OLP

Optical Fiber Line Auto Switch Protection System

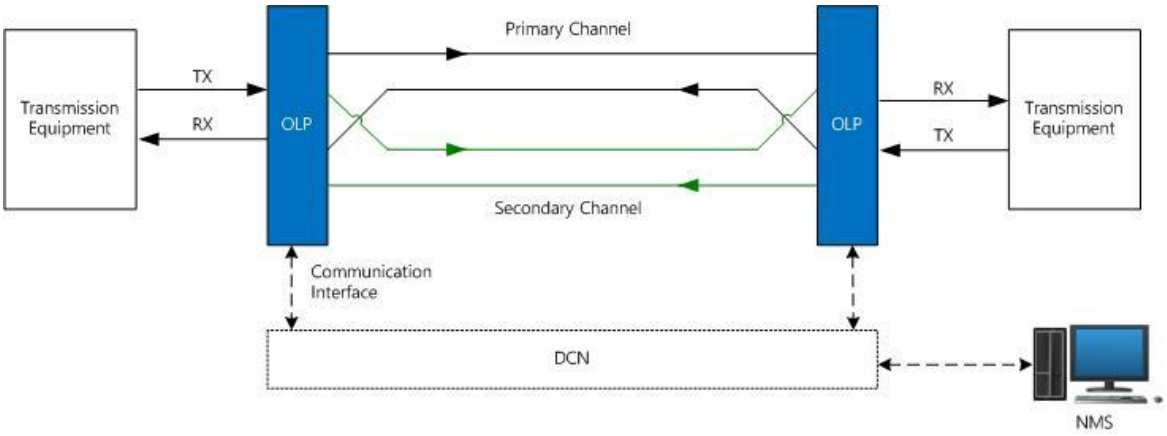
Contents

1 General

1.1 System Description

OLP (Optical Fiber Line Auto Switch Protection System) is a product that used in the protection of optical transmission line, it can realize optical power real-time monitoring and automatic optical fiber line switching.

In optical transmission network, the OLP monitor the optical power of the Primary and Secondary fiber in real time. When the Primary is accidentally broken or the performance is degraded, the OLP will automatically switch the working channel from Primary to Secondary to realize the protection of optical fiber line.



1.2 Advantages

- Working in the optical layer, transparent transmission to optical signals.
- High optical performance.
- Carrier grade switching speed.
- Support dual power supplies for redundancy.
- Support NMS for unified OAM.

1.3 Applications

- Optical fiber line auto switch protection.
- Real-time monitoring of fiber quality by optical power.
- Emergency dispatching of working routes.

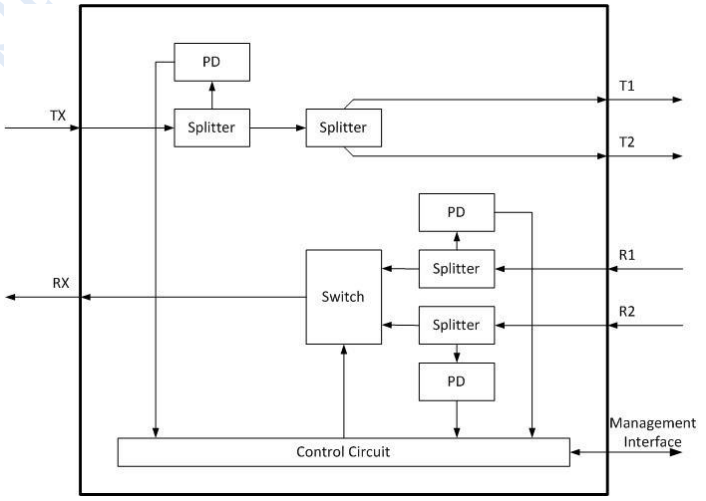
2 Equipment Types

2.1 Equipment Types

Compact OLP (1U compact type)

Pluggable OLP (1/2/4U pluggable type)

