Product Brochure

MW90010A
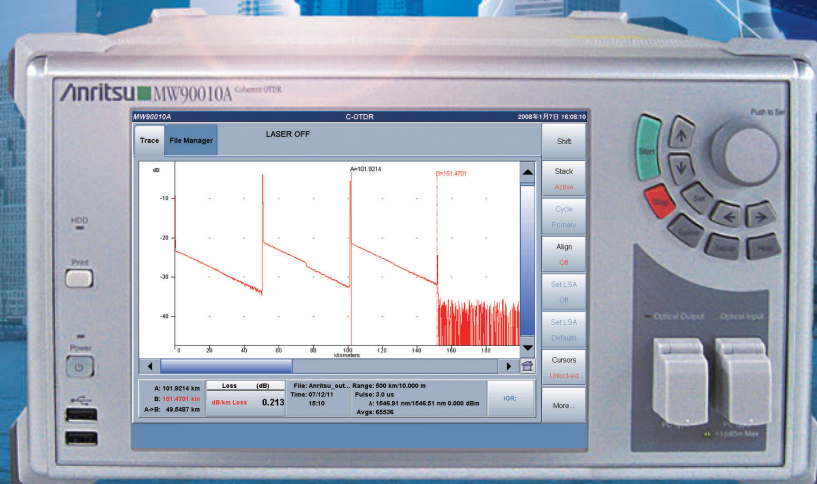
Coherent OTDR

- **Measure submarine cables up to 12,000 km long with 10 m resolution**
- **Unique Solution for Submarine Links Fault Detection**
- **Compact & Lightweight for Easy Transportation.**
- **Easy Operation**
- **Wide Dynamic Range**

The Coherent OTDR (C-OTDR) MW90010A is a measuring instrument for detecting faults in ultra-long optical submarine cables of up to 12,000 km including multiple repeaters (EDFAs). It is the ideal solution for evaluating new cables at service deployment as well as for troubleshooting in-service faults.

Ultra-long optical submarine cables use optical amplifiers to boost signals. Successful OTDR measurement through the repeaters requires configuring a backscatter detection system using up and down links. The MW90010A can measure the backscatter light through all repeaters by using coherent detection. As a result, it can display every fault condition, such as optical loss between repeaters, bending loss, distances, breaks, etc., on-screen for waveform data analysis.

Features

- Fault detection with 10 m distance resolution
- Compact and lightweight all-in-one design for on-site portability [320 (W) × 177 (H) × 451 (D) mm, 17 kg Max.]
- Simple and easy touch-panel operation for easy first-time use by any operator
- Wide dynamic range supporting fault detection and troubleshooting of submarine cables with repeaters at 80 km or wider intervals
- Built-in tunable light source with high wavelength accuracy of ±0.2 nm for wavelength setting range of 1535.03 nm to 1565.08 nm
- Adjustable output power from 0 to +13 dBm

External Appearance

Application

- Waveform at installation (Reference comparison)

