



# **OPTICAL FIBER SWITCHES**

Fiber switches are the perfect solution to analyze different light sources. Up to 9 channels can be switched within milliseconds.

Controlled by piezoelectric actuators, our fiber switches have no internal optical components and therefore avoid any form of optical aberration. Based on this principle they are wavelength independent.

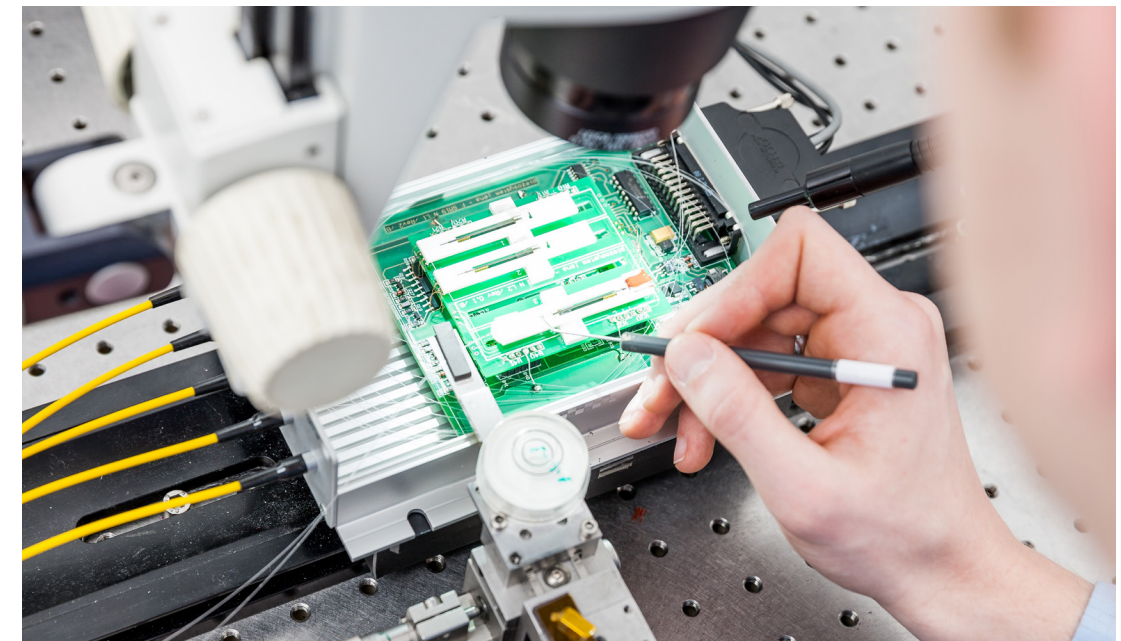
Switches support fiber core diameters from 50  $\mu\text{m}$  up to 600  $\mu\text{m}$ . Their small size and ease of use make these systems ideally suited to add on to spectrometers or other metrology devices.



### ***Applications:***

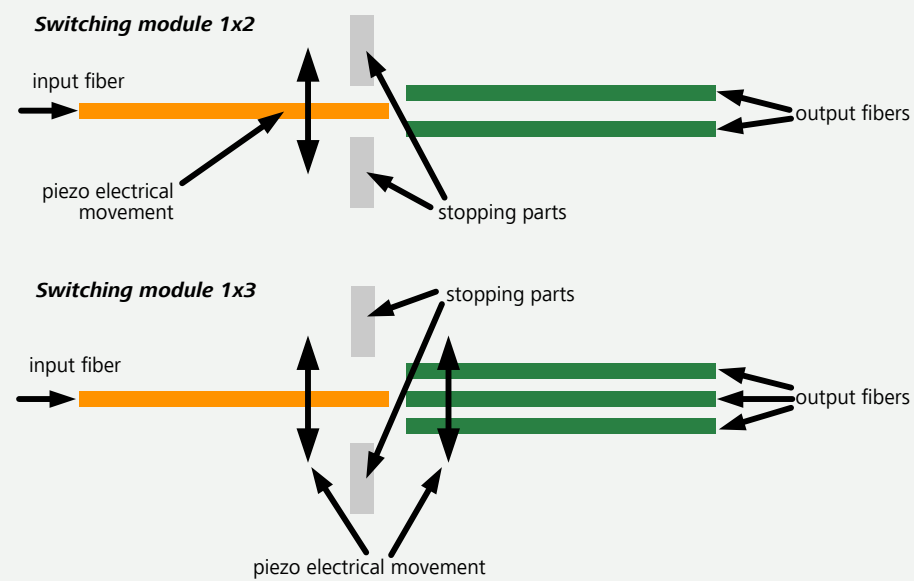
- ***OPTICAL MEASUREMENTS***
- ***SPECTROSCOPY***
- ***PROCESS ANALYTICS***
- ***ENVIRONMENTAL TRACE ANALYSIS***
- ***HIGH LINEAR MOTION***

