FOCIS Flex
Intro to Operation

May 2017

FOCIS Flex Intro to Operation Outline

- What's New in FOCIS Flex (May 2017 Update)

- Controls, Display and Interfaces

- Connector Adapter Tips

- Operation
  - Power-up / Power-Down (including Auto-Off)
  - AC Power and Battery Operation
  - Image Display Modes
    - Live Display Mode: Manual Focus, One-time Auto-focus, Auto-focus & Capture
    - Captured Image Display Mode
  - Main Menu Settings Mode
    - Pass/Fail Analysis Settings
    - Auto-focus Enable/Disable
    - Bluetooth Settings
    - Beeper
    - Time & Date
  - Saving & Sending captured images and pass/fail results
  - Viewing Saved Results using Results Manager
  - File Transfer via Bluetooth and USB

What's New in FOCIS Flex?

- **Updated FOCIS Flex HW & SW!**
  - **Brighter, larger display** with power save auto-dimming
  - Adds **MPO/MTP Auto-focus, capture & pass/fail** analysis
  - Adds **iOS-compatible Bluetooth** with MFI chip
  - Adds **WiFi live video streaming** (for future tablet App)
  - Adds **AT&T & IPC pass/fail** criteria
  - **Updated IEC pass/fail** criteria
  - Configurable **auto-save** & auto-send
  - **Image-pairing** (e.g. save image before & after cleaning)
  - **International languages**
  - **Instant On** power-up

- **Inspection Reporting**: Supported in TRM 2.0 & aeROS®
  - Included in both Basic and Advanced versions
  - **Free download** from www.AFLglobal.com → Resources → Software
  - TRM 2.0 now included with FOCIS Flex & FOCIS WiFi; aeRos Basic account is free

- **Android & iOS FOCIS Flex Apps**:   **Free!**
  - Now available from Google Play or Apple App Store
  - Accepts inspection image + pass/fail overlay via Bluetooth
  - Merges image & overlay and displays on smart device
  - Integrates with aeROS® (Setups & Reporting)

FOCIS Flex Controls, Display, Interfaces

- Controls
  - On/Off Button & LED
  - Capture Button
  - F1 Soft Key (typically 'Back' function)
  - F2 Soft Key (typically 'Select' function)
  - Navigation & Edit keys

- Display
  - Display Title
  - Image & Information display area

- Interfaces
  - Optical Inspection Port & Dust Cover
  - 5 VDC input jack and charging LED
  - Micro-USB port

Optical Inspection Port & Dust Cover

On/Off Button

Capture Button

Display Title

2-inch Color LCD (320 x 240)

Image Display Area

F1 Soft Key & Label

F2 Soft Key & Label

Navigation & Edit Keys

AFL FOCIS Flex

Main Menu 10:38
Settings
Results Manager
Last Image
WiFi
Device Info

Select

Connector Adapter Tips

- FOCIS Flex available with the following adapter tips:

Connector	UPC Connectors		APC Connectors	
	Ferrule	Bulkhead	Ferrule	Bulkhead
SC	FFLX-01-U25	FFLX-01-SC	FFLX-01-A25	FFLX-01-ASC
FC	FFLX-01-U25	FFLX-01-FC	FFLX-01-A25	FFLX-01-ASC
LC	FFLX-01-U125	FFLX-01-LC	FFLX-01-A125	FFLX-01-ALC
ST	FFLX-01-U25	FFLX-01-ST	Not applicable	Not applicable

Tighten

Loosen

- Removing Adapter Tips:
  - Turn captive nut clockwise (viewed from front / top)
  - Continue until captive nut is free of adapter tip
  - Remove tip

- Installing Adapter Tips:
  - Raise captive nut until it engages with adapter tip threads
  - Turn captive nut counter-clockwise (viewed from front / top)
  - Hand-tighten (do not over-tighten)

Note: For proper viewing, APC connectors must be aligned with the slot in the threaded area of the adapter tip

AFL FOCIS Flex
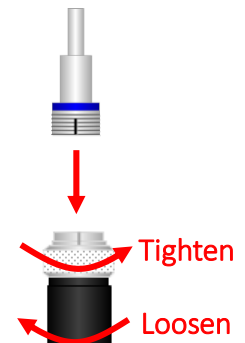
Identifying Connector Adapter Tips

- Tips are engraved and shipped in labeled containers
- Engraving indicates connector type and application
- Labels indicate:
    - AFL Part Number
    - Connector Type – Ferrule Type (UPC or APC) – Application
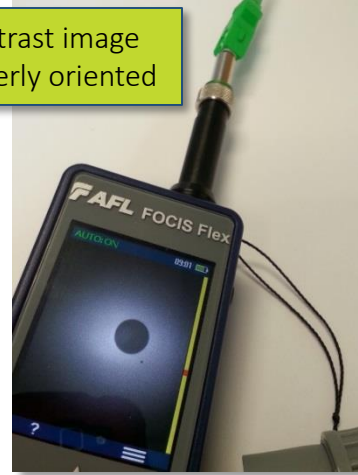- Blue ring indicates UPC connector tip; Green ring indicates APC tip
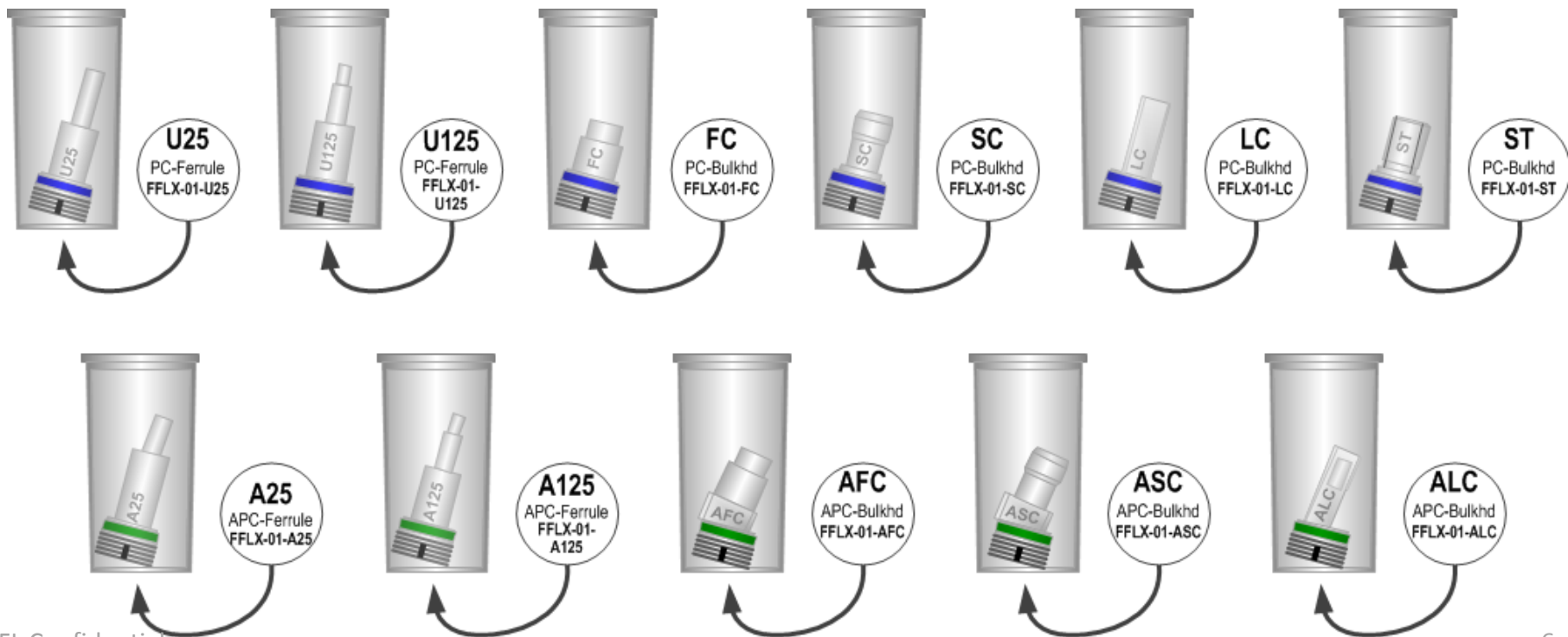
APC Connector Orientation

APC Connector Orientation using Universal 2.5 mm APC Ferrule Adapter:

Align connector key with slot in ferrule adapter tip
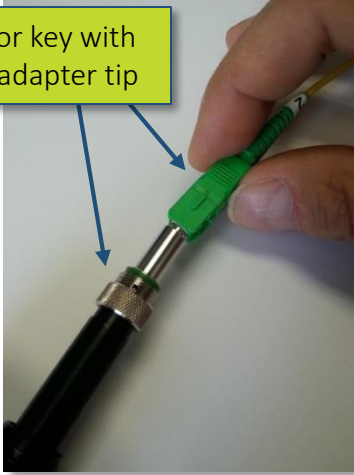
Good contrast image when properly oriented

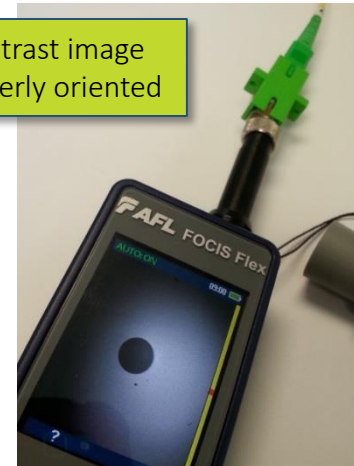Poor contrast image if improperly oriented

APC Connector Orientation using SC-APC Bulkhead Adapter:

Align bulkhead key slot with slot in bulkhead adapter tip
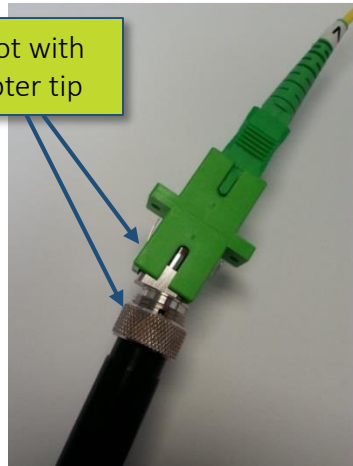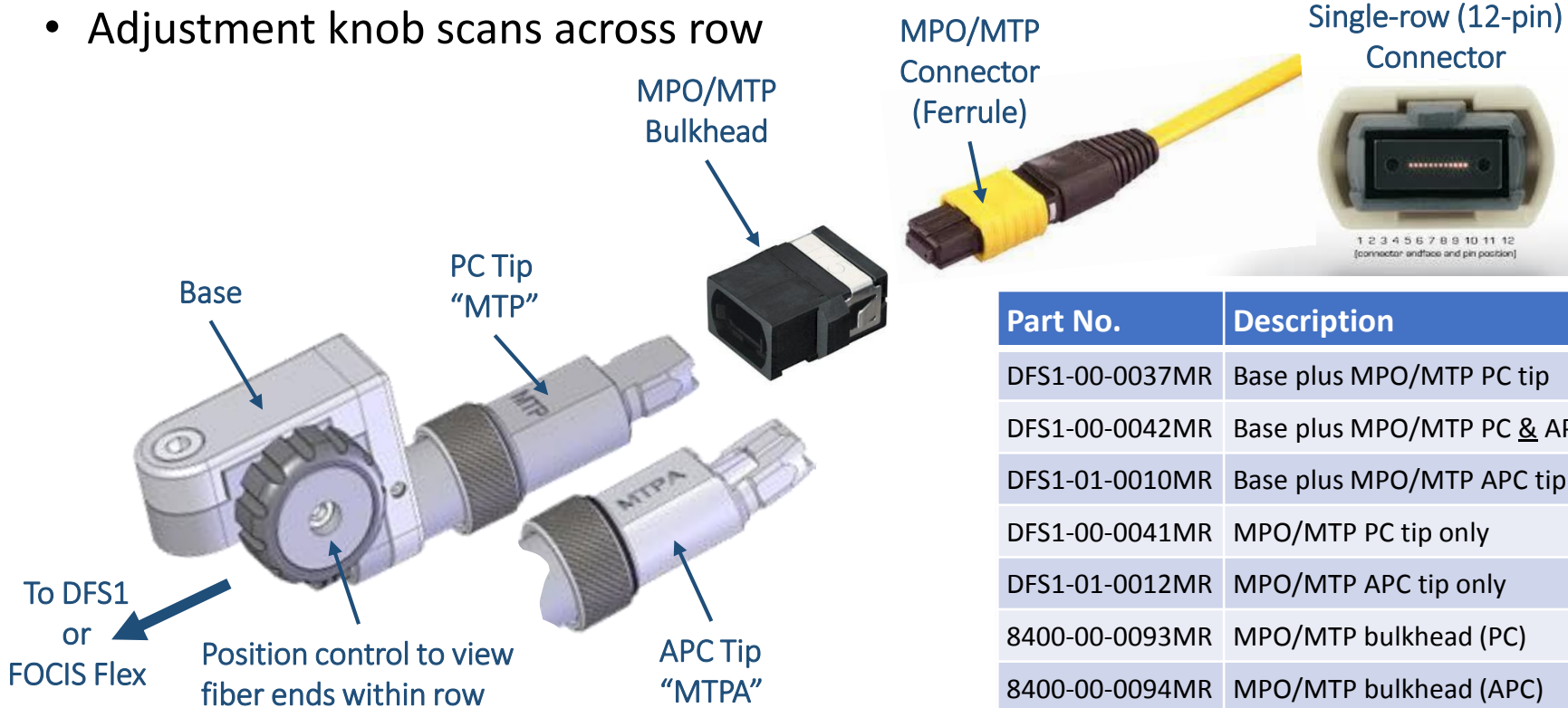

Good contrast image when properly oriented

Single-Row MTP/MPO Inspection

- Press ◀ to select 'MPO-U' or 'MPO-A' connector type in Live Image mode
  - MPO-U: Multimode MPO with PC finish
  - MPO-A: Single-mode MPO with APC finish (usually green connector)
- Base + Tip is required; Base attaches to DFS1 or FOCIS Flex
- Connectors are inspected through a bulkhead as shown
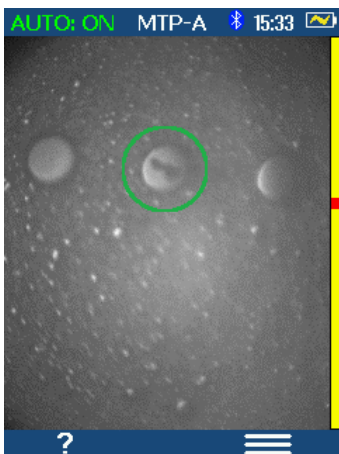- Adjustment knob scans across row

MPO/MTP Bulkhead

MPO/MTP Connector (Ferrule)

Single-row (12-pin) Connector

Base

PC Tip "MTP"

To DFS1 or FOCIS Flex

Position control to view fiber ends within row

APC Tip "MTPA"

Part No.	Description
DFS1-00-0037MR	Base plus MPO/MTP PC tip
DFS1-00-0042MR	Base plus MPO/MTP PC & APC tips
DFS1-01-0010MR	Base plus MPO/MTP APC tip
DFS1-00-0041MR	MPO/MTP PC tip only
DFS1-01-0012MR	MPO/MTP APC tip only
8400-00-0093MR	MPO/MTP bulkhead (PC)
8400-00-0094MR	MPO/MTP bulkhead (APC)

Multi-Row MTP/MPO Inspection

- Press ◀ to select 'MPO-U' or 'MPO-A' connector type in Live Image mode
  - MPO-U: Multimode MPO with PC finish
  - MPO-A: Single-mode MPO with APC finish (usually green connector)
- Connectors are inspected through a bulkhead as shown
- One adjustment knob scans across row
- Second adjustment knob selects row (up to 8 rows of 12 fibers per row

DFS1-00-0050MR

Select row

Base

PC Tip "MTP"

MPO/MTP Bulkhead

Multi-row MPO/MTP Connector (Ferrule)

24-fiber, dual-row Connector (2 rows x 12 fibers)

APC Tip "MTPA"

To DFS1 or FOCIS Flex

Select fiber within row

Part No.	Description
DFS1-00-0050MR	Base plus MPO/MTP PC tip
DFS1-01-0012MR	MPO/MTP APC tip only
8400-00-0093MR	MPO/MTP Bulkhead (PC)
8400-00-0094MR	MPO/MTP Bulkhead (APC)
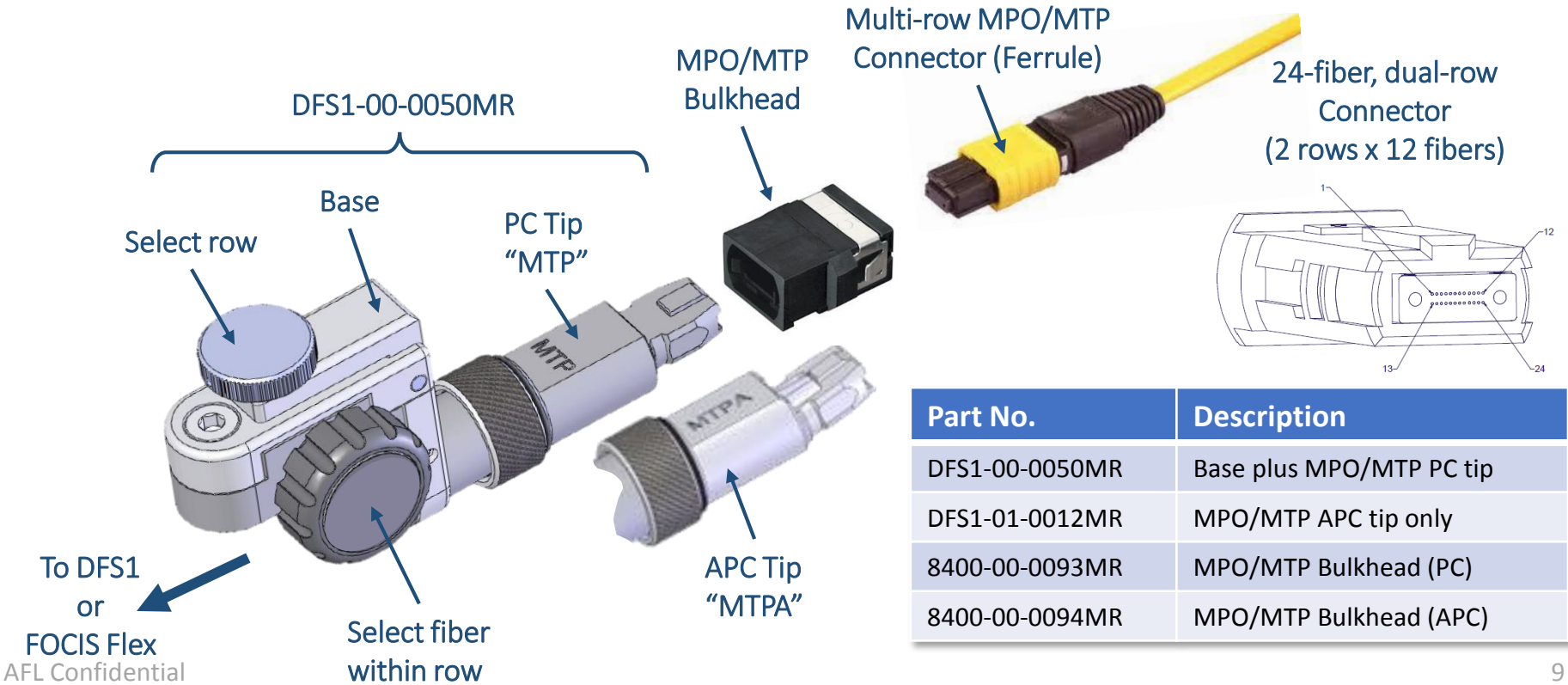
FOCIS Flex MPO Support

