WOS4000 Optical Communication Platform

1. WOS4000 Optical Communication Platform Rack

1. Product Overview

The WOS4000 optical communication platform is the brand-new 3rd generation product launched by Prevail based on professional experience in development, manufacturing, and sales of CATV transmission equipment over 20 years. It provides powerful function and flexible configuration in HFC optical data transmission solutions. The standard 4RU metal rack contains sixteen compact slots and each can be installed any functional module able to perform hot plug. Built-in dual-power hot backup, efficient fan cooling and appropriate redundant backup of functional modules contribute to carrier-class reliability. The CMM management unit provides a friendly HMI with LCD displays the operating status of each module in real time and convenient parameter setting. The network management software conforming to the SNMP protocol is offered to achieve remote management and automatic monitoring.

2. Performance Characteristics

➢ Compact slots to reduce space occupation.

➢ Support hot swap, plug and play.

➢ Advanced heat dissipation for excellent thermal stability.

➢ Dual power hot backup and multiple power supply options.

➢ LED status display in the front panel.

➢ All electronic control, no accessories.

➢ Powerful network management software.

3. Rack Composition Description

The standard configuration of WOS4000 rack includes:

➢ One metal chassis with 16 plug-in slots. 4U total in height.

➢ Two power supply modules. (AC220V or DC48V optional).

➢ One CMM management unit. LCD display and operation buttons.

➢ One network transponder with an RS232 interface and a LAN interface.

➢ Seven on site replaceable fans.

Under the standard configuration, the display screen shows as follows after power on: P1, P2 (for power supply modules) and M (for CMM management unit) are highlighted, i.e. the 3 modules are online.

WOS4000 Slot 19: Manger	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	P1	P2	M
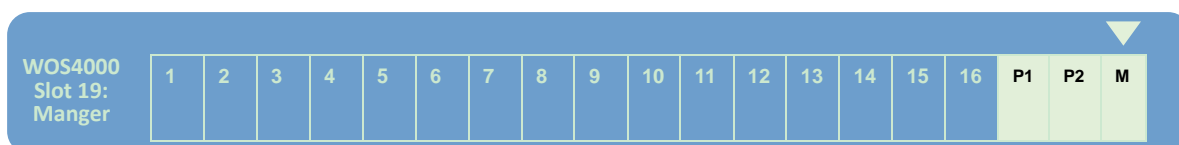
4. Operation Instructions for the Display Menu

▲▼Up and down keys: Press buttons to move the cursor up, down, left and right. The selected module or menu is highlighted.

Enter key: Press the Enter key to enter the submenu or parameter settings. Press Enter to confirm the setting.

ESC key: Exit or return to the previous menu.

4.1 Submenu Description of M (CMM management unit)

After entering the submenu, the following parameters can be seen:

FanNO.1　　　ON	Control of Fan 1, ON/OFF can be set	
FanNO.2 ON	Control of Fan 2, ON/OFF can be set	
FanNO.3 ON	Control of Fan 3, ON/OFF can be set	ON: Automatic mode, default fan on temperature is +15℃.
FanNO.4 ON	Control of Fan 4, ON/OFF can be set	
FanNO.5 ON	Control of Fan 5, ON/OFF can be set	OFF: Manually turn off the fan.
FanNO.6 ON	Control of Fan 6, ON/OFF can be set	
FanNO.7 ON	Control of Fan 7, ON/OFF can be set	
Key Sound ON	Key sound control, ON/OFF can be set	
IP Address	IP address setting	
Gateway	Gateway setting	
Net Mask	Subnet mask setting	
Trap Addr1/2	Trap1/Trap2 address setting	
NTP Addr1/2	NTP1/NTP2 address setting	
UTC +0:00	Universal Time Coordinated	
MAC Addr	MAC address setting	
DevTemp℃	Internal temperature	
SN	Serial number	
Version	Version number	
WorkTime	Total operating hours of the CMM unit.	

4.2 Submenu Description of P (power supply module)

After entering the submenu, the following parameters can be seen:

+5V	+5V actual voltage
-5V	-5V actual voltage
+24V	+24V actual voltage
FanOn Temp℃	Automatic fan on temperature inside the module, can be set
DevTemp ℃	Real-time temperature inside the module
SN	Serial number
Version	Version number
Work Time	Total operating time of the power supply module

5. Performance Specifications

Item	Parameter
Weight	12kg , rack + two power supply modules + CMM management unit
input voltage	AC100V～260V, DC 40V - 60V
Conversion efficiency	＞85%
Power factor	＞0.9
Operating temperature	-25℃～55℃
Storage temperature	-30℃～70℃
Operating humidity	95%max, non-condensing
Static	8KV
Surge (1.2/50uS)	4KV (peak) with varistor. When doing surge tests, the power supply is without overvoltage protection
Impact voltage withstand	6kV input to output, positive and negative 10 times each
Safeguard	Protection for input overvoltage, overcurrent, output overload and short circuit