- ***USE MULTIPLE PROBES WITH ONE SPECTROMETER***
- ***SWITCH LIGHT IN MILLISECONDS***
- ***LOW INSERTION LOSS OF MAX 1 DB***
- ***WAVELENGTH INDEPENDENT: UV UP TO IR***
- ***LIFETIME SWITCH CYCLES OF 100+ MILLION***
- ***LOW POWER CONSUMPTION***
- ***MULTIPLE CONNECTORS AND FIBER SIZES***

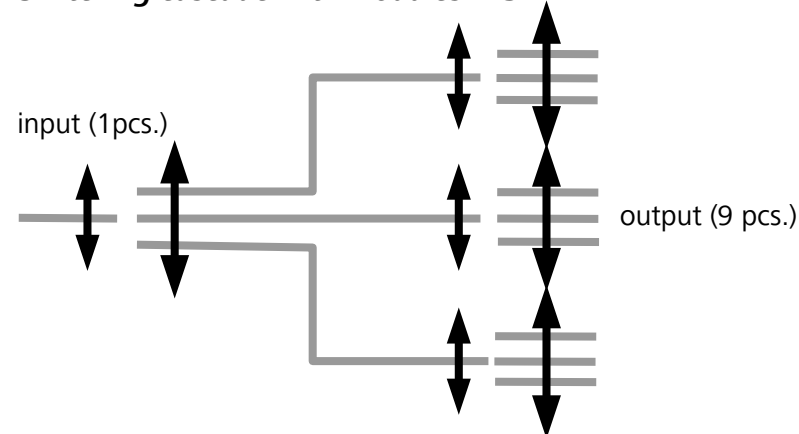


## Working Principle

Fiber switches are based on the piezo principle. Traditional switches based on optical components, like lenses or prisms will always result in a wavelength limitation and potential light loss. Piezo driven fiber switches allow the direct face to face coupling of the fiber with less compromises. These high precision mechanisms require no internal free space optical elements, and they are not susceptible to magnetic interference. The precise positioning of the piezoelectric actuators guarantees a light transmission of >80% with a typical switching time of < 3 ms.