- Waveform at fault occurrence
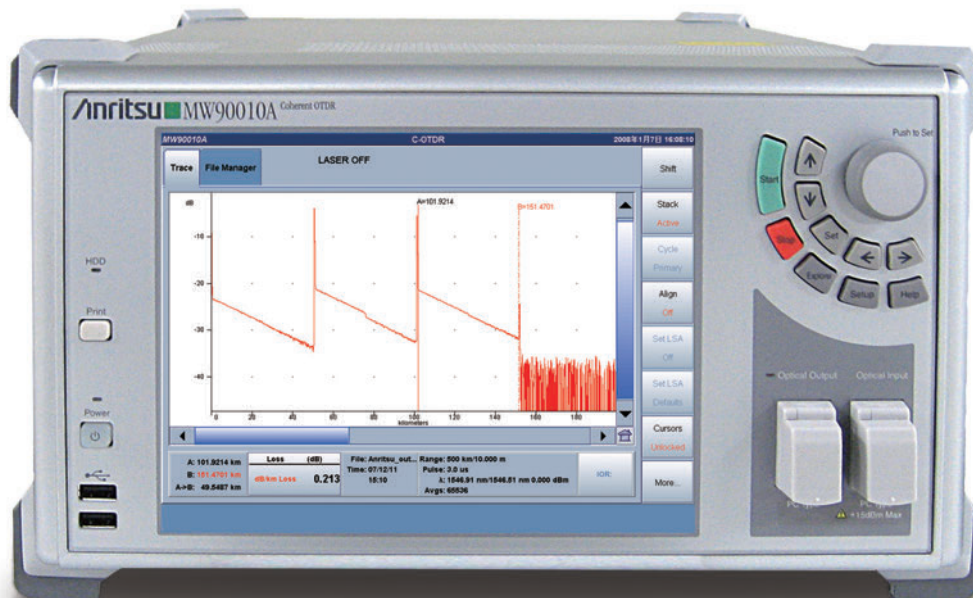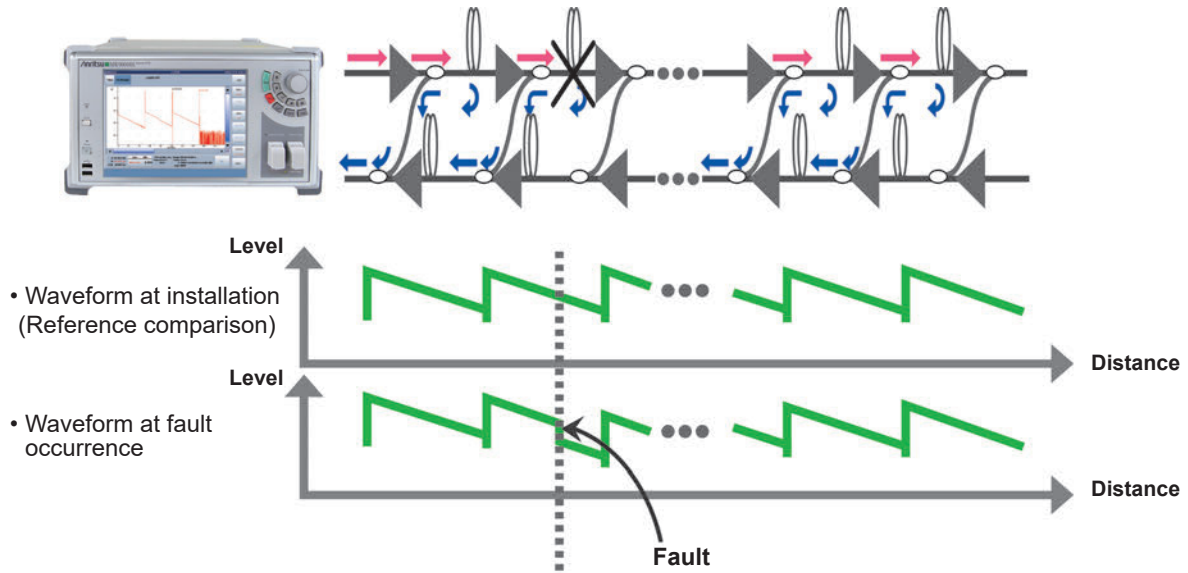
C-OTDR Measurement Example

The unsurpassed, compact, lightweight (17 kg max.), all-in-one design supports every stage of optical submarine cable management from cable installation to fault detection or past data analysis

• Measure Submarine Cables up to 12,000 km Long with 10 m Resolution

The MW90010A can capture data from up to 1.2 million points on the horizontal axis at a fixed resolution of 10 m with no dependency on measured distance. As a result, faults can be located with very high resolution even in fibers longer than 10,000 km.

• Lightweight and Compact

In comparison to previous optical submarine cable measuring equipment, the MW90010A is less than half the weight (17 kg max.) and size.

The all-in-one design incorporates a tunable light source for easy on-site portability and troubleshooting.

