

## MW9070B Optical Time Domain Reflectometer Option 02 Monitoring Function



**Monitors Optical Fibers for Faults and Sends Alarm at Abnormality**



# Automatic Fault Monitoring of Optical Fiber Cables

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More optical fiber cables are being installed to upgrade subscriber cable networks, making maintenance an increasingly-important issue.

For preventive maintenance, deterioration of optical fiber cables must be monitored before it affects communications. If a cable is broken, the fault must be detected promptly.

The Option 02 Monitoring Function incorporates these functions into the MW9070B Optical Time Domain Reflectometer (OTDR) and eliminates the need for a personal computer to control the OTDR; optical fiber cables can be monitored automatically for faults, and when a fault is detected, the OTDR sounds a local alarm, or notifies a remote computer.

## ▼ Functions

### ● Optical Fiber Fault Point Detection Function

Various functions including: quick scan (for quickly determining whether there is a fault), normal scan (for determining fault magnitude and location by checking entire optical fiber cable), and near-end scan (for determining fault magnitude and location in near-end dead zone), can be selected according to the application.

### ● Scheduler Function

This function performs monitoring automatically according to a schedule. The easy-to-use scheduler function does not require a personal computer (PC) either to control the OTDR, or to create a monitoring program.

### ● Communication Functions

The OTDR can be controlled from a remote PC via a telephone line (using modem\*), or directly via the RS-232C interface. When an alarm occurs, the OTDR sends the alarm information to the PC.

### ● Alarm Generator Control Function

When a fault is detected, the OTDR sends a alarm control signal from the parallel port.

### ● Optical Switch Control Function

The OTDR sends a signal to control the optical switch from the parallel port.

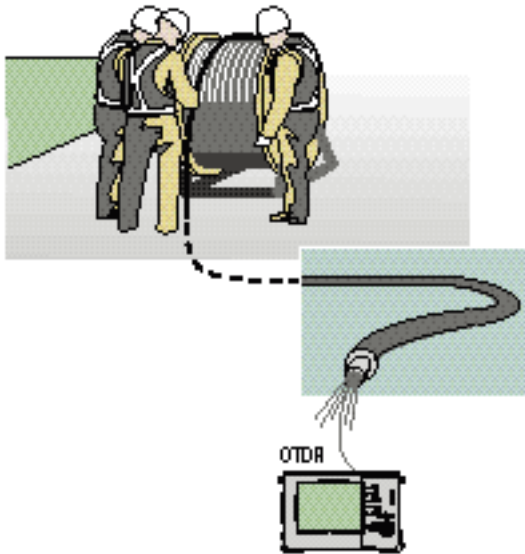
\*Only model specified in ordering information can be used.

# Wide Variety of Applications

This monitoring function can be used for the following applications:

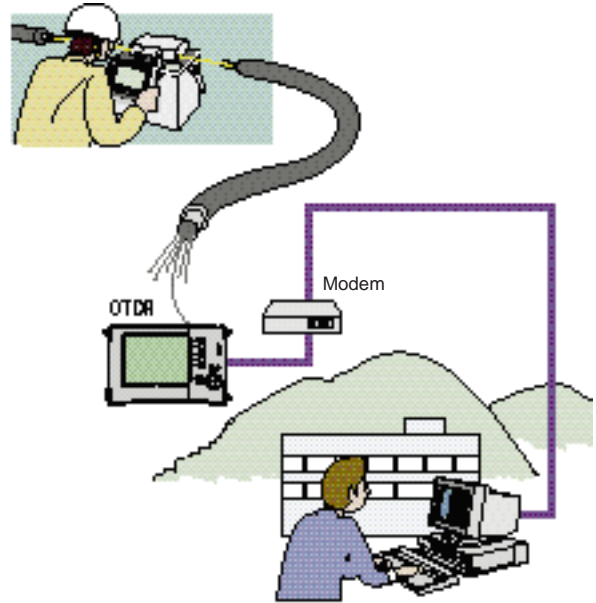
## ●Monitoring Initial Aging

Cable aging is often checked soon after optical fiber cables are installed, but before operation is started to provide a basis for monitoring short-term stable operation. In such a case, only the OTDR and scheduler are needed to monitor optical fiber cables on a regular unattended basis.



