

# A truly revolutionary OTDR

MT9090A/MU909014x/15x  
μOTDR Module™

# Anritsu



fiberVisualizer

## A truly revolutionary OTDR

### MT9090A/MU909014x/15x $\mu$ OTDR Module™ Product Introduction

Version 5.00

December 2014

Anritsu Corporation

# Introducing the MT9090A with MU909014x/15x $\mu$ OTDR Module™

**A truly revolutionary OTDR**

**Pocket-sized  
Easy Operation  
Excellent OTDR Performance  
Unique Battery Operation  
Low Cost**



Slide 2

MU909014x/15x-E-L-3

**Anritsu**

# MT9090A $\mu$ OTDR Module™ All in one

## All required fiber tests in a single $\mu$ OTDR!

New  $\mu$ OTDR is available to test optical fiber by seven functions

- OTDR
- Loss Test Set (LTS)
- Video Inspection Probe (VIP)
- Light Source (LS)
- PON Power Meter (PON-PM)
- Visible Laser Diode (VLD)
- Optical Power Meter (OPM)



# MT9090A $\mu$ OTDR Module™ Pocket Size OTDR **FOR HIGHLY PORTABLE FIELD USE**

- **Easily held with one hand**
  - » Palm-size (190mm x 96mm x 48mm)
  - » Approximately 700g
- **Battery operation**
  - » Max. 8 hours operation (with STD Battery pack)
  - » 4 hour recharge (with STD Battery pack)
  - » NiMH battery pack or “AA Alkaline Dry Battery” operation
- **Rugged design**
  - » Sealed design – no vents or fans
  - » Wrist strap to prevent “accidental” drops
- **Color indoor/outdoor display standard**
  - » 4.3” high resolution
  - » Landscape format naturally fits OTDR trace



**THE FOOLPROOF testing device**

- **Easy to use**

- » True one-button fault location
- » Automatic testing parameters selection in Full-automatic mode
- » Quick fiber evaluation
- » Event analysis table and full Trace view



Truly  
Easy!!

- **Quick boot-up**

- » Ready to test in <15 seconds



# Easy Operation(2/5)

## MT9090A $\mu$ OTDR Module™

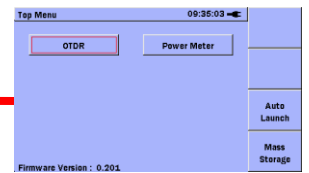
**Simple,  
One-button  
Operation**

Push **Menu** to Turn on power

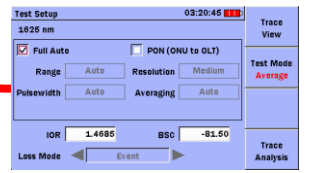
**Self Test**  
During start-up, Showing self test result.



Automatically moves to OTDR Menu from Top menu  
Can be bypassed

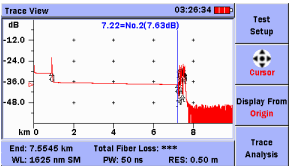


User selectable test parameters  
(or select full automode)



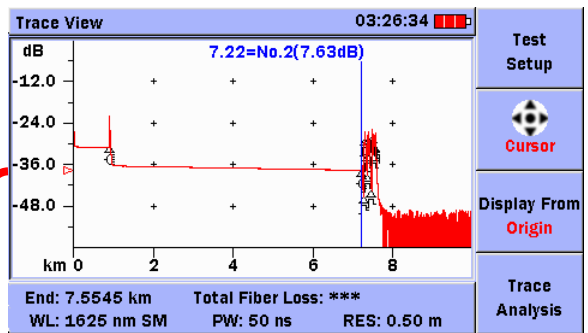
Push **Start** to start test

Automatically checks fiber connection,  
proceeds if the result is good  
(With Poor or Fair result check connection or start test manually)



During testing,  
Trace (waveform) is displayed

Finish the measurement,  
and displayed Trace analysis (Event table)



If you want to show trace then;  
- Select F4 key  
Or  
- Select an event and select Autozoom

Trace Analysis				
0 km		7.5545 km		
Total Events Found	12			
End/Fault Distance	7.5545 km			
Total Fiber Loss	***			
Cable Loss	***			
No.	Distance (km)	Type	Loss (dB)	RefL. (dB)
1	0.9030	↖	5.39	-48.4
2	7.2195	↖	7.63	-65.0
3	7.2845	↘	***	-29.6

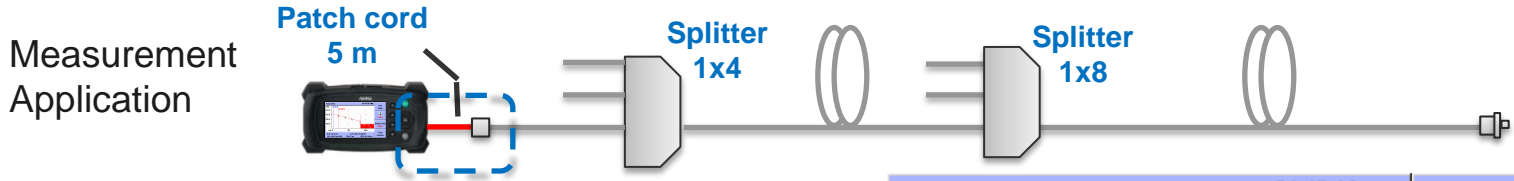






# Fiber Visualizer Mode Enhancement PON Analysis **New!**

Fiber Visualizer



**Test in Progress**

WL: 1310 nm SM | Events: \*\*

Distance Range: 25 km | Pulse Width: 5 ns

Small Pulse....

**Test in Progress**

WL: 1310 nm SM | Events: 5

Distance Range: 25 km | Pulse Width: 20 ns

Middle Pulse....

**Test in Progress**

WL: 1310 nm SM | Events: 6 | End: \*\*\* km

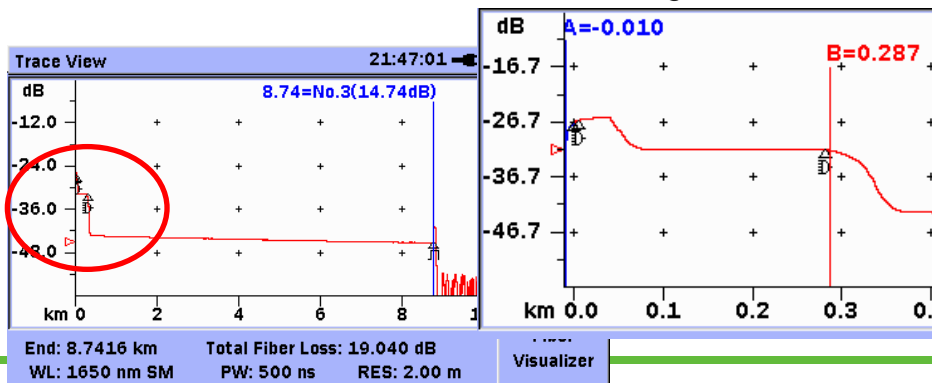
Distance Range: 25 km | Pulse Width: 50 ns

Large Pulse....

**Stable Event Detection**

WL: 1650 nm SM | Events: 3 | End: 8.7416 km

No.	Distance(km)	Loss(dB)	Ref.(dB)	Cum.Loss(dB)
1	0.0044	5.170	***	0.555



Possible to detect short fiber (5 m) and loss analysis on PON application.

# DCFL Mode

The DCFL (Drop Cable Fault Locate) mode is a useful function to investigate faults occurring in a drop cable. It consists of the Power Meter function and OTDR function, so you are not required to switch measuring instruments or applications.

