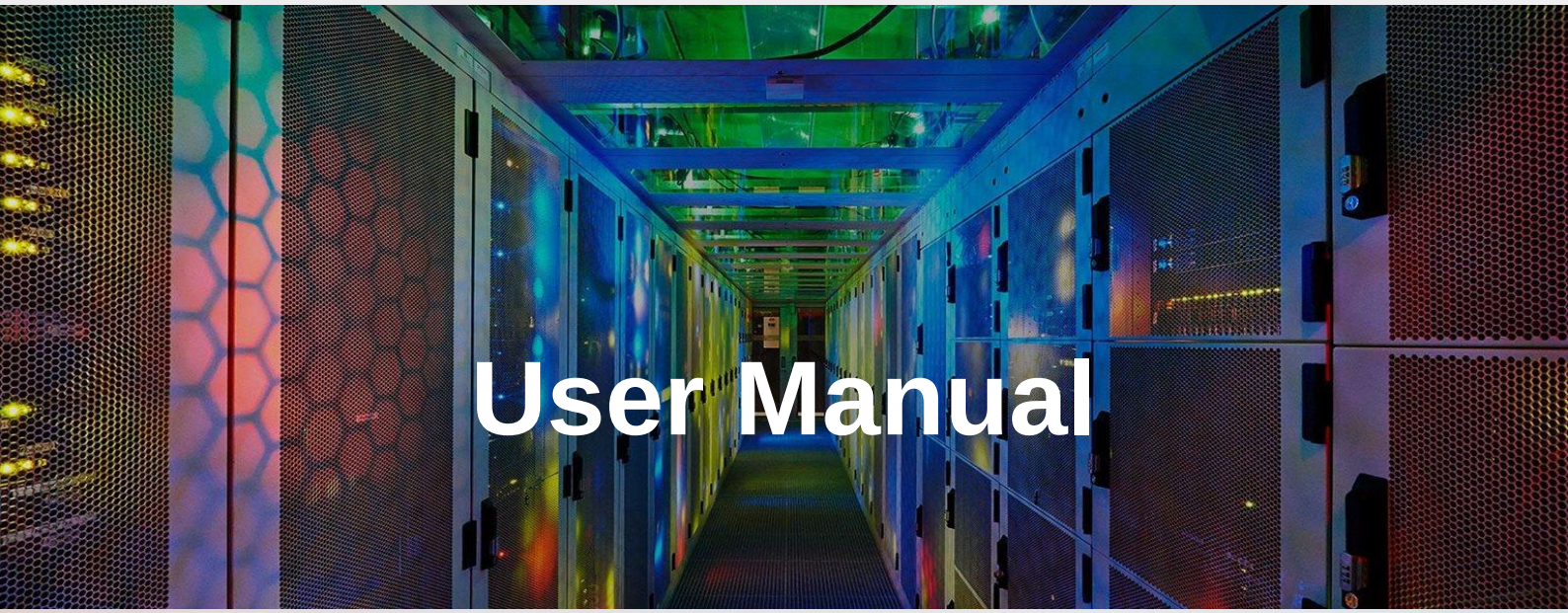
SM Fiber Optical Switches

Single-Mode Fibers, VIS-NIR Spectrum, RS232 / USB Version



User Manual

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

www.lfiber.com

1×N Single-Mode (SM) Fiber Optical Switches

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
- ➢ OTDR Testing

Specifications of the Single-Mode (SM) Optical Switches	
Number of Channels (N)	1×N (N ≤ 16) or other channel counts on request
Fiber Type	Single-mode (SM) fibers
Insertion Loss (dB)	≤ 2.0 dB @ 430-670 nm ≤ 1.5 dB @ 780-1250 nm ≤ 1.0 dB @ 1260-1590 nm ≤ 1.5 dB @ 1600-2000 nm
Operating Wavelength Range (nm)	430-2000 nm on request
Testing Wavelength (nm)	450, 532, 650, 850, 980, 1310, 1490, 1550, 1625, etc.
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, SMA, etc.
Operating Temperature (℃)	-20 to +70
Storage Temperature (℃)	-40 to +85
Dimension (mm)	135 × 64 × 32 mm, 19" rack or different sizes on request

