



Anritsu

# MW9076 Series

Optical Time Domain Reflectometer

1.31/1.45/1.55/1.625  $\mu\text{m}$  (SM), 0.85/1.3  $\mu\text{m}$  (GI)



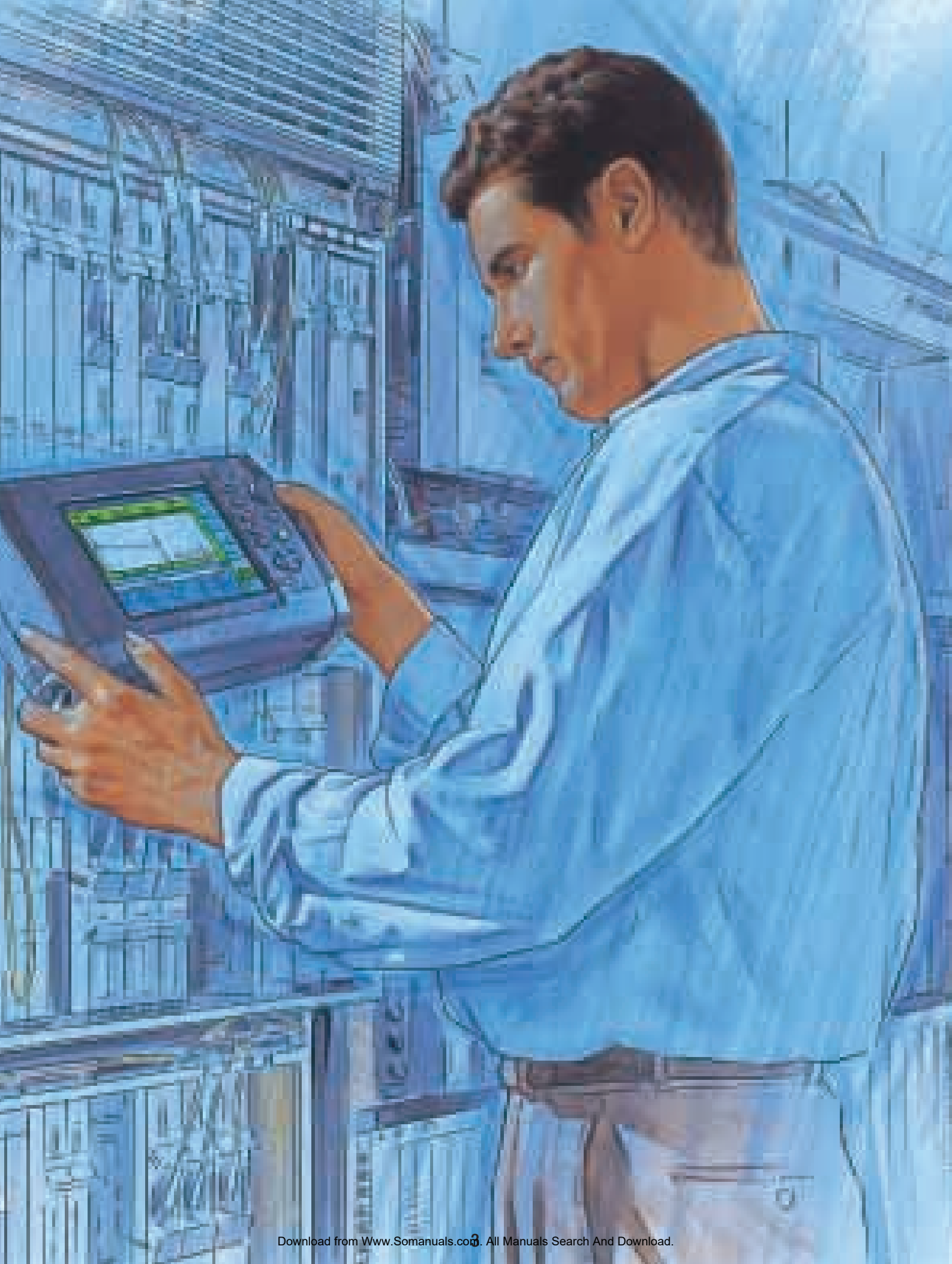
*Tomorrows Technology, Today*



# Highest Performance, Functions, and Measuring Speed

- **45 dB** high dynamic range
- **8 m** short dead zone
- Simple measurement of **chromatic dispersion** from one end of optical fiber
- Measurement in **10 s** (Full-Auto mode), **0.15 s** real-time sweep
- Automatic execution of functions such as wavelength/channel switching, file saving, printing, etc., just by pressing Start key in **repeat measurement mode**
- **5 cm** high resolution, **50,000** sampling points
- **8.4 inch transparent type TFT-LCD** color display
- **7.8 inch reflective type STN-LCD** color display for easy viewing under direct sunlight
- Optional 4 or 8 optical channel selector
- 6-hour battery life with remaining-power display
- Data read/write in Bellcore GR196 file format

Model	MW9076B1	MW9076B	MW9076C	MW9076D1	MW9076J	MW9076K
Optical fiber	SM	SM	SM	SM	GI	GI
Wavelength	1.31/1.55 $\mu\text{m}$ $\pm 25$ nm	1.31/1.55 $\mu\text{m}$ $\pm 25$ nm	1.31/1.55/ 1.625 $\mu\text{m}$ $\pm 25$ nm	1.31/1.45/1.55/ 1.625 $\mu\text{m}$ $\pm 3$ nm	0.85 $\mu\text{m}$ $\pm 30$ nm	0.85/1.3 $\mu\text{m}$ $\pm 30$ nm
Dynamic range	40.5/38.5 dB (typical value)	45/43 dB (typical value)	41.5/39.5/37 dB	34.5/33.5/32.5/30.0 dB	21 dB	21/25 dB
Dead zone (Fresnel/back-scattered)	1.6/8 m	1.6/8 m	1.6/8 m	3/25 m	2/7 m	2/7 m
Chromatic dispersion				✓		
Light source function		✓	✓			
Options	Visible LD	✓	✓	✓	✓	✓
	Optical power meter	✓	✓	✓		
	High power optical power meter	✓	✓	✓		
	Optical channel selector	✓	✓	✓		
Features	<ul style="list-style-type: none"> <li>• High cost performance</li> <li>• Short dead zone</li> <li>• Low cost</li> </ul>	<ul style="list-style-type: none"> <li>• Highest class model</li> <li>• Wide dynamic range</li> <li>• Short dead zone</li> </ul>	<ul style="list-style-type: none"> <li>• Three wavelengths</li> <li>• L-band measurement</li> </ul>	<ul style="list-style-type: none"> <li>• Chromatic dispersion measurement</li> <li>• Four wavelengths</li> <li>• Wavelength accuracy: <math>\pm 3</math> nm</li> </ul>	<ul style="list-style-type: none"> <li>• For GI fiber</li> <li>• Short dead zone</li> </ul>	<ul style="list-style-type: none"> <li>• For GI fiber</li> <li>• Dual wavelengths</li> <li>• Short dead zone</li> </ul>

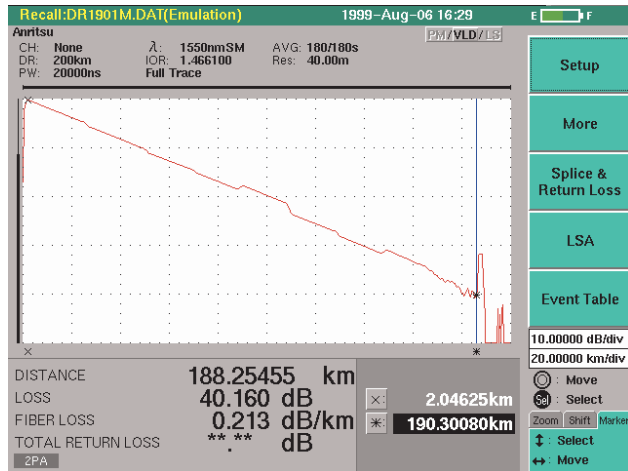


# Optical Loss Measurement

The high dynamic range and short dead zone of the MW9076B/B1/C permit accurate measurement of fiber loss and distance. And a new ASIC speeds up data measurement too.

## High Dynamic Range

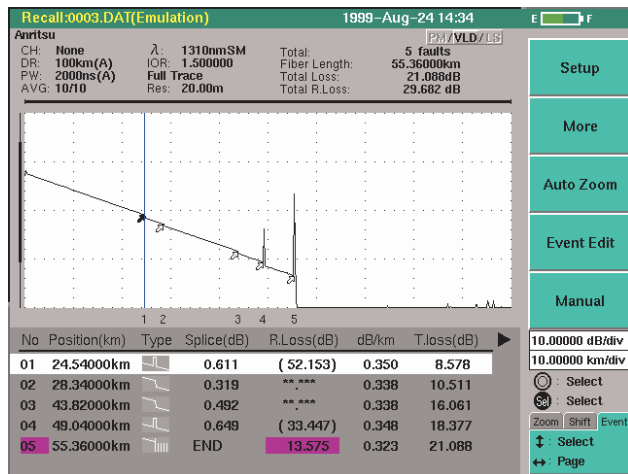
When using a wavelength of 1.55  $\mu\text{m}$  (SM), a point about 190 km distant can be measured.



