Fiber-Fiber™

Fiber Optic Switch System - Custom Configurations

(all fiber type, all wavelength, little distortion, bidirectional, latching)

(Protected by U.S. patents 7224860, 6757101, 6577430 and pending patents)

DATASHEET

BUY NOW

The FFSY Series fiber optic switch is a turn-key system with a user-friendly GUI interface. The FFSY is designed to be compatible with any custom light path configurations. It provides exceptional optical performances of nearly lossless transition, ultra-broadband with little wavelength dependence that is only limited by fiber characters, fast optical switching of less than ms, little temperature dependence, large on/off ratio, and vibration insensitivity. It connects optical channels by fiber-to-fiber direct coupling using a silicon-based micro-mechanical auto-alignment platform that is wafer-level produced in-house. The established optical path is filled with an index-matching liquid, eliminating air gaps, lenses, and coatings. The optical transition is continuous without mode distortions or unwanted surface reflection-related issues. The platform is robust and insensitive to temperature and vibration. The FFSY Series switch can accommodate all types of fibers with 0.125mm outer diameter, including SM. MM, PM, double cladding, bendable, large core, small core. The FF switches uniquely provide performance no other technologies can match.

The switch is controlled by RS232 or USB computer interface. GPIB and LabVIEW version is also available.

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

- No Signal Distortion
- Ultra Low Insertion Loss
- Broad Band
- Latching
- All Fiber Types

Applications

- Quantum System
- Sensor System
- Instrument
- Spectroscopy

Specifications

Parameter	Min	Typical	Max	Unit
Operation Wavelength	400	1260~1650	1800	nm
Insertion Loss [1]	0.5	1	3	dB
Cross Talk	55	60	70	dB
Extinction Ratio (PM Fiber)	18		23	dB
Switch Speed (Rise, Fall)		0.7	2	ms
Durability	10^7			cycle
Polarization Dependent Loss		0.04	0.2	dB
Wavelength Dependence Loss [2]		0.01	0.02	dB
Return Loss	45	55		dB
Repeatability		0.05	0.1	dB
Power Consumption		5	10	W
Operating Temperature	-5		65	°C
Optical Power Handling		300	500	mW
Storage Temperature	-40		85	°C
Switch type	Non-Latching/Latching			

Notes:

[1]. It is related to the light path configuration. Measured without connectors for 1xN. For multimode fiber, use a laser source with CPR<15

[2]. Limited only by the fiber

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Module Mechanical Dimensions

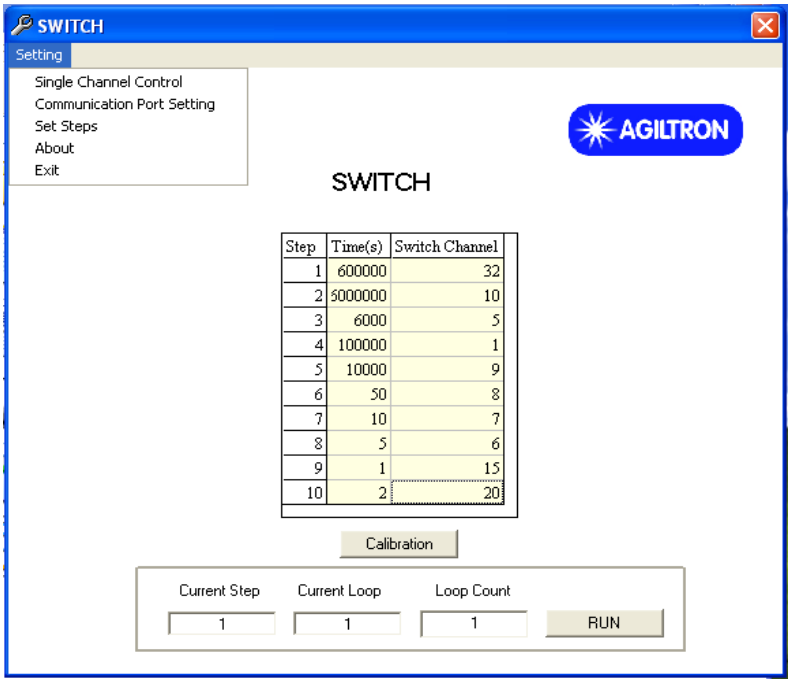
2RU 19” mount rack typically. The input and output connectors are on the front panel, while the control interface and power supplier are on the rear panel.

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

Control Interface and Power Supply

- RS 232
- Ethernet 10/100 with definable IP address
- USB
- GUI
- 110-220V (0.6 A) Power Input

Typical Graphic User Interface



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Ordering Information

	☐☐☐	☐	☐	☐	☐☐	☐
Prefix	**Type**	**Test Wavelength**	**Switch Type**	**Interface**	**Fiber Type**	**Connector**
FFSY-	Custom abbreviation Attach light path diagram Special = 000	1240-1640 = A 1060 = 1 1310 = 3 1410 = 4 1550 = 5 1310/1550 = 2 650 = 6 780 = 7 850 = 8 Special = 0	Latching = 1 Non-latching = 0	USB = 1 RS232 = 2 Ethernet = 3 GPIB = 4	Select from below table	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 ST/PC = 6 LC/PC = 7 Duplex LC/PC = 8 Quad LC/PC = 9 LC/UPC = U Special = 0

RED is Special Order

NOTE:

- **PM1550** fiber works well for **1310nm** and the short fiber in the switch does not affect system performance. **PM1550** can be spliced with **PM1310**

Fiber Type Selection Table:

01	**SMF-28**	34	**PM1550**	71	**MM 50/125µm**
02	**SMF-28e**	35	**PM1950**	72	**MM 62.5µm**
03	**Corning XB**	36	**PM1310**	73	**105/125µm**
04	**SM450**	37	**PM400**	74	**FG105LCA**
05	**SM1950**	38	**PM480**	75	**FG50LGA**
06	**SM600**	39	**PM630**	76	**STP 50/125**
07	**Hi780**	40	**PM850**	77	**IRZS23**
08	**SM800**	41	**PM980**	78	**IRFS32**
09	**SM980**	42	**PM780**		
10	**Hi1060**	43			
11	**SM400**	44	**PM405**		
12		45	**PM460**		
13		46			

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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

Application Notes

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.