

# Optical Bypass Protection Switch

(10ms, 100 μs, 100 ns)

Optical Bypass Protection Switching System (OBP) is deployed in each node to protect a cascaded or layered fiber optical network in which one equipment failure will disrupt the network integrity. In cases of power loss, software crash, or hardware failure, OBP automatically reroutes the transmission bypassing the malfunctioned equipment. This is achieved by inserting optical switches between the transmission fibers and real-time monitoring of the signal strength through the equipment, it automatically switches to the bypass connections when the signal power value is lower than a user-defined threshold. The unit integrates two detectors at the transmission and receiving lines, respectively. The automatic bypass switching signal level is user settable in the GUI. When the equipment is recovered, the transmission will be automatically restored. Our net-ready OBPs offer various reliable protection schemes against network failures. We uniquely provide fast optical switching to reduce data loss with three choices of optical switching speed: 100ns, 100 μs, 10 ms. Management of the OBP is performed using a Web GUI, reachable through the local Ethernet ports on the OBP system control card.

The order table includes a list of standard control interfaces. Additionally, we provide a list of commands to assist customer engineers in coding. For those who require it, we offer a code-writing service for customer interfaces at an additional charge.



## Features

- Reduce interrupt time
- Increase network reliability
- Improve service quality
- Real-time power monitoring
- Automatic switching

## Specifications <sup>[1]</sup>

Parameters	Min	Typical	Max	Unit
Operating Wavelength	1310/1550 ± 50			nm
Insertion Loss <sup>[1], [2]</sup>		1.2	1.5	dB
Monitoring Power Range		-50	23	dBm
Optical Power Resolution		± 0.01		dB
Return Loss		45		dB
Cross Talk On/Off Ratio		55		dB
PDL			0.05	dB
Optical Switching Time <sup>[3]</sup>	100 ns	10 ms		
Repeatability			± 0.05	dB
Noise Figure			30	dB
Durability <sup>[4]</sup>	10 <sup>7</sup>			cycle
Power Consumption			3	W
Operating Temperature	0		70	°C
Storage Temperature	-40		85	°C
Monitor Port	RJ45, Console, SFP			
Working Power	DC: 12~48V; AC: 110~220V (50/60 Hz), 50W			
Fiber Type	SMF-28 or equivalent			
Chassis Type	19" Standard Rack, 1U Dimension (HxWxD) 44.5x482.6x300mm			
Relative Humidity	5-95%			

**Notes:**

- [1]. Excluding connectors
- [2]. Multimode IL measure @ Light Source CPR<14 dB
- [3]. Optical switch speed, there are electrical signal delay in the system
- [4]. Higher reliability switches are available

**Note:** The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [click this link](#):

## Applications

- Fiber Optical Line Protection
- FTTx Networks

# Optical Bypass Protection Switch

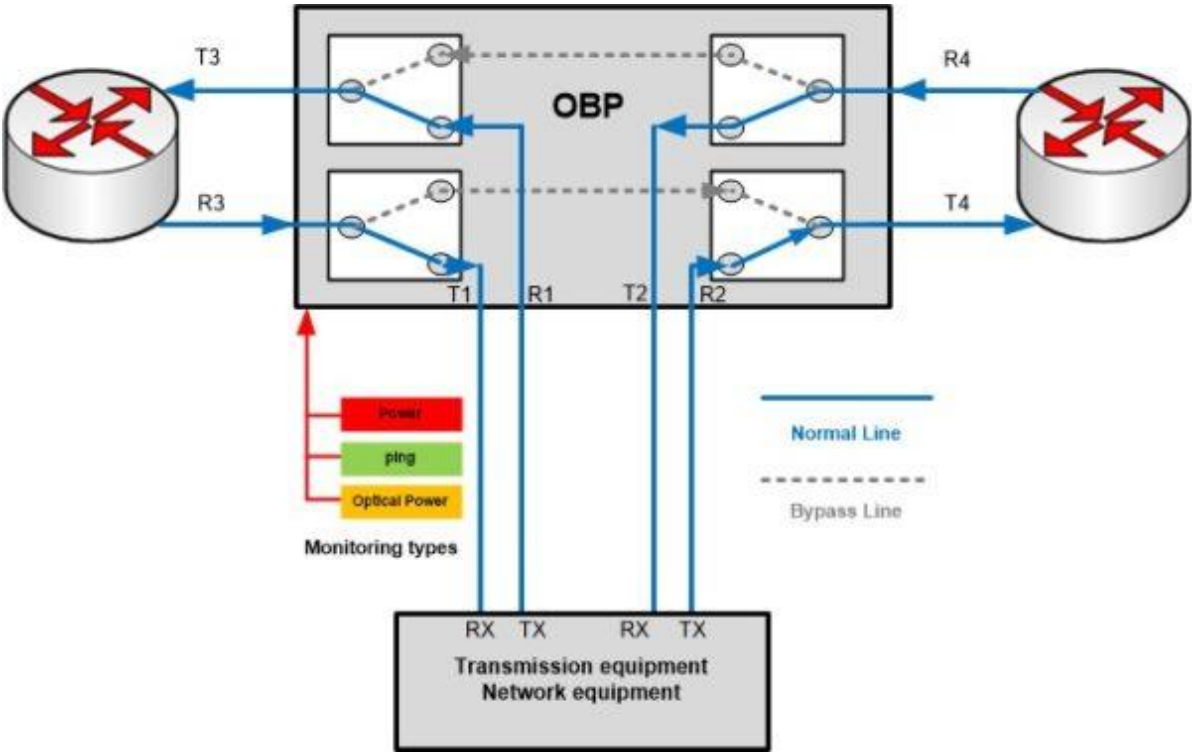
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## Mechanical Dimensions (Unit: mm)

