Anritsu Advancing beyond

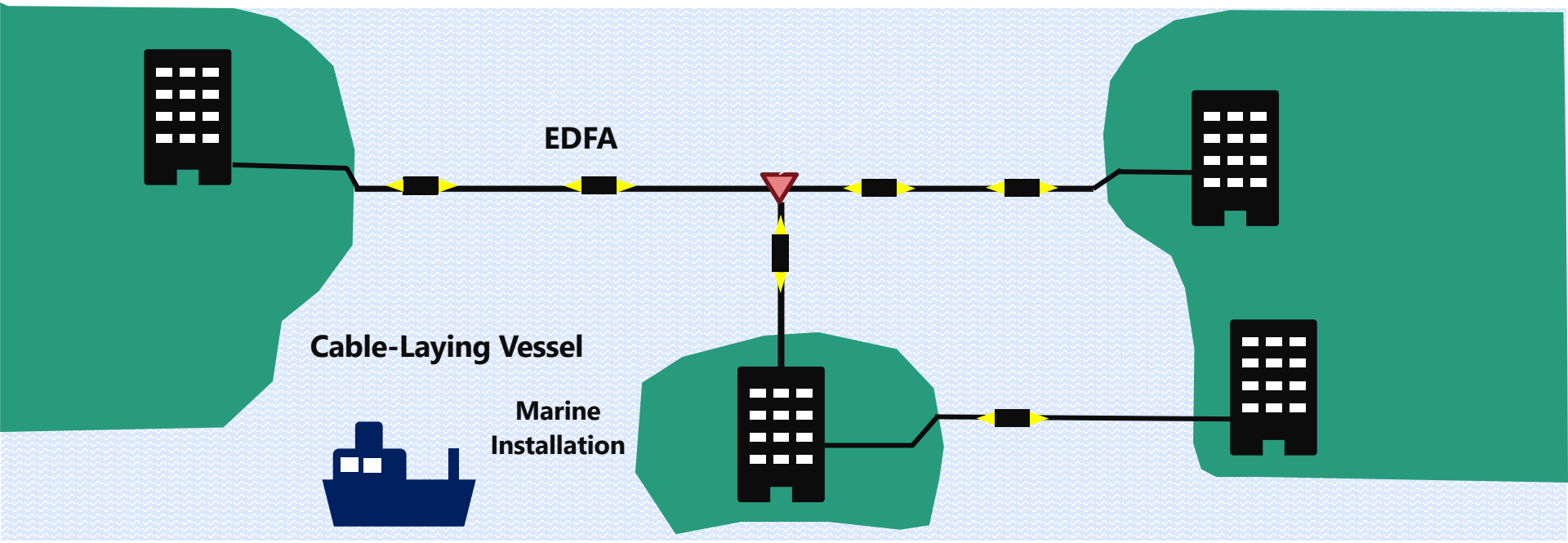
Coherent OTDR
MW90010B

Submarine Cable Features

Most of the Internet uses optical submarine cables. An Optical submarine cables use EDFA (erbiullldoped fiber amplifier) every few tens of kilometers to amplify attenuated light.

An optical submarine cable routes are intercontinental. Transmission lines span thousands of kilometers and are connected using multiple EDFAs and branches. The optical submarine cables sunk to the seafloor are made strong enough, but can be severed by fishing gear, ship anchors, or natural disasters such as earthquakes.

When optical submarine cables are severed, communication between continents is disrupted, and the impact is significant, requiring rapid identification and repair of the severed points.



Optical Submarine Cable Fault Detection

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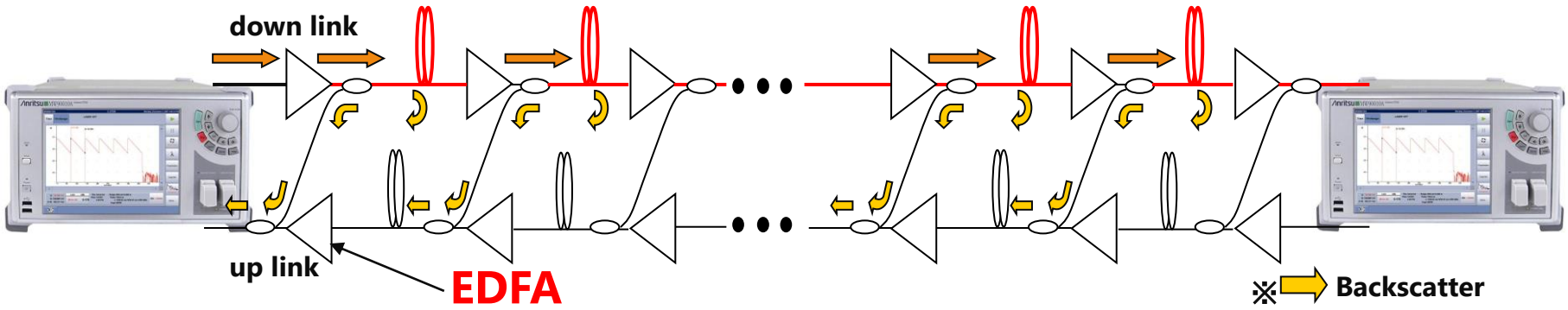
Coherent OTDR

In optical submarine communications, relaying by EDFA is essential because transmission can be extremely long, ranging from several hundred to nearly 20,000 km.

