port)	USB 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

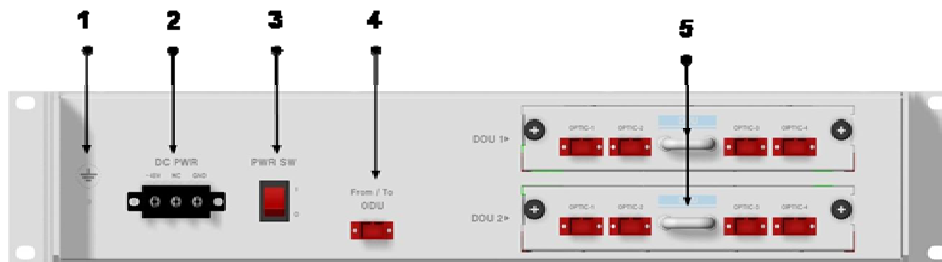


Figure 4.29 – Rear panel Outer Look

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.