AFL

Test & Inspection

FlexScan® FS300 QUAD and HDR OTDRs

User's Guide

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Safety and Legal

This user's guide provides operating instructions for testing fiber optic networks with your FlexScan OTDR and assumes that you have basic knowledge about testing fiber optic networks. The purpose of this user's guide is to explain how to use and maintain your FlexScan OTDR. Please check our web site at **www.AFLglobal.com**, **Test and Inspection** for updates to this user's guide and additional application information.

Warranty Terms and Conditions

AFL products are warranted against defective material and workmanship for a period of (1) one year from the date of delivery to the end user. Any product that is found defective within the warranty period will, at the discretion of AFL, be repaired or replaced. Warranty will be voided if the product has been repaired or altered by other than an authorized AFL product repair facility, if the void sticker has been compromised, or which have been subject to misuse, negligence, or accident. In no case shall AFL liabilities exceed the original purchase price.

Safety Information

WARNING! Use of procedures or adjustments other than those specified herein may result in hazardous radiation exposure.

850/1300 nm MM OTDR/OLS port	**This is a CLASS I LASER output.**
1310/1550 nm SM OTDR/OLS port	**This is a CLASS I LASER output.**
1310/1550/1625 nm SM OTDR/OLS/PON OPM port	**This is a CLASS I LASER output.**
VFL port	**This is a CLASS IIIa/3R LASER output. Avoid exposure to the beam!**

NOTE! FlexScan OTDRs equipped with Bluetooth/Wi-Fi (option W1) contain the following two Bluetooth / Wi-Fi Transmitter Modules:

FCC ID: X3ZBTMOD8 FCC ID: Z64-WL18DBMOD

IC: 8828A-MOD8 IC: 451I-WL18DBMOD

WARNING! Use only the specified AC adapter. Use of another type of AC adapter can damage the instrument and create the danger of fire and electrical shock.

WARNING! To avoid the danger of fire and electrical shock:

- Never use a voltage that is different from that for which the AC adapter is rated.
- Do not plug the unit into a power outlet that is shared by other devices.
- Never modify the power cord or excessively bend, twist, or pull it.
- Do not allow the power cord to become damaged.
- Do not place heavy objects on the power cord or expose it to heat.
- Never touch the AC adapter while your hands are wet.
- Should the power cord become seriously damaged (internal wiring exposed or shorted), contact the manufacturer to request servicing.
- **CAUTION!** Do not run any tests or perform functions that activate a FlexScan laser unless fiber is attached to the corresponding port.
- **CAUTION!** To avoid serious eye injury, never look directly into the optical outputs of fiber optic network equipment, test equipment, patch cords, or test jumpers. Refer to your company's safety procedures when working with optical systems.

- **NOTICE:** Except user replaceable battery, FlexScan OTDR contains no user-serviceable parts, it must be returned to AFL or authorized agents for repair and calibration.
- **IMPORTANT:** Proper care in handling should be taken when using any precision optical test equipment. Scratched or contaminated optical connectors can impact the performance of the instrument. It is important to keep the dust caps in place when the unit is not being used.
- **IMPORTANT:** Always clean OTDR port and any mating connectors using approved cleaning supplies (e.g. One-click cleaner) before mating the connectors.

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Hardware and User Interface Overview

AFL's FlexScan FS300 series includes both a combined single-mode/multimode test set and a high dynamic range single-mode test set. Both are feature-rich solutions for detecting, identifying, locating, and resolving optical network issues. Designed for novice and expert technicians alike, these devices excel in diverse environments including data centers, fiber-to-the-home deployments, and long-haul networks. The FlexScan FS300 automates test setup, shortens test time, and simplifies results interpretation, improving efficiency and reducing costs. The FlexScan FS300 product family includes an integrated VFL, broadband and/or PON power meter, and light source. They can be easily paired to AFL's award-winning FOCIS family of inspection scopes for single-fiber and/or MPO and OptiTip® multifiber inspection, ensuring technicians have everything they need to locate and resolve optical network issues.

Key Features:

- Models Include:

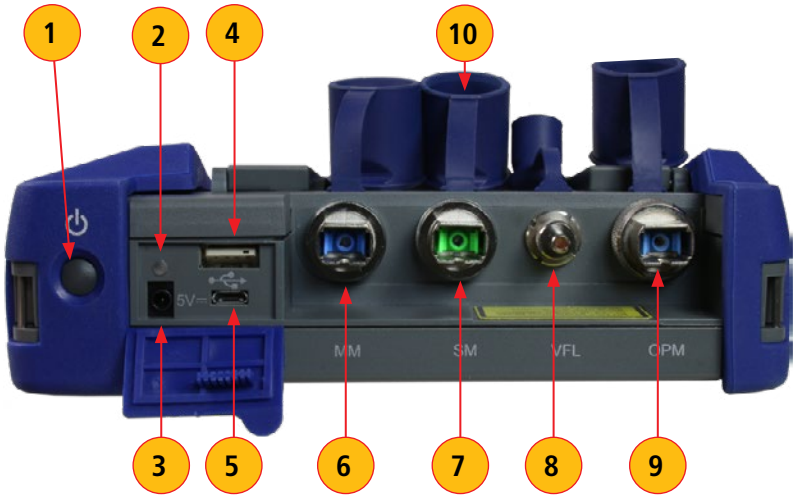
FlexScan FS300 Model	Wavelengths (nm)
FS300-320 HDR OTDR	1310/1550
FS300-323 HDR OTDR	1310/1550/1625
FS300-325 Quad OTDR	850/1300/1310/1550

  - Single-mode PON and point-to-point testing at 1310, 1550 and/or 1625 nm
  - Multimode point-to-point testing at 850 & 1300 nm
- Results Views:
  - LinkMap® view – network configuration & status at-a-glance
  - Trace view – for expert users
- Test Modes:
  - SmartAuto® test mode – Auto test using multiple, network-optimized pulse widths, averaging times, etc.
  - SmartAuto-FleXpress - faster SmartAuto tests
  - Expert and Real-Time test modes – more user-controlled settings
  - Data Center test mode – lightning fast multifiber tests
- Pass/Fail Analysis
  - Overall network health
  - Fault Detection: Location and reason
- Integrated Print to PDF
- Integrated OLS, Broadband OPM, PON OPM, VFL
- Pairs with FOCIS Flex/Duel/Lightning Inspection
- Manages AFL MPO-12/24 optical switches

Hardware Overview

Controls and Interfaces

FlexScan FS300 Model	Wavelengths (nm)
FS300-320 HDR OTDR	1310/1550
FS300-323 HDR OTDR	1310/1550/1625
FS300-325 Quad OTDR	850/1300/1310/1550



Ref	Feature	Description
1	Power button	Press to power FlexScan OTDR on/off.
2	AC/Charger indicator	Illuminates when AC is connected and indicates battery charging status. • RED light = rechargeable battery is charging. • GREEN light = rechargeable battery is fully charged.
3	Power port (5 VDC)	This is interface for the AC power adapter/charger.
4	USB host port	This USB port may be used to connect USB Flash Drive for data storage, results backup or to update FlexScan software.
5	Micro-USB function port	With the supplied USB cable, this port may be used to connect OTDR to a USB host port on a PC to upload stored results, PDF printouts and captured screen images.
6	Multimode OTDR/Source port (FS300-325 only)	**This is a CLASS I LASER output.** Multimode OTDR/Light Source port.
7	Single-mode OTDR/Source/PON OPM (PON OPM is optionally available for the FS300-323 only)	**This is a CLASS I LASER output.** Single-mode OTDR/Light Source port.

Hardware

Controls and Interfaces

Ref	Feature	Description
8	VFL port	**This is a CLASS IIIa/3R LASER output. Avoid exposure to the beam!** The VFL (visual fault locator) port is a 635 nm (visible red) laser. Used for short-range fault-location.
9	Broadband power meter port	Optical Power Meter port. Used for power (dBm, nW) or loss (dB) measurements.
10	Dust cap	Used to protect optical ports from dust/damage. It is important to keep the dust caps in place when the unit is not being used.
11	Touchscreen display	5" 800 x 480 Color Backlit LCD and Gesture-Recognition Touchscreen.
12	Home button	Press to access the Home screen.
13	Test start/stop button	Press to start a new test; or, if a test is running, stop the current test.
14	Capture screen image button	Press to capture the displayed image
15	VFL button	Use the VFL button to control the VFL laser: Press and hold ~ 1 sec to enable VFL at ~2 Hz flash rate Press and hold ~ 2 sec = CW Press and hold ~ 1 sec to switch off
16	VFL indicator	When the VFL port is active this indicator illuminates as follows: Flashing RED = VFL flashing at ~2 Hz rate Solid RED = VFL on CW OFF = VFL is off

Battery Charging

You may charge the battery while your FlexScan is switched on or off by attaching the supplied AC charger.

- Plug the included AC charger into AC outlet.
- Connect charger plug to the Power port.
- AC/Charger indicator will illuminate to indicate charging status as follows:
  - **RED** - Charging battery
  - **GREEN** - Fully charged
  - **OFF** - AC disconnected
  - **Flashing RED/GREEN** - Charging halted due to over-temperature.
- FlexScan charges while operating.
- A fully-charged battery operates for approximately 12 hours of typical use.

Understanding Battery Charge Status

When FlexScan is ON, battery icon shown on the display indicates battery status as follows:

- Battery fully charged
- Battery partially charged
- Battery discharged
- Battery charging

Battery fully charged, Battery partially charged, and Battery discharged symbols will only be shown when unit is operating without being connected to AC.

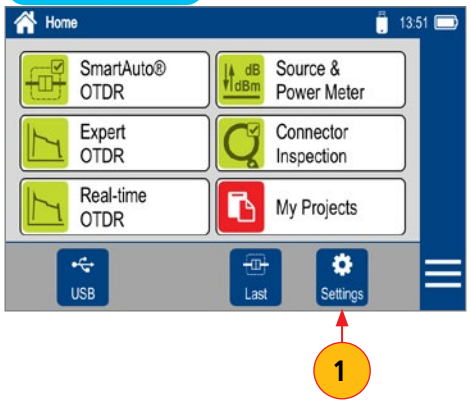
Configuring FlexScan to Auto Off

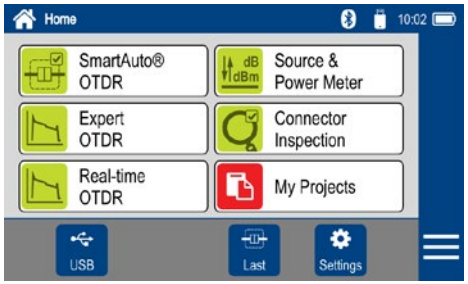
The Auto-Off feature is available for conserving battery power on your FlexScan.

To Configure the Auto Off Timer:

1. Turn your FlexScan On. From the displayed Home screen, touch Settings.
2. In the Settings menu, touch the Auto Off Timer field to display the settings sub-menu.
3. Select the desired power save option (5 min, 15 min, Never).

Home Screen





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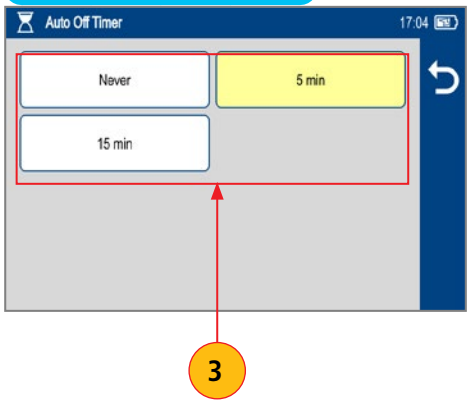
Auto Off Timer Screen

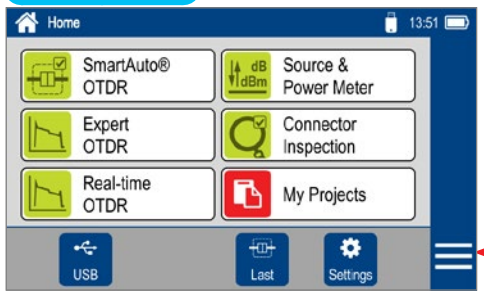


How to View Device Information

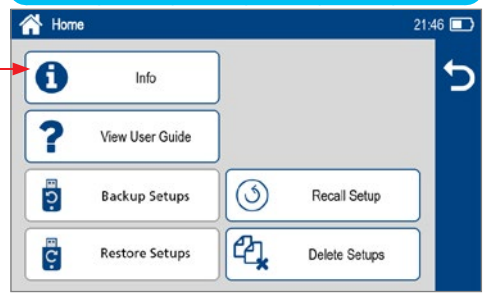
FlexScan software revision, serial number, and calibration date can be viewed from the Device Information screen, which is accessed from the Home screen.

1. From the Home screen, touch the Menu soft key.
2. From the displayed sub-screen, touch the Info tab.
3. View FlexScan Info displayed on the Device Information screen.

Home Screen



Menu Accessed from Home Screen



- **Info:** Display device info.
- **Backup Setups:** Backup setups for USB memory stick.
- **Recall Setup:** Recall saved OTDR or OPM setup.
- **Restore Setups:** Restore setups to FS300 from the USB.
- **Delete Setup:** Select and delete saved setup.

Model Number: Displays the Model Number of your FlexScan

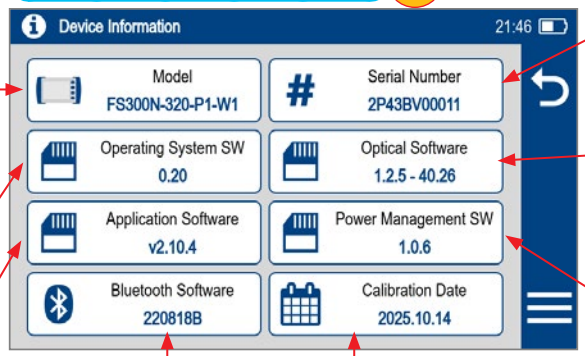
- FS300-325: 850/1300 nm Multimode plus 1350/1550 nm Single-mode OTDR
- P0/P1 indicates Source & Power Meter option installed (P1) or not installed (P0)
- P2 indicates hardware support for PON OPM. **Note:** Requires separate purchase to activate this feature.
- W0/W1 indicates Bluetooth/Wi-Fi option enabled (W1) or disabled (W0)

Operating System SW: Revision of the current Operating System software

Application Software: Revision of the current User Interface software

Bluetooth/Wi-Fi Software: Revision of the current Bluetooth/Wi-Fi software

Device Information Screen 3



Serial Number: FS300 serial number

Optical Software: Revision of the current optical firmware

Power Management SW: Revision of the current power management software

Cal Date: FlexScan's last calibration date

Notes:

- Scroll screen up/down with your finger to see additional information
- Touch Back to return to previous screen

User Interface Overview

Home Screen Features

The Home screen is the FlexScan's Main screen that is displayed at startup. While in any other screen, return to Home by either pressing the Home button or touching and holding (if available) the Back soft key. This screen contains menus of Test and Utility modes that allow users to set test parameters, select user preferences, manage saved test results, configure general settings and perform other non-test functions.

Test Modes and Features Summary

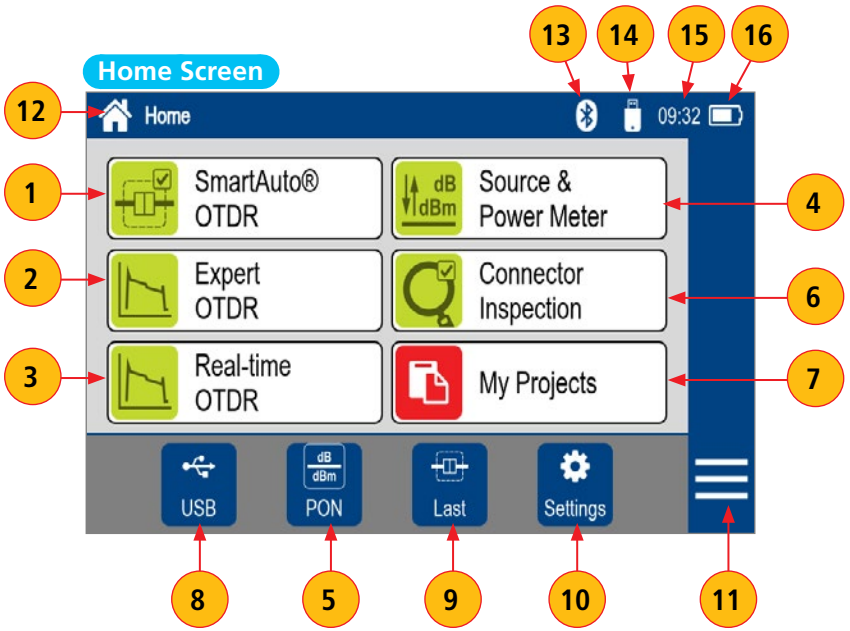
Test Modes: Smart Auto, SmartAuto-FleXpress, Expert, Rea-time, Data center OTDR,

1. **SmartAuto® OTDR** (recommended): Configure and run SmartAuto OTDR test using multi-pulse acquisition. FleXpress (fast test mode for Point-to-Point networks only) can be optionally selected in Test Type after selecting SmartAuto.
   - **SmartAuto-FleXpress** - faster SmartAuto tests
2. **Expert OTDR:** Configure and run Expert OTDR test with averaging.
3. **Real Time OTDR:** Configure and initiate OTDR test with real-time updates.

   Data Center OTDR (HDR models only): Separately purchased
4. **Source & Power Meter (Broadband Power Meter):** Enable light source and/or measure optical power.
5. **PON Power Meter** (optional on FS300-323 model only): Touch to configure PON OPM settings.
6. **Connector Inspection:** View connector inspection results received via Bluetooth from FOCIS Flex, or FOCIS Lightning probe.

Utility Modes and Features Summary

7. **My Projects:** Touch to view test results.
8. **USB:** Touch to enable file transfer. Enabling this mode allows the user to connect to a PC to upload results to the PC or download software updates from the PC.
9. **Last:** Touch to view the most recent test results.
10. **Settings:** Touch to access General Settings menu that contains Unit settings, user preferences, and common OTDR settings.
11. **Menu:** Touch to view the Home screen menu.
12. **Screen Title:** Name of the currently displayed screen.
13. **Bluetooth Icon:** Indicates Bluetooth enabled.
14. **USB:** Indicates external USB memory stick detected.
15. **Time of day.**
16. **Battery Icon:** Indicates battery charge level.



General Settings and Common Functions & Features

Configuring General Settings

While in the General Settings screen:

- Touch the desired settings option (e.g. Distance Units) to display a sub-menu.
- Touch Left/Right arrows to display additional General Settings screen.
- Touch Back to return to the previous menu.

Language

1. **Language:** touch to select the desired language (English, Finnish, French, German, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Simplified Chinese, Spanish, Traditional Chinese, Turkish, Vietnamese.).

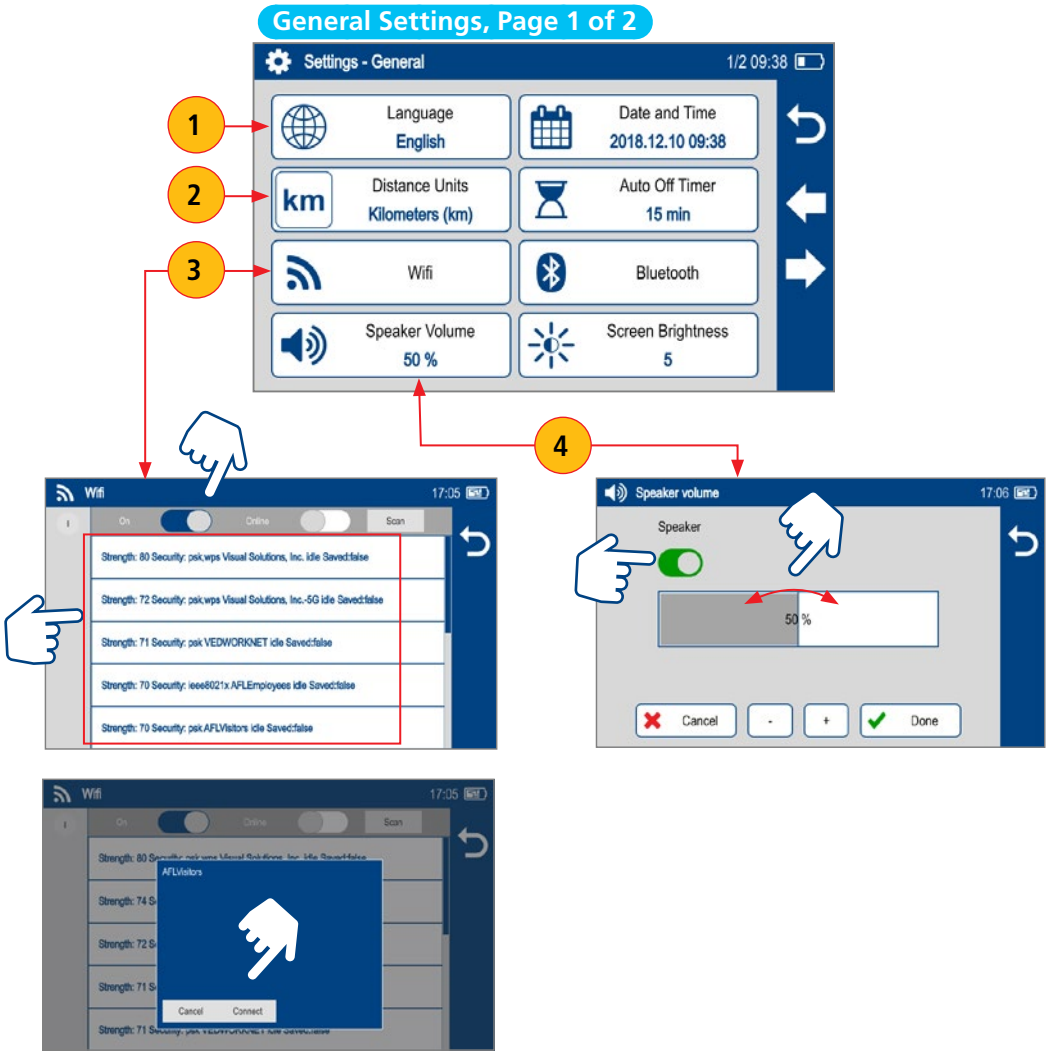
Distance Units

2. **Distance Units:** select as desired - kilometers, meters, kilofeet, feet, miles.

3. **Wi-Fi:** When available, touch to configure Wi-Fi
   - Enable Wi-Fi
   - Scan for networks
   - Select from available networks
   - Connect & enter password if required

Speaker Volume

4. **Speaker Volume:** touch to display a sub-screen, where
   - If Speaker disabled, touch the on/off control / to turn the Speaker on.
   - Touch and/or touch and drag the adjustment slider right/ left to increase/decrease the Speaker volume. Or, press [+] / [-] controls for precise adjustments of 10% by step.
   - Touch Done to save changes and return to the General Settings screen.



Date and Time

5. **Date and Time:** touch to display a sub-screen, where
   - Touch the desired Time/Date Parameter to enable it.
   - Use controls [+] / [-] to change the selected parameter value.
   - Touch Done to save changes and return to the General Settings screen.
   - Touching Cancel or Back will return to the Settings menu without saving edits.

Auto Off Timer

6. **Auto Off Timer:** Touch to display a sub-screen and select Auto Off option: 5 min, 15 min, Never.

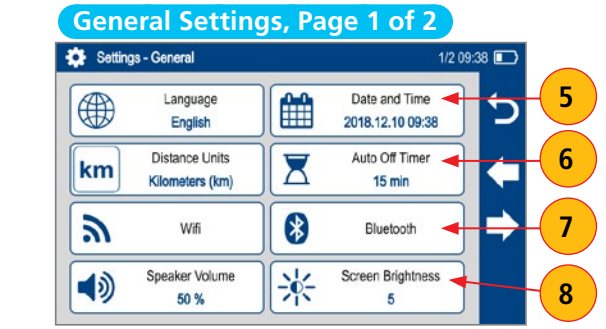
Bluetooth

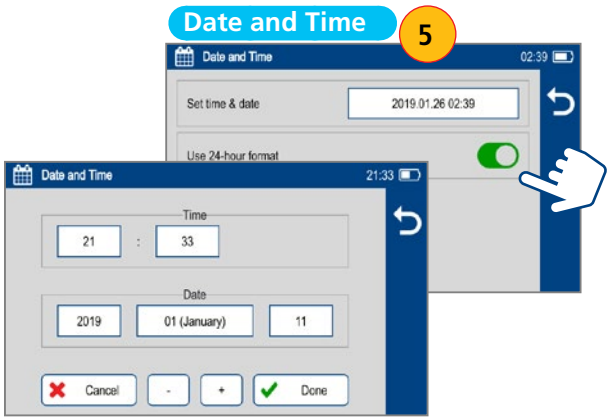
7. **Bluetooth:** Touch to display a sub-screen and enable Bluetooth.
   - Enable Bluetooth by touching the on/off control
   - To pair to a new device: Select Pair New Device to scan for and pair to another Bluetooth device
     – Select Scan to discover devices, then select device from list to pair
   - To pair to a previously used device: Select Previously Connected to view and select from list of previously connected devices
     – Touch a previously connected device to reconnect; Solid star (★) indicates selected device

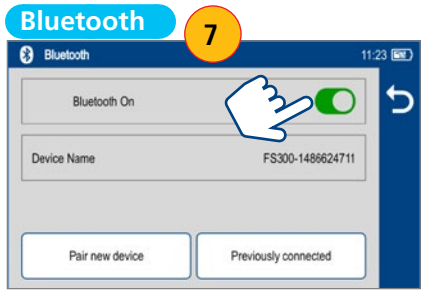
Screen Brightness and Auto-dim

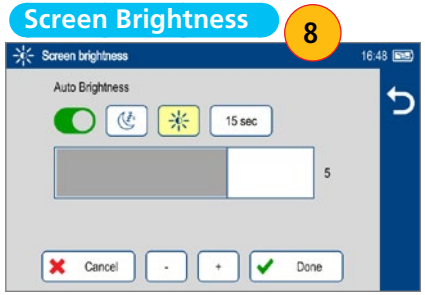
8. Screen Brightness and Auto-**dim**:
   - Touch the on/off control ◐/◑ to enable/disable the Auto Brightness feature.
   - When the Auto Brightness feature is disabled ◑, you may adjust Brightness by touching and/or touching and dragging the adjustment slider right/left to increase/decrease the Brightness value.
   - Or, you may press the [-] and [+] controls for precise adjustments of 10% by step.
   - When the Auto Brightness feature is enabled ◐, you may adjust several parameters: Auto-dim, Brightness, and Timer control. Make adjustments using sliders for dimmer, for brightness or controls for all.
   - Touch Zzz button, then touch [+] or [-] to adjust auto-dimmed display brightness.
   - Touch Sun button, then touch [+] or [-] to adjust normal display brightness.
   - Press Done to save changes and return to the General Settings screen.

When back in the General Settings, touch Left/Right arrows to display General Settings Screen # 2.