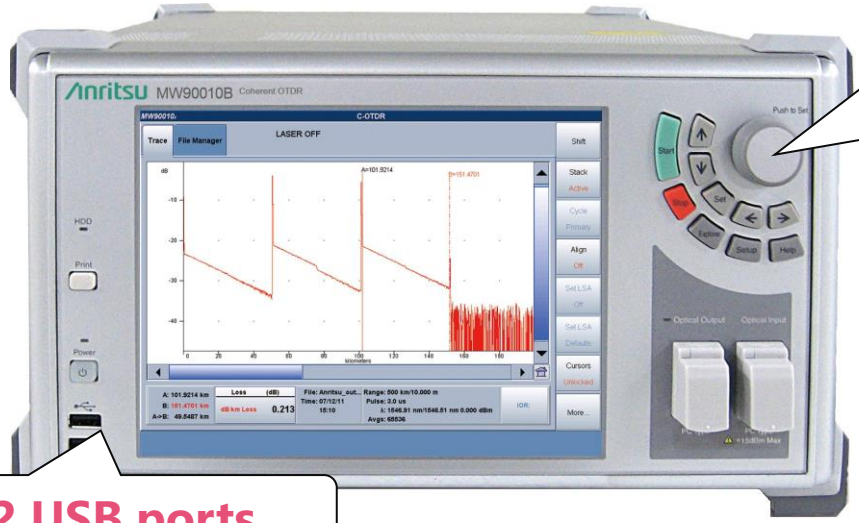
A coherent OTDR (C-OTDR) examines the optical submarine cable conditions by injecting an optical pulse into one end of the cable and using the backscatter light and Fresnel reflection of light returning to the C-OTDR after passage through the optical fiber.

On the other hand, EDFA also emit amplified spontaneous emission(ASE). Therefore, Coherent OTDR achieves high sensitivity by adopting a coherent detection method that detects interference signals (Beat signal) caused by signal light (Backscatter) and reference light (Local light).



MW90010B View

External View (Front & Back)



Touch panel, Rotary Knob and Keypad

For settings and operations in addition to touch-panel operation.

2 USB ports

Size: 320(W) x 177(H) x 451(D) mm

Mass: ≤10 kg

Interface

USB 2.0(Front2, Back1), HDMI,

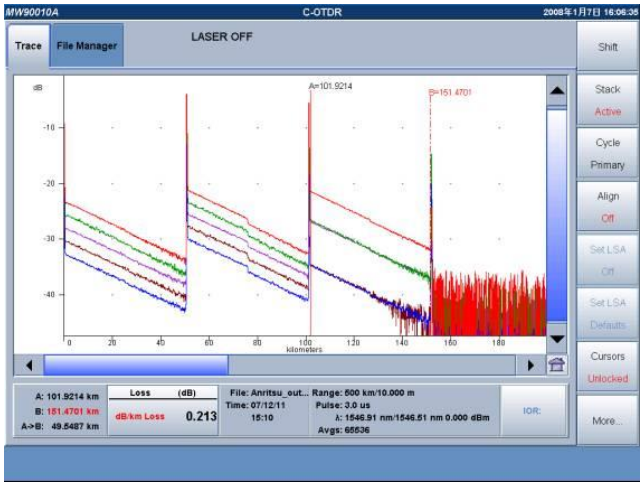
10/100/1000M Ethernet x1

- ✓ **All-in-one platform with built-in tunable light source**
- ✓ **Easy portability for on-site troubleshooting**

MW90010B GUI

Intuitive to use

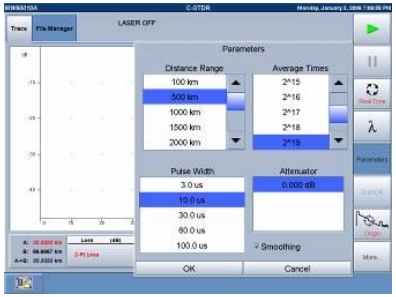
The GUI has been retained. First-time users can start measurement in three steps.



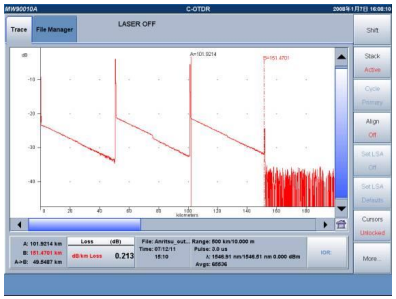
- Simple touch-panel operation
- Multi-waveform display

Simple 3-Step Operation

1) Set wavelength.



2) Set measurement conditions.



3) Start measurement.

