

OTDR

Adapters for TestPro and NSA

USER MANUAL

OTDR

User Manual

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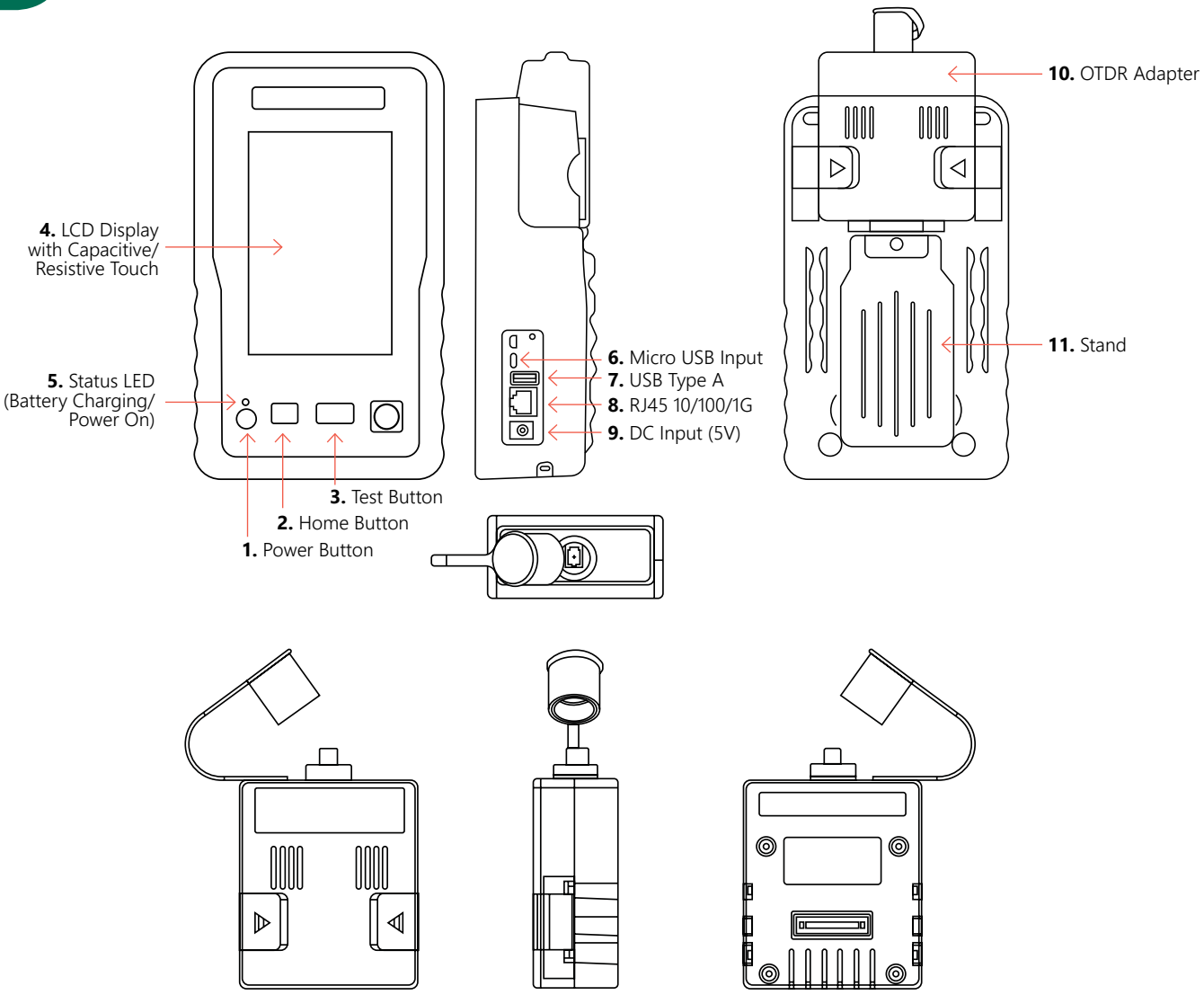
Kit Contents

For a complete list of all Product Kits & Accessories, please visit applicable product page :
https://aem-test.com/testpro or https://aem-test.com/nsa

OTDR Features

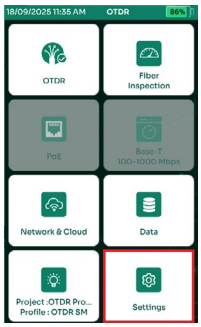


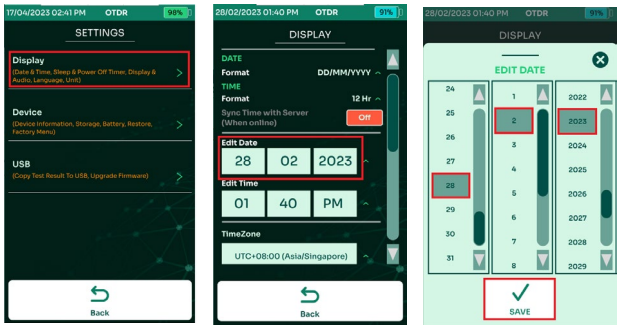
Test platform attributes:

1.	POWER BUTTON	• Powering on : press for 1 second. • Powering off : press the button once and then select [Power Off] on the touchscreen. • Force shutdown : press and hold the power button for 6 seconds or longer.
2.	HOME BUTTON	• Takes you back to home screen on the touchscreen interface.
3.	TEST BUTTON	• Starts an Autotest (Type of Autotest depends on the adapter attached to the unit.
4,	LCD DISPLAY	• Touchscreen, with color graphical user interface to navigate the menu and to view results.
5.	STATUS LED	• Red : battery charging (when unit is off) • Amber : battery charging (when unit is on) • Green : battery not charging (when unit is on)
6,	MICRO USB INPUT	• Establishes a USB-based wired link between the test platform and a personal computer. Test results can be transferred to PC software (TestDataPro) via this connection.
7,	USB TYPE A	• Multiple uses: Connect test platform to computer for test result upload to TestDataPro. Use for firmware updates. Use Edimax EW-7822ULC WiFi adapter for wireless upload of test results to TestDataPro Cloud and for Wireless Network Connectivity testing.
8,	RJ45 10/100/1G	• For link speed validation testing of cables up to 1G (when not in OTDR mode) and for upload of test results to TestDataPro Cloud when connected to Internet. (functionality is built into the basic test platform).
9.	DC INPUT	• Connects test platform to power source for charging.
10.	OTDR ADAPTER	• Singlemode and Multimode test adapters used to perform OTDR test function. Adapters are hot swappable, meaning test platform does not have to be shut down when changing test adapters.
11,	STAND	• Extend stand to place it on a table or any other flat surface, freeing you to perform other tasks while keeping an eye on the screen.

1 Settings Configurations

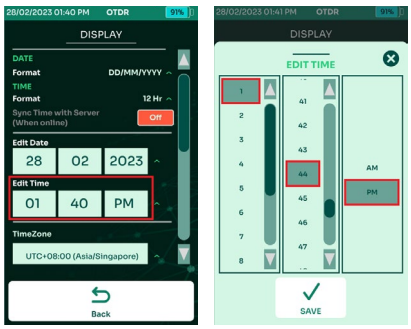
Configure the settings such as date/time, display brightness, audio volume, sleep mode, language and access device information by selecting ⚙ .



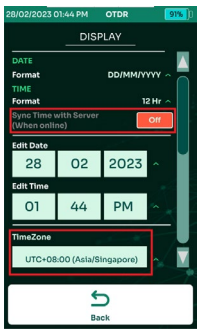


a. Date and Time

- Select [Display].
- Select Edit Date
- Scroll up/down to choose the DD, MM & YYYY. Select [Save].

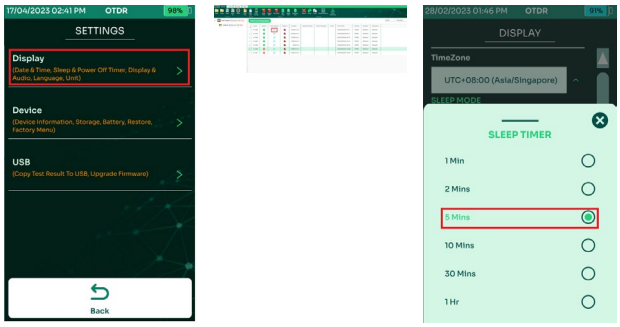


- Select Edit Time
- Scroll up/down to choose the HH, MM and AM/PM. Select [Save].
- The drop down menu to select the timezone.



