

# Testing SM Bundles with Dual Switches

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This document will explain how to test SM bundles with dual switches.

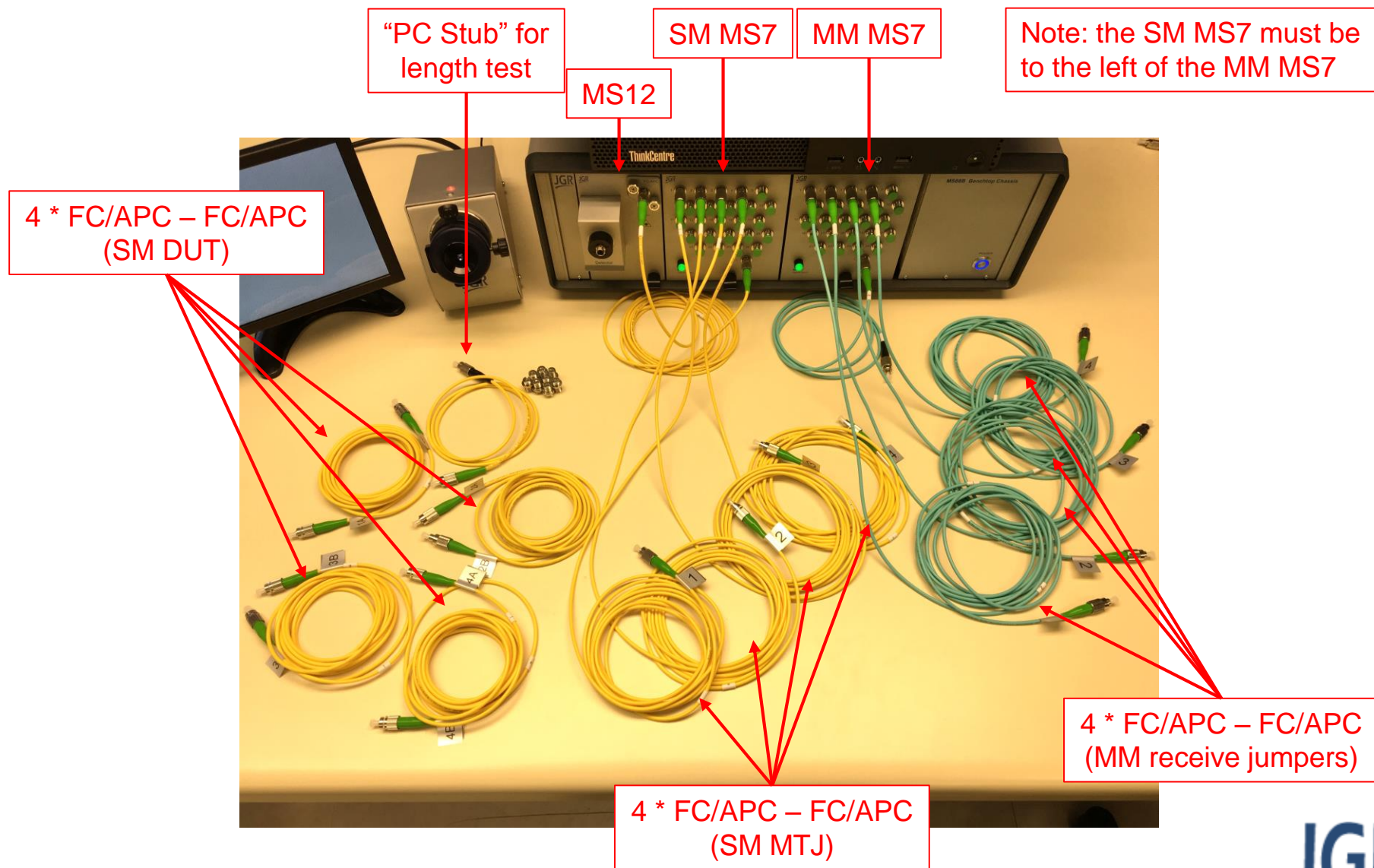
Please contact JGR Optics if you are planning to use this configuration to confirm the hardware has been correctly programmed for this application.

- Launch switch: SM MS7
- Receive switch: MM MS7 programmed as a SM MS7

Note: the MM MS7 cannot be used for a different configuration without being reprogrammed by JGR Optics.

This document will show how to do a bidirectional IL/RL test of a 4 fiber FC/APC – FC/APC bundle.