- New, enhanced FOCIS Flex supports MPO auto-focus, capture, pass/fail analysis
  - In Live Image mode, green circle identifies fiber end to be captured and analyzed
  - In Captured Image mode, three zoom levels available
  - Pass/Fail results table reports scratches & defects detected in A & B zones

- Supports both single-mode APC and multimode PC MPO connectors

- Uses the same MPO adapters previously utilized with FOCIS Flex & DFS1

- Results may be saved and included in TRM 2.0 or aeRos Test Reports

- Example FOCIS Flex MPO Images:

Live Image

Captured – Zoomed Out

Captured – Partial Zoom

Captured – Full Zoom
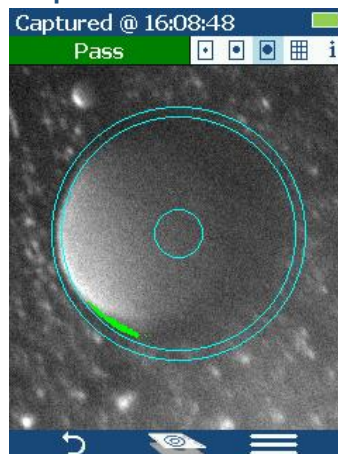
Pass/Fail Results

Opti-Tip / Opti-Tap Connector Inspection

- Opti-Tap Patch Cord Inspection
  - Use Universal 2.5mm APC ferrule adapter tip
- Opti-Tap Bulkhead Connector Inspection
  - Use DFS1-01-0007MR
- Opti-Tip Ribbon Patch Cord Inspection
  - Use DFS1-01-0013MR with barrel attached
- Opti-Tip Ribbon Bulkhead Connector Inspection
  - Use DFS1-01-0013MR with barrel removed

DFS1-01-0007MR

Barrel

DFS1-01-0013MR
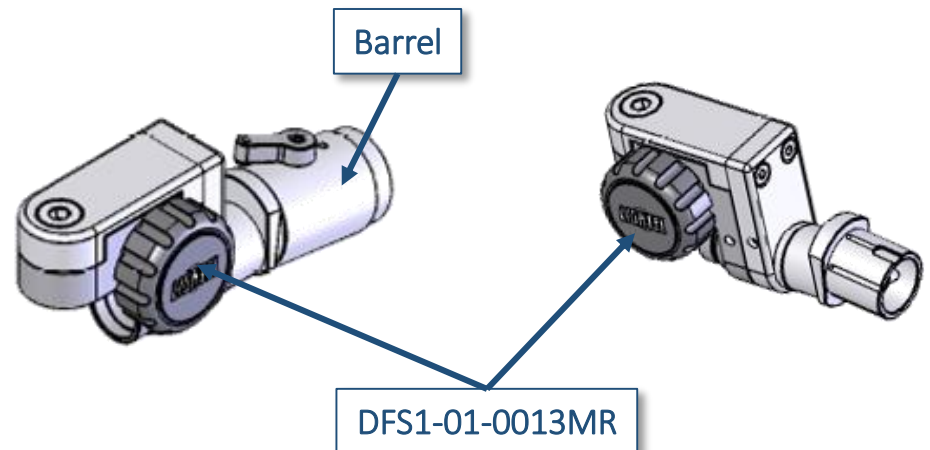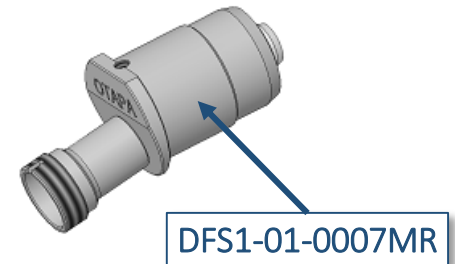
FOCIS Flex Power Up / Down

- Power-Up
  - Press and release the On/Off Button
  - Display immediately powers up in Live Image mode

- Power-Down
  - Press and hold power button until display turns off

- Auto-Off
  - From Main Menu → Settings, select 'Power Save'
  - Select desired power save option (2, 5, 15 min or Never)

Power Switch (Top View)

FOCIS Flex AC Power & Battery Operation

- Operating from AC Power and Charging the Battery
  - Plug the included AC Charger into AC outlet
  - Connect charger plug into 5 VDC jack on FOCIS Flex
  - Charging LED:
    - Off: AC not plugged in
    - Solid red: Discharged battery is being charged
    - Solid green: Battery is fully charged
    - Flashing red/green: Charging error.
      - Verify correct 5 VDC 2A charger used.
  - FOCIS Flex charges while operating

- Battery Operation
  - Battery status icon indicates battery state:
    - Charging, not fully charged
    - Charging, fully charged
    - Battery operation, fully charged
    - Battery operation, partially charged
   - Battery operation, <15 min operating time remaining

Battery Status Icon

Live Mode

1. FOCIS Flex powers up in Live Image mode

2. Help (**?**) soft key shows key functions
   - Popup Help displayed (**6**) while **?** key pressed and held

3. Press ◀ to toggle connector type (Single, MPO, MPO-Flat)
   - Single = Single fiber connector inspection (UPC or APC)
   - **New!** MPO-PC/APC = MPO/MTP® multi-fiber conn.; PC or APC finish
   - MPO-Flat = MPO/MTP multi-fiber connector; Flat finish (rare)

4. Menu (≡) soft key selects Main Menu

5. When Auto-focus enabled & Capture (⬚) pressed:
   - Auto-focus is initiated
   - Image is captured when auto-focus complete
   - Image is analyzed if Pass/Fail enabled
   - FOCIS Flex transitions to Captured Image Mode
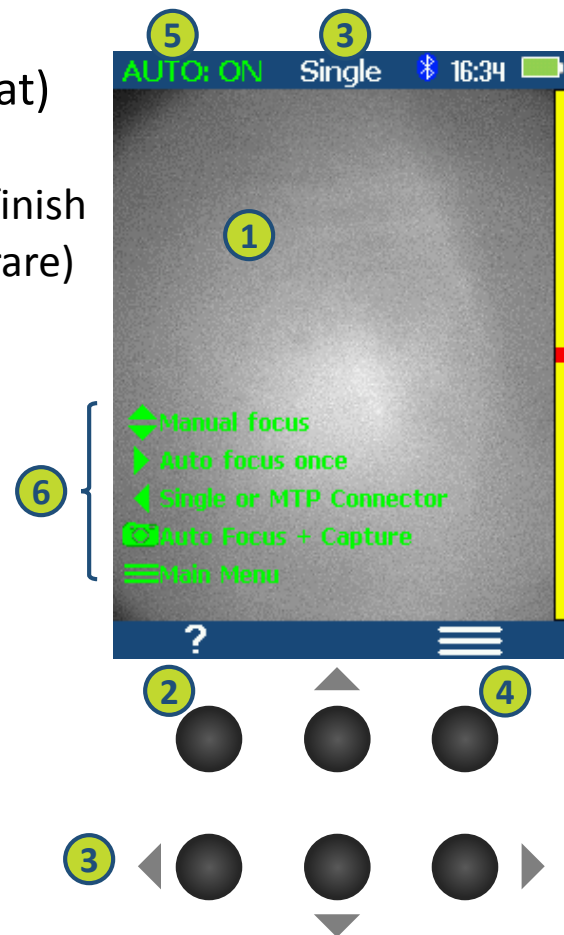
   When Auto-focus disabled:
   - Press right arrow key (▶) to Auto-focus once
   - Press Up/down keys (▲▼) to manually adjust focus
   - Press Capture Key (⬚) to capture image
   - Image is analyzed if Pass/Fail enabled
   - FOCIS Flex transitions to Captured Image Mode

Capture Button Operation

- From Live Image Display mode:
    - Press Capture to:
        - Auto-focus image (if Auto-focus enabled)
        - Capture image
        - Analyze image (if Pass/Fail enabled)
        - Enter Captured Image Display mode
- From Captured Image Display mode:
    - Press Capture to return to Live Image mode
- From Main Menu or Settings modes:
    - Press Capture to return to most recent Live or Captured Image Display mode

Capture Button

Captured Image – Image Display

- Captured Image Display (Zoomed In or Out)
    1. Filename (saved image) or 'Captured @ hh:mm:ss' (unsaved image)
    2. Pass/Fail indication (Only if Pass/Fail enabled)
    3. Display Tabs (select using left/right arrows [◀▶])
        - ▫ Zoomed Out Image
        - ◉ Partially Zoomed In Image
        - ⬤ Fully Zoomed In Image
        - ⊞ Pass/Fail Results Table
        - i Image Information
    4. Endface Image with pass/fail region overlay
        - ▪ Failing scratches / defects highlighted in red
        - ▪ Passing scratches / defects highlighted in green
    5. Back softkey (↺)
    6. Image Layers (select using up/down keys [▼▲])
        - ▪ Endface + Overlay (Default)
        - ▪ Endface only
        - ▪ Overlay only
    7. Save/Send Menu soft key (≡)
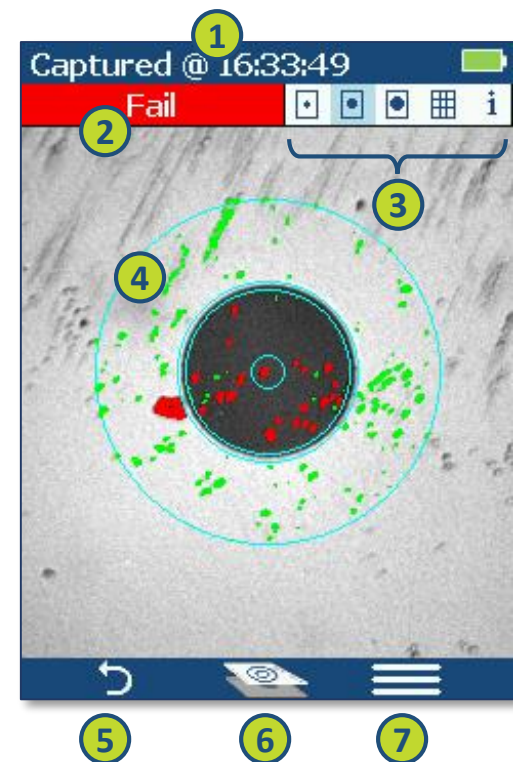
Captured Image – Pass/Fail Results

