



Quick Reference Guide

MT1000A Network Master Pro OTDR Modules

Eighth Edition



- For safety and warning information, please read this manual before attempting to use the equipment.
- Additional safety and warning information is provided within the MT1000A Network Master Pro OTDR Modules Operation Manual. Please refer to it before using the equipment.
- Keep this manual with the equipment.

Contents

Panel	1
Power	2
To Power Up	2
To Power Down	3
Forced Power Down	3
Toolbars	4
Basic Screens and Navigation	4
Standard OTDR (Optical Time Domain Reflectometer)	6
Measurement condition setup	6
Test setup	8
Measurement	11
Fiber Visualizer	12
Trace	14
FTTA (Fiber to the Antenna)	18
Construction	19
OLTS (Optical Loss Test Set)	22
File saving and loading	28
Saving the file	28
Loading the file	28
Creating the report	30
Copying a file	32

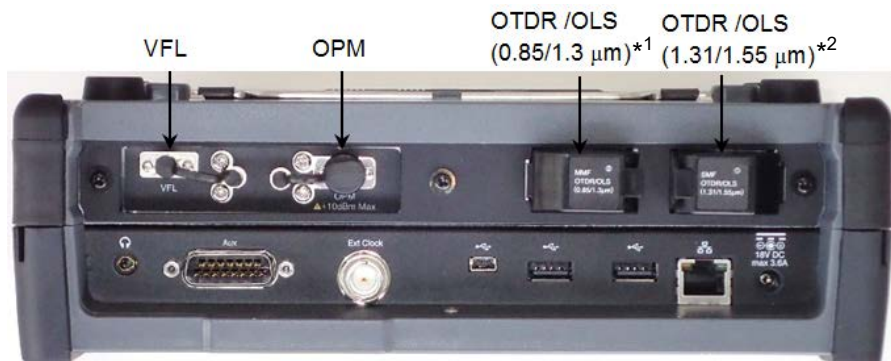
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The operational instructions of this manual may be changed without prior notice.

Panel

MU100021A panel is shown below. MU100020A and MU100022A do not have the OTDR/OLS (0.85/1.3 μm) connector.



*1: OTDR/OLS (1.65 μm) is printed on MU100023A.

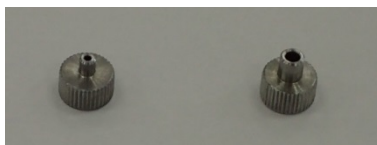
*2: OTDR/OLS (1.31/1.55/1.625 μm) is printed on MU100022A.

VFL: Visual Fault Locator (Option 002)

Visible red light is output.

OPM: Optical Power Meter

Input port for the power measurement. 1.25 mm ϕ or 2.5 mm ϕ ferrule can be connected by using the supplied Universal Connectors.



Universal Connector

OTDR/OLS: Optical Time Domain Reflectometer / Optical Light Source







Port for the OTDR measurement and light source output.

SMF (Single mode fiber) OTDR/OLS connector depends on the option:

- Option 010: UPC Connector
- Option 011: APC Connector

Power

Power button indication shows the following status.

-  Gray: Power off
-  Orange flashing (fast): Booting on AC power
-  Green flashing: Booting on battery
-  Orange flashing (slow): Charging
-  Orange: Stand by
-  Green: Operating

To Power Up

AC Operation

Connect the AC adaptor to the Network Master. The power button flashes in orange during booting and remains on after booting. Press the power button to light it up in green. After a model name is displayed, the Network Master enters Operating status and the Application Selector appears.

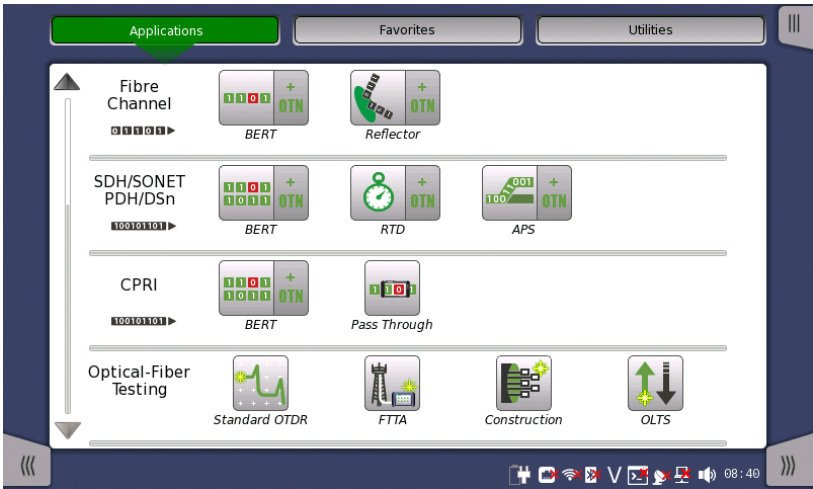


Figure 1 Application Selector

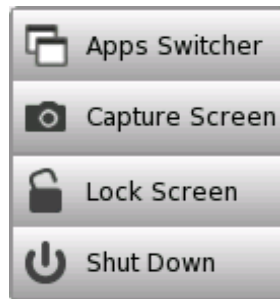
Battery Operation

Press the power button. The Network Master shows a model name and flashes the power button in green during booting.

Then, the Network Master enters Operating status and shows the Application Selector.

To Power Down

When you press the Power button, a pop-up menu containing **Shut Down** will appear.



Touch **Shut Down** and then confirm by touching **Yes** in a dialog box.

AC Operation

After you shut the Network Master down, the Network Master stays Stand by or charging state until you disconnect the AC adapter.

Battery Operation

After you shut the Network Master down, the power goes off.

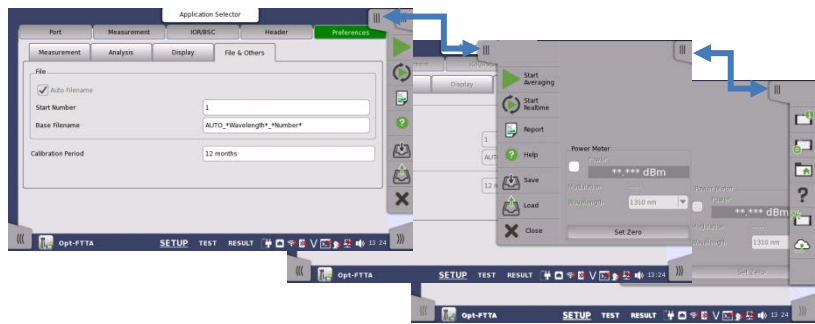
Forced Power Down

















If it is not possible to power down the Network Master using the power button menu, the following procedure can be used to make an emergency power down.

1. Disconnect AC adapter if it is connected.
2. Hold the Power button depressed for a couple of seconds.

Toolbars

General functionalities such as start/stop of test, creation of the report, displaying the help etc. are placed in expandable toolbars.



