

**OPS-1000 Series**  
**Optical protection system**  
**(Single fiber two-way)**

**TECHNICAL PARAMETERS**

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## **1.0 PRODUCT DESCRIPTION**

OPS-1000 Optics Protection System product series, mainly applies to optical communication field of single fiber two-way for main, light path switching equipment. It makes up from light path switching unit, optical power monitoring unit and network management terminal. In optical communication networks, OPS-1000 real-time monitor the optical power of operating fibers and spare fibers, when monitor the optical light path's optical power is lower than setting switching threshold, it will alarming prompt and switch to the spare fiber to realize the line protection of optical transmission system.

OPS-1000 with two light path protection modes:

1. OPS-1051 (1+1 protection mode): receiving port 2x1 optical switch; transmitting port 50/50 splitter, splitter can choose other splitting ratio: 60/40、70/30、80/20、90/10
2. OPS-1011(1:1 protection mode): receiving port 2x1 optical switch; transmitting port 2x1 optical switch

OPS-1000's bi-direction operation wavelength can be appointed by user; there are three regular types as below:

1. OPS-1500 : Bi-direction operation wavelength with 1528~1565nm  
C-Band;
2. OPS-1600: Bi-direction operation wavelength with C-Band & L-Band;
3. OPS-1400 : Bi-direction operation wavelength with 1540~1610 & 1310/1490;

## **2.0PRODUCT FEATURE**

- Wide wavelength range
- High trend optical power monitoring range
- Ultra-low insertion loss
- Very fast switching speed
- Ultra-low polarization dependent loss (PDL)
- User-definable manual mode or automatic mode.
- User-definable alarm thresholds and switching thresholds and so on.
- SNMP supporting remote management and monitoring
- 1+1 supply back-up, support hot plug
- Outage maintain
- Excellent cost performance

## **3.0MAIN APPLICATION**

- Single fiber two-way optical communication network protection and recover
- Network detection and switch

## 4.0 TECHNICAL INDEX

Performance				Index			Supplement	
				Min.	Typ.	Max.		
Optical feature	Bi-directional operation wavelength range		(nm)	1528		1565	(C-Band) OPS-1500	
					C-Band & L-Band		OPS-1600	
					1540~1610 & 1310/1490		OPS-1400	
	Insertion loss	1+1 protection	Sending end	(dB)		3.6	4.0	50/50% splitter
			Receiving end				2.5	5% Tap
		1:1 protection (single -end)						2.5
	Return loss		(dB)	55	60			APC
	crosstalk		(dB)	55	60			
	Optical power monitoring range		(dBm)	-30		+10		A type
				-23		+23		B type
				-45		+23		C type
	Optical power Resolution		(dB)				0.1	
	Optical power measurement accuracy		(dB)				0.5	-40~+23dBm
							1.0	-40~-50dBm
	Wavelength dependent loss (WDL)		(dB)				0.2	
	Polarization dependent loss (PDL)		(dB)		0.06		0.1	
	Temperature dependent loss (TDL)						0.2	0~70 °C
	Switching time	1+1 protection		(mS)		3	10	
		1:1 protection		(mS)			25	
	Fiber type			9/125				SMF-28
Optical connector			SC/APC、LC/APC				UPC Optional	
100M Ethernet interface			RJ45					
Network protocol			SNMP					
Communication interface			RS232					
Power supply		(VAC)	90	220	265		50/60Hz	
		(VDC)	-72	-48	-36			

Power consume	(W)			4	
Working temperature	(°C)	-20		65	
Storage temperature	(°C)	-40		85	
Working relative humidity	(%)	0		95	Non-condensing
Size (W)×(D)×(H)	(")	19"×10"×1.75"			

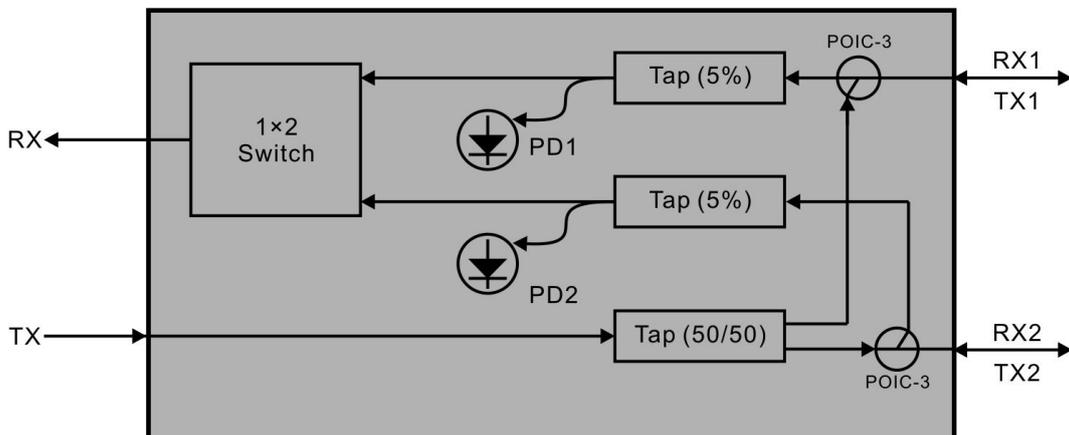
### 5.0OPS-1000 OPTICAL PROTECTION SYSTEM FUNCTION:

Optical fiber switching function	<ol style="list-style-type: none"> <li>1. Automatic switching function: When system monitoring optical power decrease of light path and exceed (under) the user setting switching threshold, the system will automatic switch from operating fiber to spare fiber.</li> <li>2. Manual switching function: Users can realize manual switch by the equipment panel button and network management terminal.</li> <li>3. Automatic/manual restore function model: with automatic restore and manual restore function model.</li> <li>4. Automatic restore function mode: After the system itself detected failure fibers recovering and users in advance setting delayed, it will automatic switch to the original lines.</li> <li>5. Manual restore function mode: the system will switch to original lines only receiving the user's orders.</li> </ol>
Optical power detection function	System supplies real time detection function of operation fiber and spare fiber.
Network management function	SNMP network management function, RS232 communication interface, supports remote monitor and management.
Parameter setting, check function	With alarming threshold, switching threshold, protection mode etc. parameter setting and checking function.
Alarm function	<ol style="list-style-type: none"> <li>1. Sound alarm: when equipment alarms, the equipment, webmasters all have alarming prompt, and offer banned sound function.</li> <li>2. Light alarm: When alarms, three will be alarming prompt, according to the indicator lights' color change or webmaster to monitor the current system status.</li> <li>3. Display alarming details: The equipment's LCD display current alarming information.</li> <li>4. Alarming classify and classification function <ol style="list-style-type: none"> <li>1 ) Classify alarm: Include optical power and other alarming function.</li> <li>2 ) Other alarm: Include equipment power off, or the equipment can't contact with operation maintenance terminal system, then start alarming.</li> <li>3 ) Alarm classification: Include common alarm, important alarm.</li> </ol> </li> </ol>
Display function	1. System business current work in operation fiber or protection fiber.

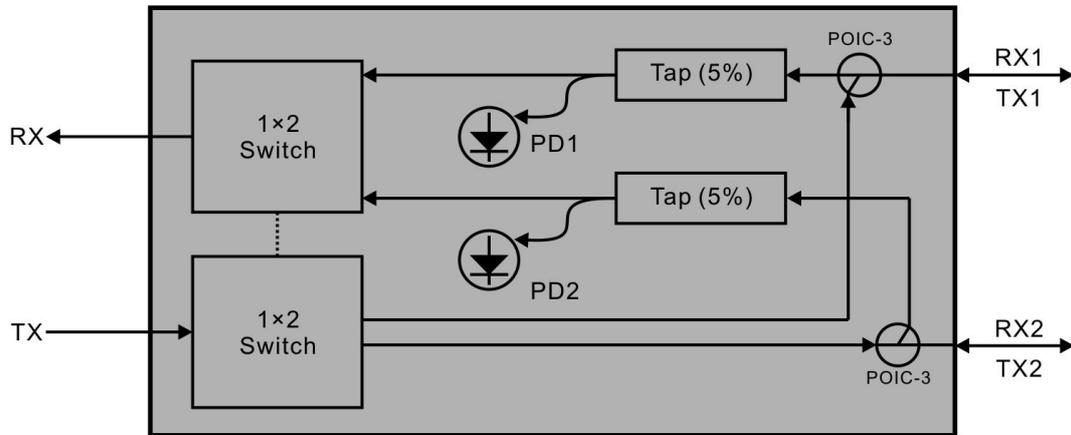
	<ol style="list-style-type: none"> <li>2. Alarm failure prompt</li> <li>3. Equipment current operation mode—manual/automatic.</li> <li>4. The current optical power value of operation fiber and spare fiber.</li> <li>5. Display the current alarm threshold, switching threshold.</li> </ol>
Reliability	<ol style="list-style-type: none"> <li>1. High reliability, mean time between failures (MTBF) not less to 100,000h.</li> <li>2. 1+1 power supply back up, support hot plug. Two-way DC power supply, two-way AC power supply, or one DC one AC power supply can be optional.</li> <li>3. System's use, not effect to optical transmission network's common work.</li> <li>4. Outage maintaining: In system outage, plus electric process to keep original work line and communication are not affected. Or switch the lines that have optical signal.</li> <li>5. Without light lock: When computer room system without light output, can maintain the original line state.</li> </ol>

