

# Testing Duplex

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This document will demonstrate how to test duplex assemblies with JGR's MS12001 cable assembly test system.

In the following example, a duplex LC assembly will be tested with a bidirectional test type.

Two methods will be shown: without a switch and with an MS7 switch module.

An added benefit of using an adapter with a single hole to test duplex is that it confirms the DUT polarity during the IL/RL testing.

- Duplex LC: DA128 tri-LC detector adapter
- Duplex SC: DA103 SC detector adapter

# Testing Duplex

## Method 1: without a switch

Begin by configuring a connector with pass/fail limits and the DUT as duplex.

The image displays two side-by-side screenshots of the MS12001 - Cable Assembly Test System software interface, showing the configuration steps for testing a duplex connector.

**Left Screenshot: Connector Configuration**

**Connector**  
This configuration window is used to identify connectors. From this window, you can add, delete or modify a specific connector profile.

Company | Customer | Connector | DUT | Test | Polarity

**Connector Identification**

Connector name: LC/UPC  
Connector type: LC/UPC

**Connector Configuration**

**Insertion Loss Limits**

Pass limit: 0.3 dB  
Warning limit: 0.3 dB

**Reflectance Limits**

Pass limit: -50 dB  
Warning limit: -50 dB

Buttons: Add, Delete, Copy To, Apply, Cancel

Status: Ready | Supervisor | 02/08/2018 | 02:19 PM

**Right Screenshot: DUT Configuration**

**DUT**  
This configuration window is used to identify devices under test (DUT). From this window, you can add, delete or modify a specific DUT.

Company | Customer | Connector | DUT | Test | Polarity

**DUT Identification**

Part number: Duplex LC/UPC-LC/UPC  
Description: Duplex LC/UPC-LC/UPC  
Manufacturer:   
Maximum fiber length (m): 10  
Fiber type: Singlemode - 9um

**Assembly type:** Duplex (circled in red)  
**Number of fibers:** 2 (circled in red)  
☒ Mandrel Free

**DUT Configuration**

End A: LC/UPC  
IL limits: 0.3 dB  
Ref. limits: -50 dB

End B: LC/UPC  
IL limits: 0.3 dB  
Ref. limits: -50 dB

**Polarity Type**

Defined Type: A

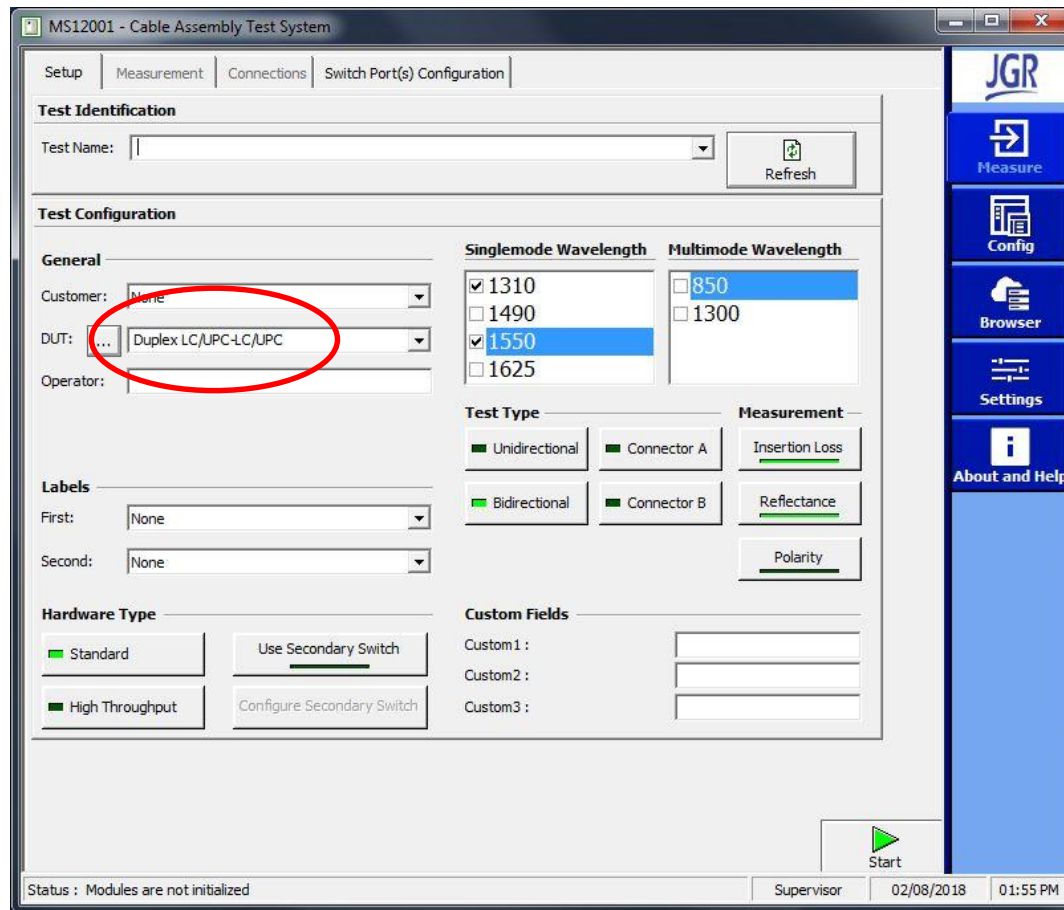
Buttons: Add, Delete, Copy To, Apply, Cancel