- Pass/Fail Results Table Display
  1. Title: Filename (saved image) or 'Captured @ hh:mm:ss' (unsaved)
  2. Pass/Fail indication (Only if Pass/Fail analysis enabled)
  3. Pass/Fail display tab selected
  4. Analysis Rule applied to determine pass/fail
  5. Analysis Zone IDs (A, B, C, D)
  6. Scratch analysis results for each zone
     - Reports number of detected scratches / defects
     - Failed rules highlighted in red
  7. Defect analysis results for each zone
  8. Back softkey (↺)
  9. Save/Send Menu soft key (≡)

Understanding 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 type (Single or MPO)
  - Connector finish (PC/UPC or APC)
  - Connector end face regions
    - A region: Core
    - B region: Cladding
    - C region: Adhesive (between cladding & ferrule)
    - D region: Physical contact area
  - Type of end face flaw:
    - Scratches
    - Defects (contamination, particles)
  - Size of flaw

A: Core
B: Cladding
C: Adhesive
D: Contact

Failing Defect

Passing Defect
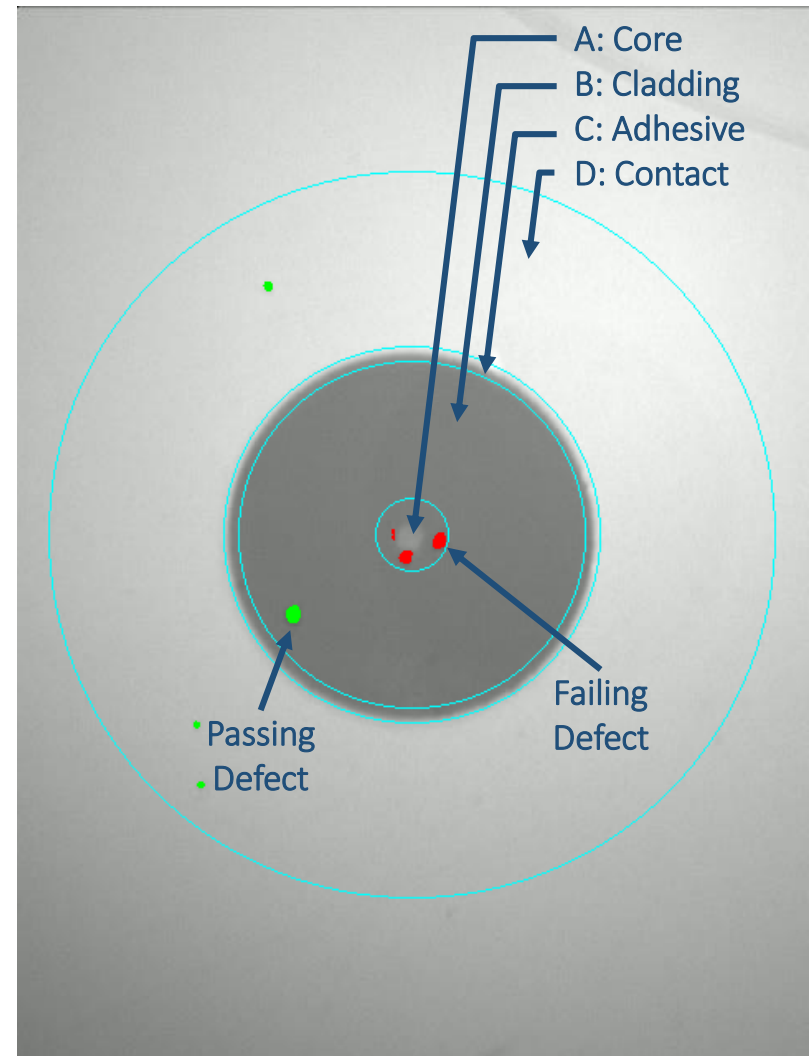
Example IEC Rule

- Rules provided for each region:
  - When MPO/MTP connector inspected, C&D regions are not evaluated.

- Example provided for:
  - Single-mode PC connector with mated connector ORL $\geq$ 45 dB

| Region	Scratches	Defects
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 > 5 μm allowed)
C: Adhesive	Blank (No limitations on scratches)	Blank (No limitations on scratches)
D: Contact	Blank (No limitations on scratches)	$\geq$10 μm: 0 (No defects $\geq$ 10 μm allowed)

Device Info Display

1. Title indicates saved or unsaved results
   - 'Captured @ hh:mm:ss' if unsaved
   - '<Cable>-<Fiber>' if saved

2. Blue highlighted area indicates default folder / file names if results are saved

3. Time indicates Time & Date image captured

4. Rule identifies pass/fail analysis rule applied

5. Back softkey (↺)

6. Save/Send Menu soft key (≡)
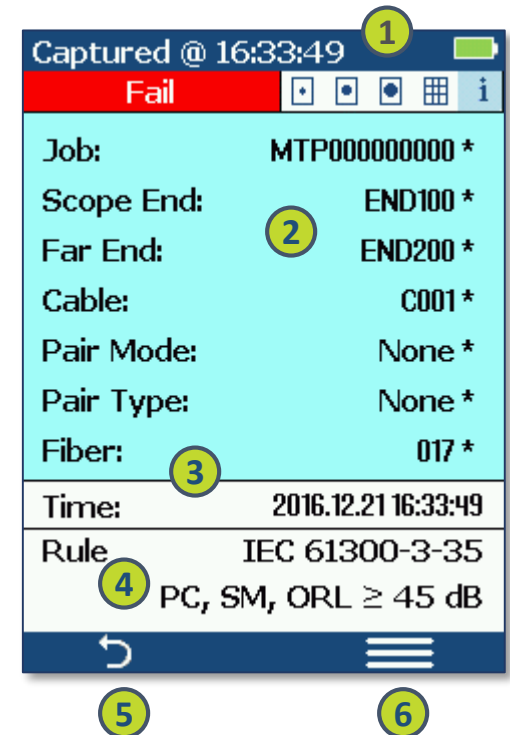
Main Menu

- Press Menu (≡) from Live Mode

- Use up/down arrows (▲▼) to select option
    - **Settings**: Configure auto-focus, pass/fail, Bluetooth, etc.
    - **Results Manager**: View or Send saved results
    - **Last Image**: Recall most recently viewed image
    - **WiFi**: Configure WiFi for remote access (future)
    - **Device Info**: View serial number, software rev, etc.

- 'Select' and right arrow (▶) select highlighted option

- Press Back (↶) to return to Live Image mode
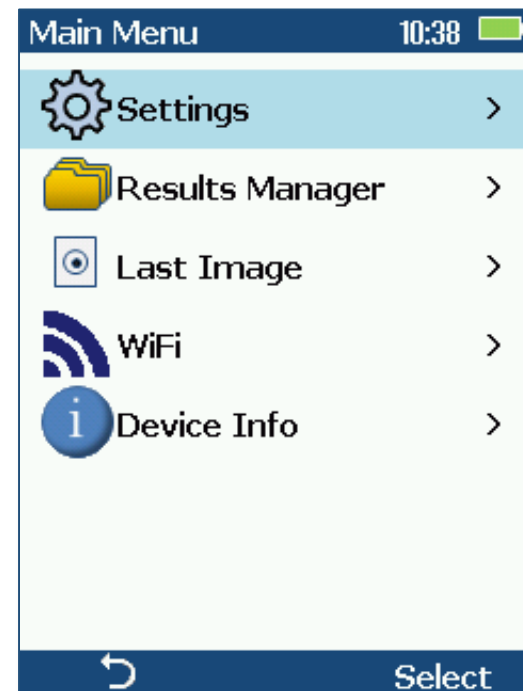
Settings Menu

- ▲▼ scroll to highlight setting to edit
  - **Capture**: Configure Capture button settings
  - **Pass/Fail**: Configure Pass/Fail Settings
  - **Bluetooth**: Pair to Bluetooth device
  - **Power Save**: Configure display brightness & auto-off
  - **Beeper**: Enable/disable beeper
  - **Time & Date**: Adjust time and date
  - **Zoom:** 2X Zoom (helpful for subjective end-face analysis)
  - **Language**: Select user interface language

- For most settings:
  - Use 'Select' or ▶ to edit highlighted settings

- When Beeper highlighted:
  - 'Select' toggles setting
  - ◀ disables setting
  - ▶ enables setting