188 km optical fiber cable

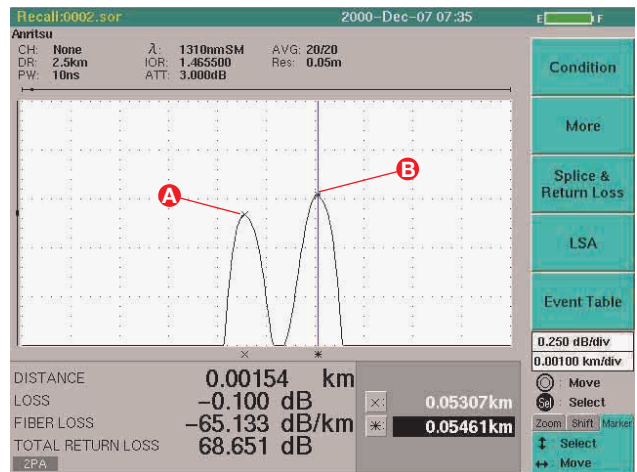
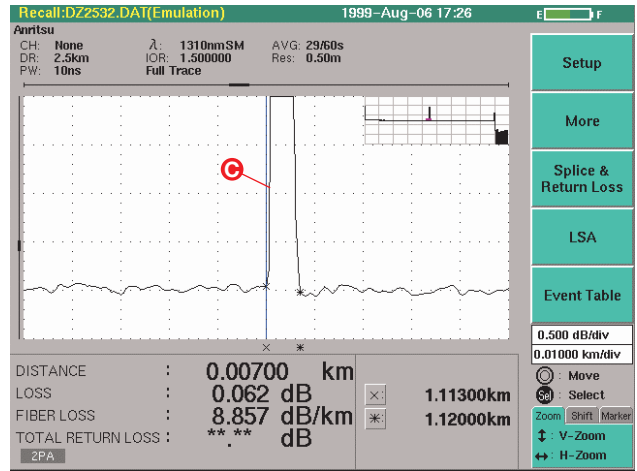
## High-Speed Measurement

It takes only 10 seconds to measure and display the waveform and connection loss on one screen. Just one press of the Start key is all that is needed to make measurement.



## Short Dead Zone

Clearly measure up to near end by 8 m dead zone (back-scatter, SM unit)



# Chromatic Dispersion Measurement

The MW9076D1 has a built-in function for measuring chromatic dispersion even outdoors. The chromatic dispersion can be measured automatically over a wide range from 1300 to 1660 nm from one end of the fiber. The dispersion reproducibility is  $\pm 0.05$  ps/(nm·km)\* and the dynamic range is 30 dB.

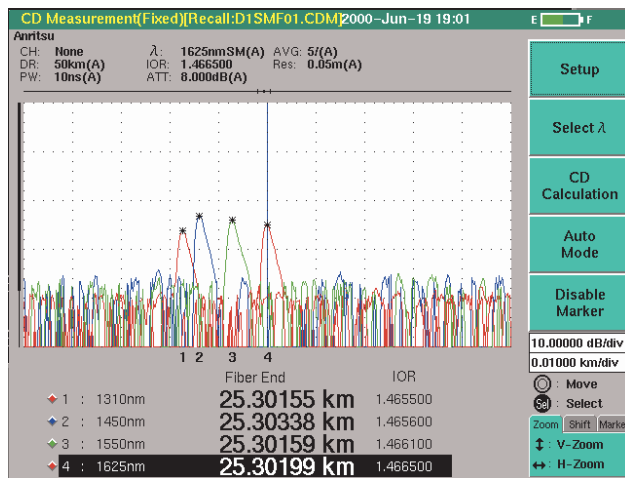
The MW9076D1 can be operated from an external PC using remote commands to measure the chromatic dispersion.

For detail of the chromatic dispersion measurement, refer to the document of "Product introduction MW9076 series Optical Time Domain Reflectometer."

\* Measured with 25 km of 1.3  $\mu$ m zero-dispersion fiber (ITU-T G.652) at 1550 nm.

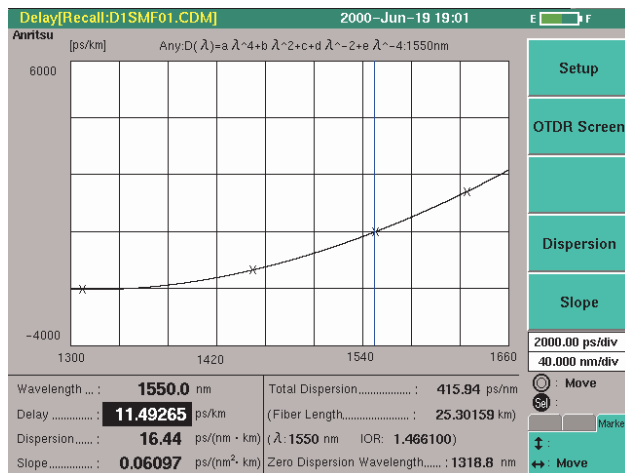
## ● Fresnel Reflection

The far-end Fresnel reflection can be measured for four wavelengths (1310/1450/1550/1625 nm).



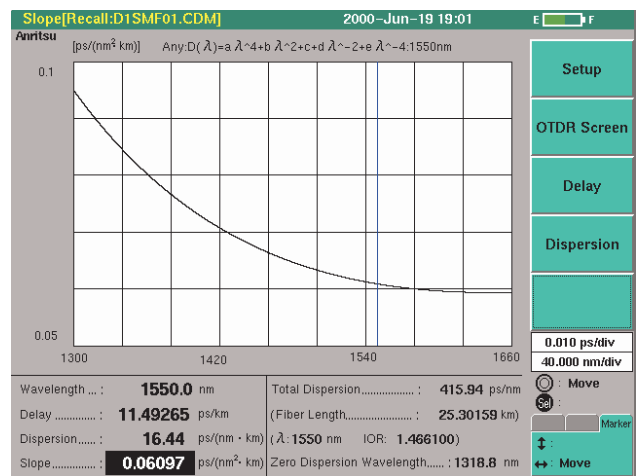
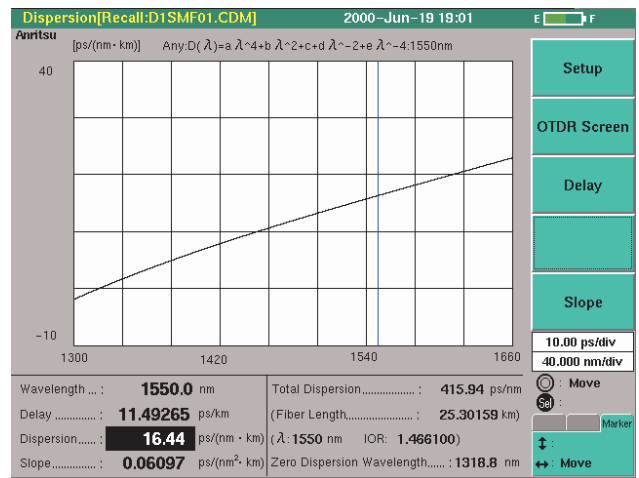
## ● Group Delay Characteristics

The fitting formula supports cubic or quintic Sellmeier, and polynomials can be applied to various types of fibers.



## ● Chromatic Dispersion Characteristics

The zero and total dispersion can be displayed along with the delay, dispersion and dispersion slope at 0.1 nm steps.