Notes:

1. Typically, the operating wavelengths of the single-mode (SM) fiber optical switches include, but are not limited to, 444 nm, 450 nm, 460 nm, 532 nm, 630 (632, 633, 635, 637) nm, 650 nm, 780 nm, 793 nm, 830 nm, 835 nm, 850 nm, 905 nm, 915 nm, 935 nm, 940 nm 980 nm, 1064 nm, 1080 nm, 1300 nm, 1310 nm, 1450 nm, 1490 nm, 1550 nm, 1625 nm, 2000 nm, etc.

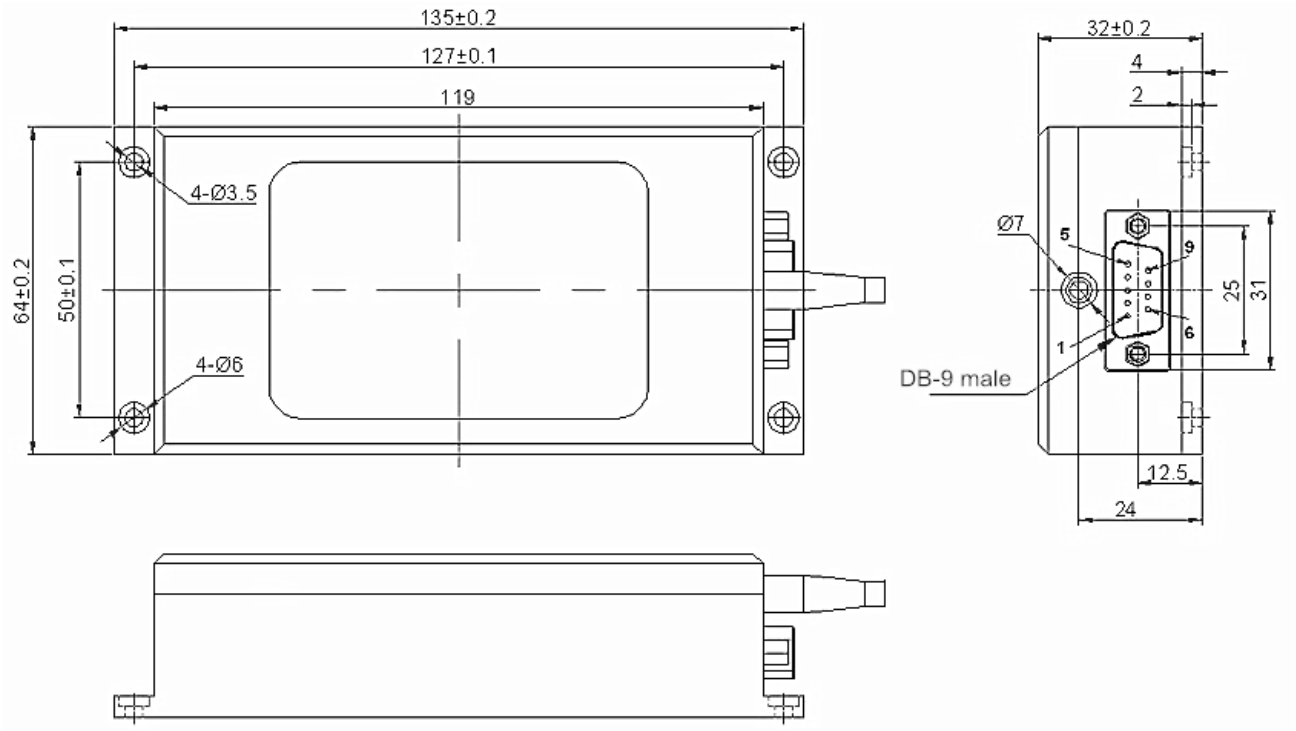
2. For requests please see the ordering information section and specify the number of channels, operating wavelength range, control mode, etc.
3. The Single-Mode fiber (SMF) Optical Switch is easily controllable through LabVIEW and Python.
4. Lfiber can offer a plug-and-play solution for directly programming the switch via RS232 / 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.
5. The SM optical switches can be powered by a universal AC/DC adaptor that is able to convert 100-250 VAC to 5 VDC.
6. Standard port/channel counts of the SM fiber optical switches: 1x2, 1x4, 1x8, 1x16, 1x24, 1x32, 1x48, 1x64, 1x128, etc. Other channel counts are also available on request.
7. The SM optical switches can be installed on standard 19-inch racks. We offer customization upon request if needed.
8. Lfiber's optical switches are customizable and the specifications are subject to change without notice.
9. For product customization or special requirements, please contact our sales representative.