- Enable the [Sync Time with server] & use the drop-down menu to select the time zone. Note: The time zone will only sync when OTDR detects internet connectivity.

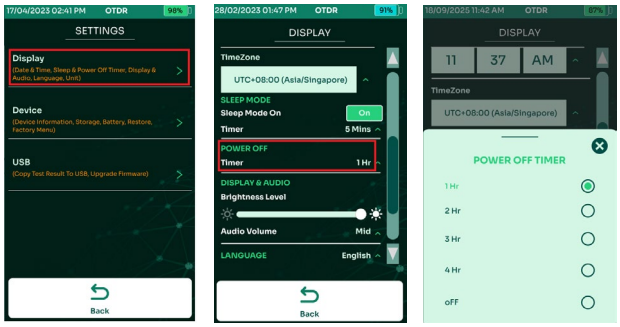
b. Sleep Mode



Sleep mode turns off the display after a period of inactivity to conserve battery. This is enabled by default and the timer is set to 5 minutes.

- Select [Display].
- Scroll down to the [Sleep Mode] section.
- Select the timer & choose the preferred time duration of inactivity after which the screen should turn off.

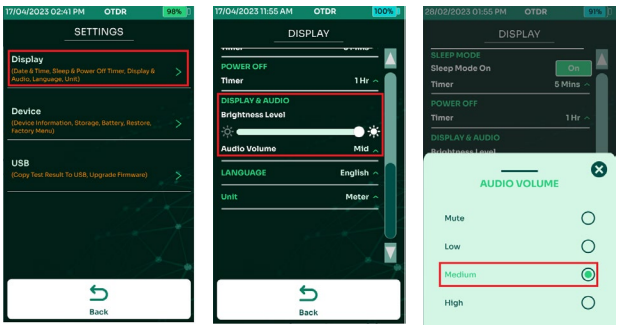
c. Power Off



Power Off timer function is only available when the OTDR is in battery mode. It is not available when the device is attached to a power supply.

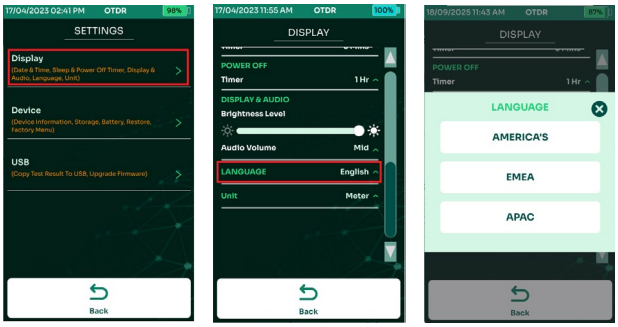
- Select [Display].
- Scroll down to the [Power Off] section.
- Select the timer & choose the preferred time duration of inactivity after which OTDR should power off.

d. Display & Audio



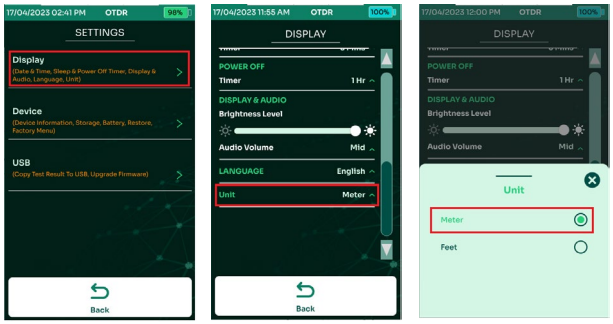
- Select [Display].
- Scroll down to [Display & Audio].
- Adjust the display brightness by dragging the brightness level bar left or right. To adjust the volume, select Audio Volume & choose Mute, Low, Medium or High.

e. Language



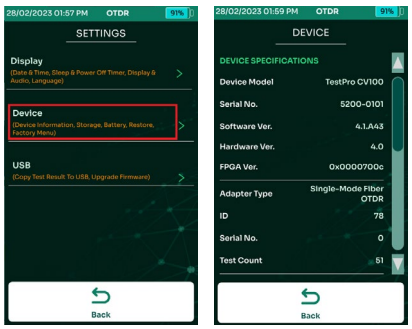
- Select [Display].
- Scroll down to [Language].
- Select one of the languages available and OTDR will reboot to save the settings.

f. Unit



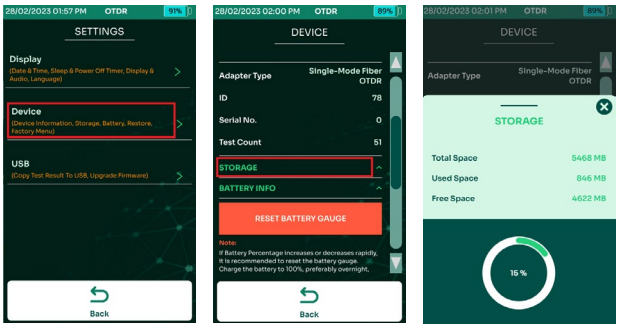
- Select [Display].
- Select [Unit].
- Select the preferred measurement standard - Metric (Meter) or US units (Feet).

g. Device Specifications



- Click [Settings] on the home screen, then [Device].

h. Storage

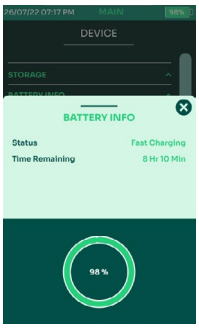


Storage displays the Total, Used and Free space on the OTDR.

- Click [Settings] on the home screen, then [Device].
- Click [Storage].

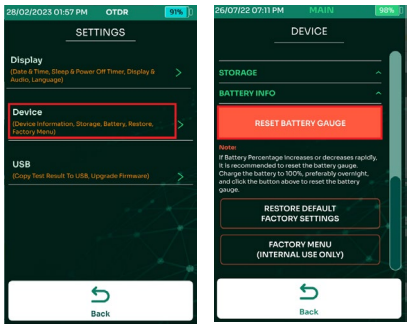
i. Battery Info





- Select [Settings] on the home screen, then [Device] and then [Battery Info].
- User will be brought to a screen showing the Charging status and Time remaining.

j. Reset Battery Gauge



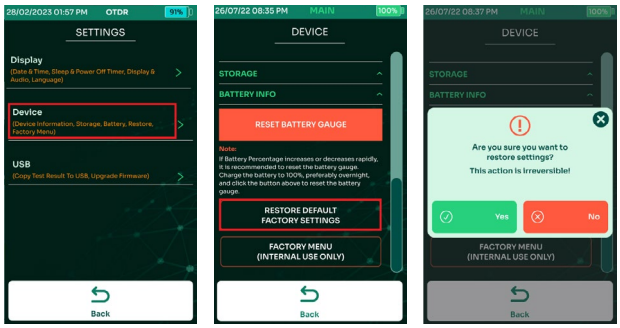
Reset Battery Gauge will recalibrate discrepancies in the battery reading. Use this feature only when the battery percentage is fluctuating.

- Select [Settings] on the home screen, then [Device]
- Select [Reset Battery Gauge].
- Click Yes on the pop-up confirmation.
- Wait for Resetting Battery Gauge to be completed.

Note :

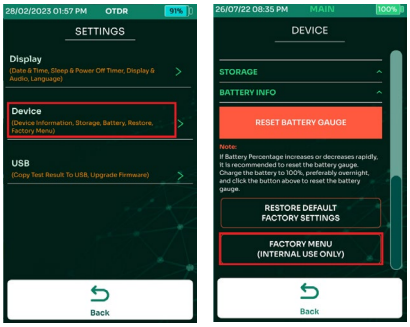
I. Ensure that the battery is fully charged to 100%. AEM recommends to charge the battery overnight.
II. Select [Reset Battery Gauge].
III. OTDR will apply the changes and reset the battery registers.

k. Restore Default Factory Settings



- Select [Settings] on the home screen, then [Device]
- Select [Restore Default Factory Settings].
- On the popup, select Yes to restore OTDR to default factory settings. The device will restart.

l. Factory Menu



Factory Menu is for manufacturer's internal use only. Access to this function is not available to users.