# Compact, Lightweight, and Easy to Operate

Rotary encoder for easy moving markers

Measurement conditions can be changed at measurement screen

Large easy-to-read 8.4 inch TFT-LCD

Simultaneous display of measured results and event table

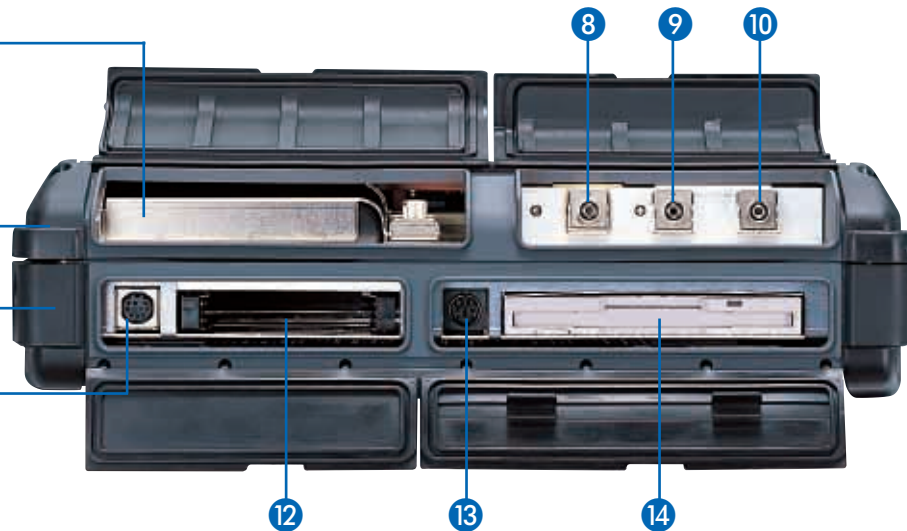


7 Lithium ion battery mounted, with remaining power display

OTDR (main frame)

Display unit

11 Connector for external CRT







115.2 kbps high-speed RS-232C interface

- |                                 |  |   |
|---------------------------------|--|---|
| ① Status-indicating LED         | ⑩ OTDR connector and light source connector for optical loss measurement | ⑯ AC adapter connector  |
| ② Function keys                 | ⑪ External monitor (VGA) connector                                       | ⑰ Power switch  |
| ③ Menu key                      | ⑫ PC card slot (two PC cards connectable)                                | ⑱ Back light and contrast control                                 |
| ④ Start key                     | ⑬ External keyboard connector  | ⑲ RS232C-1 connector  |
| ⑤ Arrow key                     | ⑭ FDD  | ⑳ Connector for printer   |
| ⑥ Select key                    | ⑮ Tilt stand   | ㉑ RS232C-2 connector control of external optical channel selector |
| ⑦ Battery pack                  |  |   |
| ⑧ Optical power meter connector |  |   |
| ⑨ Visible LD output connector   |  |   |



MW9076D1

MW9076D1 is mounted.



MU960001A/960002A  
Optical Channel Selector

The optical channel selector is mounted.

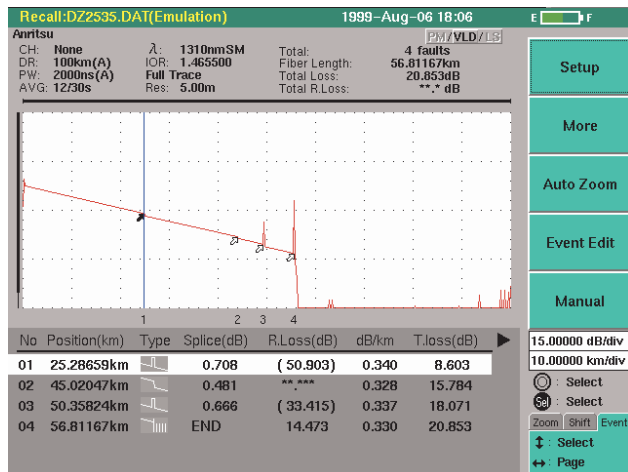
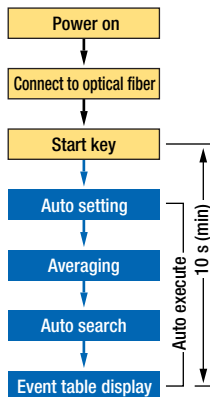


MU250000A4 Display Unit

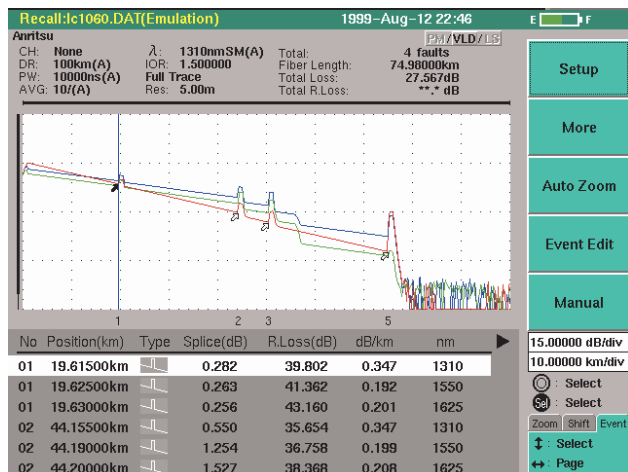
# High-Speed Measurement

## ● Full Automatic Mode

Measurement results are displayed by simply pressing the Start key. All complicated settings of distance range, pulse width, attenuator, and marker can be automatically executed. Measurement speed in this mode was significantly increased. When the wavelengths are set to ALL, wavelengths are automatically changed.



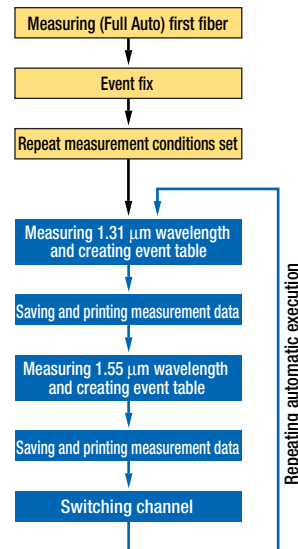
Event table



Event table (wavelength: ALL)

## ● Repeated Measurement

A series of operations, such as measurement, wavelength switching, data saving, optical channel switching, and next optical fiber measurement, can be executed automatically under preset measurement conditions. This mode is ideal for measuring a multi-core optical fiber.



2000-Dec-04 11:15

Event Table

Measurement Log Table

File name	Splice(dB)	R.Loss	dB/km	T.Loss(dB)	nm
0001.SOR	0.331	**.*	0.360	4.524	1310
1001.SOR	**.*	**.*	0.223	2.715	1550
0002.SOR	**.*	**.*	0.344	3.074	1310
1002.SOR	1.055	77.460	1.344	3.155	1550
0003.SOR	**.*	**.*	0.366	4.457	1310
1003.SOR	1.877	15.320	5.278	4.859	1550

If you want to start or continue measurement, Push Start key

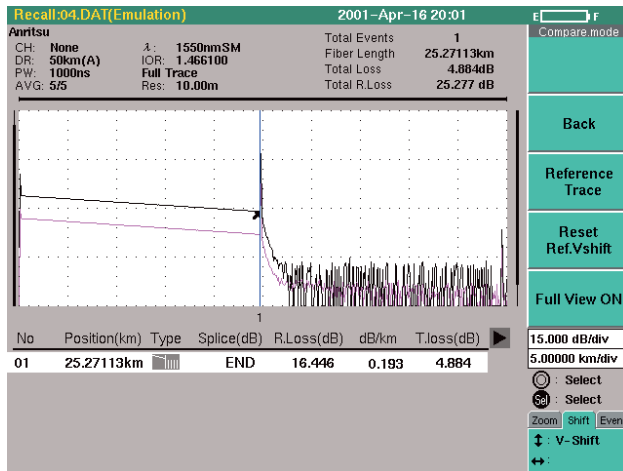
Repeat measurement log table



# Various Useful Functions

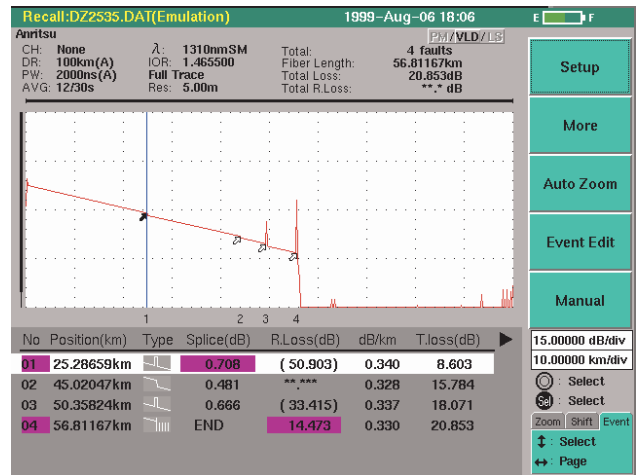
## ● Waveform Comparison Function

Measured and saved data can be compared on the same screen. In addition, differences can be displayed as a waveform for simple observation of distance and level differences. This is useful for checking aging changes or comparing several fibers.