**Step1: Power Meter Measurement**

**Step2: Fault Locate Measurement**

No.	Distance (km)	Type	Loss (dB)	RefL. (dB)
1	0.4972	┘	END	-18.316S

# MT9090A $\mu$ OTDR Module™ Excellent Performance(1/4)

## Testing Optical Fiber Anywhere in the Network

### • Excellent OTDR Performance

#### » Tests all fibers

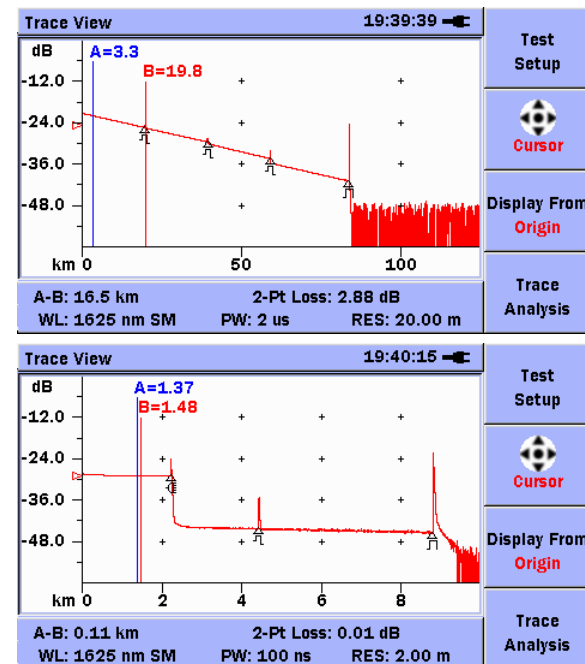
- A Core To Access Network I&M testing tool

#### » High Dynamic range, Quick fiber evaluation

- 31 – 38 dB Dynamic range
- High number of sampling points

#### » Complete PON testing tool

- High resolution and extremely short dead zones ensure entire PON (1x32, 1x64 branches) network evaluation
- Available in both In-Service test and Out-Service test configurations
- 1625 nm or 1650 nm wavelengths for in-service maintenance of PONs without external filters



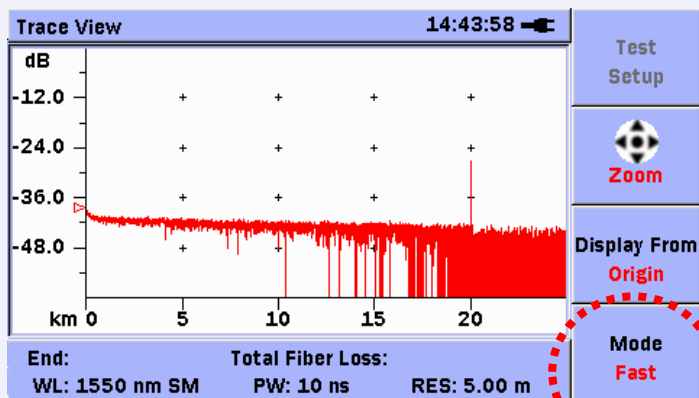
# MT9090A $\mu$ OTDR Module™ Excellent Performance(2/4)

## Testing Optical Fiber Anywhere in the Network

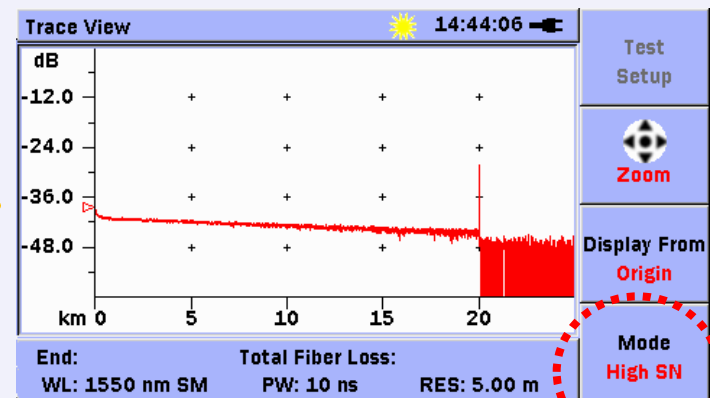
### • Excellent OTDR Performance

» User selectable Real time sweep mode

- Select “Fast” for quick screen updates
- Select “High SN” for “Low Noise” traces while in real time



Use High SN mode to reduce the trace noise for Real time measurements

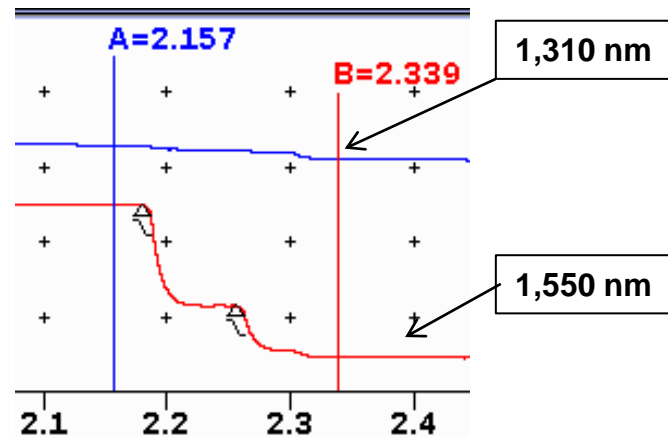
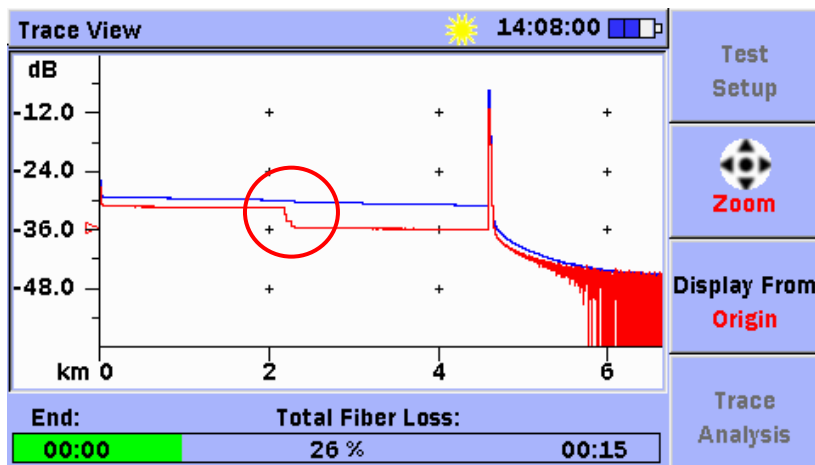


# MT9090A $\mu$ OTDR Module™ Excellent Performance(3/4)

## Testing Optical Fiber Anywhere in the Network

### • Excellent OTDR Performance

#### » Macro Bend Analysis

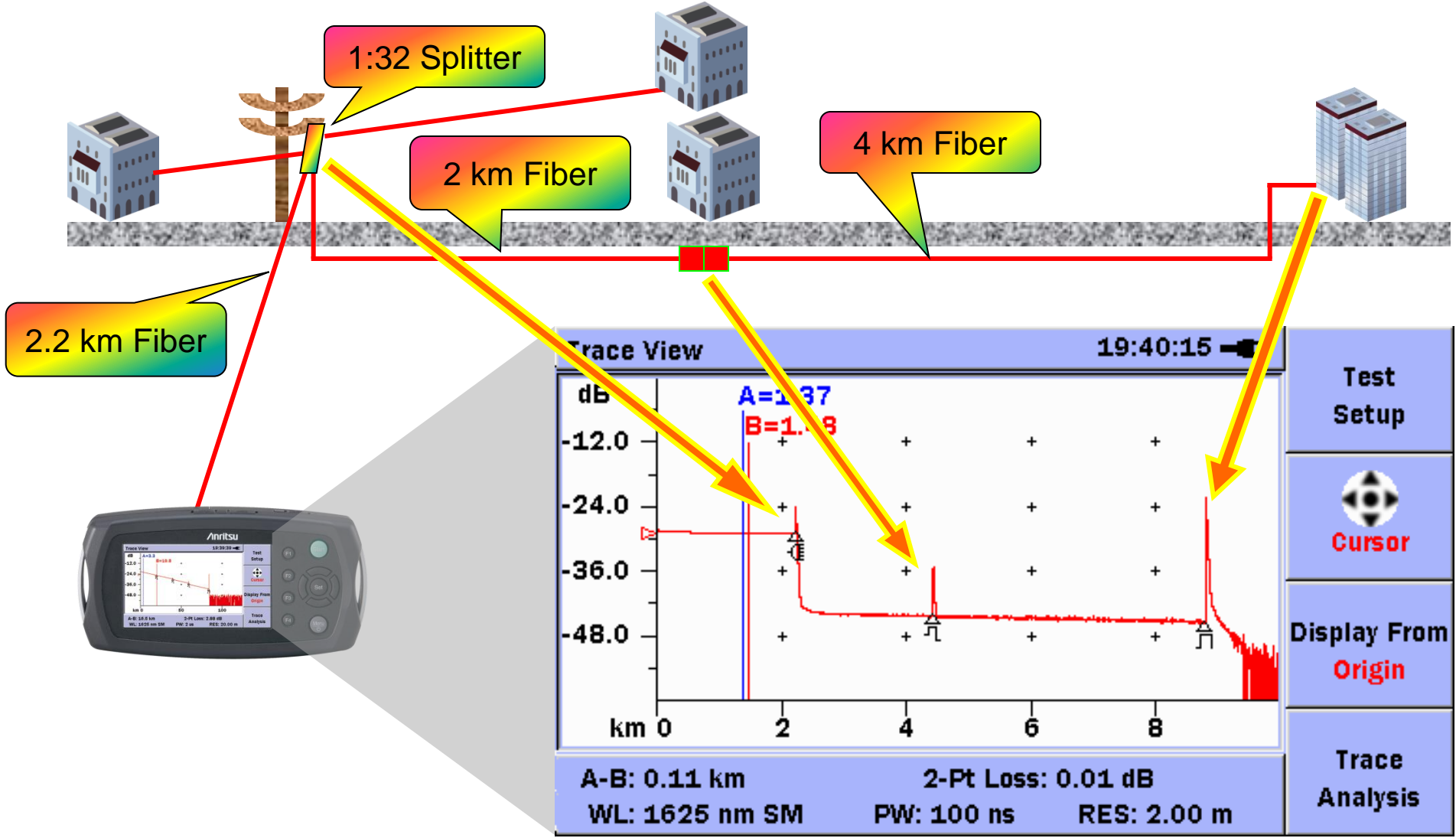


While there is no loss with the 1,310 nm waveform, there are two loss points with the 1,550 nm waveform. From these two waveforms, we are able to determine that there are two bend loss events.