MW90010B Measurement Distance

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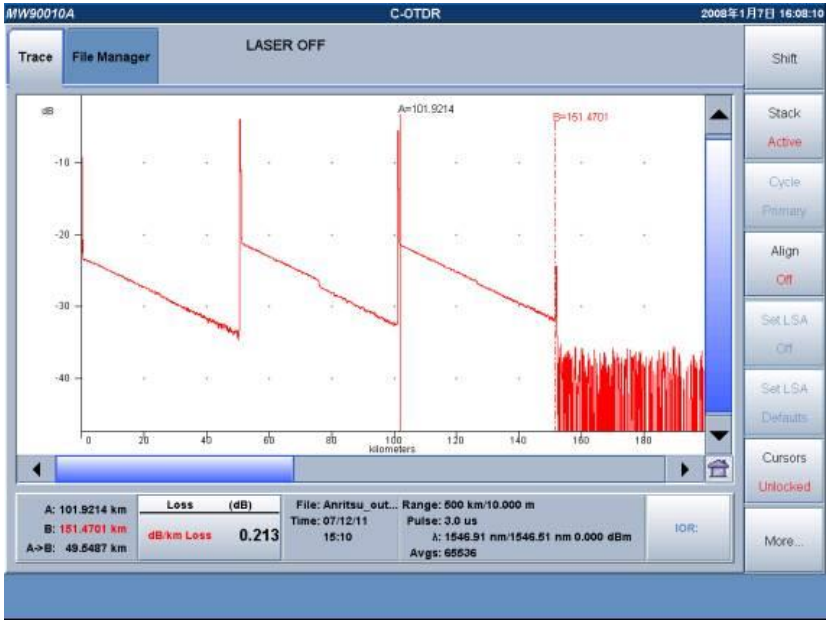
Select measurement distance according to environment

Standard optical submarine cables have repeaters every 50 to 60 km. Like its forerunner, the MW90010B can measure distance ranges of 12,000 km. Adding the Extended Measurement Distance MW90010B-003 option extends measurement of undersea cables up to 20,000 km long.



- High-resolution troubleshooting measurements with repeaters at intervals of more than 80 km (10 µs pulse width, theoretical value)
- Adding this option supporting maintenance of future ultra-long fiber cables extends measurement distance.

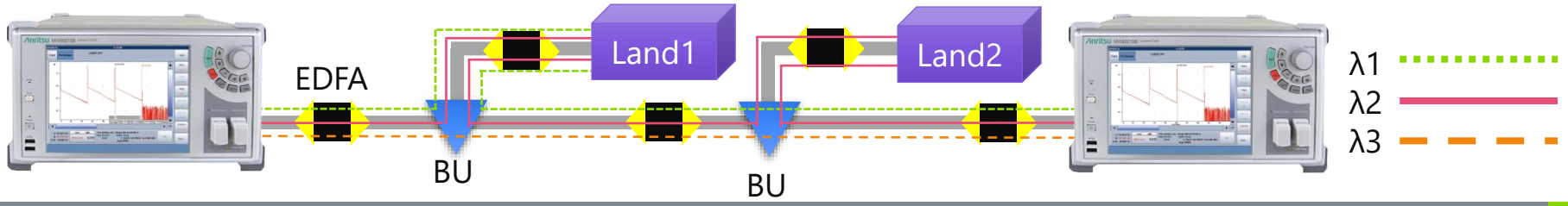
MW90010B Optical output

Built-in Tunable Light Source with wavelength accuracy of ±0.05 nm

The MW90010B has a built-in, tunable-wavelength light source covering the full C-band used for communications. On-site testing is started immediately after selecting the required wavelength.

- ✓ **1535.03 to 1565.08 nm wavelength range**
- ✓ **0.4 nm interval setting**
- ✓ **Stable measurement with probe and dummy optical outputs**
- ✓ **Optical power setting range of 0 to +13 dBm**

By being able to vary the wavelength, it is possible to measure all transmission paths that branch for each wavelength.



MW90010B Measurement time (1/2)