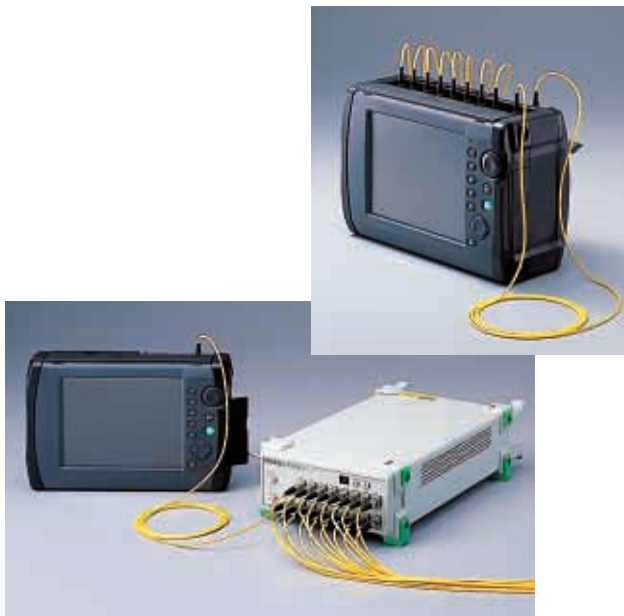
## ● Warning Level Setup Function

In automatic measurement mode, an event warning value can also be set in addition to a detection threshold value. For example, the threshold value can be set to the acceptance level, and warning value to a pass/rejection decision level. In this case, all events will be detected, and those exceeding the warning value are displayed in another color, therefore, enabling the operator to easily identify possible "borderline" events.



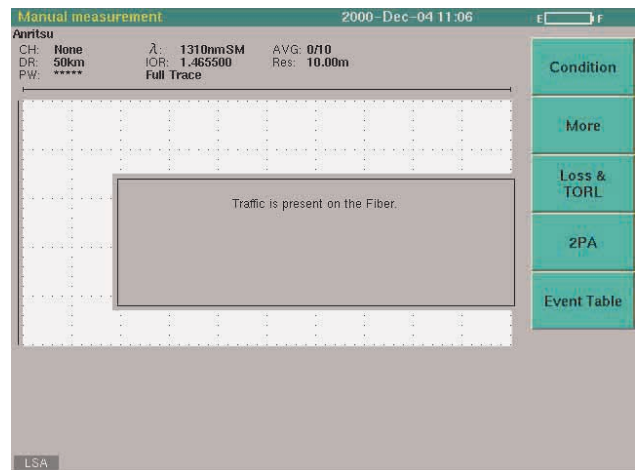
## ● Optical Channel Selector Control Function

In addition to using the built-in optical channel selector, external MN9662A/9664A Optical Channel Selector can be controlled via the RS-232C interface from an OTDR. By using these selectors, an optical fiber cable consisting of up to 32 cores can be measured automatically.



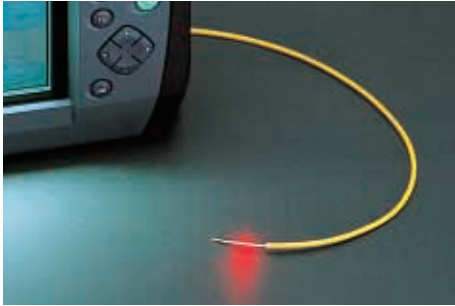
## ● Communication Light Check Function

When measuring a fiber in service, there is a possibility of mis-measurement by an OTDR. To guard against the risk of mis-measurement, this check function checks for the presence of light other than the OTDR optical measurement pulse.



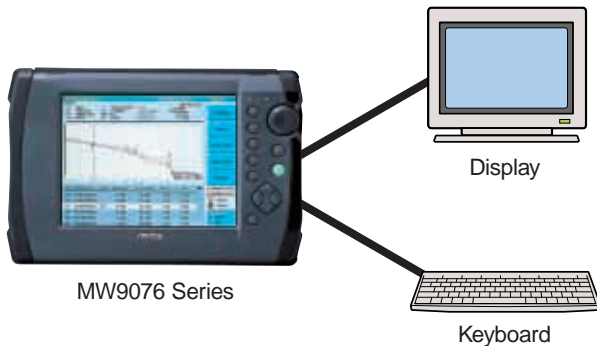
## ● Visible LD

A 635 nm visible LD option is available for the detection of breaks and loss points along the fiber to be measured.



## ● VGA Output Terminal, Keyboard

The VGA connector outputs the screen interface to a CRT monitor, which is very useful for production-line applications.



## ● Large Internal Memory

About 18 MB internal memory is provided as standard.

The following table shows the number of waveforms which can be saved in each media.

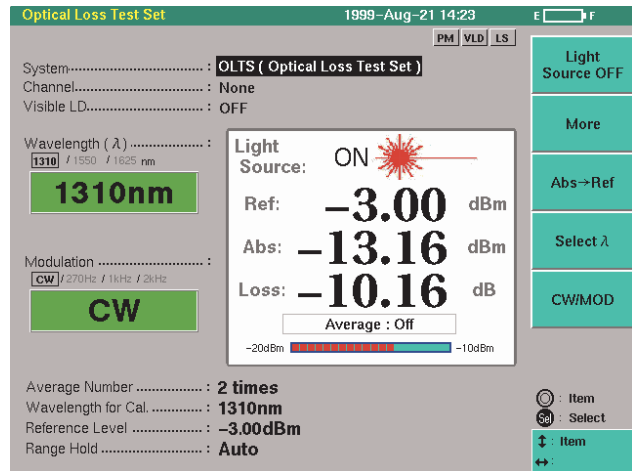
Media	GR196	Analysis
FDD (1.4 MB)	123	67
PC-ATA card (32 MB)	2700	1520
PC-ATA card (256 MB)	16000	10600
Internal memory (18 MB)	1560	860
Hard disk (1 GB)*	32700	32700

Number of data points: 5,000

\*The hard disk is for the PC card slot (IBM Microdrive DSCM-11000 + PC card adapter)

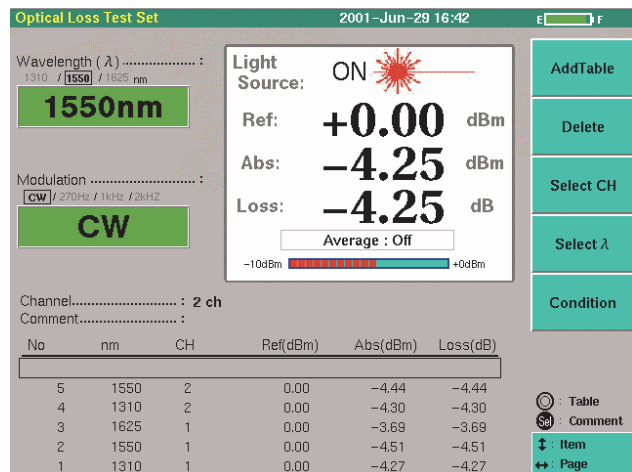
## ● Light Source, Power Meter

Optical fiber loss can be measured using the optical power meter function and light source function. Two types of optical power meters are supported: One is measurement range of  $-70$  to  $+3$  dBm (MW9076B/B1/C-02 option), the other is measurement range of  $-50$  to  $+23$  dBm (MW9076B/B1/C-03 option).



## ● Loss Table Display

The results measured with an optical power meter can be listed in a loss table for data comparison. Data in a loss table can be saved in text format.



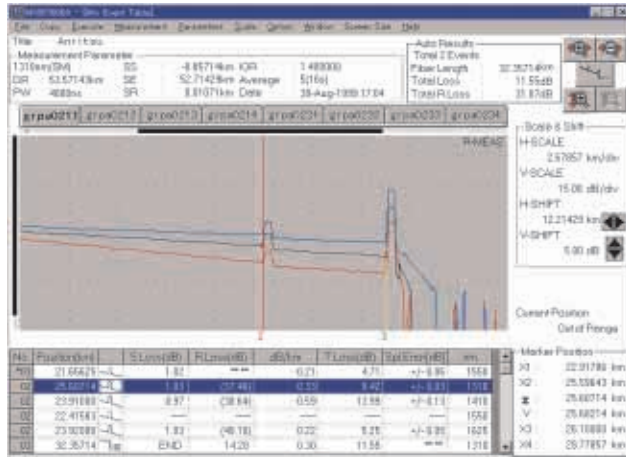
# MX907600A OTDR Emulation Software

The MX907600A is emulation software for the MW9076 series; it runs under Windows\*, and is used to analyze data measured at fiber installation, maintenance and repair on a personal computer.

\*Windows® 95, Windows® 98, Windows® Millennium Edition, Windows NT4.0® Workstation 4.0, Windows® 2000 Professional

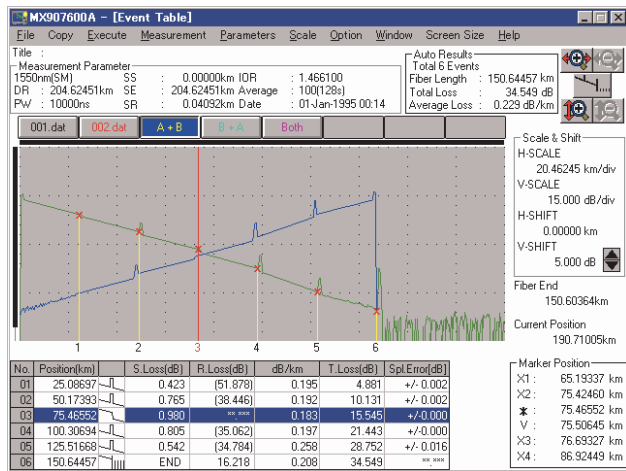
## ● Emulation Function

Measured waveform data can be analyzed using a PC.