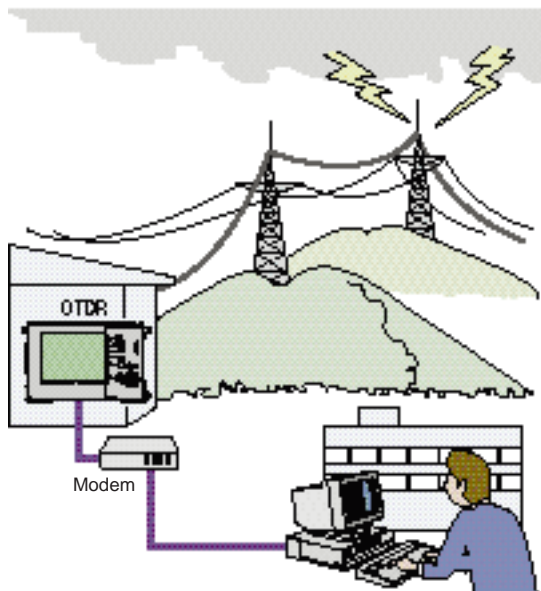
## ●Evaluating Waveforms

If an abnormality occurs during cable installation or under other circumstances when there is no experienced engineer to evaluate the waveforms, the OTDR can be connected to the center, allowing an experienced engineer to evaluate the optical fiber cables remotely.



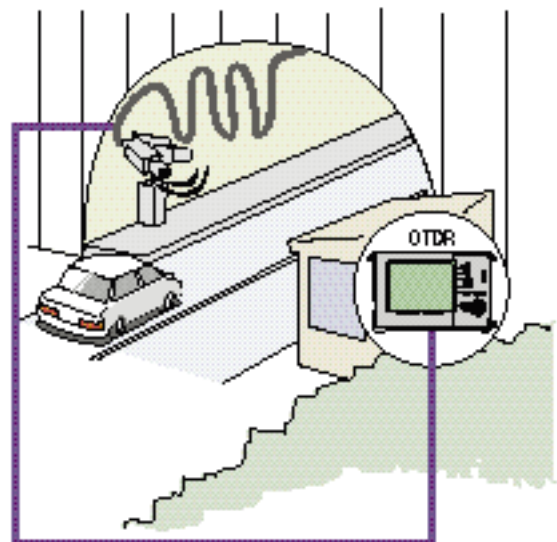
## ●Monitoring Abnormalities in Remote Locations

The OTDR is best used to test the optical fiber cables installed deep in the mountains, places where you cannot go because of snow in winter or bad weather. Simply install the OTDR and connect it to the monitoring center. The scheduler monitors the cables regularly, and sends an alarm to the center when a fault occurs.



## ●Maintaining Optical Fiber Cables

Optical fiber cables used to transmit information from moving video cameras in tunnels, etc., may break due to stress. Possible cable breakage can be detected in advance by connecting the OTDR to the optical fiber cables to monitor them regularly.



# Wide Variety of Configurations

This monitoring function includes various functions such as communications, and control of optical switch and alarm ports.

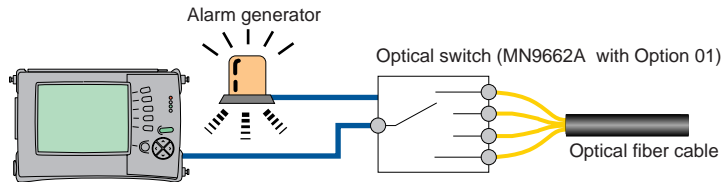
## ●Local Monitoring of Single Optical Fiber Cable

This function monitors only one optical fiber cable. The presence of faults is checked and the position of the fault is displayed on the OTDR screen.



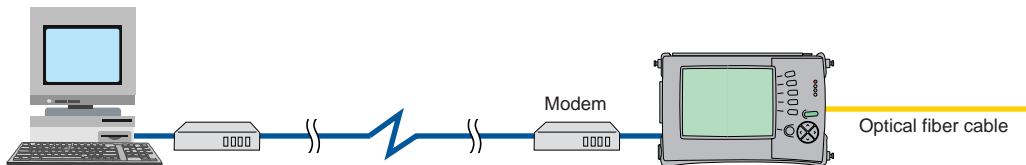
## ●Local Monitoring of Multi-Fiber Cable

This function monitors multi-fiber cable using an optical switch. The faulty channel number and fault location are determined using the alarm generator and the position of the fault is displayed on the OTDR screen.