2.2 Diagram



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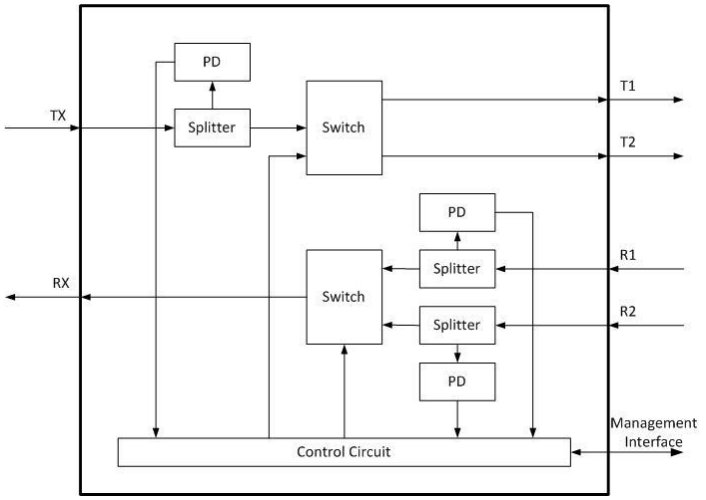

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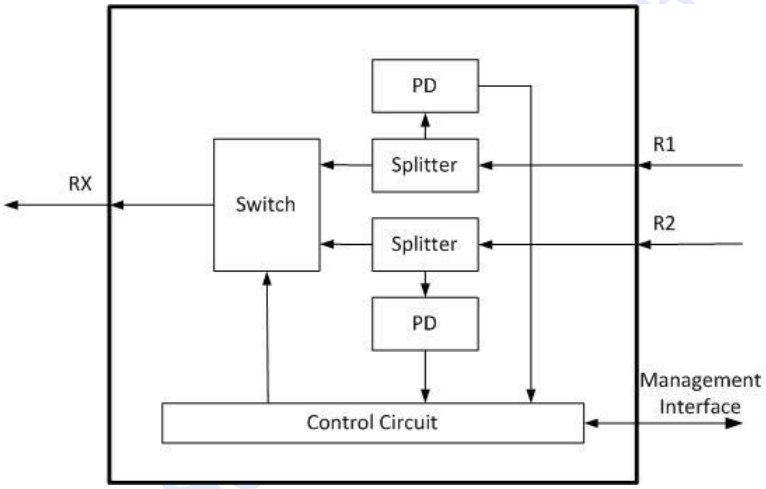


1-1

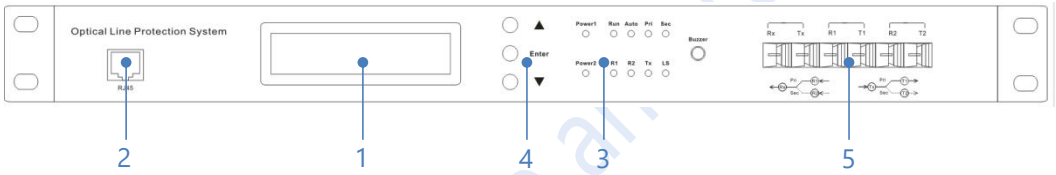
3 Compact OLP

3.1 Features

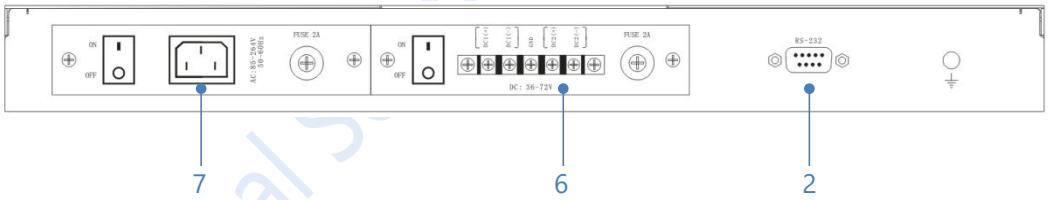
- Low cost OLP solution.
- 1U compact size for easy deployment.
- Support panel key control with LCD display.
- Support 1+1, 1:1, 1-1 three kinds of protection methods.