• Excellent GUI

Every stage from setting parameters to starting measurement is made easy using the touch-screen. The rotary knob and keypad can be used for operation too. The easy-to-use design coupled with standard interfaces for USB memory, USB mouse, keyboard, and VGA OUT, makes measurement simple even for novice OTDR operators.
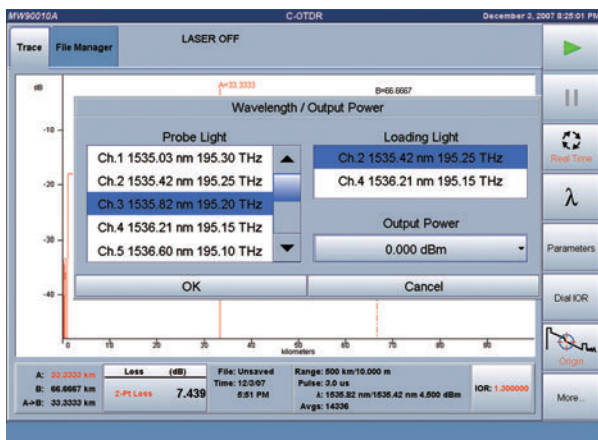

• Wide Dynamic Range

Typical optical submarine cables are designed with repeaters every 50 km to 60 km but the high resolution of the MW90010A easily supports fiber loss measurement of these systems as well as fault location of cables with repeaters spaced at more than 80 km.

• Simultaneous Display of 8 Waveforms (max.)

Installation and maintenance of optical submarine cables requires comparison of current waveform data with data at cable installation to monitor aging changes. The MW90010A makes this comparison easy because it can display up to 8 waveforms simultaneously, allowing faults to be seen at glance by comparing the install waveform with the fault waveform on one screen.
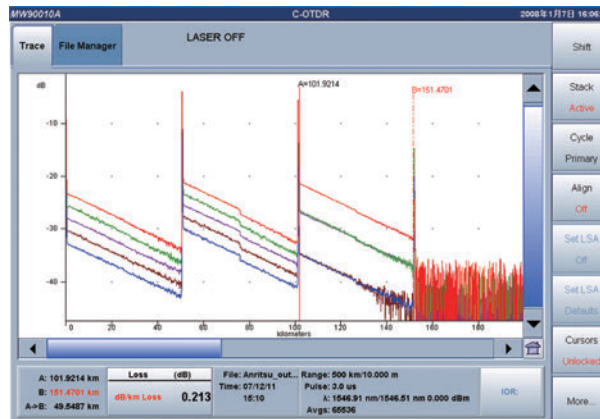
• Built-in Standard OTDR Functions

The MW90010A has the full range of versatile built-in applications, including real-time measurement, zoom/shift function, 2-point loss analysis, etc.
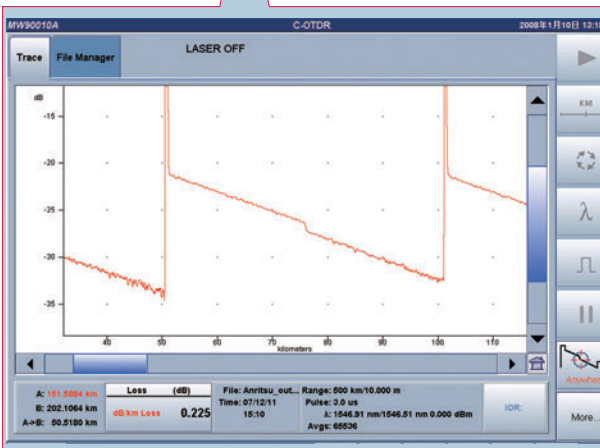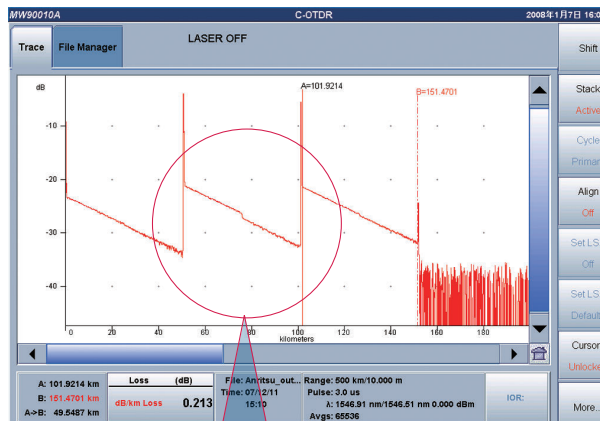
• Remote Operation Function