\*This function is not included in a single-wavelength model.

# MT9090A $\mu$ OTDR Module™ Excellent Performance(4/4)

Complete PON Measurement for both In-service & Out-of-service Testing

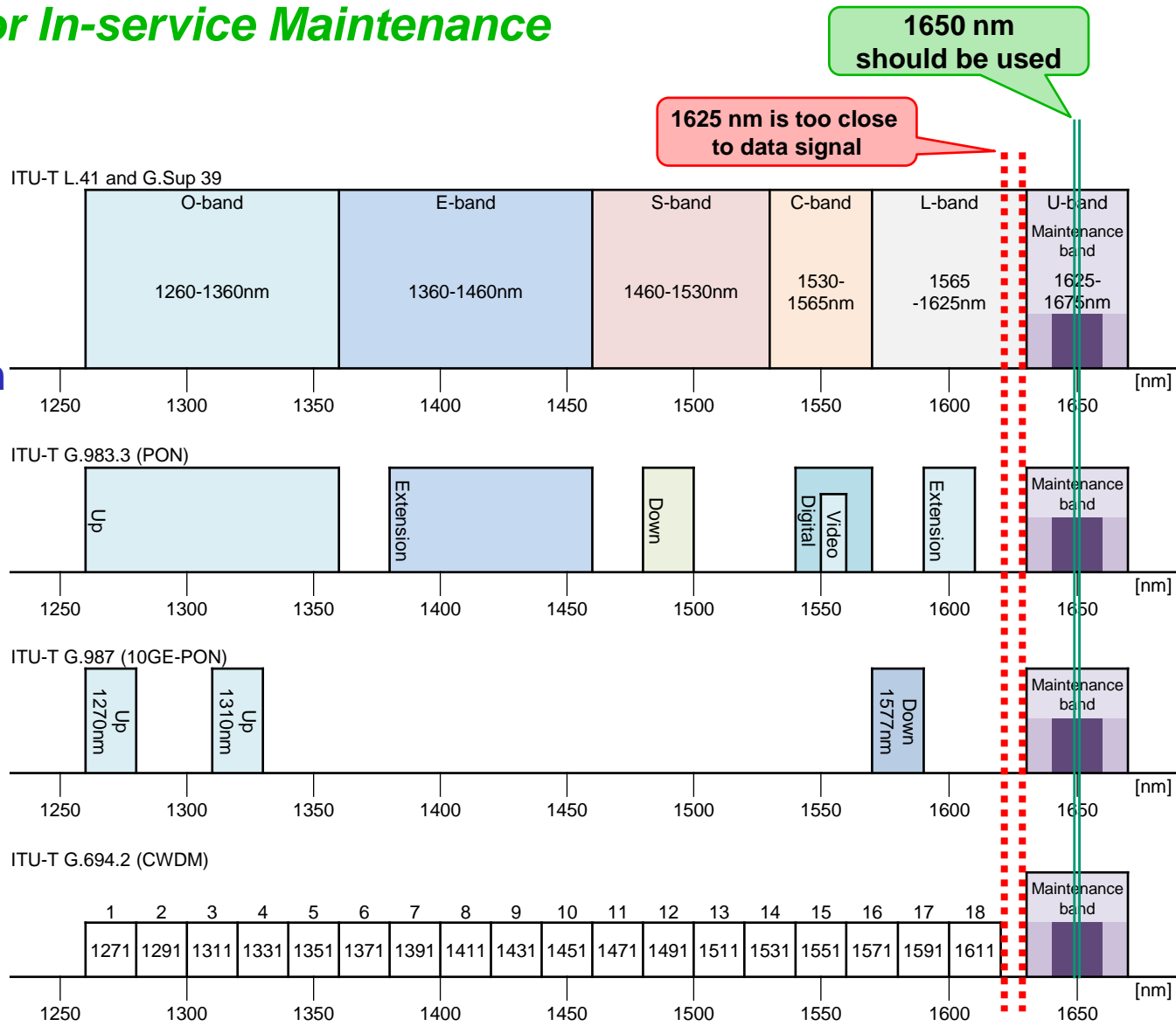


# MT9090A $\mu$ OTDR Module™ Complete test tool for In-service(1/3)

## Complete Test tool for In-service Maintenance

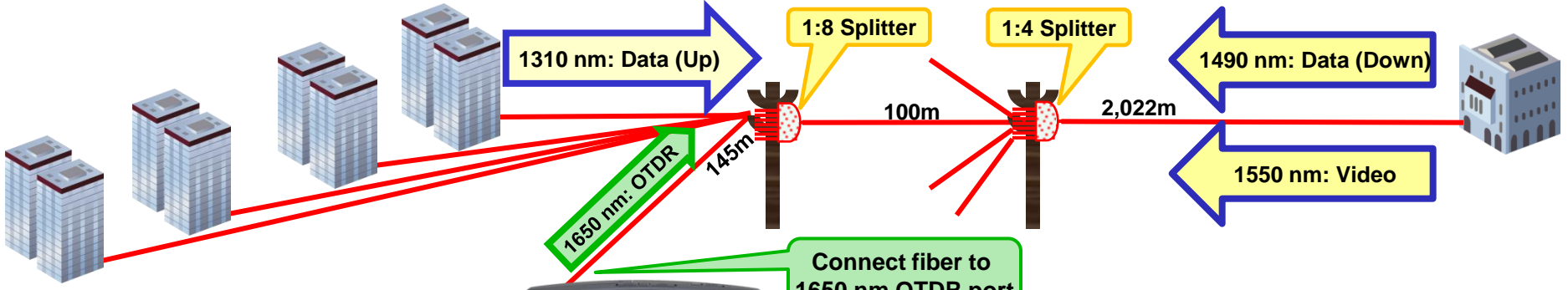
According to ITU-T recommendation, L.41 and L.66 states that a maintenance wavelength of **1650 nm** should be used for testing the Access network.

- Benefits:**
- Avoid cross-talk
  - Filter (FBG) characteristics
  - Fiber loss wavelength dependency



# MT9090A $\mu$ OTDR Module™ Complete test tool for In-service(2/3)

## Complete Test tool for In-service (PON Installation)



**1. PON PM to check 1490/1550nm Power**

PON Power Meter 20:50:14

1490 nm  
**PASS** -24.25 dBm  
Threshold: -26.00 dBm Reference: -24.23 dBm

1550 nm  
**PASS** -6.85 dBm  
Threshold: -7.00 dBm Reference: -6.85 dBm

Input

Threshold Setup  
Reference  
dB/dBm  
dBm  
Set Zero



**2. 1650nm, in-service OTDR to check fiber condition from OLT**

Trace Analysis 10:39:35

0 km 2.2768 km

Total Events Found 3  
End/Fault Distance 2.2768 km  
Total Fiber Loss 17.901 dB  
Cable Loss 7.865 dB/km

No.	Distance (km)	Type	Loss (dB)	RefL. (dB)
1	0.1450	↖	10.163	****
2	0.2554	↖	6.850	****
3	2.2768	END	-17.710	

Trace View 10:36:20

dB

No.3(12.82dB)=2.28

km 0 1 2 3 4

End: 2.2768 km Total Fiber Loss: 17.901 dB  
WL: 1650 nm SM PW: 200 ns RES: 1.00 m

Test Setup  
Analysis Setup  
Thresholds Setup  
Trace View  
Test Setup  
Zoom  
Display From Origin  
Trace Analysis