# Testing SM Bundles with Dual Switches

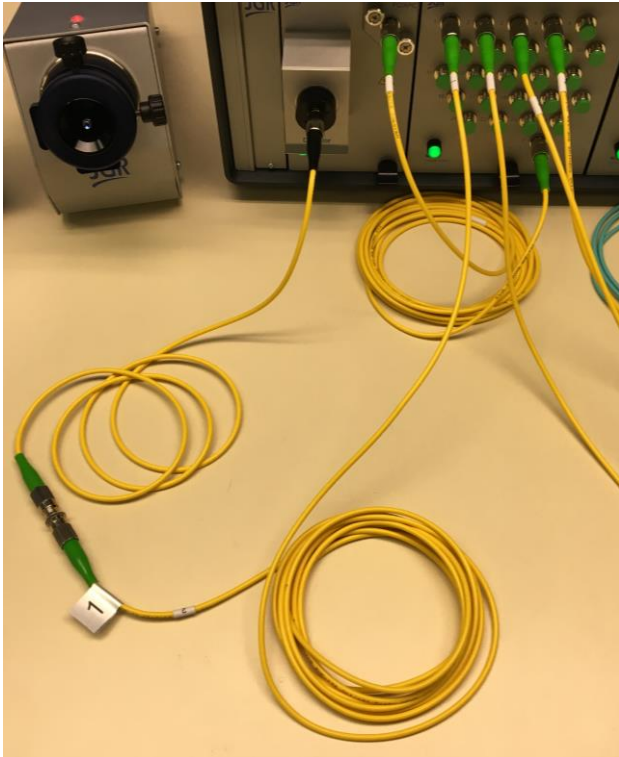


# Testing SM Bundles with Dual Switches

## 1. Length test

1.1. In order to test RL, the length will have to be input manually.

This step will measure the MS12 output – FC/APC-FC/APC – SM MS7 – SM MTJ length.



The DUT connector is APC therefore to facilitate the length measurement, a jumper with a PC termination of known length is used.

In this case, the PC stub is a 1m long FC/APC – FC/UPC jumper.

# Testing SM Bundles with Dual Switches

## 1. Length test

### 1.2. Go to Config > DUT to create a DUT for the length test.

The screenshot displays the 'MS12001 - Cable Assembly Test System' window. The 'DUT' tab is selected, showing a configuration window for identifying devices under test. The 'Part number' field is set to 'Length Test'. The 'Assembly type' is set to 'Multifiber-to-Multifiber' and the 'Number of fibers' is set to '1'. The 'Fiber type' is set to 'Singlemode - 9um'. The 'DUT Configuration' section shows 'End A' and 'End B' both set to 'FC/APC', with 'IL limits' at '0.5 dB' and 'Ref. limits' at '-65 dB'. The 'Polarity Type' section shows 'Defined Type' set to 'A'. The status bar at the bottom indicates 'Status: Supervisor 08/11/2018 02:59 PM'.

**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: Length Test

Description: Assembly type: Multifiber-to-Multifiber

Manufacturer: Number of fibers: 1

Maximum fiber length (m): 0

Fiber type: Singlemode - 9um

Mandrel Free

**DUT Configuration**

End A: FC/APC End B: FC/APC

IL limits: 0.5 dB IL limits: 0.5 dB

Ref. limits: -65 dB Ref. limits: -65 dB

**Polarity Type**

Defined Type: A

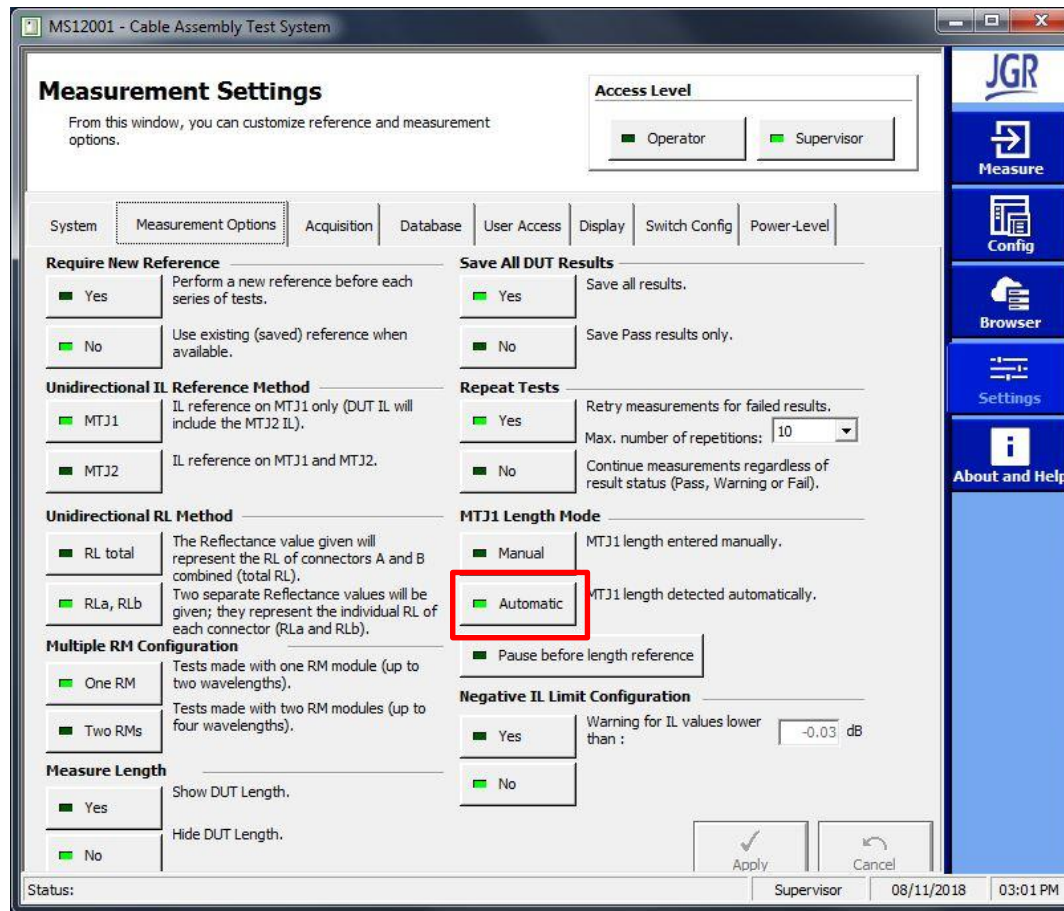
+ Add X Delete ↺ Copy To ✓ Apply ↻ Cancel