Application toolbar	Instrument toolbar
 Start Averaging	 Instrument information
 Stop the measurement	 Network setting and General settings (ex. Date, Language)
 Start Realtime* ¹	 File manager
 Skip a measurement* ²	 Displays Help
 Accept the result* ²	 Resource monitoring
 Create a report	 Cloud connection
 Displays Help	
 Save a file	
 Load a file	
 Close the application	

*1: Appears on Standard OTDR and FTTA application.

*2: Appears on Construction application.

Basic Screens and Navigation

You can navigate freely both horizontally and vertically between the various screens, as shown in the figure in next page. Set the measurement conditions on the Setup screen, and configure the test setups on the Test screen. Touching the **Start Averaging** or **Start Realtime** on the Application toolbar will display the Result screen.

Application Selector screen



Result Files Browser screen



"Navigation
area"

Setup screen



Test screen



Result screen



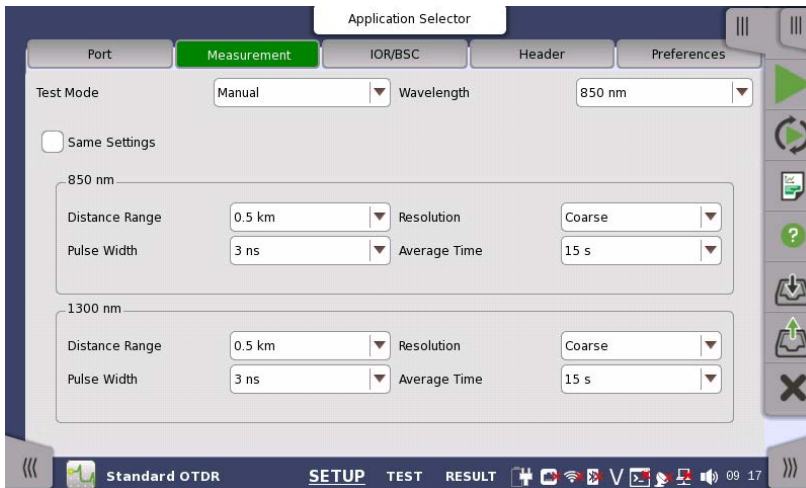
Standard OTDR (Optical Time Domain Reflectometer)



To locate where the reflection happens, and measure the fiber loss, touch **Standard OTDR** in the Application selector.

Measurement condition setup

1. To display the Setup screen, touch **SETUP** at the bottom of the screen.
2. For MU100021A and MU100023A, touch **Port** in the navigation area. For MU100021A, set the output port to **Single Mode** or **Multi Mode**. For MU100023A, set the output port to **Port 1** or **Port 2**.
3. Touch **Measurement** in the navigation area.
If selecting **Auto**, the parameters will be set automatically.
Selecting **Manual** allows user to set parameters.
Select **Wavelength** used for the measurement.



4. Touch **IOR/BSC**. Set IOR, BSC, and Fiber Type.
5. Touch **Header**. Set each items if you need. These items are saved to the file. The following items will be printed on the report:
Cable ID, Fiber ID, Location A, Location B, and Operator.

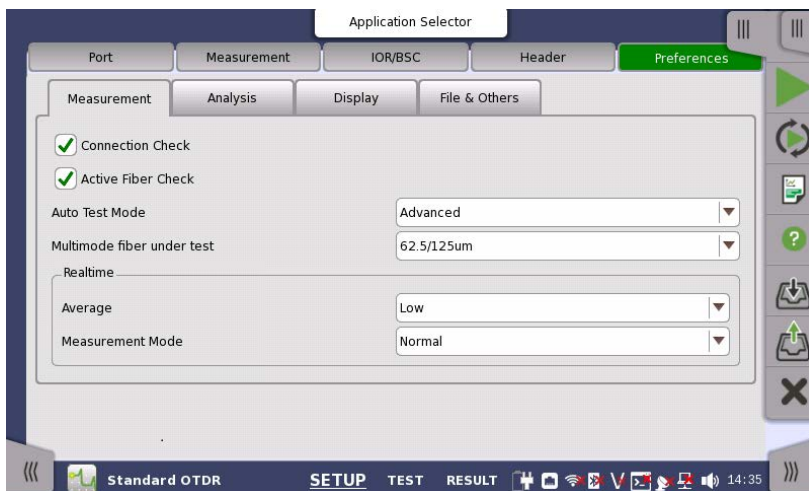
6. Touch **Preference**. Set each item if you need.

Connection Check: If selecting the check box, confirms whether or not the fiber is connected correctly to the OTDR measurement port.

Active Fiber Check: If selecting the check box, performs a "live fiber" check on the currently attached fiber under test to detect whether the fiber is carrying traffic before firing any OTDR laser sources.

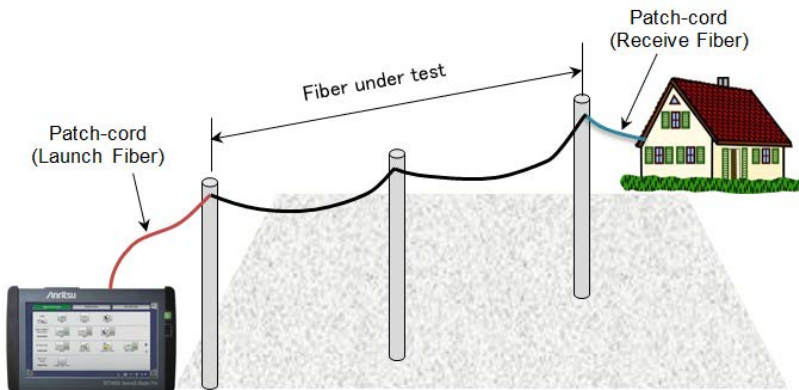
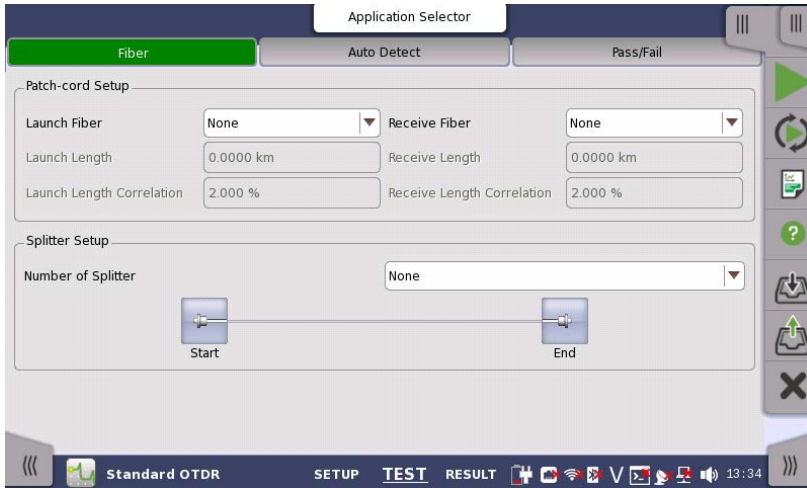
Note:

The Active Fiber Check feature does not apply for the 850/1300 nm multimode fiber.