Configuring Auto-Save (and Optional Send)

9. Auto-Save / Send

FS300 may be configured to automatically save and optionally send results when each test completes. Results may be wirelessly transferred via Bluetooth to iOS or Android device equipped with the free FlexApp.

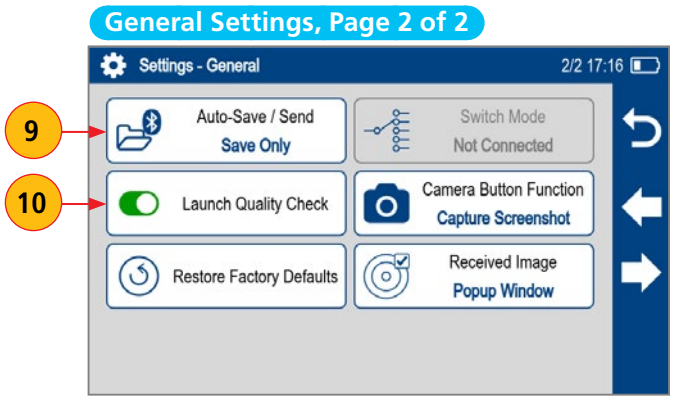
Transferred results may be wirelessly sent by mobile device to remote location for reporting using FlexReports cloud-based software.

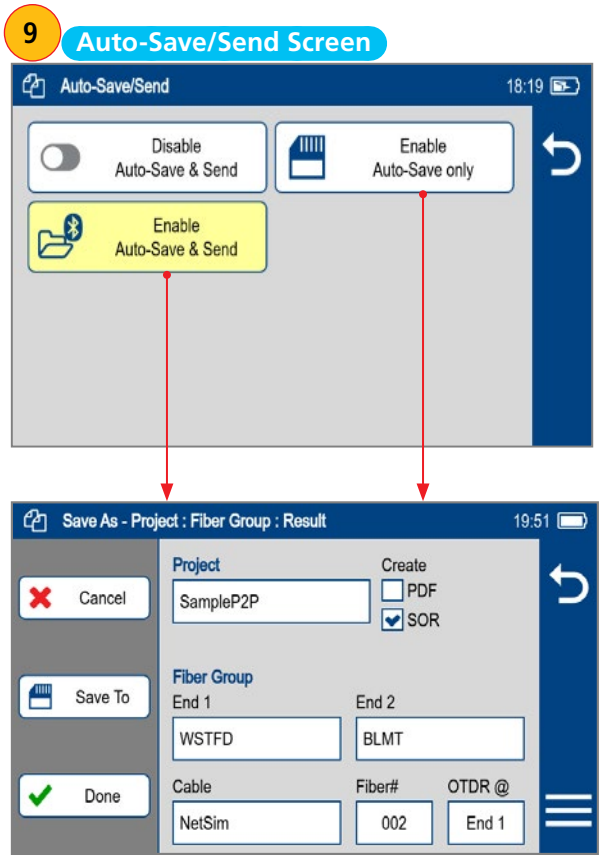
- Touch Auto-Save / Send to display additional screen and touch the desired option:
  - Disable Auto-Save & Send – Results will not be automatically saved or sent.
  - Enable Auto-Save only – Results will be saved, but not sent.
  - Enable Auto-Save & Send – Results will be saved and sent to a Bluetooth-paired mobile device running AFL FlexApp.
- If Auto-Save or Auto-Save & Send selected, Configure Project, End 1, End 2, Cable names, and Fiber# for saved results and touch Done.
- If Auto-Save enabled, results will be saved to the configured destination (internal memory or USB stick), Project, Fiber Group folder, and the Fiber# will be incremented each time a test completes.
- If Auto-Save & Send enabled, results will be wirelessly transferred via Bluetooth to iOS or Android device equipped with the free FlexApp.

Launch Quality Check

10. Launch Quality Check: Touch the on/off control to enable/disable check of the OTDR connection quality at start of each OTDR test.

- Poor launch quality is reported when excess loss or excess reflection is detected at the OTDR connection.
- Poor launch quality may result from:
  - Dirty or damaged OTDR and/or jumper connectors – Always clean OTDR port and jumper connectors before connecting to OTDR and network-under-test
  - Mismatched PC and APC connections at the OTDR – Always mate APC to APC and PC to PC.
  - Loose OTDR connector – Verify replaceable connector adapter on the OTDR port is fully tightened
  - Wrong OTDR port selected – Quad OTDRs have separate single-mode and multimode OTDR ports





Restore Defaults

11. Restore Defaults: After updating software or anytime you wish to restore the FlexScan to its factory-default settings, you may restore factory defaults by selecting Restore Defaults.

Switch Mode

12. **Switch Mode:** Touch to configure MPO switch settings.
    - MPO Switch Control is available only when AFL's MPO-24 Switch or MFS Switch is enabled and connected to FS300 via USB cable.
      – Error message appears if Switch Mode selected with no MPO switch connected and enabled.
    - When MPO Switch is connected, up to 12 multimode or 24 single-mode fibers may be tested in a single SmartAuto or Expert mode test. See "Configuring Automatic MPO Switch Control" on page 28

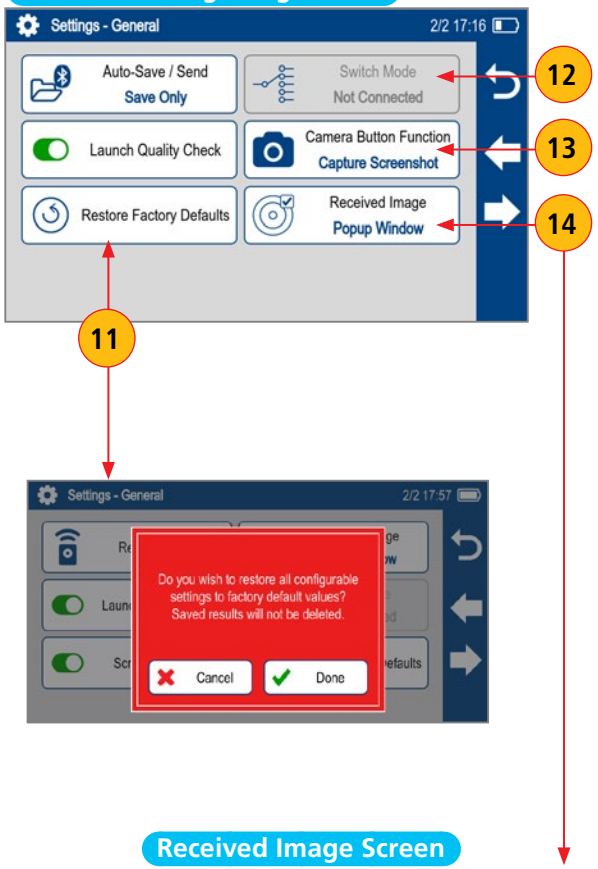
Camera Button Function

13. **Camera Button Function:** Enable Screenshot Mode to allow currently displayed screen to be captured and saved to internal memory.
    - Screenshot Mode allows the currently displayed screen to be captured and saved to internal memory.
    - When Screenshot Mode is enabled, press the Camera button to capture the currently displayed screen.
    - Captured image is saved to \SCREENSHOTS folder in the internal memory.
    - Captured Images are sequentially numbered.
    - Connect to USB port and enable USB from the Home screen to upload images to a PC.

Received Image

14. **Received Image:** FlexScan® FS300 accepts connector inspections images via Bluetooth® from FOCIS Flex and FOCIS Lightning2 inspection probes.
    - Received images may either be immediately displayed (Popup Window selected) or may be stored in memory for display when Connector Inspection selected from the Home screen (Show in Tray selected).
    - Touch to display a sub-screen and select an option for displaying inspection results transferred from the FOCIS Flex probe:
      – Display received Inspection results in popup window
      – Save received Inspection results in background and show notification in tray.

General Settings, Page 1 of 2



Received Image Screen

Managing Test Setups

The FlexScan FS300 supports OTDR and Power Meter Test Setups to be created, saved, transferred to an external device, and recalled in the field, simplifying testing and avoiding user setup errors.

There are two ways to access and manage Test Setups: from the Home screen or from the each test node test setups screen. Both methods are described below.

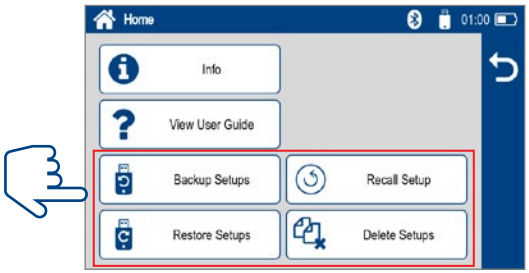
I Method **Access Test Setups from the FS300 Home screen**

This method allows you to manage previously created and saved Test Setups.

- On the Home screen, select Menu. Next screen displays four options:
  - Backup Setups to external device
  - Restore Setups from external device
  - Recall Setup: Select and recall a test setup from a list of saved setups
  - Delete Setup: Delete a test setup from a list of saved setups

Home Screen

Test Setup Manager

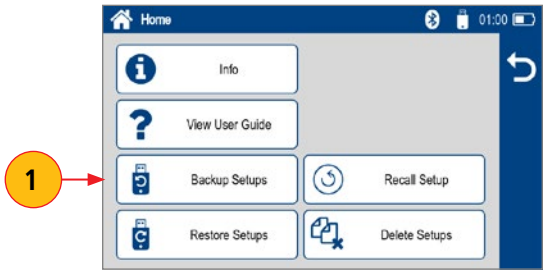


Backup Setups

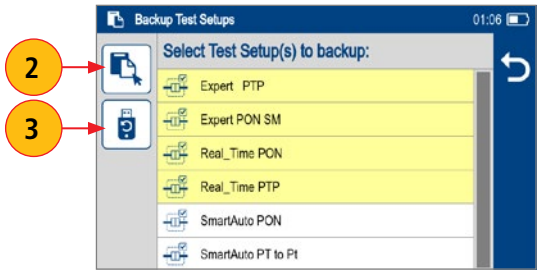
Insert USB stick into FS300 USB port.

1. On the Test Setups screen, touch Backup Setups to view a list of the previously saved setups.
2. On the next screen, select the desired file(s):
   - You may touch Add Files icon to select all files.
   - Or you may touch individual files to select as many files as needed.
3. Touch the USB icon to backup the file(s) to the USB.

Test Setup Manager



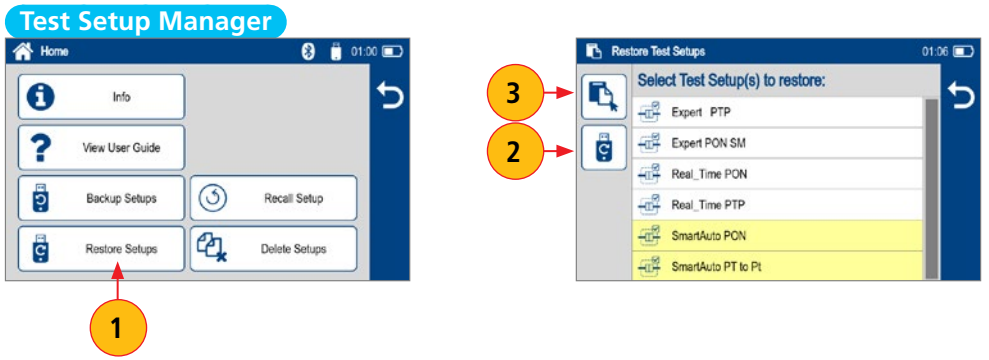
Test Setup Manager



Restore Setups

Insert USB stick into FS300 USB port.

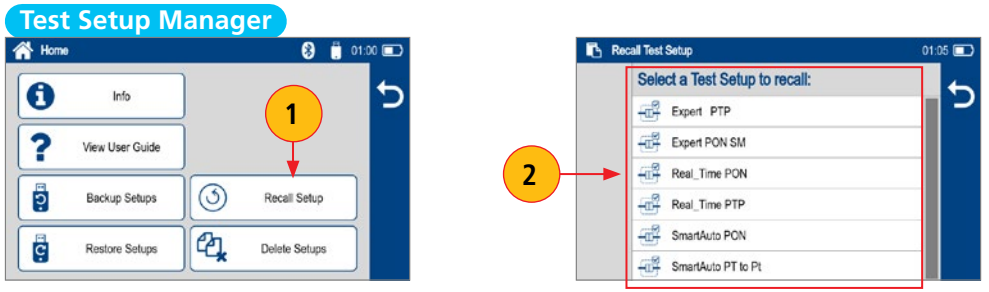
1. On the Test Setups screen, touch Restore Setups.
2. Touch USB to view a list of the setups previously backed up to that USB.
3. On the next screen, select the desired file(s):
   - You may touch Add Files icon to select all files.
   - Or you may touch individual files to select as many files as needed.



Recall Setup

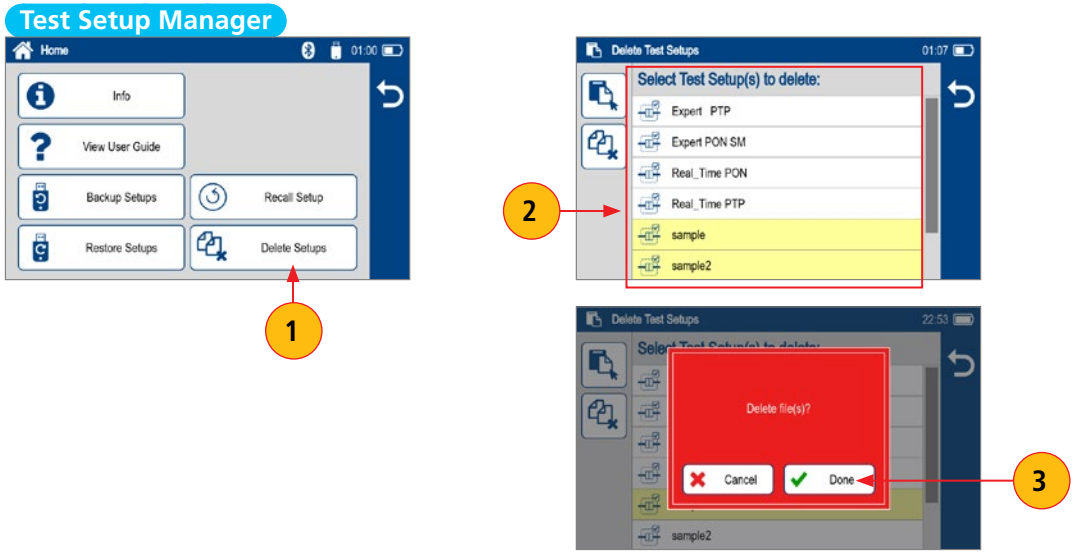
1. On the Test Setups screen, touch Recall Setup to view a list of the previously saved setups..
2. Select the test setup file to be recalled.

Note: Recalled test setups can be edited and re-saved, if desired.



Delete Setup

1. On the Test Setups screen, touch Delete Setup to view a list of the previously saved setups.
2. Select the desired test setup file(s) to be deleted.
3. Touch Done to confirm.



II Method Access Test Setups from the Current Test Mode

This method gives you the same options as the Test Setups menu accessed from the Home screen plus additional option to save a test setup.

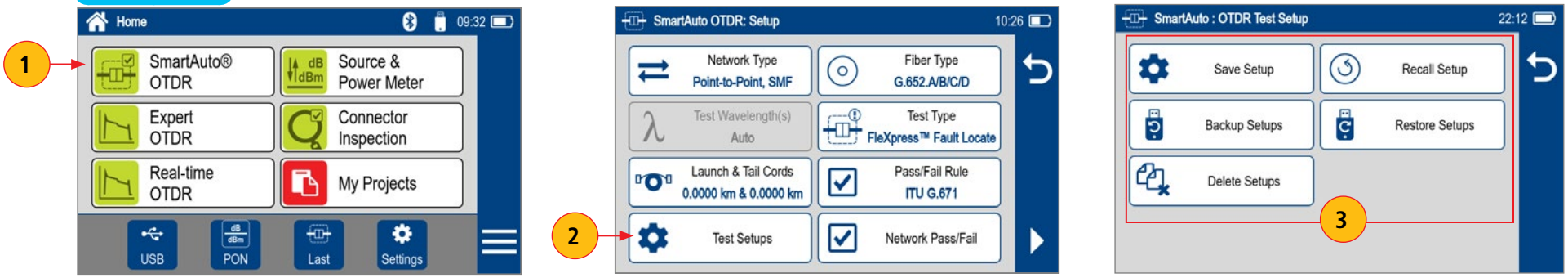
- Save Setup - Name and save the current setup for later recall.

1. From the Home screen select the desired OTDR or OPM test mode. Example screens below show steps sequence for the SmartAuto OTDR test mode.
2. While in the desired test mode, configure test settings as needed. When done, select the Test Setup option.
3. Next screen allows you to
   - Save Setup
   - Backup Setups
   - Delete Setups
   - Recall Setup
   - Restore Setups

Notes

- Refer to individual OTDR and OPM sections for details:
  - "SmartAuto OTDR Test Setups" on page 39
  - "Expert OTDR Test Setups" on page 43
  - "Real-time OTDR Test Setups" on page 47
  - "Power Meter Test Setups" on page 52

Home Screen



Live Fiber Check

To prevent service disruption on live PONs, FlexScan performs a Live Fiber check prior to every OTDR test (SmartAuto, Expert, Real-Time).

If a live fiber is detected, FS300 displays a warning screen and does not allow testing.

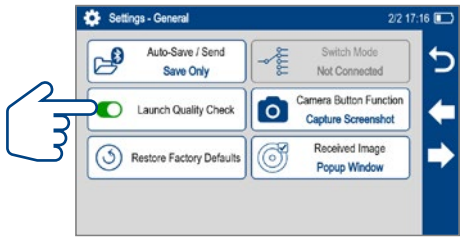
Launch Quality Check

An optional Launch Quality check enables users to detect dirty, damaged, poorly seated, or mismatched (UPC to APC) connectors.

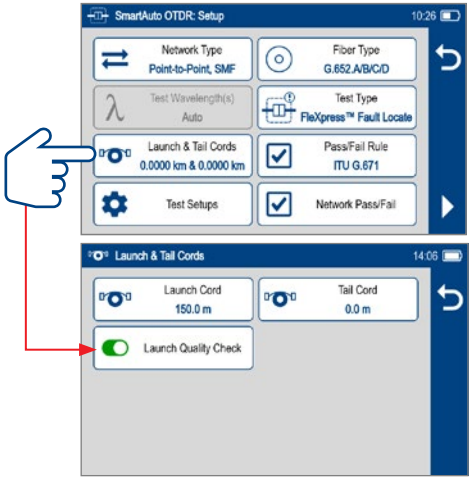
To perform the launch quality check:

1. Ensure that the Launch Quality Check option enabled in the General Settings or in any OTDR test setup screen.

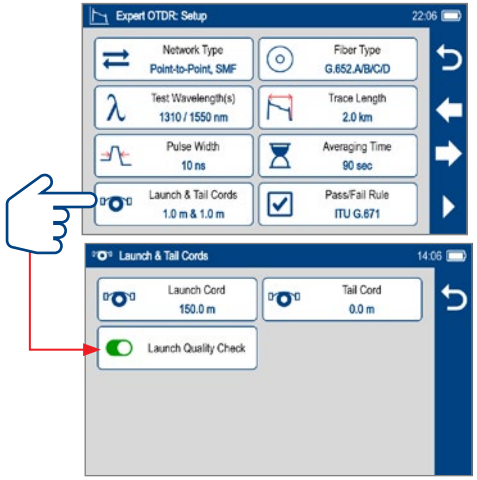
General Settings, Page 2 of 2



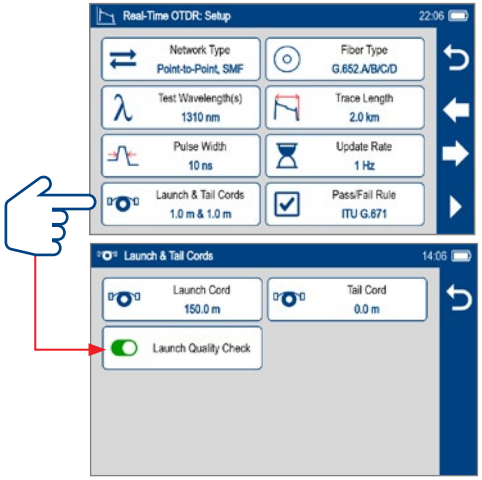
SmartAuto OTDR Test Setup



Expert OTDR Test Setup



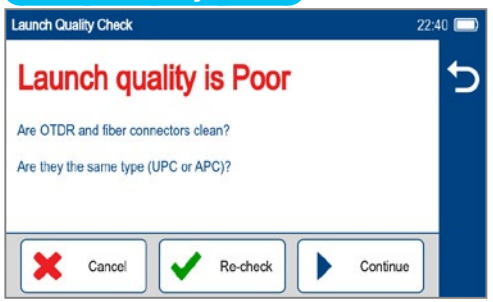
Real-Time OTDR Test Setup



2. Initiate an OTDR test.
3. The FlexScan will assess the loss and reflectance at the OTDR's connection to the launch cord (fiber ring) or fiber under test.
4. If excess loss or reflectance is detected, the OTDR displays the 'Launch Quality is Poor' warning screen. From this screen the user may chose to perform one of the following:
   - Cancel a test by touching either Cancel or Back.
   - Clean and reconnect connectors and repeat the launch quality check by touching Re-check.
   - Continue testing without checking and cleaning the connection by pressing Continue.

Note: Testing a fiber with poor launch quality may produce poor test results.

Launch Quality Check

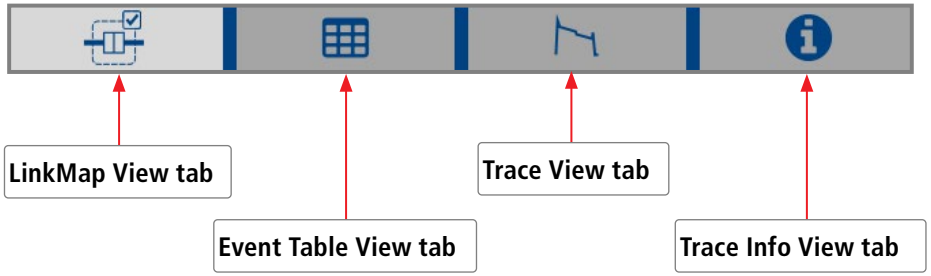


OTDR Test Results Viewers

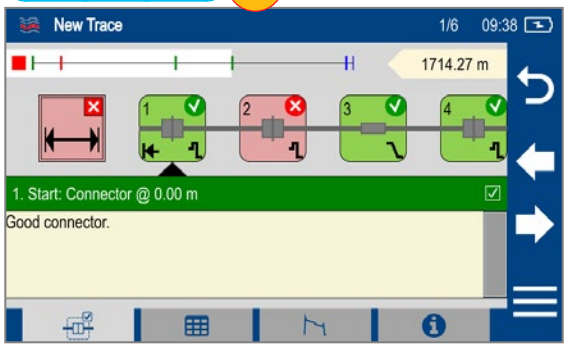
In SmartAuto® OTDR and Expert OTDR test results may be displayed in four views. To display each view touch the associated tab.

1. LinkMap View - displays an icon-based representation of the network.
2. Event Table View - displays measurements for the currently selected Link Summary, Event, or Section.
3. Trace View - Displays OTDR trace(s), graph scale (dB/div & m/div), A/B cursor locations, A-to-B cursor distance, loss, reflectance and loss/distance measurements.
4. Test Info View - displays summary of OTDR settings used for this test.

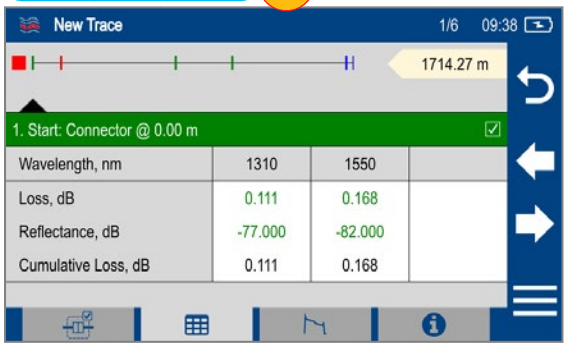
In Real-time OTDR test results are displayed in Trace View only.



LinkMap View 1

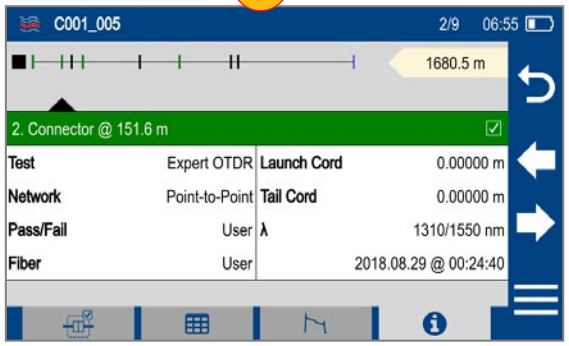


Event Table View 2



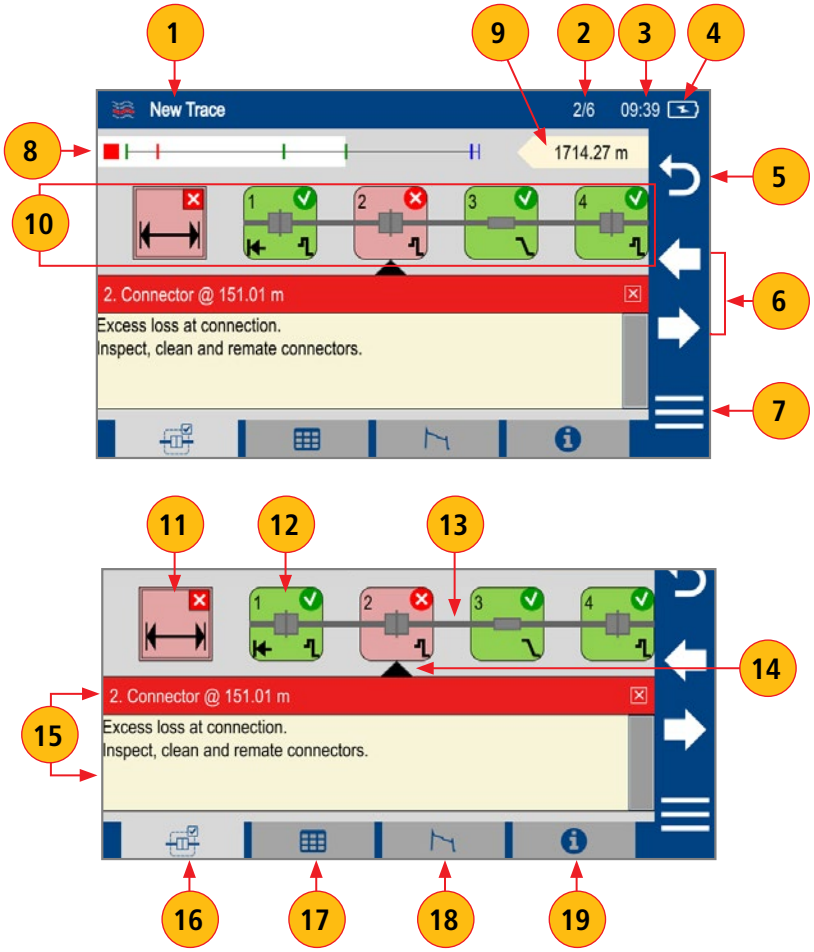
Trace View 3

Test Info View 4



Understanding LinkMap® Display Features

LinkMap display is available in SmartAuto, Expert OTDR, and Data Center. LinkMap is an icon-based representation of the analyzed network.