- Press Back (↩) to return to Main Menu

- Press Capture to return to previous image display
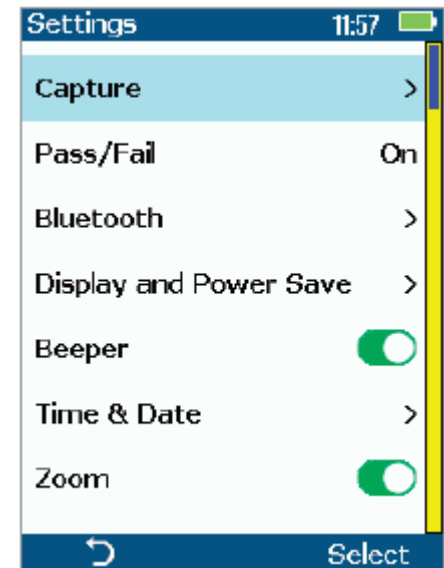
Pass / Fail Settings

- Auto Analysis:
  - ◀ disables; ▶ enables pass/fail analysis
  - 'Select' soft key toggles pass/fail analysis state

- Change Rule:
  - Highlight 'Change Rule' & press 'Select' or ▶ to change current rule
  - Use ▲▼ to highlight, then 'Select' desired rule group
    - **IEC Rules**: Per IEC-61300-3-35
    - **User Rules**: User-settable pass/fail settings
    - **IPC**: Per IPC 610-DC-16.1.1/2
    - **AT&T**: AT&T-specific pass/fail settings
  - Use ▲▼ to highlight desired rule, then press 'Use'

- View Rule
  - Highlight & press 'Select' or ▶ to view details for highlighted rule
  - User Rules may be edited while viewing
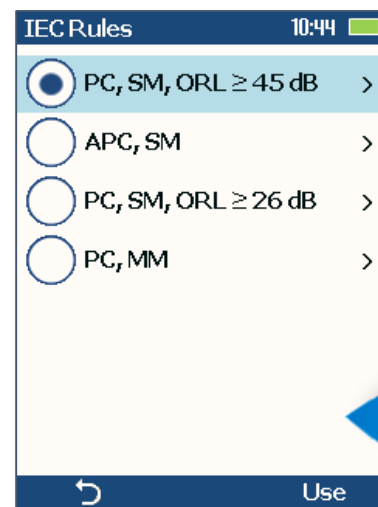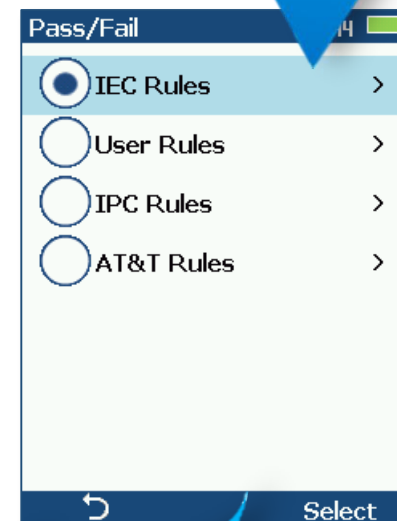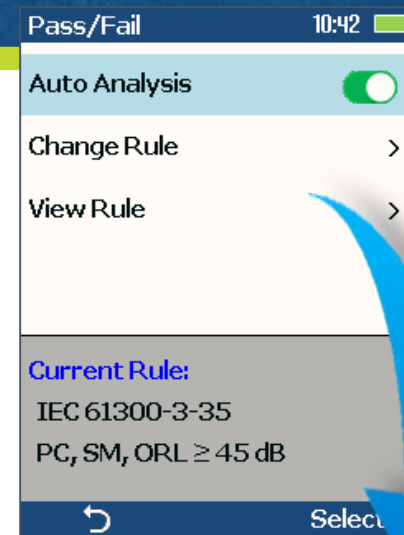
Bluetooth Settings

- Auto Send (to FlexTester):
  - ◀ disables; ▶ enables auto send
  - 'Select' soft key toggles auto send state
 - Cannot enable unless paired to another Bluetooth device

- To pair with FLEXSCAN or FlexTester:
  1. Enable Bluetooth in FLEXSCAN Settings
  2. Or configure FlexTester for pairing:
     - Select 'Bluetooth' from FlexTester 'Settings' screen
     - Set Bluetooth = ON; Set Visibility = ON
  3. From FOCIS Flex, highlight & 'Select' Pair With New Device
     - Wait for list of visible devices to be shown
     - Use ▼▲ keys to select FLEXSCAN or FlexTester to pair
  4. Select 'Set Default Connection' to complete pairing
   - After pairing, set FlexTester Visibility = OFF

FLEXSCAN Settings (1)
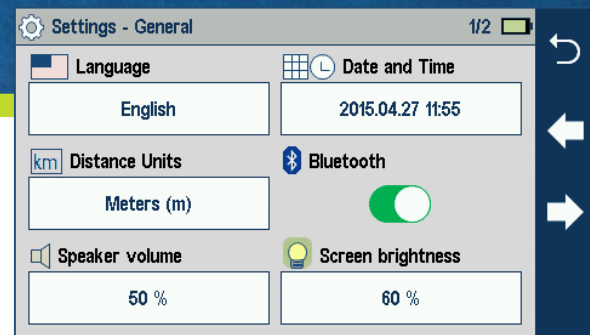
FlexTester Settings (2)
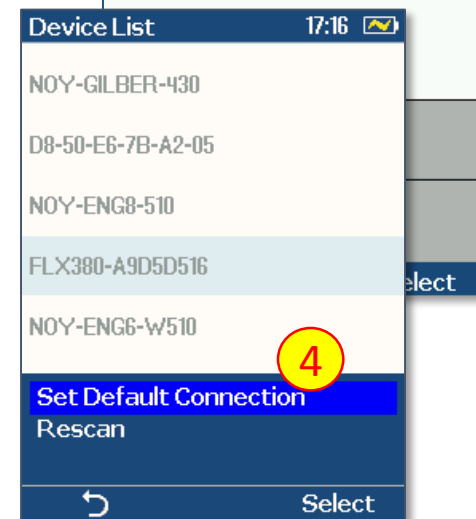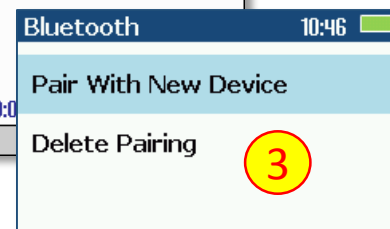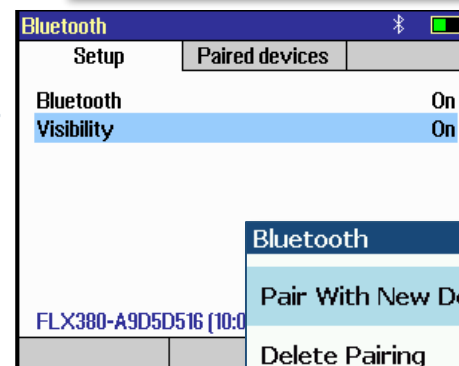
Power Save Settings

- Select Power Save from Settings

- Highlight & Select Auto Off
  - Highlight and select desired Auto-off time (or Never)

- Highlight & Select Brightness
  - Use ▲▼ to increase or decrease brightness
  - Dimmer display extends battery life

- Highlight and Select Auto dim:
  - Select Auto dim
  - Use ◄► to enable/disable auto-dimming
  - Select Delay
 - Use ▲▼ to increase / decrease auto dim time
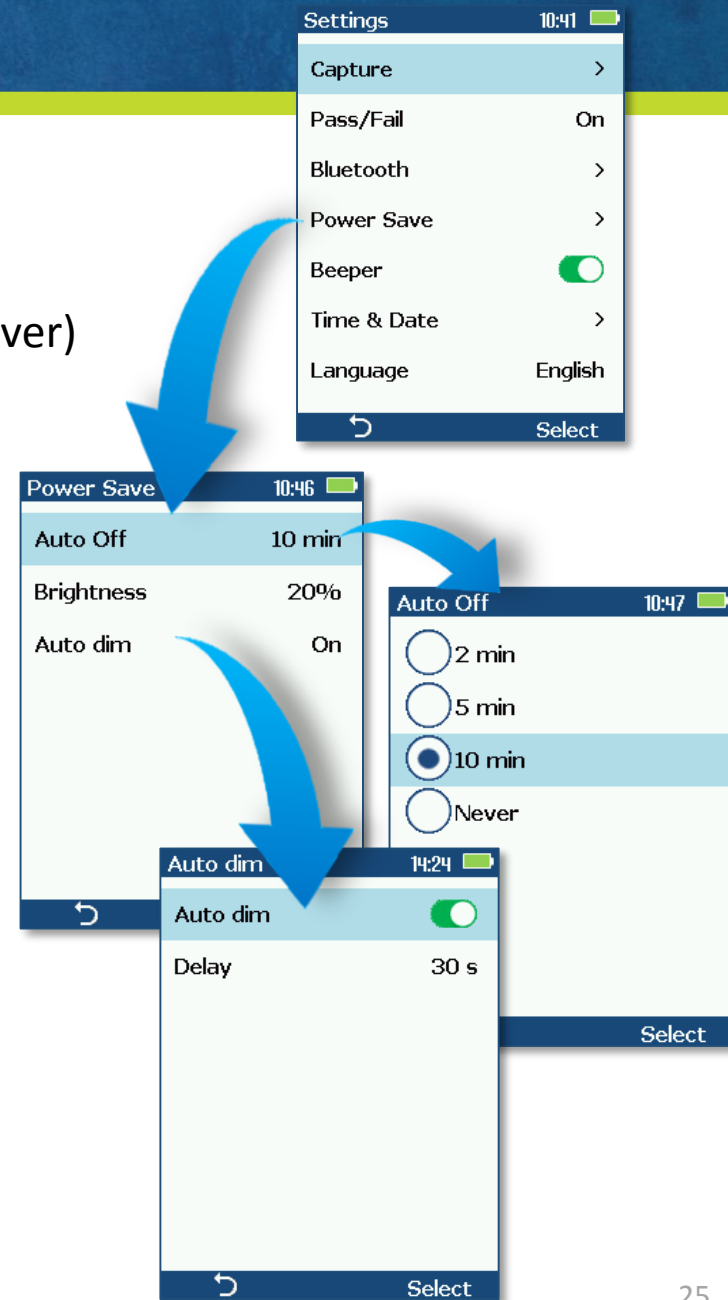
Set Time & Date; Select Language

