FOCIS Lightning

Fiber Optic Connector Inspection System

User Guide

www.AFLglobal.com or (800) 321-5298, (603) 528-7780

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Safety Information

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.

NOTE! FOCIS Lightning contains no user serviceable parts. This instrument must be returned to AFL or authorized agents for repair.

IMPORTANT! To ensure accurate measurements and operation, it is important to keep connector end-faces on the fiber under test clean.

CAUTION! Never view a live fiber. Never look directly into the optical outputs of fiber optic network equipment, test equipment, patch cords and jumpers. Laser radiation is harmful to eyes.

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.

NOTE! Refer to your company's safety procedures when working with optical systems.

NOTE! Follow your company's approved cleaning procedures.

Standards Compliance Information

AFL Test & Inspection FOCIS Lightning contains a WiFi transceiver.

FCC ID: 2ANTH-FLGHTN18

IC: 23261-FLGHTN18

NOTE: This equipment has been tested and found to comply with the limits of Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Part 15 Clause 15.21

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

ISED RF Exposure Guidance Statement:

- In order to comply with FCC/ISED RF Exposure requirements, this device must be installed to provide at least 20 cm separation from the human body at all times.
- Afin de se conformer aux exigences d'exposition RF FCC / ISED, cet appareil doit être installé pour fournir au moins 20 cm de séparation du corps humain en tout temps.

NOTE: The AFL FOCIS Lightning complies with Industry Canada RSS 247 standard. See RSS GEN 7.1.5. The term "IC:" before the certification/registration number only signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. The term "IC:" before the certification/registration number does not imply that Industry Canada approved the equipment.

Le FOCIS Lightning d'AFL est conforme à la norme d'Industrie Canada RSS 247. Voir RSS GEN 7.1.5. Le terme "IC:" avant le numéro de certification/enregistrement signifie seulement que l'enregistrement a été effectué sur la base d'une déclaration de conformité indiquant que les spécifications techniques d'Industrie Canada ont été rencontrées. Le terme "IC:" avant le numéro de certification/enregistrement n'implique pas qu'Industrie Canada a approuvé l'équipement.

ISED RSS Notice:

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference;
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage;
2. l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

General Information

FOCIS Lightning | aeRos® Solution Overview

AFL's FOCIS Lightning Fiber Optic Connector Inspection System, paired with AFL's aeRos cloud with FOCIS Flex app comprise a complete fiber optic connector inspection and workflow and data management solution.

FOCIS Lightning Fiber Optic Connector Inspection System

FOCIS Lightning is a self-contained, compact, and hand-held inspection probe that can be used independently or paired with AFL's FOCIS Flex app and aeRos cloud. FOCIS Lightning is a self-contained multi-fiber connector inspection probe with integrated screen. It is intended specifically for the inspection of multi-fiber connectors and bulkheads such MPO and MTP® including multi-row varieties. The FOCIS Lightning can perform industry standard and user-defined end-face cleanliness analysis at a rate of about 1 second per fiber. Lightning stores connector level and individual fiber images, analysis, overlays, and zones tables locally and provides both WiFi and Bluetooth wireless links. The AFL FOCIS app (iOS and Android) provides a comprehensive and user-friendly feature set as well as connectivity with AFL's cloud-based aeRos® workflow automation platform.

aeRos

aeRos is an open, cloud-based, workflow management platform that facilitates two-way communication and data exchange from engineering to project management to your technician in the field. Now everyone has access to test results and can address challenges in real-time. aeRos allows project managers to send jobs directly to technicians, defining tests and configurations as needed. Throughout the job, managers can monitor technicians' progress and help to solve problems as they arise. aeRos solution is available in two options: aeRos BASIC and aeRos PRO:

aeRos® BASIC account — Data Management solution that allows users to save their test data in the aeRos Cloud and then retrieve it from anywhere at any time with a standard Internet browser. aeRos BASIC is free to all owners of AFL's aeRos enable test equipment.

aeRos® PRO account — Workflow Management solution that allows users to manage their entire testing workflow and enables seamless and efficient communications and data management. aeRos PRO is available in annual and lifetime License configurations.

FOCIS Flex App

By pairing the FOCIS Lightning inspection probe with the FOCIS Flex app and aeRos PRO, users are enabled to control their test hardware directly from their Android or iOS smart devices. With aeRos PRO account, test projects and setups can be created and predefined in aeRos cloud, and then pushed to the smart device app to simplify the test process for technicians. Technicians receive a notification on their smart device and can work on scheduled projects. As the project is completed, inspection results are automatically synchronized with the cloud for instant access, analysis, and reporting.

FOCIS Flex app is available via Google play store or App Store.

Made for iPad mini 3 - Legal Notice

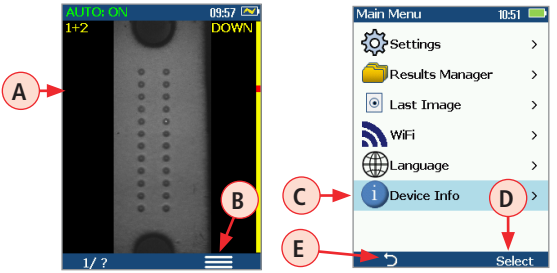
'Made for iPad' means that an electronic accessory has been designed to connect specifically to iPod, iPhone, or iPad, respectively, and has been certified by the developer to meet Apple performance standards. Apple is not responsible for the operation of this device or its compliance with safety and regulatory standards. Please note that the use of this accessory with iPod, iPhone, or iPad may affect wireless performance.

- iPad, and Retina are trademarks of Apple Inc., registered in the U.S. and other countries.
- iPad mini is a trademark of Apple Inc., registered in the U.S. and other countries.
- Android is a trademark of Google Inc.

General Information

How to View Device Information Menu

- From the Live Image mode (A), press the Menu (B) button to access the Main Menu screen.
- Press Up/Down ▲▼ arrow buttons to navigate and highlight the Device Info menu (C).
- Press Select (D) or Right ▶ arrow button to display a sub-screen of the Device Info menu, which will display the following Info:
  - Device name
  - Serial number
  - Controller version number
  - User Interface version number
- Press Back (E) button to return to Live Image mode.



Note: It is helpful to have your FOCIS Lightning Device Information available if you need to contact AFL Test & Inspection Customer Service or Technical Support.

Warranty Terms and Conditions

AFL Test and Inspection products are warranted against defective material and workmanship for a period of (1) one year from the date of delivery to the end user. Optional Extended Warranty starts at the end of the standard (1) one year warranty period. 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 repair facility or when it has been subjected to misuse, negligence, or accident.

In no case shall AFL liabilities exceed the original purchase price.

Repair Services

Please contact customer service for a return authorization number prior to sending your AFL test equipment in for repair or calibration.

USA Repair and Calibration services

AFL Test & Inspection Division
16 Eastgate Park Road
Belmont, NH 03220
(603)528-7780
(800)321-5298
ServiceRepair@aflglobal.com
https://www.aflglobal.com

Standards Compliance Information

FOCIS Lightning has been designed and tested to comply with the relevant sections of any applicable specifications including full compliance with all essential requirements of the applicable EU Directives.

FOCIS Lightning Overview

Controls, Display, Interfaces

Controls

1. Power button - ⏻
2. Image Capture button - 📷
3. F1 soft button (typically Back function)
4. F2 soft button (typically Select function)
5. Navigation and Edit functional buttons

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

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

Interfaces

10. Optical inspection port
11. Adapter tip
12. Micro-USB port
13. 5 VDC input jack
14. Charging indicator

Getting Started

Powering Up/Down

Power-Up

- Press and release the Power button (A).

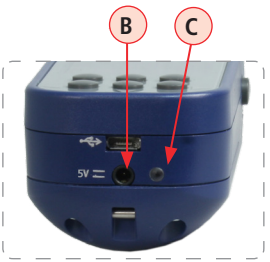
Power-Down

- Press and hold the Power button (A) until display turns off.

Configure FOCIS Lightning to Auto-Off

- From the Main Menu -> Settings, select Display & Power Save option.
- Select desired power save option: 2 min, 5 min, 10 min, Never.

Battery Charging and Operation



- Plug the included AC Charger into AC outlet.
- Connect charger plug into 5 VDC jack (B) on FOCIS Lightning.
- LED (C) indicates charging status as follows:
  - **OFF** - AC not connected
  - **RED** - Charging battery
  - **GREEN** - Fully charged
  - **RED/GREEN flashing** - Charging error. Verify correct 5VDC 2A charger is used. Allow to cool before charging.
- FOCIS Lightning charges while operating.
- Battery icon (D) indicates battery state as follows:

 - AC connected; charging, not fully charged

 - AC connected; charging, fully charged

 - Battery operation, fully charged

 - Battery operation, partially charged

 - <15 min Battery operating time remaining

Getting Started

MPO Live Image Mode Overview

FOCIS Lightning powers-up in the Live Image mode screen.