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6. WEB Interface

Login default name:admin

Default password:123456

WOS4000 Manager

User Name

Password

Sign in

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Platform   Module

System

Model	WOS-4000
SN	SN-WOS4K
Version	6.10
Mac	30:71:B2:66:99:88
IP	192.168.1.210	192.168.1.210	Set
gateway	192.168.1.1	192.168.1.1	Set
mask	255.255.255.0	255.255.255.0	Set
trap1	192.168.1.156	192.168.1.156	Set
trap2	192.168.1.55	192.168.1.55	Set

Update firmware

Step 1: upload new firmware file

选择文件 未选择任何文件   Upload

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Platform   Module

Slots

Index	Type
0	Fan Control
1	Optical Amp
2	Optical Amp
3	Optical Amp
4	Pro_Re_Recv
5	Pro_Re_Recv
6	Trans_Double
7	NULL
8	NULL
9	NULL
10	NULL
11	NULL
12	NULL
13	NULL
14	NULL

Parameter
EDFA Slot: 1

Name	Value	Configure	
Input power	4.3 dBm	Threshold	
Output Power	20.3 dBm	Threshold	
Pump1 Temp	38.0 °C	Threshold	
Pump1 Bias	3900 mA	Threshold	
Pump1 Tec	0 mA	Threshold	
Pump2 Temp	0.0 °C	Threshold	
Pump2 Bias	0 mA	Threshold	
Pump2 Tec	0 mA	Threshold	
OutputAtt	0.0 dB	0.0	Set
inputlow	-5.0 dBm	5.0	Set
PumpControl	on	off	
Device Temp	35.4 °C		

