

1:1 NET-READY OPTICAL PROTECTION SWITCH

1:1 Net-Ready Platform

Introduction

In today's network, protection switching at optical layer is a subject of great importance to the carriers. As a member of Oplink's NET-Ready product family, Oplink's NET-Ready series protection switches offer various protection schemes against fiber cuts and network failures.

(1:1) Protection

A (1:1) optical protection system provides two diverse routes for the same link using optical switches at both ends. In case of working fiber link failure, both ends switch to protection link. The (1:1) NET-Ready protection switches in 1x2 or 2x2 switch configurations provide this type of protection. The same switch fits both point-to-point and shared protection switching ring architectures. Multiple Control Modes

Multiple Control Modes

NET-Ready (1:1) protection switch provides both Manual and Automatic switching modes. In Manual mode, the system switches only based on commands from user. In Automatic mode, system switches based on power level detected and pre-set threshold. Automatic mode has two sub-modes: Revertive and Non-revertive. Under Revertive mode, system switches back to working path automatically after fault condition is cleared. Revertive mode needs an external signaling channel to realize. Under Non-revertive mode, the system stays at protection link and switch back only when current protection link has failure.

Programmable Threshold and Hysteresis

Alarm and switching threshold and hysteresis are programmable remotely or locally.

Remote Management and Alarm

NET-Ready (1:1) protection switch provides remote system configuration and management through SNMP. Web GUI and CLI is also provided for user to manage the system locally via Ethernet or craft RS-232 interface respectively.



Features

- ◆ Independent of data rate, format and wavelength
- ◆ Highly configurable to fit network applications
- ◆ Simple, plug-and-play installation
- ◆ User-definable thresholds and hysteresis
- ◆ User-selectable Revertive and Non-revertive modes
- ◆ Latching optical switch
- ◆ Remote configuration through SNMP management interface
- ◆ Front panel LED and remote alarm

Performance Specification

Optical Performance

Parameter	Value	Unit
Operation Wavelength range (λ_{op})	O-, C- or L-band	
Switch		
1x2 switch insertion loss	@ 23 °C, λ_{op}	< 0.6
	@ 23 °C, λ_{op} (include 5% tap)	< 1.2
2x2 switch insertion loss	@ 23 °C, λ_{op}	< 0.8
	@ 23 °C, λ_{op} (include 5% tap)	< 1.4
Wavelength dependent (WDL)	< 0.2	dB
Temperature dependent loss (TDL, 0~70°C)	< 0.2	dB
Polarization dependent loss (PDL)	< 0.1	dB
Return loss (with connector)	> 45	dB
Channel cross talk	> 55	dB
Repeatability	<±0.05	dB
Optical switching time (from electrical trigger to 90% stable optical output)	< 10 (typical = 3)	ms
Durability	> 10 million	cycles
Optical input power monitoring range	- 30~10 typical	dBm
Optical power reading accuracy	<±1.0	dB

[1] IL excludes connectors. [2] All band (1260~1620nm) Ultra-flat 1x2 Switch or 2x2 are also available.

Environmental

Operating temperature range	0 to 60	°C
Operating relative humidity	< 95%RH, non-condensing	
Storage temperature range	-20 to 70	°C
Storage relative humidity	< 95%RH, non-condensing	

Physical

1RU 19" and 23" rack mountable chassis	438 x 291 x 43.4	mm
Weight	approx. 3.5	kg

Interface and Power

One RJ-11 RS232 craft interface
One RJ-45 (100M) Ethernet ports
48V DC power supply, dual A/B power for feed redundancy
100-240V AC power supply. Fan used for AC.
Power consumption < 4 W
SC/PC adaptor as optical interface or customer defined, single mode fiber SMF-28

Management

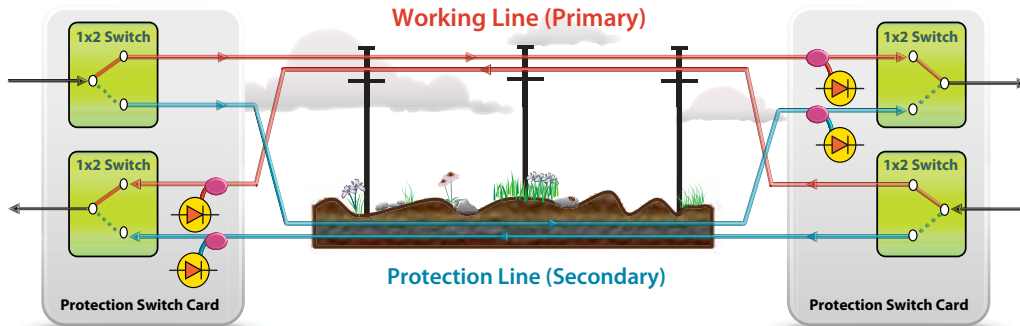
SNMP v1, v2c management interface, compliant to standard MIB browser
TL1, compliant with GR-831-CORE
Task-oriented Web GUI
Command-line interface (CLI) based management console
FTP, Telnet/RLOGIN