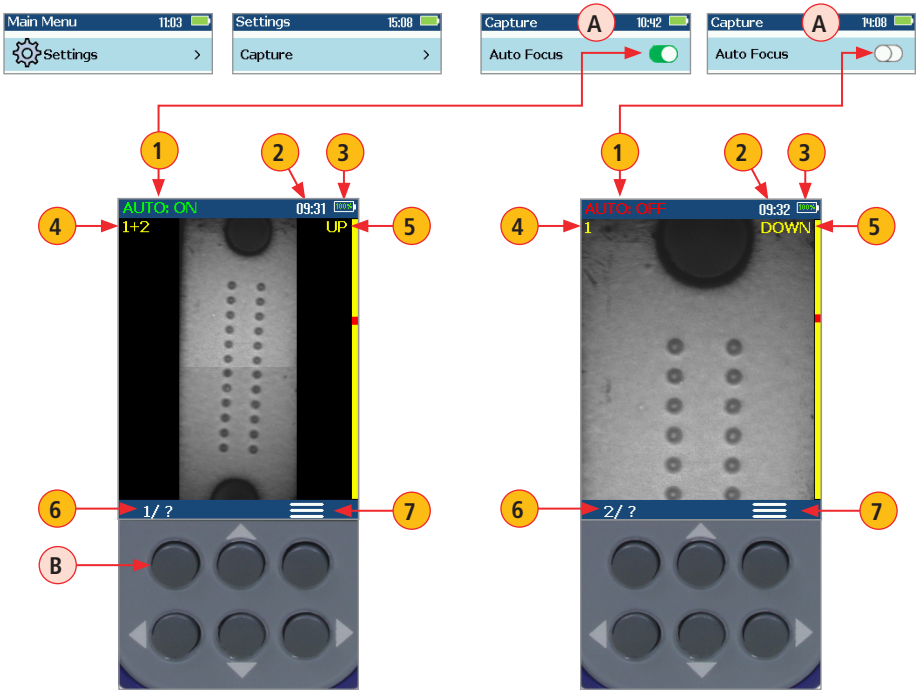
Note: Users can always display the Live Image screen (from any other mode/screen) by pressing the Capture button [camera] once or by pressing the Back ↩ button enough times.

On-screen Indicators

1 **AUTO: ON** or **AUTO: OFF** label indicates Auto Focus functionality as set in Main Menu > Settings > Capture screen (A):

– **AUTO: ON** label is displayed when Auto Focus is enabled – ◉

– **AUTO: OFF** label is displayed when Auto Focus is disabled – ○



2 Time of day - as set in Main Menu > Settings > Time & Date screen.

3 Battery charge icon indicates battery state, see "Battery Charging and Operation" on page 9.

4 Current Zoom level ID '1+2', '1' or '2' - selected by pressing the **1/? Zoom/Help** button (B).

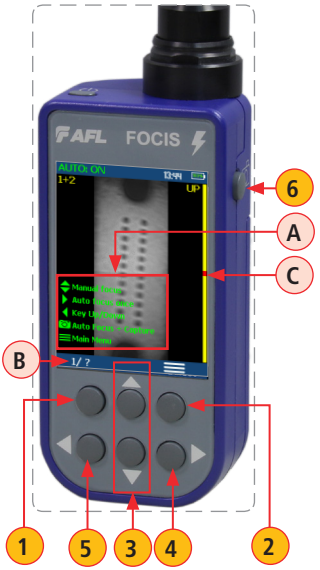
5 Up' or 'Down' - Indicate 'Up' or 'Down' MPO bulkhead alignment sleeve key position. 'Up' or 'Down' is toggled by pressing the Left ◀ arrow button.

6 Zoom/Help button label - numeric value '1+2', '1' or '2' indicates the "next zoom level" settings

7 Menu button label.

MPO Live Image Mode Features

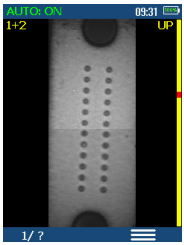
Buttons Functionality



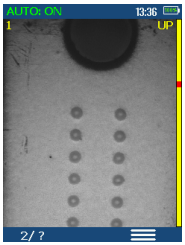
1 **1/? Zoom/Help** soft button provides several functions:

- Press and hold to display help tips (A) about buttons usage.
- Short press to toggle '1+2' > '1' > '2' zoom levels, where:
  - '1+2' displays the entire end-face image
  - '1' displays the upper half of the full end-face image
  - '2' displays the bottom half of the full end-face image
  - Label (B) above button indicates the "next zoom" settings

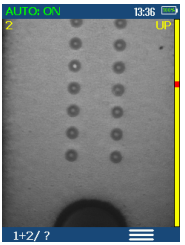
1+2 Zoom



1 Zoom



2 Zoom



2 **Menu ≡ Button**

- Press to display the Main menu that allows the user to set preferences, manage saved test results and perform other non-test functions.

3 **Up and Down Arrow** buttons:

- Press Up/Down ▼▲ arrow buttons to manually adjust focus.
- Vertical 'slider' (C) indicates the current focus level relative to focus range.

4 **Right Arrow** button: Press to auto focus once.

5 **Left Arrow** button: Press to toggle the MPO bulkhead alignment sleeve key position between Up and Down.

6 **Capture Button** 📷

In the Live Image mode: Capture button initiates live image capture.

- When the Auto Focus option is enabled in the Capture screen and Capture button 📷 is pressed:
  - Auto focus is initiated
  - Image is captured when auto focus completes
  - Image is analyzed if Pass/Fail set to On
  - FOCIS Lightning transitions to Captured Image mode
- When the Auto Focus option is disabled in the Setting screen and Capture button 📷 is pressed:
  - Image is captured (without adjusting focus)
  - Image is analyzed if Pass/Fail set to On
  - FOCIS Lightning transitions to Captured Image mode

In all other modes: Capture button is used to return to the Live Image mode.

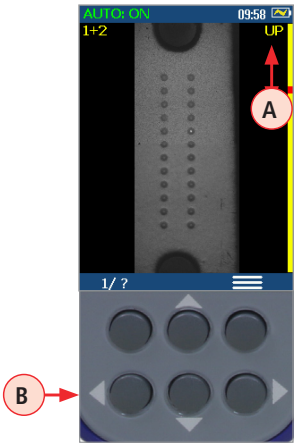
Getting Started

Understanding MPO Connector Key Orientation Settings

The goal of the MPO Key Up/Down settings is to provide users with the correct information about fiber numbering (pinout) after the image capture.

When inspecting MPO connector using bulkheads with **opposed keys, it is important to define the MPO key orientation** in the in Live Image mode prior to the Image Capture.

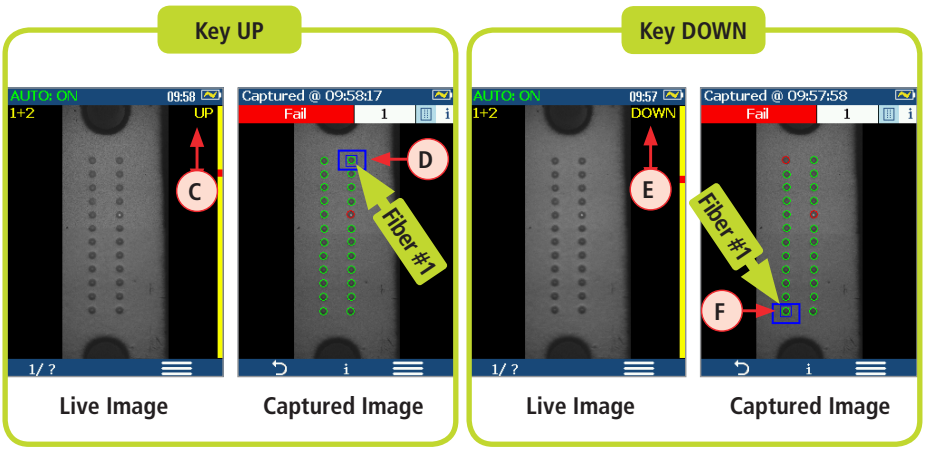
- The MPO bulkhead key position indication (UP or DOWN) is provided in the upper right corner of the display (A).
- At power-up, FOCIS Lightning defaults to key Up orientation.
- If needed, press the Left Arrow key (B) to toggle the MPO connector key orientation to DOWN.
- This setting should be defined in the in Live Image mode prior to the Image Capture.