Status: Ready | Supervisor | 02/08/2018 | 02:19 PM

# Testing Duplex

## Method 1: without a switch

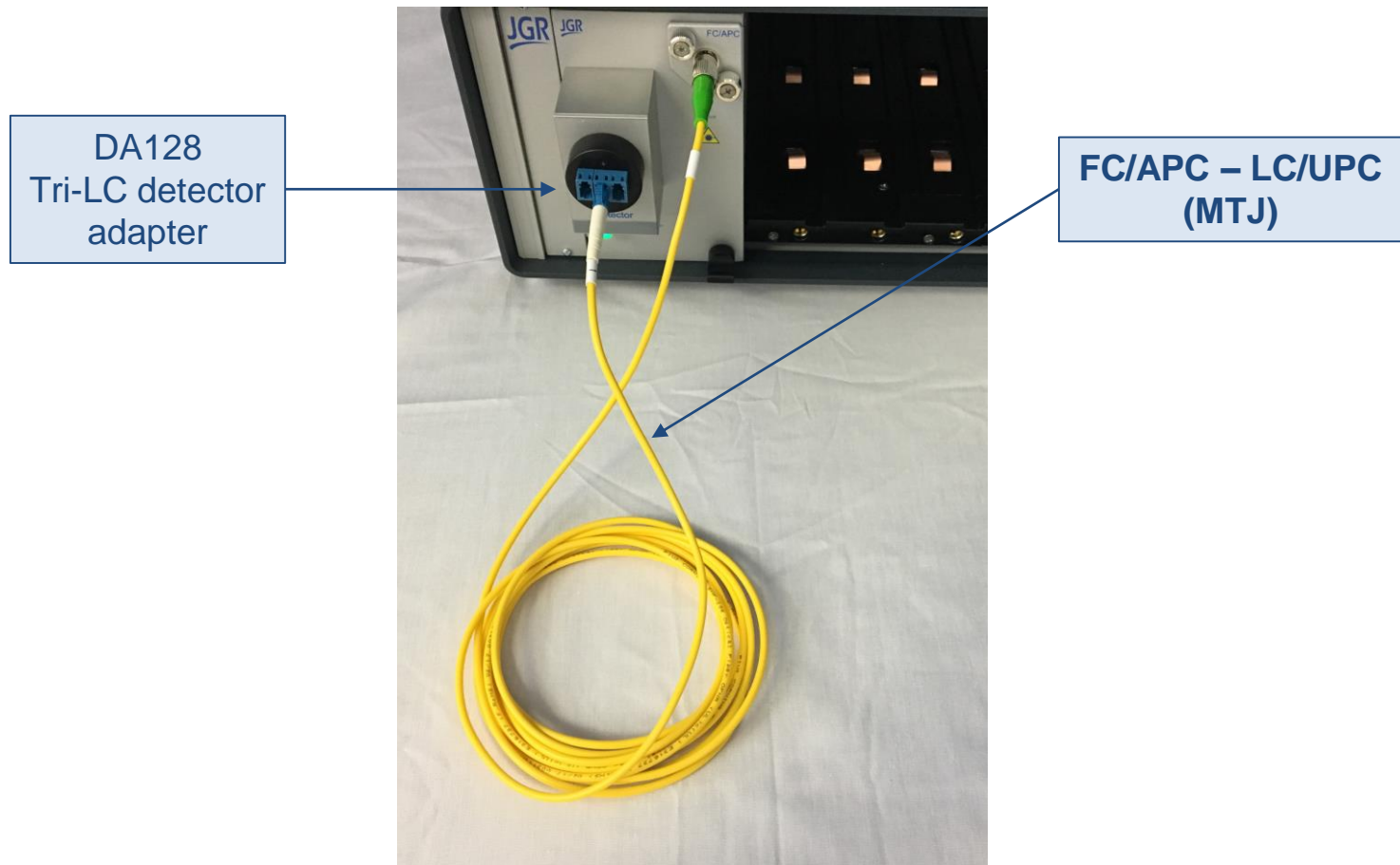
Start a test with the created DUT.