Status: Supervisor 08/11/2018 02:59 PM

# Testing SM Bundles with Dual Switches

## 1. Length test

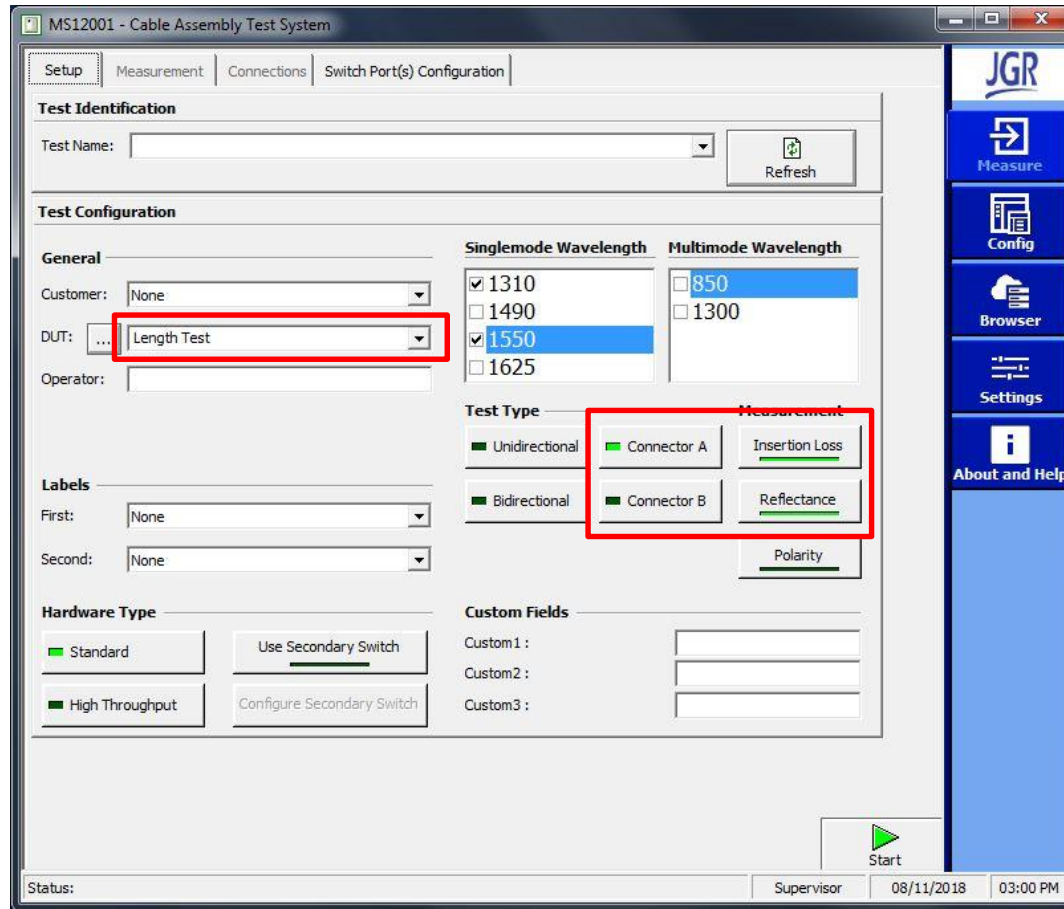
### 1.3. Go to Settings > Measurement Options to enable Automatic MTJ1 Length Mode.