Understanding Fiber Numbering After The Image Capture

After the fiber end-face image is captured, FOCIS Lightning transitions to the Captured Image mode displaying inspection results.

- Default display:
  - Fiber #1 location is indicated by Blue box -
  - Passing fiber is indicated by Green circle -
  - Failing fiber is indicated by Red circle -
- When the MPO key orientation is set to Up (C) in the Live mode, fiber #1 is located at top-right (D) as indicated by Blue box.
- When the MPO key orientation is set to Down (E),in the Live mode, after image capture, fiber #1 is located at bottom-left (F) as indicated by Blue box.



Getting Started

Capture Button Operation

- In the Live Image mode, press the Capture button to perform the following:
  - Auto Focus image (if the Auto Focus option is enabled)
  - Capture the displayed image and enter the Captured Image mode
  - Analyze image (if the Pass/Fail option is enabled)
  - Save results and send image to Bluetooth-paired device (if auto-save and auto-send enabled on '**1st Capture Key**', see "To Configure Auto-Save and Auto-Send" on page 19 for details)
  - If auto-save or auto-send enabled on '**2nd Capture Key**' (see "To Configure Auto-Save and Auto-Send" on page 19), press the Capture button again to save and/or send
- In Captured Image mode, press the Capture button to return to Live Image mode.
- In the Main Menu or Settings modes, press the Capture button to return to the most recent Live or Captured Image mode.

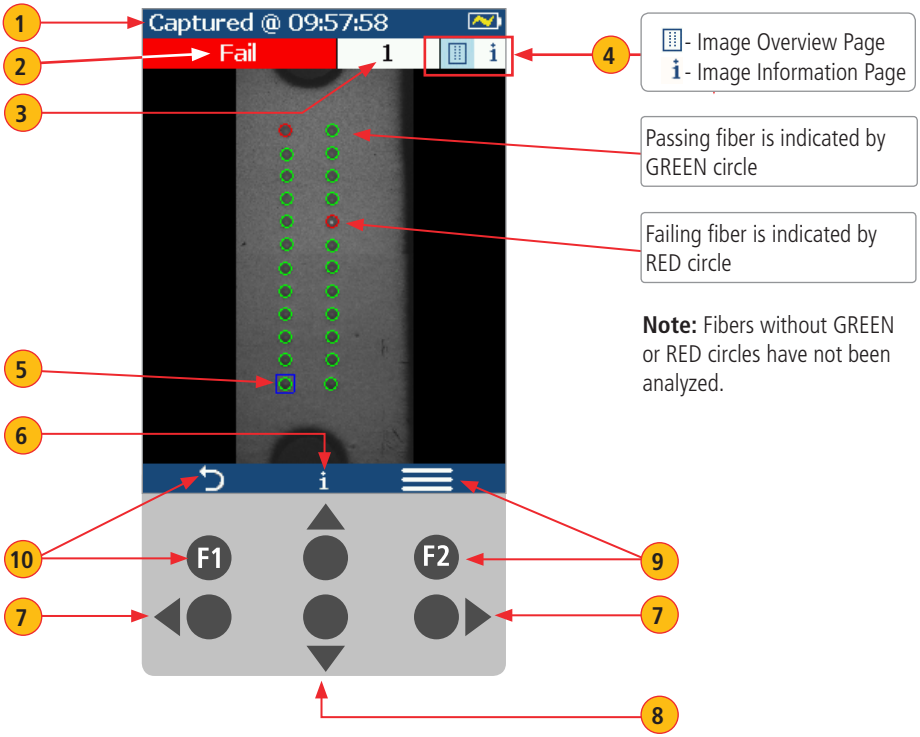
Inspecting MPO Connectors

1. Plug male (pins) or female (holes) MPO cable into appropriate MPO alignment sleeve ("bulkhead"), with adapter tip appropriate for the cable type.
2. Plug FOCIS Lightning adapter tip into the MPO alignment sleeve.
3. Turn on FOCIS Lightning (press the Power button on top).
4. The full MPO end-face in "1+2" view mode will be displayed on the FOCIS Lightning display In less than two seconds.
5. Press the Capture button to initiate fiber inspection and analysis.

Captured MPO Image - Overview Page

Once an end-face image has been captured and analyzed, the full MPO end-face image with Pass/Fail overlay (if enabled) will be displayed in the Captured Image mode.

#	Description
1	Screen title: displays file name (e.g. COO1-003) if saved image is shown or 'Captured @ hh:mm:ss' if unsaved image is shown.
2	Connector Analysis status (Pass or Fail): shown only if the Pass/Fail option is enabled in Settings.
3	Number of the currently selected fiber.
4	MPO Image Overview/Image Information page indicator: blue highlight ( ) indicates current view/page.
5	Selected fiber indicator: fiber that is the currently selected for detailed views is indicated by blue box.
6	Up ▲ arrow: press to toggle display between the MPO Image Overview and Information pages.
7	Left and Right ◀ ▶ arrow buttons: press to navigate through fibers. Direction of navigation through fibers with Left/Right arrows depends on Key Up/Down settings.
8	Down ▼ arrow button: press to display Detailed View of the currently selected fiber. See section "Detailed View of the Currently Selected Fiber" on page 15.
9	Menu ≡ button: press to display the Save/Send/Existing Folders menu.
10	Back ⮌ button: press to return to the Live Image mode.

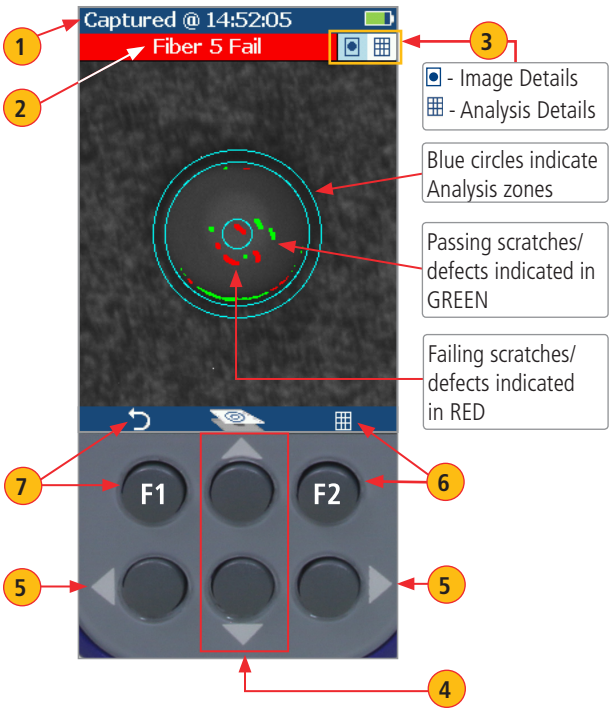


Detailed View of the Currently Selected Fiber

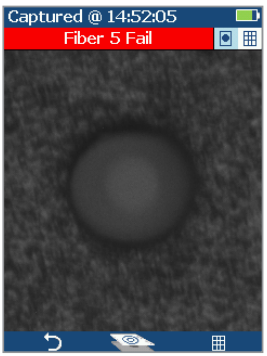
 # Description

1. Screen title: displays file name (e.g. COO1-003) if saved image is shown or 'Captured @ hh:mm:ss' if unsaved image is shown.
2. Fiber Analysis status (Pass or Fail) and Number of the currently displayed fiber.
3. Image Details/Analysis Details page indicator: blue highlight ( ) indicates the currently displayed view/page.
4. Up ▲ or Down ▼ arrow button: press to navigate through various detailed views of the currently selected fiber:
   - A End-face image with overlay layer shown (default view)
   - B End-face image only
   - C Overlay only
5. Left and Right ◀ ▶ arrow buttons: press to navigate through fibers. Direction of navigation through fibers with Left/Right arrows depends on Key Up/Down settings.
6. F2 button: press to toggle display between the Image Details and Analysis Details pages.
7. Back ⮌ button: press to return to the MPO Image Overview page.