Test setup

1. To display the Test screen, touch **TEST** at the bottom of the screen.
2. Touch **Fiber** in the navigation area. Set the length of the patch code connecting to the fiber under the test. If Output port is set to Single Mode, set the splitter configuration.



3. Touch **Auto Detect**. Set the thresholds to detect events automatically.

Application Selector

Fiber **Auto Detect** Pass/Fail

Event Loss 0.05 dB

Reflectance -60.0 dB

Fiber End 3 dB

☒ Macro Bend 0.3 dB

Splitter

1x2	3.0 dB	1x32	15.0 dB
1x4	6.0 dB	1x64	18.0 dB
1x8	9.0 dB	1x128	21.0 dB
1x16	12.0 dB		

Standard OTDR SETUP TEST RESULT 09:19

4. Touch **Pass/Fail**. Set the thresholds to judge results to pass or fail.

endevent.sor Application Selector

Fiber Auto Detect **Pass/Fail**

Pass/Fail judgment criteria Manual

☒ Non-Reflective Event Loss(fusion) 0.20 dB

☒ Reflective Event Loss(connector,mechanical) 0.50 dB

☒ Reflectance -35.0 dB

☒ Fiber Loss(dB/km) 1.00 dB/km

☒ Total Loss 3.0 dB

☒ ORL 27.0 dB

☒ Splitter Loss 3.0 dB

☒ Questionable Splitter

Standard OTDR SETUP TEST RESULT 13:36

When you select **ISO/IEC** or **JIS** in Pass/Fail judgement criteria, select an option in each of Applicable standards and Fiber Category.

Application Selector

Fiber Auto Detect **Pass/Fail**

Pass/Fail judgment criteria: ISO/IEC

Applicable standards: ISO/IEC 14763-3:2018

Fiber Category: OS2

☒ Number of Connectors: 2

☐ Number of Splices: None

Thresholds

☒ Fiber Length: 5000 m ☐ Reflectance: None

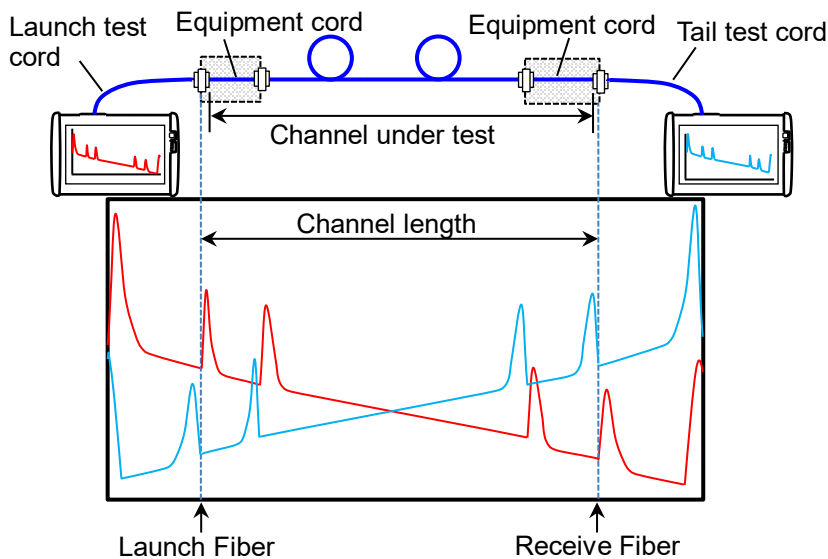
☒ Non-Reflective Event Loss (fusion): 0.30 dB ☒ Fiber Loss (dB/km): 1.00 dB/km

☒ Reflective Event Loss (Reference Connector): 0.75 dB ☒ Total Loss: 3.0 dB



☒ Reflective Event Loss (connector, mechanical): 0.75 dB


Standard OTDR **SETUP** **TEST** RESULT 10:20

Before starting test, set Launch Fiber and Receive Fiber at Patch-cord Setup, and set the Bi-Directional function to **ON**.

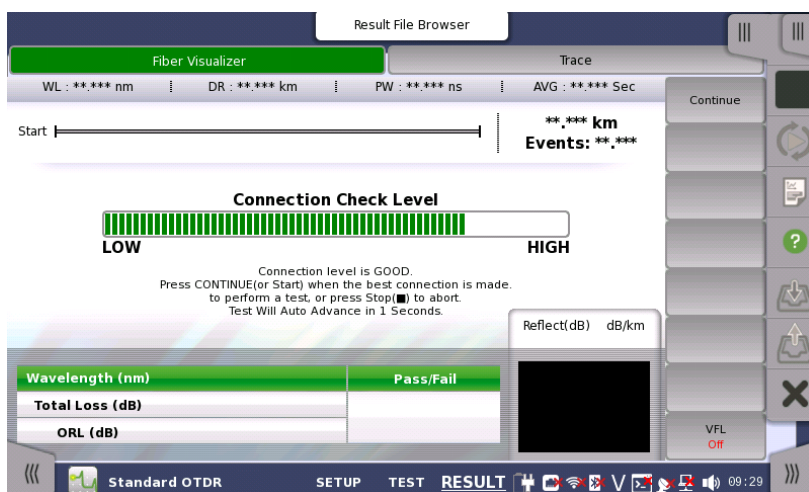


Measurement

1. After cleaning the connector of the optical fiber, connect it to the measurement port of the Network Master.
2. Touch  (Start Averaging) or  (Start Realtime) on the Application toolbar.

During the measurement  icon blinks to indicate that laser is output from the measurement port.

If **Connection Check** is selected, the connection check runs.



Good connection

The gauge is green when connection is good.

Bad connection

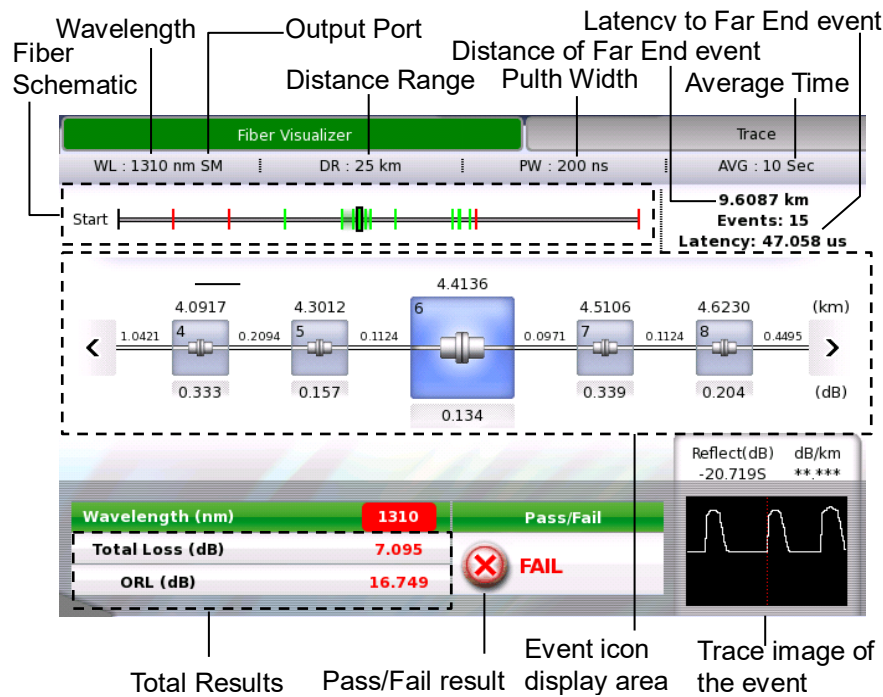
The gauge is red when connection is bad. And it is yellow when connection is not good. Touch Continue soft key to perform the test.