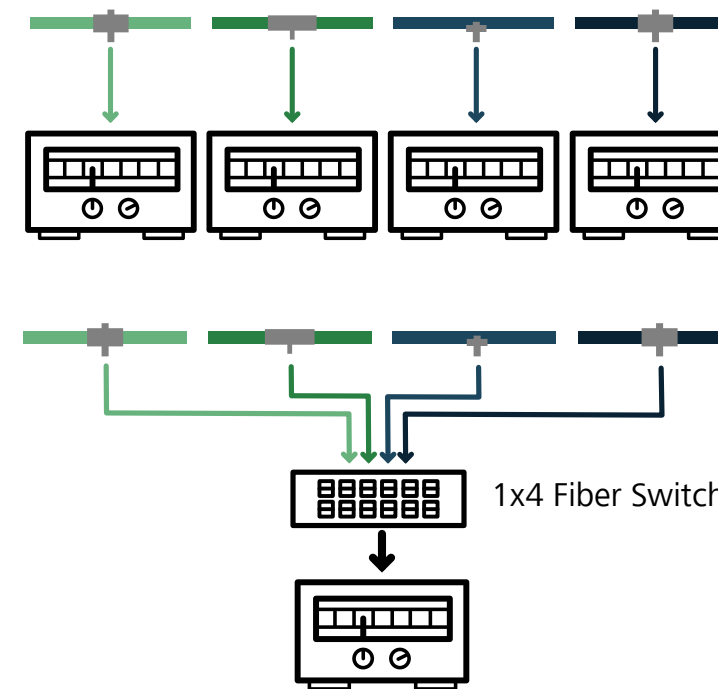


### Switching cascade with modules 1x3



## Reduce equipment costs by eliminating multiple spectrometers and adding a single fiber switch.

An optical fiber switch can receive up to nine input signals and send output to a single spectrometer. The cost of a single fiber switch is considerably less expensive than the cost of multiple spectrometers. This will reduce your start-up costs and increase your ROI. Even 100 output channels can be achieved by cascading multiple fiber switches.



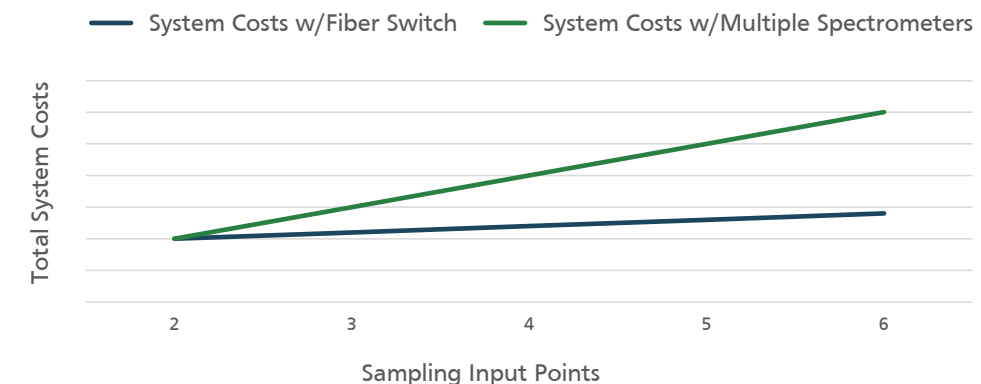
### Traditional Multi-Spectrometer Equipment Strategy:

4 process streams processed separately by 4 spectrometers (top)

### Less Expensive Fiber Switch Equipment Strategy:

Process streams are first bundled by a fiber switch and then processed by one spectrometer (bottom)

Our fiber switches feature high repeatability for situations that require thousands of switching cycles. This may be common for spectroscopic and sensing applications. These fiber switches can be used with wavelengths that range from 180 to 2600 nm, and there is also an anti-reflection option often useful in spectroscopy.



Using a fiber switch in place of 3+ spectrometers will reduce your start-up costs from day 1.

\*Assumption \$ 5000 per Spectrometer.



## Our Products

### Fiber switch 1x2 with analog control

#### Features

FSM 1 x 2 Fiber optic switches



- controlled by 5V TTL signal
- low insertion loss (0.7 dB)
- interface: optionally RS 232

### Fiber switch 1x3 up to 1x9 with analog control

FSM 1 x 3 Fiber optic switches  
FSM 1 x 4 Fiber optic switches  
FSM 1 x 6 Fiber optic switches  
FSM 1 x 9 Fiber optic switches



- controlled by 5V TTL signal
- low insertion loss (0.7 dB)
- interface: optionally RS 232

### Fiber switch with PC control

FSM 1 x 3 Fiber optic switches  
FSM 1 x 4 Fiber optic switches  
FSM 1 x 6 Fiber optic switches  
FSM 1 x 9 Fiber optic switches



- controlled by 5V TTL signal via USB, RS232 and optional: ethernet-interface
- PC interface with control software

Available connector types: SMA, FC/APC, FC/PC, ST

## Humidity Resistant Models

Fiber switches are also available in special humidity resistant models, which greatly increases their ability to withstand relative humidity up to 98% before failure. These special humidity resistant fiber switches are ideal for humid industrial environments, and applications involving operation in non-climate controlled spaces. This functionality is available in all fiber switch configurations, will not increase lead time, and adds minimal cost.