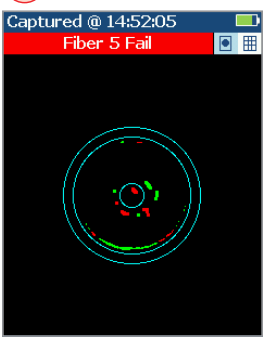
A End-face Image with Overlay



B End-face image only



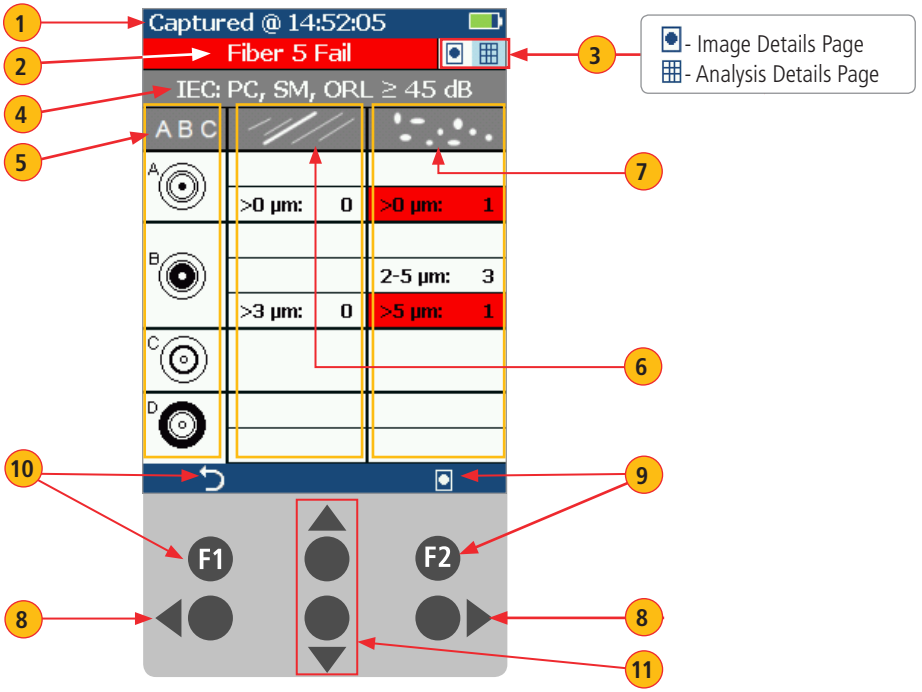
C Overlay image only



Pass/Fail Analysis Details Page

 # Description

1. Screen Title: displays File Name (e.g. COO1-003) if saved image is shown or Captured @ hh:mm:ss if unsaved image is shown.
2. Fiber Analysis status (Pass or Fail): shown only if the Pass/Fail option is enabled in Settings.
3. Image Details/Analysis Details pages indicator: blue highlight (▦) indicates current page.
4. Analysis Rule applied to determine Pass/Fail.
5. Analysis Zones: A - core, B - cladding, C - adhesive, D - contact area.
6. Scratch analysis results for each zone: reports the number of detected scratches exceeding limit for each region; highlights failed rules in RED.
7. Defect analysis results for each zone: reports the number of detected defects exceeding limit for each region; highlights failed rules in RED.
8. Left and Right ◄ ► arrow buttons: press to navigate through fibers. Direction of navigation through fibers with Left/Right arrows depends on Key Up/Down settings.
9. F2 button: press to toggle display between the Analysis Details and Image Details pages.
10. Back ⮌ button: press to return to the Live Image mode.
11. Up ▲ and Down ▼ arrow buttons: inactive on the Analysis Details page.

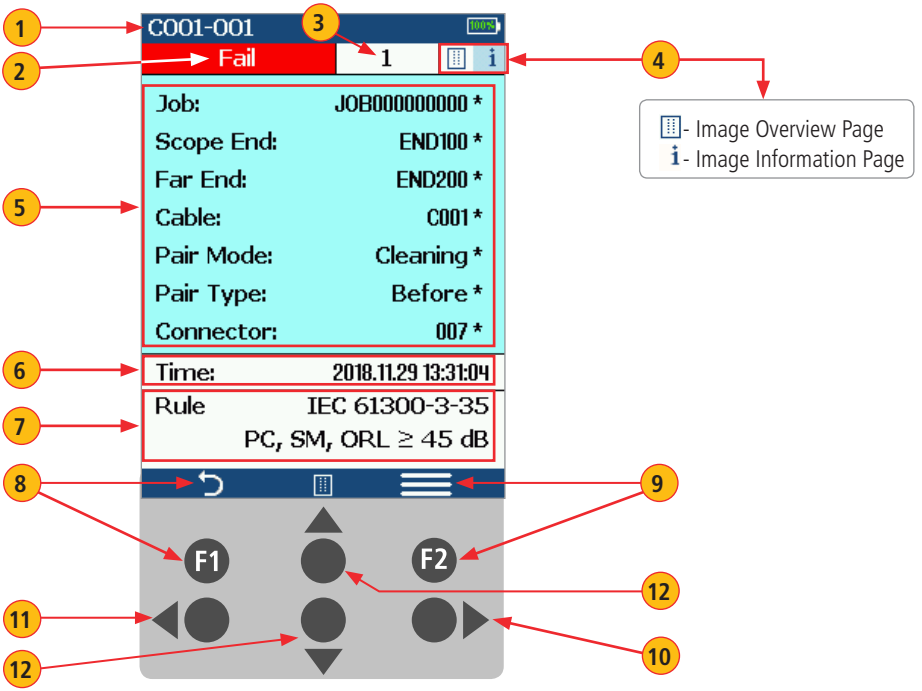


Note: See section "Setting Pass/Fail Criteria" on page 21 for details on how to select and/or edit pass/fail analysis rules.

Image Information Page

 # Description

1. Screen title: displays file name as follows:
   - <Cable>-<Connector> (e.g. C001-003) if saved image is shown.
   - 'Captured @ hh:mm:ss' if unsaved image is shown.
2. Fiber Analysis status (Pass or Fail): shown only if the Pass/Fail option is enabled in Settings.
3. Number of the currently selected fiber.
4. MPO Image Overview/Information pages indicator: blue highlight (i) indicates current view/page.
5. Results ID field: displays Job/Scope End/Cable/Pair Mode/Pair Type/Connector information.
6. Time & Date field: shows time & date of the displayed captured image.
7. Rule field: indicates pass/fail analysis rule applied.
8. Back button: press to return to the previous screen.
9. Menu ≡ button: press to display the Save/Send/Existing Folders menu.
10. Up ▲ arrow: press to return to the Overview page.
11. Left and Right ◀ ▶ arrow buttons: press to navigate through fibers. Direction of navigation through fibers with Left/Right arrows depends on Key Up/Down settings.
12. Down ▼ arrow: press to display detailed view of the currently selected fiber. See section "Detailed View of the Currently Selected Fiber" on page 15.



Note: See section "Saving Captured Images" on page 26 for details on how to save results.

Main Menu and Settings

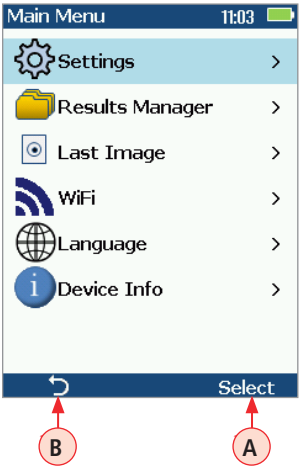
Main Menu Overview

Main Menu

The Main Menu is accessed from Live Image mode by pressing the Menu ≡ button. Main Menu is used to select user preferences, perform general settings, manage saved test results, and perform other non-test functions.

While in the Main Menu:

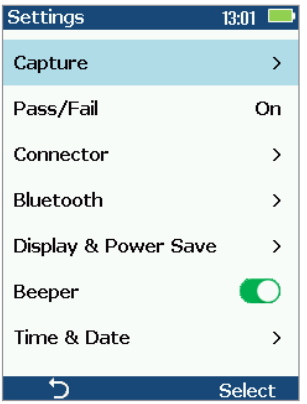
- Press Up/Down ▲▼ arrow buttons to navigate and select (highlight) one of the menu item as follows.
  - **Settings:** Use to configure Auto Focus, Pass/Fail criteria, Bluetooth, and general settings
  - **Results Manager**: Use to navigate and review or send saved test results
  - **Last Image:** Use to recall most recently viewed image
  - **WiFi:** Configure WiFi for remote access (future)
  - **Device Info**: Use to view serial number, software revision, etc
- Press Select (A) or Right ▶ arrow button to display a sub-screen of the selected menu item
- Press Back (B) button to return to Live Image mode



Settings Menu Overview

While in the Settings Menu:

- Press Up/Down ▲▼ arrow buttons to navigate and select (highlight) the desired menu item.
- For Beeper settings:
  - Pressing Select button toggles setting between enable/disable.
  - Pressing Right ▶ arrow button enables setting.
  - Pressing Left ◀ arrow button disables setting.
- For all other settings, press Select button or Right ▶ arrow button to display a sub-menu and edit the selected parameter.
- Press Back button to return to the previous menu screen.
- Press Capture Button to return to live image mode.