If the connection state is not improved even if the fiber is cleaned, the fiber needs to be replaced.

3. If the connection check result is "Good", the measurement starts and the Fiber Visualizer screen or Trace screen appears.

Fiber Visualizer

Touching the **Fiber Visualizer** button in the navigation area will display the following screen.



Touching < or > in Event icon display area allows users to scroll the icons to right or left. The event positions and displayed range are shown in the Fiber Schematic.

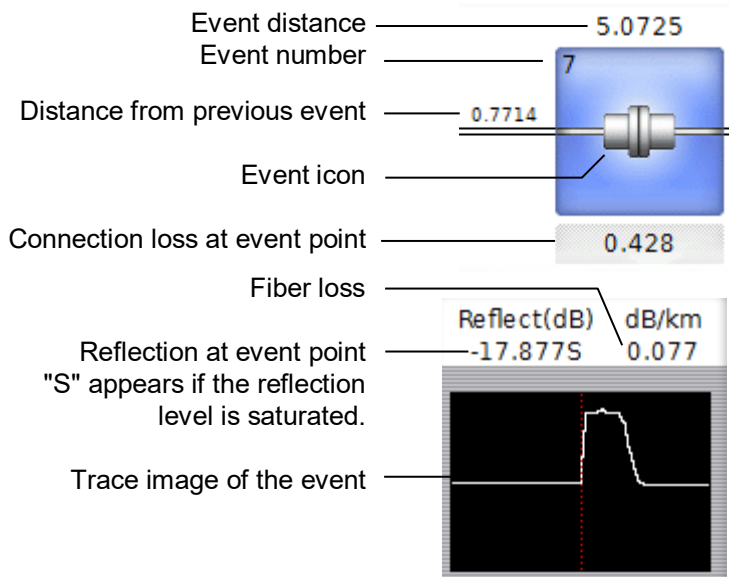
The events judged as Fail are displayed in red icon. The Trace around the event displayed enlarged in the center appears at right bottom.

Event Edit

Touch the event icon, and then touch **Event Edit** to opens the Event Edit dialog box.

Note:

Start icon and End icon cannot be edited.

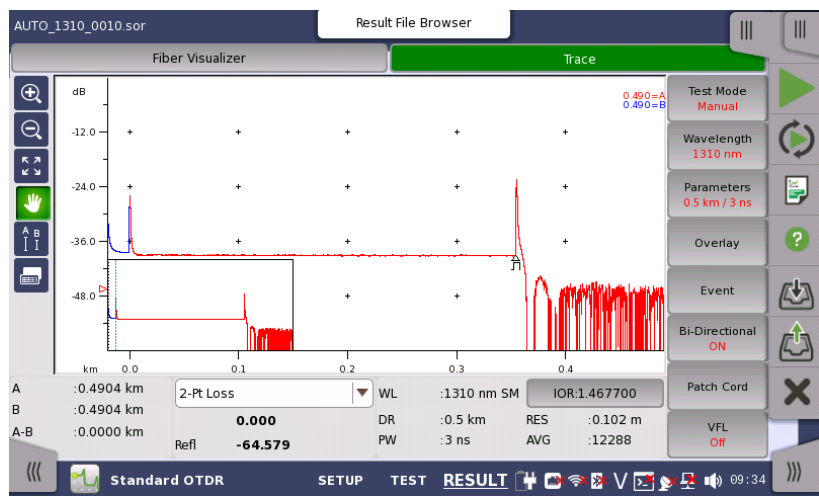


	Start of the fiber		Questionable Splitter Event
	Reflective Event		End of the fiber
	Non-Reflective Event		Questionable Event
	Grouped Event		Patch cord (Launch)
	Macro Bend Event		Patch cord (Receive)
	Splitter Event		

For soft keys on right hand, refer to the description in **Trace**. Note that only **Swap Overlay** appears for **Overlay** key in Fiber Visualizer.

Trace

Touching the **Trace** button in the navigation area will display the following screen.


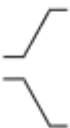




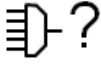




	When this icon is green, allows users to zoom the trace in by dragging area on the trace window.
	When this icon is green, allows users to zoom out the trace by touching a point on the trace window.
	Touching this icon shows the trace in full range.
	When this icon is green, touching the trace window allows users to drag the trace.
	Touching this icon displays the buttons to move a cursor and A , B , Utility buttons under the trace window.
	Touching this icon displays the event table.

Event Table

The event type is shown by the icon at event position of the trace or in the event table.

Event Types

	Reflective Event Reflection from a splice point, such as a Fresnel reflection caused by a mechanical splice or connector.
	Non-Reflective Event Non-reflective events include such low loss events as fusion splices and Macro Bends.
	Grouped Event Events spaced too close to each other for Analysis to distinguish them as separate events are reported as Grouped events.
	Far End Event Any event with a loss equal to or greater than the Fiber End threshold is reported as the Far End event.
	Questionable Event The last event is set to Questionable End in following case: <ul style="list-style-type: none"> • When the fiber length is longer than Distance Range • When Far End event is not found
	Splitter Event All events other than far end events with losses greater than the far end threshold are displayed as Splitter events.
	Questionable Splitter Event If no event exceeding the threshold set by Splitter on the Auto Detect screen is detected, the event(s) found as candidate for Splitter event is displayed as Questionable Splitter Event(s).
	Launch Event Launch Event appears at Launch fiber position. Does not appear if Launch Fiber is set to None on Fiber screen.
	Receive Event Receive Event appears at Launch fiber position. Does not appear if Receive Fiber is set to None on Fiber screen.

Cursor

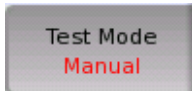
Cursor display varies depending on the selected loss type.



Touch **A**, **B**, or **LSA1** to **LSA4**.

Touch the position where moving the cursor. Touch < or > to adjust the cursor position.