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7. Structure Description

Power Supply
Module P1

Power Supply
Module P2

CMM
Management Unit

Metal Rack

Front view

Power Supply
P2 Socket

RS232
Interface

LAN
Interface

Power Supply
P2 Socket

Fan 7

Fan 1

Slot 16

Slot 1

Rear view

8. Dimension

436.8mm

416.7mm

2.5mm

177.8mm

482.6mm
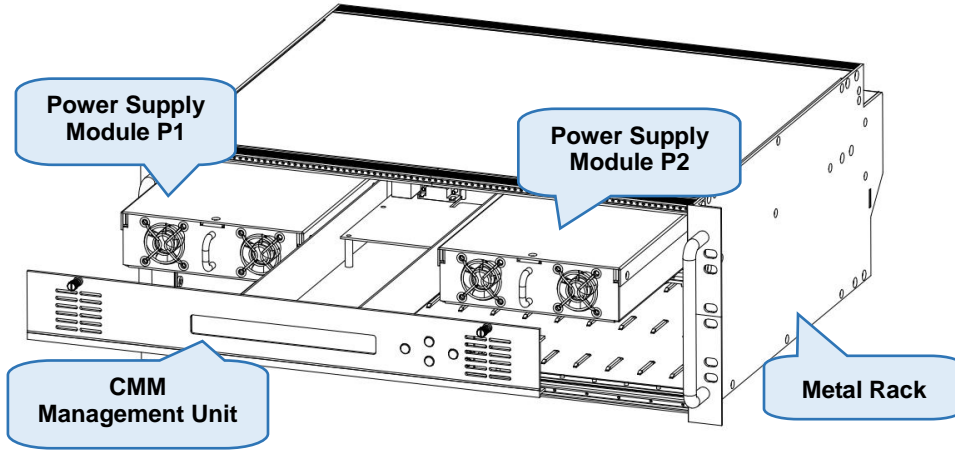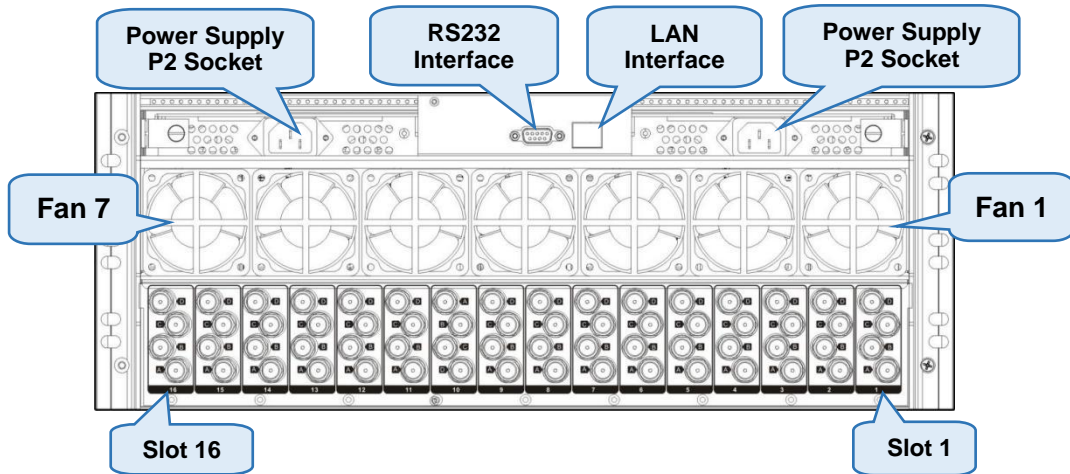
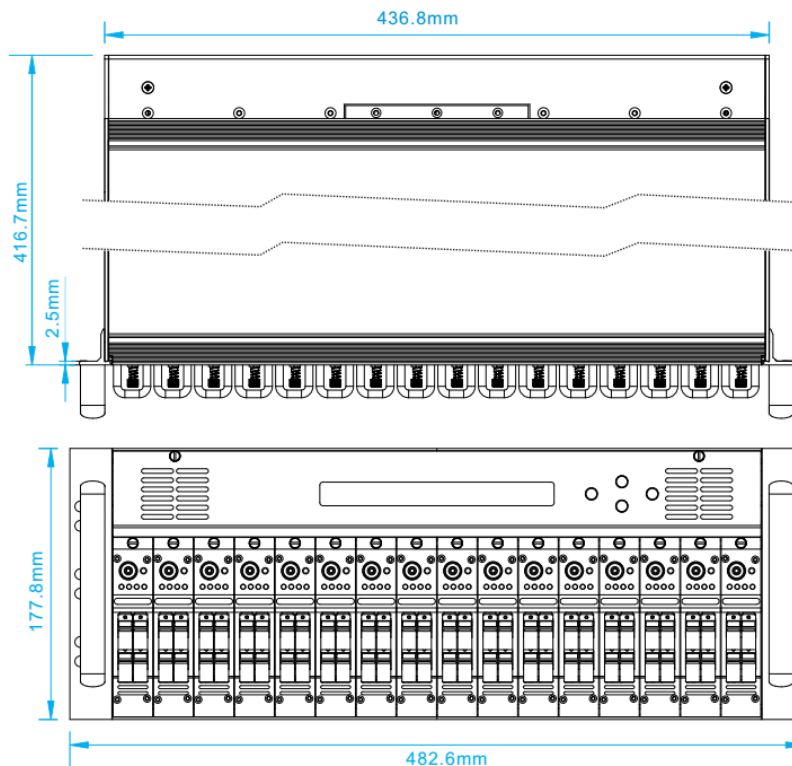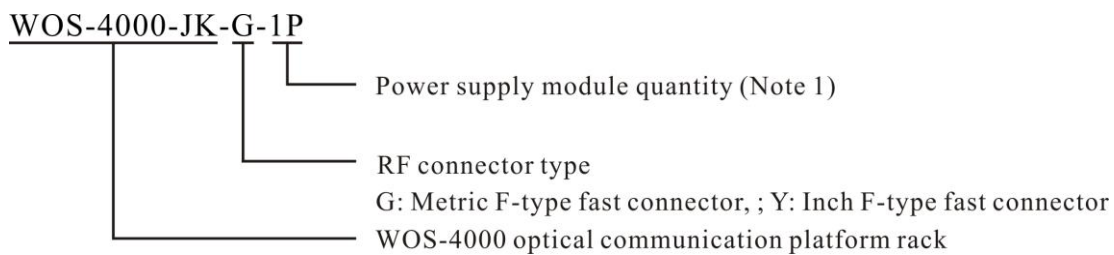## 9. Installation

➢ Installation should be done by professionals.

➢ Before installing any module, check whether the row pins on the rear of the module are bent.

➢ Tighten the fixing screws after installing any module.

➢ Install the power supply module before the CMM unit. Remove the CMM unit before the power supply module.

➢ Check whether the cable on the power supply module is removed when removing the module.

➢ When installing multiple optical platforms in the same cabinet, it is recommended that 1RU space be reserved between the optical platforms to facilitate heat dissipation.

10. Naming Specification

WOS-4000-JK-G-1P

Power supply module quantity (Note 1)

RF connector type
G: Metric F-type fast connector, ; Y: Inch F-type fast connector
WOS-4000 optical communication platform rack

Note 1:

1P-A220: AC 220V single power supply

1P-D48: DC 48V single power supply

2P-A220: AC 220V dual power supplies

2P-D48: DC 48V dual power supplies

2P-A220+D48: AC 220V+DC 48V dual power supplies

Note 2: The power cord type is a national standard three-pin plug. Other requirements, please specify in the

order.