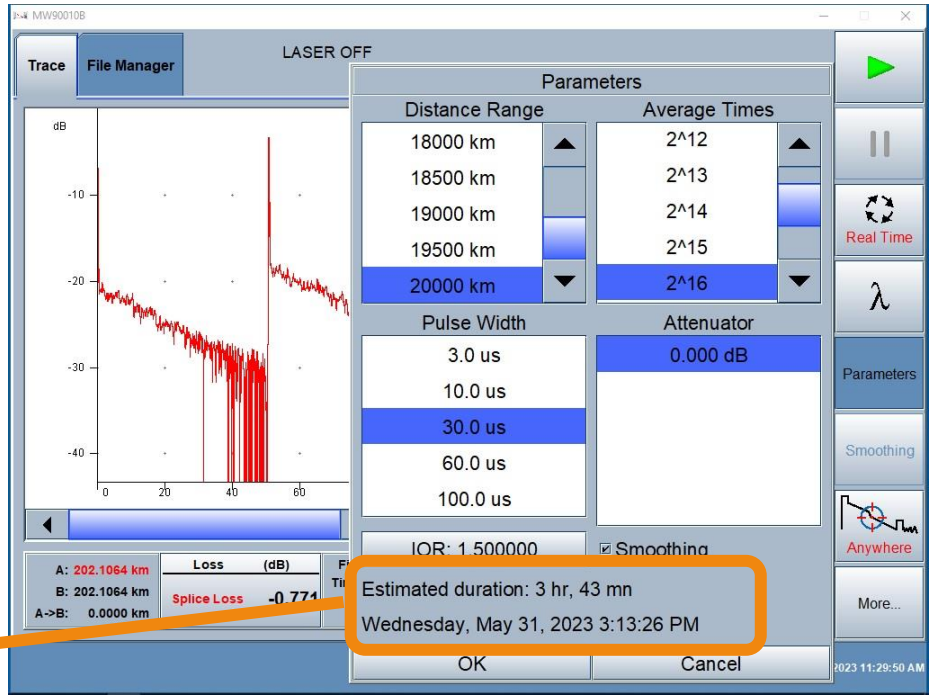
Short measurement times with wide dynamic range and high S/N

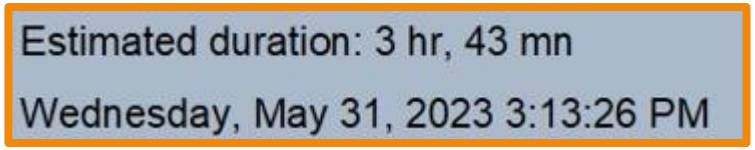
The MW90010B has a wide dynamic range and high S/N to support quick troubleshooting of optical submarine cables.

Measurement in 15 minutes (2 ^16 averagings, 1000-km distance range)

The time until measurement completed is displayed.

The estimated time until measurement is completed under the selected conditions is displayed.





The total estimated time and progress are displayed.

MW90010B Measurement time (2/2)

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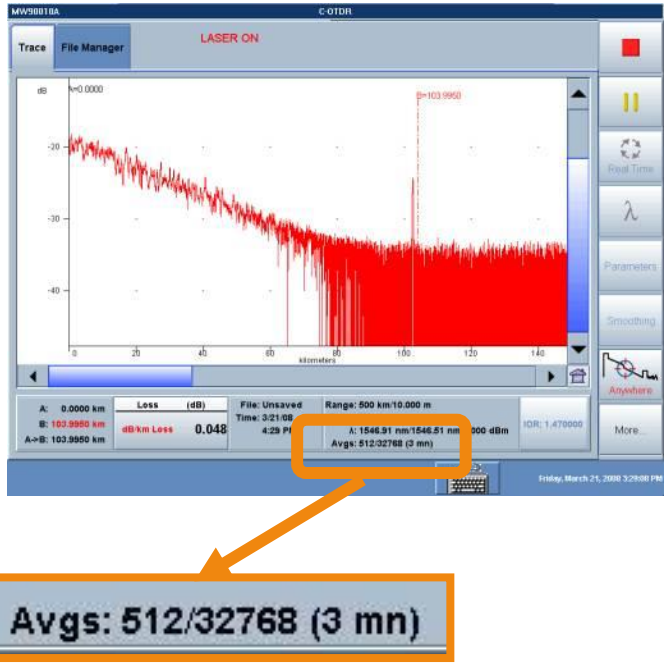
The measurement progress is displayed.

During measurement, the number of elapsed averagings and the time remaining until measurement is completed are displayed.

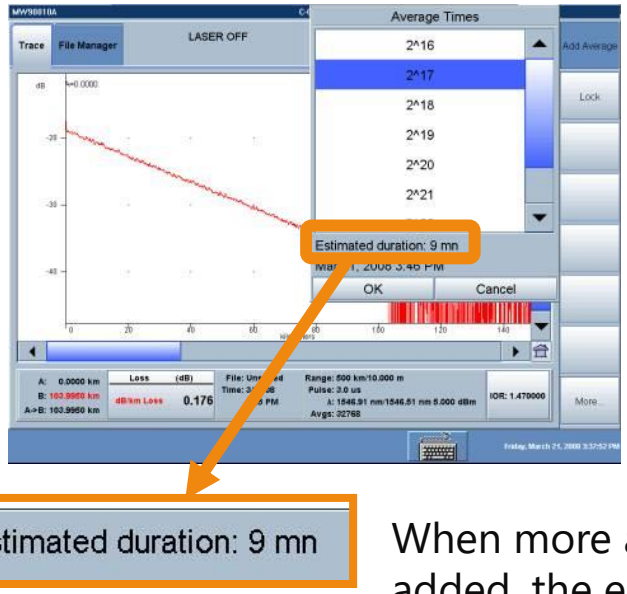


If measurement is interrupted, the waveform is displayed based on the averaging completed until the interruption.

Additional averaging measurement is supported.