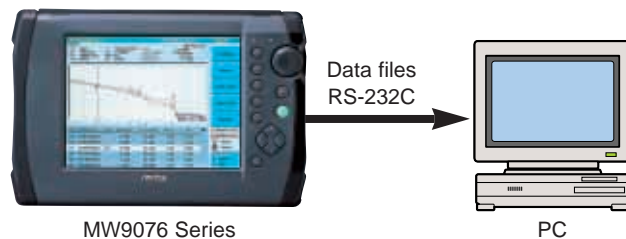
## ● Both-End Measurement Function

A new waveform can be composed by averaging data measured at both ends of an optical fiber.



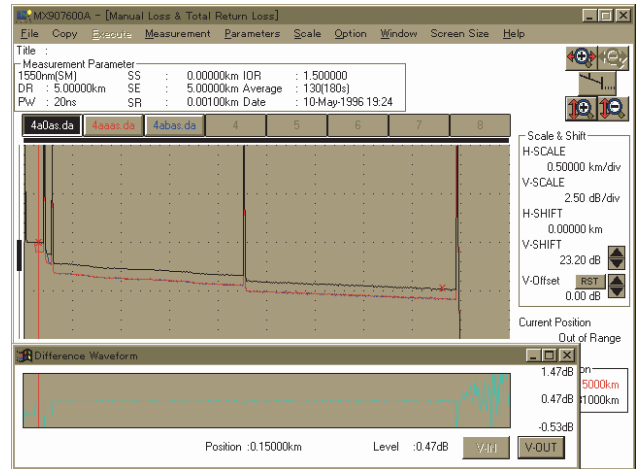
## ● Data Transmission Function

Data files recorded by the MW9076 series can be transferred to a PC via the RS-232C port.



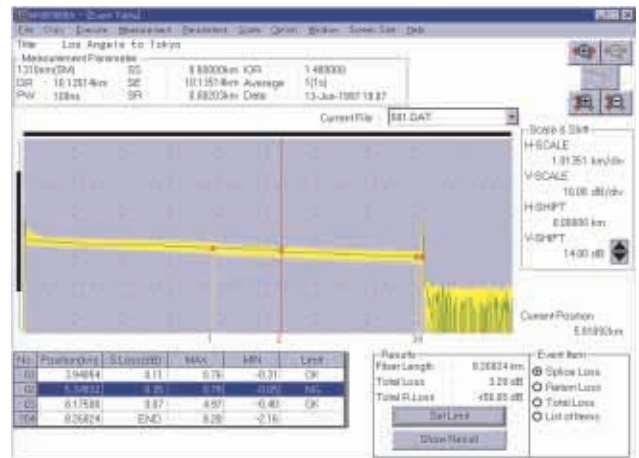
## ● Waveform Difference Display Function

When two wavelengths are chosen from waveforms read in the emulation mode, the difference between these two waveforms is displayed in another window, permitting easy comparison of aging changes in optical fibers.



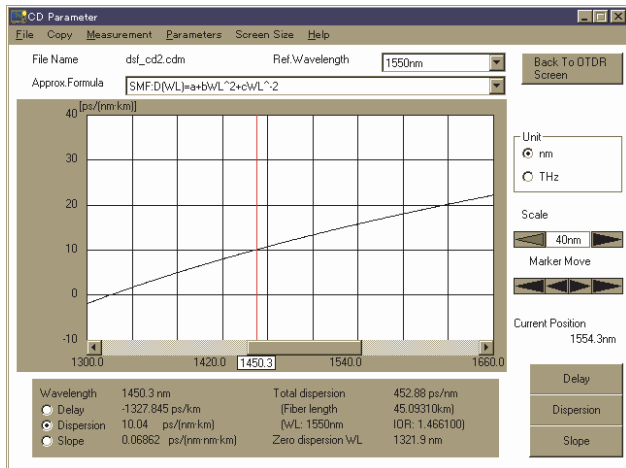
## ● Multi-Fiber Measurement Mode

This mode is useful for comparing and measuring several waveforms under the same conditions, such as when measuring a multi-fiber, or when measuring aging change in the same fiber. A maximum of 200 waveforms can be displayed simultaneously. The measurement mode, event/marker positions, event comments, IOR, and waveforms display positions can be changed for all waveforms as a group.



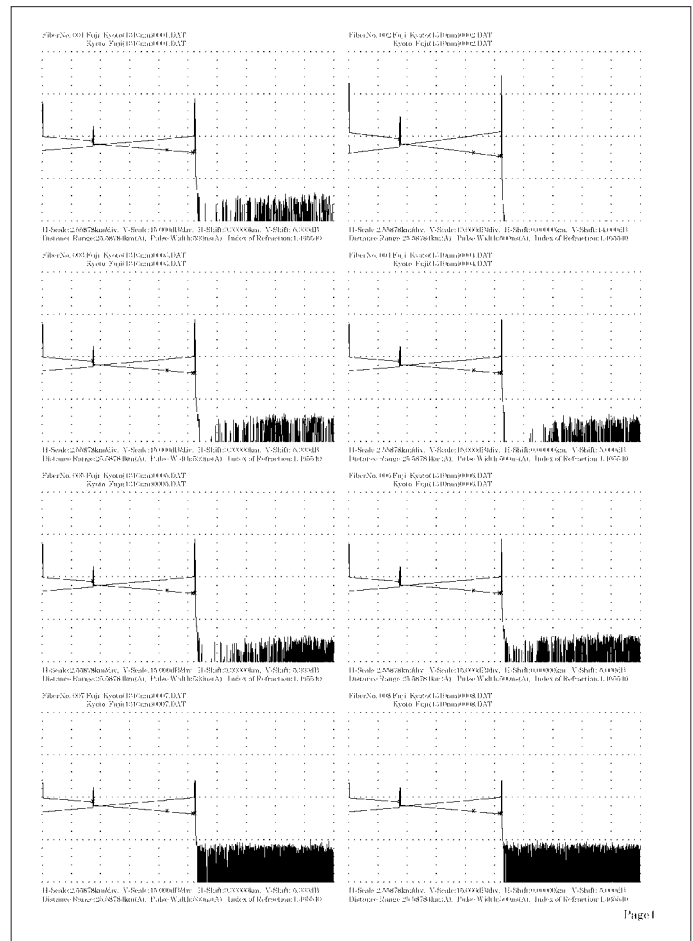
## ● Chromatic Dispersion Measurement Mode

This mode is used for chromatic dispersion measurements made by the MW9076D1. Chromatic dispersion measurements are performed by using slight differences in event positions for each waveform. The delay, chromatic dispersion, and dispersion slope can be obtained easily by selecting the dispersion approximation equation after the event position is set.



## ● Report Output

The event table of a specified file is analyzed and the printed automatically. It is also possible to print multiple waveforms on one page. In particular, at both ends measurement, the measurement results for both ends can be output automatically in a report. In addition, the report can be saved as the Excel file.