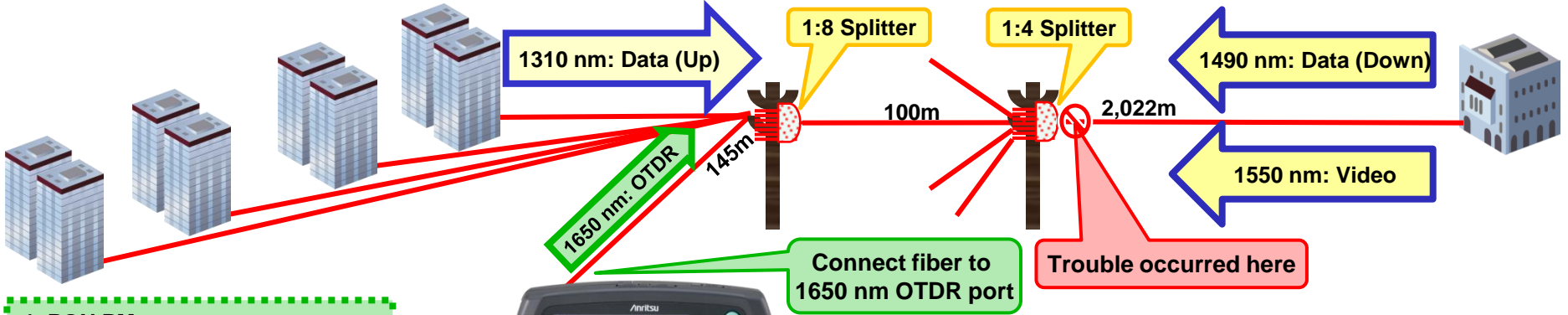
For the installation of drop fiber, PON-PM (PON Power Meter) function and 1650 nm OTDR function are useful.

1. Connect fiber to  $\mu$ OTDR (1650 nm OTDR port) and check the downstream Power of each Wavelength simultaneously
2. Perform the OTDR test, without connection change



# MT9090A $\mu$ OTDR Module™ Complete test tool for In-service(3/3)

## Complete Test tool for In-service (PON Maintenance)



**1. PON PM to check 1490/1550nm Power**

PON Power Meter		10:34:18	Threshold Setup
1490 nm	<b>FAIL</b>	-39.36 dBm	Reference
Threshold: -26.00 dBm		Reference: -24.23 dBm	
1550 nm	<b>FAIL</b>	-20.12 dBm	dB/dBm
Threshold: -10.00 dBm		Reference: -6.85 dBm	dBm
Set Zero			

Power level too low at both wavelengths

Cause of the loss



**2. 1650nm, in-service OTDR to check fiber condition from OLT**

Trace Analysis		10:48:00	Test Setup	
0 km		0.2717 km	Analysis Setup	
Total Events Found: 2			Thresholds Setup	
End/Fault Distance: 0.2717 km			Trace View	
Total Fiber Loss: 10.304 dB				
Cable Loss: 38.022 dB/km				
No.	Distance (km)	Type	Loss (dB)	Ref. (dB)
1	0.1542	IE	10.161	****
2	0.2717	JT	END	-36.706

Trace View 10:48:19

No.2(11.33dB)=0.27

dB

-12.0

-24.0

-36.0

-48.0

km 0 1 2 3 4

End: 0.2717 km Total Fiber Loss: 10.304 dB

WL: 1650 nm SM PW: 200 ns RES: 1.00 m

For the maintenance phase, there are very useful PON-PM (PON Power Meter) function and 1650 nm OTDR functions.

1. Connect fiber to  $\mu$ OTDR (1650 nm OTDR port) and check the down stream Power of each Wavelength simultaneously
2. Perform the OTDR test (without connection change) and easily locate fault

# MT9090A $\mu$ OTDR Module™ Unique Battery Operation

## *Dual battery support*

- **Long battery life**

- 8 hours typical (Telcordia GR-196-CORE Issue 2, September 2010) / 4 hour recharge with Standard NiMH Battery pack (Supplied with the original unit),

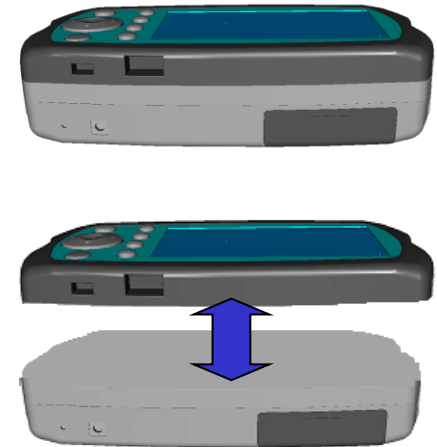
- **General Dry Battery operation available**

- General NiMH (readily available) operation is available
- Alkaline battery (“AA”) operation is also available



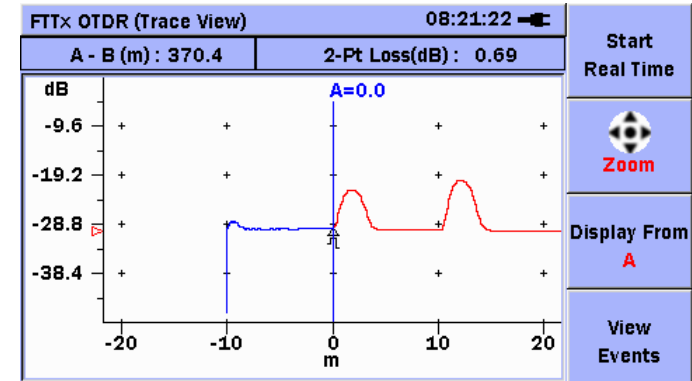
# MT9090A $\mu$ OTDR Module™ Low cost **VALUE...without compromise!**

- **Cost-effective installation and maintenance tool**
  - » Modular platform ensures maximum return on investment
  - » Simple module swap for testing additional technologies
    - 10/100/1000MB Ethernet
    - CWDM channel analyzer
    - In-service OTDR maintenance



MT9090A  $\mu$ OTDR Module™**Additional Highlights****• Built-in 10 m (30 ft) launch fiber**

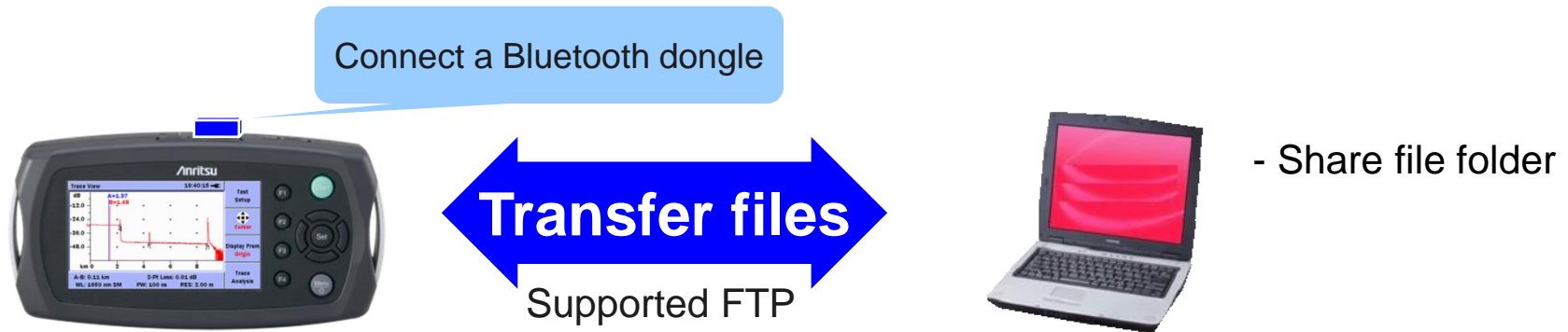
- » Measure front-end connection without additional patchcords
- » Can be enabled or disabled

**• Complete data management**

- » ~1,000 traces internal/10,000+ with USB
- » Easy “drag and drop” transfers to PC
- » Reporting and printing with “NETWORKS” PC software

# MT9090A $\mu$ OTDR Module™

## Network Connectivity(1/2)



The Bluetooth feature enables you to share files between the  $\mu$ OTDR system and a computer (or other Bluetooth-enabled device).

- The Bluetooth wordmark and logos are owned by the *Bluetooth* SIG, Inc. and any use of such marks by Anritsu is under license.