## 2. 1550nm Optical Amplifying Module WOS-WE-1550-4K

1. Product Overview

Optical fiber amplifier (EDFA) is an important optical transmission device in 1550nm optical fiber communication system. This module uses imported high-performance Er-Yb Co-doped fiber, low-noise pump laser and well-designed embedded automatic monitoring system to ensure the excellent index. Each EDFA module contains optical power detection components on input and output ports to automatically adjust the laser pump and keep the output power stable. The internal control circuit accurately maintains the output power and temperature of the laser; the parameters can be set and displayed through CMM management unit.

2. Performance Characteristics

- Support hot swap. Optical power input and output status indicator.

- Adjustable attenuator for output from 0~3 dB, 0.1dB stepping.

- Pump temperature, bias current, and cooling current are detected in real time.

3. Block Diagram
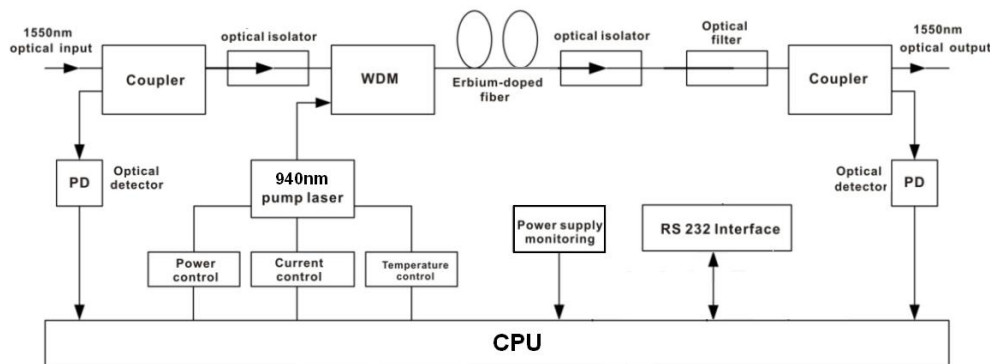
4. Technical Parameters

	Item	Unit	Technique Parameter	
EDFA	Operating bandwidth	nm	1545 - 1561	
	Input optical power range	dBm	+5 - +10	
	Output optical power	dBm	≥ 20	
	Output power stability	dBm	≤±0.3	
	Noise figure	dB	≤ 5.5	Input power: 5dBm
	Return loss	dB	≥ 40	
	Pump leaks to the input power	dB	≤ -30	
	Pump leaks to the output	dB	≤ -30	
	Polarization Dependent Gain	dB	< 0.4	
	Polarization Mode Dispersion	Ps	< 0.5	
	Optical connector type		SC/APC	
Other	Storage temperature range	℃	-5 - +45	
	Operating temperature range	℃	-30 - +70	

Operating relative humidity		Max 85% no condensation
Power voltage	W	≤20
Weight	Kg	1

5 . Operation Instructions of the Display Menu

Once the module is installed, the corresponding slot in the display menu will highlight.

After entering the submenu, the following parameters can be seen:

InPower XX.XdBm	Input optical power
InputPowerLoXX.XdBm	Alarm threshold of the low input optical power, can be set
OutPowerXX.XdBm	Output optical power
OptATTX.XdB	Output optical power attenuation,0~4dB, 0.1dB stepping
Pump1 TempXX.X℃	Pump 1 internal temperature
Pump1 BiasXXmA	Pump 1 bias current
Pump1 TECXXmA	Pump 1 cooling current
PumpCtrlON	Pump switch, "ON" is on, "OFF" is off
DevTempXX.X℃	Module internal temperature
SN	Serial number
Version	Version number
WorkTime	Total operating hours of the equipment

6. Structure Description

No.	Item	Note
1	Module fixing screw	Used to fix the module
2	Optical power input indicator	Green: between the low threshold and +10dBm Red: lower than the low threshold or more than +10dBm
3	Optical power output indicator	Green: within rated outputpower range from -2dB to+1dB Red: outside rated outputpower range from -2dB to+1dB
4	Opticalpower output1	
5	Optical power output2	
6	Optical power output3	
7	Optical power output4	
8	Optical power input	

7. Installation

➢ This module can be installed in slots from 1-16 and can be fully configured.
➢ Check if the pins on the rear of the module are bent.
➢ Install the module in place along the guide and tighten the screws.
➢ When the module is installed and powered, the optical output port must be connected to a fiber or other optical receiving

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device before the optical input is connected.

First connect the input, then the output, or the output fiber tip may be burned.