# Testing Duplex

## Method 1: without a switch

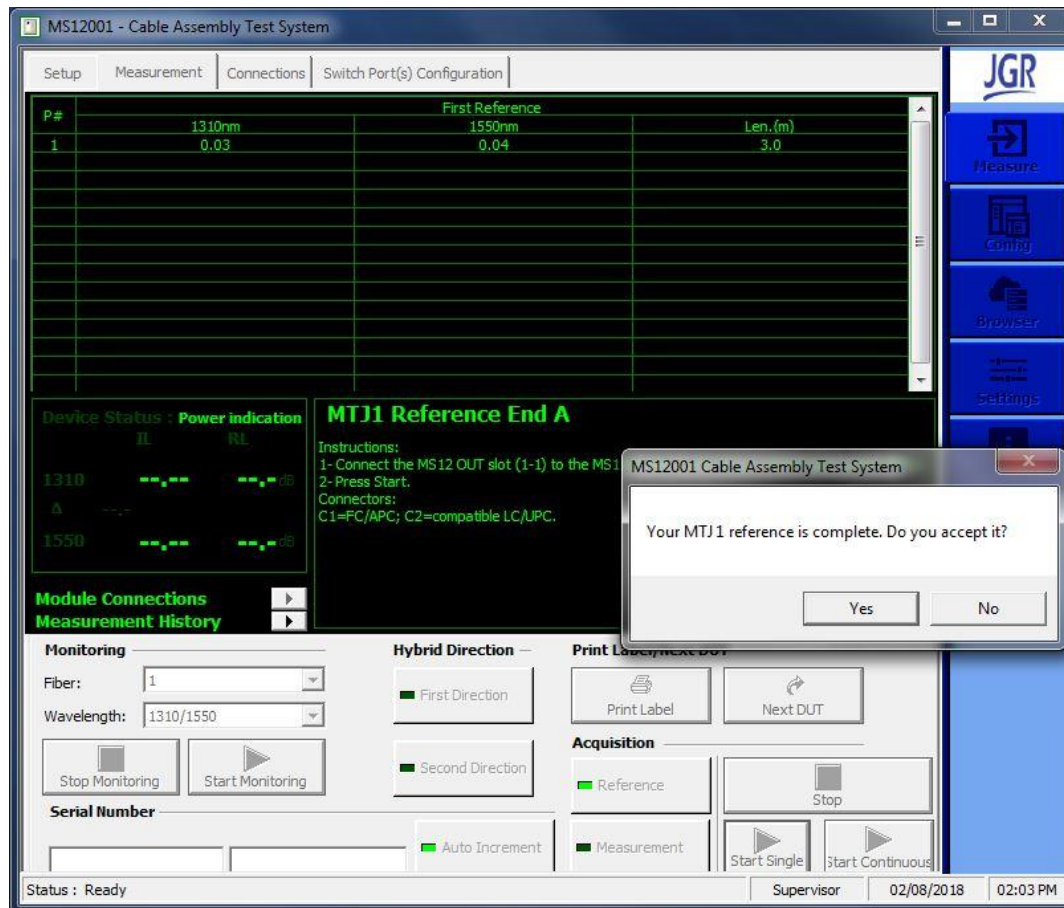
Connect the master test jumper (MTJ) as below.



# Testing Duplex

## Method 1: without a switch

Select *Reference Acquisition* and click *Start*.