Physical

GR-1221-CORE, GR-1073-CORE, UL, FCC
Designed to meet NEBS, ETSI

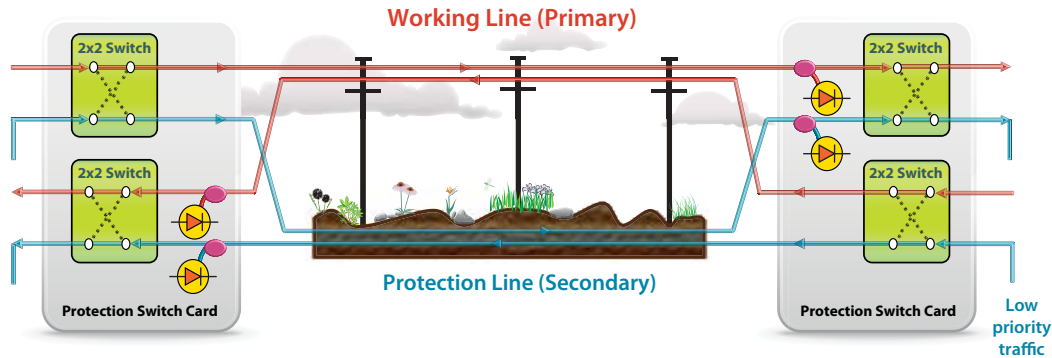
Application Example

(1:1) Protection using 1x2 switches



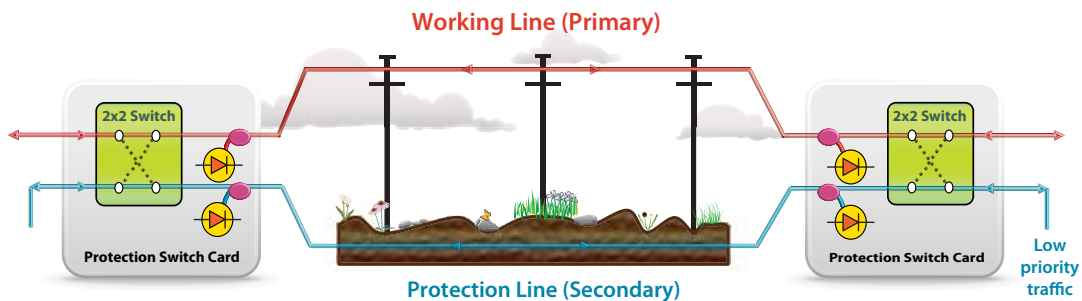
- ⦿ (1:1) point-to-point dedicated protection
- ⦿ 1x2 optical latching switch is used as the switch to route the optical path
- ⦿ Photodiodes monitor the signals from both path
- ⦿ Signaling channel is needed to realize auto-revertive function

(1:1) Protection using 2x2 switches



- ⦿ (1:1) point-to-point dedicated protection or O-BLSR ring protection
- ⦿ 2x2 optical latching switch is used as the switch to route the optical path
- ⦿ Protection line is used for low priority traffic. Low priority traffic is interrupted during failure
- ⦿ Photodiodes monitor the signals from both path
- ⦿ External signaling channel is needed to trigger transmitter end switching and auto-revertive function

Bi-directional (1:1) Protection



- ⦿ Bi-directional (1:1) protection using bi-directional 2x2 switch
- ⦿ Uni-directional tap monitors designed to monitor the only the in-coming power to detect failure such as fiber cut
- ⦿ Designed to work for bi-directional communication using the same wavelength (duplex working) or different wavelength (duplex working)

Ordering Information

Oplink can provide a remarkable range of customized optical solutions. For detail, please contact Oplink's OEM design team or account manager for your requirements and ordering information (510) 933-7200.