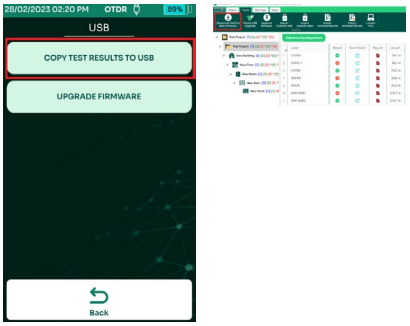
m. USB



When a USB flash drive is inserted to the OTDR USB port, device offers multiple functions i.e. Copy Test Results to USB, Upgrade Firmware.

Refer to the steps required for each of these features in the OTDR User Guide. To access the USB menu again, click Settings > USB.

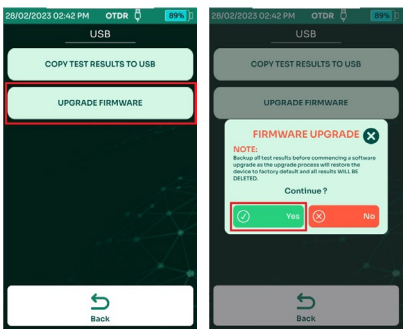
i. Copy Test Results to USB



Copy Test Result to USB will export all the test results saved inside OTDR to the USB flash drive under TestData folder.

- Select [Copy Test Results to USB]
- OTDR will start copying test results from the device to USB flash drive.

ii. Upgrade Firmware



OTDR's firmware can be upgraded using the USB flash drive.

- Go to www.aem-test.com/myaccount, log in to your account (create account for new users) and download the latest firmware under [Downloads].
- Save the OSUpgrade.zip to a USB Flash drive (formatted as FAT32).
- Attach the DC power supply to the OTDR and power on the device.
- Insert the USB flash drive. The USB menu will appear.
- Select [Upgrade Firmware].
- OTDR will warn the users to back up test results and the upgrade will reset the device to factory settings. Select [Yes] to accept and [No] to cancel.
- The device will reboot multiple times. The entire process will take at least 15 minutes to complete.

2 OTDR

AEM's modular Optical Time Domain Reflectometer (OTDR) is a device that tests the fiber cable's quality, reliability and integrity by sending optical pulses into the optical fiber installation at varying pulse widths. They measure the small amounts of reflected light that are sent back from events and then calculates the size of loss and locate the distance of the event from the device. Optical events can include splice loss, connector loss, fiber attenuation, faults and end of cable.

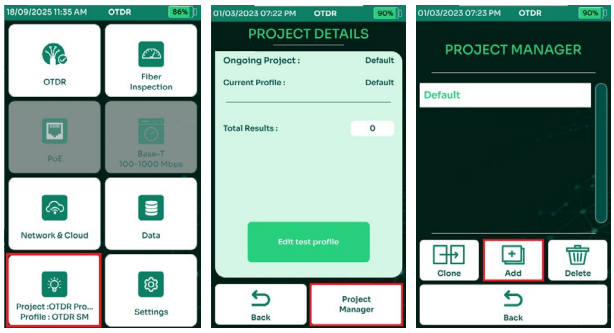
This device is widely used during fiber optic cable installation, certification, maintenance and troubleshooting. AEM's OTDR can be used in existing TestPro and NSA units running firmware version 4.1 and later.



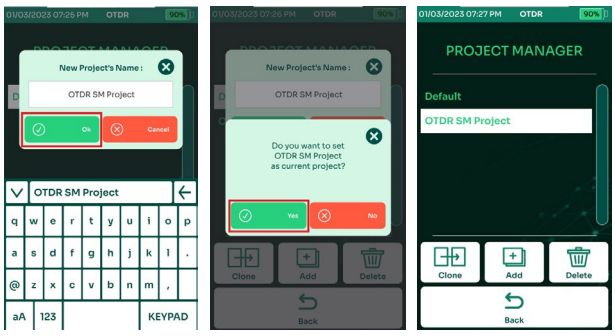
a. Project and Profile

The OTDR supports customer workflows through projects and profile descriptions. [Project] is an identifier of the customer site/location, whereas [Profile] refers to specific test configurations.

i. Setup a Project

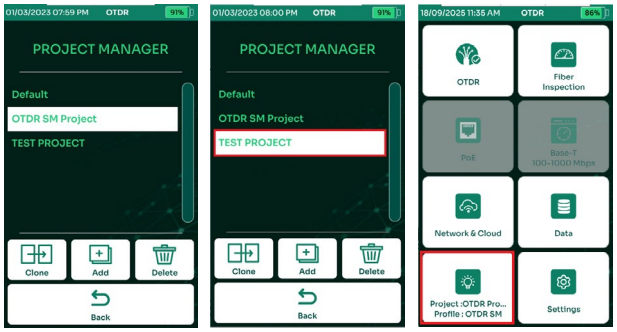


- Select [Project]/[Profile] on the home screen to create or edit a project. Once a project is selected, subsequent Autotest results will be saved there.
- Select [Project Manager] to choose a project, create a new project or to delete an existing project.
- Select [Add] to create a new project.



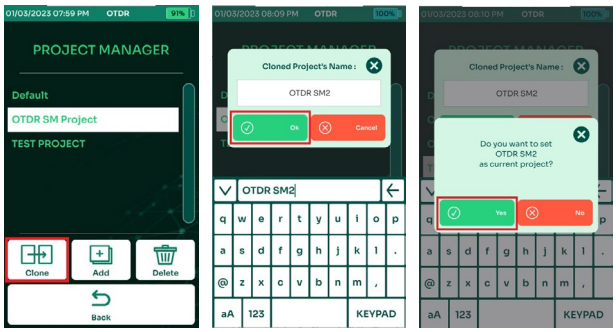
- Key in the project name and select [OK].
- A dialog box will appear confirming the OTDR SM Project to be used as a current project. Select [Yes] and OTDR SM Project is the current project being used.
- Project Manager shows the recently created project and the Default project.

ii. Switch Projects



- To switch projects, open [Project/Profile] in the main menu and choose [Project Manager].
- Select the project i.e., TEST PROJECT, this project and profile will be activated. All succeeding test results will be saved in "TEST PROJECT" project.
- Click back or press the home button to return to the main menu.

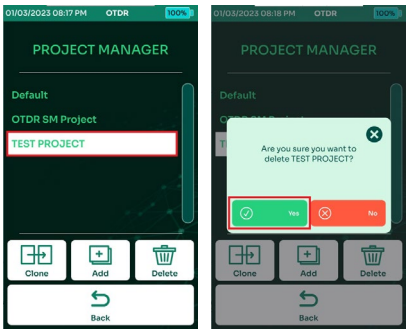
iii. Clone a Project



OTDR offers an easy way to duplicate a project that uses the same limit, cable, connector & labels through project cloning.

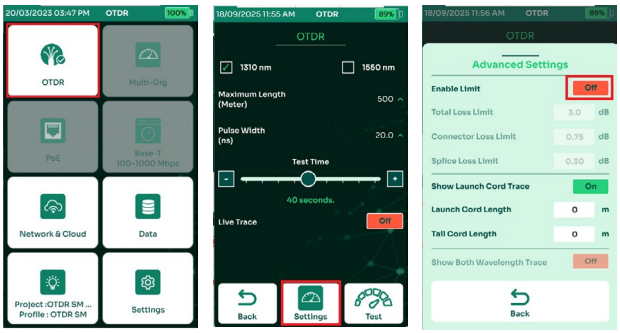
- To clone a project open [Project/Profile] in the main menu and choose [Project Manager]. Select the project to be cloned i.e., OTDR SM Project and select Clone.
- Key in the cloned project name & select [OK].
- Choose [Yes] to set the cloned project "OTDR SM2" as the current project. All succeeding test results will be saved in "OTDR SM2" project.

iv. Delete a Project

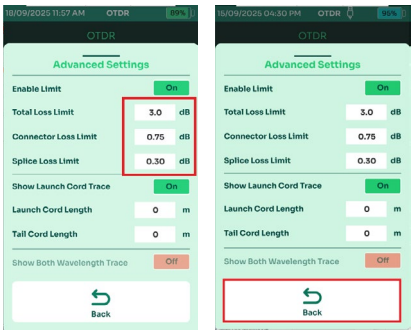


- To delete a project from OTDR, open [Project/Profile] in the main menu and choose [Project Manager]. Select the project to be deleted i.e., Test Project and select Delete.
- Select [Yes] to delete the "TEST PROJECT" project. All test results saved in "TEST PROJECT" project will be deleted and moved to Recycle Bin.

b. OTDR Test Limit



- Select [OTDR] on the home
- Select [Settings] to access Advanced Settings that includes the OTDR limit.
- In Enable Limit, select [On] to activate the limit.

