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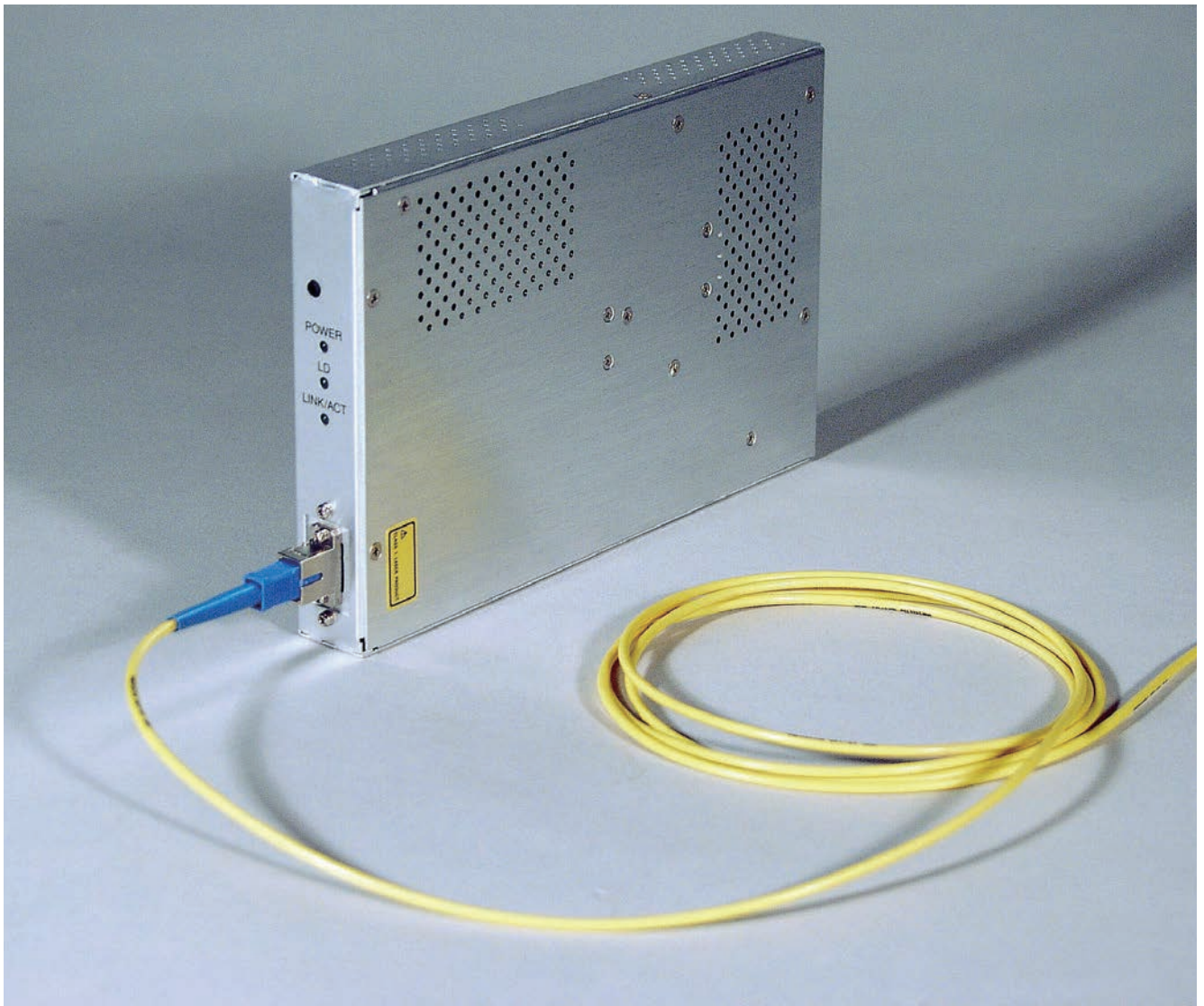
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# MW9077A/A1/A2/B

## OTDR Module

1.31  $\mu\text{m}$  (SM)/1.55  $\mu\text{m}$  (SM)/1.625  $\mu\text{m}$  (SM)