### Notes:

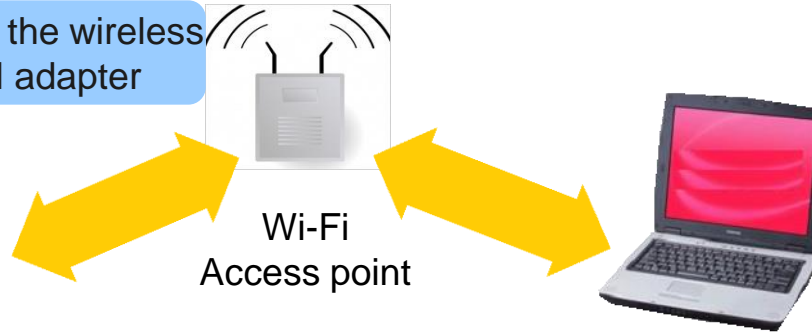
- For details of the target network Bluetooth settings, refer to the operation manual or website for the device to be used.
- FTP profile is required when sharing folders via Bluetooth. The Windows standard driver does not support USB Bluetooth dongles, so use the utility software and driver that com with your USB Bluetooth dongle.

MT9090A  $\mu$ OTDR Module™

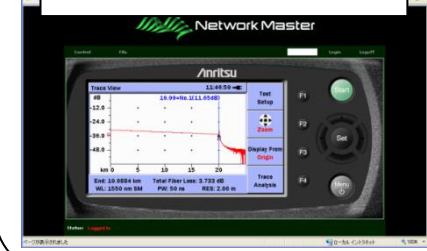
## Network Connectivity(2/2)

## Wi-Fi

Connect the wireless LAN adapter

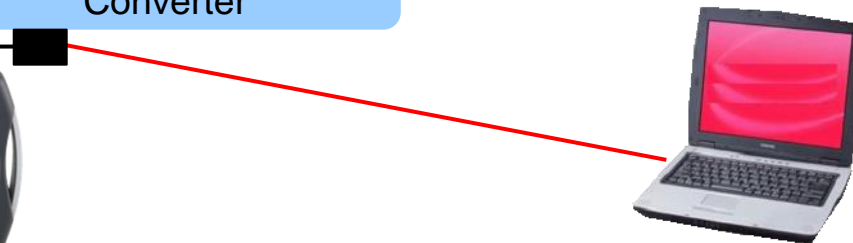


- Remote GUI
- Share file folder

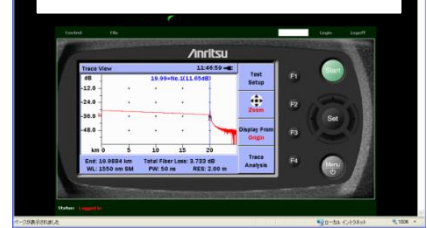


## Ethernet

Connect the USB Ethernet Converter



- Remote GUI
- Share file folder



The Wi-Fi and Ethernet features enable you to share files as well as use the remote GUI feature. You can connect the  $\mu$ OTDR and computer, and control the  $\mu$ OTDR from a browser that supports Adobe Flash Player (e.g. IE). Following pages are screen captures illustrating control of the  $\mu$ OTDR using the remote GUI, and sharing files.

## Password Protection Feature

When you use this feature, users will be required to enter a password as soon as the system boots. Users will not be able to use the system until the password is authenticated.

This feature is useful if you want to limit the use of your measuring instruments to designated users, or you want to protect important files on the system's on-internal memory.

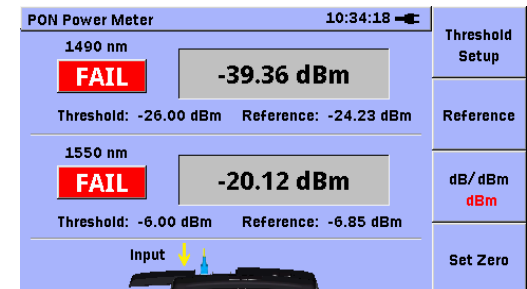
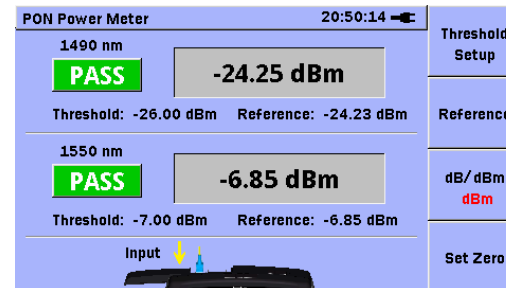
The screenshot shows the 'Setup' menu of the MT9090A  $\mu$ OTDR Module. The menu is divided into 'Basic' and 'Advanced' tabs, with 'Advanced' selected. The 'General' tab is also visible on the right. The 'Use Login Password' option is set to 'ON' and is highlighted with a red box. The 'Login Password' field contains '\*\*\*\*\*'. The 'Remote Control Password' field also contains '\*\*\*\*\*'. The 'Screen Capture Format' is set to 'PNG'. At the bottom, there are buttons for 'Apply', 'Cancel', and 'Defaults'. The time '14:18:22' and a battery icon are shown in the top right corner of the menu.

Setup	14:18:22	
Basic	Advanced	General
Screen Capture Format	PNG	
Use Login Password	ON	
Login Password	*****	
Remote Control Password	*****	
Apply	Cancel	Defaults

MT9090A  $\mu$ OTDR Module™

## Option Features(1/5)

- **PON Power Meter (PON-PM) Option (A6/C6 Model)**
  - » Same port as 1625/1650 nm OTDR
  - Not required to change the connection between OTDR and PON-PM functions
  - » Simultaneously isolate, test and display 1490/1550 nm downstream signal powers
  - » User defined thresholds showing “Pass/Fail” condition

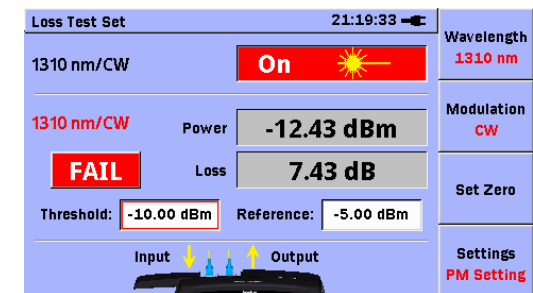
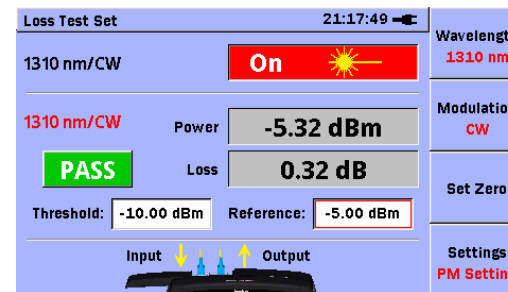




# MT9090A $\mu$ OTDR Module™

## Option Features(2/5)

- **LTS option (C6 Model)**
  - » Selectable wavelength from available OTDR test wavelengths
  - » Selectable modulation (CW, 270 Hz, 1 kHz, 2 kHz) both LS (Light Source) and PM (Power Meter)
  - » User defined thresholds showing “Pass/Fail” condition of insertion losses and absolute powers

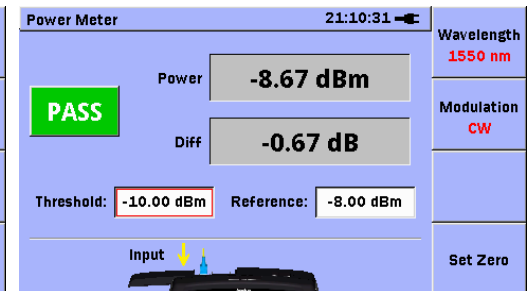
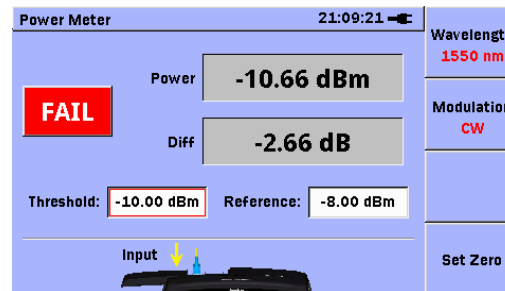
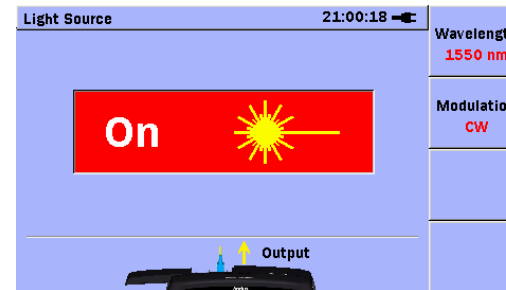