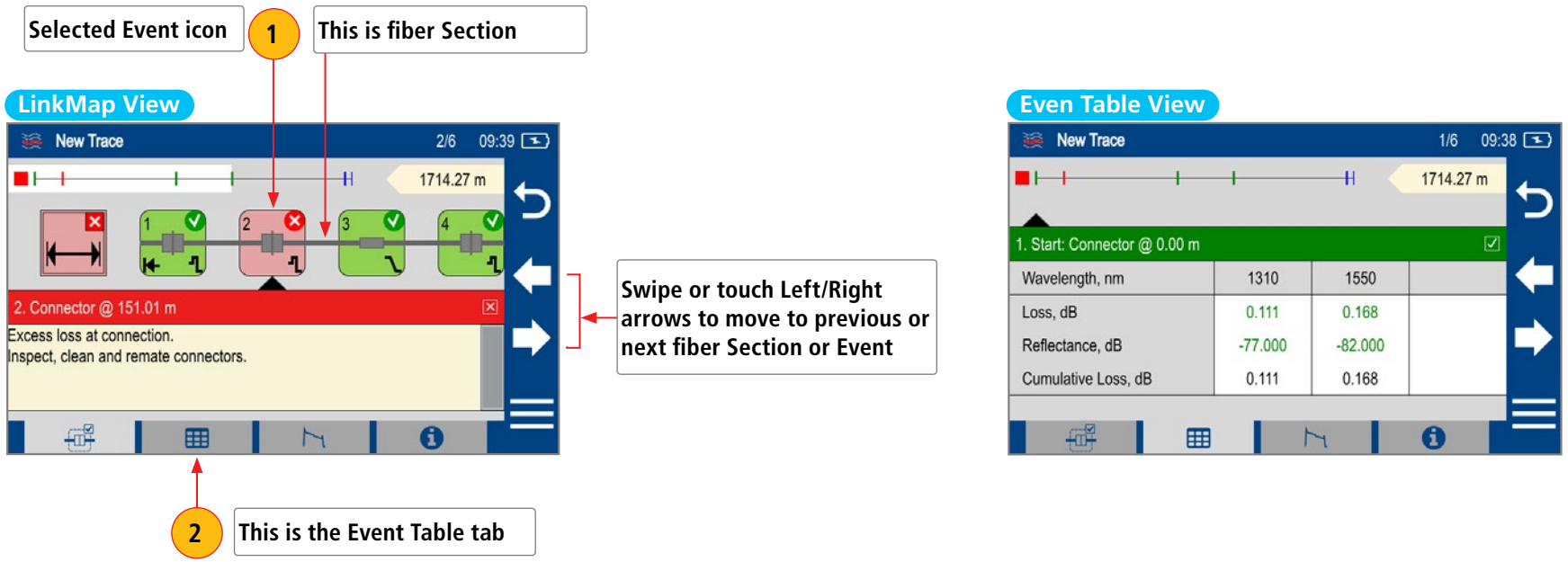
1. File name: consists of cable name and fiber number, or "New Trace" if file has not been saved.
2. x/y or x1-x2/y, where
   - x = number of the selected event
   - x1-x2 = link section between events x1 and x2
   - y = total events
3. Time of the current test as configured in General Settings.
4. Battery icon indicates battery state.
5. Back key: touch to return to the previous menu.
6. Left/Right arrow keys: touch to move to the next or previous event or link section.
7. Menu key: touch to navigate to Save As screen.
8. Link map thumbnail view with proportionally spaced events.
9. Link Length.
10. LinkMap detail view: shows summary and first 4 events, or up to 5 events. White highlighted area in thumbnail view indicates region of fiber for which events are shown in the detail view.
11. Link Summary icon: may be displayed as green (all events passed) or red (one or more events failed).
12. Event icon: event icons may be green (pass) or red (fail). Pass/Fail fault is based on event loss and reflectance thresholds configured by the currently selected Pass/Fail Rule.
13. Fiber Section between events.
14. Selection marker indicates selected Summary, Event or Fiber Section for which additional details are displayed.
15. Details of the currently selected Summary, Event, or Section.
16. LinkMap tab: when in any other test results viewer (Event Table, Trace View, Test Info View), touch to return to LinkMap View.
17. Event Table tab: touch to display measurements for the currently selected Link Summary, Event, or Section.
18. Trace tab: touch to display Trace view that depends on active icon (Link Summary, Event, Section):
    - If Summary icon is active, trace of entire network will be displayed
    - If Event icon is active, trace zoomed in at event will be displayed
19. Info tab: touch to display summary of OTDR settings used for this test.

Understanding Event Table Display Features

Event Table View may be accessed from either LinkMap® or Test Info View by touching the Event Table tab.

Event Table View displays measurements for the currently selected Link Summary, Event, or Section.

1. Touch the desired Event icon (or Section) to learn more details about that Event (or Section).
2. Touch Event Table tab to view selected Summary, Event, or Section details.

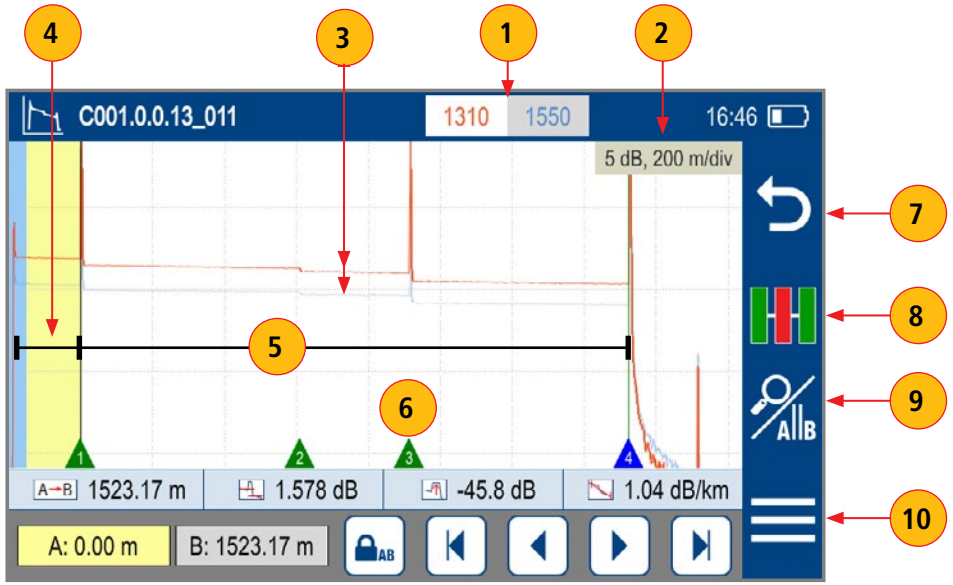


Understanding Trace Display Features

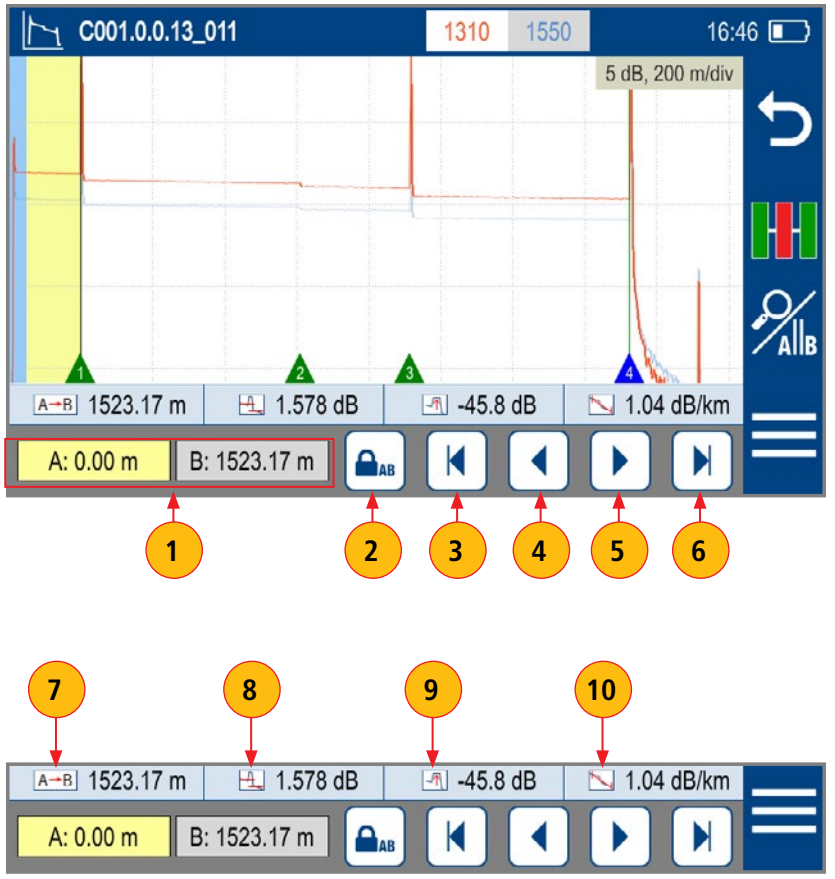
Trace Display is available in all OTDR test modes: SmartAuto, Expert, Data Center, and Real-Time OTDR

Trace View is accessed from any other results view by touching the Trace tab. Trace View displays OTDR trace(s), graph scale (dB/div & m/div), A/B cursor locations, A-to-B cursor distance, loss, reflectance and loss/distance measurements.

1. Wavelengths: Touch the desired wavelength to make it active. White background indicates active wavelength. Cursor measurements apply to active wavelength.
2. Graph scale (dB/div & distance/division (m/div, km/div, ft/div, kft/div, mi/div).
3. OTDR traces.
4. Launch cable (if present).
5. Fiber under test.
6. Event Marker:
   - Green - Passing event
   - Red - Failing event
   - Blue - Not evaluated event.
   - Touch Event marker to move active cursor to that event.
7. Touch Back to return to the previous screen.
8. Touch to switch to the LinkMap view.
9. Touch to toggle between Zoom and A|B Cursor Control modes.
10. Touch to display Menu function (Save As, Print to PDF, etc.)
    Launch cable (if present).



Trace View – Cursor Control Enabled



Cursor Movement Controls

- Swipe to pan up / down / left / right
- Pinch to zoom in/out horizontally or vertically
- 'Touch & hold' moves the active cursor to touched area; dragging after 'touch & hold' drags the active cursor

1. Touch to make a cursor active.
   - Yellow highlight indicates the currently active cursor.
   - Cursor A is always located to the left of cursor B.
2. Lock/Unlock A/B cursors (when locked, cursors move together). \
   - A|B Cursor locked icon toggles to show expected function when touched (e.g. if A|B currently locked, icons shows unlock A|B).
3. Jump active cursor to Previous Event.
4. Nudge active cursor Left.
5. Nudge active cursor Right.
6. Jump active cursor to Next Event.

A/B Cursor Measurements:

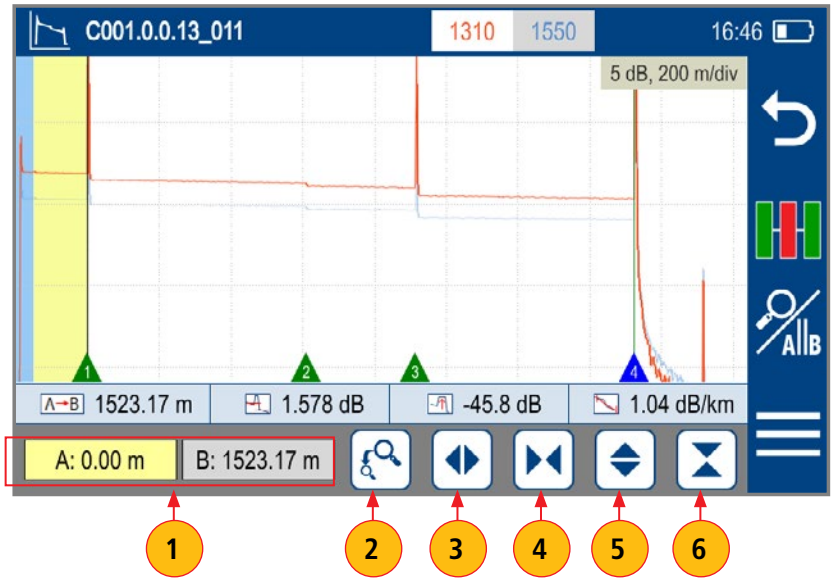
7. Distance from A to B cursor.
8. Loss between A and B cursor.
9. Maximum Reflectance between A and B cursor.
10. Loss-per-distance between A and B cursors.

Trace View – Zoom Control Enabled

Zoom Controls

- Zooming in/out centers trace about a point where the active cursor intersects with the active wavelength trace.
- Unzoom/Rezoom icon toggles to show expected function when touched (e.g. if zoomed in, icon shows Unzoom state).

1. Touch non-highlighted cursor box to make a cursor active.
   - Yellow highlight indicates the currently active cursor.
   - Cursor A is always located to the left of cursor B.
   - Cursor B is always located to the right of cursor A.
2. Touch to Unzoom (if zoomed in); Touch to Rezoom (If zoomed out).
3. Touch to zoom in horizontally around the currently active cursor.
4. Touch to zoom out horizontally around the currently active cursor.
5. Touch to zoom in vertically around the currently active cursor.
6. Touch to zoom out vertically around the currently active cursor.



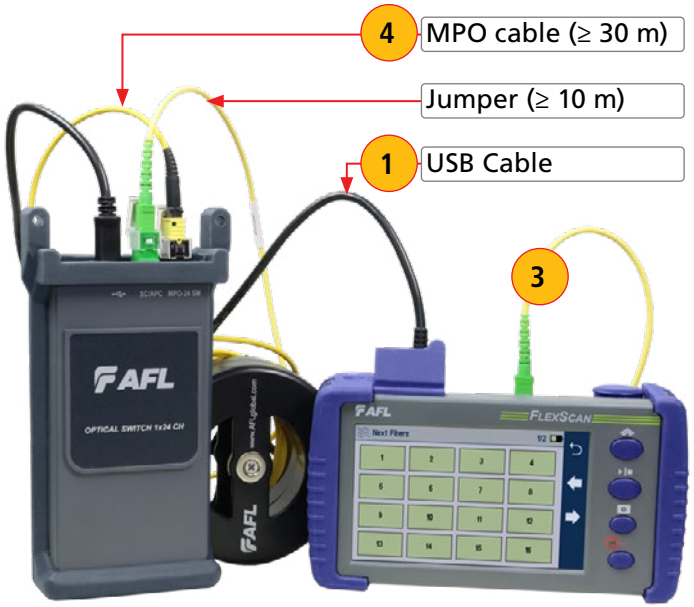
Multi-Fiber Test using MPO Switch

AFL's MPO-24 Switch enables OTDR- testing of MPO-24/MTP® and MPO-12 terminated cables with the appropriate launch rings. The MPO-24 optical fiber switch allows users to verify some or all fibers in a multi-fiber connector in a single test, saving time by automating the scanning process without the need to manually plug and unplug each fiber.

FlexScan 300 models include MPO Switch control via USB.

Main Features:

- Test up to 24 single-mode (MPO-24 switch) or 12 multimode (MPO-12 switch) fibers in a single OTDR test
- Easily configured the MPO Switch control allows testing any or all fibers in MPO connector
- Available in SmartAuto®, Expert, and Data Center OTDR test modes
- Auto-saves results to user-configured folder & files
- Auto-increments saved fiber number
- Expert mode may be required with wider pulse width or longer averaging time to compensate for 2-3 dB insertion loss of switch

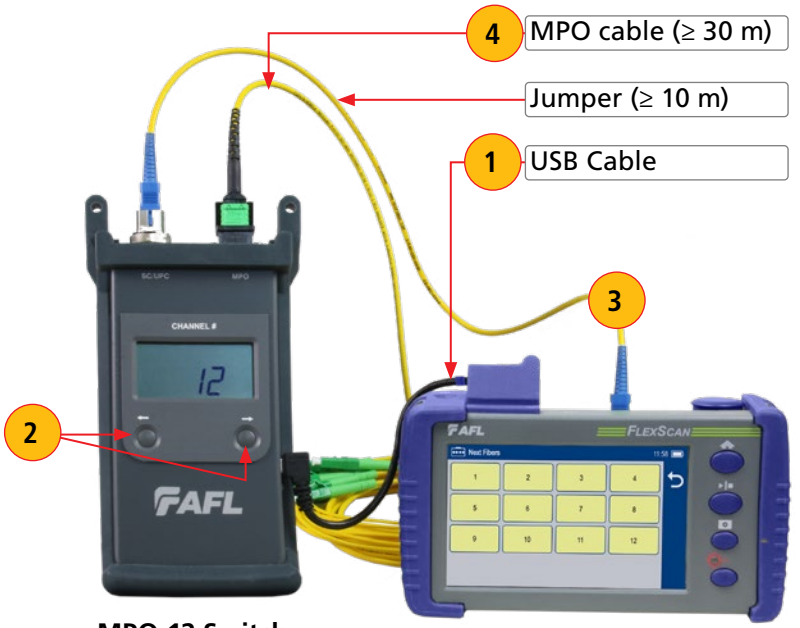


MPO-24 Switch

Connecting Equipment:

Note: MPO-24 switch is automatically powered up when connected to the OTDR

1. Connect FlexScan to MPO-24 or MPO-12 switch via USB cable
2. For MPO-12 switch only
   - Press switch channel selector to power up MPO Switch.
   - Verify switch channel displayed on MPO Switch
3. Connect OTDR port to MPO SC (APC for single-mode, UPC for multimode) port using jumper cable (≥ 10 m; 150 m fiber ring recommended)
4. Connect MPO switch MPO port to fibers to be tested
   - Use MPO Launch Cable (≥ 30 m) to connect to MPO-terminated network
   - Use MPO fan-out Cable (≥ 30 m) to connect to individual fibers



MPO-12 Switch

Configuring Automatic MPO Switch Control

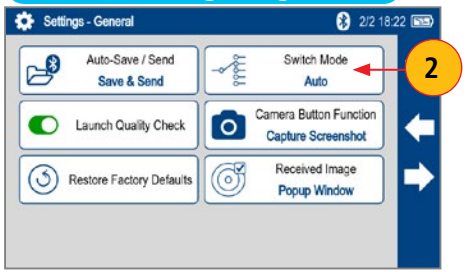
Notes:

- MPO Switch Control available only when AFL MPO switch is enabled and connected to FS300 via USB cable.
- An error message appears if the Switch Mode selected with no MPO switch connected and enabled.

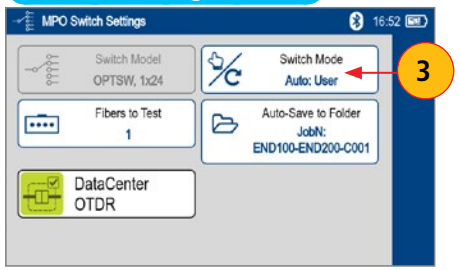
1. On the FS300 Home screen touch Settings
2. Next, navigate to and touch the Switch Mode option.
3. In the Switch Settings screen, touch the Switch Mode option to display the available modes.
4. Select one of the Auto Modes.
   - Manual – MPO Switch channel controlled manually by user
   - Auto: User – Automatic channels configured by user
   - Auto: Base 12 – Automatically test all 12 fibers
   - Auto: Base 10 – Automatically test 10 fibers (2-11)
   - Auto: Base 8 – Automatically test 8 fibers (3-10)
   - Auto: Base 8a – Automatically test 8 fibers (1-4, 9-12)
   - Auto: Base 16 – Automatically test 16 fibers (1-16)
   - Auto: Base 8a – Automatically test 24 fibers (1-24)
   - If Auto: User selected, touch Fibers to Test to configure fibers to test
5. When back in the Switch Settings screen, touch the Auto-Save to Folder option.
6. Next, select and configure Project, End 1,End 2, Cable, starting Fiber# and OTDR @ end where OTDR is located.
   - This configures Project and Fiber Group folders and test results file names, where multi-fiber test results will be saved.

Home Screen

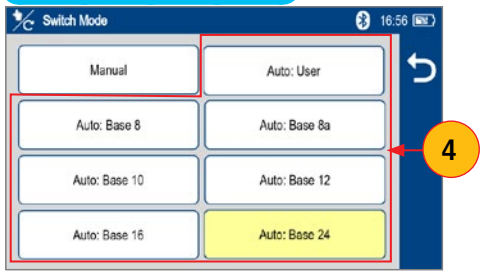
General Settings, Page 2 of 2



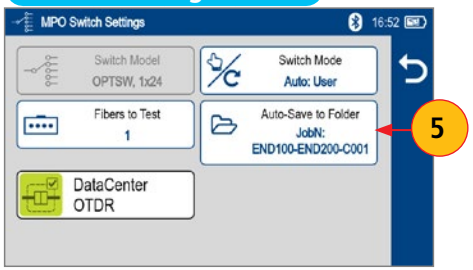
Switch Settings Screen



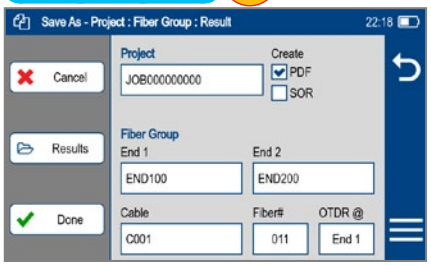
Switch Modes Screen



Switch Settings Screen



Save As Screen 6



Notes:

- After configuring the MPO switch, follow the test steps for the relevant test mode.
- Configure Launch Cable length, which equals sum of length of launch cable from OTDR to switch + length of MPO or Fan-out Cable to network + ~4 m fiber inside MPO Switch.
- Connect switch and launch cables and run a test to measure combined length of launch cable to switch + fiber in switch + launch cable to network.
- Last fiber tested is displayed on the FS300 when test completes.

SmartAuto® OTDR with FleXpress®

Configure SmartAuto OTDR Test

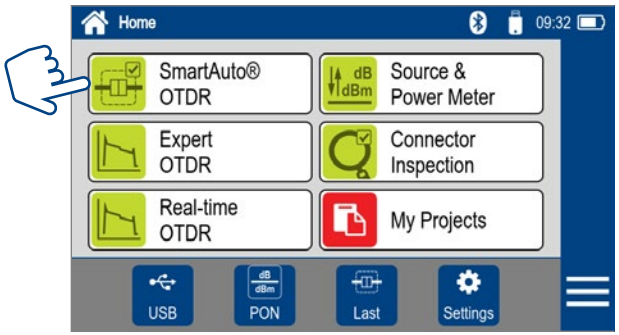
Important: Changes made to the test settings are applied to all OTDR test modes.

- From Home screen, select SmartAuto OTDR test mode.
- Configure SmartAuto test as outlined below.

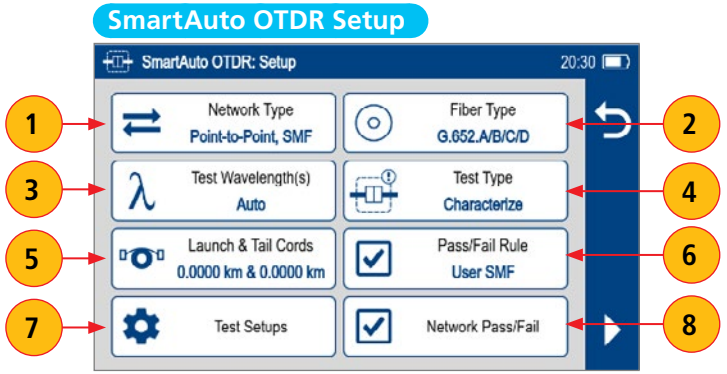
1. Network Type, see "Network Type" on page 30
   - Multimode Point-to-Point (FS300-325 only)
   - Single-mode Point-to-Point
   - Single-mode FTTH PON
2. Fiber Type, see "Fiber Type" on page 31
   - Multimode OMx or User (FS300-325 only)
   - Single-mode G.65x or User
3. Test Wavelengths, see"Test Wavelength" on page 33
   - Select desired wavelength(s) (FS300-323 only)
4. Test Type, see "Test Type" on page 33
   - Select Characterize or FleXpress
5. Launch & Tail Cords, see "Launch and Tail Cords" on page 35
   - Edit length
6. Pass/Fail Rules, see "Configuring Pass/Fail Rules" on page 36
   - ITU G.671
   - TIA-568.3-D
   - User-configured
7. Test Setups, see "SmartAuto OTDR Test Setups" on page 39
8. Network Pass/Fail – configure user-settable link length, loss and ORL

When SmartAuto (and PON OPM if desired for FS300-323) settings configured, touch 'Start' to initiate OTDR (and PON OPM) test.

Home Screen



SmartAuto OTDR Setup



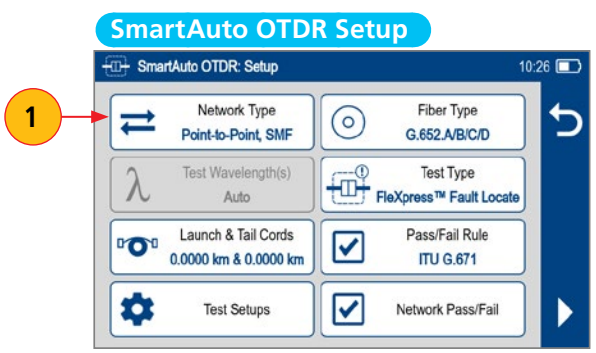
SmartAuto® OTDR Setup Details

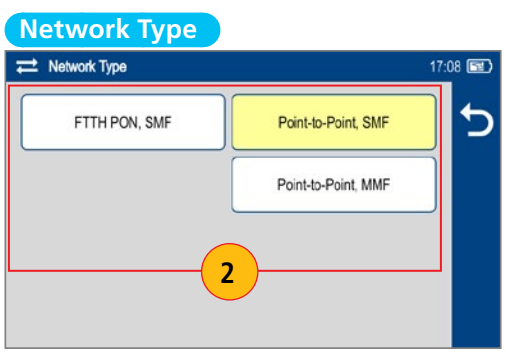
Network Type

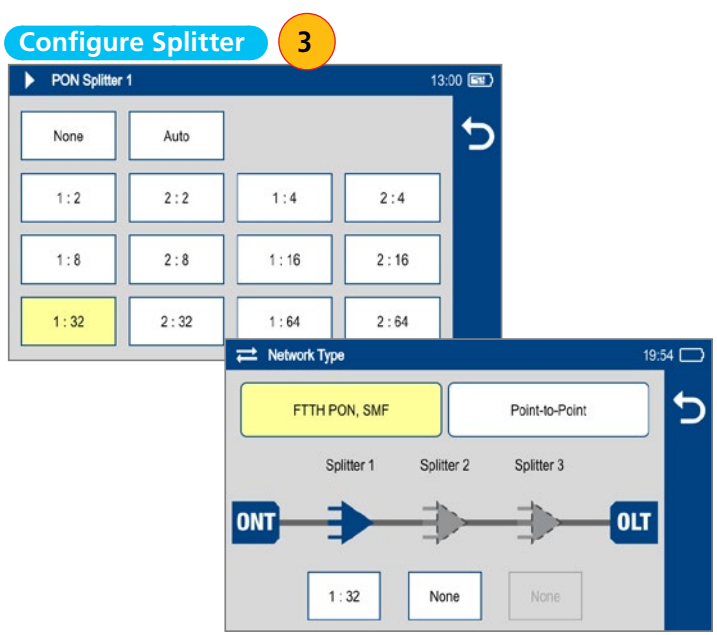
Important: Changes made to the Network Type configuration are applied to all OTDR test modes.