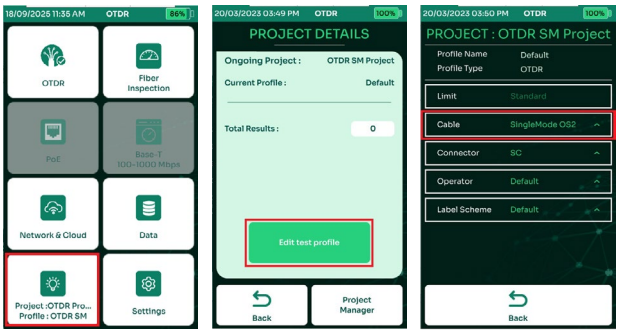


- Change the Enable Limit from Off to [On] and key in the desired Total Loss, Connector and Splices Loss requirement. Note that fiber standards shows connector loss is 0.75 dB and Splice Loss is 0.3 dB.

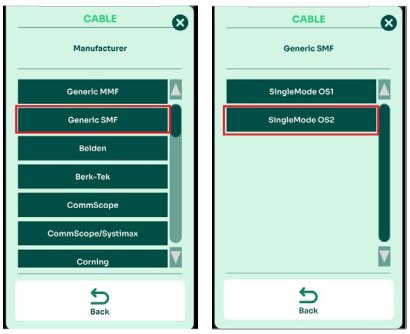
  Total Loss Limit (dB) – overall loss of the cable under test. If more than 3 dB the cable under test will marked as failed.
  Connector Loss Limit (dB) - maximum allowable connector loss. Anything more than 0.75 dB will marked as failed connector loss.
  Splice Loss Limit (dB) –maximum allowable splice loss. Anything more than 0.3 dB will marked as failed splice loss.

- Select [Back] to keep the changes to the Advanced Settings.

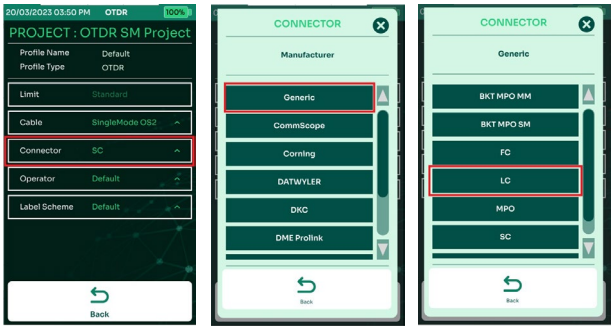
c. Cables and Connectors



- Select [Project]/[Profile] on the home screen.
- Select [Edit test profile] to change the cable and connector.
- Select [Cable: SingleMode OS2].



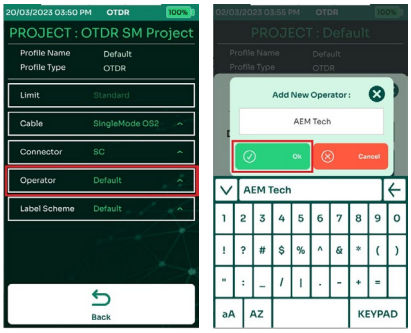
- Choose a cable from the list of manufacturers. If unsure of the type of cable, select [Generic MMF] for Multimode or [Generic SMF] for Singlemode cable.
- Choose the specific type of cable i.e.. Singlemode OS2.



Follow a similar process for choosing connectors:

- Select [Connector: SC].
- Choose a connector from the list of manufacturers. If unsure of the type of connector, select [Generic].
- Select [LC].

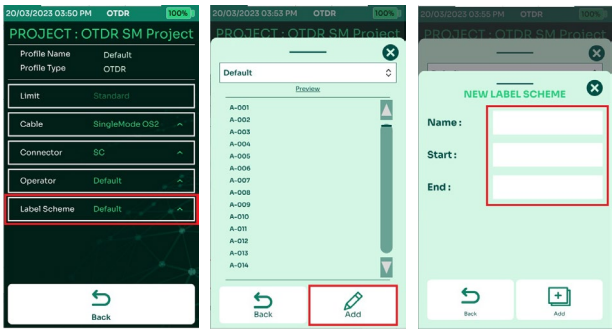
d. Operator



Adding Operator name in a project and profile is another important step in documenting the test result. When test reports are generated, it includes the operator's name to identify who conducted the certification test.

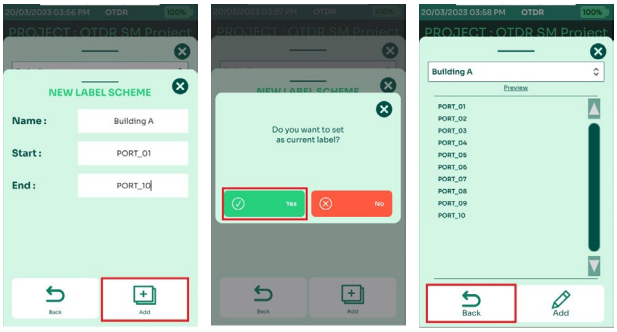
- Select [Operator: Default]. A preview of the operators saved in OTDR will be displayed.
- Select [Add] to add new operator.
- Key in the operator's name or initials and select [Ok].

e. Label Scheme



Labeling allows user to identify the associated physical locations (i.e., building, room, cabinet, rack ,port, etc.). These labels will be used to save the test results to the OTDR.

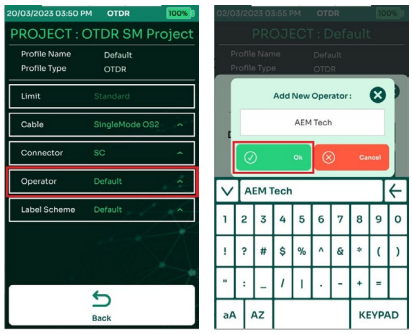
- Select [Label Scheme: Default]. A preview of the Default labels will be displayed.
- Select [Add] to add a new label to the label scheme.
- Key in the desired label name as well as the descriptions for [Start] and [End].



- Select [Add].
- Select [Yes] to the dialog box confirming the new label as the current label scheme.
- The list of newly created labels will be displayed. Select [Back] to go exit the label scheme.

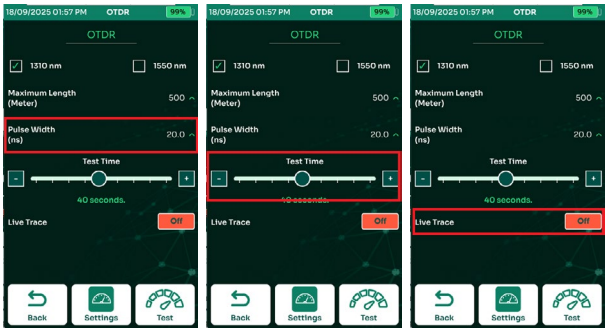
Note: The text in Start label should be lower than the End label i.e., 01 against 10. The text should match as well i.e., first 4 characters are alphabet the end label should also start with alphabet.

f. Performing OTDR Test

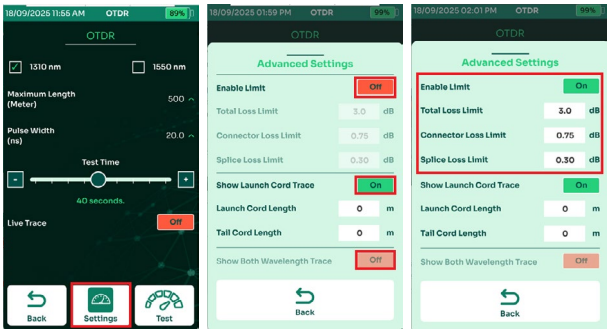


To perform OTDR test, attach either the OTDR SM for Single-mode or OTDR MM for Multi-mode adapter. Once the adapters are attached, connect one of the launch cord to the OTDR adapter and connect the other end of the launch cord to the fiber cable-under-test.