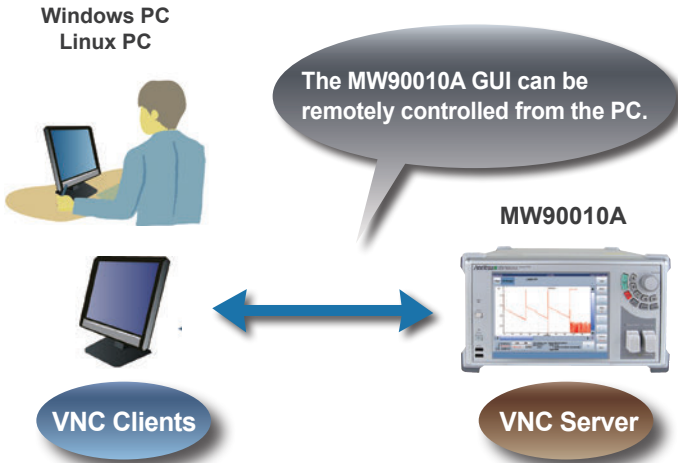The MW90010A has a built-in VNC server. When the MW90010A (server) is connected over Ethernet to a PC (client) running either a Windows or Linux OS, the MW90010A GUI can be remotely controlled from the PC to transfer files between the server and client.

Windows PC
Linux PC

The MW90010A GUI can be remotely controlled from the PC.

MW90010A

VNC Clients

VNC Server

• Additional Averaging Processing

Evaluation of optical submarine communications cables using a C-OTDR can take many hours. However, measurement productivity is greatly increased using the MW90010A Additional Averaging function. For example, after waveform data has been measured for 2^{16} averagings, the additional averaging function can be used to increase the measured data to 2^{17} averagings.

• Waveform Analysis using Emulation Software

Waveform data measured and saved by the MW90010A can be analyzed on a PC running a Windows OS using the optional NETWORKS (version 4.1 or newer) emulation software (sold separately).
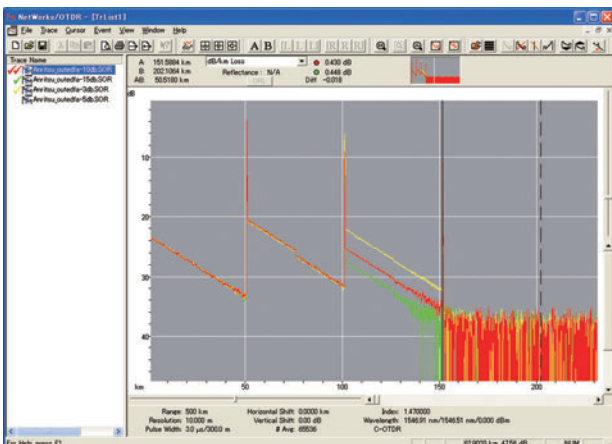
• Support for Telcordia format (SR-4731)

The Telcordia format shared by OTDR is supported.

• 2.8-GB Internal Memory

Measured data is saved in the 2.8-GB internal memory and can be copied to external USB memory stick for processing on a PC.