Sometimes, the anticipated result is not obtained because the specified number of averaging was insufficient, or it is necessary to perform measurements under several averaging conditions.

Using the MW90010B, extra averaging can be added even after measurement is completed to continue measurement.



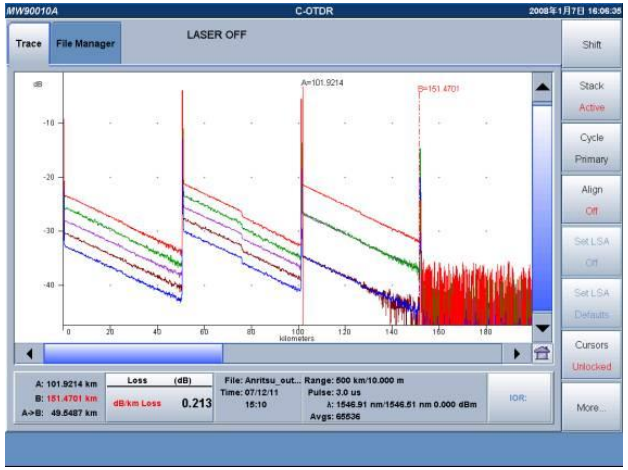
When more averaging are added, the estimated extra time is displayed.

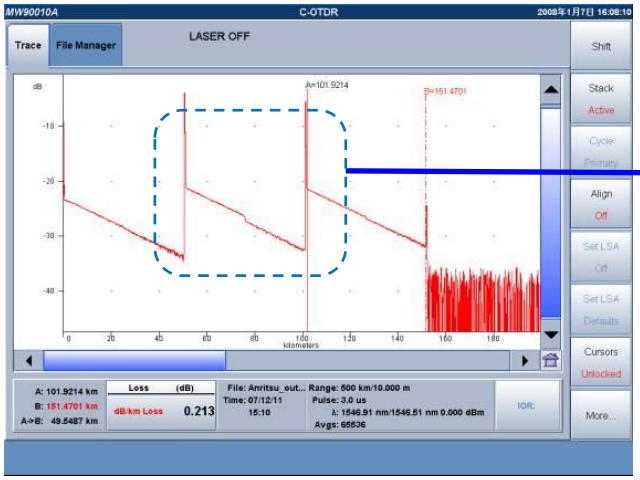
MW90010B Other functions (1/2)

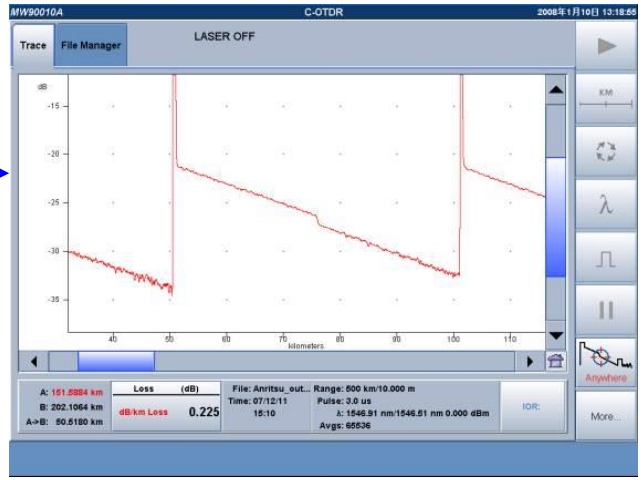
Built-in OTDR standard functions

In addition to the functions introduced so far, the following operations are available

- 2-point loss measurement
- Zoom and Shift functions
- Multi-waveform display (8 max.)