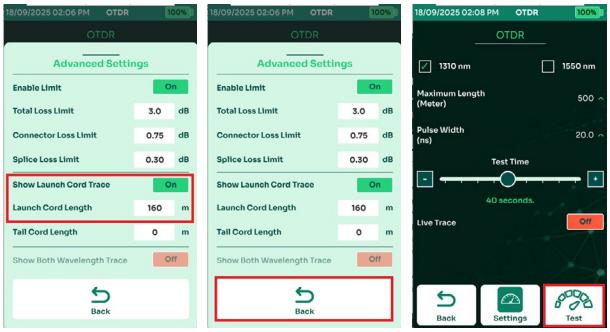
- In Main menu, select ODTR.
- In OTDR menu, one wavelength 850nm (Multimode) or 1310nm (Singlemode) is automatically selected by default. User can select another wavelength or both wavelengths manually.
- Select Maximum Length.
- Select the appropriate cable length. If the cable under test is 200 m, choose a cable length that is longer i.e., 250 m and select [Save].



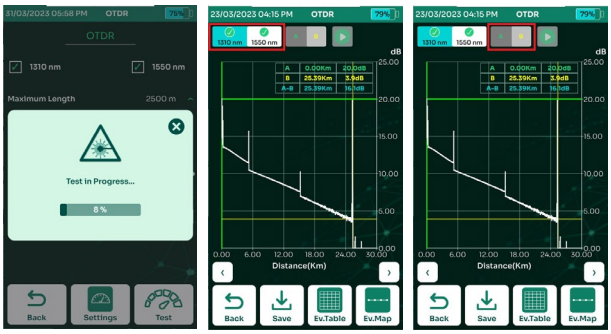
- Pulse Width is auto adjust depending on the cable Maximum Length
- Test Time is the number of test cycles that OTDR will collect during the test, then averages these results and display it in the OTDR graph. A preferred Test Time will auto adjust depending on the cable Maximum Length and Pulse Width. Longer test times, means more data samples will be collected for averaging which will result in longer test time.
- Live trace when enabled will perform a continuous OTDR tests and users have the control to start and stop the test.



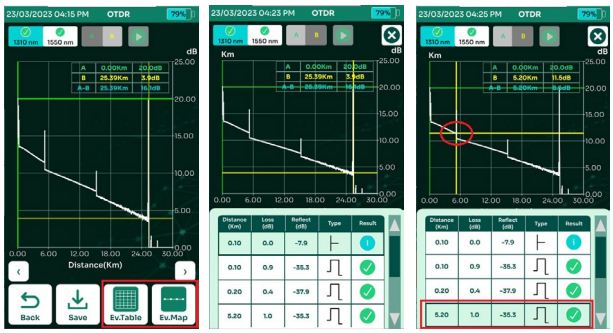
- Select [Settings]. To make changes to the settings of Limit, Launch Cord and Show both wavelength trace in plot.
- To use a custom limit, toggle the Enable to [On].
- Key in the desired Total Loss, Connector and Splice Loss limits.



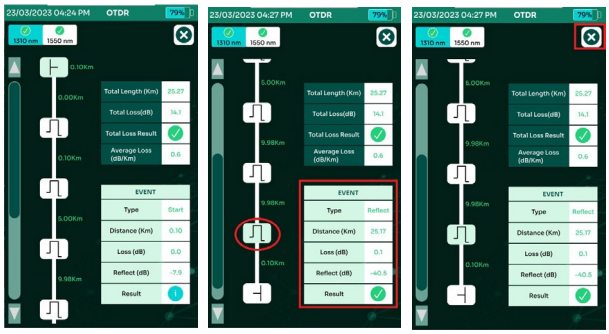
- OTDR Launch and tail cords let the tester measure the loss and reflectance of the first and last connectors in the cabling and also include them in the measurement of overall loss.
  The Launch and tail cords need to be at least 4 to 5 times the length of the pulse width you will be using, 10 times is better. The length of 10ns pulse width is 1 meter.
- Show Launch Cord Trace when disabled will not display the launch cord length in the graph, in order to highlight the cable under test. In this example, 160-meter launch cord will not be shown in the test result graph.
- Show Both Wavelength Trace when enabled will display trace of both wavelength in plot.
- Select [Back] to save the changes made to the limit and length.
- Select [Test]. OTDR test commences.



- Test in progress comes up.
- When test is complete, OTDR will display the test result. Toggle between 1310 nm and 1550 nm (Singlemode) or 850nm and 1300nm (Multimode) wavelength.
- There are two cursor lines A and B, which can be controlled individually by switching with the [A] and [B] buttons. The data table shows the location and dB of cursor lines A and B, as well as the the distance and loss between the cursor lines A and B at row A-B. By default the cursor lines A and B point at the cable start and end events, respectively.



- The event table and event map can be used to display the events.
- Select [Ev.Table], OTDR displays the events in rows and columns format.
- Select an event in the table and the cursor line in the graph jumps to that location of the event.



- Select [Ev.Map], OTDR displays the event location in the cable.
- The distances shown in the event map are the distances between two events. Select an event in the event map and the event details will update according to the type, distance, loss, reflect and result.
- The X closes the Ev.Table and Ev.Map.

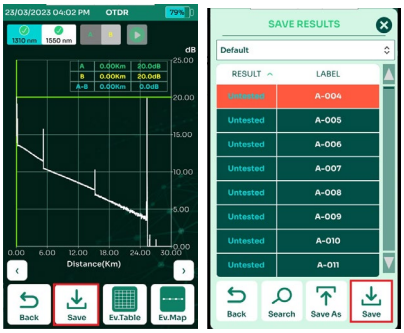
These are the events supported by OTDR:



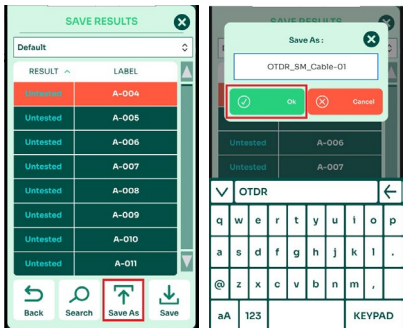
	Reflective event
	Start of fiber
	End of fiber
	Non-Reflective Event

- To zoom in to a specific location, simply select a point in the graph above and left of the area of interest and drag to a point below and right of area of interest and release.
- To exit zoom, select the zoom out icon.

g. Save Test Results

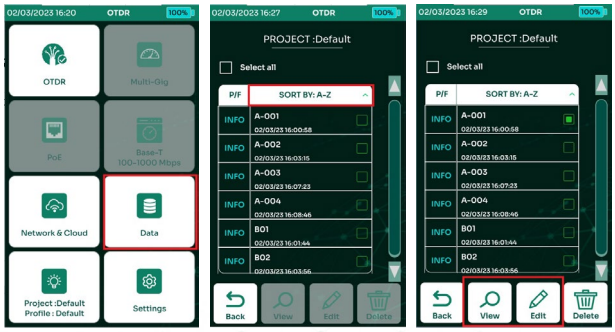


- To save the results, select [Save].
- A list of labels will show up. Choose the label i.e., A-004 and select [Save]. A dialog box will confirm that the results are being saved.



- If the label list runs out or the cable under test is not listed in the label list, click [Save As].
- Key in the label name and select [Ok].

h. Managing Saved Test Results

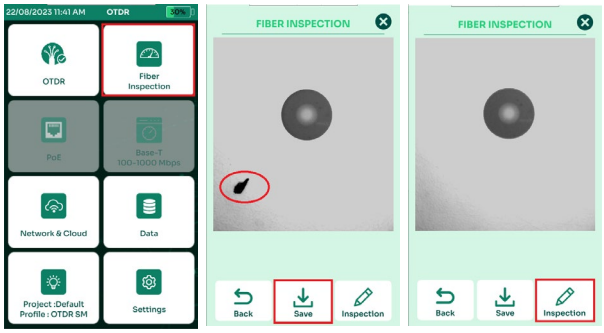


OTDR uses its internal storage to save up to 10,000 test results from different OTDR projects. This results can be exported to TestDataPro PC software via micro USB cable or via USB flash drive. When a project or test results are deleted, it is temporarily backed up in OTDR recycle bin which can be retrieved by TestDataPro. See page xx to import results to TestDataPro PC software.

- To view saved test results saved in the device, select
- {Data] in OTDR main menu.
  A list of test results will be displayed. These test results can be sorted by Name or Date.
- To view or edit the label name, choose a test result and select View or Edit.