## ●Remote Monitoring of One Optical Fiber Cable

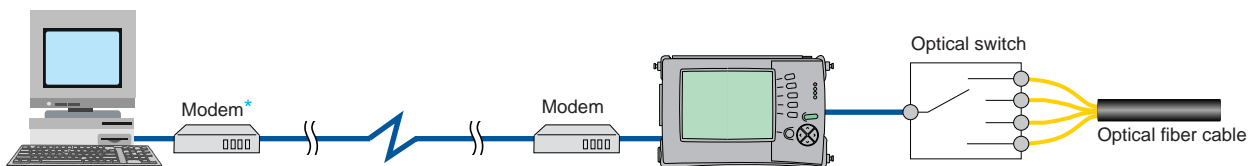
This function monitors one optical fiber cable from a remote location. If an alarm occurs, the OTDR sends the information to the remote PC and the location is output on the PC screen. The information can also be output to the alarm generator.



\*Only model specified in ordering information can be used.

## ●Remote Monitoring of Multi-Fiber Cable

This function monitors multi-fiber cable from a remote location by controlling the optical switch. The fault location is output on the PC screen. The information can also be output to the alarm generator.



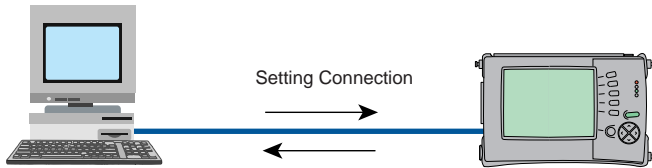
\*Only model specified in ordering information can be used.

# Construction for High-Performance Monitoring

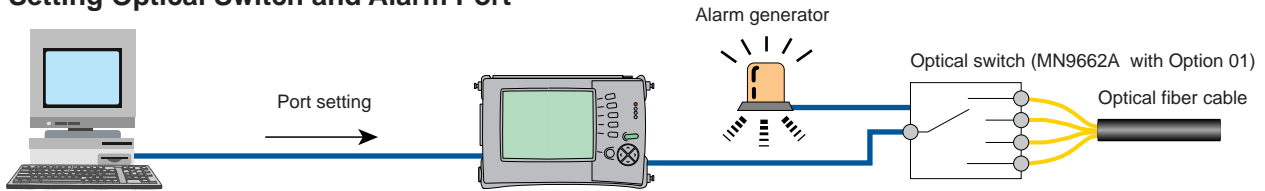
To implement monitoring, first set up the functions and then start the scheduler. A PC can be used to create the reference data and schedule, which is then downloaded to

the OTDR, eliminating complex OTDR control programs. The OTDR runs the scheduler itself without the need for a PC to control it. (However, a personal computer is required to start monitoring by remote control.)

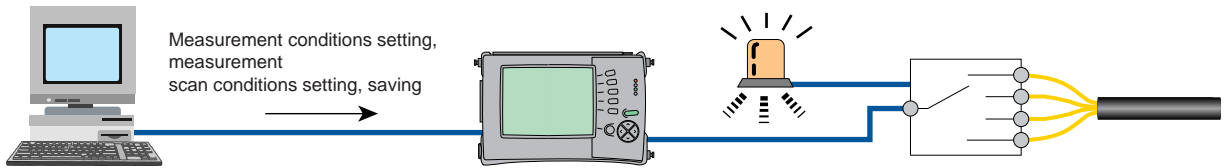
## ▼ Connection



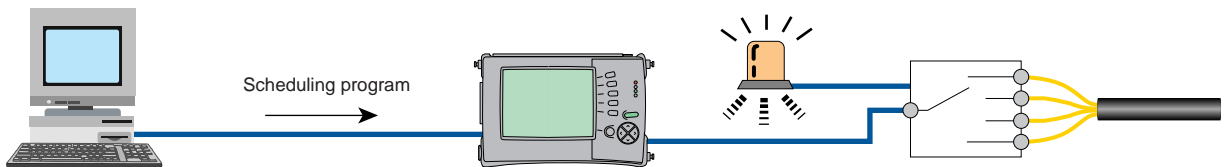
## ▼ Setting Optical Switch and Alarm Port