• PDF-format Reports

Measured data can be saved in PDF format for confirming measurement date, conditions, and waveform data on a single report.
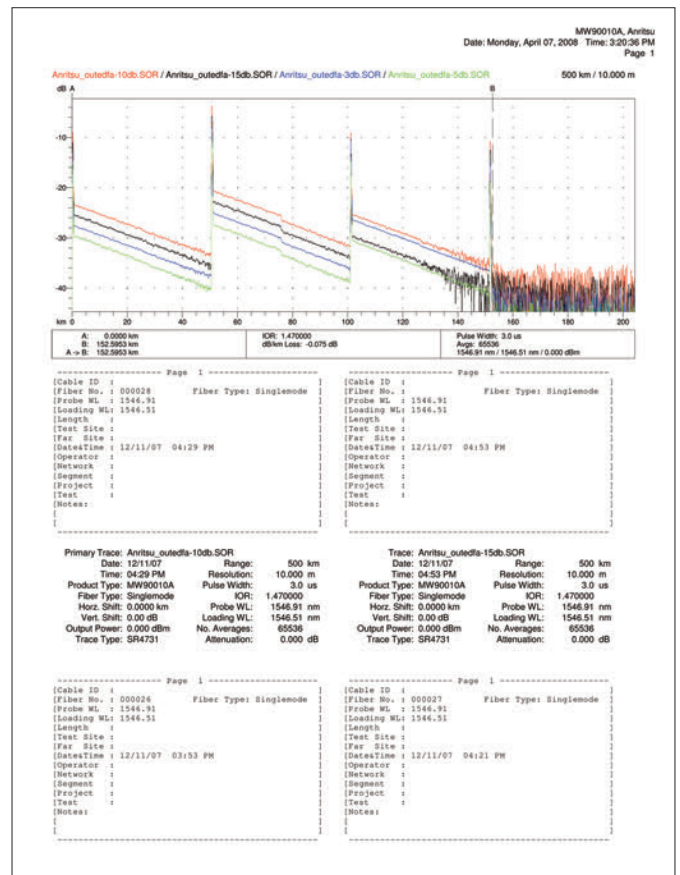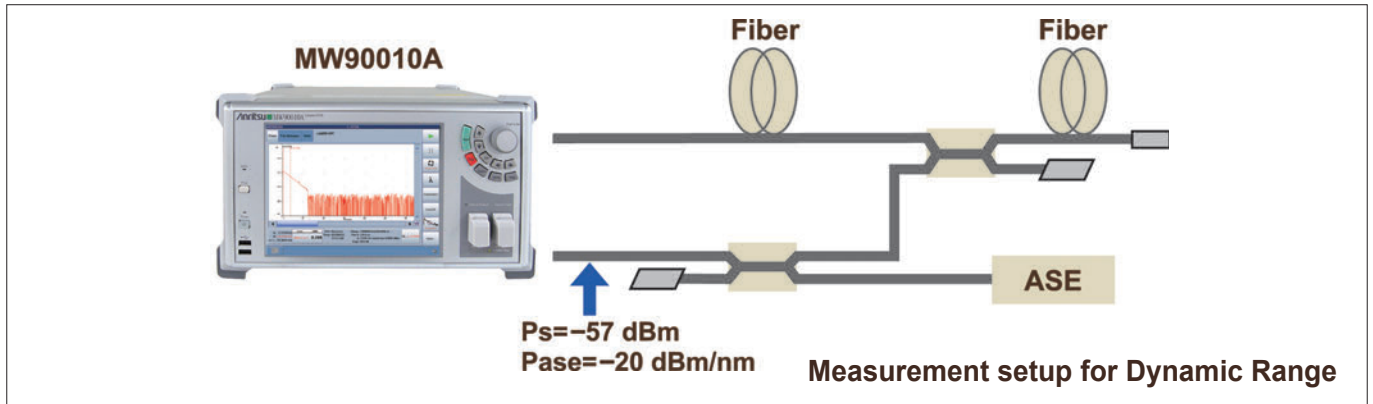
• Windows® is a registered trademark of Microsoft Corporation in the USA and other countries.