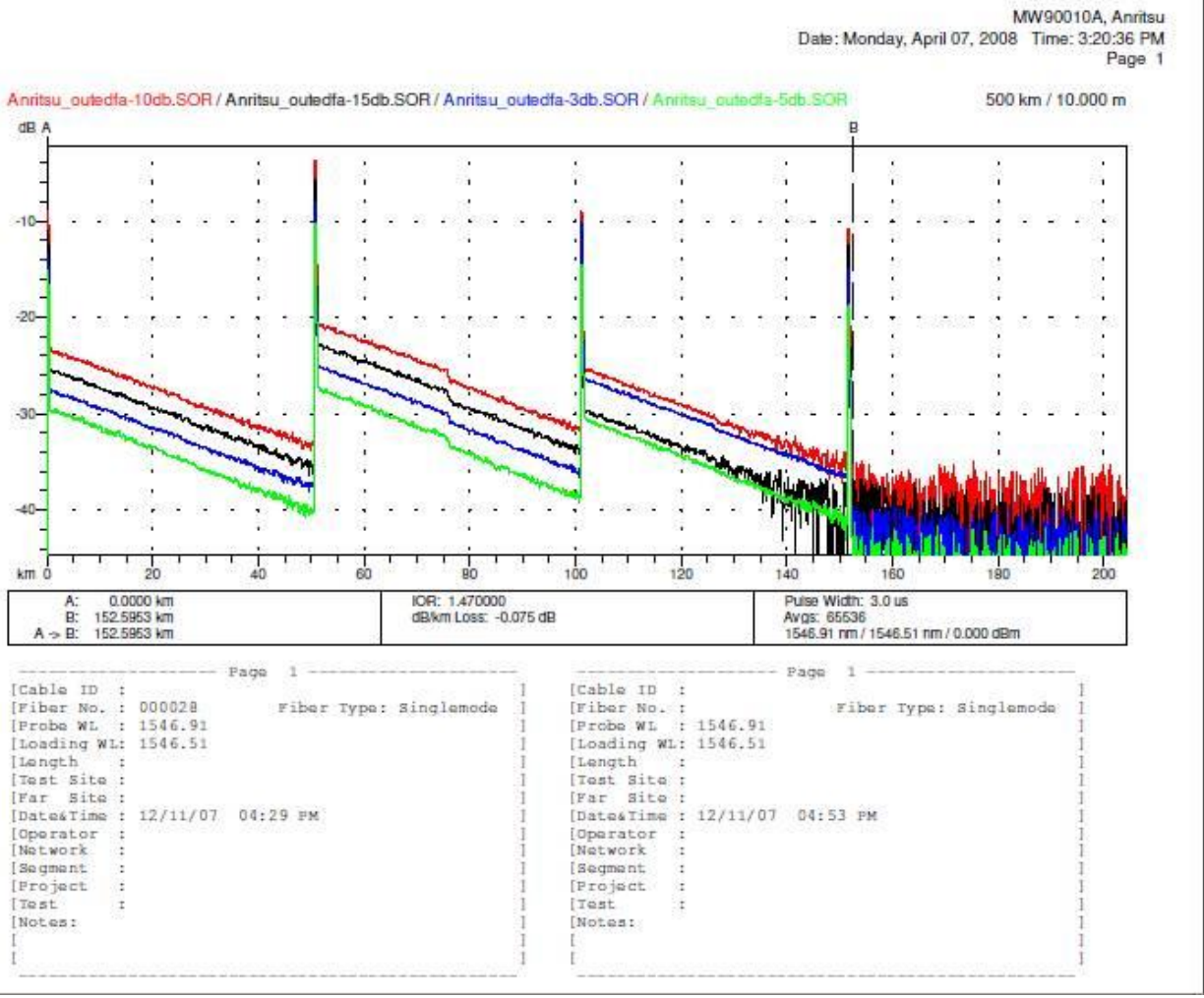






MW90010B Other functions (2/2)

- Reporting function (pdf)
- Data storage
  - Internal memory (350 GB)