➢   Avoid direct observation and contact with the fiber tip. You must confirm the equipment is off when cleaning the port.

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3. Quadruple Reverse Optical Receiver Module WOS-WR-2004-TD-S-4K

1. Product Overview

The return path optical receiver module is designed with a high-density 4-way return path receiving circuit to provide 4 independent outputs or mixed output. High output type or low output type is optional. Optical input power is as low as -21dBm. It has output level detection on the front panel and RF output independent shutdown for each channel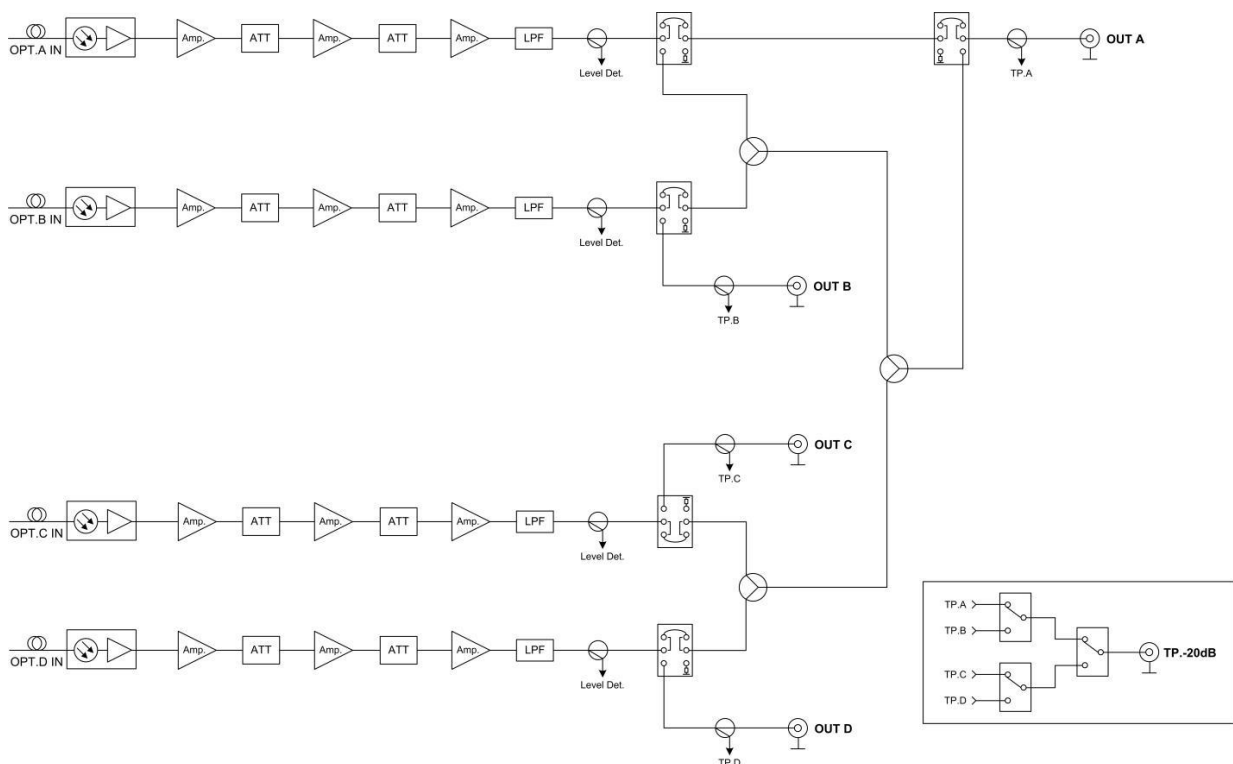. AGC or MGC level control mode is available. 204MHZ bandwidth is fully compatible with Docsis3.1 standard and can be used to form HFC bidirectional network, especially for fiber transmission of CMTS return path signals.

2. Performance Characteristics

➢ Support hot swap.

➢ Four independent output

➢ The 5-204MHZ band supports the Docsis 3.1 standard

➢ The optical AGC and MGC gain control modes are optional

➢ -21dBm ultra low power reception

➢ Normal mode and RFOG mode can be switch.

➢ Internal temperature detection and monitoring functions.

