



1×N Optical Switch

Polarization-Maintaining (PM) Fiber, RS232 / USB Version



User Manual

A photograph of a long corridor in a data center. Both sides are filled with server racks, their doors closed. The floor and ceiling are made of translucent panels that allow light to pass through, creating a vibrant, multi-colored glow. The colors range from deep blues and purples to bright yellows and reds, reflecting off the surfaces and creating a futuristic, glowing atmosphere.

This user manuals (PDF files) can be downloaded from the Lfiber website.

www.lfiber.com

1xN Polarization-Maintaining (PM) Fiber Switch



FEATURES

- ✓ Low Insertion Loss and High Reliability
- ✓ Serial Interface (RS-232)
- ✓ Modularized Design
- ✓ Epoxy-free on Optical Path

APPLICATIONS

- Optical Signal Switching and Routing
- Optical Network Monitoring
- Testing of Fiber Optic Component
- Military Communications

Specifications of the Polarization-Maintaining (PM) Fiber Switch

Channel Number (N)	1xN ($N \leq 16$) or other channel counts on request
Fiber Type	Panda PM fibers
Insertion Loss (dB)	Typ: 0.5; Max: 0.8
Extinction Ratio (dB)	≥ 20 dB (standard) or better
Operating Wavelength (nm)	1310-1550
Testing Wavelength (nm)	1310 or 1550
Return Loss (dB)	≥ 50
Crosstalk (dB)	≥ 70
Wavelength Dependent Loss (dB)	≤ 0.25
Temperature Dependent Loss (dB)	≤ 0.25
Repeatability (dB)	≤ 0.02
Lifetime (cycles)	10^7
Switching Time (ms)	≤ 8 (adjacent channel)
Power Handling (mW)	≤ 500
Power Supply	5V / 500mA
Control Mode	RS-232
Connector	FC, LC, SC, ST, etc.
Operating Temperature (°C)	-20 to +70
Storage Temperature (°C)	-40 to +85
Dimension (mm)	135 x 64 x 32 mm, 19" rack or different sizes on request

Notes:

1. Unless otherwise specified, the slow axis of the fiber is aligned with the key of the PM fiber connector.
2. The polarization-maintaining fiber (PMF) optical switch is easily controllable through LabVIEW and Python.
3. Lfiber can offer a plug-and-play solution for directly programming the switch via RS32 / USB interface upon request. If there is a need, we can offer software solutions (based on Microsoft Windows OS) so that the users can easily control the optical switch (even though you don't have any knowledge about programming) via the RS232 / USB interface on your computer.
4. The PM fiber optical switch can be powered by a universal AC/DC adaptor that is able to convert 100-250 VAC to 5 VDC.
5. This PM fiber switch can be installed on standard 19-inch racks. We offer customization upon request if needed.
6. The polarization-maintaining (PM) fiber switch is customizable and above specifications are subject to change without notice.

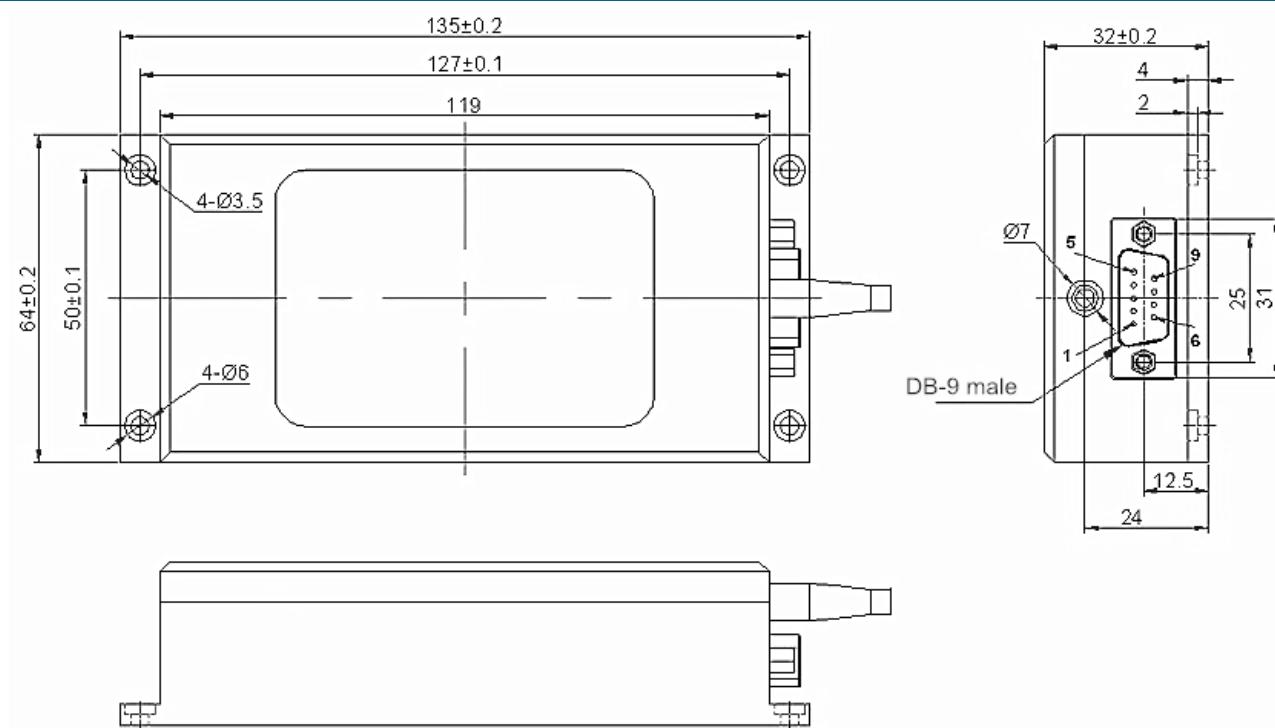
7. For product customization or special requirements, please contact Lfiber's sales representative.