Configure Network Type:

1. Touch Network Type
2. Next, select the network type:
   - FTTH PON, Single-mode - If this option is selected, only Characterize is the available Test Type
   - Point-to-Point, Single-mode - If this option is selected, two options for Test Type to chose from
     - Characterize: Most accurate, but longer test times
     - FleXpress: Faster test times, but not as accurate for longer networks
   - Point-to-Point, Multimode (FS300-325 only) - If this option is selected, only Characterize is the available Test Type
3. Configure splitters if the FTTH PON option is selected. You may chose 'Auto' option or select Split Ratio from the available options.
   - Auto (available only on FS300-325 only) – Automatically detects splitters and reports split ratio based on loss.
   - Note: Excess loss at splitter may result in incorrect split ratio being reported
   - Select split ratio for each expected splitter. Up to 3 splitters may be configured.







Fiber Type

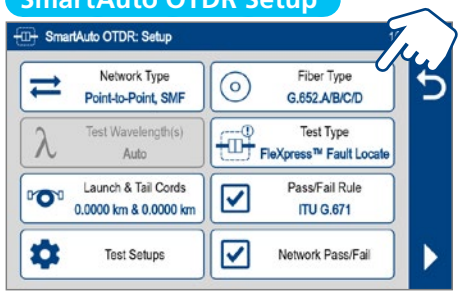
Important: Changes made to the Fiber Type selection are applied to all OTDR test modes.

Fiber Type settings depends on the selected Network Type option.

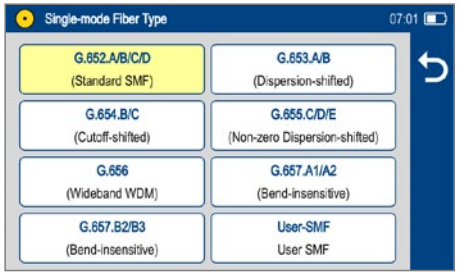
Touch the Fiber Type field to display one of the following:

- Single-mode G.65x or User-SMF options
- Multimode OMx or User-MMF options

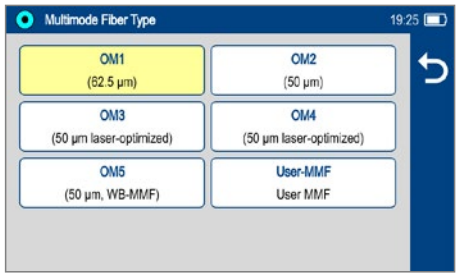
SmartAuto OTDR Setup



Single-mode Fiber Type



Multimode Fiber Type



Viewing and Configuring Fiber Type

G.65x Fiber Settings may be viewed but NOT changed.

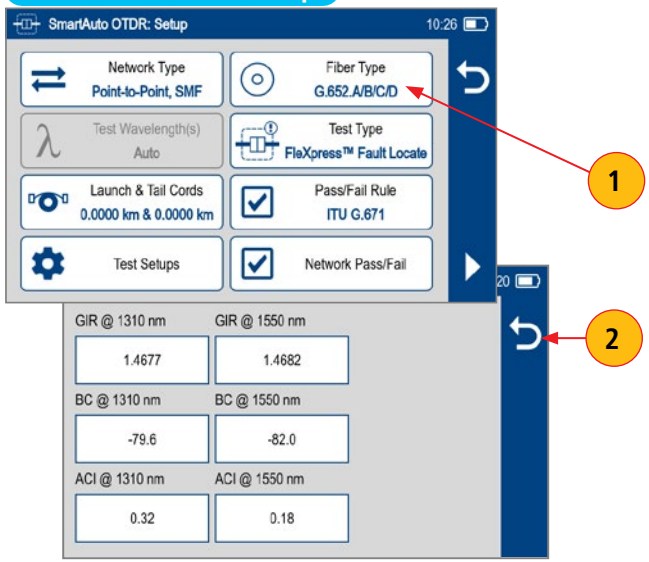
OMx Fiber Settings may be viewed but NOT changed.

User Settings may be viewed and changed.

To view G.65x or OMx Fiber Settings

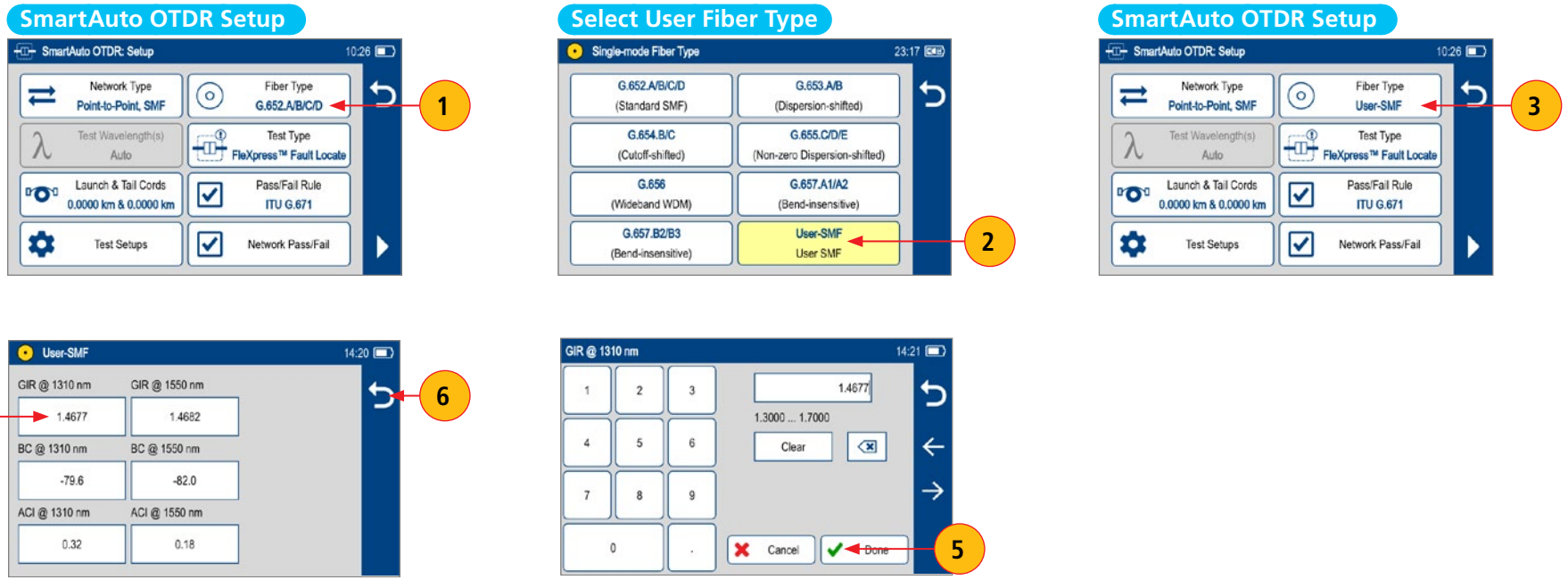
1. While in the OTDR Setup screen, make sure G.65x/OMx fiber type is displayed in the Fiber Type field.
   - If not, touch the Fiber Type field to display the Fiber Type menu and touch the desired G.65x/OMx fiber types to select.
   - When back in the OTDR Setup screen, touch and hold the displayed G.65x/OMx fiber type to open and view the default settings as follows:
     - Group Index of Refraction (GIR)
     - Backscatter Coefficient (BC)
     - Fiber Attenuation (ACI; Loss-per-Distance)
2. Touch Back to return to the OTDR Setup screen.

SmartAuto OTDR Setup



To view and edit User Fiber Type Settings

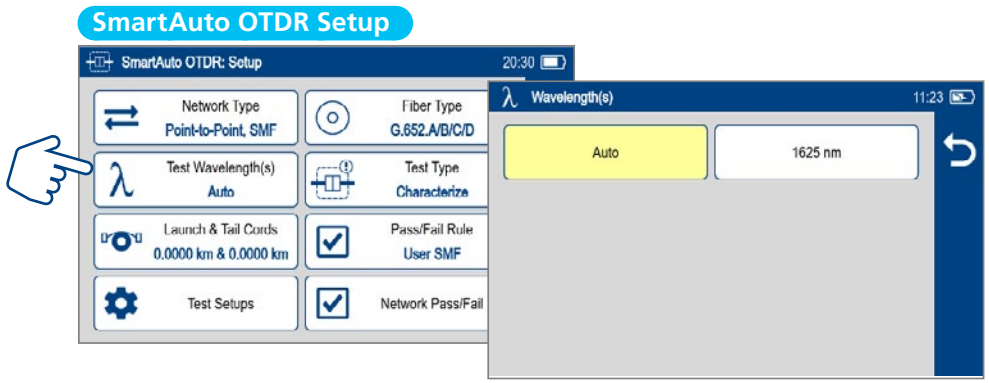
1. While in the OTDR Setup screen, make sure the User Fiber Type label is displayed in the Fiber Type field.
   - If not, touch the Fiber Type field to display the Fiber Type menu,
2. Next, touch the User option to select.
3. When back in the OTDR Setup screen, touch and hold the displayed User label to open the User Fiber Type settings screen and configure settings as follows:
   - Group Index of Refraction (GIR)
   - Backscatter Coefficient (BC)
   - Fiber Attenuation (ACI; Loss-per-Distance)
4. Touch the desired parameter field (e.g. GIR @1310 nm) to display its Editor screen.
5. Edit the value using on-screen controls. Touch Done to save changes and return to the User Fiber Type settings screen.
6. Touch Back to return to the OTDR Setup screen.



Test Wavelength

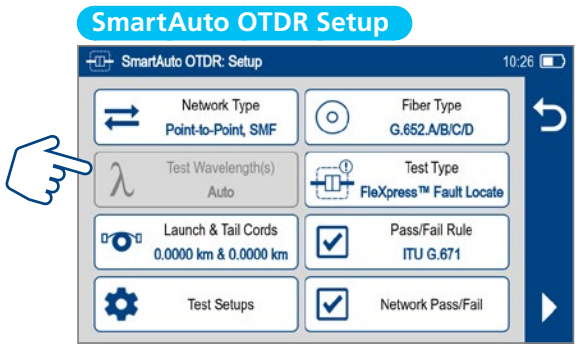
FS300-323 model only:

- Auto: 1310 and 1550 nm automatically selected
- Or, touch to select 1625 nm only



All other models:

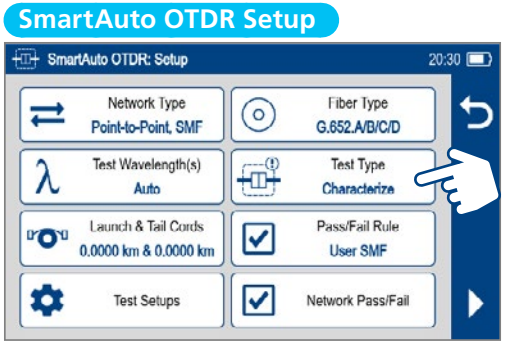
Test Wavelength(s) option is disabled - SmartAuto always tests both SMF or MMF wavelengths

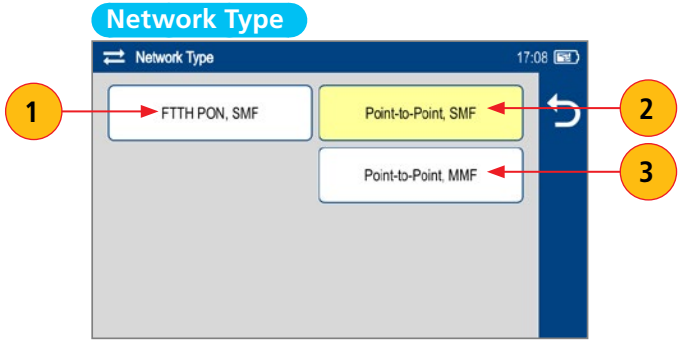


Test Type

Test Type selection depends on the previously selected Network Type option.

1. If the selected Network Type option is 'FTTH PON, SMF', then only Characterize is the available Test Type option.
2. If the selected Network Type option is 'Point-to-Point, SMF', then two options are available to select from:
   - Characterize: Most accurate, but longer test times
   - FleXpress: Faster test times, but not as accurate
3. If the selected Network Type option is 'Point-to-point, MMF' (FS300-325 only), then Characterize is the available Test Type option.





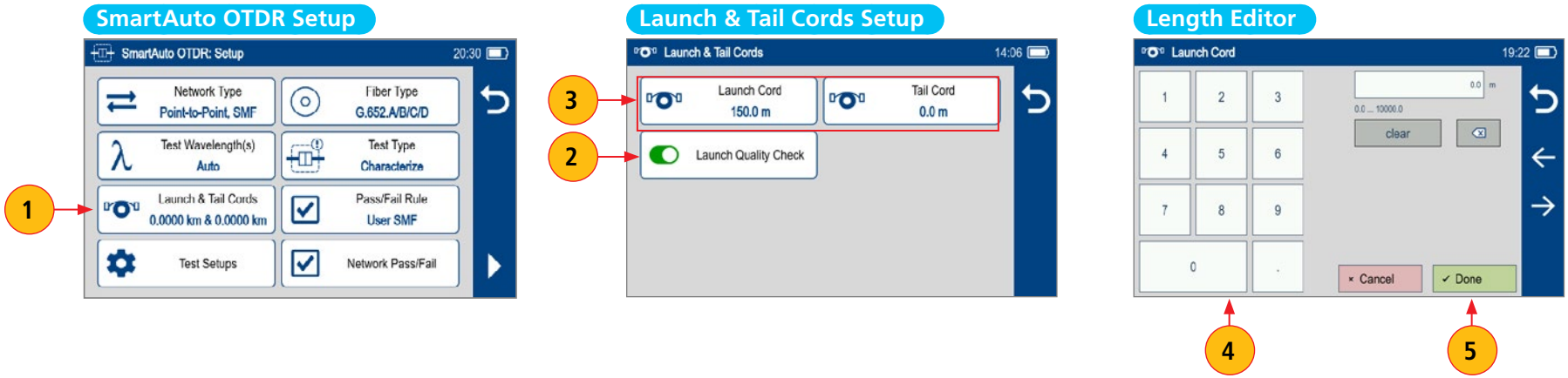
Why & When to Use FleXpress

- FleXpress (N/A for FS200-60) is ideally suited for:
  - Rapid fault location on point-to-point networks up to 65 km (40 mi)
  - Rapid Link Length, Loss & ORL verification on point-to-point networks up to 65 km (40 mi)
- FleXpress is available for point-to-point tests only, at 1310 and 1550 nm
  - Can be used in point-to-point portions of PON to (not through) splitter(s)
- FleXpress results can be “refined” by touching >>
- Use SmartAuto Characterize mode for:
  - Installation verification when you need to detect very low-loss splices
  - Installation verification when you need more precise loss measurements
  - PON testing through splitters

Launch and Tail Cords

Important: Changes made to the Launch and Tail Cord settings are applied to all OTDR test modes.

1. Touch Launch & Tail Cords to enable Launch Quality Check and configure Launch/Tail Cord length, if present.
2. Enable Launch Quality Check. When Launch Quality Check is enabled, FlexScan checks loss and reflectance of FlexScan connection to the network enabling the user to detect dirty, damaged, poorly seated, or mismatched (UPC to APC) connectors.
3. Touch the Launch/Tail Cord field to display the editor screen.
4. Using on-screen controls, enter the desired length.
5. Touch Done to save changes and return to the OTDR Setup screen.



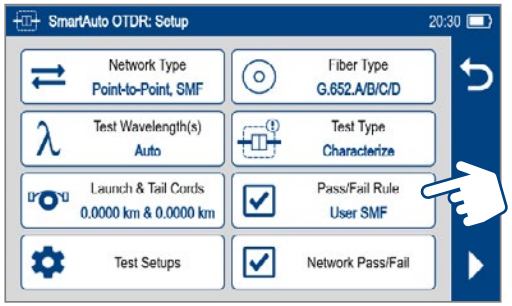
Configuring Pass/Fail Rules

Important: Changes made to the Pass/Fail Rule settings are applied to all OTDR test modes.

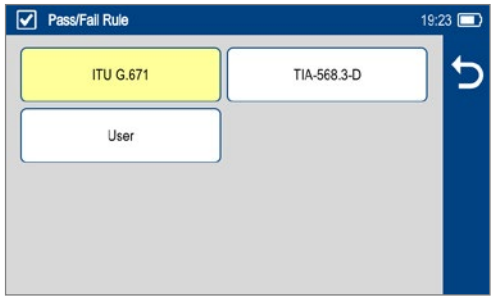
Pass/Fail margins may be set to either standard (ITU G.671, TIA-568.3-D) or user-set.

- **ITU G.671** Pass/Fail Settings may be viewed but NOT changed.
- **TIA-568.3-D** Pass/Fail Settings may be viewed but NOT changed.
- **User** Pass/Fail Settings may be viewed and changed.

SmartAuto OTDR Setup



Pass/Fail Rule

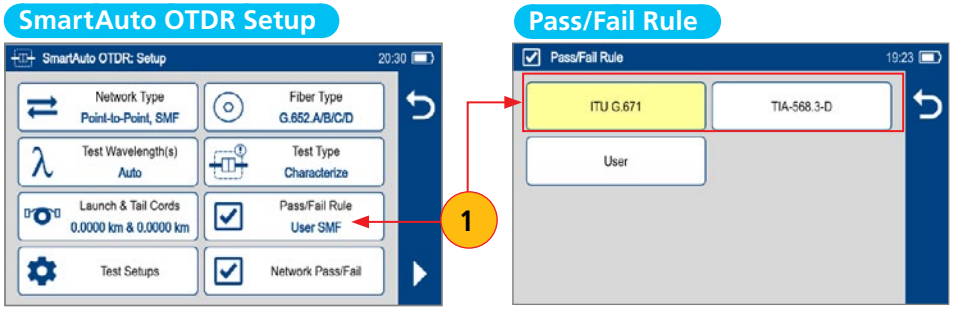


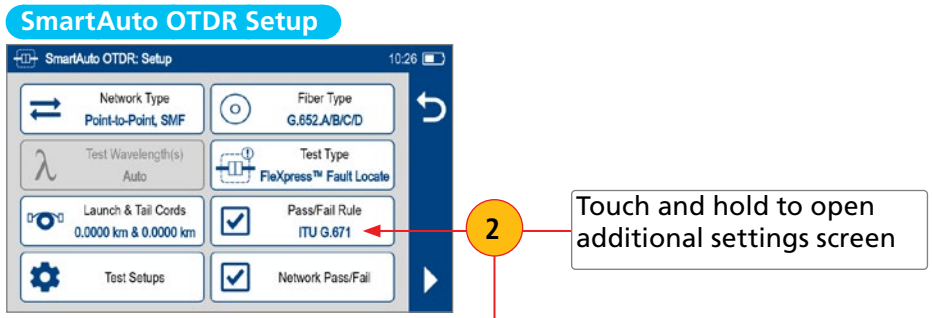
OTDR results are evaluated against selected or configured rules:

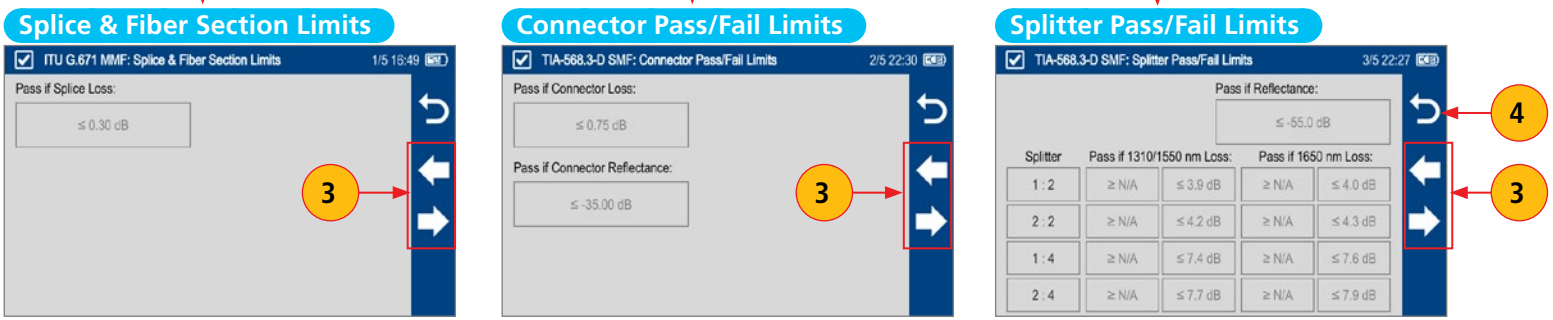
Pass/Fail Limit	ITU-G.671	TIA-568.3-D
Pass if Splice Loss	≤ 0.3 dB	≤ 0.3 dB
Pass if Connector Loss	≤ 0.5 dB	≤ 0.75 dB
Pass if Conn. Reflectance	≤ -35 dB (SM); ≤ -26 dB (MM)	≤ -35 dB (SM); ≤ -26 dB (MM)
Pass if Splitter Loss	Min ≤ Loss ≤ Max (dB) (Split ratio dependent)	Loss ≤ Max (dB) (Split ratio dependent)
Pass if Splitter Reflectance	≤ -55 dB	≤ -55 dB

ITU G.671 or TIA-568.3-D Pass/Fail Rule Settings - View Only

1. While in the OTDR Setup screen, make sure the ITU G.671 or TIA-568.3-D Rule is displayed in the Pass/Fail Rule field.
   - If not, touch the Pass/Fail Rule field to display the Rules menu
   - Touch the ITU G.671/TIA-568.3-D option to select.
2. When back in the OTDR Setup screen, touch and hold the displayed Rule to open one of the settings screen:
   - Splice & Fiber Section Limits screen
   - Connector Pass/Fail Limits screen
   - One of three Splitter Pass/Fail Limits screens
3. Touch Left / Right arrows to cycle through Limits screens.
   - View settings.
4. Touch Back to return to the OTDR Setup screen.







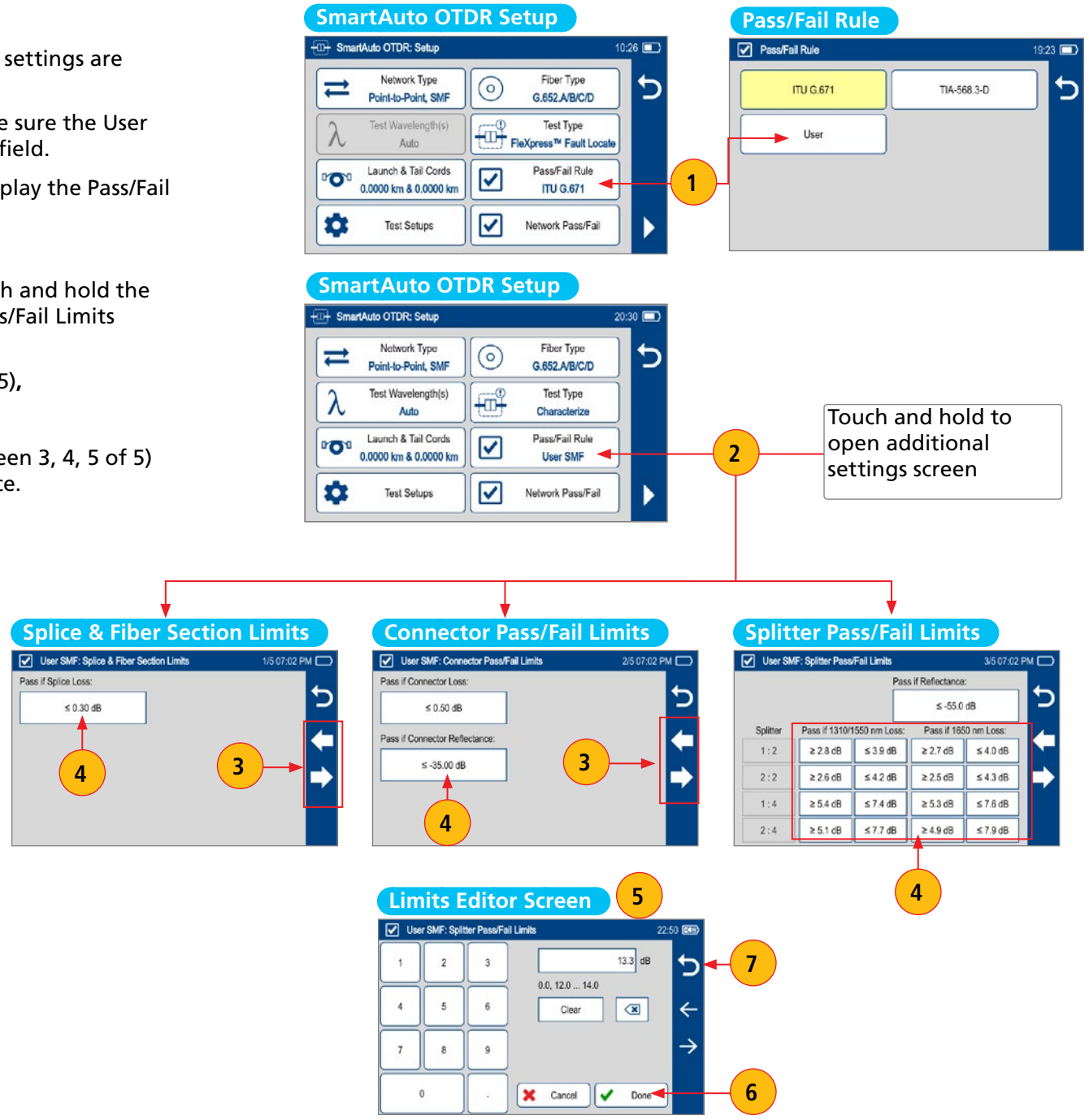
User Pass/Fail Rule Settings - View and Edit

Important: Changes made to the Pass/Fail Rule settings are applied to all OTDR test modes.

1. While in the SmartAuto Setup screen, make sure the User Rule label is displayed in the Pass/Fail Rule field.
   - If not, touch the Pass/Fail Rule field to display the Pass/Fail Rules menu
   - Touch the User option to select.
2. When back in the OTDR Setup screen, touch and hold the displayed User Rule to open one of the Pass/Fail Limits screens
   - **Splice & Fiber Section Limits** (screen 1 of 5),
   - **Connector Pass/Fail Limits** (screen 2 of 5),
   - **Splitter Pass/Fail Limits screen Limits** (screen 3, 4, 5 of 5) limits screens will be displayed in sequence.