3 Fiber Inspection

Dirty fiber components like fiber cable and connectors are one of the major problems in fiber optics, causing high connector loss and reflectance. The fiber inspection feature of TestPro allows user to check the fiber connectors for dirt before testing and installation. TestPro has built-in USB Video Class (UVC) drivers to support any fiber



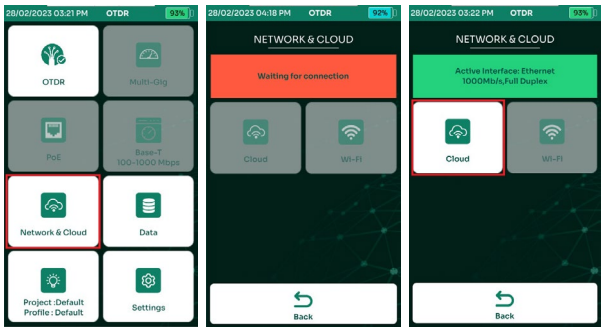
- On the main menu, select [[Fiber Inspection]. TestPro will automatically detect the fiber inspection probe and display the view of the fiber cable in TestPro screen.
- The save feature allows users to compare before and after cleaning the fiber cable. To save the current image being displayed, Select [Save].
- To compare the saved image and the current image displayed, select [Inspection]. This will retrieve the last image saved. Go go back to live image, select [Live].

4 Network and Cloud

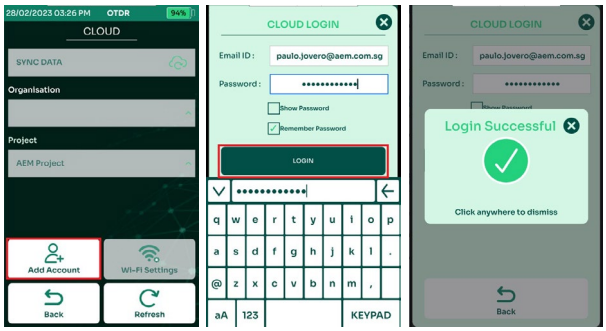
OTDR provides a way for users to upload test results from the device to the Cloud remotely. This is especially helpful when the device is on-site, and results needs to be uploaded urgently. OTDR just needs to be connected to the internet via Wi-Fi or RJ45 port located at the side of the device.

a. Ethernet Port

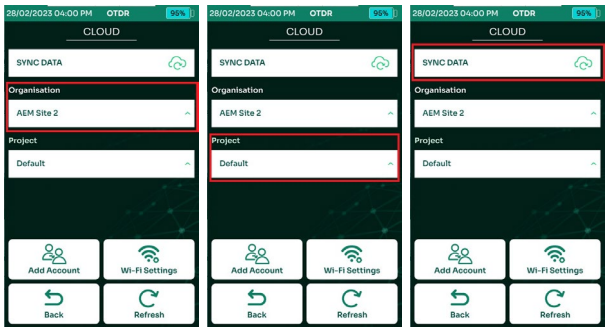
To use the OTDR Ethernet port, simply connect a LAN cable from the device to the networking device i.e., a network switch or router.



- In the Main menu, open Network and Cloud.
- The connect will turn from red to green when the LAN cable is connected, and Cloud gets enabled.
- To sign into Cloud, select [Cloud].



- Select [Add Account].
- Key in the Email ID and Password used during account registration and select Login. If not yet registered, create a free account at www.tdpcloud.com.
- Login Successful.

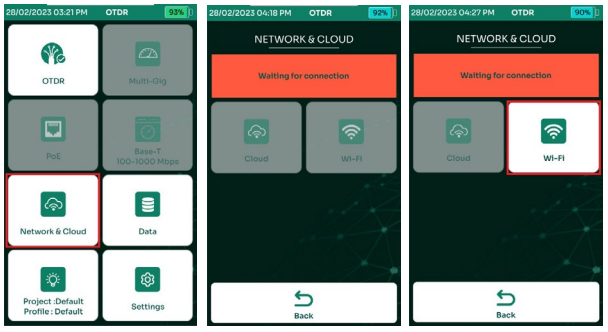


- Choose the Organization where the test results will be uploaded.
- Choose the project to be uploaded to the cloud
- Select Sync Data and OTDR will start uploading the test results to the Cloud under “AEM Site 2” organization and “Default” project name.

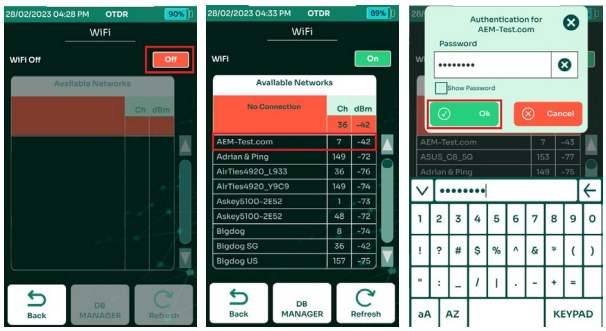
b. Wi-Fi

OTDR test results can be uploaded using Wi-Fi. Users can turn on the Wi-Fi Hotspot of the cell phone, connect the device to the Hotspot and upload test results.

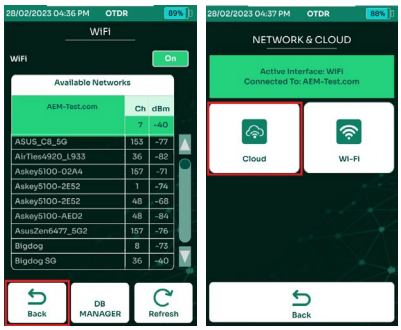
Please note that optional Edimax EW-7822ULC Wi-Fi USB adapter required for Wi-Fi. This adapter is region specific & can be purchased from Amazon or a retailer of your choice.



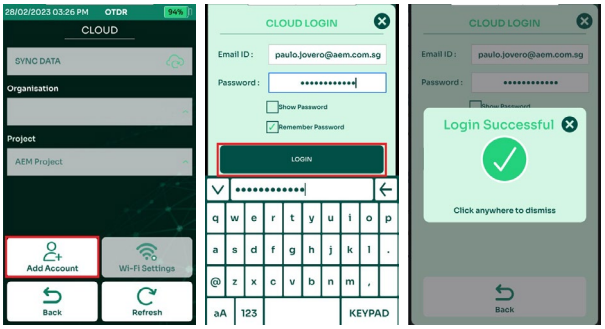
- In the Main menu, open Network and Cloud.
- Select [Wi-Fi].



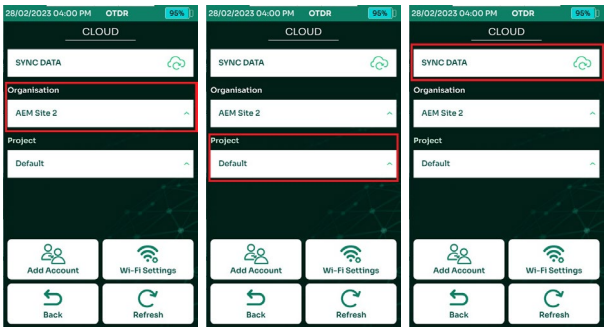
- Turn On the Wi-Fi.
- OTDR will scan for available Wi-Fi access points.
- Choose an access point, key in the password and select Ok



- When Wi-Fi is connected to the access point, select [Back].
- To sign into Cloud, select [Cloud].



- Select [Add Account].
- Key in the Email ID and Password used during account registration and select Login. If not yet registered, create a free account at www.tdpcloud.com.
- Login Successful.



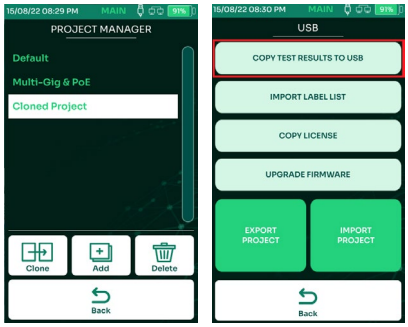
- Choose the Organization where the test results will be uploaded.
- Choose the project to be uploaded to the cloud
- Select Sync Data and OTDR will start uploading the test results to the Cloud under “AEM Site 2” organization and “Default” project name.

5 Test Results Management

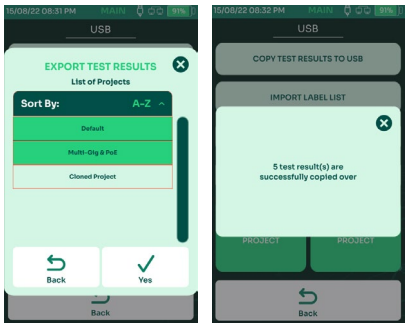
Test data stored in the internal storage of the OTDR unit can be retrieved by connecting a USB flash drive to it. The data can also be retrieved through a USB cable connection between the OTDR and a PC running the TestDataPro software. Results can also be retrieved through TestDataPro Cloud.

a. Transfering Test Results from OTDR

[Copy Test Result to USB] will export all the test results saved inside the device to the USB flash drive.