Soft keys



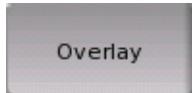
Switches between **Auto** and **Manual**. When **Manual** is set, Parameter soft key is available.



Selects the wavelength using for the test.

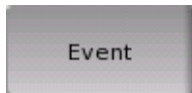


When Test Mode is set to **Manual**, opens dialog box to set Distance Range, Pulse Width, Resolution, and Average Time.



This key is available when the overlay traces are loaded.

- Drop Overlay: Opens the dialog box for selecting the trace to drop.
- Swap Overlay: Opens the dialog box for selecting the trace to swap.
- Align Overlay: Switches how to align overlay traces.
- Show Overlay: Turns the overlay trace display on or off.

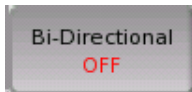


Analyze: Starts the event analysis.

Add Event: Opens the Add Event dialog box.

Edit Event: Opens the Edit Event dialog box.

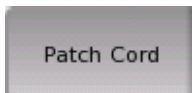
Delete Event: Deletes the event.



Bi-Directional is the function to display the Overlay trace in the reverse direction of distance and analyze the losses from the two traces.

OFF: Does not display Overlay trace in the reverse direction.

ON: Displays Overlay trace in the reverse direction and analyzes the loss.



Active Cursor to Launch: Sets the active cursor position to Launch Length of Patch-cord Setup.

Active Cursor to Receive: Sets the active cursor position to Receive Length of Patch-cord Setup.





Switches the output of VFL.

FTTA (Fiber to the Antenna)



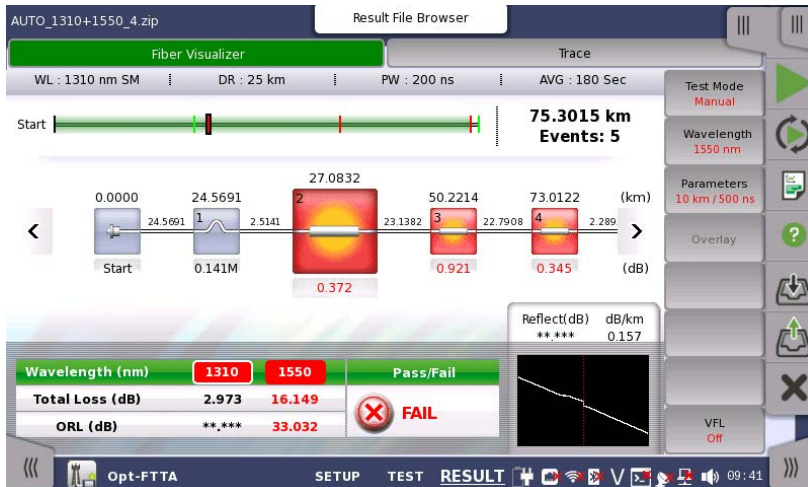
FTTA application is the optimized application for the short range fiber measurement such as between the antenna and controller in the radio base station.

1. Touch **FTTA** in the Application selector. The Setup screen appears in the same way as in Standard OTDR application. However the measurement parameters are more simplified than Standard OTDR application.
2. Set parameters on the Setup screen and Test screen in the same way as in Standard OTDR application. There are no Splitter settings in FTTA application.
3. After cleaning the connector of the optical fiber, connect it to the measurement port of the Network Master.
4. Touch  on the Application toolbar.

During the measurement  icon blinks to indicate that laser is output from the measurement port.

If **Connection Check** is selected, the connection check runs.

The measurement result appears on the Fiber Visualizer screen or Trace screen.



For the operation of screens, refer to the description in Standard OTDR application.

Construction



Construction application is optimized for performing multiple fiber measurements sequentially.

1. Touch **Construction** in the Application selector. The Setup screen appears in the same way as in Standard OTDR application.
2. Touch **Project** and enter the value in **Number of Fiber**.

Application Selector

Project Measurement Template IOR/BSC Header Preferences

Project Name: Route_001

Number of Fiber: 1

Start Fiber Number: 1

Location A: tokyo

Location B: yokohama

Direction: A->B

Store Files At: Internal/

Base Filename: *Location*_ *Wavelength*_ *Number*

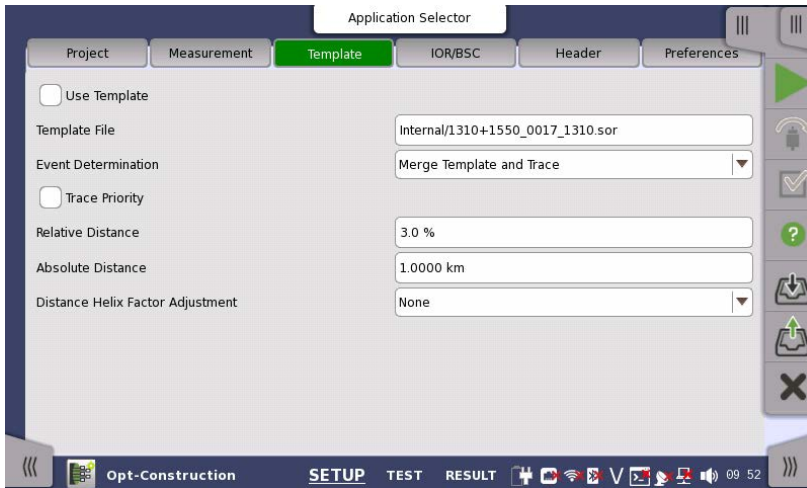
Folder : :Internal/Route_001/


File Name : :tokyo_yokohama_1310_0001.sor

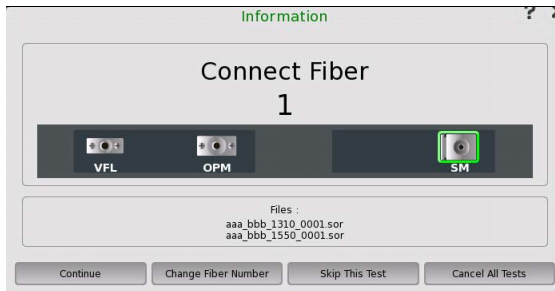
Opt-Construction SETUP TEST RESULT


3. Touch **Measurement** in the navigation area.
Touch **Wavelength** tab and select the wavelength of tests.
For MU100021A, set Output Port to **Single Mode** or **Multi Mode**.
Touch **Test Parameters** tab and set Test Mode to **Auto** or **Manual**.
When **Manual** is selected, set the values of Distance Range, Pulse Width, Resolution, and Average Time.