3. Block Diagram

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4. Technical Parameters

Item	Unit	Parameter			
		4x4 RX(HFC)		**4x4 RX(RFOG)**	
Optical Part					
Input optical wavelength	nm	1270 ~ 1610		1270 ~ 1610	
Input optical power range	dBm	-15~ -1		-25~ -10	
Optical connector type		SC/APC，LC/APC veya E2000			
Optical return loss	dB	≥40			
Responsivity		≥ 0.8 A/W			
Fiber type		Single mode			
RF Part					
RF output		4			
Frequency range	MHz	5~204			
Flatness in band	dB	±1			
Output return loss	dB	≥16			
Maximum output level (in optical AGC range)	dBμV	＞90 @Pin= -15dBm, OMI=15%		＞80 @Pin= -25dBm, OMI=15%	
Output shutdown isolation	dB	≥50			
Equivalent noise current	pA/rt(Hz)	< 4,5		≤ 1,5	
NPR Dynamic Range	dB	≥14(NPR≥36) @Pin= -15dBm	15-85 MHz	≥19(NPR≥36) @Pin= -10dBm ≥14(NPR≥36) @Pin= -15dBm ≥18(NPR≥36) @Pin= -20dBm	15-85 MHz
MER	dB	40 @-1dBm 40 @-10dBm 39 @-15dBm		40 @-10dBm 39 @-15dBm 39 @-20dBm 37 @-24dBm	
BER	-	10-9 post-FEC @-1dBm 10-9 post-FEC @-10dBm 10-9 post-FEC @-15dBm		10-9 post-FEC @-10dBm 10-9 post-FEC @-15dBm 10-9 post-FEC @-20dBm 10-9 post-FEC @-24dBm	
RFconnector type		F type			
Others					
Operating temperature	℃	-5 ～ + 55			
Storage temperature	℃	-30 ～ + 70			

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EMC		EN 50083-2
Maximum power consumption	W	<17
Weight	Kg	1

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5. Operation Instructions of the Display Menu

Once the module is installed, the corresponding slot in the display menu will highlight the module which is online.

After entering the submenu, the following parameters can be seen:

ARecvPower	-xx.xdBm	A, B, C, D channels receive optical power
BRecvPower	-xx.xdBm	
C RecvPower	-xx.xdBm	
D RecvPower	-xx.xdBm	
A OutRFLevel	xx.xdBuV	A, B, C, D output levels
B OutRFLevel	xx.xdBuV	
C OutRFLevel	xx.xdBuV	
D OutRFLevel	xx.xdBuV	
AOptAGCEn	Enable	Optical AGC settings of A, B, C, D channels: Enable: Optical AGC is on Disable: Optical AGC is off
B OptAGCEn	Enable	
C OptAGCEn	Enable	
D OptAGCEn	Enable	
RF OutPutMode		RF output mode: mixed / independent
RF WorkMode		Module working mode: HFC/RFOG
A ATT	xdB	A, B, C, D RF attenuation Attenuation range: 0~30 decibels.
B ATT	xdB	
C ATT	xdB	
D ATT	xdB	
ChanNum	xx	Channel numbers, range 0~100
DevTemp	xx.x℃	Module temperature
SN	xxxxxx	Serial number
Version	x.xx	Software version number
WorkTime	x.xHour	Total operating hours of the equipment

6. Structure Description

Front Panel

Rear Panel
Independent output

Rear Panel
Mixed output
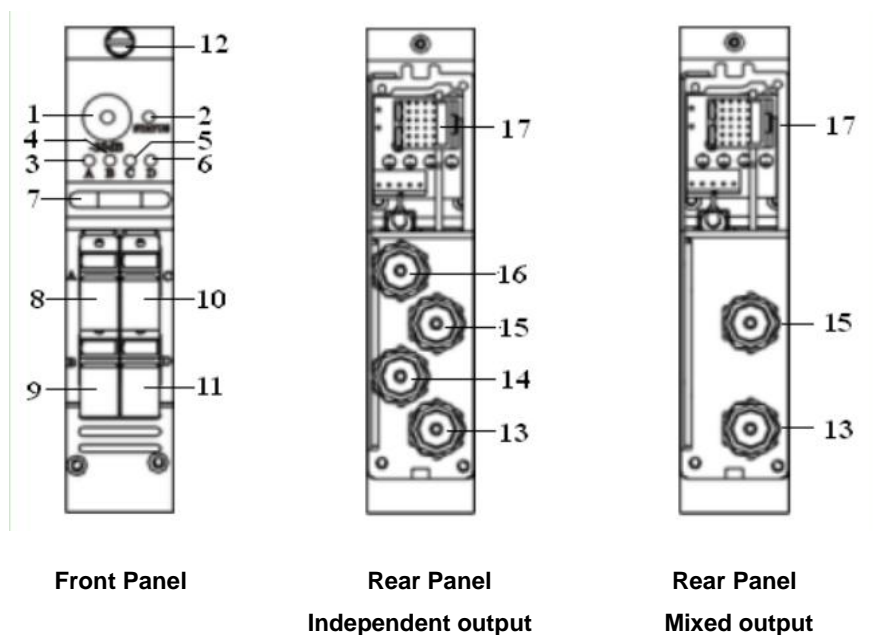
	Independent output	Mixed output	Note
1	RF output test port (on the front panel)	RF output test port (on the front panel)	-20dB
2	Select button for RF output detection	Select button for RF output detection	Cycle,theindicator of the selected channel flashes
3	Optical input indicator of A channel	Optical input indicator of A channel	Indicator on: Input optical power ≥ -26dBm
4	Optical input indicator of B channel	Optical input indicator of B channel	Indicator off: Input optical power <-26dBm
5	Optical input indicator of C channel	Optical input indicator of C channel	Flashing: used for RF test
6	Optical input indicator of D channel	Optical input indicator of D channel	
7	Module handle	Module handle	Used to plug the module
8	Optical power input A	Optical power input A	
9	Optical power input B	Optical power input B	
10	Optical power input C	Optical power input C	
11	Optical power input D	Optical power input D	
12	Module fixing screw	Module fixing screw	Used to fix the module
13	A channel RF signal output	Mixed signal output	F connector of A channel on the rear panel of rack
14	B channel RF signal output		F connector of B channel on the rear panel of rack
15	C channel RF signal output	Mixed signal test point （-20dB）	F connector of C channel on the rear panel of rack
16	D channel RF signal output		F connector of D channel on the rear panel of rack
17	Module socket	Module socket	