- Set Time & Date:
    - Highlight and 'Select' Time & Date from Settings
    - Use ◀▶ to select time/date field to edit
    - Adjust setting using ▼▲
    - Select 'Ok' to complete time/date setting

- Select Language
    - Highlight and 'Select' Language from Settings
    - Highlight and 'Select' desire language
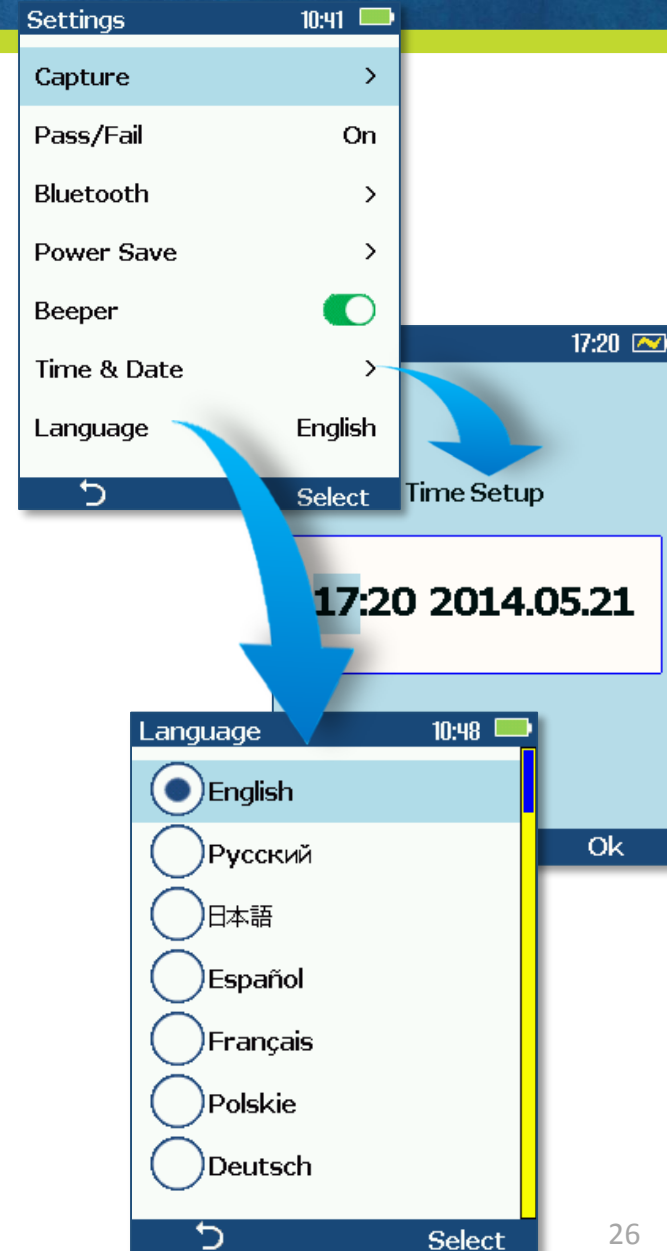
Configuring Auto-Save & Auto-Send

1. Select Capture from Settings Menu

2. Highlight Auto Focus
   - Use ◀▶ to enable or disable auto-focus

3. Highlight and Select Auto-Send
   - Use ▲▼ to disable auto-send, enable on first Capture, or enable on second Capture

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

5. Highlight and Select Save to Folder/File
   - Use ▲▼ to select & edit folder/file fields

- 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.
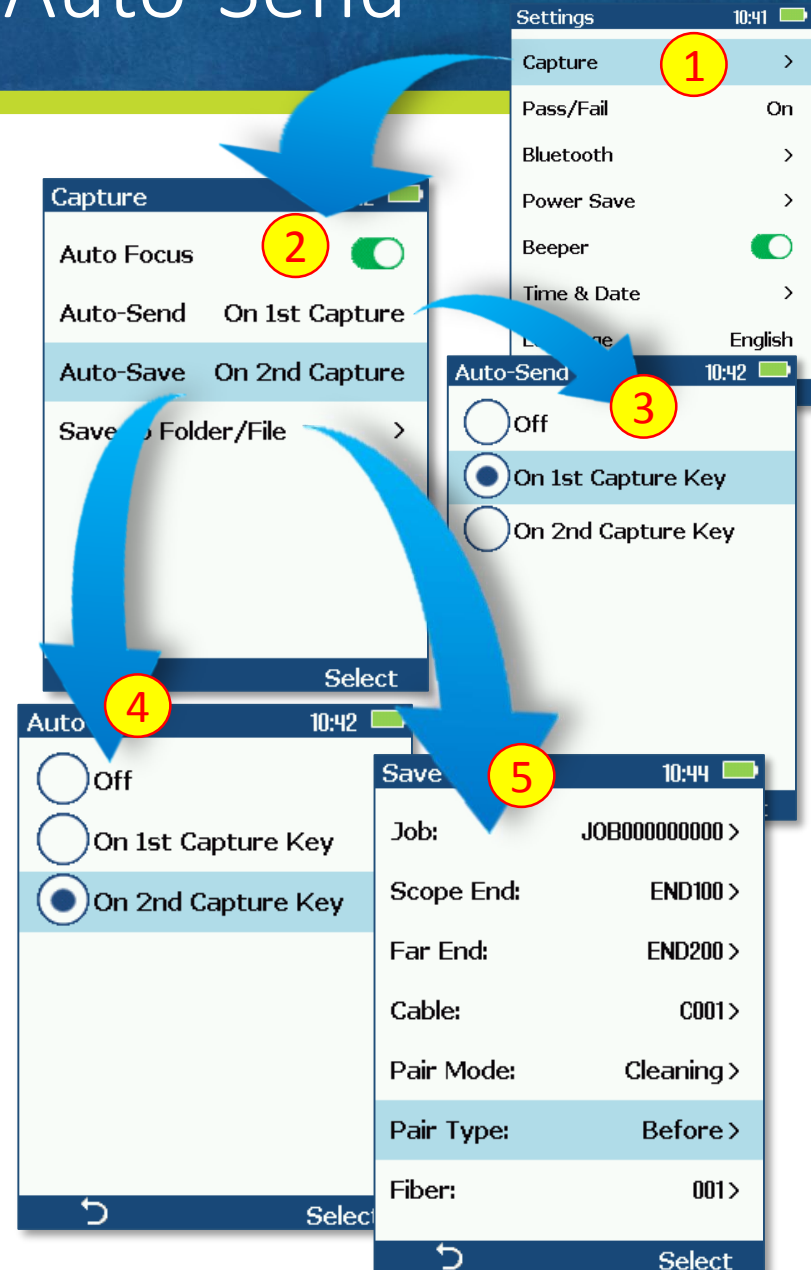
Configuring Image-Pairing

- What is Image Pairing?
  - Allows user to capture and save two images for each fiber
- Pairing Modes & Pairing Types:

Pairing Mode	Pairing Type
None	**None** – Image pairing disabled
Cleaning	**Before** – image before connector cleaned **After** – image after connector cleaned
Input / Output	**Input** – network input connector image **Output** – network output connector image
Documentation	**As built** – image of connector when network built **As found** – connector as found when troubleshooting
Mating	**Jumper** – image of patch cord connector **Bulkhead** – image of panel-mounted bulkhead connector

Save As... 10:44

Job: JOB000000000 >
Scope End: END100 >
Far End: END200 >
Cable: C001 >
Pair Mode: Cleaning >
Pair Type: Before >
Fiber: 001 >

Select

- TRM 2.0 allows user to prepare reports containing paired images

Saving Captured Images

- Press 'Menu' (≡) from Captured Image Display

- Highlight 'Save' and press 'Select' soft key to save image and results to currently indicated file

- To edit file name:
    - Navigate to Job, Cable End, Cable, Pair Mode, Pair Type, or Fiber to edit using ▲▼ keys
    - Press ▶ or 'Select'
    - Use ◀▶▲▼ keys to edit field
    - Press 'Ok' soft key