# Testing SM Bundles with Dual Switches

## 1. Length test

1.4. In Measure > Setup, configure the following test then press Start.





# Testing SM Bundles with Dual Switches

## 1. Length test

1.5. Select Reference Acquisition and press Start Single. Subtract the length of the PC Stub from the displayed length. This is the MTJ length to input manually during the DUT testing.

The screenshot displays the MS12001 Cable Assembly Test System software interface. The main window shows a table with the following data:

P#	1310nm	1550nm	Len.(m)
1	1.44	1.15	10.2

A red box highlights the 'Len.(m)' value of 10.2, with a red arrow pointing to it. A red text box below the table states: **Manual Length = 10.2 – 1 = 9.2 m**.

The interface also includes a 'Device Status' section with 'Power indication' for 1310 and 1550 nm, and a 'Module Connections' section. A dialog box titled 'MS12001 Cable Assembly Test System' is open, asking: 'Your MTJ1 reference is complete. Do you accept it?' with 'Yes' and 'No' buttons.

The bottom of the interface shows 'Monitoring' settings (Fiber: 1, Wavelength: 1310/1550), 'Hybrid Direction' (First Direction, Second Direction), 'Print Label/Next DUT' buttons, 'Acquisition' (Reference, Measurement), and 'Start Single' button. The status bar at the bottom indicates 'Status: Ready', 'Supervisor', and the date/time '08/11/2018 03:06 PM'.



# Testing SM Bundles with Dual Switches

## 2. Test configuration

### 2.1. Go to Config > Connector to set the connector pass/fail limits.

The screenshot shows the 'MS12001 - Cable Assembly Test System' window. The 'Connector' tab is selected in the top navigation bar. The window title is 'MS12001 - Cable Assembly Test System'. The main content area is titled 'Connector' and includes a description: 'This configuration window is used to identify connectors. From this window, you can add, delete or modify a specific connector profile.'

Below the description is a tabbed interface with the following tabs: Company, Customer, Connector (selected), DUT, Test, and Polarity.

The 'Connector Identification' section contains two text input fields: 'Connector name:' with the value 'DEMO APC' and 'Connector type:' with the value 'DEMO APC'.

The 'Connector Configuration' section is divided into two columns: 'Insertion Loss Limits' and 'Reflectance Limits'. Each column has two rows: 'Pass limit:' and 'Warning limit:'. The values are as follows:

Limit Type	Insertion Loss Limits (dB)	Reflectance Limits (dB)
Pass limit:	0.5	-60
Warning limit:	0.5	-60

At the bottom of the window, there is a status bar with the text 'Status : Ready'. To the right of the status bar are several buttons: '+ Add', 'X Delete', 'Copy To', a green checkmark 'Apply', and a red 'X' 'Cancel'. The bottom right corner of the window shows the user 'Supervisor', the date '08/11/2018', and the time '03:07 PM'.

On the right side of the window, there is a vertical toolbar with the JGR logo at the top, followed by buttons for 'Measure', 'Config', 'Browser', 'Settings', and 'About and Help'.

# Testing SM Bundles with Dual Switches

## 2. Test configuration

### 2.2. Go to Config > DUT to create the DUT configuration.

The screenshot displays the 'MS12001 - Cable Assembly Test System' software interface. The main window is titled 'DUT' and contains a description: 'This configuration window is used to identify devices under test (DUT). From this window, you can add, delete or modify a specific DUT.' Below this, there are tabs for 'Company', 'Customer', 'Connector', 'DUT', 'Test', and 'Polarity'. The 'DUT' tab is selected.

The 'DUT Identification' section includes the following fields:

- Part number: DEMO 4 Fiber
- Description: (empty)
- Manufacturer: (empty)
- Maximum fiber length (m): 0
- Fiber type: Singlemode - 9um
- Assembly type: Multifiber-to-Multifiber
- Number of fibers: 4
- Mandrel Free: (checked)

The 'DUT Configuration' section includes the following fields:

- End A: DEMO APC
- End B: DEMO APC
- IL limits: 0.5 dB
- Ref. limits: -60 dB

The 'Polarity Type' section includes the following field:

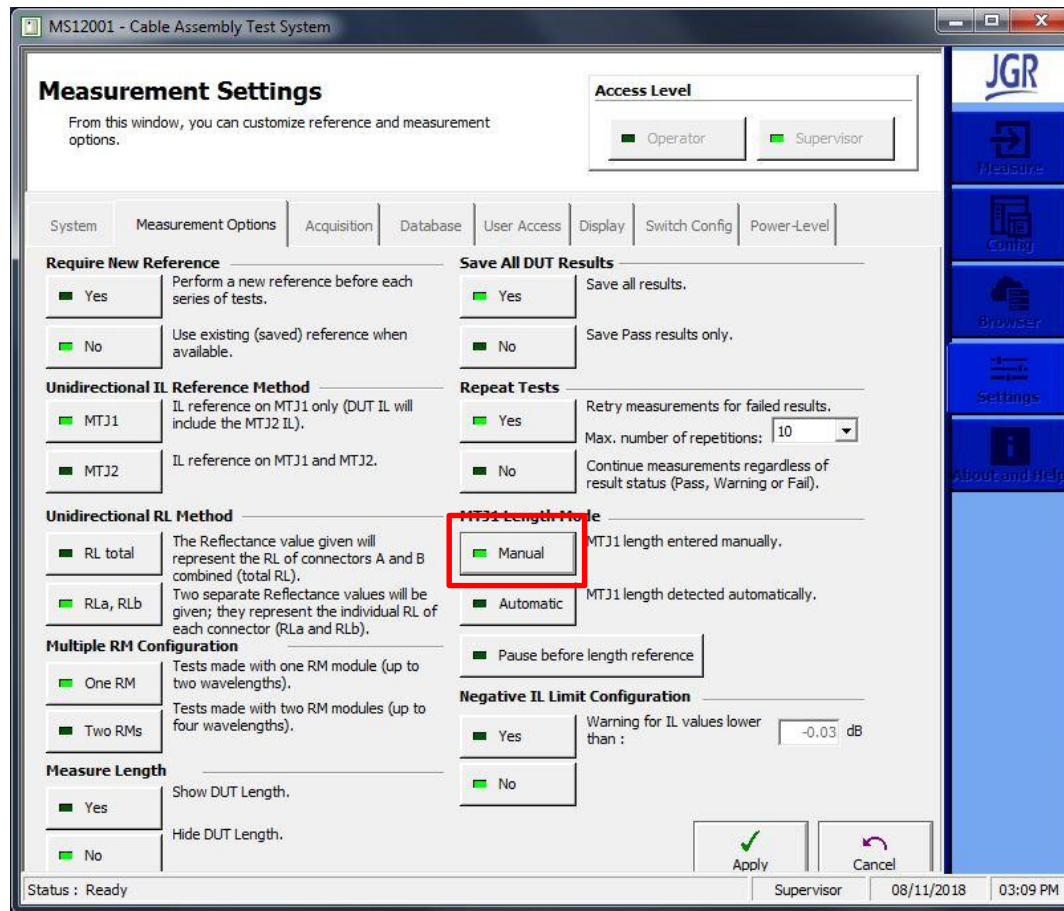
- Defined Type: A

At the bottom of the window, there are buttons for '+ Add', 'X Delete', 'Copy To', 'Apply', and 'Cancel'. The status bar at the bottom indicates 'Status : Ready', 'Supervisor', '08/11/2018', and '03:08 PM'.