# MT9090A $\mu$ OTDR Module™

## Option Features(3/5)



- **LS Option (A6/C6 Model)**
  - » Selectable wavelength from available OTDR test wavelengths
  - » Selectable modulation (CW, 270 Hz, 1 kHz, 2 kHz)
- **PM option (A6/B/B1/C/C6 Model)**
  - » Selectable wavelength (1310/1490/1550 nm)
  - » Selectable modulation (CW, 270 Hz, 1 kHz, 2 kHz) (A6/C/C6 Model)
  - » User defined thresholds showing “Pass/Fail” condition of insertion losses and absolute powers (A6/C/C6 Model)



# MT9090A $\mu$ OTDR Module™

## Option Features(4/5)

- **Visual Laser Diode (VLD, Visible Fault Locator) Option (A1/B1 Model)**

- » Integrated 650 nm laser
- » Can also be used to identify a particular fiber
- » Can be used simultaneously with power meter or OTDR



- **Video Inspection Probe (VIP, Connector inspection) option**

- » 400x image displayed
- » Pass/Fail Analysis
- » All software pre-loaded
- » Eye-safe
- » Image save/recall
- » Hardware includes probe/tips



# MT9090A $\mu$ OTDR Module™

## Option Features(5/5)

VIP 15:59:16

Core PASS

Cladding FAIL

Adhesive PASS

Contact FAIL

FAIL

Save

View Result Table

Overlays ON

Press Start for Live Image

When analysis completes, the following information appears:

- Core
- Cladding
- Adhesive
- Contact

As well as a pass/fail determination for the total area for each.

VIP 16:02:20

Zone Name	Diameter ( $\mu$ )	Result
1 Core	25	PASS
2 Cladding	120	PASS
3 Adhesive	130	PASS
4 Contact	250	PASS

Defects	Count	Area ( $\mu^2$ )	Scratches	Count
1 PASS	0	0.00	PASS	0
2 PASS	0	0.00	PASS	0
3 PASS	0	0.00	PASS	0
4 PASS	0	0.00	PASS	0

PASS

Press Start for Live Image

From the Table View, you can identify “defects” or “scratches” on the end of the fiber.

The automatic pass/fail determination is made in accordance with the IEC61300-3-35 standard.

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VIP Test Result

Date: Model: Title: Operator:

Test Method: Test Standard: Test Result: Pass/Fail/Not Test:

Test Result: PASS

Zone Name	Diameter ( $\mu$ )	Defects	Count	Area ( $\mu^2$ )	Scratches	Count
Core	25	PASS	0	0.00	PASS	0
Cladding	120	PASS	0	0.00	PASS	0
Adhesive	130	PASS	0	0.00	PASS	0
Contact	250	PASS	0	0.00	PASS	0

Pass/Fail: PASS

Capture Time: 2016/02/10 13:25:14

Output PDF Report

You can also create a PDF report on the system.

MT9090A  $\mu$ OTDR Module™

## Specifications(1/4)

MT9090A Mainframe	
Dimensions and Mass	190 (W) x 96 (H) x 48 (D) mm (7.5" x 3.8" x 1.9") (including mainframe and module) <700 g (1.54 lbs.)(including mainframe, module and Standard battery)
Display	4.3-inch TFT Color LCD (480 x 272 pixels, transmissive)
Interface	USB 1.1, Type A x 1 (memory), Type B x 1 (USB mass storage)
$\mu$ OTDR Module™ Common (MU909014C/C6, MU909015C/C6, MU909014A1/B/B1 and MU909015B/B1, MU909015A6)	
Fiber Type	10 $\mu$ m/125 $\mu$ m SMF (ITU-T G.652)
Distance Range	0.5, 1, 2.5, 5, 10, 25, 50, 75, 125, 250 km (IOR=1.500000)
Pulse Width	5, 10, 20, 50, 100, 200, 500ns, 1, 2, 5, 10, 20 $\mu$ s
Linearity	Which ever is greater $\pm 0.05$ dB/dB or $\pm 0.1$ dB
Return Loss Measurement Acc	14.8 $\pm$ 2 dB
Distance Measurement Acc	$\pm 1$ m $\pm 3$ x Measurement distance x $10^{-5}$ $\pm$ Marker resolution (excluding IOR uncertainty)
Data Storage	Internal memory 40 MB (<1,000 traces) External (USB Memory): 1GB (<30,000 traces)
IOR Setting	1.3000 to 1.7000 (0.0001 steps)
Units	Km, m, kft, ft, mi
Other Functions	Integrated launch fiber: 10m (30ft) Connection Check: Automatic check of OTDR to FUT connection quality Live fiber detect: Verifies presence of communication light in fiber Real time sweep: <1 sec (typ.)
Language	User Selectable (English, Simplified Chinese, Traditional Chinese, Korean, Japanese, French, German, Italian, Spanish, Polish, Portuguese, Finnish, Danish, Swedish, Spanish (Latin America), Russian and Dutch)
Power Supply	9V (dc), 100 V (ac) to 240 V (ac), Allowable Input voltage range: 90 V (ac) to 264 V (ac), 50 Hz/60 Hz
Fiber Event Analysis	Automatic, Displayed in table format based on user defined PASS/FAIL thresholds
Loss Measurement Modes	2 point loss, Splice loss, dB/km Loss LSA, ORL, Event
OTDR Trace Format	Telcordia universal (.SOR) issue 2 (SR-4731)
Battery	NiMH (Standard battery), NiMH (AA Type), Alkaline Dry Battery (AA Type) Operating time (Standard battery): 8 hours (typ., Telcordia GR-196-CORE Issue 2, September 2010) Recharging time: <4 hours (typ.)
Environment	Vibration: MIL-T-28800E Class 3, Dust and Drip proof: IP51
EMC	EN61326-1, EN61000-3-2

MT9090A  $\mu$ OTDR Module™

## Specifications(2/4)

MU909014C/C6 and MU909015C/C6 $\mu$ OTDR Module™						
Model Name		MU909015C/C6-057 MU909015C/C6-067	MU909015C/C6-058 MU909015C/C6-068	MU909015C/C6-059 MU909015C/C6-069	MU909014C/C6-057 MU909014C/C6-067	MU909014C/C6-058 MU909014C/C6-068
Center Wavelength		1310/1550 $\pm$ 20 nm 1625nm $\pm$ 15nm	1310/1550 $\pm$ 20 nm 1650nm $\pm$ 15nm	1310/1490/1550 $\pm$ 20 nm	1310/1550 $\pm$ 20 nm 1625nm $\pm$ 15nm	1310/1550 $\pm$ 20 nm 1650nm $\pm$ 15nm
Dynamic Range	PW=20 $\mu$ sec	38dB/37dB/35dB	38dB/37dB/35dB	36dB/35dB/35dB	32.5dB/31dB/32.5dB	32.5dB/31 B/32.5dB
	PW=500nsec	27dB/26dB/25dB	27dB/26dB/24dB	25dB/24dB/24dB	24.5dB/23dB/24dB	24.5 B/23dB/24dB
Dead Zone (IOR=1.500000)	Fresnel: $\leq$ 0.8 m (Typical), Backscatter: $\leq$ 4.0 m (1310 nm, Typical), $\leq$ 4.5 m (1490/1550/ 1625/ 1650 nm, Typical)					
Number of Sampling Points	<250,001 pts (Course: <7,501 pts, Medium: <20,001 pts, Fine: <250,001 pts)					
Sampling Resolution	2 cm (min.)					
Environment	Operating temperature and humidity: -10 to +50°C, <95 % (no condensation)					

MU909014A1/B/B1 and MU909015B/B1 $\mu$ OTDR Module™					
Model Name		MU909015B/B1-056 MU909015B/B1-066	MU909014B/B1-056 MU909014B/B1-066	MU909014A1-053 MU909014A1-063	MU909014A1-054 MU909014A1-064
Center Wavelength		1310/1550 $\pm$ 20 nm	1310/1550 $\pm$ 20 nm	1625 $\pm$ 15 nm	1650 $\pm$ 15 nm
Dynamic Range	PW=20 $\mu$ sec	37 dB/36 dB	32.5 dB/31 dB	32.5 dB	32.5 dB
	PW=500nsec	28 dB/26 dB	24.5 dB/23 dB	24.5 dB	24 dB
Dead Zone	Fresnel: $\leq$ 1 m, Backscatter: $\leq$ 5 m				
Number of Sampling Points	<125,001 pts (Course: <6,251 pts, Medium: <25,001 pts, Fine: <125,001 pts)				
Sampling Resolution	5 cm (min.)				
Environment	Operating temperature and humidity: -5 to +40°C, <80 % (no condensation)				