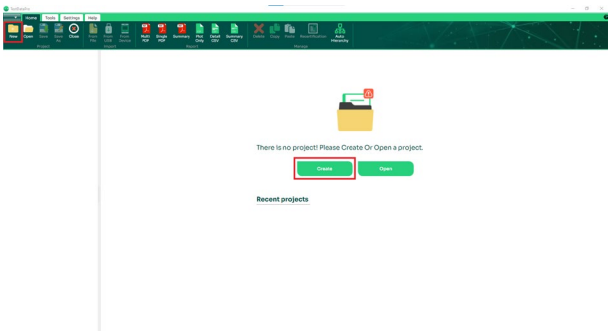
- Example: 3 projects saved in OTDR.
- Insert a USB flash drive to the OTDR USB port and select [Copy Test Results to USB].
- Choose the project(s) that needed to be exported and click Yes.
- A dialog box will confirm the number of test results exported to the USB flash drive.



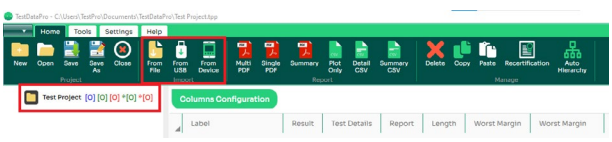
b. TestDataPro Test Management Software

TestDataPro is a test result management software allowing the user to transfer test results from a OTDR unit to a PC or laptop & then manage them according to project, building, floor, rooms, racks and/or panels. Users can also use TestDataPro to view the results or to generate PDF reports.

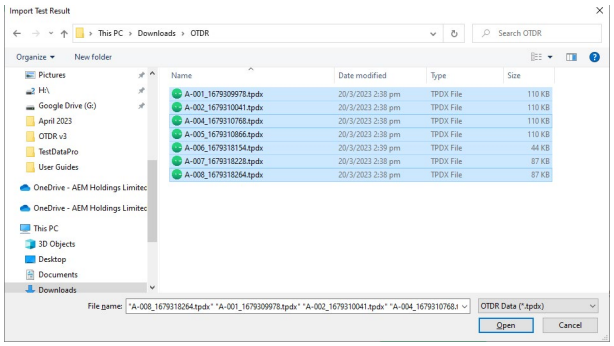
Visit www.aem.test.com/myaccount to download TestDataPro. Install the TestDataPro software and refer to the TestDataPro user guide. The procedures for importing data into TestDataPro and generating test reports are also illustrated in the following pages:



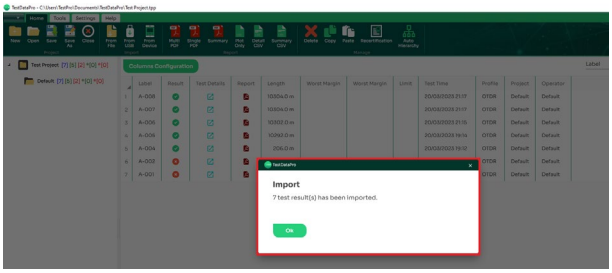
- Select [New] on the top left corner or [Create] to create a new project.



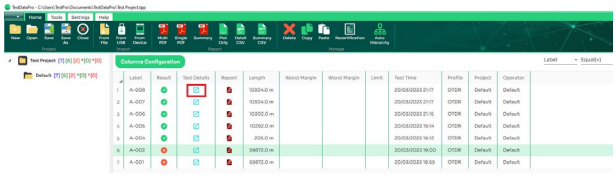
- After a new Test Project is created, select either [From File] - to import test results from any location in the PC or [From USB] - to import test results directly from USB flash drive or [From Device] - to retrieve test results from the OTDR unit.



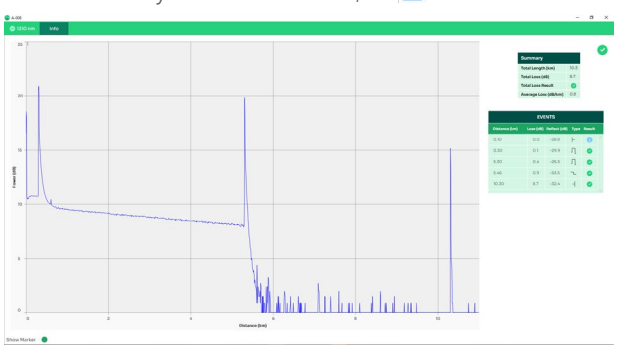
- Browse to the test result folder (i.e USB flash drive), select the tpdx file and click [Open].



- To import from the USB drive, create a new project and click [From USB] >> expand the device serial number >> select the project(s) >> click OK. When importing from the device, click [From Device] the test results will automatically import and sort according to project. A dialog box will confirm once the import is complete.

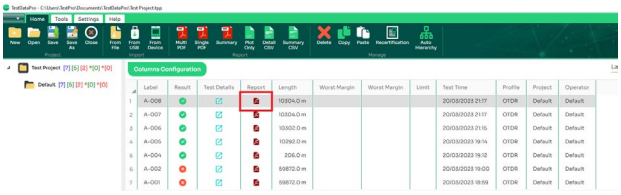


- To view any of the Test Details, clic .

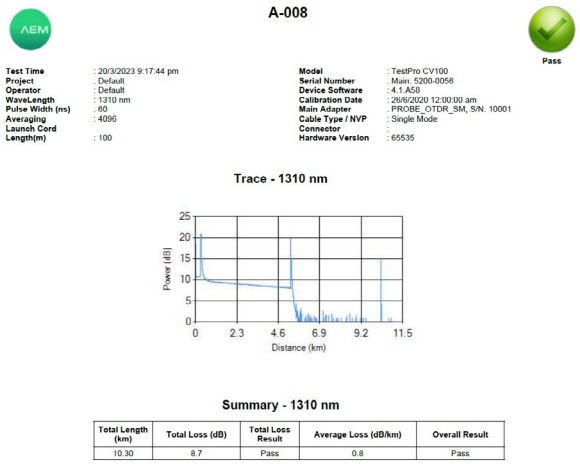


- [Summary] will show the total length (m or km), total loss in dB, total loss result can be pass or fail and average loss in dB per m or km. It also displays the events detected during the test.

c. Generating Test Reports

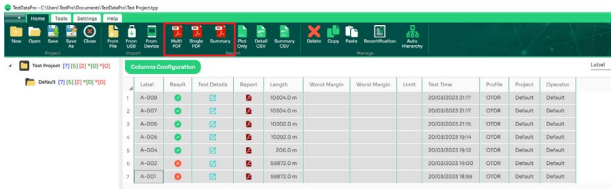


- Click to generate a test report in pdf format.



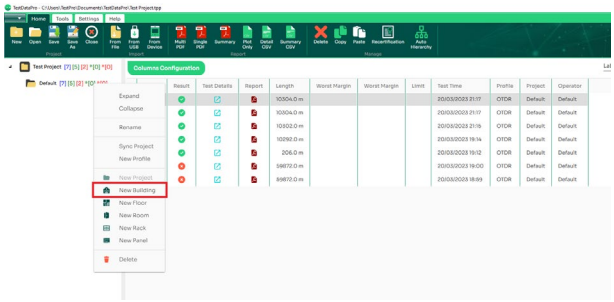
- User will be brought to a page showing the detailed test results.

d. Generating Multiple Test Reports

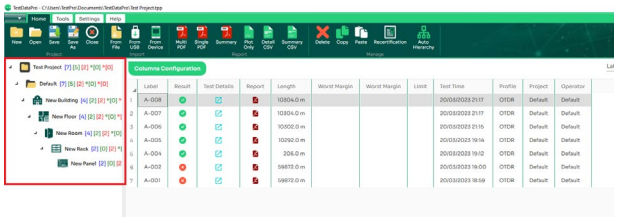


- To export multiple test reports, select all the desired test results and click [Multi PDF] if users wants to split test reports into multiple pdfs. Select [Singple PDF] if user wants to combine all test reports into a single pdf file.

e. Adding Hierarchy

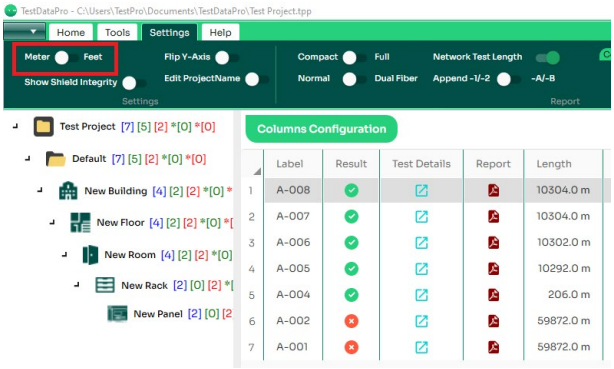


- To add new locations, right click on the project folder and select the type of location i.e., new building, floor, rack or panel.