Microsoft Excel - KF\_report.xls

Both Ends Measurement Splice Loss Summary Rep

Wavelength: 1310 nm

Cable: MI Fuji - Kyoto City

Splice No / MI Fuji->Kyoto City(km)/Kyoto City->MI Fuji(km)

Fiber No.	01			02			03			AVG	Min	Max	A<->B (dB)
	4.47275	10.9311	13.1879	2.46667	2.46667	0.20982	2.46667	2.46667	0.20982				
001	0.76	0.13	0.02	0.30	0.02	0.76	5.36						
002	0.77	0.13	0.03	0.31	0.03	0.77	5.36						
003	0.76	0.13	0.03	0.31	0.03	0.76	5.36						
004	0.76	0.13	0.02	0.30	0.02	0.76	5.42						
005	0.76	0.13	0.02	0.30	0.02	0.76	5.40						
006	0.76	0.13	0.02	0.30	0.02	0.76	5.41						
007	0.76	0.13	0.01	0.30	0.01	0.76	5.45						
008	0.76	0.13	0.01	0.30	0.01	0.76	5.45						

Preview: Page 2 of 2

# Specifications

## ● Optical Time Domain Reflectometer (main frame)

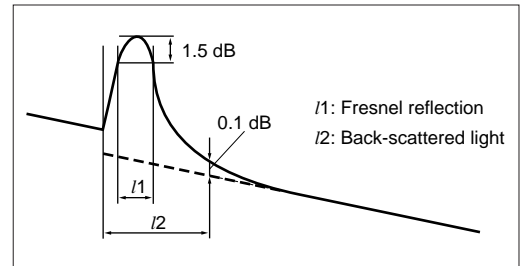
Model	MW9076B	MW9076C	MW9076B1	MW9076J	MW9076K	MW9076D1
Wavelength	1310/1550 nm ±25 nm*1	1310/1550/1625 nm ±25 nm*1	1310/1550 nm ±25 nm*1	850 nm ±30 nm	850/1300 nm ±30 nm	1310/1450/1550/ 1625 nm ±3 nm*1
Measurable optical fiber	10/125 µm single-mode optical fiber (ITU-T G.652)			62.5/125 µm GI fiber*2		10/125 µm single-mode optical fiber (ITU-T G.652)
Optical connector	FC, SC, DIN, HMS-10/A, ST (replaceable, PC type)			FC, SC, DIN, ST (replaceable, PC type)		FC, SC, DIN, HMS-10/A, ST (replaceable, PC type)
Distance range	1, 2.5, 5, 10, 25, 50, 100, 200, 250, 400 km			1, 2.5, 5, 10, 25, 50, 100 km		1, 2.5, 5, 10, 25, 50, 100, 200, 250, 400 km
Pulse width	10, 20, 50, 100, 500, 1000, 2000, 4000, 10000, 20000 ns			10, 20, 50, 100 ns	10, 20, 50, 100 ns (0.85 µm) 10, 20, 50, 100, 500, 1000 ns (1.3 µm)	10, 20, 50, 100, 500, 1000, 2000, 4000, 10000, 20000 ns
Dynamic range*3 (S/N=1)	42.5 dB (1.31 µm) 40.5 dB (1.55 µm) *Typical value: 45 dB (1.31 µm) 43 dB (1.55 µm)	41.5 dB (1.31 µm) 39.5 dB (1.55 µm) 37 dB (1.625 µm)	38 dB (1.31 µm) 36 dB (1.55 µm) *Typical value: 40.5 dB (1.31 µm) 38.5 dB (1.55 µm)	21 dB	21 dB (0.85 µm) 25 dB (1.3 µm)	34.5 dB (1.31 µm) 33.5 dB (1.45 µm) 32.5 dB (1.55 µm) 30.0 dB (1.625 µm)
Dead zone (back-scattered light)*4	≤8 m (1.31 µm) ≤9 m (1.55 µm)	≤8 m (1.31 µm) ≤9 m (1.55 µm) ≤12 m (1.625 µm)	≤8 m (1.31 µm) ≤9 m (1.55 µm)	≤7 m (deviation: ±0.5 dB) ≤50 m (deviation: ±0.1 dB)	≤7 m (0.85 µm, deviation: ±0.5 dB) ≤10 m (1.3 µm, deviation: ±0.5 dB) ≤50 m (deviation: ±0.1 dB)	≤25 m
Dead zone (Fresnel reflection)*5	≤1.6 m			≤2 m		≤3 m
Marker resolution	0.05 to 800 m			0.05 to 200 m		0.05 to 800 m
Sampling resolution	0.05 to 80 m			0.05 to 20 m		0.05 to 80 m
Sampling points*6	Quick mode: 5001, 6251 Normal mode: 20001, 25001 High mode: 40001, 50001					
Y-axis scale	0.25, 0.5, 1, 2.5, 5, 10, 15 dB/div (15 dB/div is indicated only at Auto and Full Auto measurement.)					
IOR settings	1.400000 to 1.699999 (0.000001 steps)					
Distance measurement accuracy	±1 m ±3 x measurement distance x 10 <sup>-5</sup> ±marker resolution (excluding uncertainty caused by fiber IOR)					0.1 m ±3 x measurement distance x 10 <sup>-5</sup> ±marker resolution (excluding uncertainty caused by fiber IOR)
Loss measurement accuracy (linearity)	±0.05 dB/dB or ±0.1 dB (whichever is greater)					
Return loss measurement accuracy	±2 dB			±4 dB		±2 dB
Automatic measurement*7	<p>Measurement items: Total loss, total return loss. Each event distance, connection loss, return loss, or reflection amount (displays in table format)</p> <p>Threshold values Connection loss: 0.01 to 9.99 dB (in 0.01 dB steps), Return loss: 20 to 60 dB (in 0.1 dB steps), Fiber-end: 1 to 99 dB (in 1 dB steps)</p> <p>Warning values Splice connection loss: 0.1 to 10 dB (in 0.01 dB steps), Connector connection loss: 0.1 to 10 dB (in 0.01 dB steps), Return loss: 10 to 50 dB (in 0.1 dB steps), Fiber loss: 0.01 to 10 dB (in 0.01 dB steps), Total loss: 0.1 to 60 dB (in 0.1 dB steps), Total return loss: 10 to 50 dB (in 0.1 dB steps), Average loss: 0.01 to 10 dB (in 0.01 dB steps)</p> <p>Number of detected events: Up to 99 Automatic setting: Distance range, pulse width, averaging count (time) Measurement time: ≤60 s (in full automatic measurement mode) Connection check: Automatic check of front panel connector connection quality Communication light check: Check for presence of communication light in optical fiber to be measured</p>					
Manual measurement	<p>Measurement items: Transmission loss and distance between 2 points, loss per unit length between 2 points, connection loss, return loss/reflection amount, total return loss, average loss Real-time sweep: 0.1 to 0.2 second or less*8</p>					

Model	MW9076B	MW9076C	MW9076B1	MW9076J	MW9076K	MW9076D1
Optical loss measurement light source function	<p>Applicable optical fibers: SM optical fiber (ITU-T G.652)</p> <p>Optical connectors: Shared with OTDR (same port)</p> <p>Light-emitting elements: FP-LD</p> <p>Center wavelength: 1310/1550 ±25 nm (MW9076B, CW, 25°C) 1310/1550/1625 ±25 nm (MW9076C, CW, 25°C)</p> <p>Spectrum width: ≤5/10 nm (MW9076B, CW, 25°C) ≤5/10/10 nm (MW9076C, CW, 25°C)</p> <p>Output level accuracy: −3 ±1.5 dBm (CW, 25°C, SM optical fiber: 2 m)</p> <p>Optical output short term stability: ≤0.1 dB [CW, at one point from −10° to +40°C (±1°C), Difference between maximum and minimum values in one min, SM optical fiber cable: 2 m]</p> <p>Output waveform CW, 270 Hz, 1 kHz, 2 kHz (Modulated waves are square waves.) Modulation frequency: 270 Hz/1 kHz/2 kHz ±1.5%</p> <p>Laser safety specification: 21CFR Class 1, IEC 60825-1 Class 1</p>					
Chromatic dispersion measurement	<p>—</p> <p>Wavelength range: 1300 to 1660 nm, Wavelength accuracy: ±0.5 nm*<sup>9</sup> (typical), Zero-dispersion repeatability: ±0.6 nm (typical)*<sup>10</sup>, Dispersion repeatability: ±0.05 ps/(nm•km)*<sup>10</sup> * Typical Dynamic range: 30 dB (4% Fresnel, typical)</p>					
Other functions	<p>Waveform storage [Bellcore. SOR (GR-196-CORE, SR-4731) or Anritsu. Dat format, user selectable], waveform comparing function, print output (Centronics), repeated measurement function (A series of operations such as wavelength switching, waveform storage, and printing can be executed by pressing a single key.), relative distance set (zero cursor set), calendar clock, distance unit set (km, m, kf, f, mi), title input (up to 32 characters), remaining battery power display</p>					
Laser safety specification	21CFR Class 1, IEC Pub. 60825-1 Class 1					
Power	≤35 W max. (at charging), 4 W (in standard state, MU250000A power consumption included.)					
Battery	Continuous operation: 6 h (typical value)* <sup>11</sup>					
	<p>290 (W) × 194 (H) × 30 (D) mm (MW9076B/B1/C/J/K main frame) 290 (W) × 194 (H) × 75 (D) mm (MU250000A Display Unit included) ≤1.4 kg ≤3.7 kg (MU250000A display unit and battery pack included)</p> <p>290 (W) × 194 (H) × 77 (D) mm (MW9076D1 main frame) 290 (W) × 194 (H) × 122 (D) mm (with MU250000A Display Unit) ≤3.1 kg (MW9076D1 main frame only), ≤5.4 kg (with MU250000A Display Unit and battery pack included)</p>					