- To save to an existing folder:
    - Highlight 'Existing folders'
    - Press ▶ or 'Select'
    - Use ▲▼ to select desired Job folder
    - Press ▶ to open selected Job folder
    - Repeat for desired Cable folder & Fiber
    - Press 'Use' soft key
   - Highlight 'Save' and press 'Select'
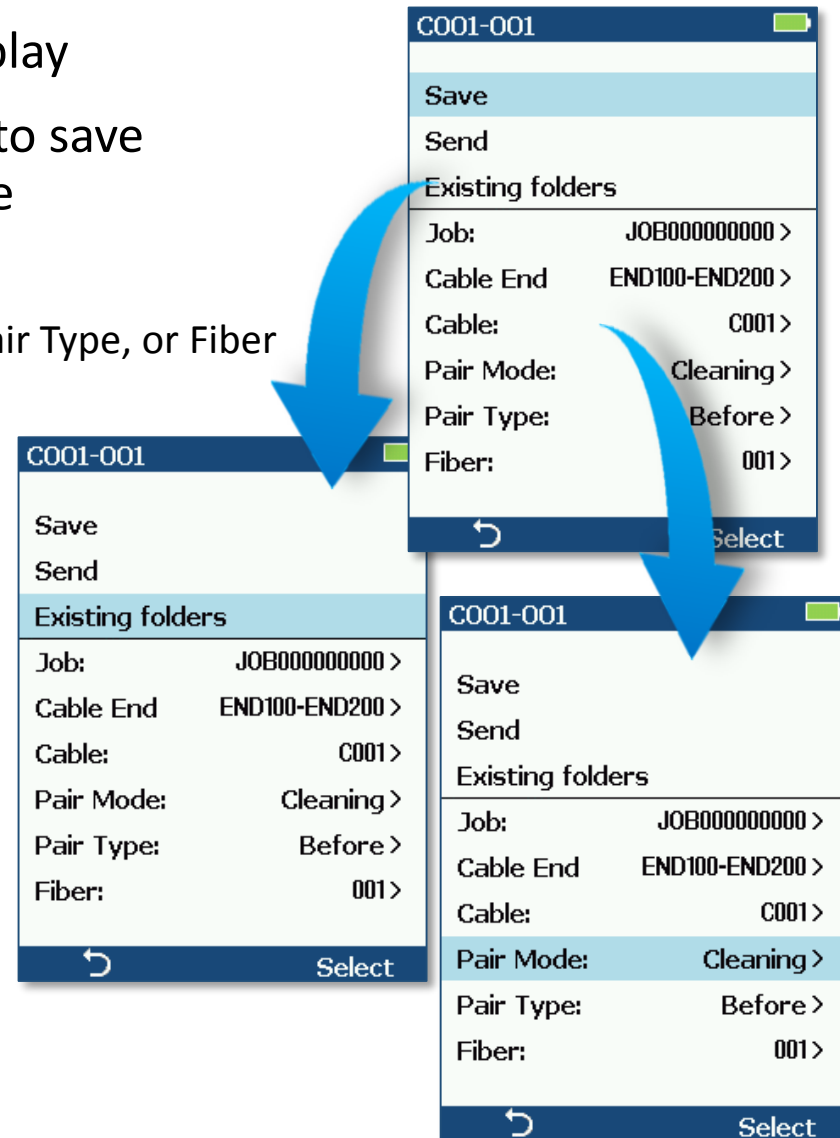
Using FOCIS Flex with FLEXSCAN OTDR

- Inspection is completed using FOCIS Flex
  - Auto-focuses on connector end-face
  - Captures end-face image
  - Auto-centers image and applies IEC or user-selected pass/fail criteria
  - Displays image and pass/fail results on FOCIS Flex
  - Optionally automatically transfers image and pass/fail results to FLEXSCAN

- Transferred Image and pass/fail results may be displayed on FLEXSCAN
  - Image and results can be stored in FLEXSCAN, associated with OTDR results

- Process:
  - Enable Bluetooth on FLEXSCAN
  - Enable Bluetooth on FOCIS Flex and pair FOCIS Flex to FLEXSCAN
  - Select Connector Inspection on FLEXSCAN
  - Press 'Capture' on FOCIS Flex; View image & results on FLEXSCAN

Enable Bluetooth on FLEXSCAN

- Select 'Settings' from Home screen

- Select 'Bluetooth' from Settings screen

- Enable 'Bluetooth radio' on Bluetooth screen
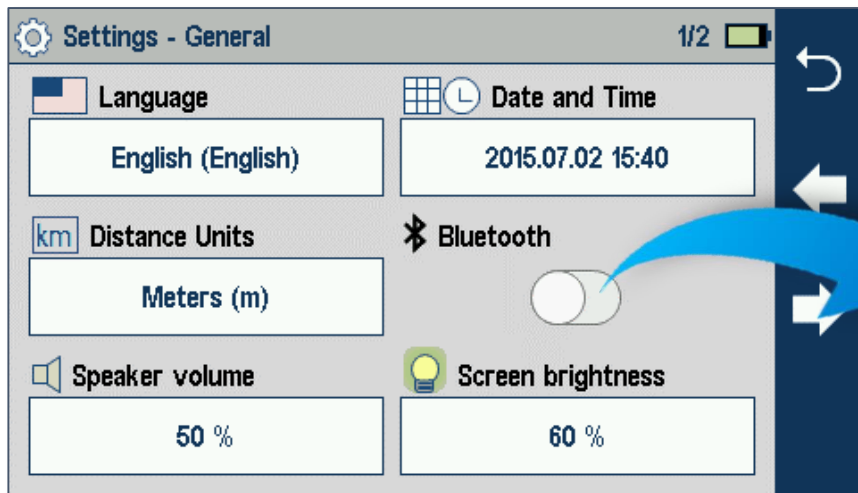
Pair FOCIS Flex to FLEXSCAN

- Select 'Settings' from FOCIS Flex Main Menu

- Select 'Bluetooth' from Settings Menu

- Select 'Pair with New Device'

- Wait for list of devices to be displayed

- Select displayed 'FS200' device and 'Set as Default Device'
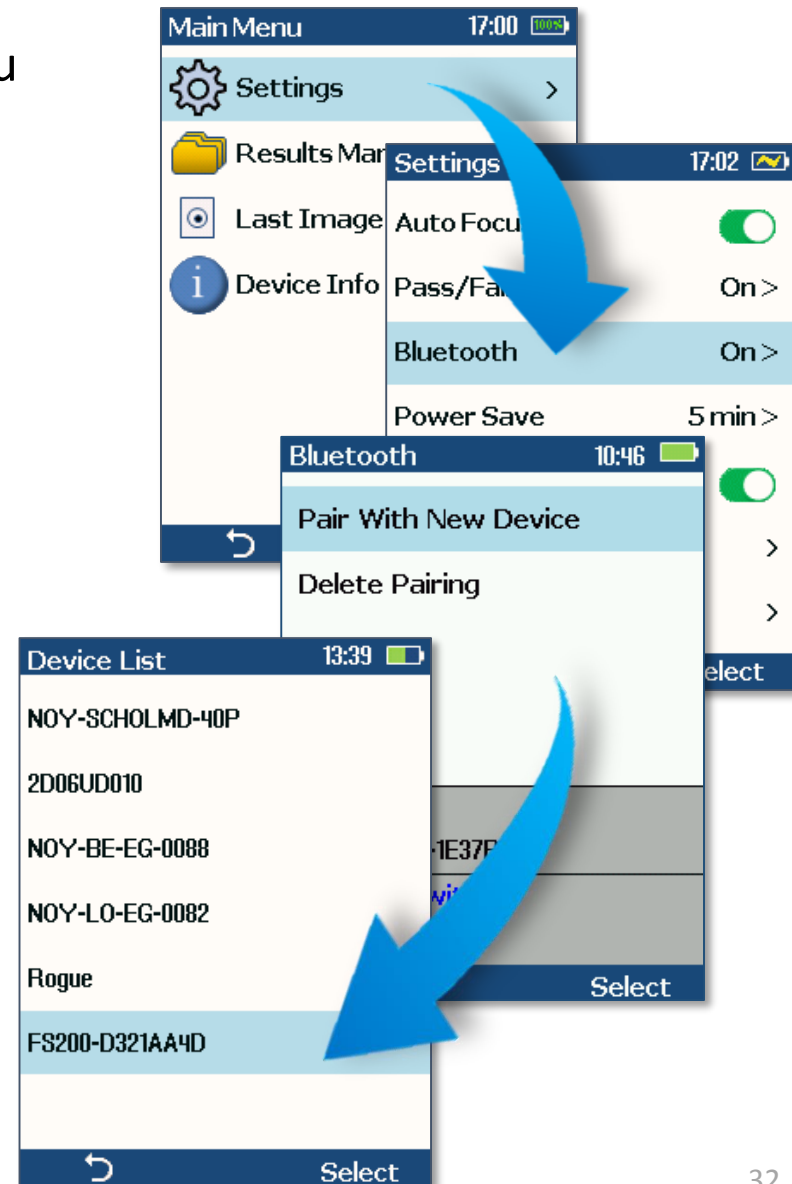
Capture and View Results

- Press 'Capture' on FOCIS Flex

- FOCIS Flex auto-focuses, captures, analyzes, and sends to FLEXSCAN

- FLEXSCAN displays image and pass/fail results (assuming pass/fail enabled on FOCIS Flex)

- Touch 'Save' folder to save results on FLEXSCAN

Manually Send Results to FlexTester

- Select FlexTester Settings → Bluetooth…

- Enable Bluetooth with Visibility = 'On'

- Pair FOCIS Flex with FlexTester
  - See slide Bluetooth Settings
  - Enable Auto Send in Bluetooth Settings

- Capture an Image or Recall Saved Image
  - See slide Capture Button Operation
  - See slide Results Manager – View Saved Images

- Press Menu (≡) from Captured Image mode

- Highlight 'Send' and press 'Select'

- After a few seconds, captured image will appear on FlexTester
  - Press ⇨ key on FlexTester to view pass/fail results table