Pin Configurations of the Polarization-Maintaining (PM) Fiber Switch

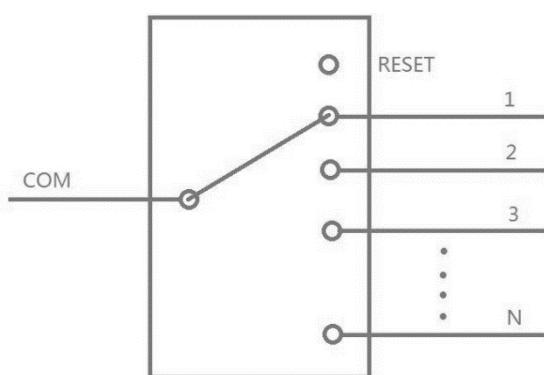
DB-9 Male Connector

Pin No.	I/O	Signal	Description
2	Input	RXD	Receive Data
3	Out	TXD	Send Data
5	Power	GND	Ground
8	Power	GND	Ground
9	Power	VCC1	5.0 ± 5% VDC Power Supply (500mA)
1, 4, 6, 7	NC	NC	Vacancy

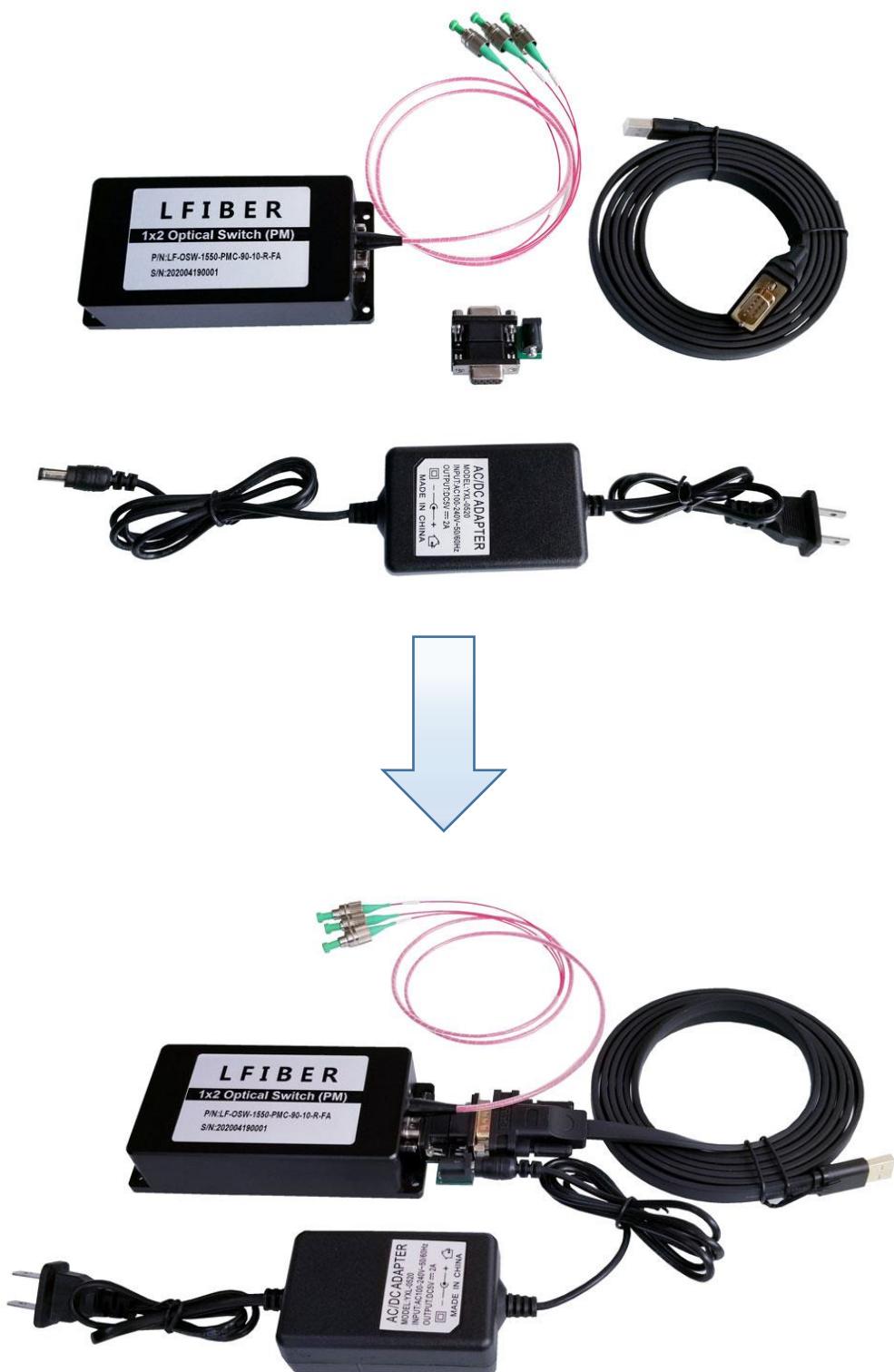
Dimension of the Polarization-Maintaining (PM) Fiber Switch



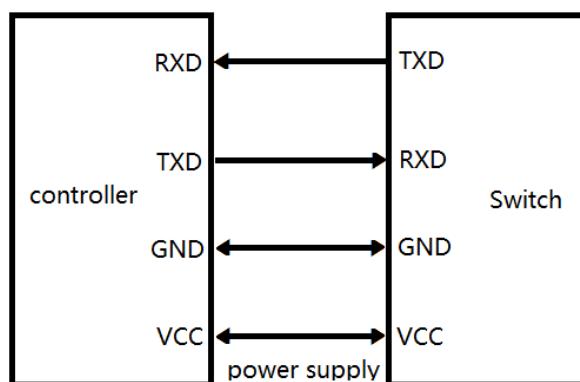
Optical Route of the Polarization-Maintaining (PM) Fiber Switch



RS232 Control via USB: Hardware Connection of the PM Fiber Switch



Control Chart of the Polarization-Maintaining (PM) Fiber Switch



Communication Protocol

- “_” expression underline.
- Communication protocols are all capital letters.
- The communication protocol commands, “<” as the start, “>” as a terminator.