Model	MW9076B	MW9076C	MW9076B1	MW9076J	MW9076K	MW9076D1
Environmental condition	Operating temperature and humidity: $-10^{\circ}$ to $40^{\circ}\text{C}$ , $\leq 85\%$ (no condensation) Storage temperature and humidity: $-20^{\circ}$ to $60^{\circ}\text{C}$ , $\leq 85\%$ Vibration: Conforming to MIL-T-28800E Class 3 Shock: 76 cm height, 6 surfaces, 8 corners*12 Dust-proofing: MIL-T-28800E Drip-proofing: MIL-T-28800E					
EMC	EN61326: 1997/A1, 1998 (Class A) EN61000-3-2: 1995/A2, 1998 (Class D) EN61326: 1997/A1, 1998 (Annex A)					
LVD	EN610101-1: 1993/A2, 1995 (Installation Category II, Pollution Degree 2)					

- \*1 At  $25^{\circ}\text{C}$ , pulse width:  $1\ \mu\text{s}$
- \*2 For GI fiber (core diameter:  $62.5\ \mu\text{m} \pm 3.0\ \text{nm}$ , NA:  $0.275 \pm 0.015$ , transmission loss:  $\leq 3.2/0.9\ \text{dB/km}$  (wavelength:  $0.85/1.3\ \mu\text{m}$ ). At measurement of  $50/125\ \mu\text{m}$  GI fiber, the dynamic range drops by about  $3.0\ \text{dB}$ .
- \*3 At  $25^{\circ}\text{C}$ , pulse width: SM  $20\ \mu\text{s}$ , GI  $100\ \text{ns}$  ( $0.85\ \mu\text{m}$ ),  $1\ \mu\text{s}$  ( $1.3\ \mu\text{m}$ )
- \*4 Pulse width:  $10\ \text{ns}$ , return loss: SM  $40\ \text{dB}$ , GI  $30\ \text{dB}$ , deviation:  $\pm 0.1\ \text{dB}$  (Refer to the figure right.)
- \*5 Pulse width:  $10\ \text{ns}$  (Refer to the figure right.)
- \*6 Either value is automatically selected in each mode, depending on the distance range.
- \*7 Automatic measurement is a supporting function which enables to operate easier, it doesn't assure results. As there is a case of miss detection, please check a waveform data, either.
- \*8 At quick mode
- \*9 Compared value with internal wavelength data at chromatic dispersion measurement
- \*10 Measured with  $25\ \text{km}$  of  $1.3\ \mu\text{m}$  zero-dispersion fiber (ITU-T G.652) at  $1550\ \text{nm}$ .  
Not an error from absolute value but repeatability of measured results. Contact Anritsu Corporation in case of measuring ITU-T G.655 fiber.
- \*11 At back light low brightness, measurement not executed.
- \*12 Dropped on the floor of plywood thickness  $5\ \text{cm}$  fixed by concrete. Not applicable to the MW9076D1.



## ● MU250000A/A1/A4 Display Unit

Display	MU250000A Unit: 8.4 inch color, TFT-LCD (640 × 480 pixels, transparent type, with back light) MU250000A1 Unit: 7.2 inch color, STN-LCD (640 × 480 pixels, semi-transparent type, with back light on/off) MU250000A4 Unit: 7.8 inch color, STN-LCD (640 × 480 pixels, reflective type, with front light on/off)
Interface	Serial interface: RS-232C-1 (115.2 kbps max.), with D-sub 9-pin connector RS-232C-2 (57.6 kbps max.), with mini-DIN 8-pin connector Printer interface: 8-bit parallel interface (Centronics), with D-sub 25-pin connector Keyboard interface: IBM US ENGLISH (101 keys) 106 keys compatible, with mini-DIN 6-pin connector VGA output connector: Mini-DIN 10-pin connector
FDD	Built-in 3.5 inch (1.44 MB/720 KB)
Power supply	10 to 26.4 Vdc 100 to 250 Vac (rated), 50/60 Hz, ≤50 VA max. (Specific AC adapter is used.) Battery: CGR-B/802D Lithium ion battery pack can be used. (Mounted in main frame)
Power	≤35 W
Dimensions and mass	290 (W) × 194 (H) × 45 (D) mm, ≤1.9 kg
Environmental conditions	Restricted by memory card specifications when a memory card is mounted. AC adapter: Depend on the conditions of AC adapter Operation temperature and humidity: -10° to +40°C, ≤85% (no condensation), +5° to +40°C, ≤80% (FDD is used.) Storage temperature and humidity: -20° to 60°C, ≤85% Vibration: Conform to MIL-T-28800E Class 3 Shock: 76 cm height, 6 surfaces, 8 corners*1 Dust proofing: Conform to MIL-T-28800E Drip proofing: Conform to MIL-T-28800E
EMC	Same as MW9076 series
LVD	Same as MW9076 series

\*1 Dropped on the floor of plywood thickness 5 cm fixed by concrete

## ● Battery pack: CGR-B/802D

Battery	Lithium ion secondary battery
Voltage, capacity	14.4 V, 2550 mAh (36.72 Wh)
Continuous drive time	See the MW9076 series specifications
Charging time	≤3 h
Dimensions and mass	134.5 (W) × 89.5 (H) × 20.5 (D) mm, ≤390 g

## ● AC adapter: ADP60WB24.0

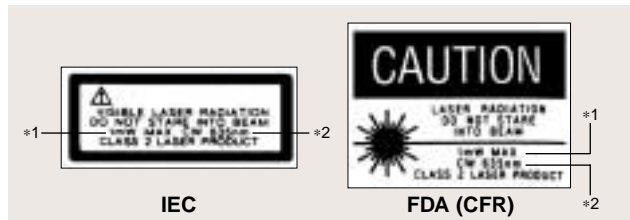
Rated AC input	100 to 240 Vac, 50/60 Hz
Rated DC output	24 Vdc, 2.5 A
Dimensions and mass	109.5 × 62.5 × 31 mm, ≤350 g
Safety specifications	UL, CSA, TÜV, CE, AS
Environmental conditions	Operating temperature and humidity: 0° to +40°C, 80% Storage temperature and humidity: -20° to +80°C, 90%

## ● Visible LD: MW9076B/B1/C/D1/J/K-01

Central wavelength	635 ±15 nm (at 25°C)
Optical output	-3.0 ±1.5 dBm
Output optical fiber	10/125 μm, SM (ITU-T G.652)
Optical connector	FC, SC, ST, DIN, DIAMOND (HMS-10/A) *Replaceable
Optical safety	IEC Pub. 60825-1 Class 2, 21CFR Class 2
Environmental conditions	Same as MW9076 series
EMC	Same as MW9076 series
LVD	Same as MW9076 series

### Safety measures for laser products

This option complies with optical safety standards in Class 2 of the IEC pub. 60825-1 and the FDA (21CFR1040.10, USA); the following descriptive labels are affixed to the product (FDA label is only affixed to product for export to the USA).



The maximum output is indicated under \*1, and the wavelength under \*2.

Caution: Do not look directly into the laser beam.

## ● Optical power meter: MW9076B/B1/C-02, MW0976B/B1/C-03

Applicable optical fiber	10/125 μm, SM (ITU-T G.652)
Optical connector	FC, SC, ST, DIN, DIAMOND (HMS-10/A) *Replaceable
Wavelength range	1.2 to 1.7 μm
Measurement range	Option 02: +3 to -70 dBm (continuous light) +0 to -73 dBm (modulated light) Option 03: +23 to -50 dBm (continuous light) +20 to -53 dBm (modulated light)
Measurement accuracy	Option 02: ±5% (-30 dBm, 1.31/1.55 μm, continuous light) Option 03: ±5% (-10 dBm, 1.31/1.55 μm, continuous light)
Return loss	≥36dB (1.55 ±0.02 μm)
Environmental conditions	Same as MW9076 series
EMC	Same as MW9076 series
LVD	Same as MW9076 series

## ● MU960001A/960002A Optical Channel Selector

Model	MU960001A	MU960002A
Configuration	1 × 4	1 × 8
Wavelength range	1.2 to 1.65 μm (The specified wavelengths are 1.31/1.55 μm.)	
Optical fiber	10/125 μm, SM (ITU-T G.652)	
Optical connector	FC, SC, ST, DIN, HMS-10/A *Replaceable	
Insertion loss	≤2.5 dB	≤4.5 dB
Environmental conditions	Same as MW9076 series (not applicable to the shock)	
Dimensions	290 (W) × 194 (H) × 47 (D) mm	
Mass	≤1.5 kg	≤2.0 kg
EMC	Same as MW9076 series	
LVD	Same as MW9076 series	

\*MU960001A/MU960002A can not be attached to MW9076D1.