7. Installation

➢ This module can be installed in slots 1-16 and can be fully configured.

➢ Check whether the pins on the rear of the module are bent.

➢ Install the module in place along the guide and tighten the screws.

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4. 1550nm Directly Modulated Optical Transmitter Module WOS-WT-1550-4K
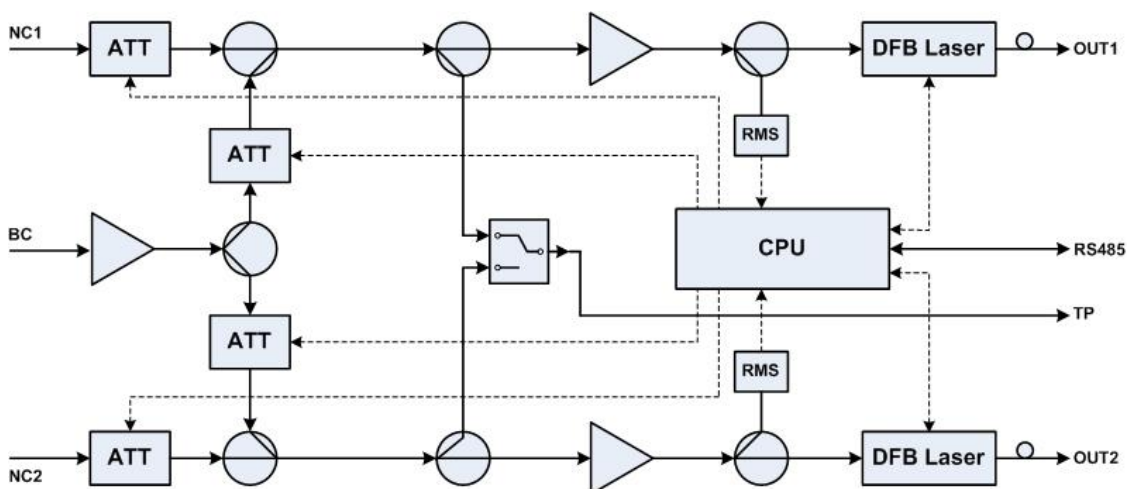
1. Product Overview

In accordance with the planning of the Next Generation Broadcasting Network (NGB) and various PON standards, 1550nm is defined as the transmission wavelength for HFC downstream. The high cost of 1550nm external modulated transmitter and dispersion effects of 1550nm directly modulated transmitter make network transformation difficult. Thus we create the 1550nm directly modulated optical transmitter with electronically controlled dispersion compensation. It supports up to 1.2GHz band and DOCSIS 3.1 system. With multi RF inputs and high isolation, it enables the signal transmission of QAM and IPQAM smoothly. Support transmission distance of 50KM with electronically controlled dispersion compensation. Multi-wavelength networking is optional.