- To select any of the locations, right click on the project folder and select any of the sub-locations i.e., new building, floor, room, rack or panel.

f. Meter to Feet

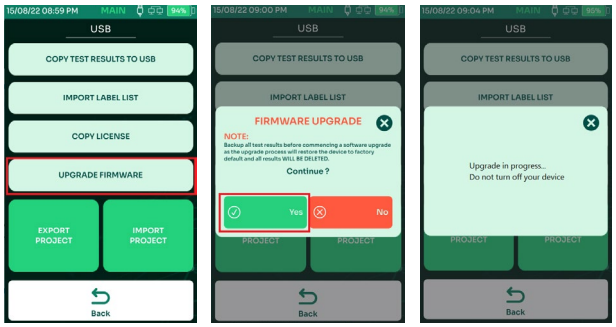


- To change the measurement stand, go to [Settings] tab & toggle between the two options - [meter] and [feet].

6 Firmware & License Updates

a. Firmware Update via USB Flash Drive with OSUpgrade.zip File

OTDR's firmware can be upgraded using the USB flash drive. OTDR firmware version should be 2.4 or later.

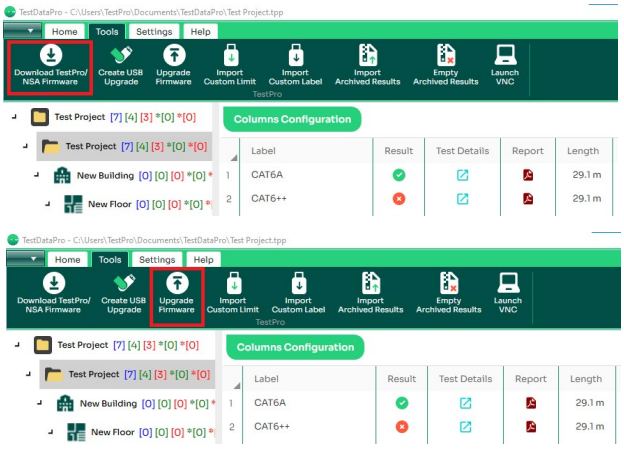


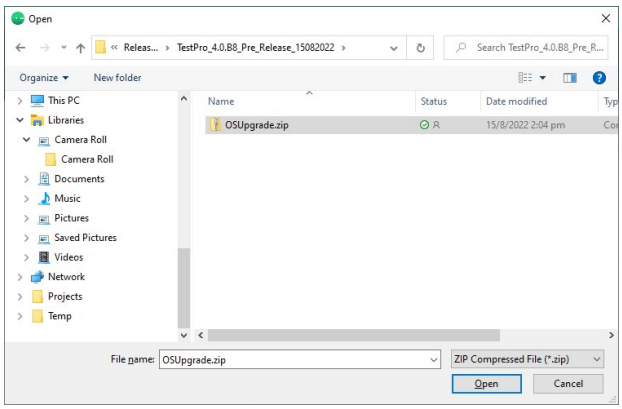
- Insert the USB flash drive. The USB menu will appear. Select [Upgrade Firmware]
- OTDR will remind users to back up test results as the upgrade resets the device to factory settings. Select Yes to accept and No to cancel.
- OTDR will reboot multiple times. The entire process will take 15 minutes to complete.

Note: Ensure that the OTDR unit is attached to a power supply before starting the upgrade process.

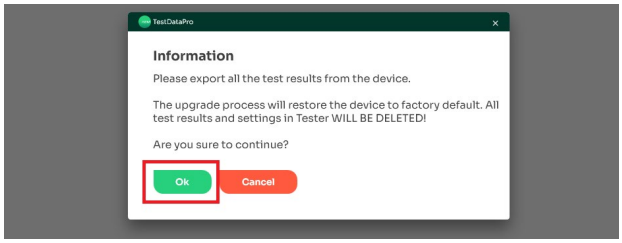
b. Firmware Upgrade using TestDataPro

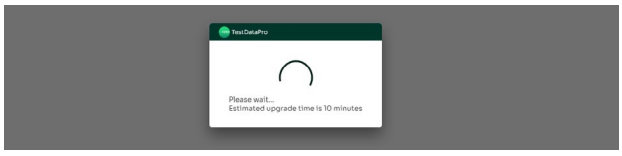
Before starting the firmware upgrade, make sure that the OTDR unit is attached to a power supply. OTDR will reboot multiple times to complete the upgrade.





- Launch TestDataPro. On the main screen, select [Tools] then [Download TesPro/NSA Firmware].
- Save the OSUpgrade.zip to any location on the computer i.e., Downloads
- Once download is complete, select [Upgrade Firmware] and browse to the location of the zip file. Select OSUpgrade.zip and click [Open].





- A dialog box will remind users to back up test results before proceeding with the firmware update. Click [OK] to continue.
- The firmware update will commence. Estimated time for the update is 15 minutes

> ***Note:***
>
> *Please note that the Edimax adapter or any other device, such as a USB memory stick, must be removed from the USB port on the tester prior to packing it up. Failure to do so could result in adapter damage during transport. In addition, the Edimax adapter will always draw power from the tester when it is plugged in.*

OTDR Specifications

Specifications	Multimode	Singlemode
Wavelength Range	850 nm +/- 10 nm	1310 +/- 25 nm
	1300 nm +35/-15 nm	1550 +/- 30 nm
Compatible Fiber Type	50/125 µm, 62.5/125 µm for multimode	Single mode
Event Dead Zone	0.5 m typical for 850 nm, 4.5 m typical for 1300 nm	0.6 m typical for 1310 nm, 0.6 m typical for 1550 nm
Attenuation Dead Zone	2.5 m typical for 850 nm, 4.5 m typical for 1300 nm	3.6 m typical for 1310 nm, 3.7 m typical for 1550 nm
Dynamic Range	25 dB for 850 nm, 27 dB for 1300 nm	29 dB for 1310 nm, 27 dB for 1550 nm
Max Distance Range Setting	40 km	130 km
Distance Measurement Range	9 km for 850 nm, 35 km for 1300 nm	80 km for 1310 nm, 130 km for 1550 nm
Reflectance Range	-14 dB to -57 dB for 850 nm, -14 dB to -62 dB for 1300 nm	-14 dB to -65 dB for 1310 nm, -14 dB to -65 dB for 1510 nm
Pulse Width	3, 5, 10, 15,...., 24995, 25000 nsec	3, 5, 10, 15,...., 24995, 25000 nsec

TestPro/NSA Specifications

Battery
- Lithium ion
- 3.6V
- 15300 mAh
- Approximate test time : 8 hrs (based on an approximate 200 test per day)
- Charging time : 7 hrs

Power Adapter
- 5V, 3A (supplied)
- 5-12V (supported)
- 2.1mm DC jack

Operating System
- Linux

RJ45 Test Ports
- 10/100/1G Test Port
- Network Connectivity Port

Adapter Interface
- 60-pin high-frequency connector rated for 5000 insertion cycles
- Hot Swappable

Test Data Management
- TestDataPro PC Software

Data Transference
- USB Flash Type A
- Micro USB
- USB Cable

If the results from the measurements are within the specified limits, then the cable-under-test will be deemed to have passed the test. If the measurement results are not within the specified limits, then it has failed the test.

Technical Support

Live Phone Support :
Monday - Friday | 8am-5pm (Arizona,USA)
T : 480-534-1232
Toll Free : 833-572-6916

Email Monitored 24hrs
customercare@aem-test.com

For more information and details specifications, please visit: AEM-Test.com/OTDR

If you need technical assistance, please visit us at: AEM-Test.com/customer-care

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F: +65 6483 1822