To View and Edit Splice, Connector, Splitter Pass/Fail Limits

3. Touch Left / Right arrows to cycle through screens.
4. Touch the desired threshold field to display its Editor screen.
5. When Editor screen is displayed, edit the threshold value using on-screen controls.
6. Touch Done to save changes and return to the Thresholds screen.
7. Touch Back to return to the SmartAuto Settings screen.



SmartAuto OTDR Test Setups

There are two ways to access and manage Test Setups:

I Method **Access Test Setups from the FS300 Home screen**

Four options are available (see Method I in "Managing Test Setups" on page 17:)

- Backup Setups to external device
- Restore Setups from external device
- Recall Setup: Select and recall a test setup from a list of saved setups
- Delete Setup: Delete a test setup from a list of saved setups

II Method **Access Test Setups from the SmartAuto Test Mode**

In addition to all options available using Method I, this method provides an option to save newly configured test setup.

- Save Setup: Name and save the current setup for later recall
- Recall Setup: Select and recall a test setup from a list of saved setups
- Backup Setups to external device
- Restore Setups from external device
- Delete Setup Delete a test setup from a list of saved setups

Save Setup

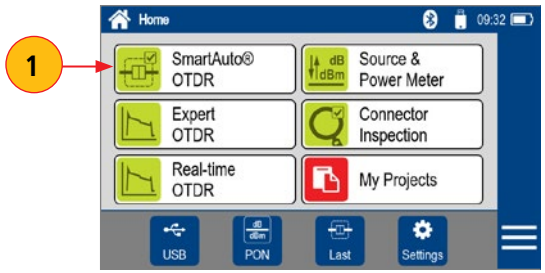
1. On the Home screen, select the SmartAuto OTDR test mode.
2. After inputting SmartAuto test settings, touch Test Setups.
3. Touch Save Setup.
4. Name the test setup using text editor.
5. Touch Done to store the newly created Setup. After selecting Done, the SmartAuto OTDR setup screen is displayed.

Note: Saving only applies to the current test setup. This is the only way to save the created test setup

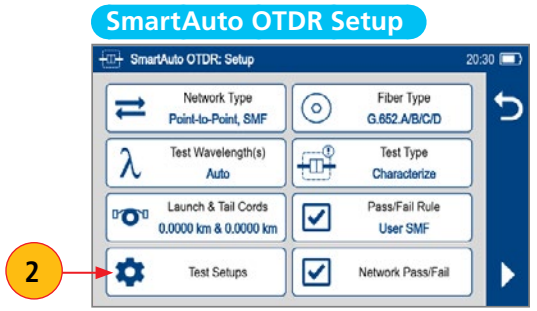
Recall, Backup, Restore, and Delete SmartAuto OTDR Test Setups

For details on how to recall, backup, restore, and delete test setups, see "Managing Test Setups" on page 17.

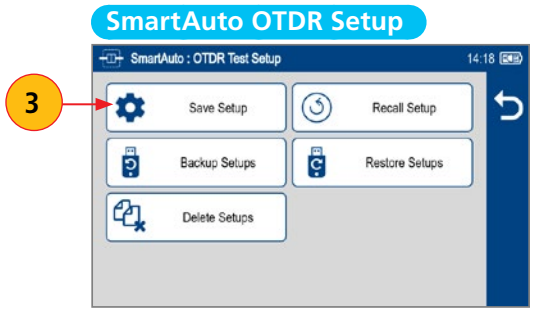
Home Screen



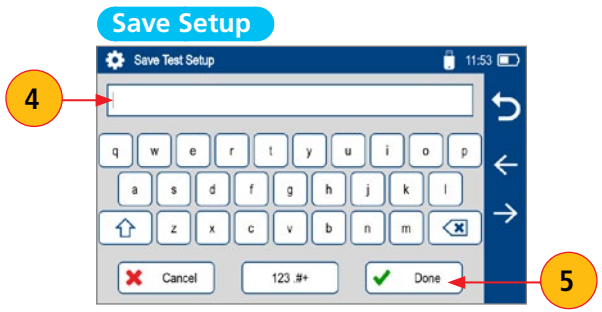
SmartAuto OTDR Setup



SmartAuto OTDR Setup



Save Setup



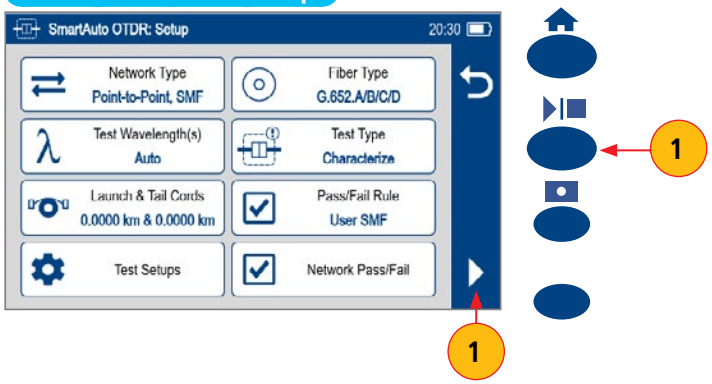
Test Sequence in SmartAuto OTDR Test

If no setting changes required, initiate testing as outlined below

If setting changes required, see "Configure SmartAuto OTDR Test" on page 29.

1. Initiate the SmartAuto OTDR test by touching Start soft key or pressing test Start/Stop button.
2. FlexScan begins testing with the Live Fiber Detection and, for FS300-323, Live PON OTDR Test and if these checks pass, proceeds to next step. See "Live Fiber Check" on page 20
3. If the Launch Quality check is enabled in any OTDR test setup or General Settings screen, FlexScan checks loss and reflectance of the OTDR connection. See "Launch Quality Check" on page 20
4. If launch quality is 'good', FlexScan starts testing using settings configured in the SmartAuto OTDR test setup screen.
5. When testing is completed, FlexScan displays the LinkMap® screen, which is a primary display in the SmartAuto OTDR mode. From the LinkMap display you can switch to the Trace display.

SmartAuto OTDR Setup



LinkMap® Display Features in SmartAuto OTDR Test

See section "Understanding LinkMap® Display Features" on page 22.

Event Table Display Features in SmartAuto OTDR Test

See section "Understanding Event Table Display Features" on page 23

Trace Display Features in SmartAuto OTDR Test

See section "Understanding Trace Display Features" on page 24.

Expert OTDR

Understanding Expert OTDR Settings

Parameter	Description
Network Type	Available options to select from: • Point-to-Point, SMF • FTTH PON, SMF • Point-to-Point, MMF (available on FS300-325 only) See "Network Type" on page 30
Fiber Type	• G.65x or User-SMF • OMx or User-MMF See "Fiber Type" on page 31
Test Wavelengths	Test Wavelengths depend on the selected Network Type: • Single-mode Network Type: 1310, 1550, 1625, 1310/1550, 1310/1625, 1550/1625 or 1310/1550/1625 • Multimode Network Type: 850, 1300 or 850/1300 nm See"Test Wavelength" on page 33
Trace Length	The Trace Length parameter determines the distance range of the full (unzoomed) trace. It also determines the distance between data points in the trace: the longer the Trace Length, the wider the data point spacing. Range should be at least 20% longer than network length including launch and receive cables. •SMF range: 250 m to 240 km •MMF range: 250 m to 30 km
Pulse Width	Short pulse widths provide the shortest event and attenuation dead zones. Longer pulse widths provide smoother trace, but closely-spaced events may overlap and be reported as single event. Longer pulse widths only available on longer Trace Lengths. • SMF: 3 ns to 20 µs • MMF: 3 ns to 10 µs
Pass/Fail Rules	Select Pass/fail Rules: ITU G.671, TIA-568.3-D or User. See "Configuring Pass/Fail Rules" on page 36
Launch and Tail Cords	• Configure Launch and Tail Cords lengths, if present. • Enable Launch Quality Check to check loss and reflectance of the FlexScan connection to the network. See section "Launch and Tail Cords" on page 35.
Averaging Time	The Averaging Time parameter determines the duration of a timed test and the number of trace averages performed. Longer averaging time produces a smoother trace.

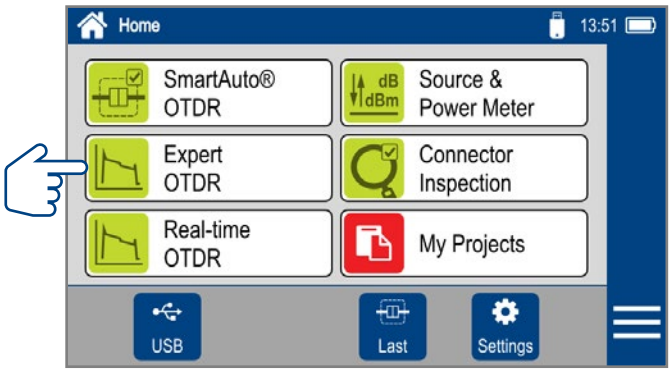
Configure Expert OTDR Test

Expert OTDR test mode is accessed from the Home screen by touching the Expert OTDR tab. While in the Expert OTDR screen:

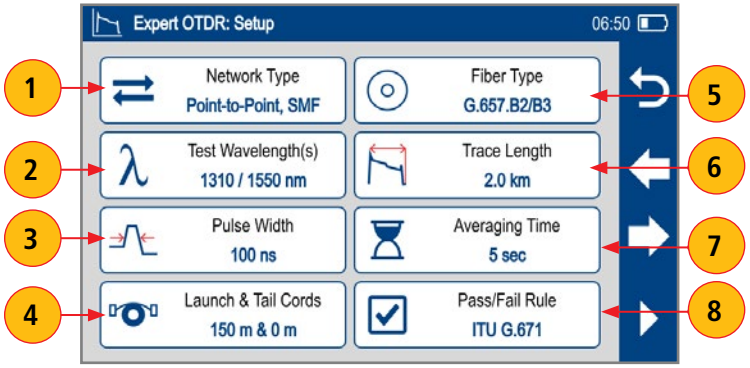
- Touch the desired test setup parameter to display a sub-screen.
- While in a sub-screen, touch the desired field to set the value.
- Touch Start to initiate test.
- Touching Back will return to the Home screen.

1. Network Type, see "Network Type" on page 30
   - Multimode Point-to-Point (FS300-325 only)
   - Single-mode Point-to-Point
   - Single-mode FTTH PON
2. Test Wavelengths, see"Test Wavelength" on page 33
   - Select desired wavelength(s) (FS300-323 only)
3. Select Pulse Width. This setting depends on the selected Trace Length. For longer test ranges, additional pulse widths are found on 2nd page.
4. Launch & Tail Cords, see "Launch and Tail Cords" on page 35
   - Edit length
5. Fiber Type, see "Fiber Type" on page 31
   - Multimode OMx or User (FS300-325 only)
   - Single-mode G.65x or User
6. Select Trace Length in Distance units that are set in the General Settings.
7. Select Averaging Time. Longer averaging will result in smoother trace.
8. Pass/Fail Rules, see "Configuring Pass/Fail Rules" on page 36
   - ITU G.671
   - TIA-568.3-D
   - User-configured
9. Test Setups, see "Expert OTDR Test Setups" on page 43
10. Network Pass/Fail – configure user-settable link length, loss and ORL

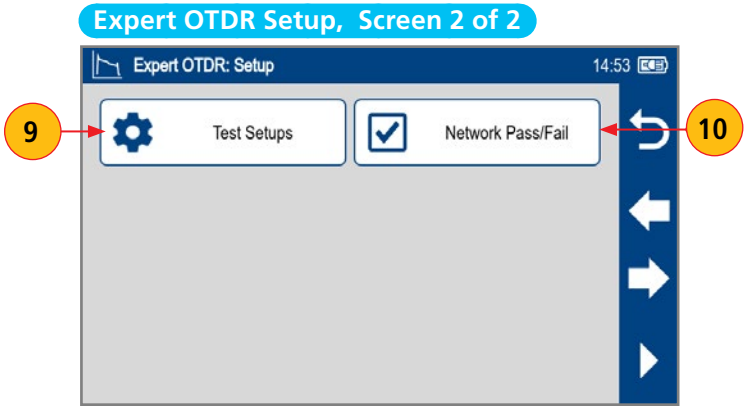
Home Screen



Expert OTDR Setup, Screen 1 of 2



Expert OTDR Setup, Screen 2 of 2



Expert OTDR Test Setups

There are two ways to access and manage Test Setups:

I Method **Access Test Setups from the FS300 Home screen**

Four options are available (see Method I in "Managing Test Setups" on page 17:)

- Backup Setups to external device
- Restore Setups from external device
- Recall Setup: Select and recall a test setup from a list of saved setups
- Delete Setup: Delete a test setup from a list of saved setups

II Method **Access Test Setups from the Expert Test Mode**

In addition to all options available using Method I, this method provides an option to save newly configured test setup.

- Save Setup: Name and save the current setup for later recall
- Recall Setup: Select and recall a test setup from a list of saved setups
- Backup Setups to external device
- Restore Setups from external device
- Delete Setup Delete a test setup from a list of saved setups

Save Setup

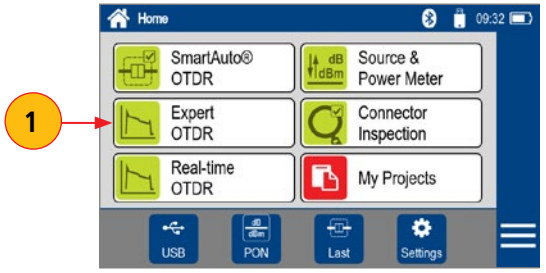
1. On the Home screen, select the Expert OTDR test mode.
2. After inputting Expert test settings, navigate to and touch Test Setups.
   - Use Left/Right Arrows to display additional Settings screen.
3. Name the test setup using text editor.
4. Touch Done to store the newly created Setup. After selecting Done, the Expert OTDR setup screen is displayed.

Note: Saving only applies to the current test setup. This is the only way to save the created test setup

Recall, Backup, Restore, and Delete Expert OTDR Test Setups

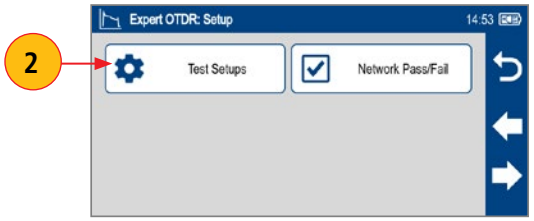
For details on how to recall, backup, restore, and delete test setups, see "Managing Test Setups" on page 17.

Home Screen



Expert OTDR Setup, Screen 1 of 2

Expert OTDR Setup, Screen 2 of 2

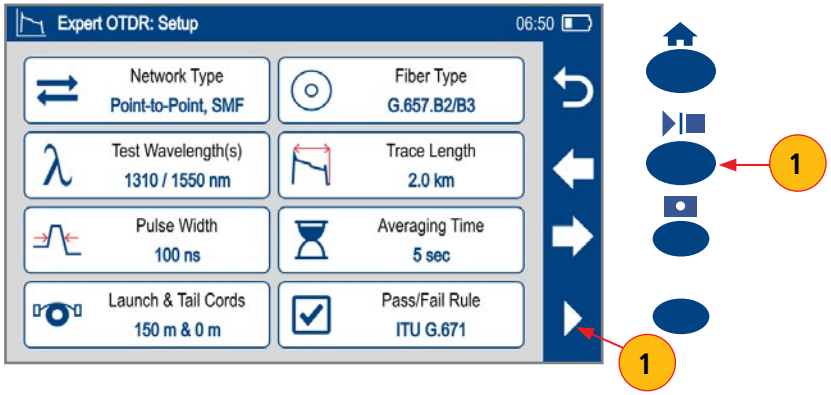


Save Setup

Test Sequence in Expert OTDR Mode

Initiate Expert OTDR test by touching Start or pressing the Start/Stop button.

1. FlexScan begins testing with the Live Fiber check and if a live fiber is NOT detected, proceeds to next step. For details, see section "Live Fiber Check" on page 20.
2. If the Launch Quality check is enabled, FlexScan checks loss and reflectance of the OTDR connection. For details see section "Launch Quality Check" on page 20.
3. If launch quality is 'good', FlexScan starts testing at the selected wavelength using settings configured in Expert OTDR settings screen.
4. If dual-wavelength test is enabled, FlexScan continues testing at 2nd wavelength.
5. Event analysis is completed when testing at selected wavelength(s) completes.
6. When testing is completed, FlexScan displays test results that may be viewed in one of four views as follows:
   - LinkMap View. For details, see section "Understanding LinkMap® Display Features" on page 22.
   - Event Table View. For details, see section "Understanding Event Table Display Features" on page 23.
   - Trace View. For details, see section "Understanding Trace Display Features" on page 24.
   - Test Info View. This View displays summary of OTDR settings used for this test.



LinkMap® Display Features in Expert OTDR Test

See section "Understanding LinkMap® Display Features" on page 22.

Event Table Display Features in Expert OTDR Test

See section "Understanding Event Table Display Features" on page 23

Trace Display Features in Expert OTDR Test

See section "Understanding Trace Display Features" on page 24.

Real-Time OTDR

Understanding Real-time OTDR Settings

Parameter	Description
Network Type	Available options to select from: • Point-to-Point, SMF • FTTH PON, SMF • Point-to-Point, MMF (available on FS300-325 only) See "Network Type" on page 30
Fiber Type	• G.65x or User-SMF • OMx or User-MMF See "Fiber Type" on page 31
Test Wavelengths	Test Wavelengths depend on the selected Network Type: • Single-mode Network Type: 1310, 1550, 1625, 1310/1550, 1310/1625, 1550/1625 or 1310/1550/1625 • Multimode Network Type: 850, 1300 or 850/1300 nm See"Test Wavelength" on page 33
Trace Length	The Trace Length parameter determines the distance range of the full (unzoomed) trace. It also determines the distance between data points in the trace: the longer the Trace Length, the wider the data point spacing. Range should be at least 20% longer than network length including launch and receive cables. •SMF range: 250 m to 240 km •MMF range: 250 m to 30 km
Pulse Width	Short pulse widths provide the shortest event and attenuation dead zones. Longer pulse widths provide smoother trace, but closely-spaced events may overlap and be reported as single event. Longer pulse widths only available on longer Trace Lengths. • SMF: 3 ns to 20 µs • MMF: 3 ns to 10 µs
Pass/Fail Rules	Select Pass/fail Rules: ITU G.671, TIA-568.3-D or User. See "Configuring Pass/Fail Rules" on page 36
Launch and Tail Cords	• Configure Launch and Tail Cords lengths, if present. • Enable Launch Quality Check to check loss and reflectance of the FlexScan connection to the network. See section "Launch and Tail Cords" on page 35.
Refresh Rate	Select the desired Refresh Rate • Slower refresh rate produces smoother traces

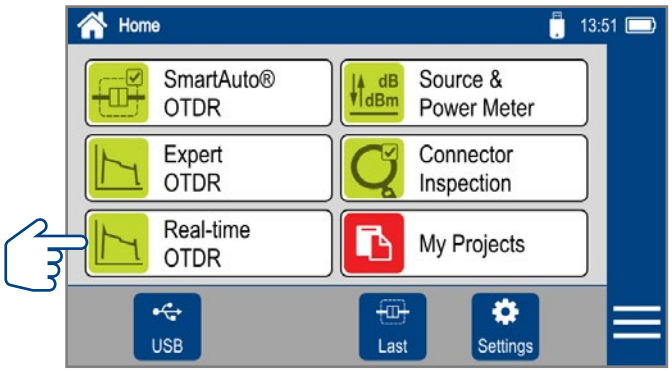
Configure Real-time OTDR Test

Real-time OTDR test mode is accessed from the Home screen by touching the Real-time OTDR tab. While in the Real-time OTDR screen:

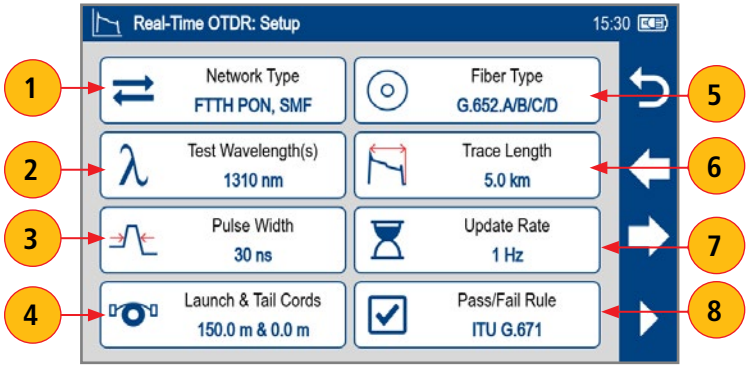
- Touch the desired test setup parameter to display a sub-screen.
- While in a sub-screen, touch the desired field to set the value.
- Touch Start to initiate test.
- Touching Back will return to the Home screen.

1. Network Type, see "Network Type" on page 30
   - Multimode Point-to-Point (FS300-325 only)
   - Single-mode Point-to-Point
   - Single-mode FTTH PON
2. Test Wavelengths, see"Test Wavelength" on page 33
   - Select desired wavelength(s) (FS300-323 only)
3. Select Pulse Width. This setting depends on the selected Trace Length. For longer test ranges, additional pulse widths are found on 2nd page.
4. Launch & Tail Cords, see "Launch and Tail Cords" on page 35
   - Edit length
5. Fiber Type, see "Fiber Type" on page 31
   - Multimode OMx or User (FS300-325 only)
   - Single-mode G.65x or User
6. Select Trace Length in Distance units that are set in the General Settings.
7. Select the desired Refresh Rate. Slower refresh rate produces smoother traces.
8. Pass/Fail Rules, see "Configuring Pass/Fail Rules" on page 36
   - ITU G.671
   - TIA-568.3-D
   - User-configured
9. Test Setups, see "Real-time OTDR Test Setups" on page 47
10. Network Pass/Fail – configure user-settable link length, loss and ORL

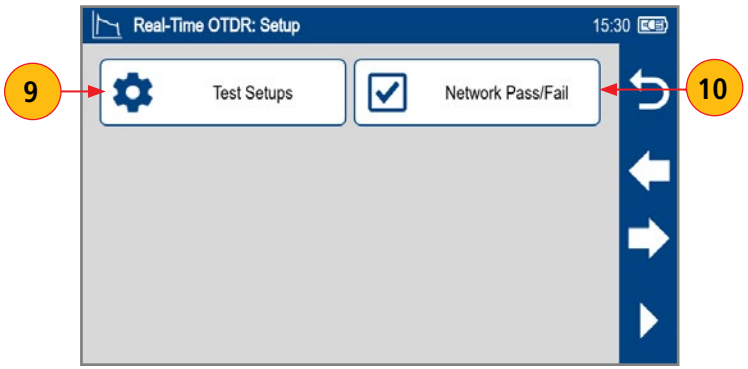
Home Screen



Real-time OTDR Setup, Screen 1 of 2



Real-time OTDR Setup, Screen 2 of 2



Real-time OTDR Test Setups

There are two ways to access and manage Test Setups:

I Method **Access Test Setups from the FS300 Home screen**

Four options are available (see Method I in "Managing Test Setups" on page 17:)

- Backup Setups to external device
- Restore Setups from external device
- Recall Setup: Select and recall a test setup from a list of saved setups
- Delete Setup: Delete a test setup from a list of saved setups

II Method **Access Test Setups from the Real-time Test Mode**

In addition to all options available using Method I, this method provides an option to save newly configured test setup.

- Save Setup: Name and save the current setup for later recall
- Recall Setup: Select and recall a test setup from a list of saved setups
- Backup Setups to external device
- Restore Setups from external device
- Delete Setup Delete a test setup from a list of saved setups

Save Setup

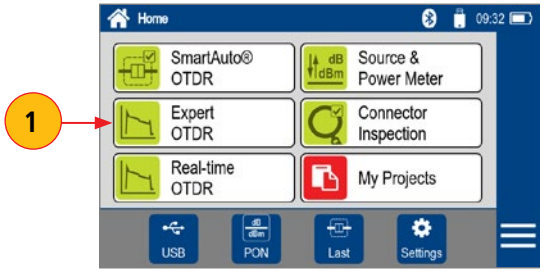
1. On the Home screen, select the Real-time OTDR test mode.
2. After inputting Real-time test settings, navigate to and touch Test Setups.
   - Use Left/Right Arrows to display additional Settings screen.
3. Name the test setup using text editor.
4. Touch Done to store the newly created Setup. After selecting Done, the Real-time OTDR setup screen is displayed.

Note: Saving only applies to the current test setup. This is the only way to save the created test setup

Recall, Backup, Restore, and Delete Real-time OTDR Test Setups

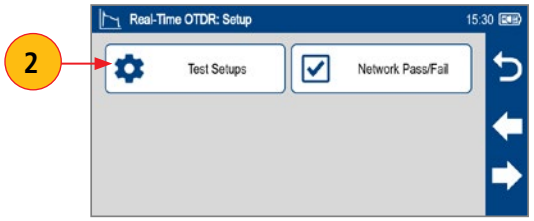
For details on how to recall, backup, restore, and delete test setups, see "Managing Test Setups" on page 17.

Home Screen

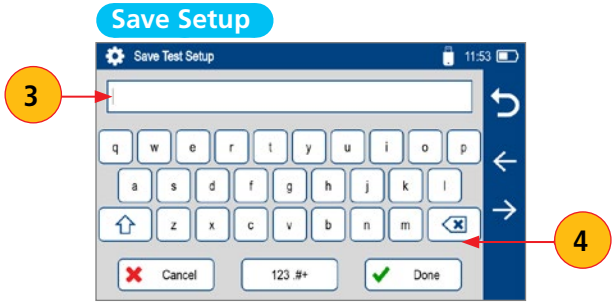


Real-time Setup, Screen 1 of 2

Real-time OTDR, Screen 2 of 2



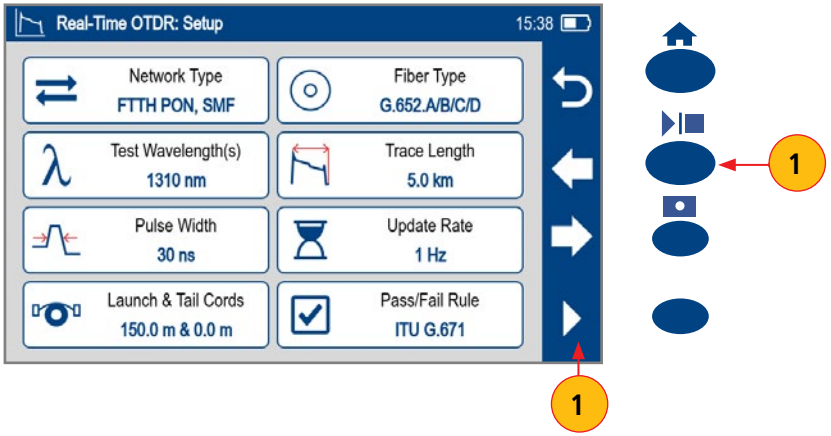
Save Setup



Test Sequence in Real-time OTDR Mode

Initiate Real-time OTDR test by touching Start or pressing the Start/Stop button.