2. Performance Characteristics

➢ Support hot swap

➢ 1.2GHz band, support DOCSIS 3.1 system

➢ Two optical output, two independent CMTS signal input and one common CATV signal input

➢ RF input with high isolation

➢ Low noise DFB laser with predistortion

➢ Electronically controlled dispersion compensation to support 50KM transmission distance and optimize long-distance transmission performance

➢ Optional ITU standard wavelength

➢ Modular structure design

3. Block Diagram

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4. Technique Parameters

Item	Unit	Parameter
Optical part		
Optical wavelength	nm	ITU wavelength, C31.....C37 is optional
Laser type		DFB laser
Optical modulation mode		Direct optical intensity modulation
Optical connector type		SC/APC
Output optical power	dBm	>8
RF part		
Frequency range	MHz	110 ~ 1218
RF input level	dBuV	75~85
Flatness in band	dB	± 1
RF input impedance	Ω	75
Input return loss	dB	≥ 16
AGC control range	dB	±5
AGC adjustable range	dB	±5
MGC adjustable range	dB	0 ~ 20
BC-NC RF isolation	dB	≥ 50	Isolation between two RF inputs
RF input test port	dB	-20±1
CNR	dB	≥ 50	Test link: optical transmitter--18dBm EDFA--20km
C/CSO	dB	≥ 59	fiber—optical attenuator--optical receiver (Pin= 0dBm, noise
C/CTB	dB	≥ 62	bandwidth 5MHz, single wavelength) CENELEC 42 channel load, OMI total value 19-21%
Others		
Maximum power consumption	W	≤20
Operating temperature	℃	-5 ~ + 55
Storage temperature	℃	-30 ~ + 70
Weight	Kg	1

5. Operation instructions of the display menu

Once the module is installed, the corresponding slot in the display menu will highlight the module which is online. After entering the sub menu, the following parameters can be seen:

(1) Sub menu A:

A Out Power	XX.XdBm	Laser output power of channel A
A RFLevel	XX.XdBuV	Laser drive level of channel A
A LaserTemp	XX.X℃	Laser temperature of channel A
A LaserBias	XXmA	Laser bias current of channel A
A Laser Tec	XXA	Laser cooling current of channel A
A CurRFMode	AGC	Current RF operating mode of channel A, AGC or MGC optional
A AGCOffset	XdB	AGC offset of channel A, adjustable range: ±5dB
A MGCAtt	XdB	MGC attenuation of channel A, adjustable range 0~20dB

A NCAtt	XdB	NC attenuation of channel A
A BCAtt	XdB	BC attenuation of channel A
A ChanNum	84	Number of transmission channels, 1 ~ 200
A Wavelength	1550	Wavelength of channel A
A LaserCtrl	ON	Laser switch, ON, OFF
A FiberLength	XX KM	Set dispersion compensation distance, 0-50KM, 1KM stepping
DevTemp	XX.X℃	Module internal temperature
Model		Serial number
Version		Software version number
WorkTime		Total operating hours of the equipment

(2) Submenu B:

B Out Power	XX.XdBm	Laser output power of channel B
B RFLevel	XX.XdBuV	Laser drive level of channel B
B LaserTemp	XX.X℃	Laser temperature of channel B
B LaserBias	XXmA	Laser bias current of channel B
B Laser Tec	XXA	Laser cooling current of channel B
B CurRFMode	AGC	Current RF operating mode of channel B, AGC or MGC optional
B AGCOffset	XdB	AGC offset of channel B, adjustable range: ±5dB
B MGCAtt	XdB	MGC attenuation of channel A, adjustable range 0~20dB
B NCAtt	XdB	NC attenuation of channel B
B BCAtt	XdB	BC attenuation of channel B
B ChanNum	84	Number of transmission channels, 1 ~ 200
B Wavelength	1550	Wavelength of channel B
B LaserCtrl	ON	Laser switch, ON, OFF
B FiberLength	XX KM	Set dispersion compensation distance, 0-50KM, 1KM stepping
DevTemp	XX.X℃	Module internal temperature
Model		Serial number
Version		Software version number
WorkTime		Total operating hours of the equipment

6. Structure Description

Front panel   Rear panel

	Description	Remark
1	Module fixing screw	
2	Level test port	-20dB
3	Switch button of RF TP in A/B channel	
4	Monochrome status indicator (Channel A)	Off: Laser parameter alarm; Flashing green: RF alarm; Constant green: working normally.
5	Monochrome status indicator (Channel B)	Off: Laser parameter alarm; Flashing green: RF alarm; Constant green: working normally.
6	Monochrome operating indicator	TB on: Test point is on channel B.
7	Monochrome operating indicator	TA on: Test point is on channel A.
8	Optical power output	
9	Optical power output	
10	Module socket	
11	NC2: CMTS signal B input	
12	BC: CATV common input	
13	NC1: CMTS signal A input	

7. Installation

➢ This module can be installed in slots 1-16 and can be fully configured.

➢ Check whether the pins on the rear of the module are bent.

➢ Install the module in place along the guide and tighten the screws.

➢ Avoid direct observation and contact with the fiber tip. You must confirm the equipment is off when cleaning the port.

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