## 6.0OPS-1000 TWO KINDS OF PROTECTED TYPE PRINCIPLE DIAGRAM

### 6.1 OPS-1551-2-0 (1+1 principle diagram)

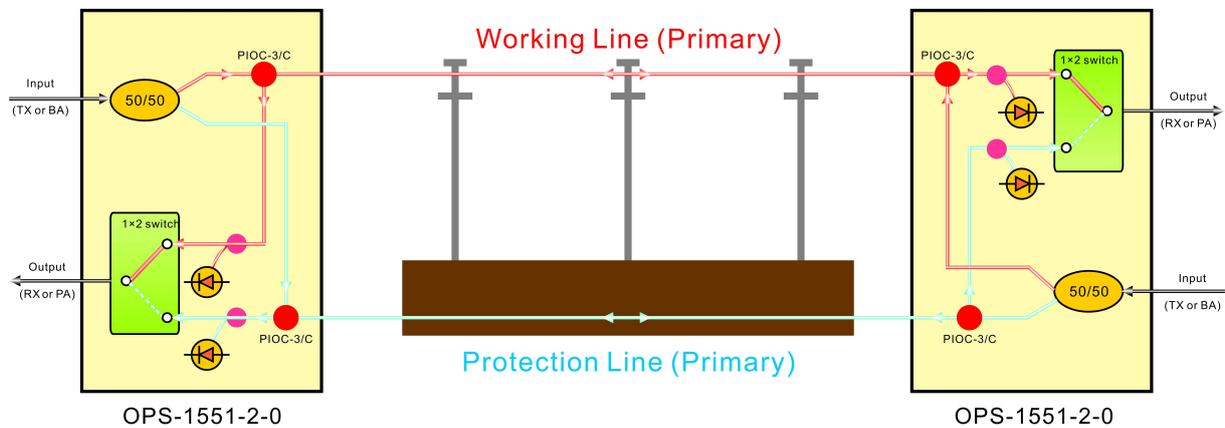


## 6.2 OPS-1511-2-0 (1:1 principle diagram)



## 7.0 OPS-1000 TWO KINDS OF PROTECTED TYPE APPLICATION REFERENCE DIAGRAM

### 7.1 1+1 protection mode (OPS-1551、OPS-1651)



Remark: PIIOC-3/C : Polarization Independence triple-ports Optical Circulator



## 9.0 ORDERING INFORMATION

OPS - 1 5 5 1 - 2 - 0 -   - F / SA -   /   

Huatai Optics Protection System	Apply to network	Work wavelength		TX light splitting ratio & switch number		RX switch number		RX Test PD number		TX Test PD number		Optical power test range (dBm)		Optical port position		Connector		Number of power supply		Power supply	
1	Single Fiber Bi-direction	5	Two Way 1528~1665nm C-Band	5	50/50	1	1ps	2	2ps	0	0ps	A	-30~+10	F	Front panel	SA	SA/APC	S	Single PS	22	220VAC
				6	60/40					1	1ps	B	-23~+23	B	Back panel	SP	SC/UPC	D	Dual PS	11	110VAC
		6	Two Way C-Band & L-Band	7	70/30	2	2ps	2	2ps	C	-45~+23	LA	LA/APC	P	Dual PS, hot plug	48	-48VDC				
				8	80/20			LA	LC/UPC	42	-48VDC & 220VAC										
	Dual Fiber Bi-direction	6	Two Way C-Band & L-Band	9	90/10	1	1:1 Model	0	0ps	FA	FA/APC	FA	FA/APC	P	Dual PS, hot plug	48	-48VDC				
				8	80/20			1	1ps	B	-23~+23	B	Back panel			SP	SC/UPC	D	Dual PS	11	110VAC
		4	Two Way 1540~1610 & 1310/1490	9	90/10	1	1:1 Model	2	2ps	C	-45~+23	LA	LA/APC	P	Dual PS, hot plug	48	-48VDC				
				8	80/20			LA	LC/UPC	42	-48VDC & 220VAC										

Remark: Bi-directional operation wavelength can be appointed by users.