Specifications

MW90010A Coherent OTDR

Fiber Under Test	ITU-T G.653 (DSF)
Optical Connector	FC, SC, DIN, HSM-10/A, ST (Replaceable, PC type)
Wavelength (Probe Light)	1535.03 nm to 1565.08 nm (ITU-T Grid, Wavelength in vacuum setting with 50 GHz steps)
Wavelength Accuracy	±0.2 nm (+20°C to +30°C)
Warm-up Time	30 minutes (+20°C to +30°C)
Loading Light Source (Dummy)	" wavelength of probe light " +50 GHz or –50 GHz The loading wavelength can be selectable at +50 GHz or –50 GHz of the probe (OTDR) wavelength.
Pulse Width	3, 10, 30, 60, 100 μs
Optical Output Power	0 to +13 dBm, 0.5 dB steps

Dynamic Range
(one way, S/N=1)
(See the block diagram on previous page)
	>17 dB
	Measurement Conditions:
	  Pulse width: 10 μs, Average times: 2^{16}, Distance range: 1000 km, Smoothing: On, Ps: –57 dBm @ Pin[*1]
	  Pase: –20 dBm/nm @ Pin[*1]

Dead Zone	0.5 km (Pulse width: 3 μs)
Distance Measurement Accuracy	±10 m ±0.5 × 10^{-6} × measurement value (m) This does not include optical fiber refraction index (IOR) based uncertainty.
Vertical Scale	0.02, 0.05, 0.1, 0.2, 0.5, 1.0, 2.0, 5.0, 10.0 dB/div
Distance Range	100 km, 500 km to 12,000 km (in 500 km steps)
Sampling Resolution (IOR = 1.500000)	10 m
Measurement Time	15 minutes (Distance range: 1000 km, Average times: 2^{16})
Average Times	2^8 to 2^{24}
Ior Settings	1.300000 to 1.700000 (0.000001 steps)
Monitor Output	–25 to –15 dBm (for OTDR Wavelength Monitor)

Other Functions	• Real Time Measurement
	• Multiple Trace Display (8 Waveforms max.)
	• Zoom & Shift
	• Loss Calculation
	  Splice Loss, 2Pt Loss, 2Pt LSA, dB/ km Loss, dB/km LSA, 2Pt & dB/km, 2Pt & dB/km LSA
	• File Save formats
	  GR-196, SR4731
	• USB Memory support
	• Internal Memory (2.8 GB)
	• Print
	  External printer, Hard copy (file: PDF)
	• Distance Unit
	  miles, feet, kilofeet, meters, kilometers
	• File Utility
	  File: Copy, Paste, Delete
	  Folder: Create new
	• Help function
	• Remote Control Function (Option)

Display	8.4 inch, XGA (1024 × 768) color LCD with touch panel
Interface	USB (2 ports, REV1.1), Mouse (USB), Keyboard (PS/2), VGA
Power Supply	100 VAC to 120 VAC/200 VAC to 240 VAC, 50 Hz to 60 Hz, ≤300 VA
Dimensions and Mass	320 (W) × 177 (H) × 451 (D) mm, <17 kg
Environmental Conditions	Temperature: +10°C to +35°C (operating), –10°C to +50°C (storage) Humidity: <85% RH Vibration: Conforms to MIL-STD-810D

CE	EMC	2014/30/EU, EN61326-1, EN61000-3-2
	LVD	2014/35/EU, EN61010-1
	RoHS	2011/65/EU, (EU) 2015/863, EN IEC 63000: 2018

Laser Safety Level[*2]	IEC 60825-1: 2007
	  CLASS 1M: Optical Output Port
	  CLASS 1: Monitor Port
	21CFR1040.10
	Excludes deviations caused by conformance to Laser Notice No. 50 dated June 24, 2007

Measurement setup for Dynamic Range

*1: Ps: Maximum backscatter level at the input [dBm]

Pase: ASE level at the input [dBm]