Main Menu and Settings

Capture Settings

To Enable Auto Focus

1. From the Main Menu, select Settings > Capture > Auto Focus
   - Use ◀▶ to enable or disable the auto-focus option ◉/○ as needed.

To Configure Auto-Save and Auto-Send

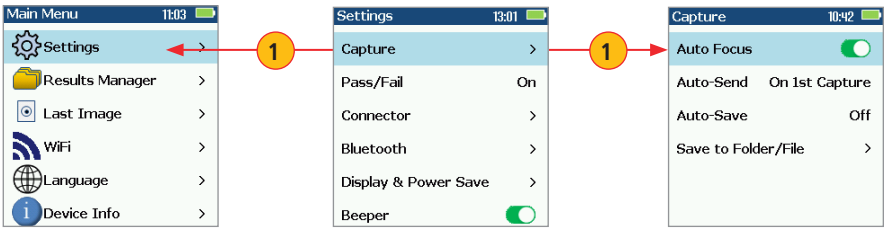
2. Highlight and Select Auto-Send. Use ▼▲ to disable auto-send, enable on 1st Capture Key, or enable on 2nd Capture Key.
3. Highlight and Select Auto-Save. Use ▼▲ to disable auto-send, enable on 1st Capture Key, or enable on 2nd Capture Key.

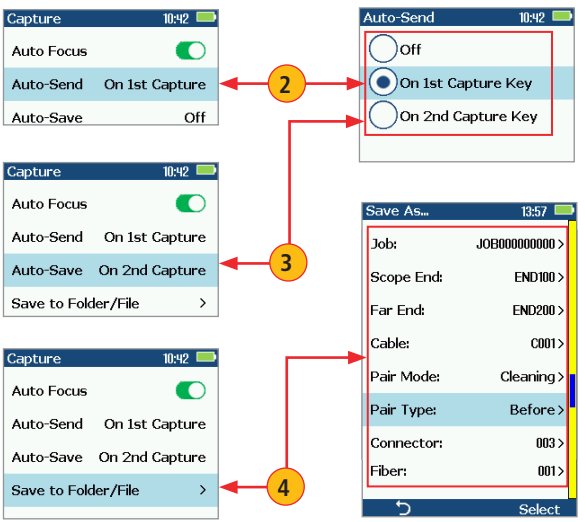
To Configure 'Save to' Destination

4. Highlight and select Save to Folder/File. Use ▼▲ to select and edit the desired folder/file field.

When Auto-Send/Save is enabled, press Capture from Live Image mode to auto-focus (if enabled), capture image, analyze pass/fail (if enabled), then send image and pass/fail results to paired device and save image and pass/fail results to configured Job/Cable folder.

Note: If Auto-Save or Auto-Send on 2nd Capture Key is enabled, you will be prompted to press the Capture button again to save or send. Press the Back button if you do not wish to save or send image.





Main Menu and Settings

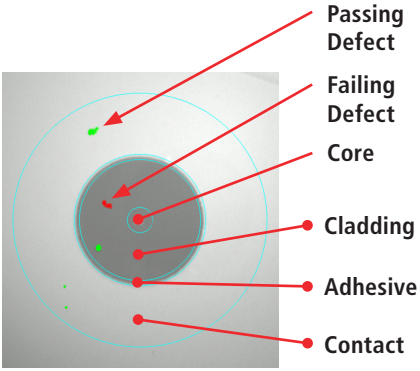
Pass/Fail Analysis

IEC Pass/Fail Analysis

IEC 61300-3-35 defines connector inspection pass/fail criteria.

Pass/Fail criteria depends on:

- Fiber type (SMF or MMF).
- Connector end face regions:
  - A region: Core
  - B region: Cladding
  - C region: Adhesive (between cladding and ferrule)
  - D region: Physical contact area
- Type of end face flaw:
  - Scratches
  - Defects (contamination, particles, chips)
- Size of flaw.



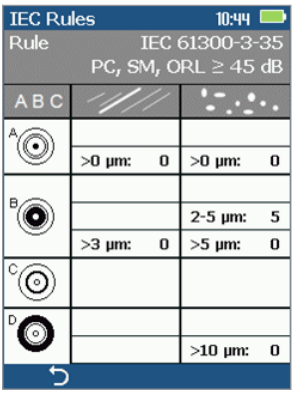
IEC 61300-3-35 for multi-fiber MPO/MTP connectors only defines the following regions (or zones):

- A region: Core
- B region: Cladding

Example IEC Rule

Shown below is the display when the IEC rule for single-mode PC connector with return loss ≥ 45 dB is selected. The table identifies the number of scratches or defects of a certain size, which may be allowed in each of the core, cladding, and contact regions.

Region	Scratch	Defect
A: Core	>0 µm: 0 No scratches >0 µm allowed	>0 µm: 0 No defects >0 µm allowed
B: Cladding	>3 µm: 0 No scratches >3 µm allowed	2-5 µm: 5 Up to 5 defects 2-5 µm diameter allowed
		>5 µm: 0 No defects >3 µm allowed
C: Adhesive	Blank (No limitations on scratches)	Blank (No limitations on scratches)
D: Contact	Blank No limitations on scratches	0 ≥ 10 µm No defects ≥ 10 µm allowed



Main Menu and Settings

Setting Pass/Fail Criteria

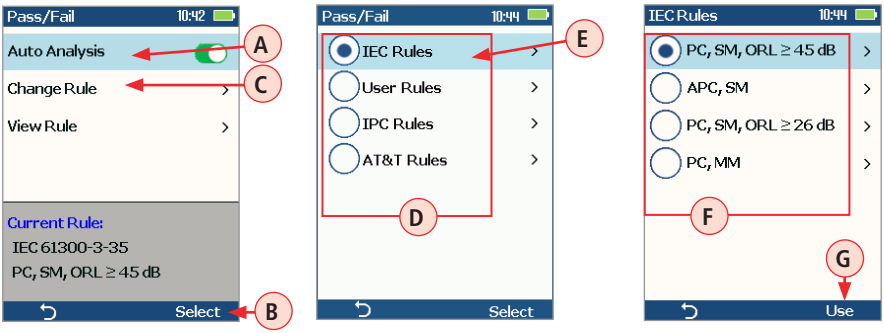
Pass/Fail menu is accessed from the Live Image mode > Main Menu > Settings.

Enable/disable Auto Analysis

- Highlight Auto Analysis (A).
- Press Select (B) to enable/disable / Pass/Fail analysis.

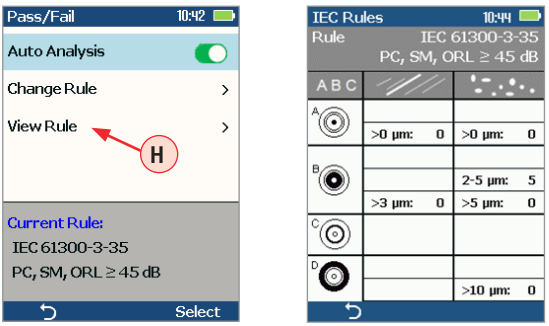
Change Rule:

- Highlight Change Rule (C).
- Press Select or Right ▶ arrow button to display a list of the available Rules (D).
- Use Up/Down ▲▼ arrow buttons to highlight the desired Rule group (E).
- Press Select or Right ▶ arrow button to display a sub-list (F).
- Use Up/Down ▲▼ arrow buttons to highlight the desired rule.
- Press Use (G) to apply the selected Rule in Pass/Fail analysis.



View Rule

- Highlight View Rule (H).
- Press Select or Right ▶ arrow button to view details for the current rule.
- User Rules may be edited while viewing.