## Control Interfaces

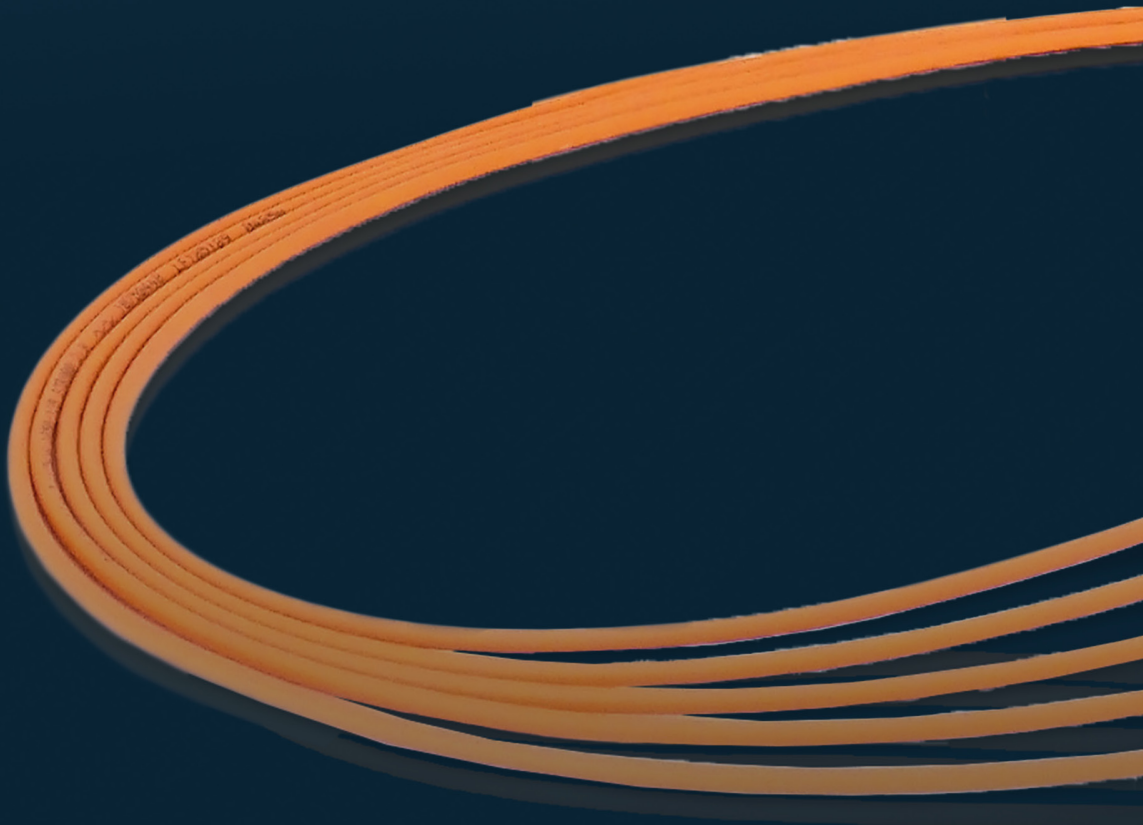
Our fiber switches offer multiple control options. They can be easily controlled via TTL signal (high and low) by BD code, and this is usually the most practical for switches built into the small casing (for 1 x 2 or 1 x 3 models up to 200 micron core size diameter).

RS232 interface is incorporated into our fiber switches that are built in the industrial rack size casing. For the small casing we offer a separate control box (part # Z-950-95) where the interface board is located.

A USB interface is also standard for the fiber switches built into the 19" industrial rack. An Ethernet interface (part # Z-950-100) can be added for all switches that are assembled into a standard 19" industrial rack. Users will benefit from the easy installation into existing network systems. For every interface type the required software comes with the fiber switch.



Built on years of experience designing piezo products, we possess unique designs and technology. We hope to be your trusted partner and fiber switch supplier.



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