4. When using the template trace, touch **Template** in the navigation area.

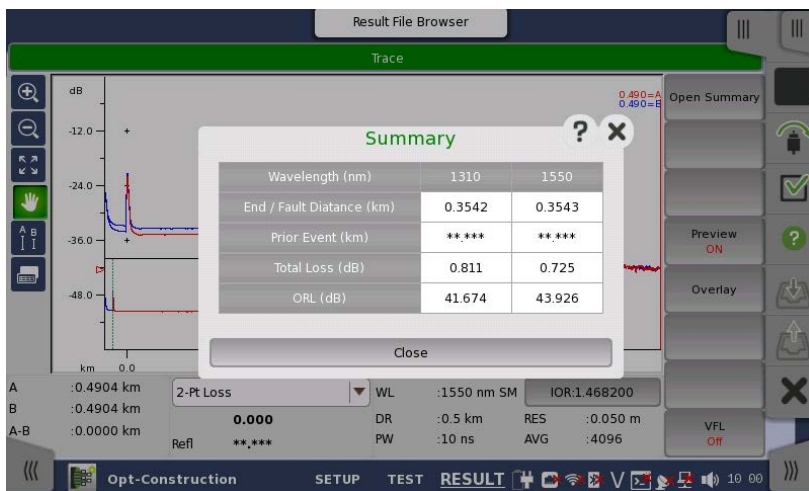


5. For Test setup, refer to page 8 to 9.
6. Touch  on the Application toolbar.
The **Information** dialog box appears.



7. After cleaning the connector of the optical fiber, connect it to the measurement port of the Network Master.
8. Touch **Continue**. During the measurement  icon blinks to indicate that a laser is output from the measurement port.
If **Connection Check** is selected, the connection check runs.

9. If **Preview** has set to **On** during the measurement, the **Summary** dialog box is displayed after the measurement.



Close the **Summary** dialog box and touch ☒ to resume the next fiber measurement.

When **Preview** is set to **Off**, the traces are erased automatically after the measurement.

10. The **Information** dialog box appears. Confirm the fiber number on the dialog box.
11. Repeat step 7 to 10 until the end of the Number of fiber which is set in the **Project** screen.

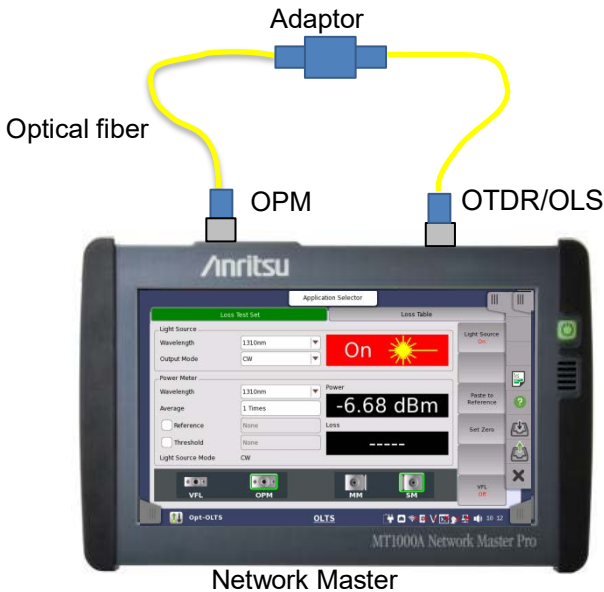
OLTS (Optical Loss Test Set)



OLTS applications allows users to measure an optical fiber loss. The optical power and the optical loss are displayed as the test results.

To measure an optical loss

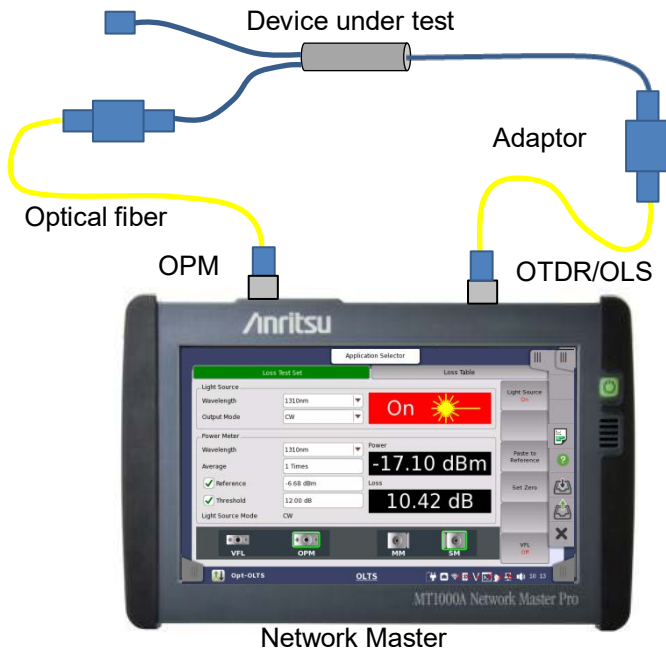
1. Touch **OLTS** in the Application selector.
2. Connect the light source (OTDR/OLS) and OPM via adaptor.
Confirm that fiber type and the core diameter are appropriate.
To measure the level including the loss of the adaptor, connect adaptor between the optical fibers.



3. Set **Wavelength** and **Output Mode** of the Light Source.
4. Set **Wavelength** of Power Meter to the same value of step 1.
5. Select **Reference** check box.
6. Touch **Light Source** soft key and set to **On**.
7. After measured value appears in "Power", touch **Paste to Reference** soft key. The power value is copied to the Reference field.

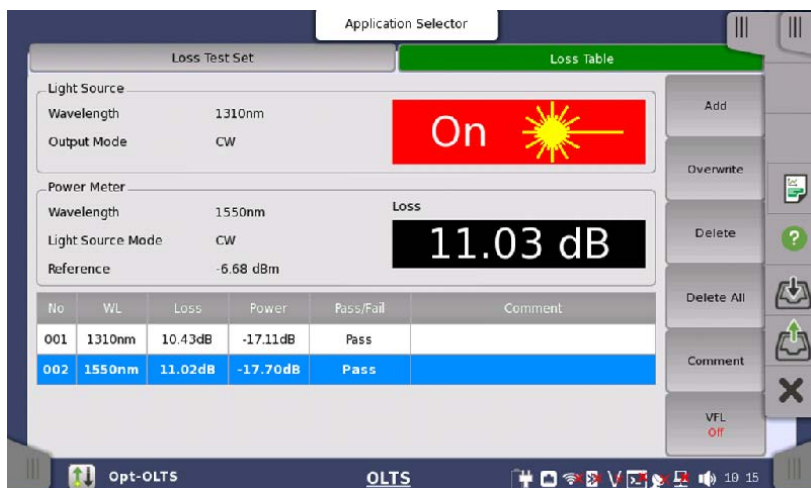


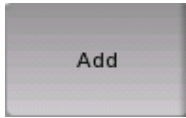
8. Remove the optical fiber from the adaptor, and then connect the device under test.



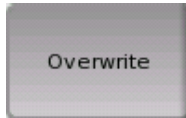
Measurement result appears in **Loss**.

9. Select **Threshold** check box. Touch the field to set the threshold value for pass/fail judgment.
10. Touch **Loss Table** in the navigation area.
11. Touch the **Add** soft key. Measurement result will be added to the table.