# Ordering Information

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

Model/order No.	Name	Remarks
	<b>Optical Time Domain Reflectometer (main frame)</b>	
MW9076B	SMF 1.31/1.55 µm OTDR	Requires Display Unit
MW9076B1	SMF 1.31/1.55 µm OTDR	Requires Display Unit
MW9076C	SMF 1.31/1.55/1.625 µm OTDR	Requires Display Unit
MW9076D1	SMF 1.31/1.45/1.55/1.625 µm OTDR	Requires Display Unit
MW9076J	GIF 0.85 µm OTDR	Requires Display Unit
MW9076K	GIF 0.85/1.3 µm OTDR	Requires Display Unit
	<b>Standard accessories (main frame)</b>	
W1659AE	MW9076 series operation manual:	1 copy
W1660AE	MW9076 series serial interface manual:	1 copy
	Connector adapter *1:	1 pc
Z0404A	Lithium ion battery pack:	1 pc
	<b>Units</b>	
MU250000A	Display Unit	8.4 inch TFT-LCD
MU250000A1	Display Unit	7.2 inch STN-LCD
MU250000A4	Display Unit	7.8 inch STN-LCD
	<b>Standard accessories (display unit)</b>	
ADP60WB24.0	AC adapter	
Z0402	Protective cover	
J0979	A-2 (Japan) power cord*4	For Japan
J0980	A-2 power cord*4	For USA, Canada, Taiwan
J0981	B4 power cord*4	For UK, Malaysia, South Africa, Hong Cong
J0982	C7 power cord*4	For Europe
J0983	S3 power cord*4	For Oceania, China
J1027	P4 power cord*4	For India
J1028	D1 power cord*4	For Switzerland
Z0403A	Belt with hook	
MU960001A	Optical Channel Selector	1 × 4 channels, with connector adapter*1
MU960002A	Optical Channel Selector	1 × 8 channels, with connector adapter*1
	<b>Battery pack</b>	
Z0404A	Lithium ion battery pack	
	<b>Software</b>	
MX907600A	OTDR Emulation Software	
	<b>Options</b>	
MW9076B/B1/C/D1/J/K-01	Visible LD*1	Factory option
MW9076B/B1/C-02	Optical power meter*1,*2	Factory option
MW9076B/B1/C-03	High power optical power meter*1,*2	Factory option
MW9076B/C-25	FC-APC connector	Angled PC type, factory option
MW9076B/C-26	SC-APC connector	Angled PC type, factory option
MW9076B/B1/C/D1/J/K-37	FC-PC connector	User replaceable
MW9076B/B1/C/D1/J/K-38	ST connector	User replaceable
MW9076B/B1/C/D1/J/K-39	DIN connector	User replaceable
MW9076B/B1/C/D1/J/K-40	SC connector	User replaceable
MW9076B/B1/C/D1/J/K-43	DIAMOND (HMS-10/A) connector	User replaceable
MW9076B/C-47	HRL-10 connector	Factory option
MU960001A-37	FC-PC connector	User replaceable
MU960002A-37	FC-PC connector	User replaceable
MU960001A-38	ST connector	User replaceable
MU960002A-38	ST connector	User replaceable
MU960001A-39	DIN connector	User replaceable
MU960002A-39	DIN connector	User replaceable
MU960001A-40	SC connector	User replaceable
MU960002A-40	SC connector	User replaceable
MU960001A-43	HMS-10/A connector	User replaceable
MU960002A-43	HMS-10/A connector	User replaceable
	<b>Application parts</b>	
Z0301A	Keyboard	Requires mini-DIN conversion adapter (Z0434)
Z0434	Mini-DIN conversion adapter	For keyboard (Z0301A)
JT8MA3-NT1	PC-ATA card (8 MB)	
JT16MA3-NT1	PC-ATA card (16 MB)	
JT32MA3-NT1	PC-ATA card (32 MB)	
JT64MA3-NT1	PC-ATA card (64 MB)	
JT128MA3-NT1	PC-ATA card (128 MB)	
JT256MA3-NT1	PC-ATA card (256 MB)	

Model/order No.	Name	Remarks
JT512MA3-NT1	PC-ATA card (512 MB)	<p>To connect optical fiber cable with FC connector With FC-PC at both ends (SM) For MW9076B/B1/C/J/K, 440 (W) × 310 (H) × 110 (D) mm For MW9076D1(MW9076B/B1/C + MU960001A/ 960002A), 430 (W) × 300 (H) × 170 (D) mm Holds main frame and thermal printer</p> <p>For chromatic dispersion measurement For chromatic dispersion measurement For remote control with IBM-PC/AT or J-310 (9pin-9pin) For PC-98 remote control (9pin-25pin) For connection with external optical channel selector For external monitor FC-APC closed width: 2 mm (conforms to seiko-giken) FC-APC closed width: 2.14 mm (conforms to SSI) Return loss: &gt;50 dB (SC-PC), &gt;65 dB (SC-APC)</p> <p>Operates only with AC adapter, printing width: 72 mm, printing speed: approximately 13 s (manual measure- ment result with header), 0° to +40°C, dimensions: 119 (W) x 77 (H) x 174 (D) mm, Sanei products (AC adapter and printer cable are sold separately.) For BL-80R2, AC 100 to 240 V 120 Vac ±10%, 60 Hz, 0° to +40°C, Seiko products (printer cable: sold separately) 230 Vac ±10%, 50 Hz, 0° to +40°C, Seiko products (printer cable: sold separately) Common for each printer</p> <p>For BL-80R2 Thermal printer (10 rolls/set) For DPU-414 Thermal printer (10 rolls/set)</p>
J0057	Optical adapter FC type	
J0635□*3	Optical fiber cord	
B0442	Soft carrying case	
Z0435	Soft carrying case	
Z0436	Hard carrying case	
J0617B	Replaceable optical connector (FC)	
J0618D	Replaceable optical connector (ST)	
J0618E	Replaceable optical connector (DIN)	
J0618F	Replaceable optical connector (HMS-10/A, HFS-13/A)	
J0619B	Replaceable optical connector (SC)	
J0441	Total internal reflection cord (FC-PC), 1 m	
J1039	Total internal reflection cord (SC-PC), 1 m	
J0654A	Serial interface cord	
J0655A	Serial interface cord	
J0977	Serial interface cord	
J0978	VGA conversion cable	
J0952A	FC-PC-FC-APC(SG)-1M-SM	
J0953A	FC-PC-FC-APC(SI)-1M-SM	
J0954A	SC-PC-SC-APC-1M-SM	
Z0282	Ferrule cleaner	
Z0283	Ferrule cleaning tape (6 pcs/set)	
Z0284	Adapter cleaner (Stick type, 200 pcs/set)	
J1041	1.31/1.55 LWPF fiber cord (SC-PC), 1 m	
	<b>Peripherals</b>	
BL-80R2	High speed thermal printer	
BL-100W	AC adapter	
DPU-414-31B	Thermal printer	
PW-4007-U1	AC adapter	
DPU-414-31B	Thermal printer	
PW-4007-E1	AC adapter	
J0614	Printer connection cable	
	<b>Supplies</b>	
BL-80-30	Printer paper	
TP411-28CL	Printer paper	

\*1: Specify one of FC, ST, DIN, SC or DIAMOND. When the connector type is not specified, FC-PC is supplied.

\*2: The optical power meter (option 02) and high-level-input optical power meter (option 03) cannot be mounted at the same time.

\*3: Specify the optical fiber length as A, B or C (A: 1 m, B: 2 m, C: 3 m)

\*4: Specify one of A2, B4, C7, S3, P4 or D1



Hard Carrying Case (Z0436)



Soft Carrying Case (B0442, Z0435)



Battery Pack (Z0404A)



Thermal Printer (BL-80R2)



Keyboard (Z0301A)

# Selection Guide

## Display Units



**MU250000A**  
8.4" TFT-LCD  
For indoor, exceedingly easy to see



**MU250000A1**  
7.2" STN-LCD  
For indoor, easy to see



**MU250000A4**  
7.8" STN-LCD  
For outdoor, exceedingly easy to see under direct sunshine



A display screen is an insertion photograph.

## Main Frames

For SM fiber



**MW9076B1:**  
High cost performance

**MW9076B:**  
Highest class type

**MW9076C:**  
Three wavelengths type



**MW9076D1:**  
Chromatic dispersion measurement function

For GI fiber



**MW9076J:**  
Single wavelength type

**MW9076K:**  
Dual wavelengths type

## Options

MU960001A Optical Channel Selector (1 x 4)

MU960002A Optical Channel Selector (1 x 8)

Optical Power Meter (Option 02)

High-Power Optical Power Meter (Option 03)

Soft Carrying Case (B0442)

\*

Soft Carrying Case (Z0435)

\*When Optical Channel Selector installed

## Supports all main frames

Visible LD (Option 01)

Keyboard

PC-ATA Card

Battery Pack

Thermal Printer

Hard Carrying Case (Z0436)



Specifications are subject to change without notice.

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