1RU 19" mount rack typically. The input and output connectors and the control interface are on the front panel, while and power inputs are on the rear panel.

\*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

## Optical Diagram



## Electrical Power Requirements

The protection switch comes with dual power supply. The requirement for each power supply is 110~220V / 1.8A. The whole power consumption is less than 100W.

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## Ordering Information

Prefix	Type	Channel <sup>[1]</sup>	Wavelength	Package <sup>[2]</sup>	Fiber Type	Switch Speed	Power Supply	Connector
<b>OBSP-</b>	Module = 1 Module+Rack = 2 Special = 0	1 = 1 2 = 2 3 = 3 4 = 4	1240-1640nm = 1 850/1310nm = 2 Special = 0	Pluggable Module = 9 Standard 1RU = 1 2U = 2 Special = 0	SMF-28 = 1 Special = 0	10 ms = 1 100 μs = 2 100 ns = 3	12V DC = 1 48V DC = 2 110~220VAC = 3 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 ST/PC = 6 LC/PC = 7 Duplex LC/PC = 8 LC/UPC = U Special = 0

[1]. Each Channel contains Tx and Rx pair

[2]. Rack Mount Depth ~ 430mm.

### Fiber Core Alignment

Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

### Fiber Cleanliness

Fibers with smaller core diameters (<5 μm) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

### Maximum Optical Input Power

Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the how handling by expanding the core side at the fiber ends.

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## Questions and Answers

**Q:** If the device were to fail, would the switch continue to pass the fiber light through the switch as configured before failure? When power is restored, does the IN/OUT configuration before failure remain in place?

**A:** This depends, if one mirror fails, it only affects the light go through that mirror. Yes, when power back up it will go to the previous points

**Q:** When power is restored, does the IN/OUT configuration before failure remain in place?

**A:** Yes, when power back up it will go to the previous flightpath

**Q:** If power to the device were shutoff, would the device continue to pass the fiber light as configured before failure?

**A:** This function is call latching. We uniquely offer MEMS latching switch but cost more.

**Q:** With the Ethernet Control Option, does the switch support SNMPv3

**A:** Yes. This internet standard protocol allows user to write their own control code

**Q:** With the Ethernet Control Option, what type of encryption does the SNMPv3 use?

**A:** MD5/DES

**Q:** With the Ethernet Control Option, could this device be controlled by multiple users at different locations and all users will also see the configuration updates?

**A:** Yes

**Q:** With the Ethernet Control Option, could this switch be controlled by multiple users at different locations and all users will also see the configuration updates?

**A:** Yes

**Q:** With the Ethernet Control Option, does the user need to install any software on their computer other than a web browser?

**A:** No

## Laser Safety

This product meets the appropriate standard in Title 21 of the Code of Federal Regulations (CFR). FDA/CDRH Class 1M laser product. This device has been classified with the FDA/CDRH under accession number 0220191. All versions of this laser are Class 1M laser products, tested according to IEC 60825-1:2007 / EN 60825-1:2007. An additional warning for Class 1M laser products. For diverging beams, this warning shall state that viewing the laser output with certain optical instruments (for example eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard. For collimated beams, this warning shall state that viewing the laser output with certain instruments designed for use at a distance (for example telescopes and binoculars) may pose an eye hazard.

Wavelength = 1.3/1.5 μm.

Maximum power = 30 mW.



\*Caution - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

\*IEC is a registered trademark of the International Electrotechnical Commission.