1. FlexScan begins testing with the Live Fiber check and if a live fiber is NOT detected, proceeds to next step. For details, see section "Live Fiber Check" on page 20.
2. If the Launch Quality check is enabled, FlexScan checks loss and reflectance of the OTDR connection. For details see section "Launch Quality Check" on page 20.
3. If launch quality is 'good', FlexScan starts testing at selected wavelength using settings configured in Real-time OTDR settings screen.
4. Trace View is the only screen shown in the Real-time OTDR mode. For details, see section "Understanding Trace Display Features" on page 24.



Trace Display Features Real-Time OTDR

See "Understanding Trace Display Features" on page 24.

Data Center OTDR

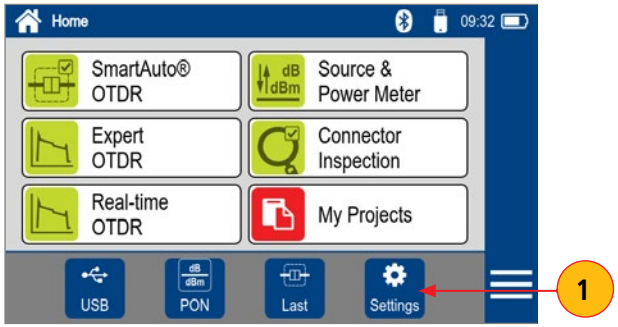
Configure Data Center OTDR Test

Data Center test mode is a separately-charged advanced software feature. If it is not enabled on your device, contact Tech Support. The Device Information screen displays its status.

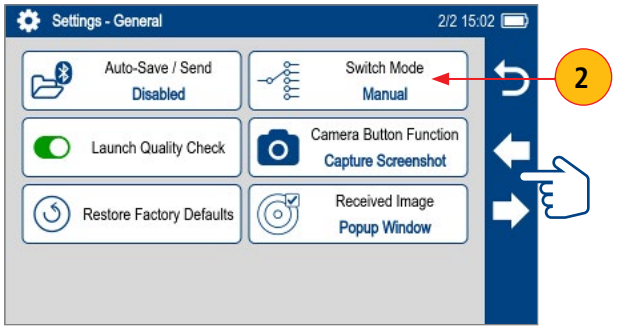
It is only available for single-mode multi-fiber testing with an MPO switch. The USB cable from the switch must be connected to the OTDR to access the MPO switch settings.
See "Multi-Fiber Test using MPO Switch" on page 27.

1. From Home screen, select Settings.
2. Navigate to and select the Switch Mode tab.
   - Use Left/Right Arrows to display additional Settings screen.
3. In the MPO Switch Setup scree, configure switch settings. Follow the instructions provided in section "Multi-Fiber Test using MPO Switch" on page 27.
4. After the MPO switch is configured, touch the Data Center OTDR tab.
5. Configure Data Center OTDR test settings as follows:
   - Network Type, see "Network Type" on page 30N
   - Fiber Type, see "Fiber Type" on page 31
   - Launch & Tail Cords, see "Launch and Tail Cords" on page 35
   - Pass/Fail Rules, see "Configuring Pass/Fail Rules" on page 36

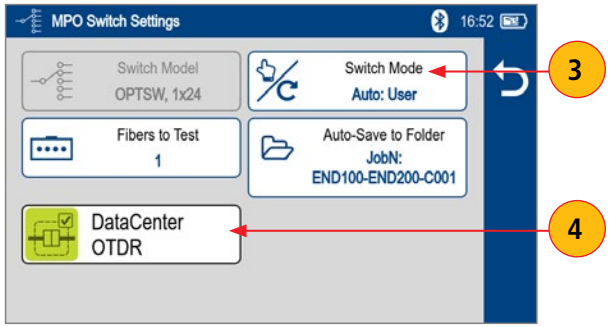
Home Screen



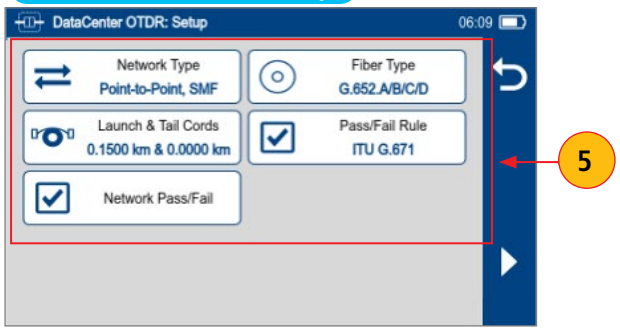
General Settings, Page 2 of 2



MPO Switch Setup Screen



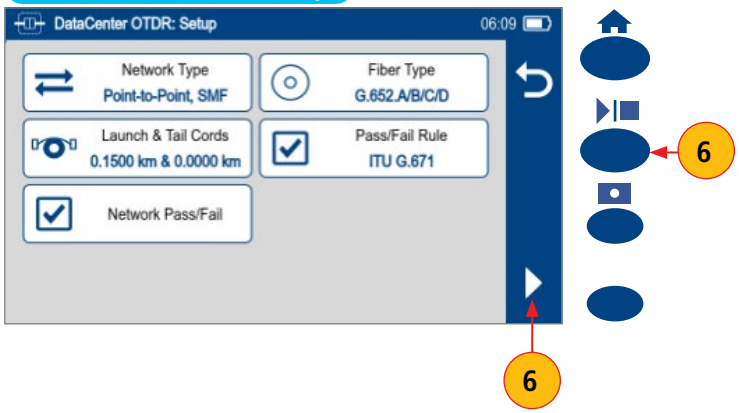
Data Center OTDR Setup



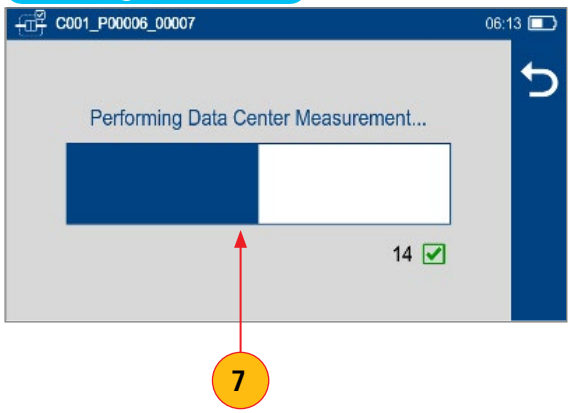
- Network Pass/Fail – configure user-settable link length, loss and ORL

6. When all settings configured, initiate the Data Center OTDR test by touching Start soft key or pressing test Start/Stop button.
   - FlexScan begins testing with the Live Fiber Detection and, for FS300-323, Live PON OTDR Test and if these checks pass, proceeds to next step. See "Live Fiber Check" on page 20
   - If the Launch Quality check is enabled in any OTDR test setup or General Settings screen, FlexScan checks loss and reflectance of the OTDR connection. See "Launch Quality Check" on page 20
   - If launch quality is 'good', FlexScan starts testing using settings configured in the Data Center OTDR test setup screen.
   - When testing is completed, FlexScan displays the LinkMap® screen, which is a primary display in the SmartAuto OTDR mode. From the LinkMap display you can switch to the Trace display.
7. Next, you will see the test progress screen.
8. When the test is complete, the Select a Fiber screen is displayed. Touch any fiber to display its results.

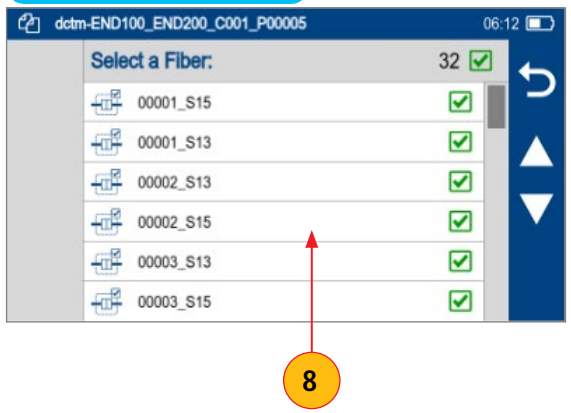
Data Center OTDR Setup



Test Progress Screen



Select a fiber Screen



LinkMap® Display Features in Data Center OTDR Test

See section "Understanding LinkMap® Display Features" on page 22.

Event Table Display Features in in Data Center OTDR Test

See section "Understanding Event Table Display Features" on page 23

Trace Display Features in Data Center OTDR Test

See section "Understanding Trace Display Features" on page 24.

Light Source and Power Meter Test Mode

1. Source & Power Meter test mode is accessed form the Home screen:
   - Broadband OPM: tough the Source & Power Meter test mode tab.
   - PON OPM (FS300-323 only): touch the PON tab at bottom of the Home screen.

Light Source Settings and Features

2. Light source on/off control: Touch to enable/disable the light source function – this is only available on the Source & Power Meter display.
3. Test mode selection control: Touch to select test mode (Wave ID, CW, Tone).
   - Wave ID: Select Wave ID mode (shown in the screen example) for fastest loss measurements.
     - Test 1310/1550/1625 or 850/1300, individually/simultaneously within SM or MM
     - Power Meter automatically synchronizes to received wavelength(s).
   - CW: Use CW mode to generate continuous wave light at a single wavelength.
   - Tone: Generate Tone for fiber identification (270 Hz, 330 Hz, 1 kHz, 2 kHz).
4. Touch to select test wavelength.

Broadband and PON Power Meter Settings and Features

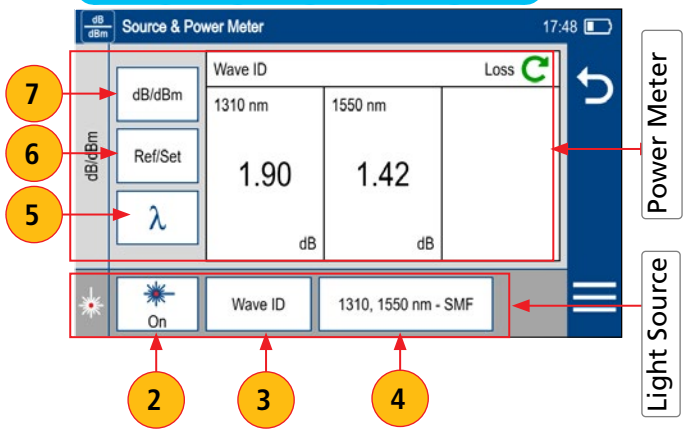
5. Wavelength control (not available on PON OPM): If used with Wave ID source, power meter automatically synchronizes to and indicates received wavelength(s):
   - If used with non Wave ID source, touch to select wavelength.
   - Wave ID functionality is not available on PON OPM - FS300-323 model
   - Wavelengths on PON Power Meter screen are always 1490 and 1550/1577 nm.
6. Set reference control: Touch and hold Ref/Set to store new reference(s) at received wavelength(s). Touch Ref/Set to view stored reference(s).
7. Power/Loss toggle control: Touch to toggle between power (dBm or nW) and loss (dB) mode.

Notes:

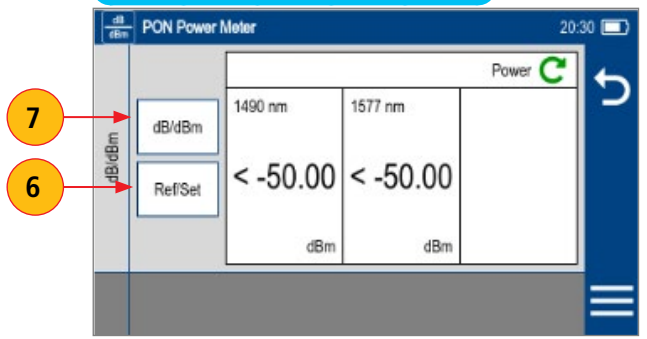
- Power meter detects and indicates fiber identifying tones when used with a light source capable of generating a modulated Tone signal.
- OPM Test Setups may be saved for future use. See "Power Meter Test Setups" on page 52.
- To configure power or loss measurement pass fail limits, see "Broadband OPM Power & Loss Measurement Pass/Fail Limits" on page 53 and "PON OPM Power & Loss Measurement Pass/Fail Limits" on page 56.

Home Screen

Source & Broadband Power Meter



PON OPM - FS300-323 Model



Power Meter Test Setups

There are two ways to access and manage Test Setups::

I Method Access Test Setups from the FS300 Home screen

Four options are available (see Method I in "Managing Test Setups" on page 17:)

- Backup Setups to external device
- Restore Setups from external device
- Recall Setup: Select and recall a test setup from a list of saved setups
- Delete Setup: Delete a test setup from a list of saved setups

II Method Access Test Setups from the Source & Power Meter Test Mode

In addition to all options available using Method I, this method provides an option to save newly configured test setup.

- Save Setup: Name and save the current setup for later recall
- Recall Setup: Select and recall a test setup from a list of saved setups
- Backup Setups to external device
- Restore Setups from external device
- Delete Setup Delete a test setup from a list of saved setups

Save Setup

1. On the Home screen, select the Source & Power Meter test mode.
2. After inputting Source & Power Meter test settings, touch Menu.
3. Next, select Setups to display Setups menu.
4. Next, select Save Setup.
5. Name the test setup using the displayed text editor.
6. Touch Done to store the newly created Setup. After selecting Done, the Source & Power Meter setup screen is displayed.

Note: Saving only applies to the current test setup. This is the only way to save the created test setup

Recall, Backup, Restore, and Delete OPM Test Setups

For details on how to recall, backup, restore, and delete test setups, see "Managing Test Setups" on page 17.

Broadband Power Meter Operation

Broadband OPM Power & Loss Measurement Pass/Fail Limits

Power Pass/Fail Limits

- TX Output typically specified for min/max output level
- RX Input typically specified for min/max input levels

To Configure Min/Max Power Limits

1. While in the Source & Power Meter screen, touch Menu.
2. Next, touch Pass/Fail.

In the OPM Pass/Fail Setup screen, configure min/max Power Limits as follows:

3. Make sure Power Pass/Fail is enabled.
4. Touch the desired max/min value for the selected wavelength.
5. When the OPM Max/Min Power Limit editor is displayed, make edits using on-screen controls.
   - Touch Clear or Backspace to clear the previously set value
   - Touch the numeric pad to enter new value
   - Touch Done to save edits and return to the OPM Pass/Fail Setup screen.
   - Touch Cancel or Back to return to the OPM Pass/Fail Setup screen with no edits saved
6. Press Back to return to the Source & Power Meter screen and observe measurements. Display will indicate Power or Loss Pass/Fail status.

Understanding Measured Power Pass/Fail:

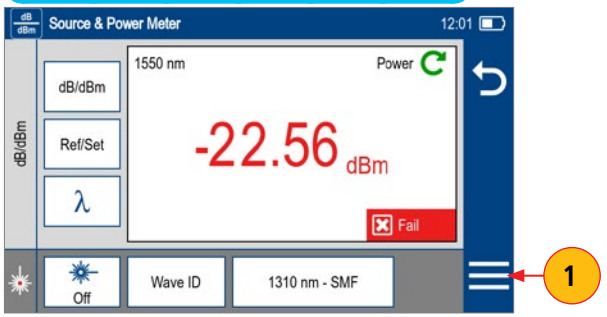
Pass status is displayed if

- [Min Power Limit] ≤ [Measured Power] ≤ [Max Power Limit]

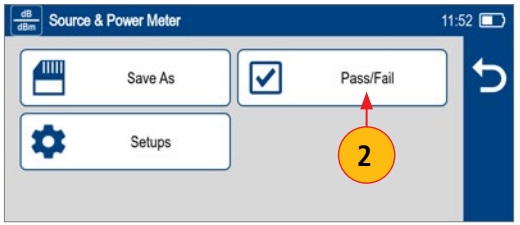
Fail status is displayed if

- [Measured Power] < [Min Power Limit] OR [Measured Power] > [Max Power Limit]

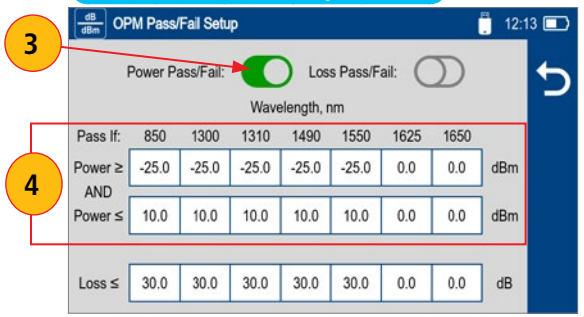
Source & Broadband Power Meter



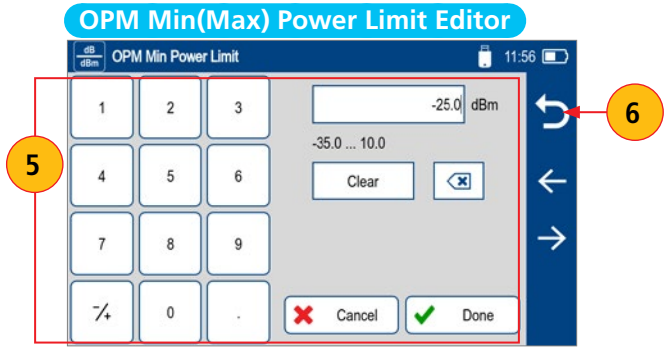
Source & Broadband Power Meter Menu



OPM Pass/Fail Setup Screen



OPM Min(Max) Power Limit Editor



Insertion Loss Pass/Fail Limits

- Networks typically specified for max allowed Loss

To Configure Min/Max Loss Limits

1. While in the Source & Power Meter screen, touch Menu.
2. Next touch Pass/Fail.

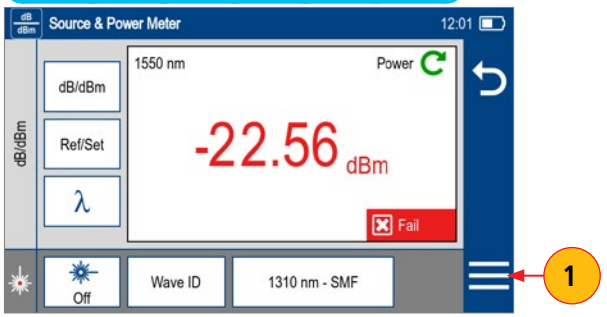
In the OPM Pass/Fail Setup screen, configure max Loss limits as follows:

3. Make sure Loss Pass/Fail editing mode is On.
4. Touch the desired max value for the selected wavelength.
5. When the OPM Max Loss Limit editor is displayed, make edits using on-screen controls.
   - Touch Clear or Backspace to clear the previously set value
   - Touch the numeric pad to enter new value
   - Touch Done to save edits and return to the OPM Pass/Fail Setup screen.
   - Touch Cancel or Back to return to the OPM Pass/Fail Setup screen with no edits saved
6. When done editing, press Back to return to the Source & Power Meter screen and observe measurements. Display will indicate Power or Loss Pass/Fail status.

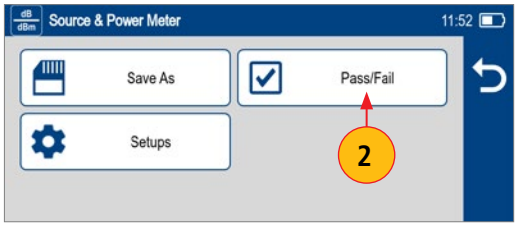
Understanding Measured Loss Pass/Fail:

- Enable and configure max Loss limits in dB
- Display indicates Loss Pass/Fail
  - Pass status is displayed if [Measured Loss] ≤ [Max Loss Limit]
  - Fail status is displayed if [Measured Loss] > [Max Loss Limit]

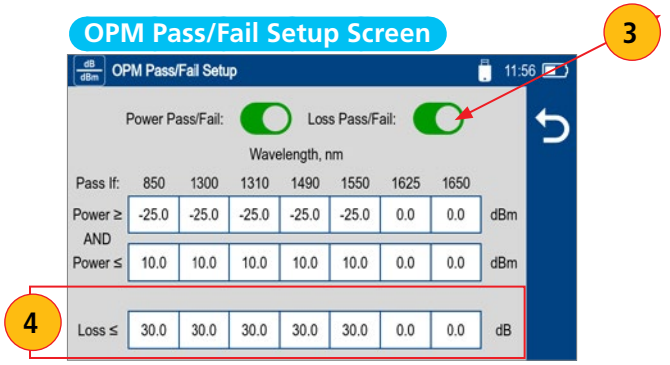
Source & Broadband Power Meter



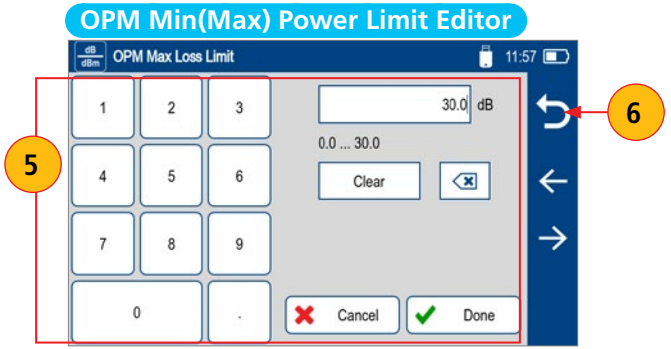
Source & Broadband Power Meter Menu



OPM Pass/Fail Setup Screen



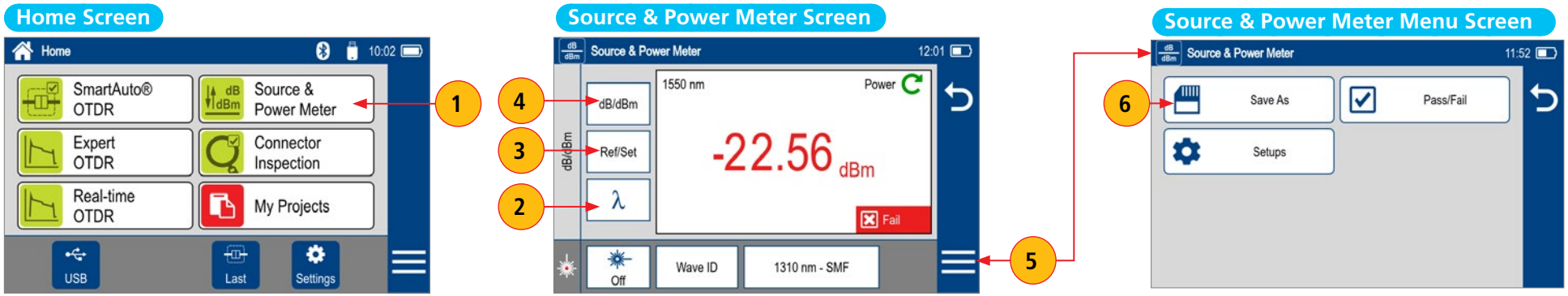
OPM Min(Max) Power Limit Editor



Measuring Optical Power - Broadband OPM

Important: It is important to keep all optical connections and surfaces free from dirt, oils, or other contaminants to ensure proper operation. Always clean all test jumpers before conducting the test procedures outlined in this guide.

1. Turn on the FS300 and touch the Source & Power Meter tab to enable.
   - Refer to section "Broadband Power Meter Operation" on page 53 on how to configure and understand Power and Loss measurements with applied Pass/Fail limits.
   - Select the appropriate fiber optic test jumper. The fiber type of this jumper must be the same as the fiber type normally connected to the output being measured.
   - Mount the appropriate adapter on the OPM optical input. This adapter must match the connector on the end of the test jumper you will connect to the FS300 OPM port.
   - Connect one end of the test jumper to the FS300 OPM port and the other end to the optical output to be measured.
2. If used with non Wave ID source, touch λ to cycle through and select the calibrated wavelength that matches the nominal wavelength of the source being measured. If used with Wave ID source, power meter automatically synchronizes to and indicates received wavelength(s).
3. Touch Ref/Set to view stored reference(s). Touch and hold to store new reference at received wavelength.
4. Touch dB/dBm to toggle between power (dBm or nW) and loss (dB) mode.
5. Touch the Menu icon to display power meter menu.
6. Touch Save As to save current power or loss measurement.
   - Refer to section "Results: Saving, Recalling, Sharing" on page 64 for details.
7. From the displayed Menu screen, you may also enable/disable and adjust power and loss pass/fail limits and access Test Setups screen.



PON Power Meter Operation

PON OPM Power & Loss Measurement Pass/Fail Limits

Power Pass/Fail Limits

- TX Output typically specified for min/max output level
- RX Input typically specified for min/max input levels

To Configure Min/Max Power Limits

1. While in the Source & Power Meter screen, touch Menu.
2. Next, touch Pass/Fail.

In the PON OPM Pass/Fail Setup screen, configure min/max Power Limits as follows:

3. Make sure Power Pass/Fail is enabled.
4. Touch the desired max/min value for the selected wavelength.
5. When the OPM Max/Min Power Limit editor is displayed, make edits using on-screen controls.
   - Touch Clear or Backspace to clear the previously set value
   - Touch the numeric pad to enter new value
   - Touch Done to save edits and return to the OPM Pass/Fail Setup screen.
   - Touch Cancel or Back to return to the OPM Pass/Fail Setup screen with no edits saved
6. Press Back to return to the Source & Power Meter screen and observe measurements. Display will indicate Power or Loss Pass/Fail status.