MU909015A6 $\mu$ OTDR Module™			
Model Name		MU909015A6-053 MU909015A6-063	MU909015A6-054 MU909015A6-064
Center Wavelength		1625nm $\pm$ 15nm	1650nm $\pm$ 15nm
Dynamic Range	PW=20 $\mu$ sec	35 dB	35 dB
	PW=500nsec	25 dB	24 dB
Dead Zone (IOR=1.500000)	Fresnel: $\leq$ 0.8 m (Typical), Backscatter: $\leq$ 4.5 m (Typical)		
Number of Sampling Points	<250,001 pts (Course: <7,501 pts, Medium: <20,001 pts, Fine: <250,001 pts)		
Sampling Resolution	2 cm (min.)		
Environment	Operating temperature and humidity: -10 to +50°C, <95 % (no condensation)		

MT9090A  $\mu$ OTDR Module™

## Specifications(3/4)

Power Meter			
Models	MU909015C6/14C6, MU909015A6	MU909015C/14C	MU909015B/B1, MU909014B/B1
Wavelength	1310/1490/1550/1625/1650 nm	1310/1490/1550 nm	1310/1490/1550/1625/1650 nm
Fiber Type	10 $\mu$ m/125 $\mu$ m SMF (ITU-T G.652)		
Measurement range	-50 to +26 dBm (CW) -40 to +13 dBm (270 Hz, 1 kHz, 2kHz)	-50 to -5 dBm (CW)	
Measurement port	Shared with OTDR port (1625 or 1650 nm OTDR port) Dedicated port (Opt.059 and 069)	Shared with OTDR port 1310/1550 nm OTDR port (Except options 059 and 069) 1310/1490/1550 nm OTDR port (Opt.059 and 069)	
Measurement Accuracy	$\pm$ 0.5 dB		
Modes of Operation	CW, 270 Hz, 1 kHz, 2kHz	CW	

Light Source (through OTDR port)	
Models	MU909015C6/14C6, MU909015A6
Wavelength	Same as OTDR
Fiber Type	10 $\mu$ m/125 $\mu$ m SMF (ITU-T G.652)
Wavelength Accuracy	1310/1550 $\pm$ 25nm (MU909015C6/14C6) 1490 $\pm$ 25nm (MU909015C6-059/15C6-069) 1625 $\pm$ 25nm (MU909015C6/14C6-057, MU909015A6-053, MU909015C6/14C6-067, MU909015A6-063) 1650 $\pm$ 25nm (MU909015C6/14C6-058, MU909015A6-054, MU909015C6/14C6-068, MU909015A6-064)
Output power	-5 $\pm$ 1.5 dBm
Output stability	$\leq$ 0.2dB
Modes of Operation	CW, 270 Hz, 1 kHz, 2 kHz
Warm-up time	10 minutes (after optical output is turned ON)

Visible Laser Diode	
Models	MU909014A1/B1/15B1
Connector	2.5 mm universal
Wavelength	650 $\pm$ 15 nm (CW, +25°C)
Output Power	0 $\pm$ 3 dBm (CW, +25°C)
Modulation	CW, 1 Hz

MT9090A  $\mu$ OTDR Module™

## Specifications(4/4)

PON Power Meter	
Models	MU909015C6/14C6, MU909015A6
Wavelength	1490/1550 nm
Fiber Type	10 $\mu$ m/125 $\mu$ m SMF (ITU-T G.652)
Measurement range	-50 dBm to +13 dBm (1490nm, CW), -50 dBm to +26 dBm (1550nm, CW)
Measurement port	Shared with OTDR port (1625 or 1650 nm) Dedicated port (Opt.059 and 069)
Measurement Accuracy	$\pm$ 0.5 dB
Isolation	1490nm: >35 dB, 1550nm: >50 dB

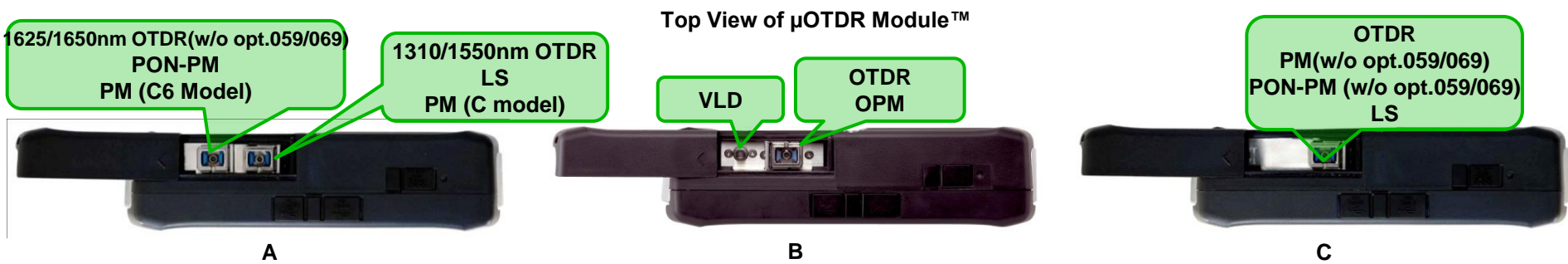
Loss Test Set	
Models	MU909015C6/14C6
Fiber Type	10 $\mu$ m/125 $\mu$ m SMF (ITU-T G.652)
Measurement port	Light Source: Shared with OTDR port (1310/1550 nm OTDR port; Except options 059 and 069) Shared with OTDR port (1310/1490/1550 nm OTDR port; Options 059 and 069)
	Power Meter: Shared with OTDR port (1625 or 1650nm OTDR port; Except options 059 and 069) Dedicated port (Options 059 and 069)
Light Source	
Wavelength	1310 $\pm$ 25 nm, 1550 $\pm$ 25 nm (Except options 059 and 069) 1310 $\pm$ 25 nm, 1490 $\pm$ 25 nm, 1550 $\pm$ 25 nm (Options 059 and 069)
Output Power	-5 $\pm$ 1.5 dBm (CW, 25°C)
Output stability	$\leq$ 0.2dB
Modes of Operation	CW, 270 Hz, 1 kHz, 2 kHz
Warm-up time	10 minutes (after optical output is turned ON)
Power Meter	
Wavelength	1310/1490/1550/1625/1650 nm
Measurement range	-50 to +26 dBm (CW)
	-40 to +13 dBm (270 Hz, 1 kHz, 2kHz)
Measurement Accuracy	$\pm$ 0.5 dB
Modes of Operation	CW, 270 Hz, 1 kHz, 2kHz



# MT9090A $\mu$ OTDR Module™

## Models and Functions Matrix

	Model No.		Wavelength	Dynamic Range	PM	PON-PM	LTS	LS	VLD	Top view
	PC type	APC type								
Installation / Maintenance Models	MU909014C-057	MU909014C-067	1310/1550/1625 nm	32.5/31/32.5 dB	√					A
	MU909014C-058	MU909014C-068	1310/1550/1650 nm	32.5/31/32.5 dB	√					A
	MU909015C-057	MU909015C-067	1310/1550/1625 nm	38/37/35 dB	√					A
	MU909015C-058	MU909015C-068	1310/1550/1650 nm	38/37/35 dB	√					A
	MU909015C-059	MU909015C-069	1310/1490/1550 nm	36/35/35 dB	√					C
	MU909014C6-057	MU909014C6-067	1310/1550/1625 nm	32.5/31/32.5 dB	√	√	√	√		A
	MU909014C6-058	MU909014C6-068	1310/1550/1650 nm	32.5/31/32.5 dB	√	√	√	√		A
	MU909015C6-057	MU909015C6-067	1310/1550/1625 nm	38/37/35 dB	√	√	√	√		A
	MU909015C6-058	MU909015C6-068	1310/1550/1650 nm	38/37/35 dB	√	√	√	√		A
	MU909015C6-059	MU909015C6-069	1310/1490/1550 nm	36/35/35 dB	√	√	√	√		A
General Purpose Models	MU909014B-056	MU909014B-066	1310/1550 nm	32.5/31 dB	√					C
	MU909014B1-056	MU909014B1-066	1310/1550 nm	32.5/31 dB	√			√		B
	MU909015B-056	MU909015B-066	1310/1550 nm	37/36 dB	√					C
	MU909015B1-056	MU909015B1-066	1310/1550 nm	37/36 dB	√			√		B
Maintenance Models	MU909014A1-053	MU909014A1-063	1625 nm	32.5 dB					√	B
	MU909014A1-054	MU909014A1-064	1650 nm	32.5 dB					√	B
	MU909015A6-053	MU909015A6-063	1625 nm	35 dB	√	√		√		C
	MU909015A6-054	MU909015A6-064	1650 nm	35 dB	√	√		√		C