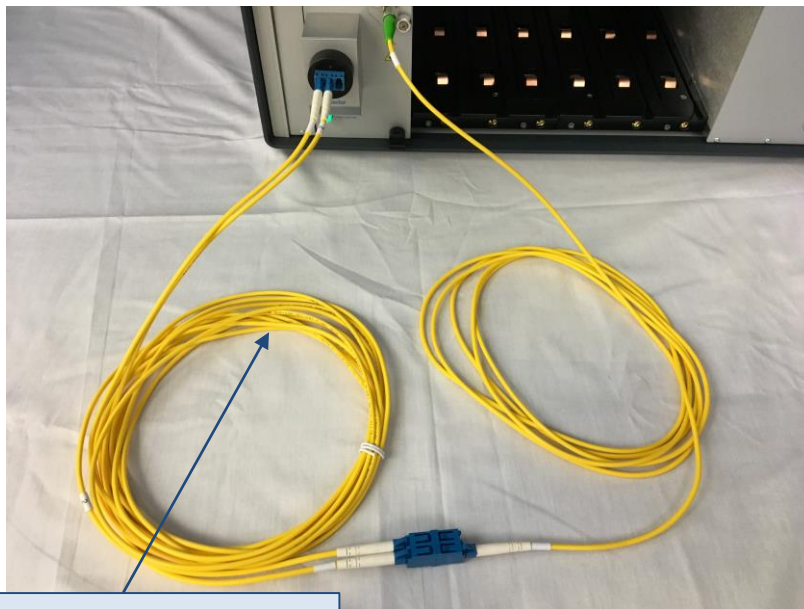


# Testing Duplex

## Method 1: without a switch

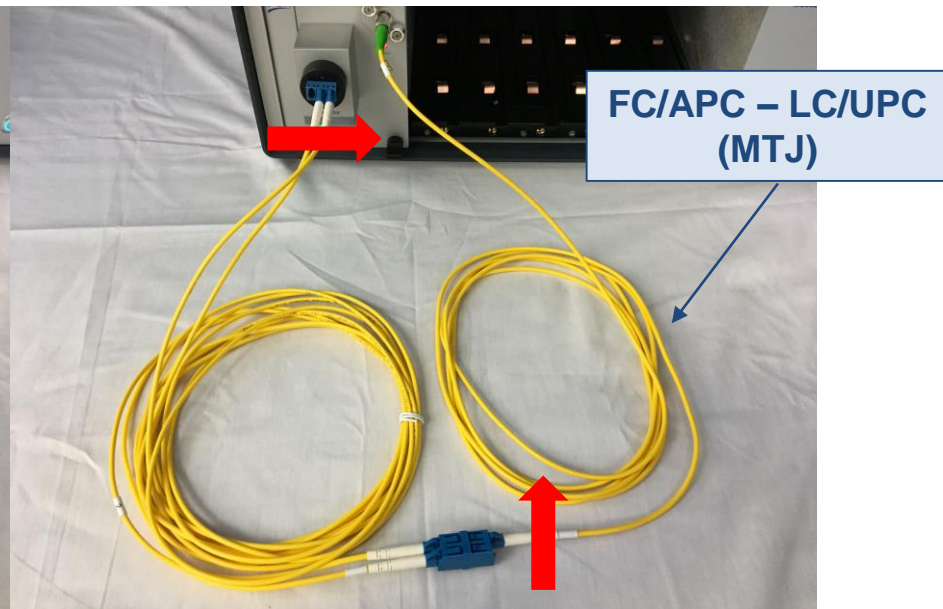
The fibers will be tested one at a time. The software will pause to allow the operator to switch over the MTJ in the mating adapter and the DUT in the detector.

Test Fiber #1



2\*LC/UPC – 2\*LC/UPC  
(DUT)

Test Fiber #2



FC/APC – LC/UPC  
(MTJ)