Understanding Measured Power Pass/Fail:

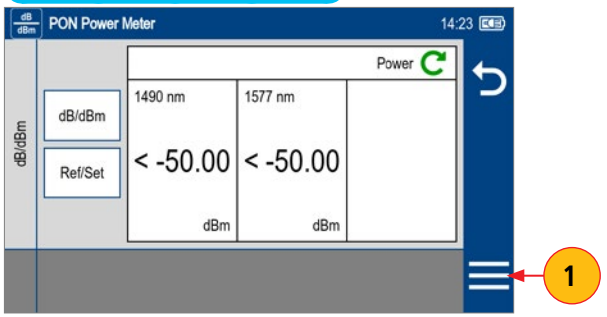
Pass status is displayed if

- [Min Power Limit] ≤ [Measured Power] ≤ [Max Power Limit]

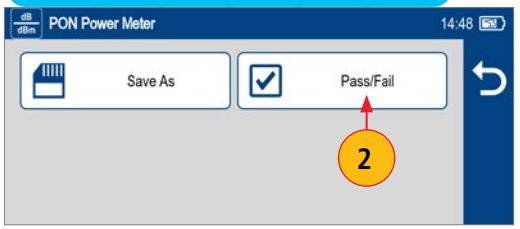
Fail status is displayed if

- [Measured Power] < [Min Power Limit] OR [Measured Power] > [Max Power Limit]

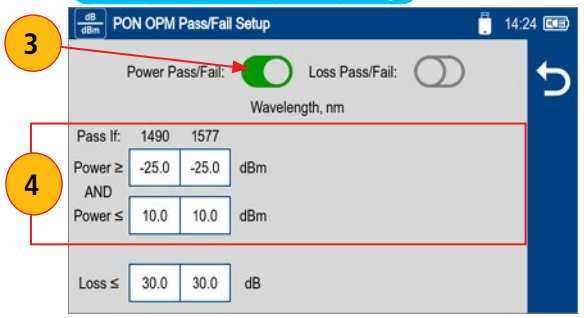
PON Power Meter Screen



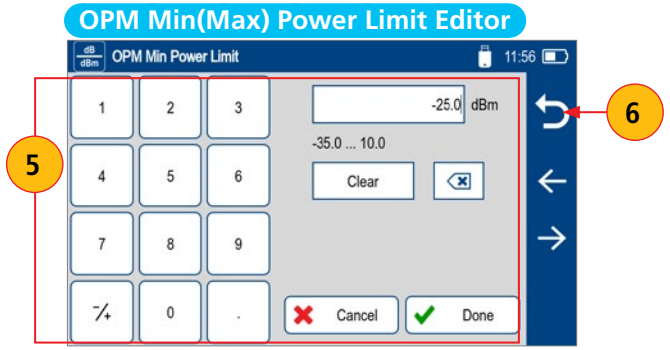
PON Power Meter Menu Screen



PON OPM Pass/Fail Setup



OPM Min(Max) Power Limit Editor



Insertion Loss Pass/Fail Limits

- Networks typically specified for max allowed Loss

To Configure Min/Max Loss Limits

1. While in the Source & Power Meter screen, touch Menu.
2. Next touch Pass/Fail.

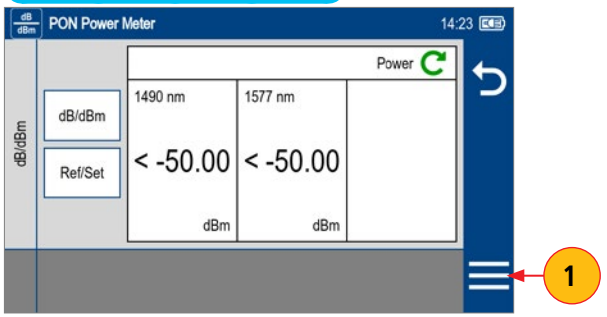
In the PON OPM Pass/Fail Setup screen, configure max Loss limits as follows:

3. Make sure Loss Pass/Fail editing mode is On.
4. Touch the desired max value for the selected wavelength.
5. When the OPM Max Loss Limit editor is displayed, make edits using on-screen controls.
   - Touch Clear or Backspace to clear the previously set value
   - Touch the numeric pad to enter new value
   - Touch Done to save edits and return to the OPM Pass/Fail Setup screen.
   - Touch Cancel or Back to return to the OPM Pass/Fail Setup screen with no edits saved
6. When done editing, press Back to return to the Source & Power Meter screen and observe measurements. Display will indicate Power or Loss Pass/Fail status.

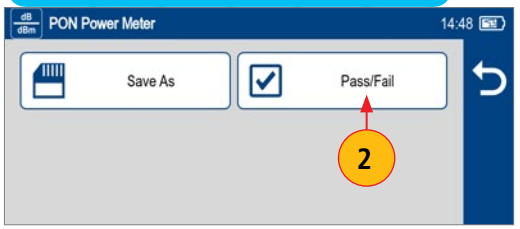
Understanding Measured Loss Pass/Fail:

- Enable and configure max Loss limits in dB
- Display indicates Loss Pass/Fail
  - Pass status is displayed if [Measured Loss] ≤ [Max Loss Limit]
  - Fail status is displayed if [Measured Loss] > [Max Loss Limit]

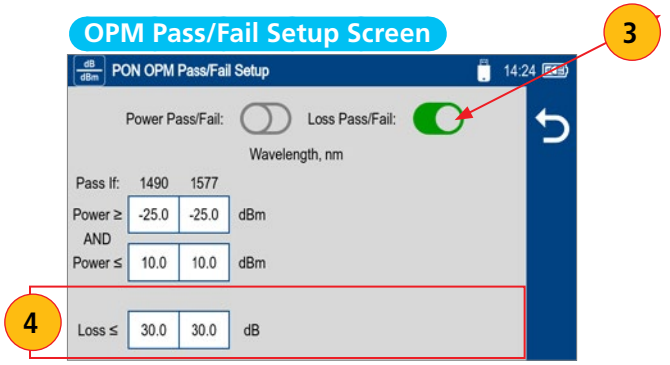
PON Power Meter Screen



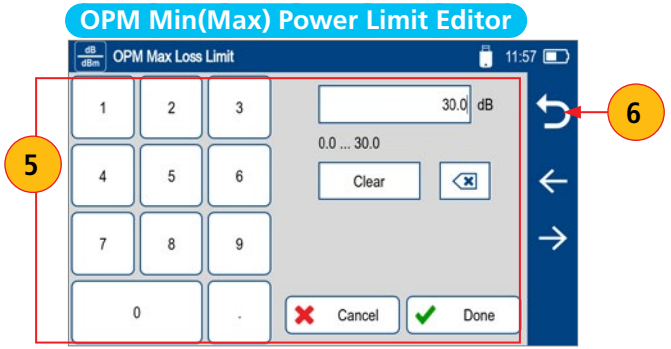
PON Power Meter Menu Screen



OPM Pass/Fail Setup Screen



OPM Min(Max) Power Limit Editor



Measuring Optical Power - PON OPM

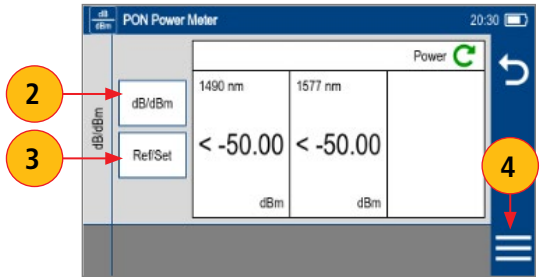
Notes:

- PON OPM is a separately-charged advanced software feature. If it is not enabled on your device, contact Tech Support. The Device Information screen displays its status.
- PON OPM is only supported in the FS300-323 model.

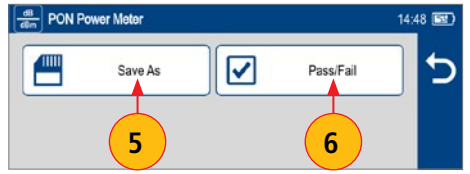
1. Touch the PON tab at bottom of the Home screen to display the PON Power Meter screen.
   - Refer to section "PON OPM Power & Loss Measurement Pass/Fail Limits" on page 56 on how to configure and understand Power and Loss measurements with the applied Pass/Fail limits.
   - Wave ID feature is not available on PON OPM. Wavelengths on PON Power Meter screen are always 1490 and 1550/1577 nm.
2. Touch to toggle between power (dBm or nW) and loss (dB) mode.
3. Touch and hold Ref/Set to store new reference(s) at received wavelength(s). Touch Ref/Set to view stored reference(s).
4. Touch the Menu icon to display power meter menu.
5. Touch Save As to save current power or loss measurement as follows:
   - Select the Save As tab
   - Fill in the appropriate information – can create new project name or Save to an existing project
   - Select Done when finished
6. From the displayed Menu screen, you may also enable/disable and adjust power and loss pass/fail limits as follows:
   - Touch the Pass/Fail tab
   - Refer to section "Broadband Power Meter Operation" on page 53
7. Pressing 'Start Test' on SmartAuto OTDR screen initiates both a SmartAuto OTDR and PON OPM test.

Home Screen

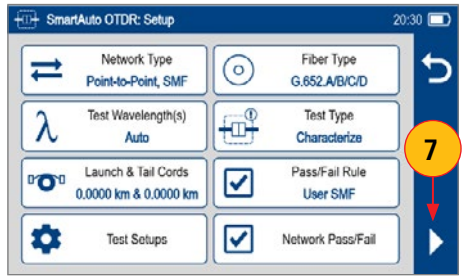
PON Power Meter Screen



PON Power Meter Menu Screen



SmartAuto OTDR Setup



Inspecting Fibers with FOCIS Flex and FlexScan

Optical connectors may be inspected using FOCIS Flex auto-focusing connector inspection probe with IEC Pass/Fail analysis. Captured fiber end-face images and Pass/Fail results are immediately displayed on the FOCIS Flex and on the paired FlexScan OTDR and may be saved in either FOCIS Flex or FlexScan. A micro-USB port on either FOCIS Flex or FlexScan supports fast upload of internally stored results to PC.

FOCIS Flex Inspection Probe Overview

For detailed instructions on how to operate FOCIS Flex inspection probe, please refer to the FOCIS Flex User's Guide (available on www.AFLglobal.com) or the FOCIS Flex Quick Reference Guide provided with your FOCIS Flex inspection probe.

Controls

1. Power button.
2. Power On/Off indicator (GREEN when On).
3. Image Capture button.
4. F1 soft key (typically Back function).
5. F2 soft key (typically Select function).
6. Navigation and Edit functional keys.

Display (2-inch Color LCD [320 x 240])

7. Screen title.
8. Battery status icon.
9. Image and information display area.
10. F1 and F2 soft key labels area.

Interfaces

11. Optical inspection port.
12. Adapter tip.
13. Dust cover.
14. Micro-USB port.
15. 5VDC @ 2A input jack.
16. Charging indicator.

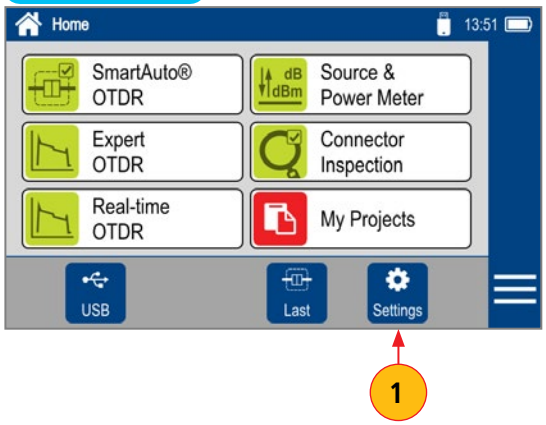
Pairing FlexScan with FOCIS Flex Inspection Probe

To transfer fiber-end images from the FOCIS Flex inspection probe and display inspection results on FlexScan, you must first pair your FOCIS Flex probe with FlexScan.

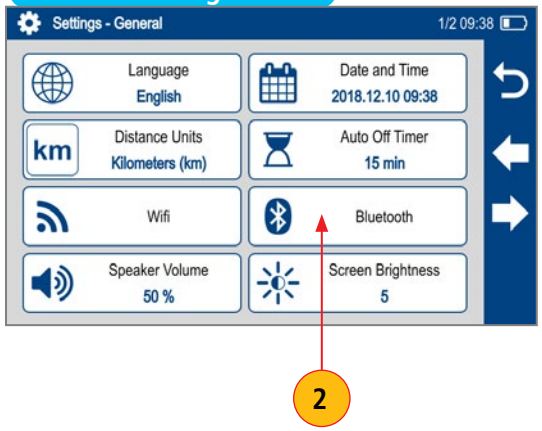
Enable Bluetooth on FlexScan

1. From the Home screen, touch Settings.
2. In the General Settings screen, touch Bluetooth.
3. Touch the Bluetooth On/Off control to enable.
4. Select Pair New Device to scan for and pair to another Bluetooth device.
   - Select Scan to discover devices, then select device from list to pair.
5. Select Previously Connected to view and select from list of previously connected devices.
   - Touch a previously connected device to reconnect;-
   - Solid star (★) indicates selected device. In the device name field you will see Bluetooth ID displayed for your FlexScan device.

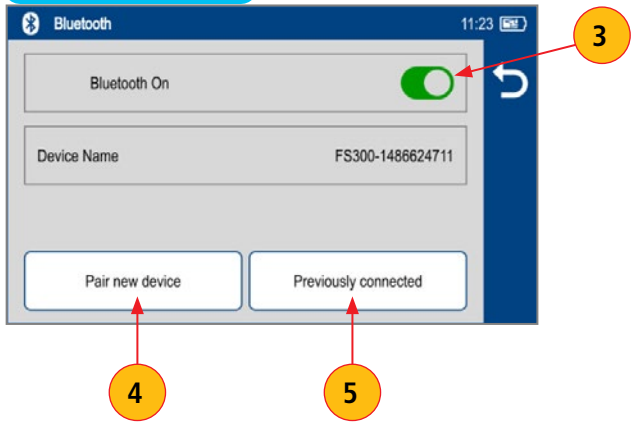
Home Screen



General Settings Screen

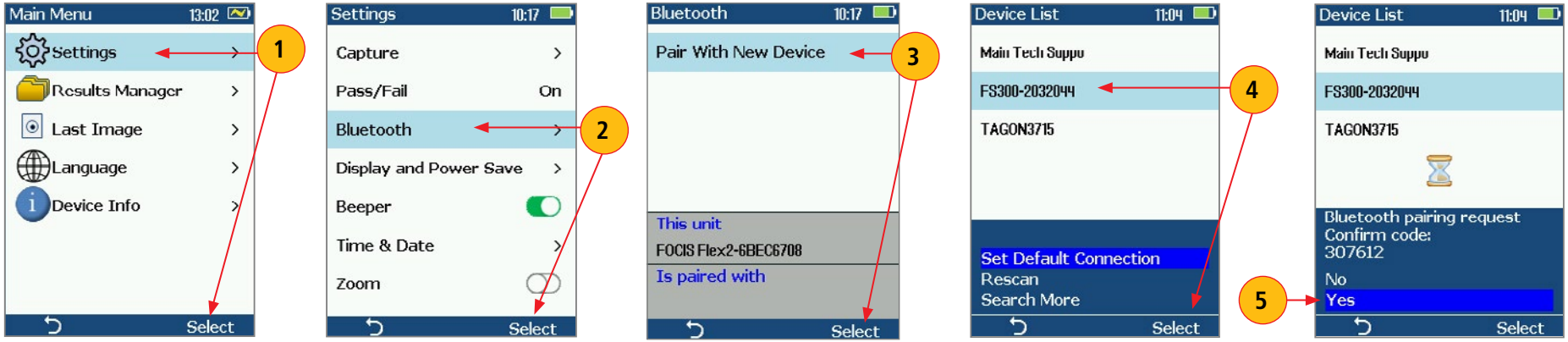


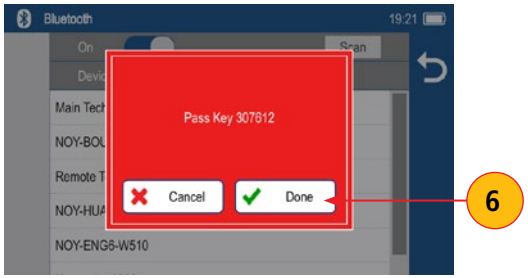
Bluetooth Screen



Enable Bluetooth on FOCIS Flex

1. From FOCIS Flex Main Menu, select Settings, then press Select.
2. From the displayed Settings Menu, select Bluetooth, then press Select.
3. Highlight Pair with New Device, then press Select.
4. When a list of devices is displayed, navigate to and select Bluetooth ID of the FlexScan device, and then press Select to Set as Default Device.
5. Confirm Code displayed on FOCIS Flex by selecting Yes
6. Confirm Code displayed on FlexScan by touching Done.

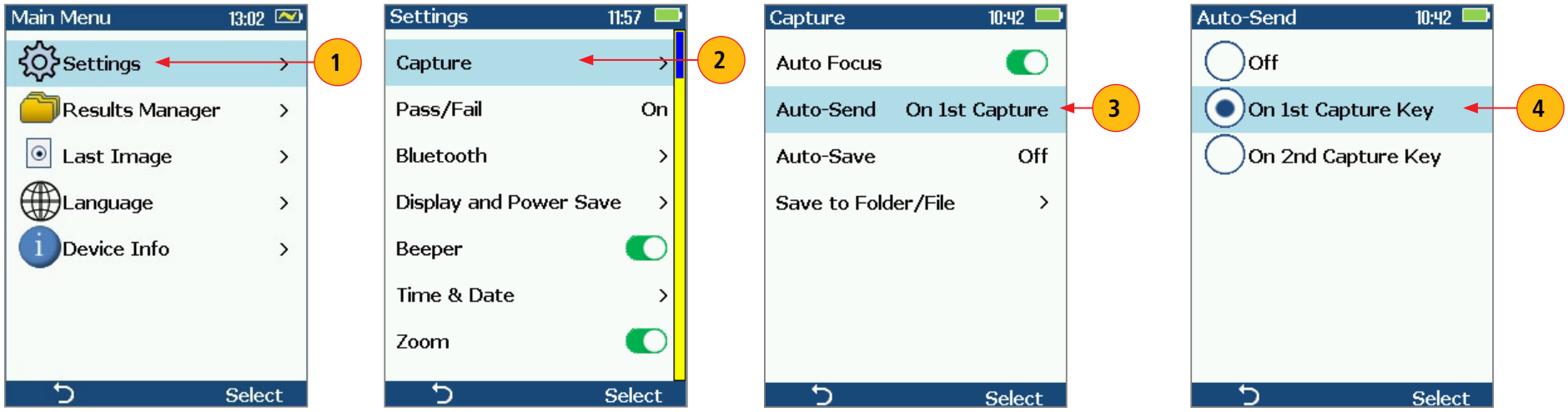




Configuring Auto-Send on FOCIS Flex

1. From the Main Menu, select Settings.
2. Next, select Capture to display the Capture settings screen.
3. Highlight and Select Auto-Send.
4. Use Arrow Keys to enable Auto-Send on 1st Capture key or on 2nd Capture key.

When Auto-Send is enabled, pressing Capture key from Live Image mode will initiate auto-focus (if enabled), capture image, analyze pass/fail (if enabled), then send image and pass/fail results to paired FlexScan OTDR.



Inspecting Optical Connectors

Once FlexScan is paired to FOCIS Flex with Bluetooth enabled on both units, perform the following steps.

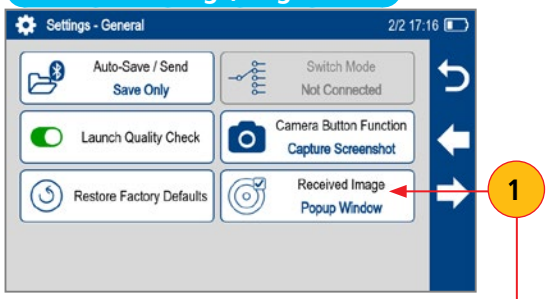
On FOCIS Flex:

- If testing an optical fiber connector, slide the ferrule of the optical fiber into the adapter tip installed on the FOCIS Flex inspection port. Use caution not to contaminate the end-face of the fiber connector.
- If testing an optical fiber connector mounted in a bulkhead adapter, slide the adapter tip into the bulkhead adapter.
- You will see a Live fiber-end image appear on the FOCIS Flex display.
- Press the Capture button to auto-focus, capture, analyze and display the connector end-face image. (Refer to section "FOCIS Flex Inspection Probe Overview" on page 59).
- Once captured, the fiber end-face image is analyzed by the FOCIS Flex.
- Once analysis is done, inspection results appear on the FOCIS Flex display.
- Simultaneously, FOCIS Flex will send results to the FlexScan paired to it.

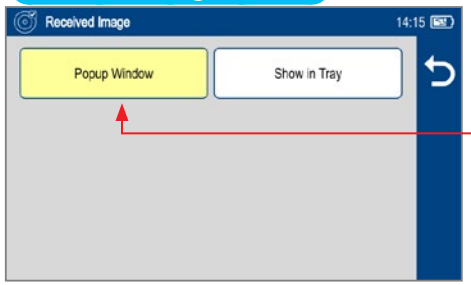
On FlexScan:

1. If the Received Image option is set to Popup Window in General Settings, inspection results received from FOCIS Flex will be immediately displayed on FlexScan screen even if Connector Inspection mode is not enabled in the Home screen
2. If the Received Image option is set to Show in Tray in General Settings, inspection results will only be displayed when Connector Inspection mode is enabled in the Home screen.
3. Once the connector inspection results displayed, they may be saved.
4. To save results in FlexScan, select Menu.
5. Next, select Save As to name and save inspection image and Pass/Fail results.

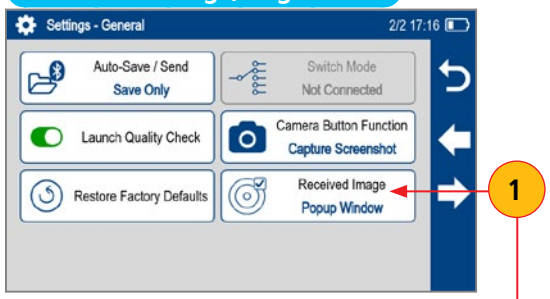
General Settings, Page 1 of 2



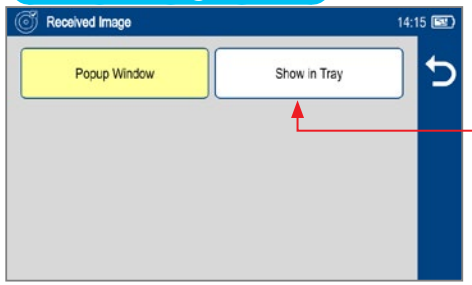
Received Image Screen



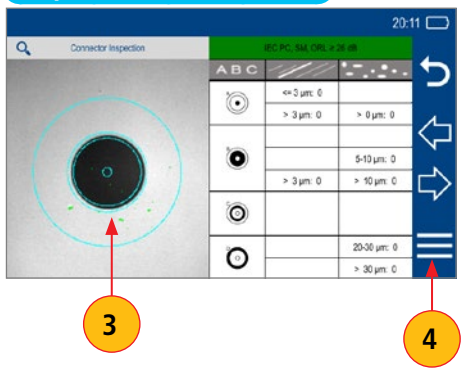
General Settings, Page 1 of 2



Received Image Screen



Inspection Mode Screen



Note:

For inspection results to be included in reports with OTDR results, they must be saved with the same [Job], [End1], [End2], [Cable] and [Fiber#] names used for the associated OTDR results

Results: Saving, Recalling, Sharing

Understanding FS300 File Naming Structure

Fiber test results may be stored in the FlexScan internal memory or external USB stick. Saved test results are organized into a Fiber Group sub-folder within a Project folder. The name of a saved result consists of several parameters, which are defined in the Save As screen:

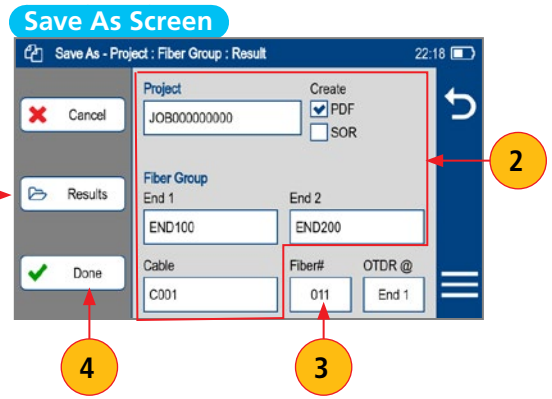
<Project>, <End 1>, <End 2>, <Cable>, <Fiber#> & <OTDR@>

OTDR Test Results Name Structure

End 1-End 2-Cable_Fiber#_Wavelength.SOR

- Fiber Group Name: defined in the Save As screen
- Fiber #: auto-incremented after each save
- S13 for 1310 nm
  S15 for 1550 nm
  S16 for 1625 nm
  M85 for 850 nm
  M13 for 1300 nm

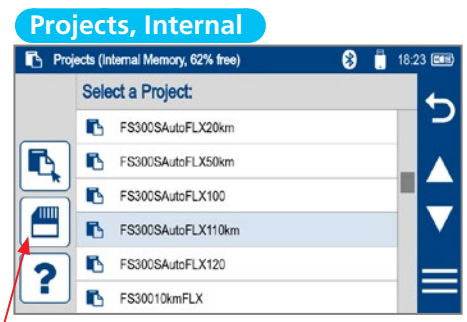
Touch Results to select Internal memory or USB (if present) and navigate to the desired Job and Cable folder

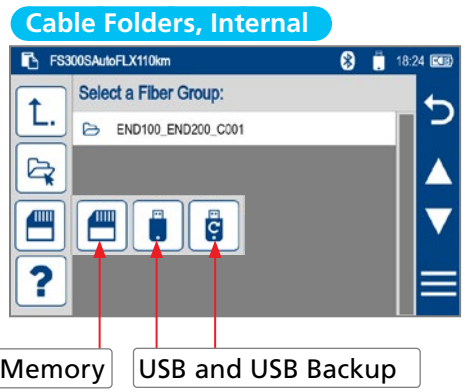


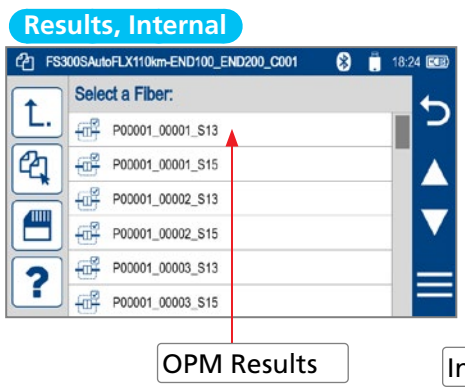
1. Touch Results to display File Manager and navigate to the desired Project / Fiber Group folder.
2. Project, End 1, End 2, and Cable are user-defined in Text Editor.
3. Fiber number auto-increments after each save, but can be modified in Number Editor as needed.
4. Touch Done when finished.

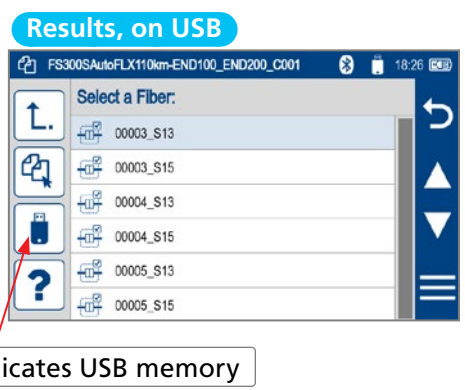
For Bi-directional OTDR reports, results must be obtained and stored from each end of the network:

- Use same test settings (range, pulse width, etc.) in both directions; Use same launch and receive cables in both directions; Swap End 1, End 2 names; Bi-directional averaging and report generation is performed using FlexReports.