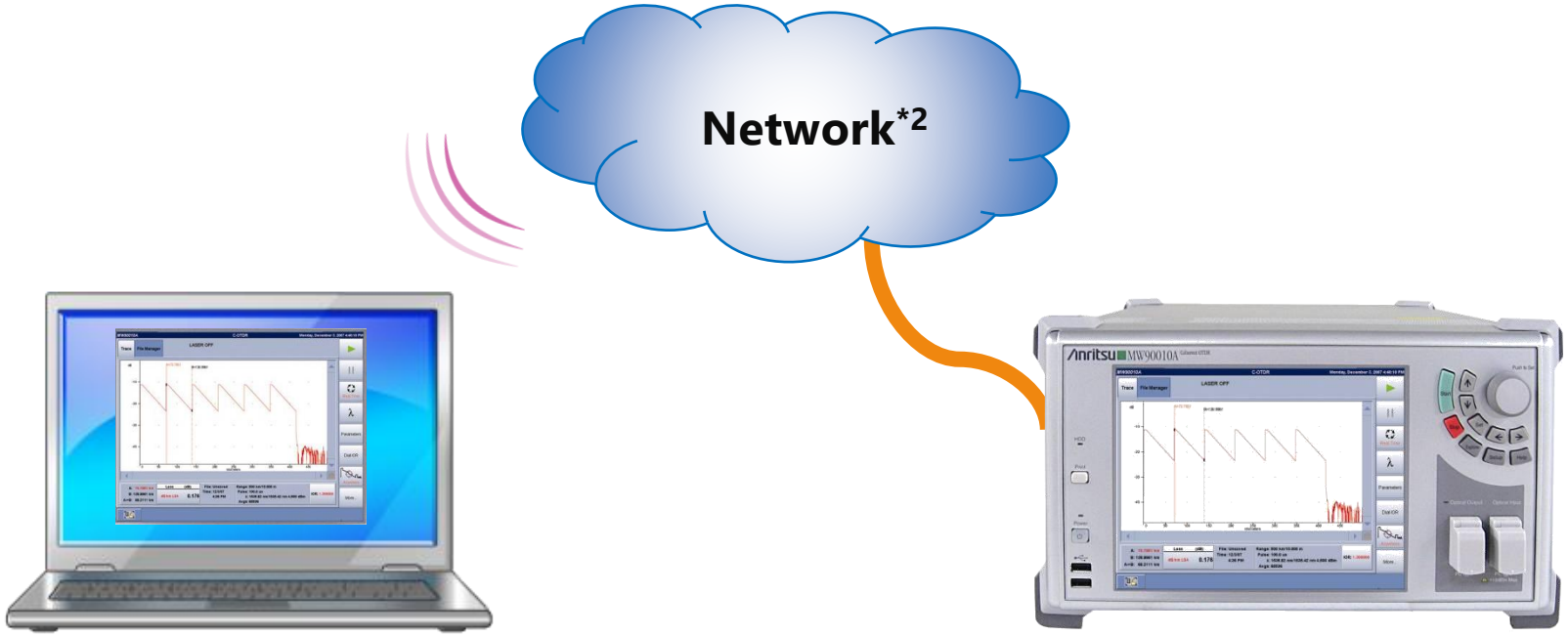


MW90010B Remote control

Remote Operation

The MW90010B implements wired Ethernet.

By connecting this to the network, the MW90010B is able to operate remotely from another PC using the Windows Desktop function*1.

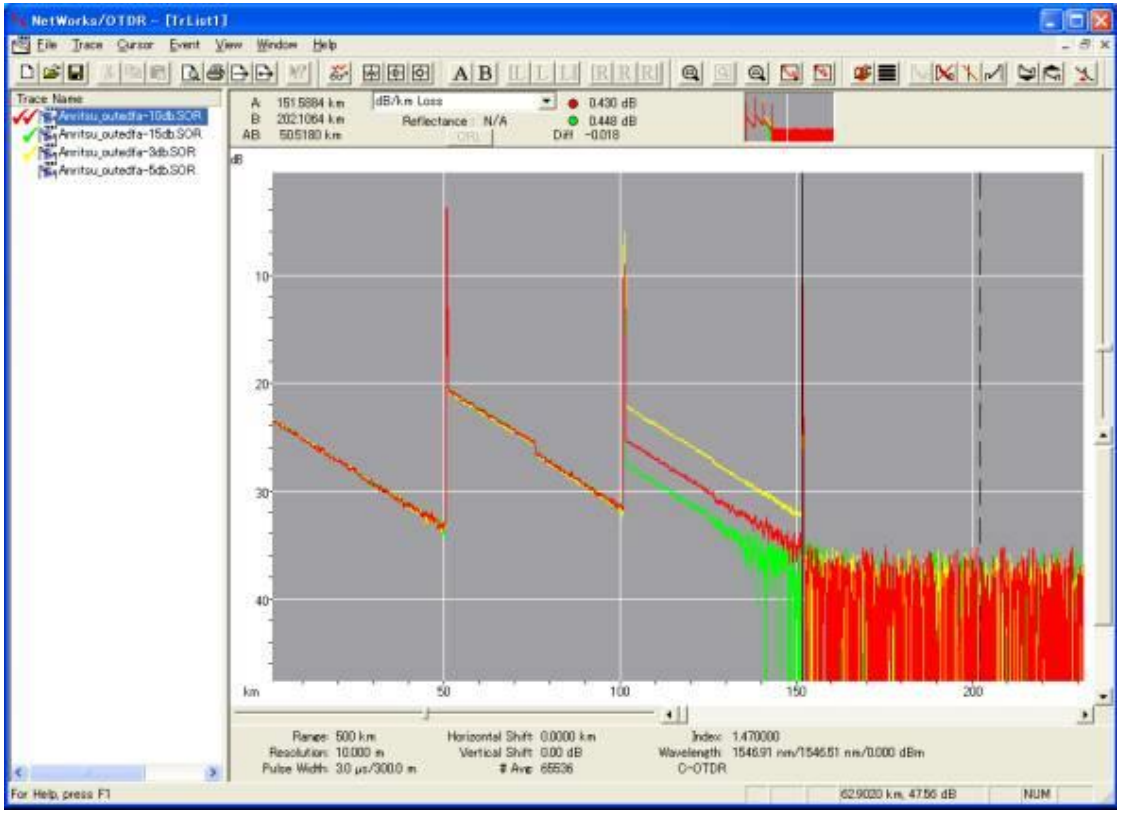


*1: User settable
*2: Contact network administrator for network connection details.

MW90010B Waveform Analysis Tools

Emulation Software

Captured waveform data can be analyzed on a Windows PC using the NETWORKS emulation software (version 4.1 or newer).