# Testing SM Bundles with Dual Switches

## 2. Test configuration

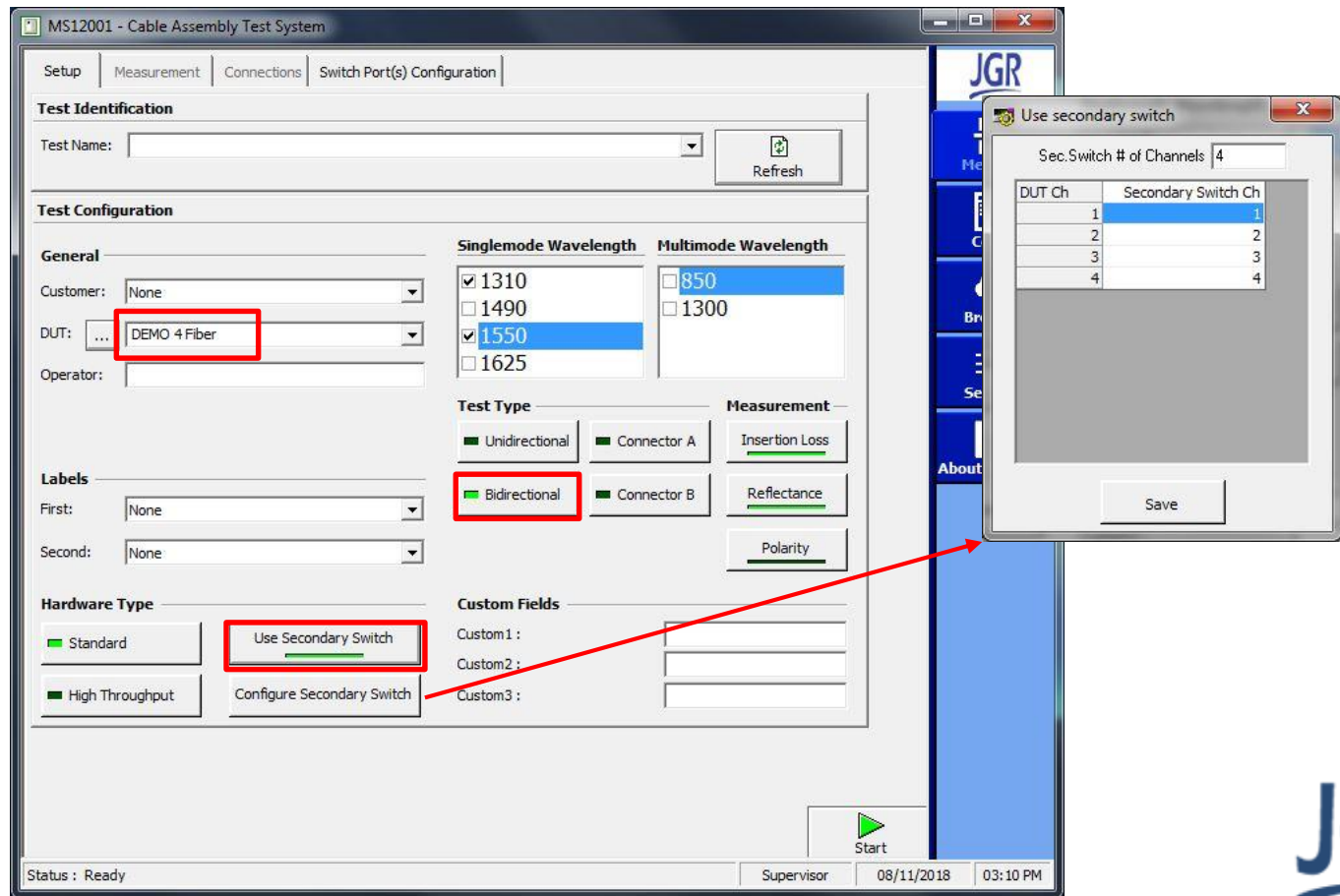
### 2.3. Go to Settings > Measurement Options to enable Manual MTJ1 Length Mode



# Testing SM Bundles with Dual Switches

## 2. Test configuration

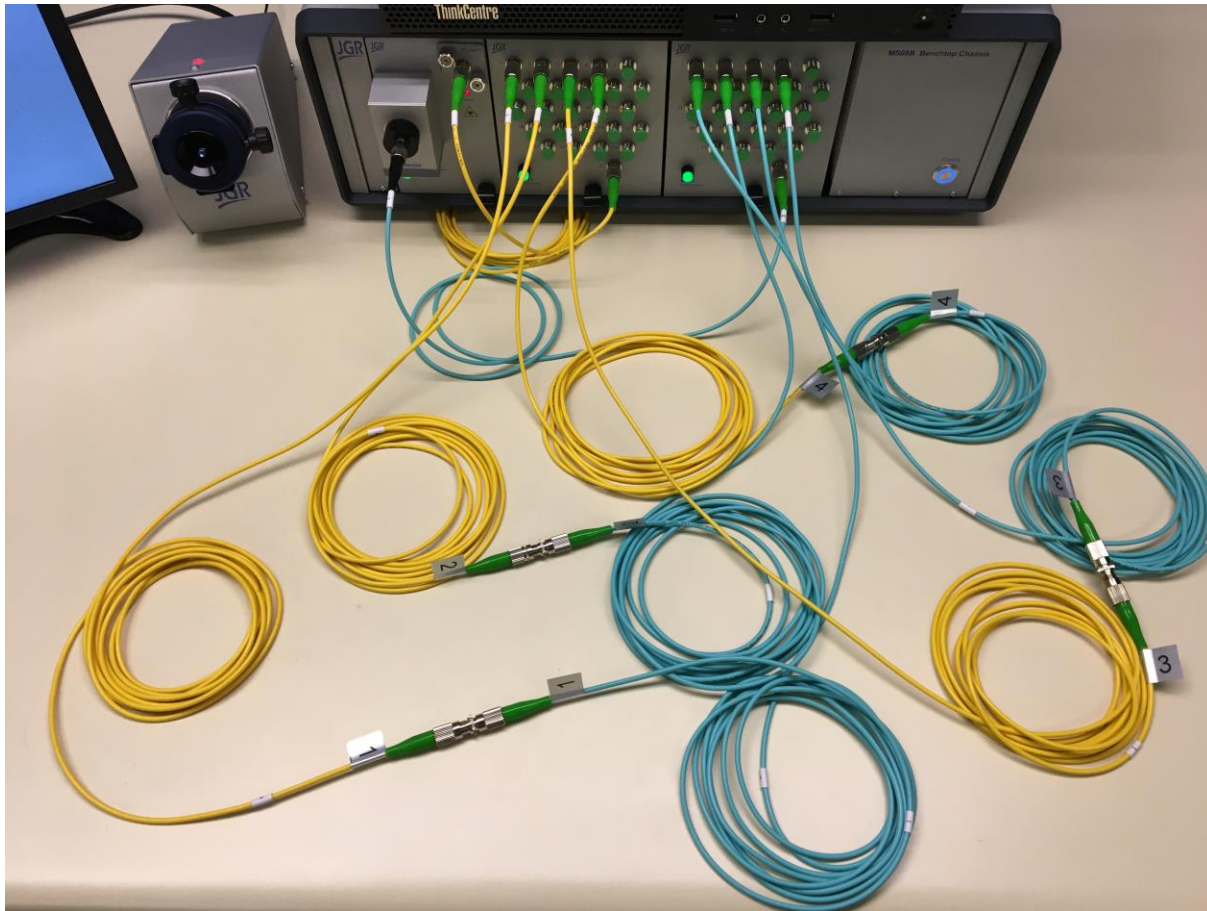
2.4. In Measure > Setup, configure the test. Click Configure Secondary Switch to configure the MM MS7 to the corresponding DUT channels then click Start.