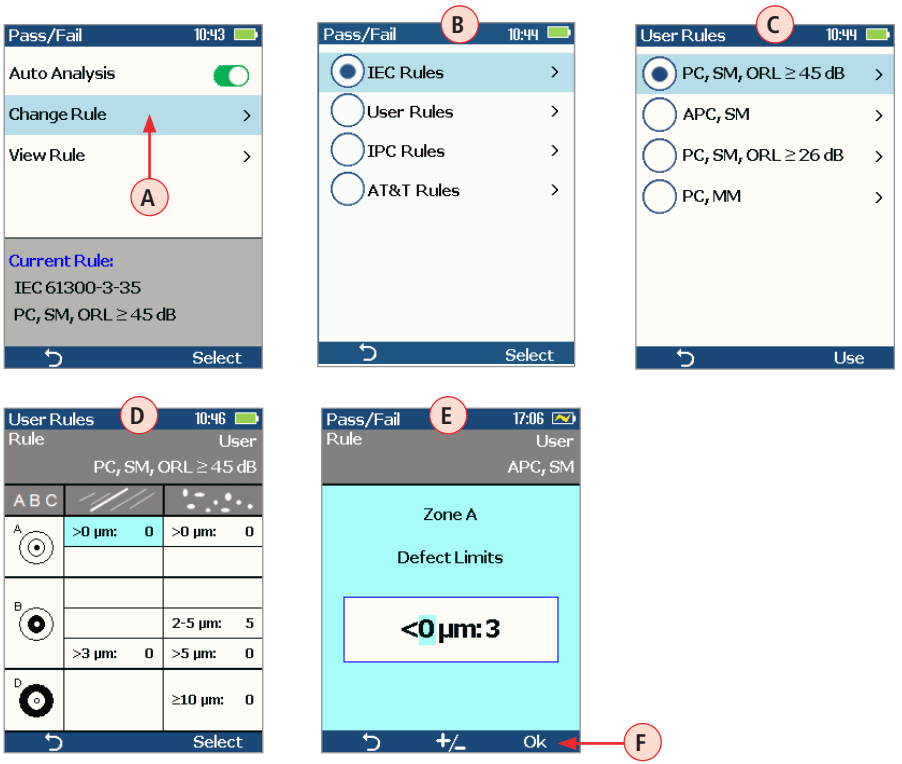


Main Menu and Settings

Setting Pass/Fail Criteria

Edit User Rule:

- Highlight the Change Rule option (A).
- Press Select or Right ▶ arrow button to display a list of Rules sub-screen (B).
- Highlight the User Rules group.
- Press Select to display a list of User Rules (C).
- Use Up/Down ▲▼ arrow buttons to highlight the desired rule to edit.
- Press the Right ▶ arrow button to view details screen for currently selected rule.
- While in the Rule details screen (D), use arrow buttons to highlight the desired Region and Scratches/ Defects parameter.
- Press Select to display the Limits Editor screen (E).
- Use Left/Right ◀▶ arrow buttons to select a digit.
- Use Up/Down ▲▼ arrow buttons to change the value.
- Press Ok (F) to confirm changes.



Main Menu and Settings

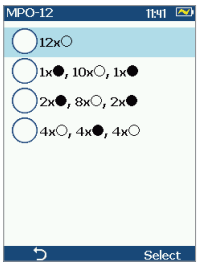
Connector Settings

MPO Connector Fiber Configurations Support

FOCIS Lightning supports all fiber configurations of MPO-12 up to two rows, with "base 8", "base 10", and "base 12" fiber configurations per row as well as other MPO options.

Note that solid circle is "dark" or an unused fiber, and open circle is an active or used fiber and will be analyzed by FOCIS Lightning.

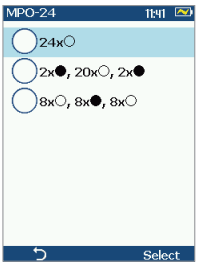
Supported MPO-12 fiber configurations



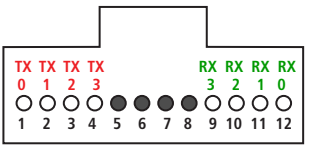
○ – active (used) fiber

● – dark (unused) fiber

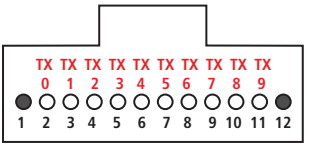
Supported MPO-24 fiber configurations



Single Row MPO Fiber Configuration Examples

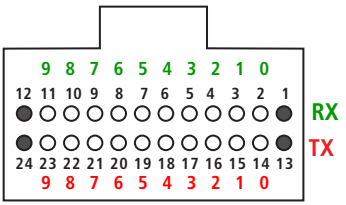


Base 8



Base 10

Dual Row MPO Fiber Configuration Examples



Base 20

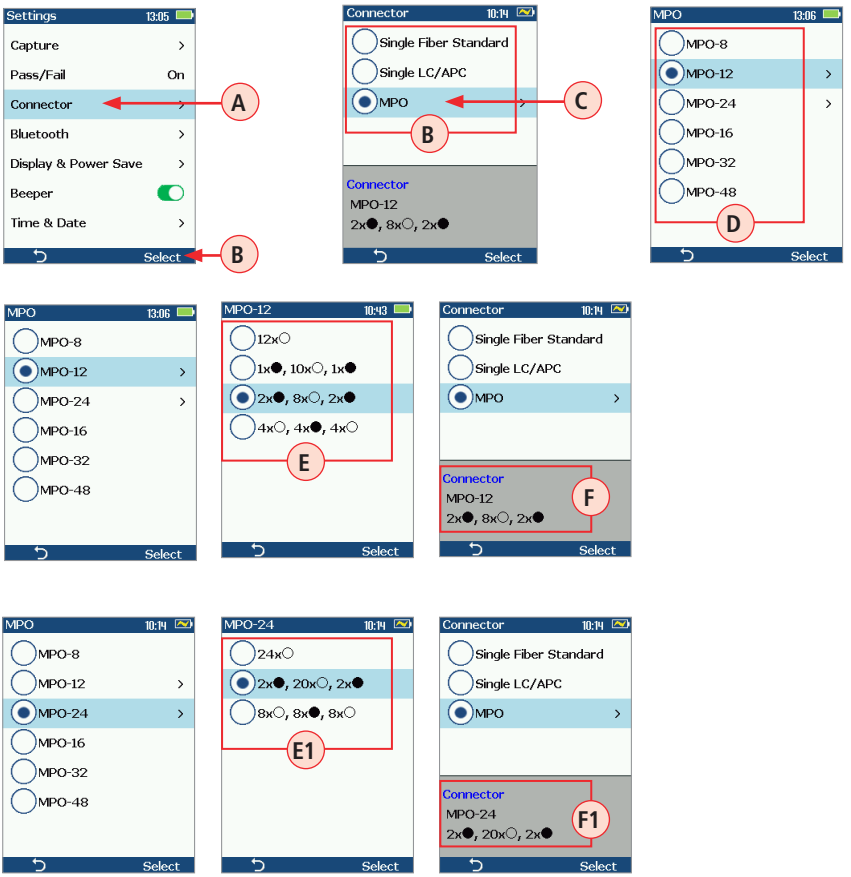
Main Menu and Settings

To Configure MPO Connector

Note: It is important to set the correct MPO fiber configuration prior to inspection! If the MPO connector setting is not configured correctly, the auto-analysis results will likely show "false negatives" and possibly "false positives".

To Configure MPO Connector

- From the Main Menu > Settings, highlight Connector (A).
- Press Select or Right ▶ arrow button to display the Connector menu, which shows a list of the available Connector options (B).
- Highlight MPO option (C), press Select.
- From the displayed list (D), highlight the desired MPO connector, press Select.
  - Note that for MPO-12 and MPO-24, you would need to select fiber configuration (E for MPO-12; E1 for MPO-24), and then press Select.
- **Important:** Note that selected MPO configuration (F for MPO-12/ F1 for MPO-24) is displayed at the bottom of Connector menu.



Main Menu and Settings

Configuring Bluetooth

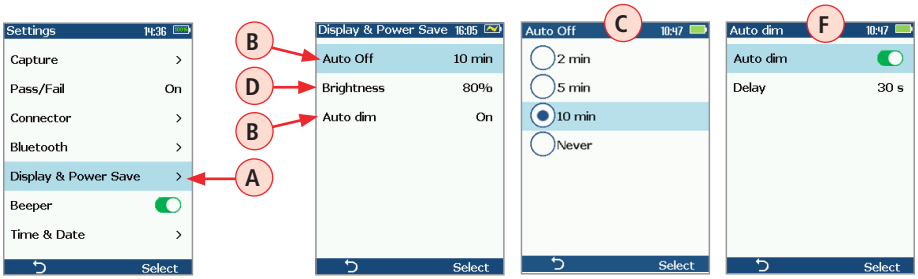
See section "Sharing Captured Test Results" on page 29.

Display & Power Save Settings

From the Main Menu > Settings, highlight the Display & Power Save (A) option, press Select.