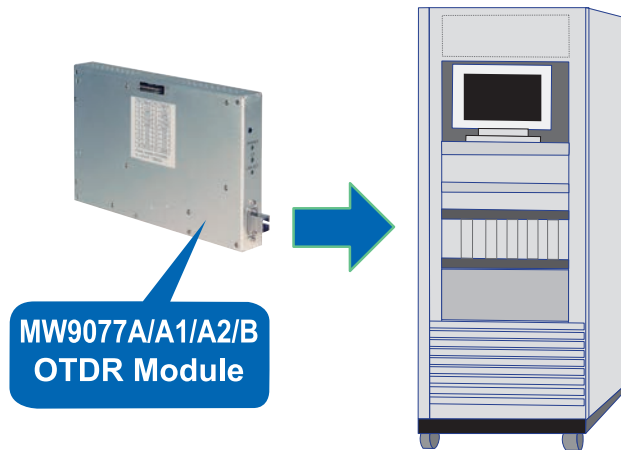
*Compact and High-performance OTDR Module for Optical Fiber Monitoring Systems*

- **Compact A5-size for monitoring optical fiber systems**
- **Wide operating temperature range ( $-5^{\circ}$  to  $+55^{\circ}\text{C}$ )**
- **Fast data transmission by Ethernet interface**

The MW9077A/A1/A2/B OTDR Module is ideal for monitoring optical fiber systems. In recent years, optical-fiber monitoring is being used in many fields including maintenance of optical-communications networks as well as security sensors, flood sensors and disaster-prevention systems, etc. The MW9077A/A1/A2/B offers a compact and high-performance solution for optical fiber applications.

### Compact A5-size for Monitoring Optical Fiber Systems

Space is an important factor in designing a monitoring systems. Factors such as functions, performance, and module size favor use of compact modules. Furthermore, using a compact module helps reduce the size of the whole system, leading to system-wide cost reductions. The compact MW9077A/A1/A2/B is less than A5 size (200 × 130 × 25 mm). Even systems with severe space Limitations can use this module.

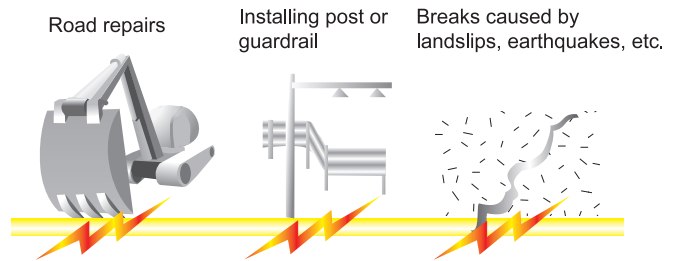


### Wide Operating Temperature Range

The system operating temperature is affected by various environmental factors, such as installation location, and monitored objects. In addition, the heat that the system generates itself influences the operation temperature. As a result, temperature of the monitoring system must also be monitored to assure reliability. The MW9077A/A1 dynamic range is stable from  $-5^{\circ}$  to  $+55^{\circ}\text{C}$ , supporting its use in a wide range of temperature environments (MW9077A2/B is stable to  $+25^{\circ}\text{C}$ ).

### Fast Data Transmission over Ethernet Interface

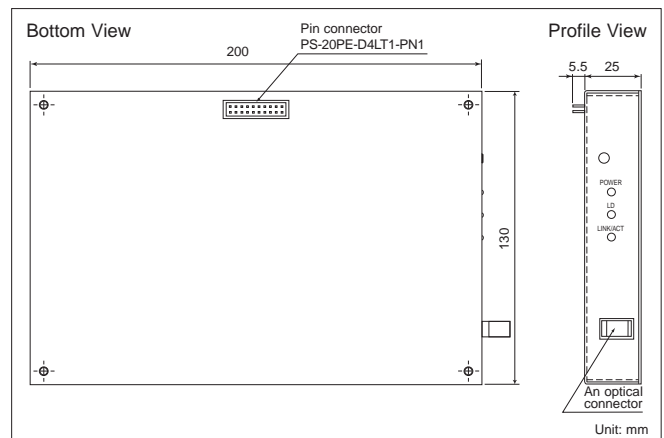
Optical fibers are monitored for various reasons. For example, to assess long-term changes in optical fiber, the system checks the fiber every several hours using an OTDR. In other cases, such as when there is a network fault, the system checks the fiber immediately using an OTDR to find the fiber break. On the other hand, monitoring is always performed to detect changes in the loss of an optical fiber. The MW9077A/A1/A2/B can perform trace sweep at intervals of about 1 second with smoothing by averaging. The Ethernet interface transmits waveform data to a controller at high speeds, making fiber monitoring much easier.