Results Manager – View Saved Images

- 'Select' Results Manager

- Use ▼▲ to navigate to desired Job folder

- Press ▶ to select highlighted Job folder

- Use ▼▲ and ▶ to select desired Cable folder

- Use ▼▲ and ▶ to select desired File
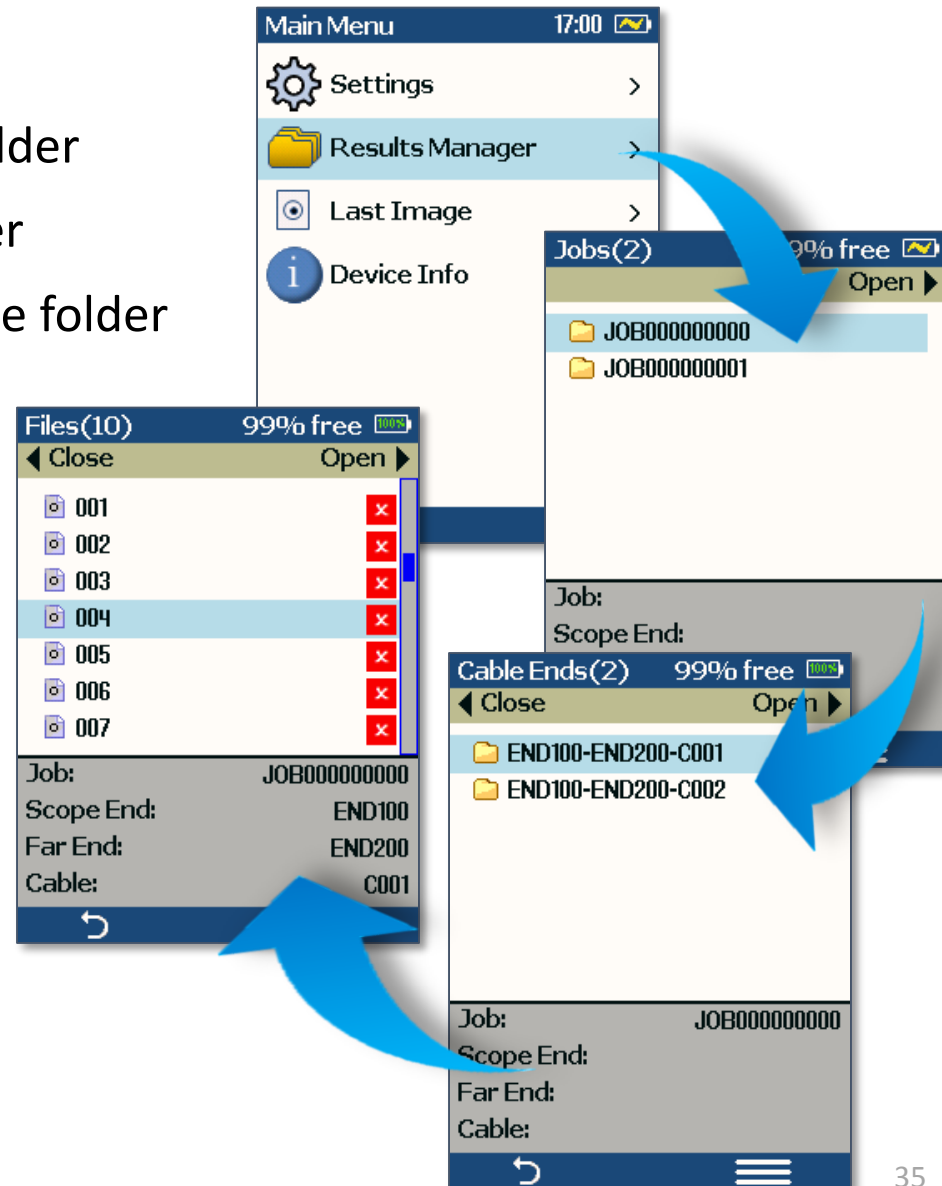
Transferring Results via USB

- Turn FOCIS Flex Off

- Using provided USB cable, connect FOCIS Flex's micro-USB port to PC's USB port

- Verify FOCIS Flex displays:
    - Video
    - Mass storage

- Select Mass storage mode

- At PC, select 'My Computer'

- Verify device labeled 'PROBE (E:\)' appears in My Computer window
    - Note: Drive letter assigned to PROBE device may be different

- Double-click PROBE (E:\) device to view contents of FOCIS Flex internal memory

- Double-click on RESULTS folder

- Drag, copy, or move some or all of the results to your PC

- When finished, disconnect USB cable, then turn off FOCIS Flex

Inspection Reporting using TRM 2.0

- Upload inspection results to PC using supplied USB cable (see previous slide)

- Install and run TRM 2.0

- Select Report Wizard

- Navigate to uploaded FOCIS Flex Results
  - Select entire [Cable] for all results
  - Select individual fiber for single result

- Select desired inspection template (2 or 12 results per page)

- Select Finish and print or save as .PDF
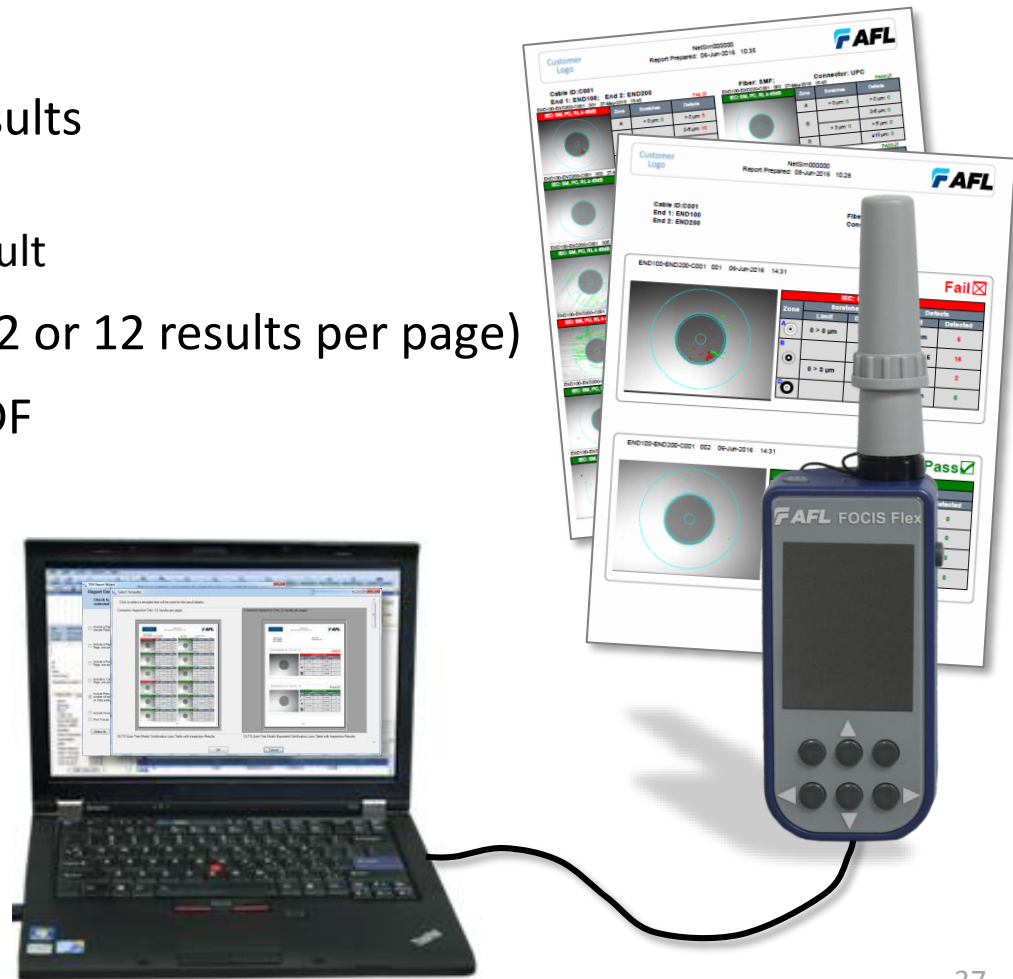
Using FOCIS Flex with FOCIS Flex App

- Download FOCIS Flex App to your Mobile Device

- Pair FOCIS Flex to your mobile device
  - In mobile device Bluetooth Settings, make device visible
  - In FOCIS Flex Bluetooth Settings, select 'Pair to new device'
  - Select displayed mobile device (when device is displayed and hourglass disappears)
  - Select 'Set as Default'
  - Verify FOCIS Flex indicates it is paired with your Mobile Device

- In Capture Settings, configure FOCIS Flex to send on 1st or 2nd Capture Key

- From Live Image mode, view connector end-face and press Capture

- FOCIS Flex will capture image and send it to your mobile device

- FOCIS Flex App will display received image

- For App details, see FOCIS Flex Inspection | aeRos User's Guide
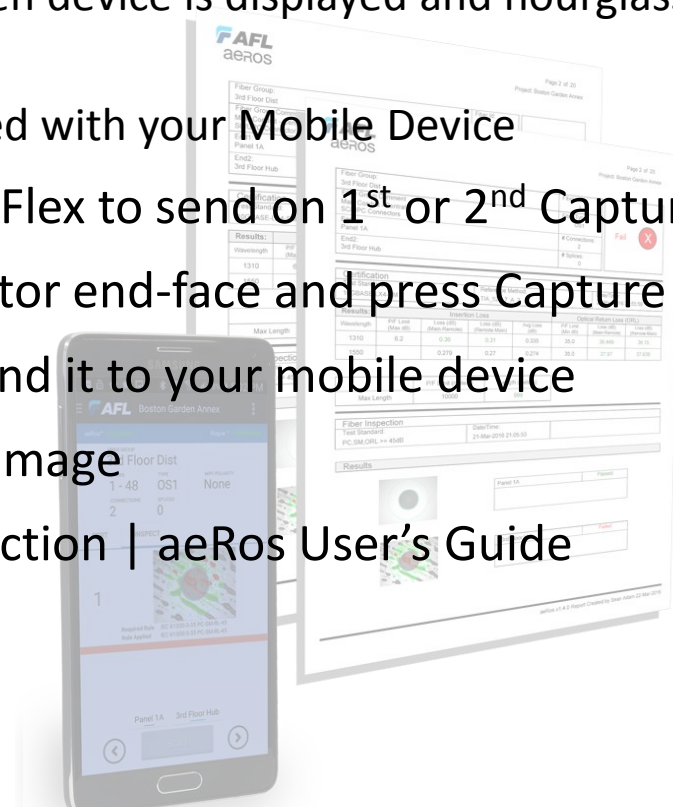
Contacts

Product Manager:

Maury Wood
(978) 758-3891
maury.wood@AFLglobal.com

AFL T&I – Technical Support:

Mark Tatham
(603) 528-7780 x145
mark.tatham@AFLglobal.com

Bill Cadden
(978) 455-9211
william.cadden@AFLglobal.com

Thank You!

www.AFLglobal.com