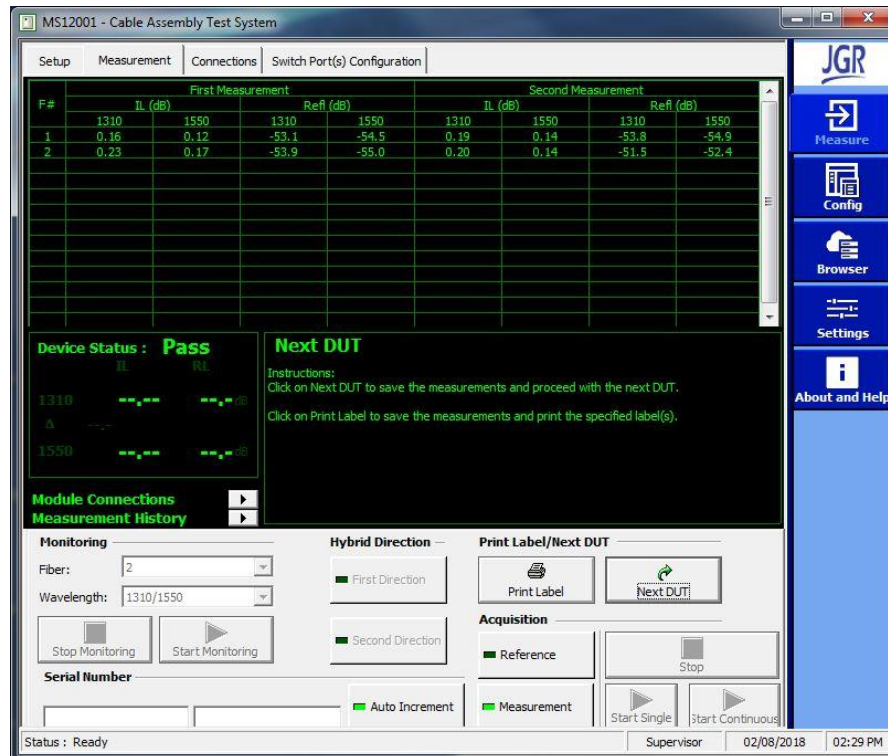


# Testing Duplex

## Method 1: without a switch

After measuring fibers #1 and #2 of side A, flip the DUT to measure side B. Enter a serial number and press *Next DUT* to save the results.

Note: a pass IL result can only occur with the correct polarity. The DA128 (tri-LC) and DA103 (SC) only allow light to go through the center hole. Incorrect polarity will display as no light (very high IL > 40 dB).





# Testing Duplex

## Method 2: with an MS7 switch module

For faster testing, a switch can be used to allow for 2 master test jumpers. JGR's switches have excellent repeatability ( $\pm 0.005$  dB) which make them invisible to power readings. For this method, configure a multifiber-to-multifiber DUT.

The screenshot displays the 'MS12001 - Cable Assembly Test System' software interface. The main window is titled 'DUT' and contains a configuration form. The form is divided into several sections: 'DUT Identification', 'DUT Configuration', and 'Polarity Type'. The 'DUT Identification' section includes fields for 'Part number', 'Description', 'Manufacturer', 'Maximum fiber length (m)', 'Fiber type', 'Assembly type', and 'Number of fibers'. The 'DUT Configuration' section includes fields for 'End A', 'End B', 'IL limits', and 'Ref. limits'. The 'Polarity Type' section includes a 'Defined Type' field. The 'Assembly type' dropdown menu is highlighted with a red circle, showing 'Multifiber-to-Multifiber' selected. The 'Number of fibers' field is set to '2'. The 'Fiber type' dropdown menu is set to 'Singlemode - 9um'. The 'End A' and 'End B' dropdown menus are set to 'LC/UPC'. The 'IL limits' and 'Ref. limits' fields are set to '0.3 dB' and '-50 dB' respectively. The 'Defined Type' dropdown menu is set to 'A'. The status bar at the bottom shows 'Status: Supervisor 02/08/2018 04:27 PM'. The JGR logo is visible in the top right corner of the window and in the bottom right corner of the slide.

**DUT**

This configuration window is used to identify devices under test (DUT). From this window, you can add, delete or modify a specific DUT.

Company Customer Connector DUT Test Polarity

**DUT Identification**

Part number: Duplex LC/UPC-LC/UPC

Description: Duplex LC/UPC-LC/UPC

Manufacturer:

Maximum fiber length (m): 10

Fiber type: Singlemode - 9um

Assembly type: Multifiber-to-Multifiber

Number of fibers: 2

Mandrel Free

**DUT Configuration**

End A: LC/UPC

End B: LC/UPC

IL limits: 0.3 dB

Ref. limits: -50 dB

**Polarity Type**

Defined Type: A

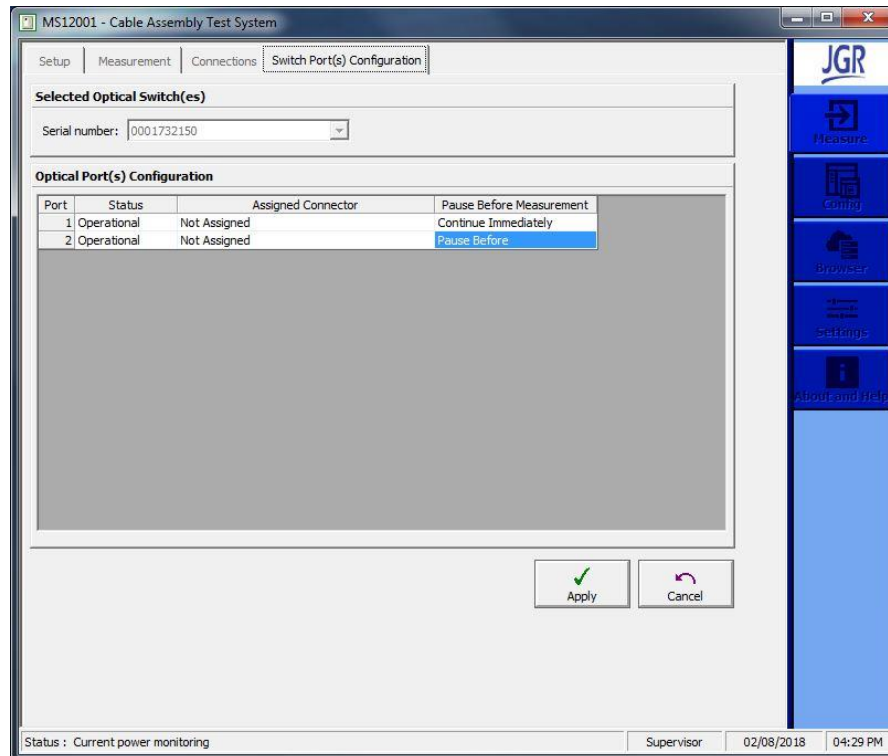
+ Add - Delete ↺ Copy To ✓ Apply ↶ Cancel

Status: Supervisor 02/08/2018 04:27 PM

# Testing Duplex

## Method 2: with an MS7 switch module

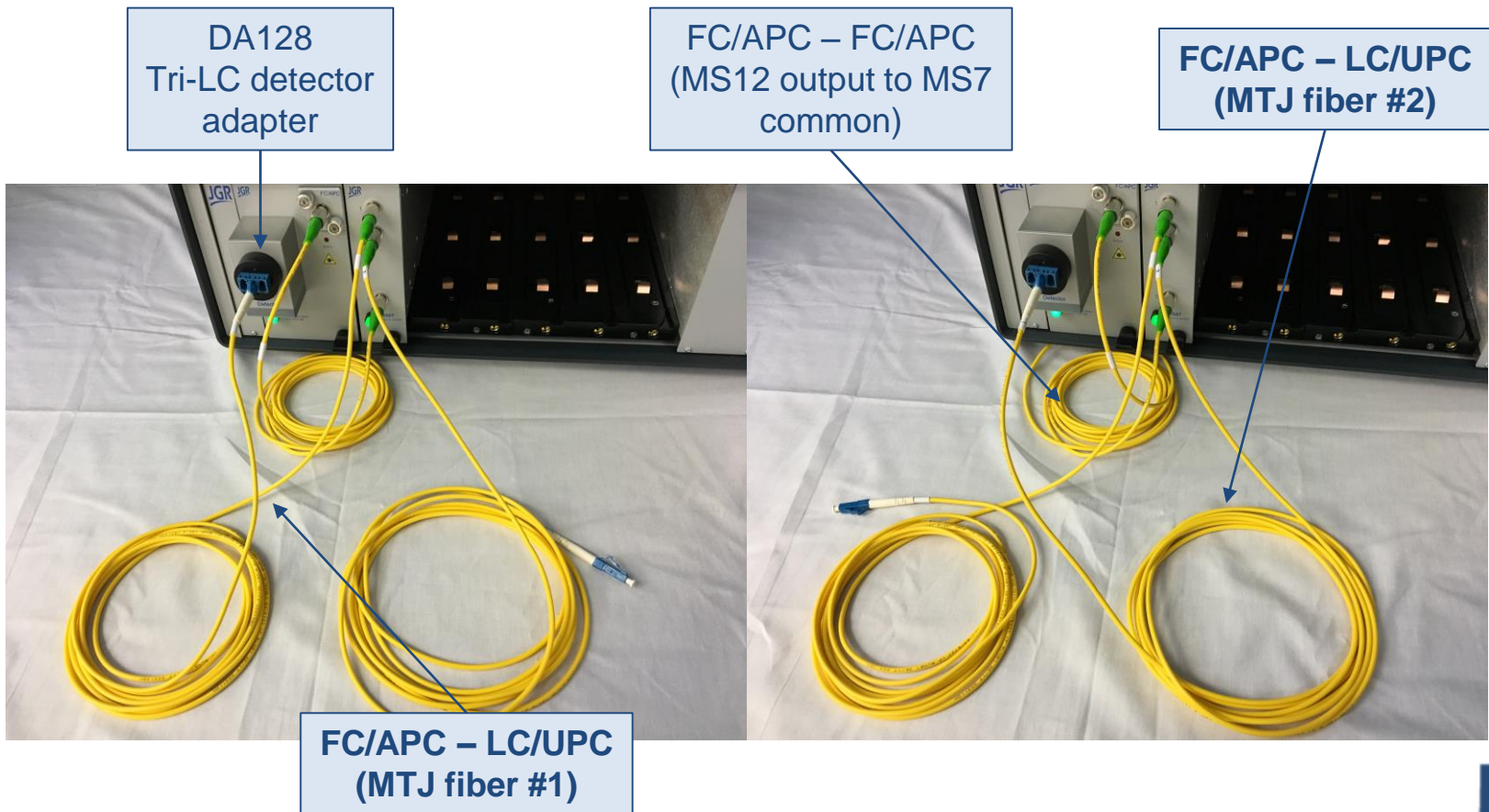
Start a test with the created DUT then go to *Switch Port(s) Configuration*. Add a pause before channel 2 so the operator has time to move the DUT in the detector from position 1 to 2.