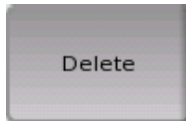




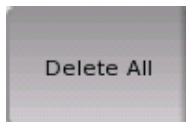
Adds the measured loss value to the table.



Overwrites the loss value to the row of the selected number.



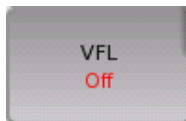
Deletes the last row from the table.



Deletes all rows from the table.



Opens the dialog box for editing the comment.

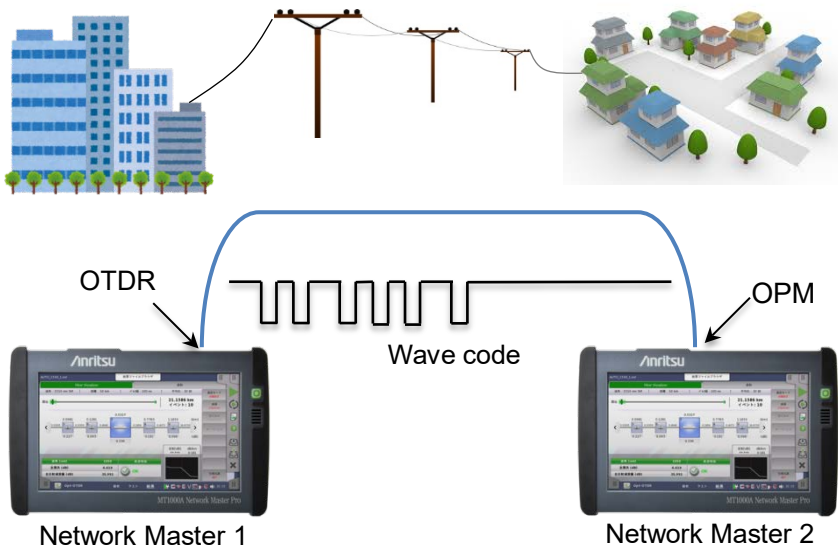


Switches the output of VFL.

To measure an optical loss by using two Network Masters

When a reference of the power meter cannot be measured directly, touch the Reference field and input a power value.

In the transmitter side Network Master, setting the Output Mode of Light Source to **Wave Code** sends the wavelength and the its power meter reference modulating output light. The receiver side Network Master sets the detected wavelength and the reference value to itself automatically and displays the loss.



1. Set Output Mode in Light Source of Network Master 1 to **CW**.
2. Measure reference values of Network Master 1 for all wavelengths. Refer to step 1 to 3 in "To measure an optical loss" for details.
3. Connect Network Master 1 Light Source (OTDR/OLS) and Network Master 2 OPM to both ends of DUT.
4. Set Network Master 1 Light Source as following:
Wavelength: (any)
Output Mode: **Wave Code**


- Set Network Master 1 Light Source to **On**.

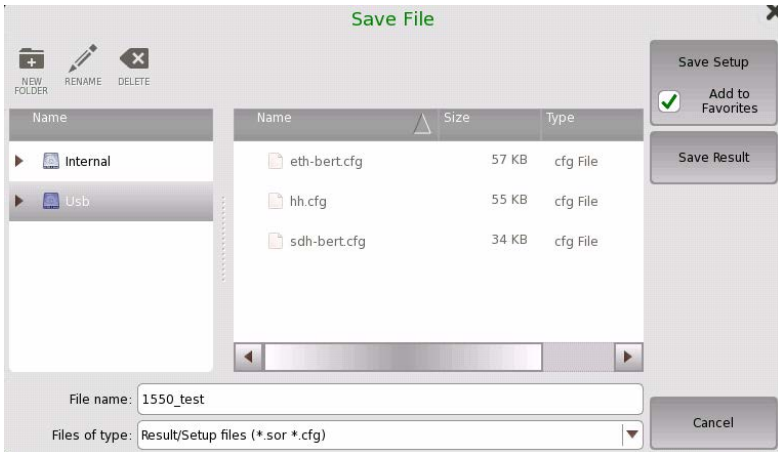


- Network Master 2 detects wavelengths and reference values received from Network Master 1. Wavelength of the power meter is set automatically and a loss is displayed.

File saving and loading


Saving the file

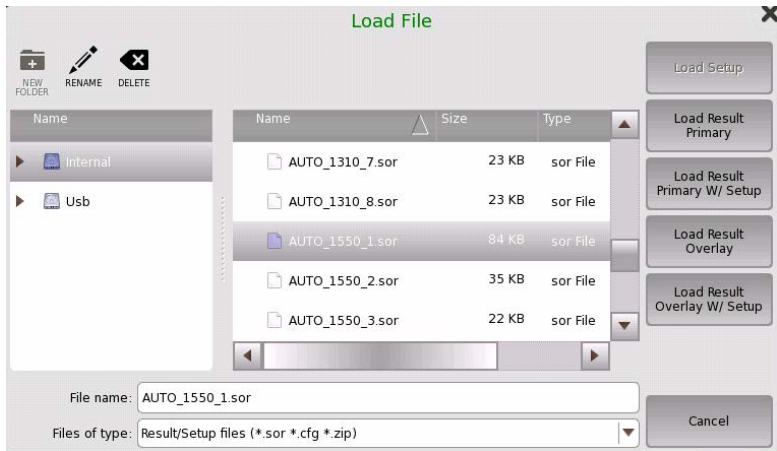
1. Touch  on the Application toolbar.
2. Touch the **File name** field to enter the file name.



3. Touch **Save Setup** to save the test setup parameters.
The test setup is appended to **Favorites** in the Application Selector if selecting **Add to Favorites** check box.
Touch **Save Results** to save the test results and the test setup parameters.

Loading the file

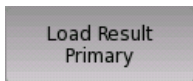
1. Touch  on the Application toolbar.
2. Touch the file in the list to select the file.
Selecting **File type** will filter the file names on the list.



3. Touch a button:

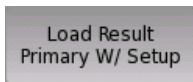


Loads a setup file (*.cfg).



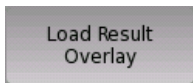
Loads a test result file (*.sor or *.zip).

If loading a result file (*.sor), the primary trace is overwritten.



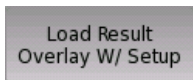
Loads a test result file (*.sor or *.zip).

If loading a result file (*.sor), the primary trace is overwritten and the application test setup will change according to parameters in the loaded file.



Loads a test result file (*.sor or *.zip).

If loading a result file (*.sor), the overlay trace will be appended. Overlay trace can be appended up to 12.




Loads a test result file (*.sor or *.zip).

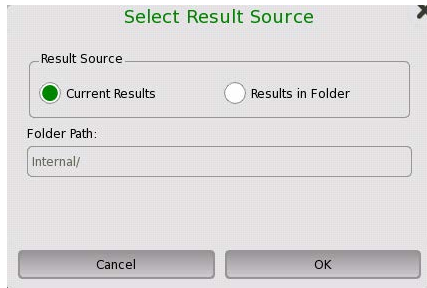
If loading a result file (*.sor), the overlay trace will be appended. And the application test setup will change according to parameters in the loaded file.