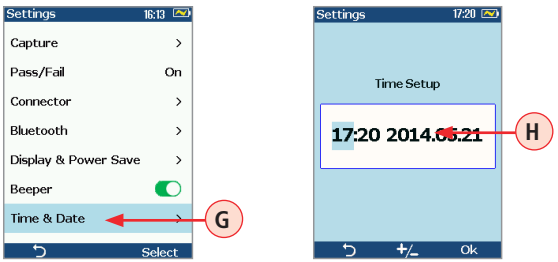
From the displayed menu, you may perform the following settings:

- Highlight and select the Auto Off option (B)
  - From the displayed Auto Off sub-menu (C), highlight and select the desired time option.
- Highlight and select Brightness (D)
  - Use Up/Down ▲▼ arrow buttons to increase or decrease the brightness
  - Note: dimmer display extends battery life
- Highlight and select the Auto dim option (E). From the displayed sub-menu (F):
  - Select Auto dim; use Left/Right ◀▶ arrow buttons to enable/disable auto-dimming
  - Select Delay, use Up/Down ▲▼ arrow buttons to increase/decrease auto dim time



Set Time and Date

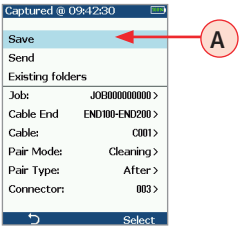
- Highlight Time & Date (G).
- Use Select or Right ▶ arrow button to display the Time/Date setup menu (H).
- Use Left/Right ◀▶ arrow buttons to select the desired time/date field to edit.
- Use Up/Down ▲▼ arrow buttons to change the selected value.
- Press OK to confirm time/date settings and return to the Settings screen.



Saving Captured Images

Saving to the Current Folder

- While in the Captured Image mode, press the Menu ≡ button to display the Save/Send screen.
- Highlight Save (A) and press Select button to save image and results to the current folder.

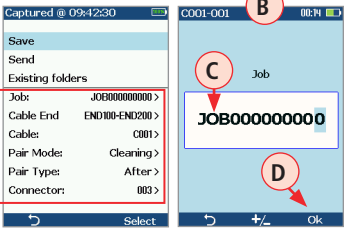


Saving to a Newly Created Folder

New Job, Cable End, Cable, or Connector names/numbers are created by editing an existing file name.

To edit a file name

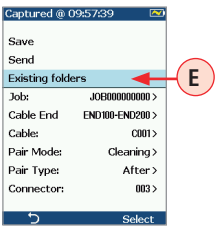
- While in the Save/Send screen, using Up/Down ▼▲ buttons, navigate to the desired parameter: Job, Cable End, Cable, Pair Mode, Pair Type, or Connector.
- Press Select or Right ▶ arrow button to display Editor (B).
- Use ◀▶ ▼▲ arrow buttons to edit text field (C).
- Press Ok (D) to save new name .

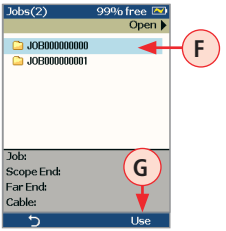


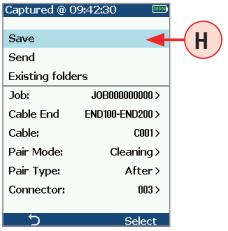
Note: this will make the newly created Job, Cable End, Cable, or Connector current.

Saving to an Existing Folder

- Highlight the Existing folders (E) option.
- Press Select or Right ▶ arrow button to display a list of existing folders.
- Use Up/Down ▲▼ arrow buttons to select desired Job folder (F).
- Press Right ▶ arrow button to open selected Job folder.
  - Repeat for desired Cable folder and Fiber number as needed.
- Press Use (G) to confirm selection.
- When back in the Save/Send screen, highlight Save (H) and press Select.





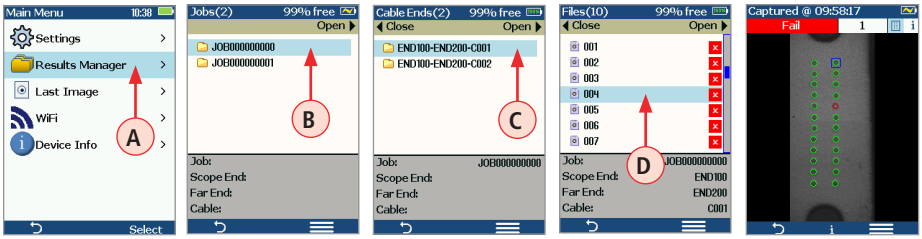


Viewing Saved Results (Results Manager)

Opening Image Files - Reviewing Saved Results

The Results Manager is accessed from the Live Image mode > Main Menu.

- From the Main Menu, use Up/Down ▲▼ arrows to navigate and highlight the Results Manager (A).
  - Press Select or Right ▶ arrow button to display a list of existing Job folders.
- Use Up/Down ▲▼ arrow buttons to navigate and highlight the desired Job folder (B).
  - Press Right ▶ arrow button to open the selected Job folder and display a list of existing Cables.
- Use Up/Down ▲▼ arrow buttons to navigate and highlight the desired Cable folder (C).
  - Press Right ▶ arrow button to open the selected Cable folder and display a list of existing files.
- Use Up/Down ▲▼ arrow buttons to navigate and highlight the desired image File (D).
  - Press Right ▶ arrow button to open the selected image File.
- Press Back button or Capture button to return to Live Image mode.

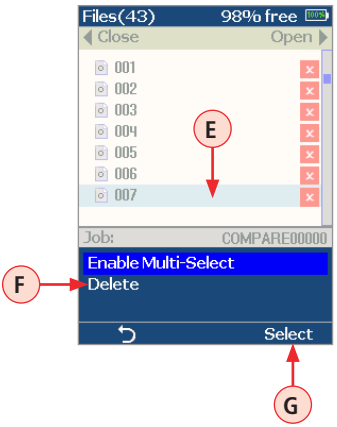


Creating New Jobs/Cables/Files

New Job, Cable End, Cable, or Fiber names are created in the Captured Image mode by editing an existing file name. For details see section titled "Saving to a Newly Created Folder" on page 26.

Deleting Jobs/Cables/Files

- Access the Results Manager.
- Use the Up/Down ▲▼ buttons to navigate and highlight the desired job/cable/file (E).
- Press the Menu ≡ button.
- Press the Up/Down ▲▼ buttons to highlight Delete (F).
- Then press Select (G) to delete the highlighted job/cable folder or results file.



Using FOCIS Lightning with FOCIS Flex App

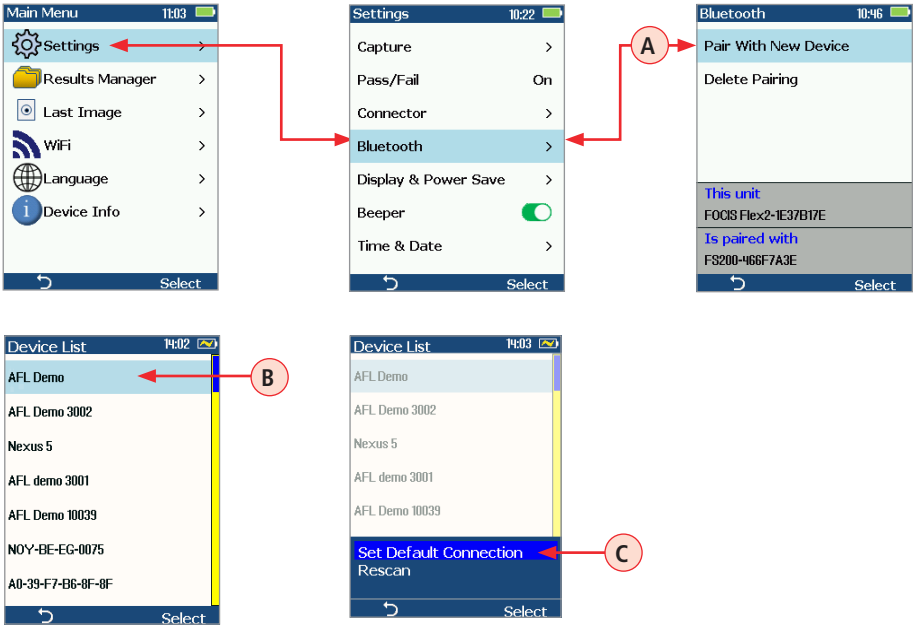
- Download FOCIS Flex App from Google Play or Apple App Store to your smart device.
- Pair FOCIS Lightning to your smart device.

In smart device Bluetooth Settings:

- Enable Bluetooth and make your device visible.

