



## Applications

- Strain measurements for structures requiring hundreds or thousands of fiber-optic sensors.
- Large sensing applications requiring 8 to 16 optical fibers.

## Description

The **Micron Optics sm041** Channel Multiplexer adds sensor and optical-fiber-connection capacity to the sm125-500 Optical Sensor Interrogator.

There are two basic types of **sm041**. First is the switch-type (**sm041-416 and -408**). Robust optical switches can be programmed to alternate between multiple banks of sensors. This boosts capacity of the sm125-500 Optical Sensor Interrogator to up to 16 fibers and more than 2000 sensors.

The second type of **sm041** Channel Multiplexer is the coupler-type (**sm041-016 and -008**). Coupler-type extensions provide a tidy way to connect up to four optical fibers to a single optical channel on the sm125-500 Optical Sensor Interrogator. For many applications this can greatly simplify fiber routing and sensor installation.

**Micron Optics** supplies a LabVIEW™ utility example that provides the user a path to customize the use of the additional channels provided by the switch-type extension. No special software is needed for the coupler-type **sm041**.



## Where are Micron Optics Instruments Deployed?

- **Civil Structures/Civionics** (bridges, dams, tunnels, buildings, etc.)
- **Energy** (wind turbines, pipelines, nuclear reactors, etc.)
- **Aerospace Vehicles** (composite structures, wind tunnels, dynamic tests, etc.)
- **Oil & Gas** (well reservoir management, platform structural health monitoring, etc.)
- **Marine Vessels** (hull, mast, rudder, submarine pressure tests, etc.)
- **Transportation** (railways, roadways, etc.)
- **Homeland Security** (perimeter intrusion, shipping container integrity, etc.)
- **Research** (medical devices, military armor, chemical sensing, etc.)



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## Specifications

sm041-416

sm041-408

sm041-016

sm041-008

## Optical

|   |                         |                  |               |               |
|---|-------------------------|------------------|---------------|---------------|
| Number of Optical Channels <sup>a</sup> | 4 In / 16 Out           | 4 In / 8 Out     | 4 In / 16 Out | 4 In / 8 Out  |
| Wavelength Range                        | Same as host instrument |                  |               |               |
| Scan Frequency <sup>b</sup>             | 0.25 Hz to 250 Hz       | 0.5 Hz to 500 Hz | 1 Hz to 1 kHz | 1 Hz to 1 kHz |
| Optical Connectors                      | FC/APC                  |                  |               |               |

## Mechanical

|            |                          |                 |                 |                 |
|------------|--------------------------|-----------------|-----------------|-----------------|
| Dimensions | 114 mm x 234 mm x 132 mm |                 |                 |                 |
| Weight     | 1.4 kg (3 lbs.)          | 1.4 kg (3 lbs.) | 1.4 kg (3 lbs.) | 1.4 kg (3 lbs.) |

## Environmental

|                       |            |  |  |  |
|-----------------------|------------|--|--|--|
| Operating Temperature | 0 to 50 °C |  |  |  |
|-----------------------|------------|--|--|--|

## Electrical

|               |  |     |     |
|---------------|--|-----|-----|
| Input Voltage | Powered via DIN connector from host instrument | N/A | N/A |
| Interfaces    | DIN connection to host instrument              | N/A | N/A |
| Protocols     | Supplied with host instrument                  |     |     |

## Data Management

|                      |          |  |  |
|----------------------|----------|--|--|
| Remote Software      | Included |  |  |
| LabVIEW™ Source Code | Included |  |  |

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## Notes:

- <sup>a</sup> Rate values scale with host instrument acquisition rate.  
 Examples: The sm041-416 uses 1x4 optical switching. Therefore, the effective maximum scan rate of the host device would be divided by 4.  
 A host instrument with a 1 kHz scan rate coupled with a sm041-416 will in effect present a maximum scan frequency of 250 Hz.  
 A host instrument with 1 Hz scan rate coupled with the sm041-416 will in effect present a maximum scan frequency of 0.25 Hz.

**sm041-416 (16-Channel Switch Extension)**

Expands optical channel I/O from Micron Optics' sm125-500 Optical Sensor Interrogator to 16 channels for sensor arrays. Product pricing includes all necessary optical jumpers, custom cable connection to sm125-500 for power and communication, and a LabVIEW™ example (with source code) for managing data on 16 channels.

**sm041-408 (8-Channel Switch Extension)**

Expands optical channel I/O from Micron Optics' sm125-500 Optical Sensor Interrogator to 8 channels for sensor arrays. Product pricing includes all necessary optical jumpers, custom cable connection to sm125-500 for power and communication, and a LabVIEW™ example (with source code) for managing data on 8 channels.

**sm041-016 (16-Channel Coupler Extension)**

Contains four 1x4 couplers to accommodate connection of up to four fibers to each optical input channel from Micron Optics' sm125 Optical Sensor Interrogator. All fibers are scanned simultaneously. This type of configuration provides no net gain of wavelength range or sensor capacity; it is solely intended to provide more fiber connection flexibility.

**sm041-008 (8-Channel Coupler Extension)**

Contains four 1x2 couplers to accommodate connection of up to four fibers to each optical input channel from Micron Optics' sm125 Optical Sensor Interrogator. All fibers are scanned simultaneously. This type of configuration provides no net gain of wavelength range or sensor capacity; it is solely intended to provide more fiber connection flexibility.



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