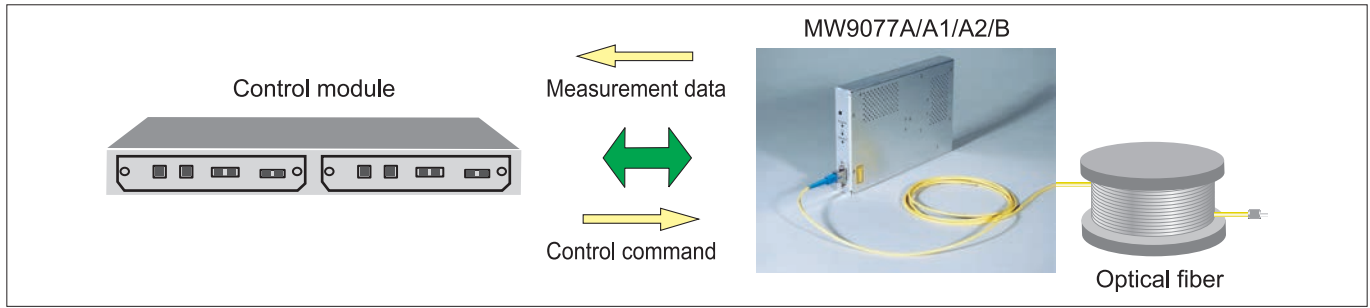


### Fast and Precision Operation from Controller

The MW9077A/A1/A2/B has a 10BASE-T compatible Ethernet interface for control over an Ethernet network. (The IP address is set using RS-232C.) A comprehensive set of commands is built-in, including commands for setting measurement conditions, transferring measured data to the controller, along with a full range of file formats, making it easy to match settings with the monitored fiber.

### Appearance of MW9077A/A1/A2/B





# Specifications

Model	MW9077A	MW9077A1	MW9077A2*1	MW9077B
Wavelength*2	1310 nm ±25 nm	1550 nm ±25 nm	1625 nm ±25 nm	1310 nm/1550 nm ±25 nm
Fiber under test	10 μm/125 μm single-mode optical fiber (ITU-T G.652)			
Distance range	1, 2.5, 5, 10, 25, 50, 100, 200, 250, 400 km			
Pulse width	10 ns ±30%, 30 ns ±25%, 100 ns ±10%, 300 ns ±10%, 1 μs ±10%, 3 μs ±10%, 10 μs ±10%, 20 μs ±10%			
Dynamic range	41 dB (+25°C, Pulse width 20 μs) 39 dB at -5° to +55°C (S/N = 1)	40 dB (+25°C, Pulse width 20 μs) 38 dB at -5° to +55°C (S/N = 1)	37 dB (+25°C, Pulse width 20 μs) (S/N = 1)	39 dB (1.31 μm, +25°C, Pulse width 20 μs)*3 38 dB (1.55 μm, +25°C, Pulse width 20 μs)*3 (S/N = 1)
Dead zone (back scattered light)*4	≤20 m			
Dead zone (Fresnel reflection)*5	≤5 m (typ. 2 m)			
Sampling resolution*6	0.05 m to 80 m			
Number of sampling points	Normal: 5001 or 6251, Fine: 20001 or 25001			
IOR	1.400000 to 1.699999 (in 0.000001 steps)			
Distance measurement accuracy	±1 m ±3 × Measurement distance × 10 <sup>-5</sup> ± sampling resolution			
Loss measurement accuracy (linearity)	±0.05 dB/dB or ±0.1 dB (whichever is greater)			
Return loss measurement accuracy	±2 dB			
Automatic measurement*7	Measurement items: Total loss, Each event distance, Connection loss, Return loss or reflectance Threshold values: Connection loss : 0.01 to 9.99 dB (in 0.01 dB steps) Reflectance: -14 to -70 dB (in 0.1 dB steps), Fiber end : 1 to 99 dB (in 1 dB steps) Number of detected events: Up to 99 Automatic setting: Distance range, Pulse width, Averaging count (time)			
Manual measurement	Measurement items: Transmission loss and distance between 2 points, Connection loss, Reflectance			
Other functions	Relative distance setting (zero offset cursor), Calendar clock (without backup), Distance unit: m (Fixed)			
Laser safety	IEC 60825-1: 2007: CLASS 1 21CFR1040.10 Excludes deviations caused by conformance to Laser Notice No. 50 dated June 24, 2007			
Power supply	+12 Vdc ±1 V, 1.5 A Max.			
Interface	Ethernet interface*8: 10 Base with 20 pin connector Serial interface: RS-232C: 115.2 kbps (The IP address is set using RS-232C)			
Dimensions and Mass	200 (W) × 130 (H) × 25 (D) mm, ≤0.6 kg			
Environmental conditions	Operating temperature and humidity: -5° to +55°C, ≤95% (no condensation) (MW9077A/A1/B) -5° to +50°C, ≤85% (no condensation) (MW9077A2) Storage temperature: -40° to +70°C			
EMC	EN61326-1, EN61000-3-2			