In FOCIS Lightning:

- From the Main Menu, select Settings > Bluetooth > Pair With New Device (A).
- Press Select and wait for a list of detected devices to be displayed.
- From the displayed Device List screen, select your smart device (B).
- Press Select.
- Select Set Default Connection (C).
- Press Select.
- Verify that FOCIS Lightning indicates that it is paired with your smart device.
- In Capture Settings, configure FOCIS Lightning to send on 1st or 2nd Capture Key.
- From Live Image mode, view connector end-face and press the Capture Key.
- FOCIS Lightning will capture image and send it to your smart device.
- FOCIS Flex App on your smart device will display received image.
- For App details, see FOCIS Flex Inspection | aeRos User's Guide.



Sharing Captured Test Results

Sending Captured Results to FlexScan

Automatically sending results to FlexScan

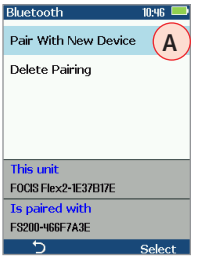
Note: Auto Send option cannot be enabled unless FOCIS Lightning is paired to another Bluetooth device.

Configuring Bluetooth

On FlexScan

- Configure FlexScan for pairing:
  - Select Settings > Bluetooth.
  - Enable Bluetooth with Visibility option setting them to On.

On FOCIS Lightning



- From the Main Menu > Settings > Bluetooth, select Pair With New Device (A) and pair FOCIS Lightning with FlexTester/FlexScan:
  - Wait for list of visible devices to be shown.
  - Use ▼▲ arrow buttons to select FlexScan device to pair with.
  - Select Set Default Connection to complete pairing.
  - After pairing, set FlexTester Visibility to Off.
- From the Main Menu > Settings > Capture, configure FOCIS Lightning to auto-send captured images on 1st or 2nd Capture Key. See "To Configure Auto-Save and Auto-Send" on page 19.
- Press the Capture button to return to Live Image mode.
- Press the Capture button to focus, capture, analyze and send image to FlexTester/FlexScan.
- **On FlexTester**
- After a few seconds, captured image will appear on your FlexTester.
- Press Right ▶ arrow button on FlexTester to view Pass/Fail results table.

On FlexScan

- After a few seconds, captured image and pass/fail results will appear on your FlexScan.

Manually Send Results to FlexScan

- Pair FOCIS Lightning to FlexScan.
- Press the Capture button to focus, capture and analyze image or recall saved image (see "Viewing Saved Results (Results Manager)" on page 27 for details).
- Press Menu ≡ button to display Save/Send sub-screen.
- Highlight Send and press Select.
- After a few seconds, captured image will appear on FlexScan.
- Press Right ▶ arrow button on FlexTester to view Pass/Fail results table.

WiFi-based Inspection File Access on FOCIS Lightning

On the FOCIS Lightning:

- From the Main Menu select WiFi> Results Manager

  The screen will display:

  FOCIS LTNG

  556CA492

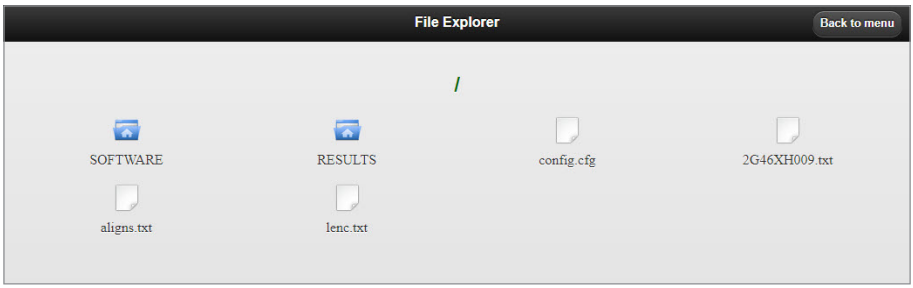
  1.0.8

  Password: 1234567890

NOTE: The second and third line will differ depending upon the specific Lightning unit and software version installed

On the linking device:

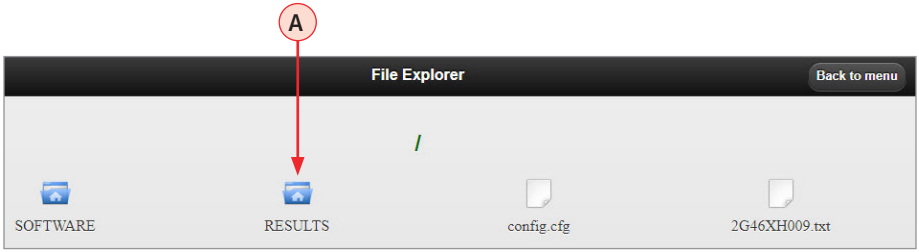
- Ensure device to be linked (PC, tablet, smart phone) is on and WiFi is enabled
- In the WiFi settings control panel of the linking device, locate FOCIS Lightning device, select, and enter password '1234567890'
- Tap/click 'Connect' and note Connected status on the device
- Type the IP address 192.168.1.1 into the device web browser (Microsoft Internet Explorer for example)
- The FOCIS Lightning File Explorer (example web browser) menu screen should appear as below

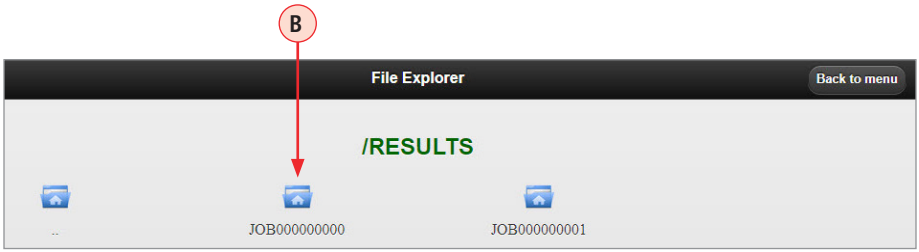


WiFi-based Inspection File Access on FOCIS Lightning

To download and view saved results:

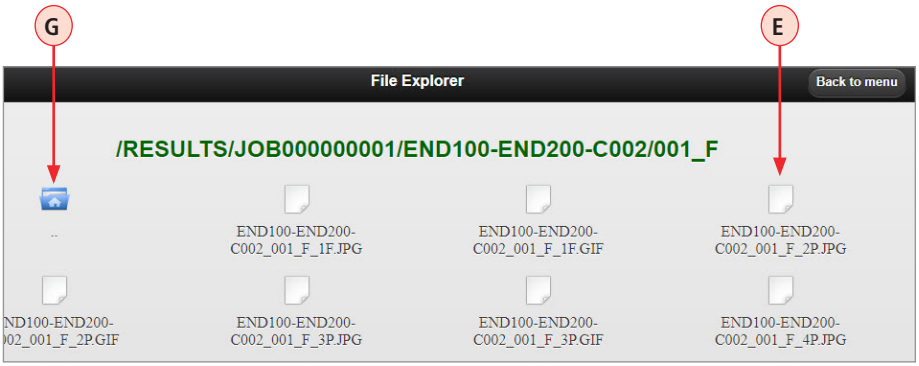
- Tap/click on 'RESULTS' folder (A)
- Tap/click on one of the JOB folders (B), then an ENDx-ENDy folder (C), then a connector folder (D)

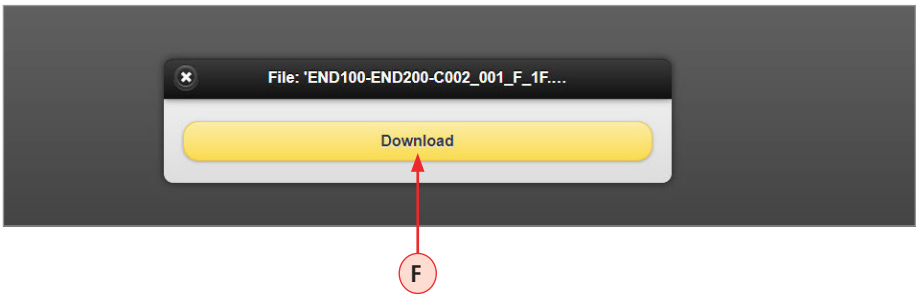




WiFi-based Inspection File Access on FOCIS Lightning

- Tap/click on one of the connector .JPG or .GIF files (for example) (E)
- Tap/click the 'Download' button to download and save file (F)
- Select location to save selected file (if requested)
- Repeat as necessary
- To return to upper level folder(s) tap/click on the blue folder labeled '..' (G)





Thank you for choosing AFL Test & Inspection!

www.AFLglobal.com or (800) 321-5298, (603) 528-7780