# Testing Duplex

## Method 2: with an MS7 switch module

Go back to the measurement screen and reference each MTJ.



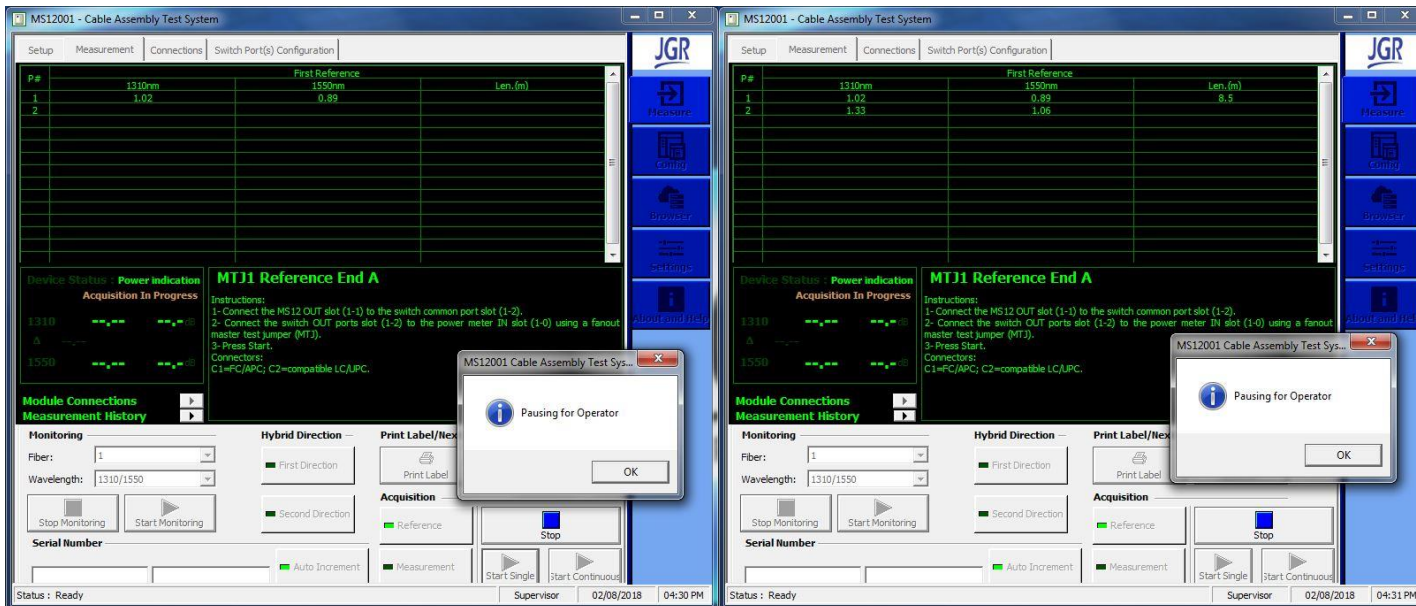
# Testing Duplex

## Method 2: with an MS7 switch module

The reference order is as follows:

1. IL fiber #1
2. Pause for operator
3. IL fiber #2 and length fiber #1
4. Pause for operator
5. Length fiber #2.

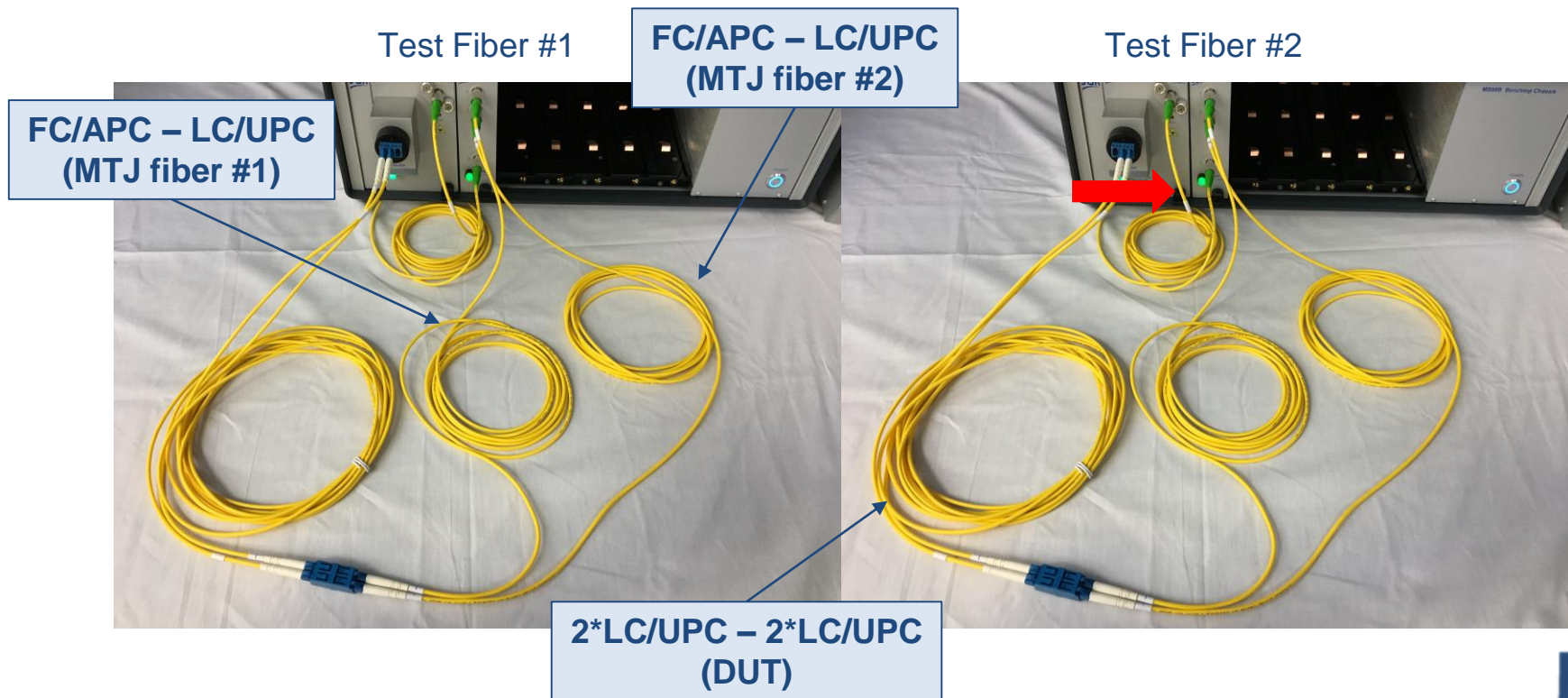
Note: during length reference, the connector does not have to be in the detector.



# Testing Duplex

## Method 2: with an MS7 switch module

With this method, only the detector side connector must be moved to test each fiber.



# Testing Duplex

## Method 2: with an MS7 switch module

After measuring fibers #1 and #2 of side A, flip the DUT to measure side B. Enter a serial number and press *Next DUT* to save the results.

Note: a pass IL result can only occur with the correct polarity. The DA128 (tri-LC) and DA103 (SC) only allow light to go through the center hole. Incorrect polarity will display as no light (very high IL > 40 dB).