MT9090A  $\mu$ OTDR Module™

## Models and Software Application Matrix

	Model No.		Wavelength	Dynamic Range	Fiber Visualizer	DCFL Mode
	PC type	APC type				
Installation / Maintenance Models	MU909014C-057	MU909014C-067	1310/1550/1625 nm	32.5/31/32.5 dB	√	
	MU909014C-058	MU909014C-068	1310/1550/1650 nm	32.5/31/32.5 dB	√	
	MU909015C-057	MU909015C-067	1310/1550/1625 nm	38/37/35 dB	√	
	MU909015C-058	MU909015C-068	1310/1550/1650 nm	38/37/35 dB	√	
	MU909015C-059	MU909015C-069	1310/1490/1550 nm	36/35/35 dB	√	
	MU909014C6-057	MU909014C6-067	1310/1550/1625 nm	32.5/31/32.5 dB	√	√
	MU909014C6-058	MU909014C6-068	1310/1550/1650 nm	32.5/31/32.5 dB	√	√
	MU909015C6-057	MU909015C6-067	1310/1550/1625 nm	38/37/35 dB	√	√
	MU909015C6-058	MU909015C6-068	1310/1550/1650 nm	38/37/35 dB	√	√
	MU909015C6-059	MU909015C6-069	1310/1490/1550 nm	36/35/35 dB	√	
General Purpose Models	MU909014B-056	MU909014B-066	1310/1550 nm	32.5/31 dB	√	
	MU909014B1-056	MU909014B1-066	1310/1550 nm	32.5/31 dB	√	
	MU909015B-056	MU909015B-066	1310/1550 nm	37/36 dB	√	
	MU909015B1-056	MU909015B1-066	1310/1550 nm	37/36 dB	√	
Maintenance Models	MU909014A1-053	MU909014A1-063	1625 nm	32.5 dB	√	
	MU909014A1-054	MU909014A1-064	1650 nm	32.5 dB	√	
	MU909015A6-053	MU909015A6-063	1625 nm	35 dB	√	√
	MU909015A6-054	MU909015A6-064	1650 nm	35 dB	√	√

# MT9090A $\mu$ OTDR Module™

## Ordering Guide

Must be ordered as separate line items

Product Number	Product Name
MT9090A	Mainframe

Product Number	Product Name
MU909014A1	$\mu$ OTDR Module
MU909014B	$\mu$ OTDR Module
MU909014B1	$\mu$ OTDR Module
MU909014C	$\mu$ OTDR Module
MU909014C6	$\mu$ OTDR Module
MU909015A6	$\mu$ OTDR Module
MU909015B	$\mu$ OTDR Module
MU909015B1	$\mu$ OTDR Module
MU909015C	$\mu$ OTDR Module
MU909015C6	$\mu$ OTDR Module

**(1) Main frame  
(if customer already owns a mainframe this item may not be required)**

Product Number	Product Name
MU909014A/B/C-025	FC-APC Connector key width 2.0mm
MU909014A/B/C-026	SC-APC Connector
MU909014A/B/C-037	FC Connector
MU909014A/B/C-039	DIN Connector
MU909014A/B/C-040	SC Conector
MU909015A/B/C-025	FC-APC Connector key width 2.0mm
MU909015A/B/C-026	SC-APC Connector
MU909015A/B/C-037	FC Connector
MU909015A/B/C-039	DIN Connector
MU909015A/B/C-040	SC Conector

**(2)  $\mu$ OTDR Module**

**(3)  $\mu$ OTDR Option**  
- Wavelength  
- Dynamic Range  
- Functions

**(4) Optical Connector type**

Product Number	Product Name	Remarks
MU909014C-057	SMF 1310/1550/1625nm $\mu$ OTDR Module (UPC)	
MU909014C-067	SMF 1310/1550/1625nm $\mu$ OTDR Module (APC)	32.5/31/32.5 dB
MU909014C-058	SMF 1310/1550/1650nm $\mu$ OTDR Module (UPC)	
MU909014C-068	SMF 1310/1550/1650nm $\mu$ OTDR Module (APC)	32.5/31/32.5 dB
MU909015C-057	SMF 1310/1550/1625nm $\mu$ OTDR Module (UPC)	
MU909015C-067	SMF 1310/1550/1625nm $\mu$ OTDR Module (APC)	38/37/35 dB
MU909015C-058	SMF 1310/1550/1650nm $\mu$ OTDR Module (UPC)	
MU909015C-068	SMF 1310/1550/1650nm $\mu$ OTDR Module (APC)	38/37/35 dB
MU909015C-059	SMF 1310/1490/1650nm $\mu$ OTDR Module (UPC)	
MU909015C-069	SMF 1310/1490/1650nm $\mu$ OTDR Module (APC)	36/35/35 dB
MU909014C6-057	SMF 1310/1550/1625nm $\mu$ OTDR Module (UPC/OPM/LS)	
MU909014C6-067	SMF 1310/1550/1625nm $\mu$ OTDR Module (APC/OPM/LS)	32.5/31/32.5 dB
MU909014C6-058	SMF 1310/1550/1650nm $\mu$ OTDR Module (UPC/OPM/LS)	
MU909014C6-068	SMF 1310/1550/1650nm $\mu$ OTDR Module (APC/OPM/LS)	32.5/31/32.5 dB
MU909015C6-057	SMF 1310/1550/1625nm $\mu$ OTDR Module (UPC/OPM/LS)	
MU909015C6-067	SMF 1310/1550/1625nm $\mu$ OTDR Module (APC/OPM/LS)	38/37/35 dB
MU909015C6-058	SMF 1310/1550/1650nm $\mu$ OTDR Module (UPC/OPM/LS)	
MU909015C6-068	SMF 1310/1550/1650nm $\mu$ OTDR Module (APC/OPM/LS)	38/37/35 dB
MU909015C6-059	SMF 1310/1490/1550nm $\mu$ OTDR Module (UPC/OPM/LS)	
MU909015C6-069	SMF 1310/1490/1550nm $\mu$ OTDR Module (APC/OPM/LS)	36/35/35 dB
MU909014B-056	SMF 1310/1550nm $\mu$ OTDR Module (UPC)	
MU909014B-066	SMF 1310/1550nm $\mu$ OTDR Module (APC)	32.5/31 dB
MU909014B1-056	SMF 1310/1550nm $\mu$ OTDR Module (UPC/VLD)	
MU909014B1-066	SMF 1310/1550nm $\mu$ OTDR Module (APC/VLD)	32.5/31 dB
MU909015B-056	SMF 1310/1550nm $\mu$ OTDR Module (UPC)	
MU909015B-066	SMF 1310/1550nm $\mu$ OTDR Module (APC)	37/36 dB
MU909015B1-056	SMF 1310/1550nm $\mu$ OTDR Module (UPC/VLD)	
MU909015B1-066	SMF 1310/1550nm $\mu$ OTDR Module (APC/VLD)	37/36 dB
MU909014A1-053	SMF 1625nm $\mu$ OTDR Module (UPC/VLD)	
MU909014A1-063	SMF 1625nm $\mu$ OTDR Module (APC/VLD)	32.5 dB
MU909014A1-054	SMF 1650nm $\mu$ OTDR Module (UPC/VLD)	
MU909014A1-064	SMF 1650nm $\mu$ OTDR Module (APC/VLD)	32.5 dB
MU909015A6-053	SMF 1310/1550/1625nm $\mu$ OTDR Module (UPC/OPM/LS)	
MU909015A6-063	SMF 1310/1550/1625nm $\mu$ OTDR Module (APC/OPM/LS)	35 dB
MU909015A6-054	SMF 1310/1550/1625nm $\mu$ OTDR Module (UPC/OPM/LS)	
MU909015A6-064	SMF 1310/1550/1625nm $\mu$ OTDR Module (APC/OPM/LS)	35 dB

# MT9090A $\mu$ OTDR Module™

## Accessories(1/2)



Mainframe with Protector



**B0663A Protector**  
The mainframe with fitted protector  
(Includes a shoulder strap)

\*Standard Accessory



**B0601B  
Standard Soft Case**  
This standard accessory  
accommodates the  
mainframe with fitted  
protector

\*Standard Accessory



**B0602A  
Deluxe Soft Case**  
Full Network Master  
operation without removal  
from the case.  
This does not  
accommodate the  
mainframe if the protector  
is fitted.



**B0600B Hard Case**  
This accommodates two mainframes  
(with or without fitted protector),  
accessories (LS or PM, backup battery,  
fiber cleaner, etc.).

# MT9090A $\mu$ OTDR Module™

## Accessories(2/2)



**G0306A**  
**Video Inspection Probe**

400x Fixed type



**OPTION-545VIP**  
**Video Inspection Probe**

Selectable 200x/400x type

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