# Testing SM Bundles with Dual Switches

## 3. Reference

3.1. Connect the SM MTJ to the MM receive jumpers and the common of the MM MS7 to the MS12 detector.





# Testing SM Bundles with Dual Switches

## 3. Reference

3.2. Select Reference Acquisition and click Start Single. The software will begin by referencing the IL for each channel then you will be prompted to manually enter the length.

MTJ Length

Please enter MTJ 1 length:

Ports	Length (m)
1	
2	
3	
4	

OK Cancel

Type in the result of the length test for each channel

MS12001 - Cable Assembly Test System

Setup Measurement Connections Switch Port(s) Configuration

P#	1310nm	1550nm	Len.(m)
1	1.17	1.22	9.2
2	1.15	1.33	9.2
3	1.26	1.25	9.2
4	1.14	1.23	9.2

Device Status : Power indication  
IL RL

1310 --- dB  
1550 --- dB

Module Connections  
Measurement History

Monitoring  
Fiber: 1  
Wavelength: 1310/1550  
Stop Monitoring Start Monitoring

Serial Number

Hybrid Direction  
First Direction  
Second Direction  
Auto Increment

Acquisition  
Reference  
Measurement  
Start Single

Status : Ready Supervisor 08/11/2018 03:21 PM

MTJ1 Reference End A

Instructions:  
1- Connect the MS12 OUT slot (1-1) to the switch common port slot (1-4).  
2- Connect the switch OUT ports slot (1-4) to the master test jumper (MTJ).  
3- Press Start.  
Connectors:  
C1=FC/APC; C2=compatible DEMO APC.

MS12001 Cable Assembly Test System

Your MTJ1 reference is complete. Do you accept it?