OPM Test Results Name Structure

Fiber test results may be stored in the FlexScan internal memory or external USB stick. Saved test results are organized into a Fiber Group sub-folder within a Project folder. The name of a saved result consists of several parameters, which are defined in the Save As screen:

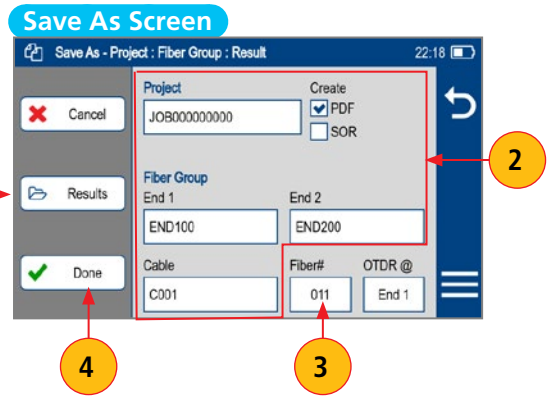
<Project>, <End 1>, <End 2>, <Cable>, <Fiber#> & <OTDR@>

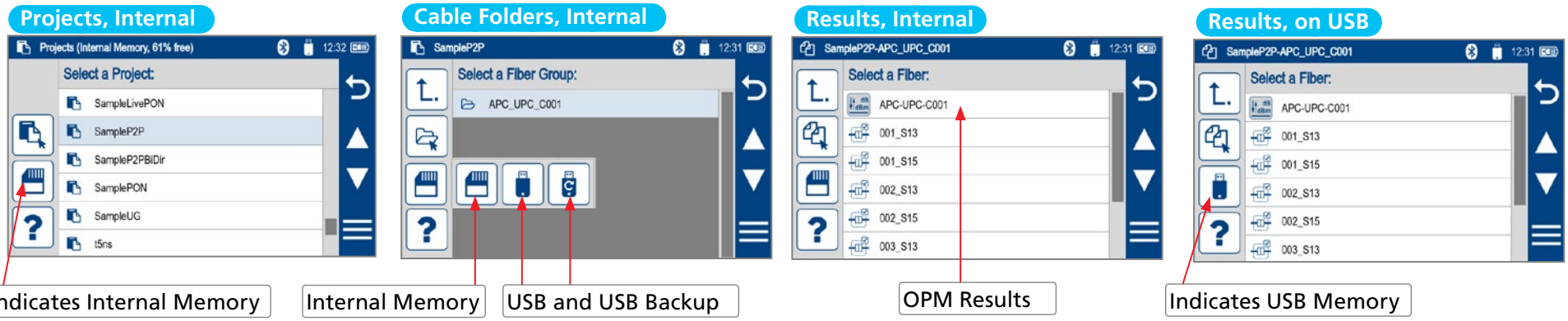
End 1-End 2-Cable.ATD

Cable Name: defined in the Save As screen

1. Touch Results to display File Manager and navigate to the desired Project / Fiber Group folder.
2. Project, End 1, End 2, and Cable are user-defined in Text Editor.
3. Fiber number auto-increments after each save, but can be modified in Number Editor as needed.
4. Touch Done when finished.

Touch Results to select Internal memory or USB (if present) and navigate to the desired Job and Cable folder



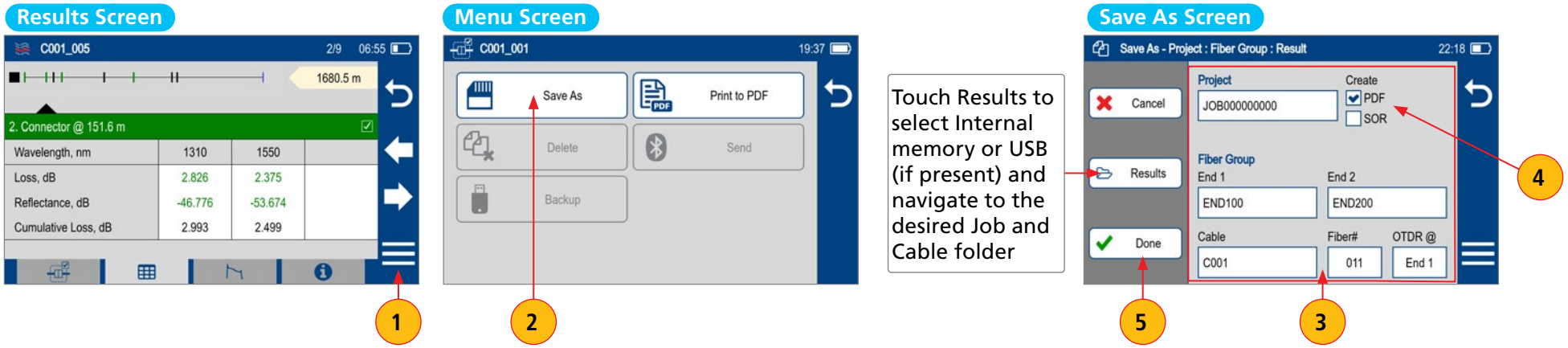


Note: FlexScan can be configured to automatically save results and optionally send results to FlexApp via Bluetooth each time a test is completed. See "Configuring Auto-Save (and Optional Send)" on page 15 for details.

Manually Saving Results to the Current Folder

Saving to the Current Folder

1. While in the Results view, touch Menu
2. Next, touch Save As.
3. In the Save As screen, review Project, End 1, End 2, Cable names, and Fiber# used to identify saved results.
4. Select if results are to be saved in SOR and/or PDF file format.
5. Touch Done to save test results.



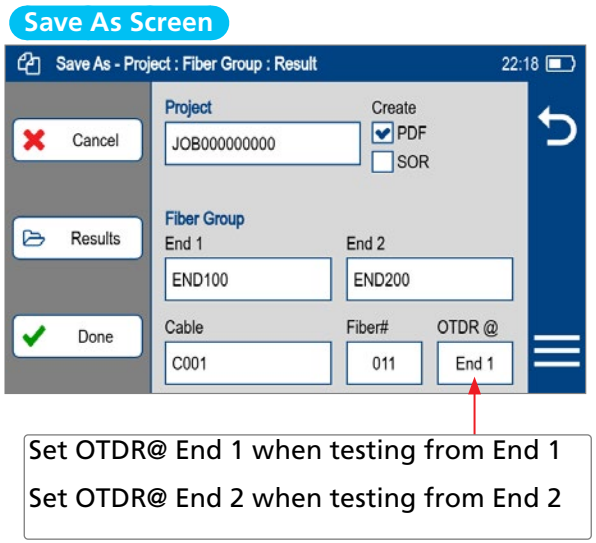
Saving to a Newly Created Folder

1. While in the Results view, touch Menu icon.
2. From the displayed sub-screen, touch Save As.
3. Define Project, End 1, End 2, Cable, Fiber#, and OTDR@ fields used to name saved results:
   - Touch any field to edit it
4. Select if results are to be saved in SOR and/or PDF file format.
5. Touch Done to save test results.

Note: this will make the newly created Job, OTDR End, Cable, or Fiber current.

Saving Results for Bi-directional Reporting

- Results must be obtained and stored from each end of the network. Bi-directional averaging and report generation is performed using FlexReports.
- To ensure FlexReports can associate results from both ends, proper naming of test results is critical:
- Use same Project name and Fiber Group name when testing from each end.
- Fiber Group name created from End 1, End 2, and Cable names.
- Use same End 1 and End 2 names.
  - Set OTDR@ End 1 when testing from End 1
  - Set OTDR@ End 2 when testing from End 2



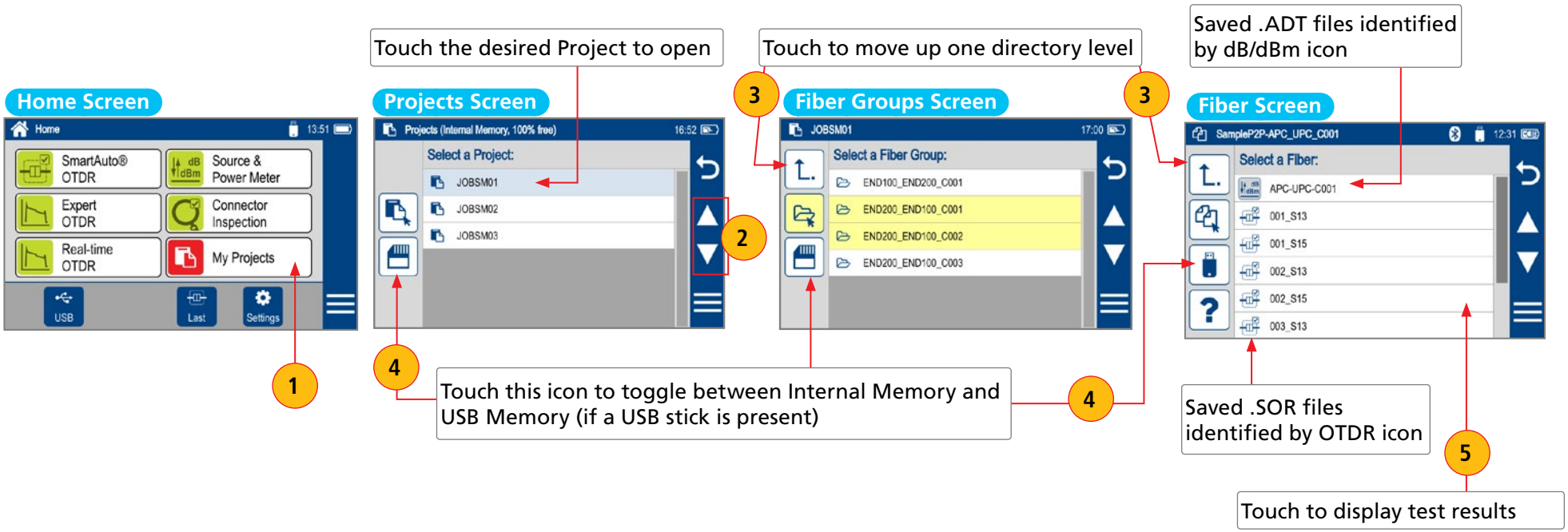
Auto-Saving Results

FlexScan can be configured to automatically save results and optionally send results to FlexApp via Bluetooth each time a test is completed. See "Configuring Auto-Save (and Optional Send)" on page 15 for details.

Recalling and Viewing Saved Test Results

To View Saved Test Results

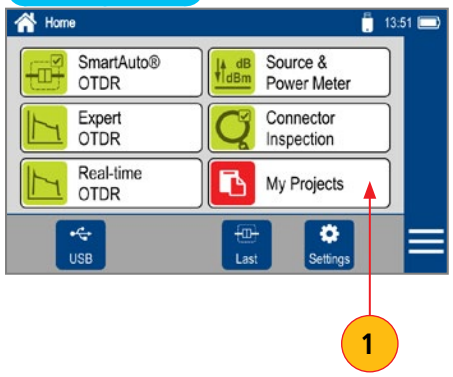
1. From the Home screen, touch My Projects.
   - Navigate through Project/Fiber Group/Fiber screens to locate the desired test record, then touch it to display test results.
2. In Project/Fiber Group/Fiber screen, touch up/down keys or swipe to scroll up/down through list of files.
3. In Fiber Group/Fiber screen, touch Arrow Up icon to navigate up to Fiber Groups or Projects level.
4. In Project/Fiber Group/Fiber screen, touch the Memory/USB icon to toggle between USB memory stick and internal memory card (if USB stick present).
5. In Fiber screen, touch the desired result to view.



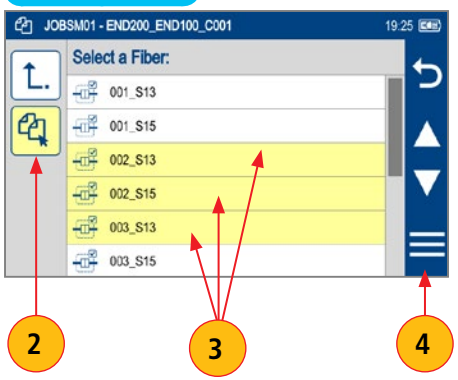
Deleting Projects/Fiber Groups/Fibers (Results)

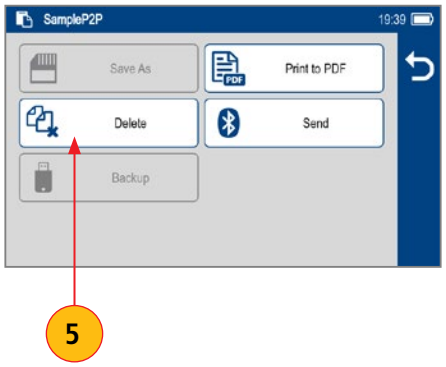
1. From the Home screen, touch My projects to display the Results Manager, which may be displayed as Projects screen, Fiber Groups screen, or Fibers screen.
   - Navigate through the Projects/Fiber Groups/Fibers screen to locate the desired result(s).
2. Touch Add Files icon control to enable select function.
3. Touch as many files as needed to select.
4. Touch the Menu soft key to display a sub-menu.
5. Touch Delete.
6. Then touch Done to confirm deletion.

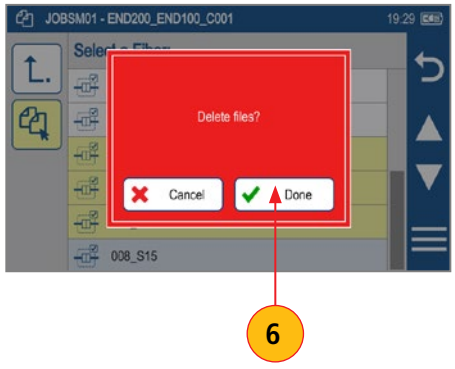
Home Screen



Fibers Screen







Transferring Files to a PC via USB

To transfer files from your FlexScan to a PC using a USB cable, perform the following:

- Connect your FlexScan to a PC using the supplied micro-USB to USB cable. Make sure the micro-plug is fully seated in your FlexScan.
- Touch the USB soft key on the FlexScan's Home screen.
- On your PC, open My Computer. A new removable drive named FS300 X: will appear, where 'X:' is the drive letter assigned to your FlexScan.
- Under FS300 X: you should see two or three folders:
  RESULTS, SOFTWARE and possibly SCREENSHOTS.
- Copy the RESULTS folder to your PC.
  - Under RESULTS you will see: TRACES.
  - Under TRACES you will see all of the folders containing OTDR traces or OPM results.

Note:

Before removing the USB cable connecting your FlexScan to your PC, or pressing the Cancel soft key on the USB screen, left click the Safely Remove Hardware icon in the Start bar of your PC, then left click the Safely remove USB Mass Storage Device – Drive (X:) message, where 'X' is the drive letter assigned to your FlexScan.

Home Screen

Uploading Results via Bluetooth to a Mobile device Running the FlexApp

See the following instructions:

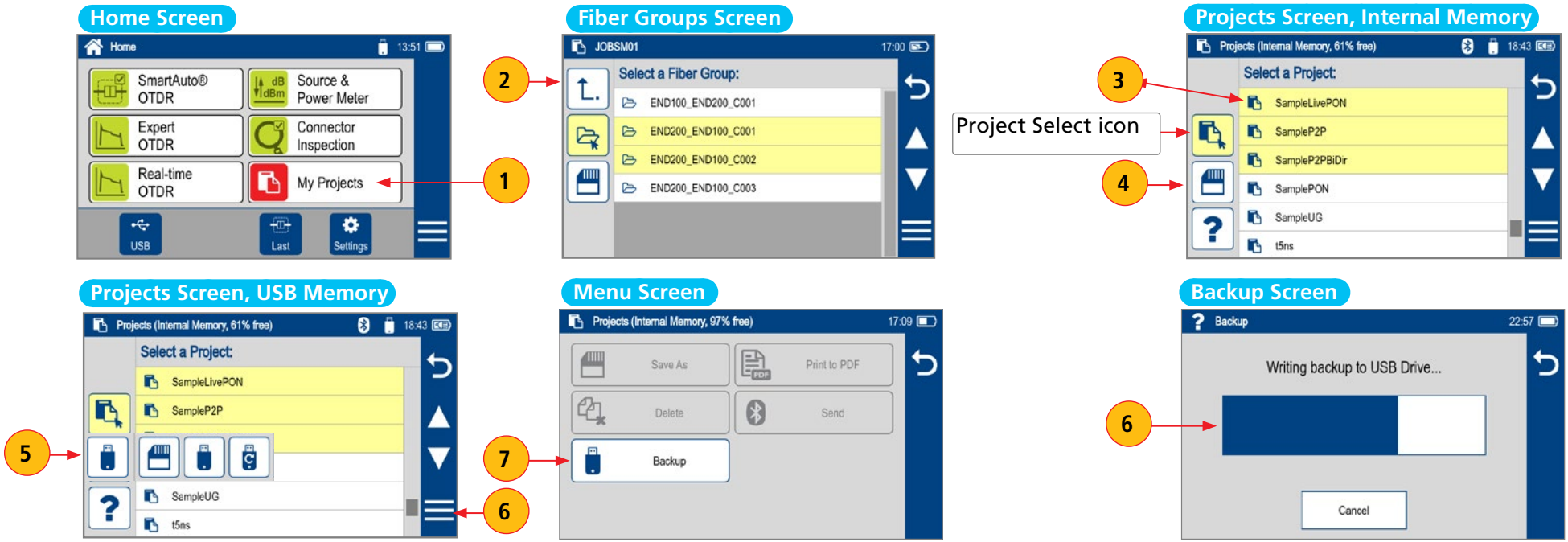
FlexApp on Android Device— Wireless Transfer of FlexScan® FS300/TS100 Results to FlexReports for Easy Reporting

FlexApp on iOS Device — Wireless Transfer of FlexScan® FS300/TS100 Results to FlexReports for Easy Reporting

Backing up Results to External USB Memory Stick

To back up internally stored results to USB memory stick, plug external USB memory stick into FlexScan and perform the following steps

1. From the Home screen, touch My Projects.
2. If the Arrow Up icon is shown, touch it to navigate up to Projects level until the Arrow Up icon disappears.
3. Select as many Projects as needed.
   - Single project: Long press a project to select it
   - Multiple projects:
     - Touch the Project Select icon
     - Touch each desired project (each will highlight to yellow)
4. Verify that Internal Memory is currently selected - memory card icon is shown.
5. If the USB memory shown, touch the USB icon to toggle to internal memory.
6. Touch Menu.
7. Next, touch Backup.
8. Wait until “Writing backup to USB drive…” completes.



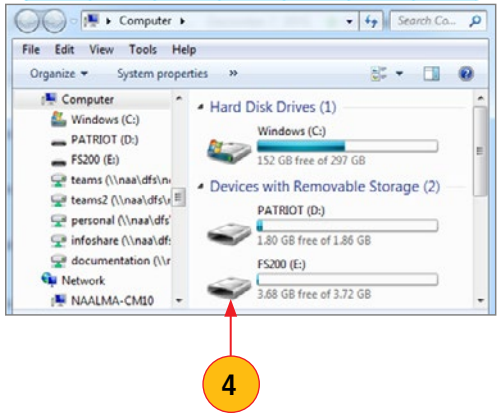
Restoring Results from External USB Memory Stick

Use a PC to restore backed up FlexScan results from the USB memory stick:

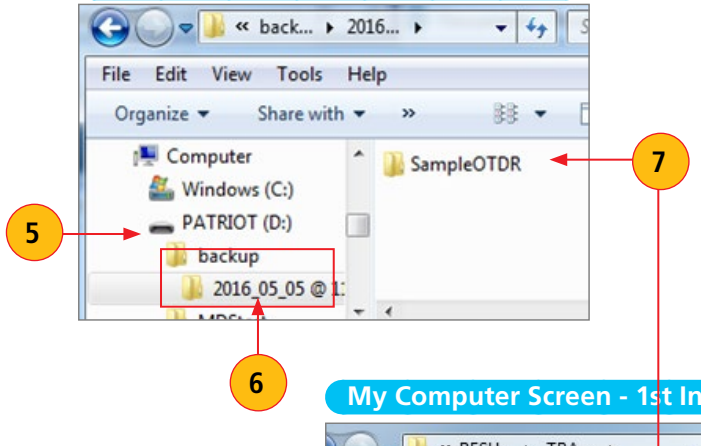
1. Turn on the FlexScan OTDR and connect to a PC via USB cable.
2. Touch the USB icon on the FlexScan's Home screen.
3. Plug the USB memory stick containing test results into a PC.
4. Open 'My Computer' and double-click on the FS300 drive.
5. Open 2nd instance of 'My Computer' and double-click on the USB drive.
6. Within USB drive, double-click on 'backup' folder, then select date/time-stamped folder.
7. Drag contents of the desired backup folder from the USB to the FS300\Results\Traces folder.
8. PC will prompt to confirm overwrite of folders or files having the same names.

Home Screen

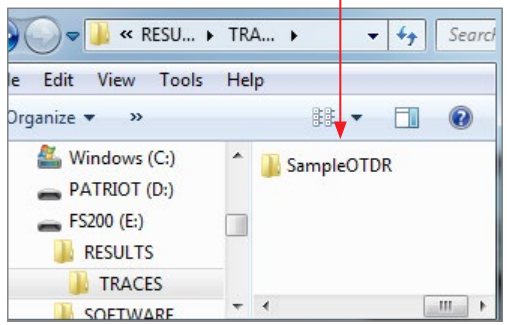
My Computer Screen - 1st Instance



My Computer Screen - 2nd Instance



My Computer Screen - 1st Instance



Print Results to PDF

Saved test results may be organized into reports and printed to PDF file format as needed.

1. Navigate to the desired test results and touch Menu from the results display.
2. Touch Print to PDF from the displayed menu.
3. Select options to include cover page and configure content of printout.
4. Scroll and touch check boxes to configure additional options.
5. Touch Done to complete setup and generate PDF report.
6. Generated PDF report will be saved to the same RESULTS > TRACES > PROJECT folder as test results.
   - For single fiber tests, the PDF filed is stored at the SOR file view of the Select a Fiber screen
   - For multifiber tests, the PDF file is stored in the fiber group level of the Select a Fiber Group screen (first entry on the screen)
   - Files are named based on selected FiberID and PortID (as applicable)
   - If duplicate PDF file name exists, user is prompted to Overwrite, Rename or Cancel
7. Touch OK when done.
8. Connect FlexScan to USB and upload PDF to PC for printing

Note: Created PDF may also be sent via Bluetooth to FlexApp running on a mobile device

Uploading PDF reports to PC

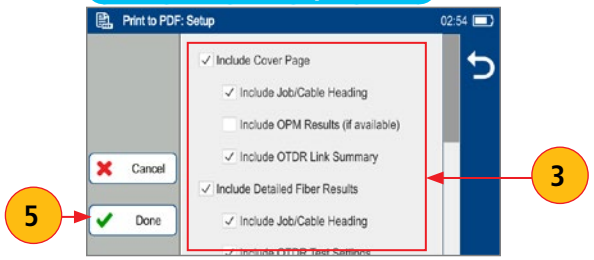
- Connect FlexScan to PC (via FlexScan's micro-USB function port and USB port on a PC).
- On FlexScan, enable USB mode (on Home screen).
- On PC, navigate to FS300 (X:) > RESULTS > TRACES > "Destination PROJECT folder".
- Upload PDF report from FlexScan to PC.

Note: Future software update will allow PDF to be sent to another device via Bluetooth or Wi-Fi (Bluetooth/Wi-Fi option required).

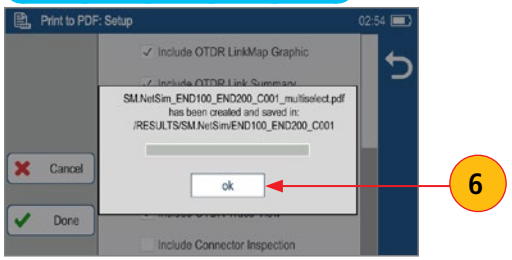
Results Screen

Menu Screen

Print to PDF Setup Screen



Print to PDF Setup Screen



Generating Reports with FlexReporter Software Suite

FlexReporter Software Suite works with AFL Test and Inspection instruments to provide a simple-to-use, high performance cloud enabled reporting platform. FlexReporter combines FlexApp – a mobile App that wirelessly transfers test results to FlexReporter-Cloud from the field with a fast, comprehensive, 3-step reporting solution – FlexReports PC software. The FlexReporter software suite is developed to make the complicated task of reporting faster, simpler, and easy-to-use.

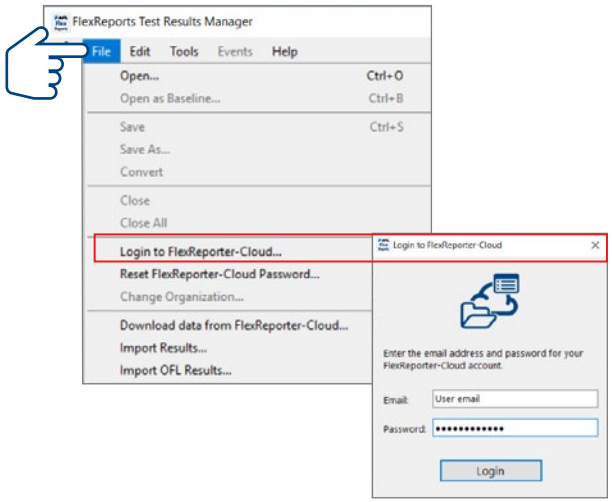
FlexReports is a Windows®-compatible PC software that provides comprehensive test results analysis and reporting for AFL FlexScan OTDRs, FOCIS inspection systems, OLTS, and OPM products.

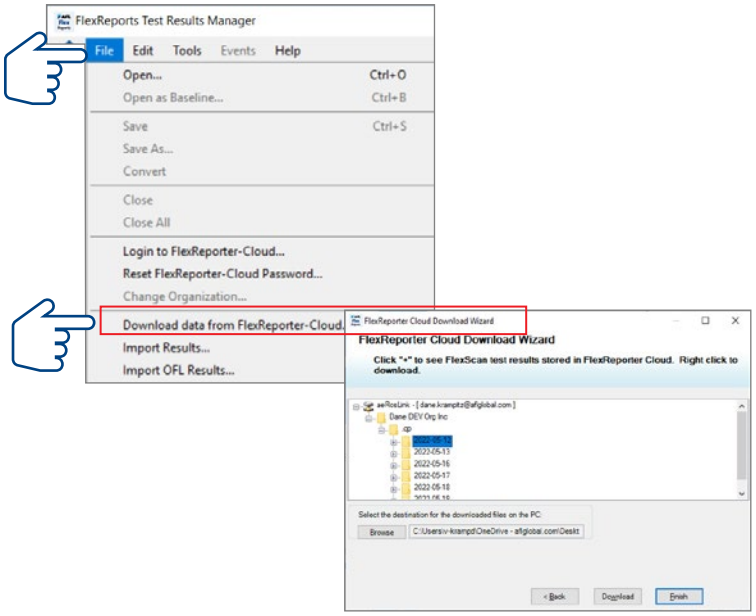
FlexApp is a mobile Android and iOS App that supports AFL's FlexScan® OTDRs and FOCIS connector inspection products (FOCIS Flex, FOCIS Lightning). FlexApp wirelessly transfers test results from any FlexScan OTDR or FOCIS inspection probe directly to FlexReporter-Cloud from the field for subsequent analysis, editing, and reports generation with FlexReports PC software.

Using FlexReports for Downloading Test Results from FlexReporter-Cloud

1. Install and run latest version of FlexReporter.
2. From FlexReports Home screen menu, click File and click "Log in to FlexReporter-Cloud" to log in.
3. Click "Download data from FlexReporter-Cloud". Navigate and select the desired folder with results for download, then click "Download".
4. Return to the FlexReports Home Menu to view results or generate a test report.

Download FlexReports





Generating Reports

See FlexReports User's Guide for detailed explanation.

Contacts

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Product Registration	www.AFLglobal.com/Register
AFL's Customer Portal - Direct	content.AFLglobal.com/Direct.html