*2: 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
MW90010A	**Main Frame** Coherent OTDR
W3030AE	**Standard Accessories** Power Cord: 1 pc MW90010A Operation Manual (CD-R): 1 copy
MW90010A-001 MW90010A-002*1	**Options** Remote Control Function OS Upgrade to WES2009
MW90010A-101 MW90010A-102*2	Remote Control Function Retrofit OS Upgrade to WES2009 Retrofit
MW90010A-037*3 MW90010A-038*3 MW90010A-039*3 MW90010A-040*3 MW90010A-043*3	**Options (Optical Connector)** FC Connector ST Connector DIN 47256 Connector SC Connector HMS-10/A Diamond Connector

Model/Order No.	Name
NETWORKS B0335C B0604A J0617B J1409A J1410A J1411A J1412A J0057 J0635*4 J0952A Z0914A Z0915A Z0284 W3024AE Z0397A*5 Z0412A*5 Z0413A*5 Z0414A*5	**Application Parts** Emulation Software (Version 4.1 or newer) Carrying Case Rack Mount Kit Replaceable Optical Connector (FC-PC) Replaceable Optical Connector (ST) Replaceable Optical Connector (DIN) Replaceable Optical Connector (SC) Replaceable Optical Connector (HMS-10/A) Optical Adapter FC type Optical Fiber Cord with FC-PC at both ends (SM, with FC-PC at both ends) FC · PC-FC · APC(SG)-1M-SM Ferrule Cleaner Replacement Reel for Ferrule Cleaner (6 pcs/set) Adapter Cleaner (Stick type, 200 pcs/set) MW90010A Operation Manual (Printed version) FC Adapter Cap DIN Adapter Cap SC Adapter Cap HMS-10 Adapter Cap

*1: Please be sure to specify.

*2: Factory (in Japan) option.

*3: Required option
Specify the optical connector type. The same type of connector will be supplied for the optical output port, optical input port, and optical monitor port.

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

*5: Monitor Output Port optical connector cap. Specify exchangeable optical connectors (J1409A, J1410A, J1411A, J1412A and J0617B) as a pair.

Network Master Pro MT1000A

10G Multirate Module	**MU100010A**
100G Multirate Module	**MU100011A**

Installing the MU100010A or MU100011A in the MT1000A supports commissioning and maintenance tests of communications networks operating at speeds from 1.5 Mbps to 100 Gbps. In addition to Ethernet, OTN, eCPRI/RoE/CPRI/OBSAI, Fibre Channel and SyncE protocols used by mobile-network base stations are supported too.

OTDR Module 1310/1550 nm SMF	**MU100020A**
OTDR Module 1310/1550/850/1300 nm SMF/MMF	**MU100021A**
OTDR Module 1310/1550/1625 nm SMF	**MU100022A**
OTDR Module 1310/1550/1650 nm SMF	**MU100023A**

Installing an OTDR Module MU100020A/MU100021A/MU100022A/MU100023A provides the OTDR functions required for optical fiber I&M. Work efficiency is increased by all-in-one support for optical fiber tests and data communications network commissioning. I&M tests of 1.5 Mbps to 100 Gbps communications networks can be executed by simultaneously installing the MU100010A or MU100011A. In addition to supporting Ethernet, OTN, etc., networks, Mobile base station CPRI and OBSAI, as well as SyncE protocols are also supported.

MT9090 Series

µOTDR Module   MU909014/15
Compact OTDR for full automatic verification of optical networks, FTTH-PON, Metro and Core.

Gigabit Ethernet Module   MU909060A
Dedicated field test solution for installation and troubleshooting Ethernet links in access networks.

CMA5 Series
For Optical Fiber Installation and Maintenance.

ACCESS Master MT9085 Series
For WAN/MFH/DCI/FTTH Optical Fiber I&M
- Improved operability with powerful synergy of 8-inch touchscreen and hardware keys
- At-a-glance Pass/Fail evaluation using Fiber Visualizer
- All OTDR, OLTS, and Visible Light Source operations on one screen
- Short event dead zone of ≤0.8 m and high dynamic range of 46 dB max.
- Power meter option for measuring optical power up to +30 dBm

Anritsu
envision : ensure