Yes No

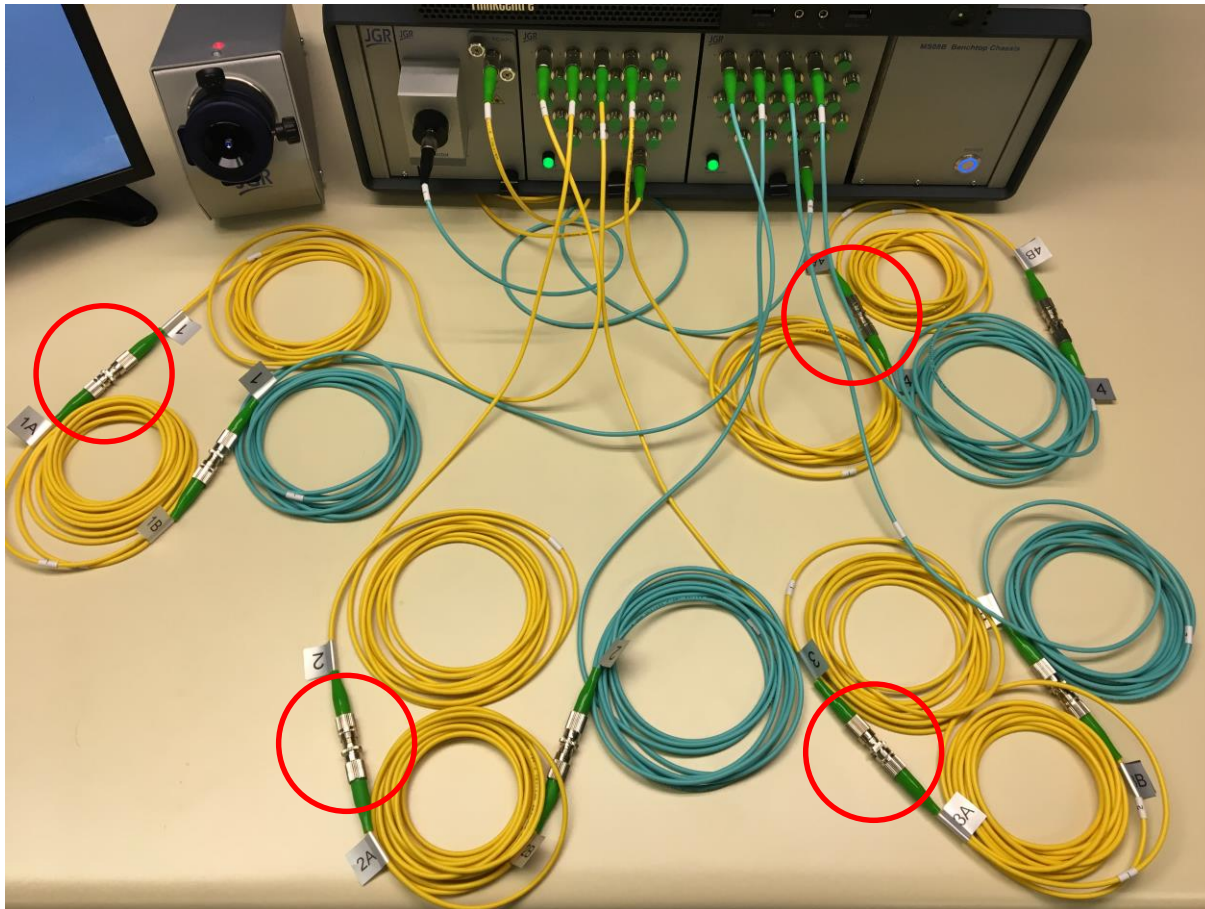
Print Label Next DUT

Stop

# Testing SM Bundles with Dual Switches

## 4. Measurement

4.1. Connect the SM MTJ to the end A of the DUT and the end B of the DUT to the MM receive jumpers.





[www.jgroptics.com](http://www.jgroptics.com)

#### 4.2. Click Start Single to measure end A.



# Testing SM Bundles with Dual Switches

## 4. Measurement

4.3. Flip the DUT (SM MTJ to end B of DUT, end A of DUT to MM receive jumpers) then click Start Single to measure end B. Enter a serial number and click Next DUT to save the results.

The screenshot displays the MS12001 - Cable Assembly Test System software interface. The main window is titled "MS12001 - Cable Assembly Test System" and has tabs for Setup, Measurement, Connections, and Switch Port(s) Configuration. The Measurement tab is active, showing a table of measurement results for four fiber bundles (F# 1 to 4) across two measurements. The table includes columns for IL (dB) and Refl (dB) for both 1310 nm and 1550 nm wavelengths. Below the table, the "Device Status" is "Pass". The "Next DUT" section provides instructions: "Click on Next DUT to save the measurements and proceed with the next DUT." and "Click on Print Label to save the measurements and print the specified label(s).". The "Module Connections" section shows "Measurement History". The "Monitoring" section includes fields for Fiber (1) and Wavelength (1310/1550), with buttons for Stop Monitoring and Start Monitoring. The "Serial Number" section shows "DEMO-4-Fiber" and "1", with an "Auto Increment" checkbox. The "Hybrid Direction" section has buttons for First Direction and Second Direction. The "Print Label/Next DUT" section has buttons for Print Label and Next DUT. The "Acquisition" section has buttons for Reference, Stop, and Start Single. The status bar at the bottom shows "Status: Ready", "Supervisor", "08/11/2018", and "03:41 PM".

F#	First Measurement				Second Measurement			
	IL (dB)		Refl (dB)		IL (dB)		Refl (dB)	
	1310	1550	1310	1550	1310	1550	1310	1550
1	0.20	0.18	-78.8	-78.8	0.22	0.22	-79.2	-78.7
2	0.06	0.09	-71.0	-78.0	0.07	0.15	-79.6	-78.8
3	0.05	0.04	-78.7	-79.1	0.04	0.07	-79.2	-79.5
4	0.26	0.19	-74.8	-77.3	0.32	0.22	-71.6	-78.7

**Device Status : Pass**

**Next DUT**

Instructions:  
Click on Next DUT to save the measurements and proceed with the next DUT.  
Click on Print Label to save the measurements and print the specified label(s).

**Module Connections**  
**Measurement History**

**Monitoring**  
Fiber: 1  
Wavelength: 1310/1550  
Stop Monitoring Start Monitoring

**Serial Number**  
DEMO-4-Fiber 1 Auto Increment

**Hybrid Direction**  
First Direction  
Second Direction

**Print Label/Next DUT**  
Print Label Next DUT

**Acquisition**  
Reference Stop Start Single

Status: Ready Supervisor 08/11/2018 03:41 PM