## ▼ Creating Reference Data

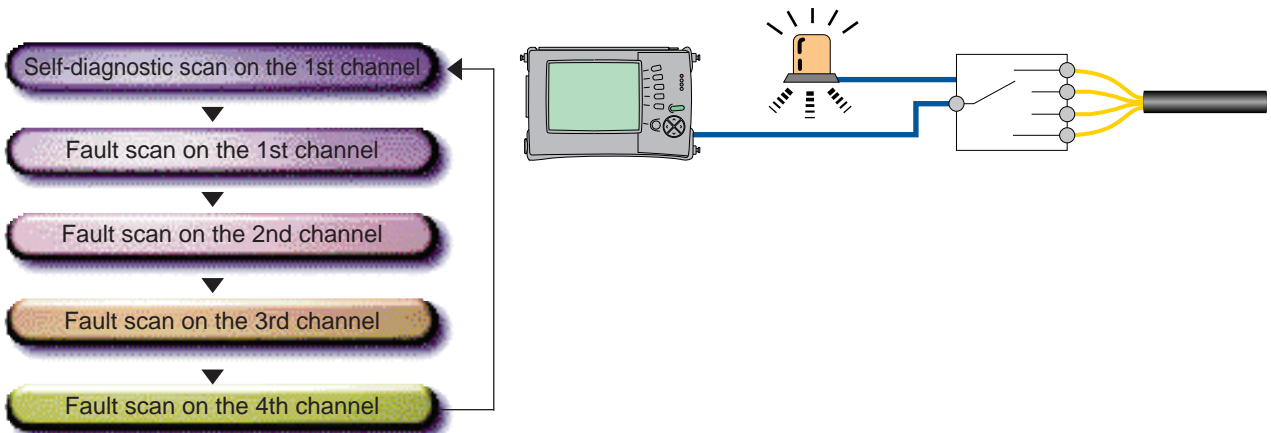


## ▼ Creating Schedule



## ▼ Starting Monitoring

The repetition interval can be defined.





# Main Functions

## ●Communication Parameter Setup Function

Selects whether to connect directly via RS-232C port or via telephone line. This function also sets the modem.



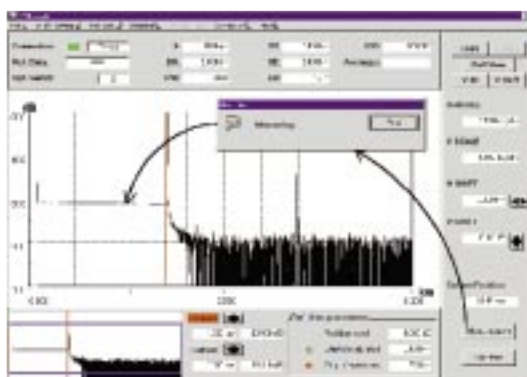
## ●Optical Switch and Alarm Port Setup Function

Assigns each of eight bits of OTDR parallel port to optical switch or alarm port.



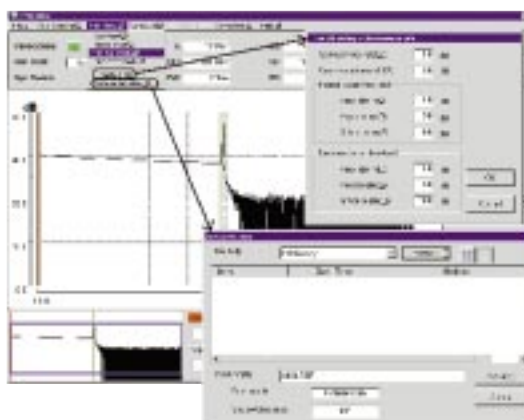
## ●Setting Conditions and Measurement Functions

Sets OTDR measurement conditions and executes measurement. When measurement is complete, this function reads the waveform and displays it on the PC screen.



## ●Reference Data Creation Function

Saves user reference data type, evaluation range, and fault threshold value as reference data.



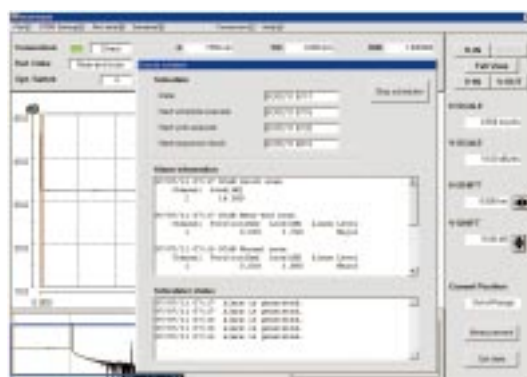
## ●Scheduler Function

Defines which optical switch numbers are to be monitored in which order, and at what intervals. This function also saves the alarm waveform and information to a file.



## ●Alarm Screen

Displays optical switch number, distance, loss, and alarm type at alarm. This function can also save the OTDR communication log.