When loading a result file (*.sor), the parameters in the following screens are not overwritten.

- **Preferences** in the Setup screen
- **Pass/Fail** in the Test screen

Creating the report

1. Touch  on the Application toolbar.
2. In the **Select Result Source** dialog box, select the measurement result from which you create a report, and touch **OK**.



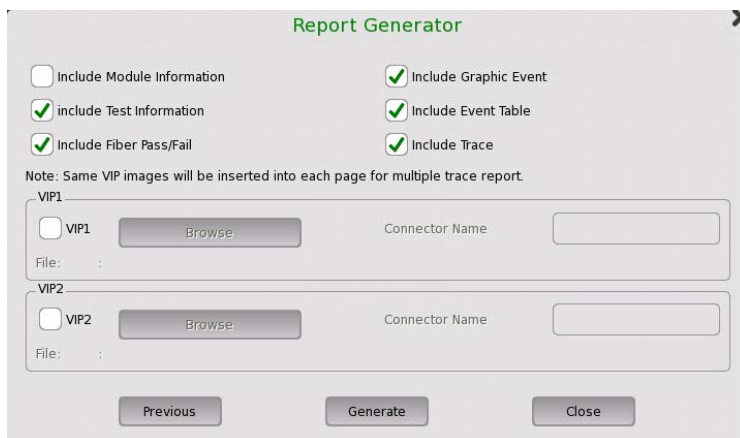
The 'Select Result Source' dialog box has a title bar with a close button. It contains two radio buttons under the label 'Result Source': 'Current Results' (selected) and 'Results in Folder'. Below this is a text field labeled 'Folder Path:' containing the text 'Internal/'. At the bottom are 'Cancel' and 'OK' buttons.

3. Select the file format of Report file, and set Logo in **Report Generator** dialog box. Touch **Next**.



The 'Report Generator' dialog box has a title bar with a close button. It features a dropdown menu labeled 'Select Report' with 'OTDR Standard Report' selected. Below is the 'Select Format' section with three radio buttons: 'PDF' (checked), 'XML', and 'CSV'. The 'Include Logo' section has an unchecked checkbox and a file selection button (three dots) next to an empty text field. At the bottom are 'Previous', 'Next', and 'Close' buttons.

- Select check boxes of items outputting to the report, and set the VIP (Video Inspection Probe) file. Touch **Generate**.



Report Generator

☐ Include Module Information
 ☒ Include Graphic Event

☒ Include Test Information
 ☒ Include Event Table

☒ Include Fiber Pass/Fail
 ☒ Include Trace

Note: Same VIP images will be inserted into each page for multiple trace report.

VIP1

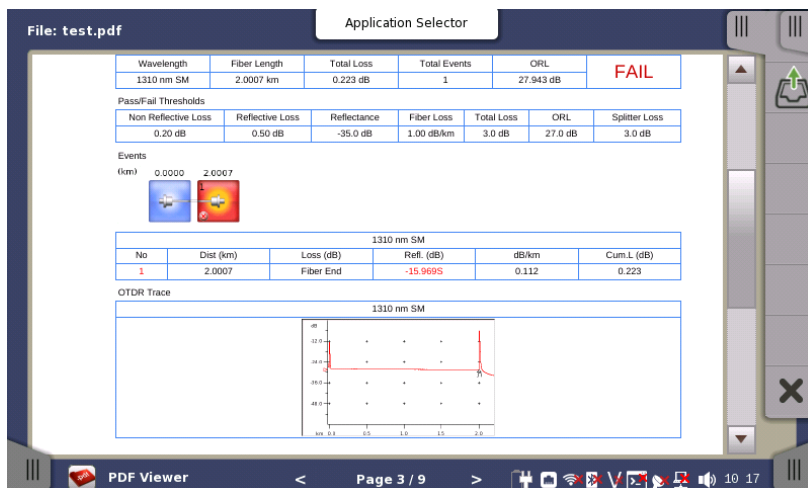
☐ VIP1 Connector Name
 File:

VIP2

☐ VIP2 Connector Name
 File:

- Touch the **File name** field to enter the file name.
- Touch **Save Report**.
- The message appears when the report has been generated. To confirm the PDF, touch **View PDF**.

After PDF viewer launched, the report is displayed.



File: test.pdf Application Selector

Wavelength	Fiber Length	Total Loss	Total Events	ORL	
1310 nm SM	2.0007 km	0.223 dB	1	27.943 dB	FAIL

Pass/Fail Thresholds

Non Reflective Loss	Reflective Loss	Reflectance	Fiber Loss	Total Loss	ORL	Splitter Loss
0.20 dB	0.50 dB	-35.0 dB	1.00 dB/km	3.0 dB	27.0 dB	3.0 dB

Events

(km) 0.0000 2.0007

1310 nm SM

No	Dist (km)	Loss (dB)	Ref. (dB)	dB/km	Cum.L (dB)
1	2.0007	Fiber End	-15.9695	0.112	0.223


OTDR Trace

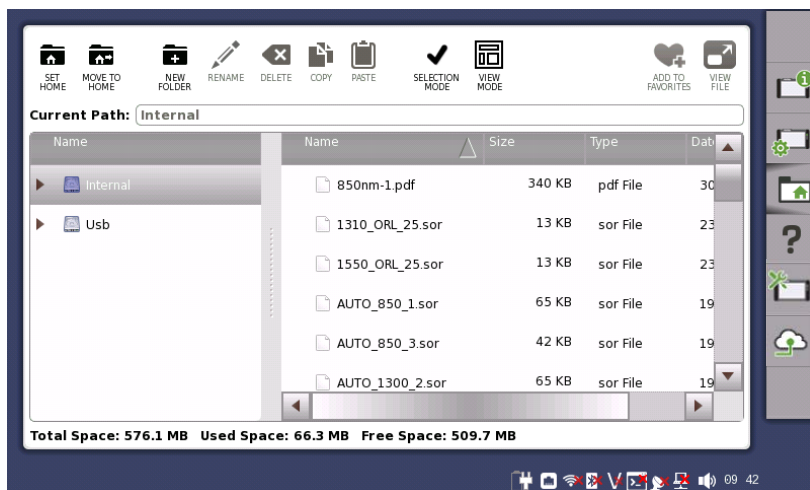
1310 nm SM



PDF Viewer Page 3 / 9

Copying a file

File Manager allows users to copy the report file to a USB flash drive.

1. Attach a USB flash drive to Network Master.
2. Touch  on the Instrument toolbar. Internal folder is the storage in Network Master. Information (Free Space etc.) is displayed at bottom of window.



3. Touch the filename to copy.
4. Touch .
5. Touch **Usb**.
6. Touch .



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