Pin Configurations of the Single-Mode (SM) Optical Switches

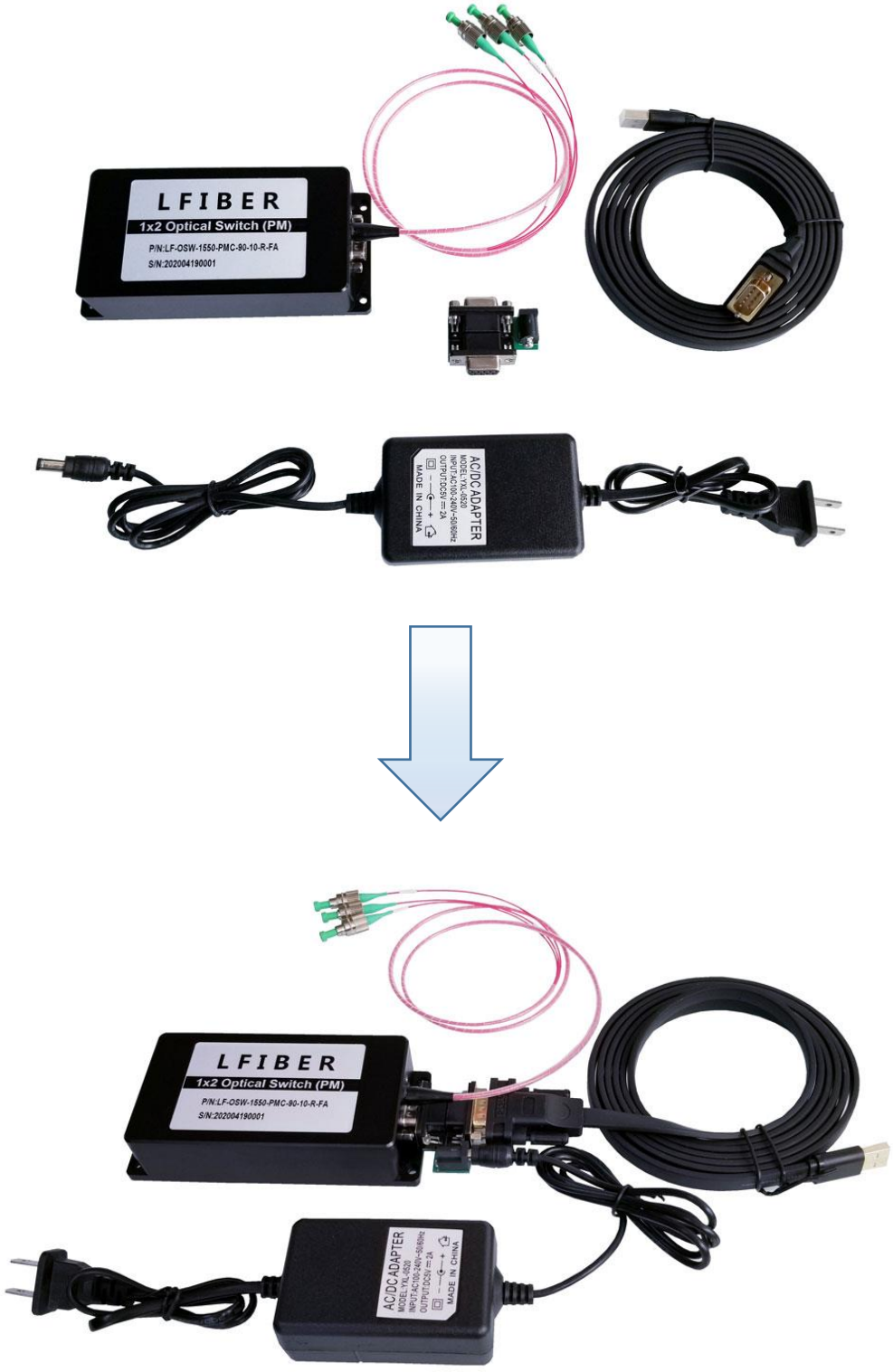
DB-9 Male Connector

Pin No.	I / O	Signal	Descriptions
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

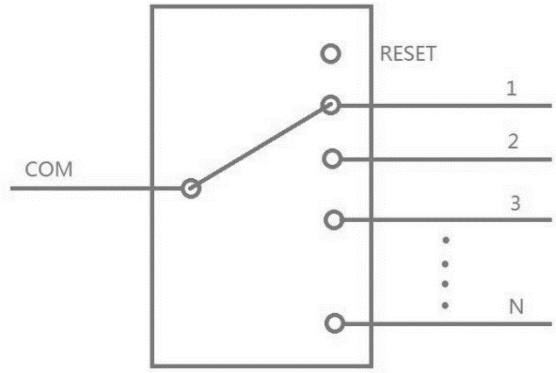
Dimensions of the Single-Mode (SM) Optical Switches



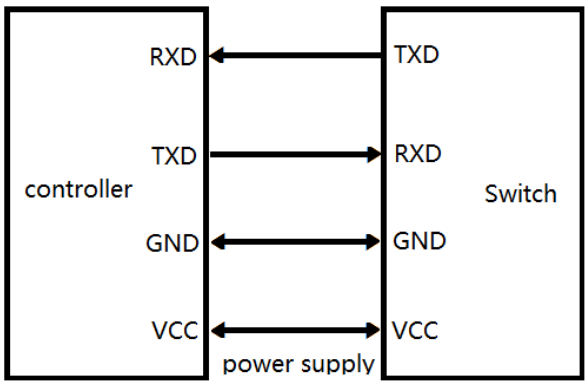
RS232 Control via USB: Hardware Connection of the Optical Switches



Optical Route of the Single-Mode (SM) Optical Switches



Control Chart of the Single-Mode (SM) Optical Switches



Communication Protocol

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

Usage	Instructions	Descriptions
Set optical switch channels	Send: <OSW_OUT_XX>	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.
	Return1: <OSW_OUT_OK>	
	Return2: <OSW_OUT_OVERFLOW>	