# Specifications

## ●Monitoring Function (MW9070B Option 02)

<b>Form</b>	Installed in MW9070B Optical Time Domain Reflectometer
<b>Functions</b>	Detects optical fiber faults (quick scan, normal scan, and near-end scan), scheduler, modem/communication setting, controls alarm generator and optical switch (eight ports for optical switches and alarm generator)

## ●Installation Program

<b>Functions</b>	Reads and records files, sets OTDR measurement conditions, executes OTDR measurement, reads OTDR waveform, manipulates waveform, sets optical switches and alarm ports, sets OTDR modem, select reference data type, sets fault threshold value, sets evaluation range, saves reference data, creates/downloads/executes scheduler, sets serial port/modem, connects/disconnects network
<b>System requirements</b>	Computer: i486TM or later (Pentium 75 MHz or later recommended) running Windows95 Memory: 16 MB or more (32 MB or more recommended) Hard disk drive: 16 MB or more free space (20 MB or more recommended) Floppy disk drive: 1 (able to read 3.5" floppy disk in 1.44 MB format) Display: Color with 800 × 600 or higher resolution Mouse RS-232C: 1 port or more

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Windows is a registered trademark of Microsoft Corporation.

## ●Optical switch (MN9662A with Option 01)

Typical values are given for reference only to assist in the use of this instruments, and are not guaranteed specifications.

<b>Number of channels</b>	1 x 8
<b>Wavelength*1</b>	1.2 to 1.65 $\mu$ m
<b>Applicable optical fiber</b>	SM (ITU-T G.652)
<b>Insertion loss*2</b>	$\leq$ 1.6 dB (1.1 dB typ.)
<b>Return loss*3</b>	$\geq$ 45 dB (PC connector)
<b>Polarization dependent loss*4</b>	$\leq$ 0.03 dBp-p (0.015 dBp-p typ.)
<b>Crosstalk</b>	$\leq$ -80 dB
<b>Switching repeatability*5</b>	$\leq$ 0.02 dBp-p (0.003 dBp-p typ.)
<b>Switching time</b>	Min: $\leq$ 600 ms*6, Max: $\leq$ 800 ms*7
<b>Switching life</b>	$\geq$ 1 x 10 <sup>7</sup> times
<b>Max. input level</b>	+23 dBm (200 mW)
<b>I/O optical connector</b>	FC, SC, ST, DIN, HMS-10/A (all PC type)
<b>Display</b>	Seven-segment green LED
<b>Temperature range</b>	Operating: 0° to 50°C, Storage: -30 to 71°C
<b>Remote control</b>	RS-232C (D-sub 9-pin), parallel interface (36-pin)
<b>Contact output*8</b>	4 circuits, $\leq$ 50 Vdc, $\leq$ 0.2 A, non-polarity
<b>Power</b>	85 to 132/170 to 250 Vac, $\leq$ 35 VA, 47.5 to 63 Hz
<b>Dimensions and mass</b>	213 (W) x 88 (H) x 351 (D) mm, $\leq$ 4.5 kg

\*1: Specifications at 1.31  $\mu$ m and 1.55  $\mu$ m measured using master optical fiber cable

\*2: Including connector loss at 2 points

\*3: Return loss depends on connected connector

\*4: At constant temperature in operating temperature range

\*5: At constant temperature in operating temperature range and constant polarization condition

\*6: Between channel 1 and channel 2

\*7: Between channel 7 and channel 8

\*8: When the contact outputs are used, the optical channels 1 to 4 are usable.

# ▼ Ordering Information

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

Model/Order No.	Name	Quantity	Remarks
	<b>Main unit</b>		
<b>MW9070B-02</b>	Monitoring Function		Program included in MW9070B
	<b>Standard accessories</b>		
<b>MX907002B</b>	Installation Program (for MW9070B monitoring function):	1 pc	On 3.5" floppy disk
<b>W1320AE</b>	MX907002B instruction manual:	1 pc	
<b>J0654A</b>	Serial interface cable:	1 pc	Standard kit (for IBM-PC/AT and J3100 remote control)
<b>J0655A</b>	Serial interface cable:	1 pc	PC-98 kit (for PC-98 remote control)
	<b>Optional accessories</b>		
<b>No. 364*1</b>	Modem		3 Com (US Robotics) 56k fax modem*2

\*1: When use this modem in a country other than Japan, it may be not operate normally.  
Purchase a modem of the same modem number in the country.

\*2: Only this model can be used.

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Specifications are subject to change without notice.

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