\*1: When an optical pulse from the MW9077A2 (1.625 μm) is input (in-service monitoring) into an optical fiber used for communications at 1.55 μm, the optical communications signal is affected by Raman amplification. Take care when using this setup.

\*2: At 25°C, Pulse width : 1 μs

\*3: The dynamic range specification at a pulse width of 3 μs is shown below  
26.5 dB (1.31 μm, +25°C), 25.5 dB (1.55 μm, +25°C), (S/N = 1)

\*4: At pulse width 10 ns

\*5: At pulse width 10 ns, Return loss: 35 dB (MW9077A/A1/A2), 40 dB (MW9077B)

\*6: IOR = 1.500000

\*7: Automatic measurement is support function : Automatic measurement results are not guaranteed. There is a possibility to miss detection of event. Please check each result at on your own.

\*8: Signal exchange with 10BASE-T

Note: This product outputs the pulse light of a high peak power. When this product is used in the state where it connected with transmission equipment, attaching a wavelength filter etc. should take care about the input of too much OTDR pulse light to Receiver. There is a possibility of damaging Receiver of transmission equipment.

### Safety measures for laser products

This product complies with optical safety standards in 21CFR1040.10 and IEC 60825-1; the following descriptive labels are affixed to the product.



# Ordering Information

Please specify the model/order number, name and quantity when ordering.

The names listed in the chart below are Order Names. The actual name of the item may differ from the Order Name.

Model/Order No.	Name
MW9077A* <sup>1</sup> MW9077A1* <sup>1</sup> MW9077A2* <sup>1</sup> MW9077B* <sup>1</sup>	<b>Main frame</b> OTDR Module (Wavelength 1.31 μm) OTDR Module (Wavelength 1.55 μm) OTDR Module (Wavelength 1.625 μm) OTDR Module (Wavelength 1.31/1.55 μm)
W2254AE* <sup>2</sup>	<b>Standard accessory</b> MW9077A/A1 Operation Manual: 1 copy
MW9077A-01 MW9077A/A1/A2/B-37* <sup>3</sup> MW9077A/A1/A2/B-38* <sup>3</sup> MW9077A/A1/A2/B-39* <sup>3</sup> MW9077A/A1/A2/B-43* <sup>3</sup> MW9077A/A1/A2/B-25* <sup>3</sup> MW9077A/A1/A2/B-26* <sup>3</sup>	<b>Options</b> 1550 nm Filter (Factory option, 1550 nm cut filter inside) FC Connector (Factory option, Fixed) ST Connector (Factory option, Fixed) DIN Connector (Factory option, Fixed) HMS-10/A Connector (Factory option, Fixed) FC-APC Connector (Factory option, Fixed) SC-APC Connector (Factory option, Fixed)

\*1: In the case of purchase, Please concluded a sales contract.

\*2: A new table is attached at purchase of the MW9077A2/B.

\*3: Standard connector for specified option. If not specified, SC connector (Fixed) supplied as standard.