3.2 Outline

Front



Back



1: LCD Display

2: LAN and RS-232 interface: management interface

- LAN: RJ-45 connector
- RS-232: DB9 male connector

3: Indicated LED

LED	Indication	Descriptions
Power1 Power2	Power Supply status	On: Power on Off: Power off
Run	Equipment running status	Flashes 1 time/second

Auto	Working mode status	On: Auto mode Off: Manual mode
Pri, Sec	Working channel status	Pri on: Working on Primary Channel Sec on: Working on Secondary Channel
R1	RX level status of Primary channel	Green: normal (the RX level is higher than the switching threshold) Red: Alarm (the RX level is lower than the switching threshold)
R2	RX level status of Secondary channel	Green: normal (the RX level is higher than the switching threshold) Red: Alarm (the RX level is lower than the switching threshold)
TX	Connection status between OLP and transmission equipment	Green: Normal (OLP received optical signal from transmission equipment) Red: Alarm (OLP do not received optical signal from transmission equipment)
Ls	Working status of internal Light Source	Green: Normal Off: Internal LS is inactive or unassembled Flash with Green light: RX level is lower than the switching threshold. (Internal LS is available for 1:1 only, which is used for monitoring standby channel)

4: Panel key

Enter: Long press to enter or exit the menu. Short press to confirm and save the setting.

▲▼: Select the menu.

Exit: Exit the menu.

5: Optical interface

Port	Connection
TX	Connect to TX port of transmission equipment
RX	Connect to RX port of transmission equipment

T1	Connect to TX port of primary optical fiber
R1	Connect to RX port of primary optical fiber
T2	Connect to TX port of secondary optical fiber
R2	Connect to RX port of secondary optical fiber

6: -48V DC connector

7: 220V AC connector

3.3 Specifications

Parameters	Unit	1:1	1+1	1-1
Working Wavelength	nm	1310±50nm, 1550±50nm		
Optical Power Monitoring Range	dBm	+23 ~ -50		
Optical Power Monitoring Accuracy	dB	±0.25		
Optical Power Monitoring Resolution	dB	±0.01		
Return Loss	dB	≥55		
PDL	dB	≤0.05		
WDL	dB	≤0.1		
Insertion Loss	dB	TX<1.2 RX<1.2	TX<4 RX<1.2	<1.2
Switching Time	ms	<35	<15	<15
Working Life	times	$>10^7$		
Working Temperature	°C	-10 ~ +60		
Storage Temperature	°C	-20 ~ +75°C		
Power Supply	V	-48V DC, 220V AC, Support dual PS		
Power down Status		Maintain or Switch to backup path		
Optical Interface		SC/LC (selectable)		
Management Interface		RJ-45, RS-232		
Rack Size		19'inch, 1U height		

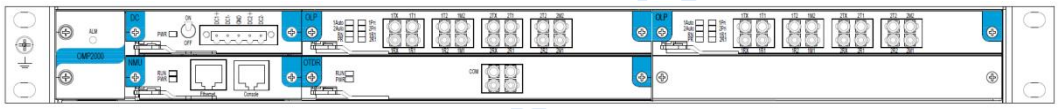
4 Pluggable OLP

4.1 Features

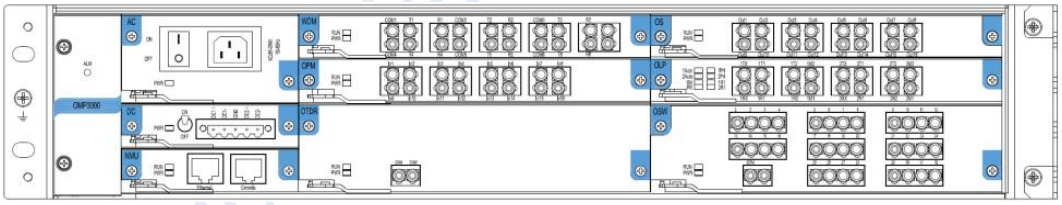
- Highly-scalable platform by pluggable design.
- High integration, large capacity. (2ch OLP per 0.5U card)
- 3 types chassis: 1U with 4 slots, 2U with 8slots, 4U with 16 slots.
- Optional OTDR test function for fiber OAM.
- Optional EDFA to achieve long-haul transmission.