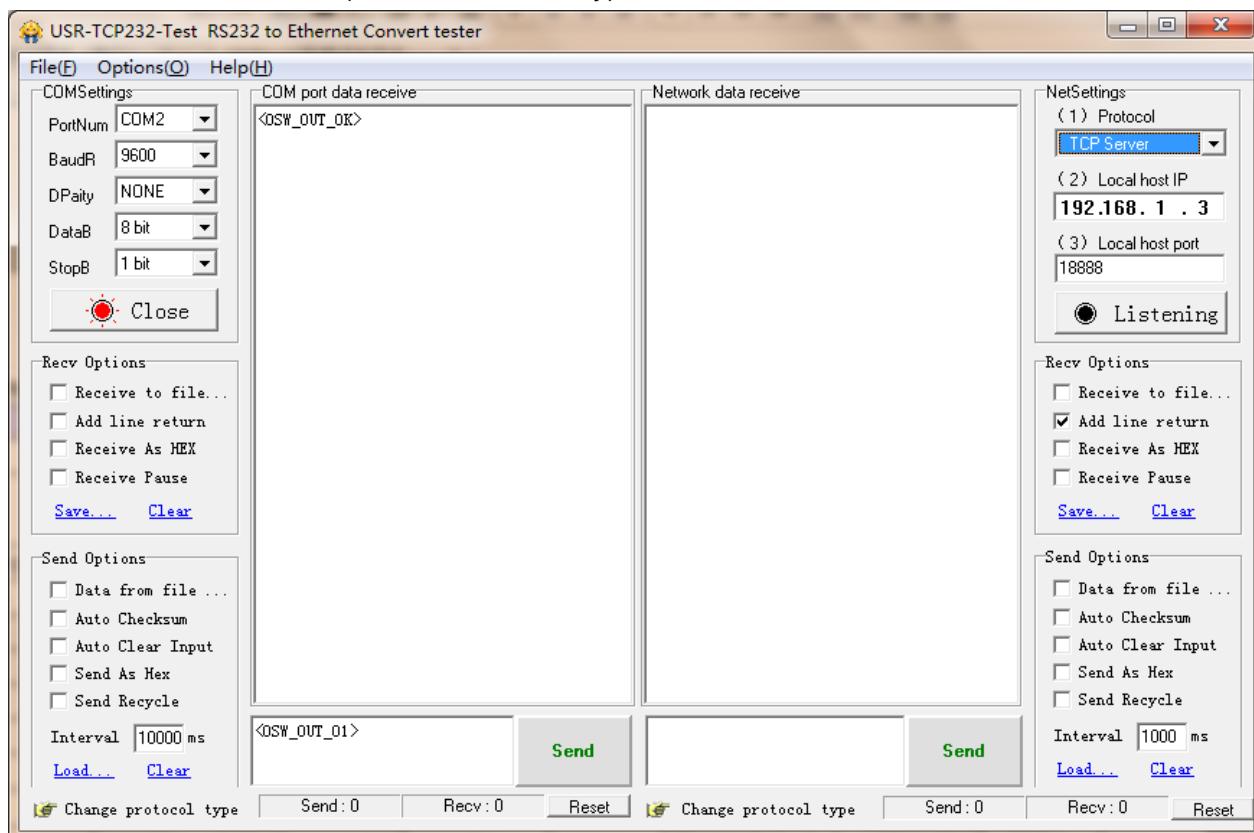
Usage	Instruction	Description
Set optical switch channels	Send: <OSW_OUT_XX> Return1: <OSW_OUT_OK> Return2: <OSW_OUT_OVERFLOW>	Set the "XX" value to select the fiber channel. When "XX" is 00, the switch will be reset. Set 01 to select channel 1. A successful setup will return 1. It returns 2 when "XX" is larger than total channel amount.
Query optical switch channels	Send: <OSW_OUT_?> Return: <OSW_OUT_XX>	Send the query command and it will return an "XX" value to indicate the current channel.
Query optical switch type	Send: <OSW_TYPE_?> Return: <OSW_TYPE_LF-OSW-1X16_1310~1550_PM_90_05_R_FA>	Send the query command and it will return following basic information of the switch. Model: LF-OSW-1×N Wavelength Range: 1310-1550 nm Fiber Type: Panda PM fibers Protective Casing: 0.9 mm Fiber Length: 0.5 m Control Interface: RS-232 Connector type

Operating Instructions

COM Settings

Baud rate: 9600 | Data bits: 8 bit | Stop bit: 1 bit | Parity bit: None | Command error return “<OSW_ERROR>”

Software Control Chart (For Reference Only)



- The optical switch transmits the command to control the optical switch through RS232 serial communication. The optical switch receives the command successfully and returns the response.
- To program the PM fiber switch directly over USB (RS232 control), we can throw in a USB 2.0 to DB9 male serial cable (RS232 converter/adaptor), and then the switch can be connected to the USB port on your device. To download the driver for the converter/adaptor, visit: <https://www.lfiber.com/usb-2-0-to-db9-male-serial-cable-driver-for-lfibers-optical-switches/>
- The PM fiber optical switch is bidirectional in operation.

Ordering Information for the Polarization-Maintaining (PM) Fiber Switch

Port/Channel Number	Test Wavelength	Fiber Type	Control Mode	Fiber Length	Connector
1×N (N ≤ 16)	1310 nm	Panda PM fibers	RS232 (via DB9 Male)	0.50 m	None
Custom ...	1550 nm		RS232 (via USB)	1.00 m	LC/UPC
	Custom ...			1.50 m	LC/APC
				Custom ...	SC/UPC
					SC/APC
					FC/UPC
					FC/APC
					Custom ...