Specifications

Item	Specifications
Wavelength Range	1527.60 nm to 1567.13 nm, 50 GHz step
Wavelength Accuracy	±0.05 nm
Loading Light	Available (probe light ±1ch)
Output Power	0 to +13 dBm
PW	3, 10, 30, 60, 100 μs
Dynamic Range	>18 dB typ. (standard value >17 dB) ((PW = 10 μs, Ps = –57 dBm, ASE –20 dBm/nm, 25°C)
Dead Zone	0.5 km
Distance Range	100 km, 500 to 2000 km （500 km step） 12,500 to 20,000 km (option)
Distance Accuracy	±10 m ±0.5 x 10^{-6} x measurement value (m)
Average	2^8 to 24
Display	8.4” touch screen (XGA (1024 x 768))
Size, Weight	320(W) x 177(H) x 451(D) mm, ≤10 kg
Warm-up Time	2 minutes
Operation System	Windows 10 IoT Enterprise LTSC 2019
User Interface	USB 2.0 x 3, HDMI x 1, 10/100/1000M Ethernet x 1
Internal Memory	350 GB

Ordering Information

Order No.	Name
	- Main Unit -
MW90010B	Coherent OTDR
	- Standard Accessories -
	Power Cord
B0329G	Front cover
Z2167A	Operation Manual(CD-ROM)
	- Standard Connectors*1 -
MW90010B-037	FC Connector
MW90010B-040	SC Connector
	- Software Option -
MW90010B-003	Extended Measurement Distance

Order No.	Name
	- Optional Accessories -
NETWORKS	Emulation Software (Version 4.1 or newer)
B0335C	Carrying Case
J0617B	Replaceable Optical Connector (FC-PC)
J1411A	Replaceable Optical Connector (SC)
J0057	Optical Adapter FC type
J0635□	Optical Fiber Cord with FC-PC at both ends (SM, with FC-PC at both ends)
J0952A	FC・PC-FC・APC(SG)-1M-SM
Z0914A	Ferrule Cleaner
Z0915A	Replacement Reel for Ferrule Cleaner (6 pcs/set)
Z0284	Adapter Cleaner (Stick type, 200 pcs/set)
Z0397A	FC Adapter Cap
Z0413A	SC Adapter Cap

*1: Please specify either connector at the time of purchase.

I&M Solution of Submarine cable

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Anritsu extends its line of I&M products for submarine cables.

Dry Plant

OTDR

- ✓ Up to 46 dB DR
- ✓ Short dead zone

Ethernet Tester

- ✓ 100/200/400 GbE testing
- ✓ FEC margin analysis

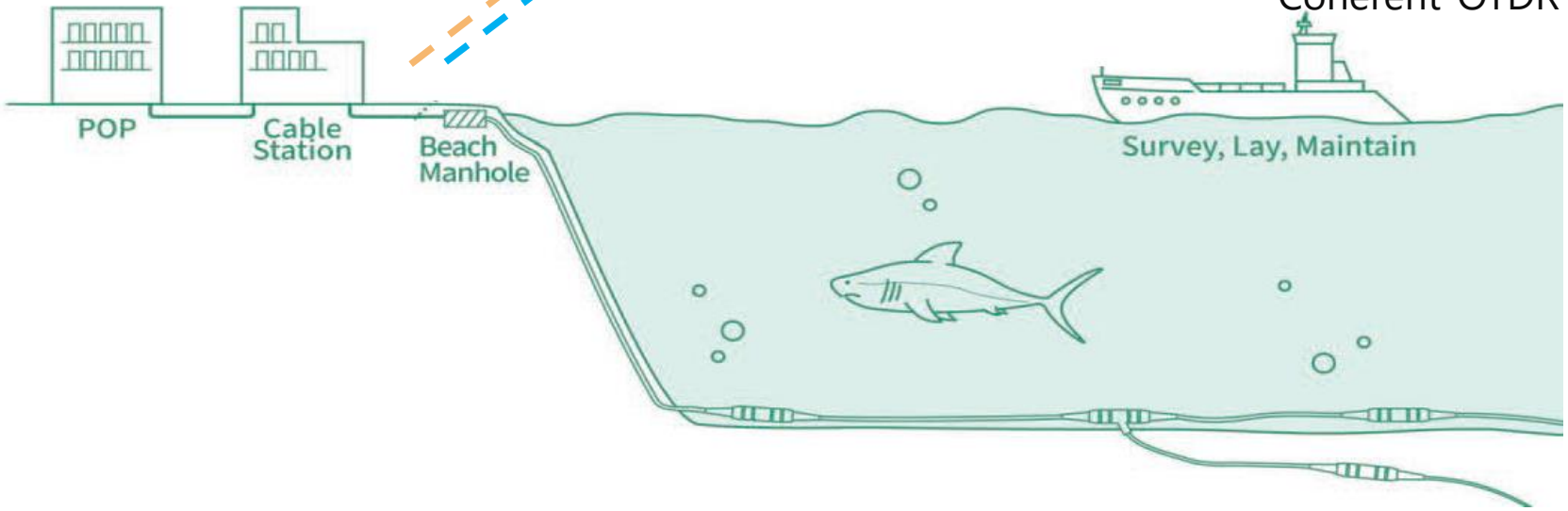
Wet Plant

- ✓ High accurate OSNR measurement
- ✓ Fast sweep
- ✓ High resolution

Optical Spectrum Analyzer

- ✓ Distance Range: Max 20,000 km
- ✓ Wavelength Range: 1527.60 - 1567.13nm,
- ✓ Dynamic Range: 18 dB (typ.)

Coherent-OTDR



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