4.2 Outline

1U



2U



4.3 Specifications

4.3.1 General

1) Environmental Condition

- Working Temperature: -5°C to +55°C
- Humidity: ≤ 85% (@ 25°C)

2) Power Supply

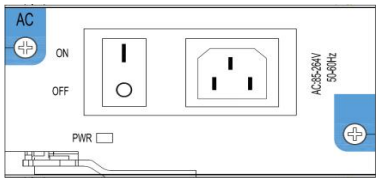
- Power Supply: -48V/DC±20% (85-264)V/AC
- Power consumption: less than 50W in full configuration.

3) Chassis dimension

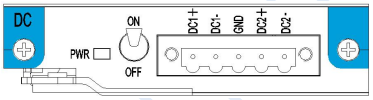
Chassis	Dimension (W×D×H)
1U	483×240×44mm
2U	483×240×89mm
4U	483×240×176mm

4.3.2 Power Unit (PWU)

Outline:



AC Card (1U height)



DC Card (0.5U height)

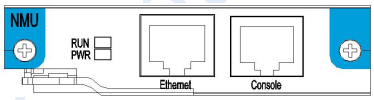
Specifications:

AC Input : 85-264V/AC

DC Input : -48V/DC ± 20%

4.3.3 Network Management Unit (NMU)

Outline:



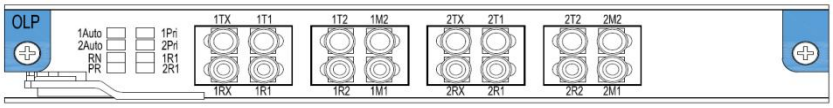
Specifications:

Ethernet Port : 10/100Mbps (RJ-45)

Console : for debugging only.

4.3.4 Optical Line Protection Card (OLP)

Outline:



Specifications:

Parameters	Unit	1:1	1+1	1-1
Working Wavelength	nm	1310±50nm, 1550±50nm		
Optical Power Monitoring Range	dBm	+23 ~ -50		
Optical Power Monitoring Accuracy	dB	±0.25		
Optical Power Monitoring Resolution	dB	±0.01		
Switching Time	ms	<35	<15	<15
Insertion Loss	dB	TX<1.2 RX<1.2	TX<4 RX<1.2	<1.2
Return Loss	dB	≥55		
Power down Status		Maintain or Switch to backup path		
Optical Interface		LC/UPC		
Channels		Max.2 per card		

Ports:

Port	Channel	Connection
1TX	Channel 1	Connect to TX port of transmission equipment
1RX	Channel 1	Connect to RX port of transmission equipment
1T1	Channel 1	Connect to TX port of primary optical fiber
1R1	Channel 1	Connect to RX port of primary optical fiber
1T2	Channel 1	Connect to TX port of secondary optical fiber
1R2	Channel 1	Connect to RX port of secondary optical fiber
1M1	Channel 1	OTDR monitoring port for 1T1/1T2
1M2	Channel 1	OTDR monitoring port for 1R1/1R2

2TX	Channel 2	Connect to TX port of transmission equipment
2RX	Channel 2	Connect to RX port of transmission equipment
2T1	Channel 2	Connect to TX port of primary optical fiber
2R1	Channel 2	Connect to RX port of primary optical fiber
2T2	Channel 2	Connect to TX port of secondary optical fiber
2R2	Channel 2	Connect to RX port of secondary optical fiber
2M1	Channel 2	OTDR monitoring port for 2T1/2T2
2M2	Channel 2	OTDR monitoring port for 2R1/2R2

Indicated LED:

LED	Indication	Descriptions
PR	Power Supply status	On: Power on Off: Power off
RN	Running status	Flashes 1 time/second
1Auto	Working mode status of channel 1	On: Auto mode Off: Manual mode
2Auto	Working mode status of channel 2	On: Auto mode Off: Manual mode
1Pri	Working channel status of channel 1	On: Working on Primary Channel Off: Working on Secondary Channel
2Pri	Working channel status of channel 2	On: Working on Primary Channel Off: Working on Secondary Channel
1R1	RX level status of Primary channel of channel 1	Green: normal (the RX level is higher than the switching threshold) Red: Alarm (the RX level is lower than the switching threshold)
2R1	RX level status of Primary channel of channel 2	Green: normal (the RX level is higher than the switching threshold) Red: Alarm (the RX level is lower than the switching threshold)

5 Working Parameters

5.1 Working Mode

Auto mode: The channels are switch automatically according to the switching threshold.

Manual mode: The channels are switch by setting manually.

OLP support Manual mode auto-return to Auto mode. In a certain period of time, if the OLP does not have any manual operation, Manual mode will automatically return to Auto mode. The factory default setting is 30 minutes. The available value is 1 to 999 minutes. Auto-return function is disabled if the value is set to 0.

Notes: The OLP equipment should be working on Auto mode after operation completed for preventing protection failure.

5.2 Working Channel

OLP will select the working channel automatically according to the optical line status while working under Auto mode.

Working channel can be selected manually by panel key, commands or NMS . While switching the working channel, the Working Mode will be changed to Manual automatically.

5.3 Working Wavelength

1310nm or 1550nm can be selected as working wavelength.

5.4 Switching Threshold

The factory default setting of switching threshold is -30dBm.

In case the optical power of Primary channel is lower than the threshold, OLP will switch the working channel to Secondary.

5.5 Switching Delay

Delay switching and Non-delay switching can be seleted in Auto working mode.

Delay switching: In case the optical power of Primary channel is lower than the threshold, OLP will switch the working channel to Secondary channel after M（M=1~999）seconds delay.

Non-Delay switching: In case the optical power of Primary channel is lower than the threshold, OLP will switch the working channel to Secondary channel immediately.

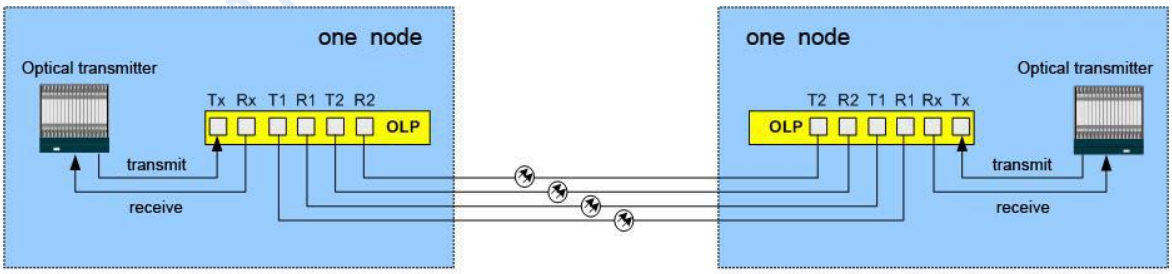
5.6 Working Channel Auto-Switching back

Auto Switching Back or Non-auto Switching Back can be selected.

In Auto switching back, while the primary optical line recover, OLP will switch the working channel from Secondary back to Primary automatically. In this mode, delay can be set from 1 to 999 minutes.

But in Non-auto switching back, the working channel will be maintain in the Secondary channel, even if the Primary channel has recovered.

6 Engineering Connection Diagram



7 Network Management System

The OLP network management system can realize unified management and control of all OLP equipment.

Features:

- Support Windows OS.
- Web-based access, friendly operation.
- GIS platform for visualized management and location.

Functions:

- System Management.
- Equipment Management.
- GIS Topology Management
- OLP Management
- OTDR Test Management
- Alarm Management
- Report Management