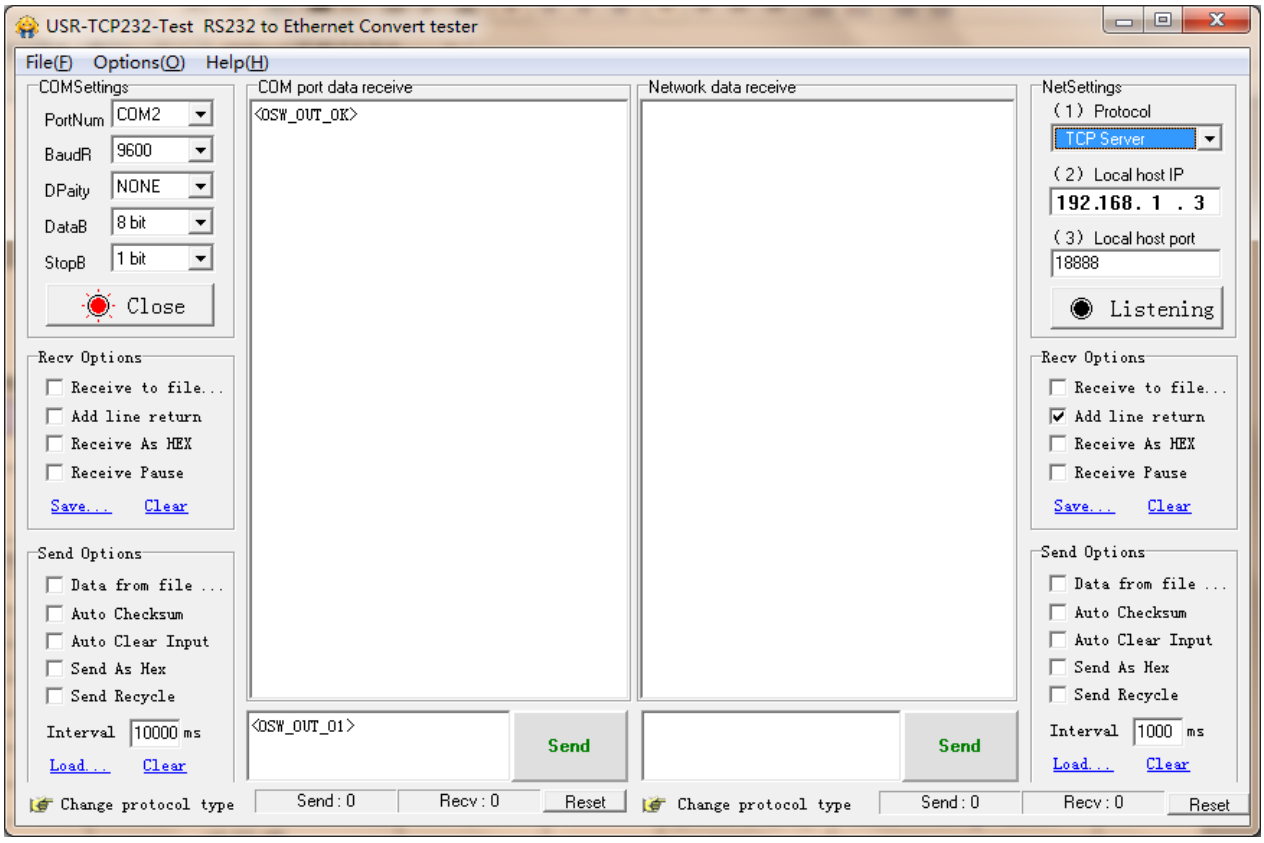
Query optical switch channels	Send: <OSW_OUT_?> Return: <OSW_OUT_XX>	Send the query command and it will return an "XX" value to indicate the current channel.
Query optical switch type	Send: <OSW_TYPE_?> Return: <OSW_TYPE_LF-OSW-1X16_1310~1550_SM_90_05_R_FA>	Send the query command and it will return following basic information of the switch. Model: LF-OSW-1×N Wavelength Range: 1310-1550 nm Fiber Type: SM 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 single-mode (SM) optical switches transmit the command to control the optical switch through RS232 serial communication. The optical switches receive the command successfully and return the response.
- To program the optical switches directly via 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 (computer). 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 optical switches are bidirectional in operation.

Ordering Information for the Single-Mode (SM) Optical Switches

Number of Channels	Operating Wavelength	Fiber Type	Control Mode	Fiber Length	Connector
1×2	444 nm	Single-Mode Fibers	RS232 (via DB9 Male)	0.50 m	None
1×4	450 nm		RS232 (via USB)	1.00 m	LC/UPC
1×8	460 nm			1.50 m	LC/APC
1×16	532 nm			Custom …	SC/UPC
Custom …	630 / 632 / 633 nm				SC/APC
	635 / 637 nm				FC/UPC
	650 nm				FC/APC
	780 nm				Custom …
	793 nm				
	830 nm				
	835 nm				
	850 nm				
	905 nm				
	915 nm				
	935 nm				
	940 nm				
	980 nm				
	1064 nm				
	1080 nm				
	1300 nm				
	1310 nm				
	1450 nm				
	1490 nm				
	1550 nm				
	1625 nm				
	2000 nm				
	Custom …				