

Testing In-line Attenuators in MS12001

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This document will detail the correct procedure and steps to take in MS12001 to test in-line attenuators

The attenuator specifications in this example are as follows:

- Single-mode
- SC/APC
- IL = 7 ± 1 dB @ 1310, 1550 nm
- RL < -60 dB @ 1310, 1550 nm

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Begin by creating a connector configuration (see next slide).

MS12001 was designed to test cable assemblies therefore below the limit is a pass and above is a fail. In the case of attenuators, the IL specification is a range.

Our example gives $IL = 7 \pm 1$ dB so a pass is an IL between 6 dB and 8 dB. We can use the pass/warning/fail system to define the desired range:

- Pass limit = 8 dB
- Warning limit = 6 dB

With this configuration, MS12001 will display the IL in yellow for an attenuator in spec. It will display the IL in green or red for an attenuator out of spec.

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The screenshot displays the 'Connector' configuration window within the MS12001 - Cable Assembly Test System. The window title is 'MS12001 - Cable Assembly Test System'. The main heading is 'Connector', with a sub-heading explaining that this window is used to identify connectors and manage their profiles. Below this, there are tabs for 'Company', 'Customer', 'Connector', 'DUT', 'Test', and 'Polarity', with 'Connector' currently selected. The 'Connector Identification' section contains a dropdown menu for 'Connector name' (set to '7 dB APC Attenuator Connector') and a text field for 'Connector type' (set to 'SC/APC'). The 'Connector Configuration' section is divided into two columns: 'Insertion Loss Limits' and 'Reflectance Limits'. Under 'Insertion Loss Limits', the 'Pass limit' is set to 8 dB and the 'Warning limit' is set to 6 dB. Under 'Reflectance Limits', the 'Pass limit' is set to -60 dB and the 'Warning limit' is set to -65 dB. A vertical toolbar on the right side of the window includes icons for 'Measure', 'Config', 'Browser', 'Settings', and 'About and Help'. At the bottom of the window, there are buttons for 'Add', 'Delete', 'Copy To', 'Apply', and 'Cancel'. The status bar at the very bottom shows 'Status:', 'Supervisor', the date '17/08/2017', and the time '03:24 PM'.

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: 7 dB APC Attenuator Connector

Connector type: SC/APC

Connector Configuration

Insertion Loss Limits		Reflectance Limits	
Pass limit:	8 dB	Pass limit:	-60 dB
Warning limit:	6 dB	Warning limit:	-65 dB

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

Status: Supervisor 17/08/2017 03:24 PM

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Create a DUT configuration for the attenuator.

Be sure to deselect the “Mandrel Free” option.

This will put a pause between the RL and IL measurements.

The screenshot displays the 'MS12001 - Cable Assembly Test System' software interface. The main window is titled 'DUT' and contains the following sections:

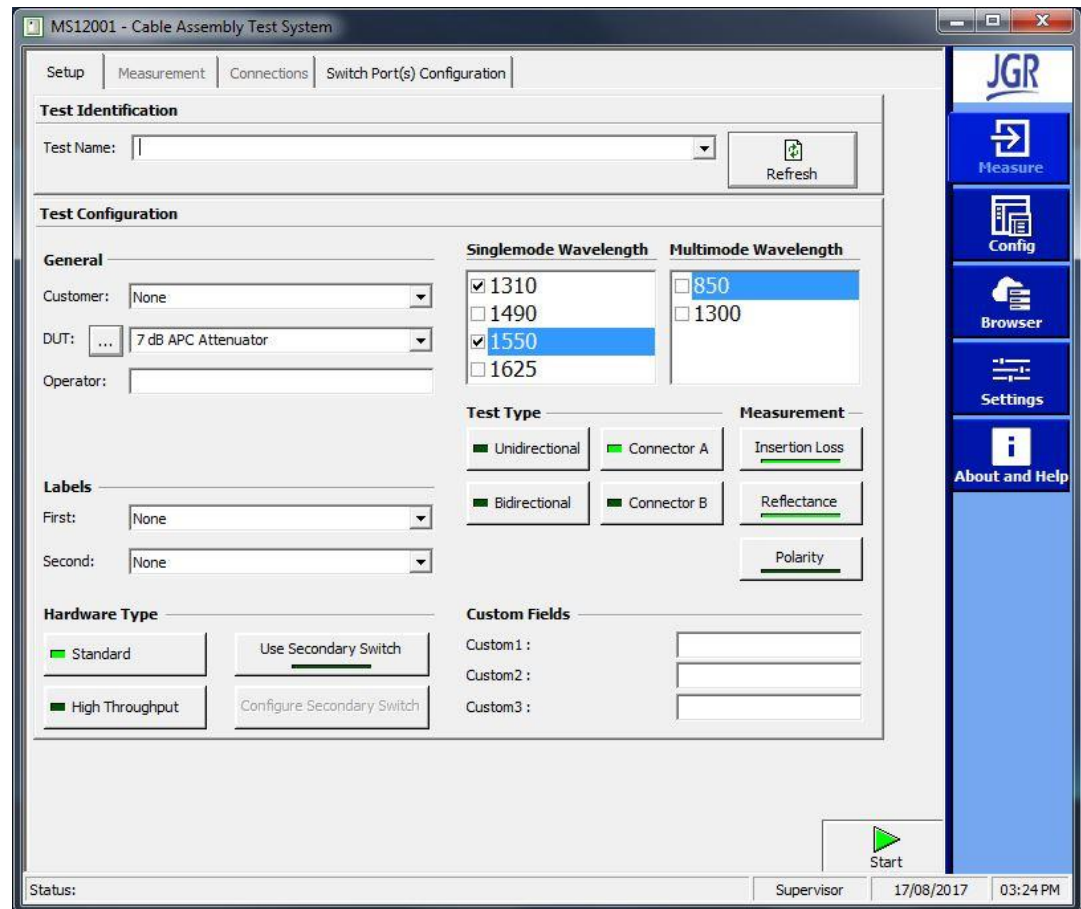
- DUT Identification:** Includes fields for Part number (7 dB APC Attenuator), Description, Manufacturer, Maximum fiber length (m) (10), Fiber type (Singlemode - 9um), Assembly type (Simplex), and Number of fibers (1). A checkbox for 'Mandrel Free' is present and is currently unchecked.
- DUT Configuration:** Includes fields for End A and End B (both 7 dB APC Attenuator Connector), IL limits (8 dB), and Ref. limits (-60 dB).
- Polarity Type:** Includes a field for Defined Type (A).

At the bottom of the window, there are buttons for Add, Delete, Copy To, Apply, and Cancel. The status bar at the bottom right shows 'Supervisor', '17/08/2017', and '03:24 PM'. A vertical sidebar on the right contains icons for Measure, Config, Browser, Settings, and About and Help.

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Setup a test with the desired parameters.

An attenuator can be considered as a single connector therefore a “Connector A” test is suitable.



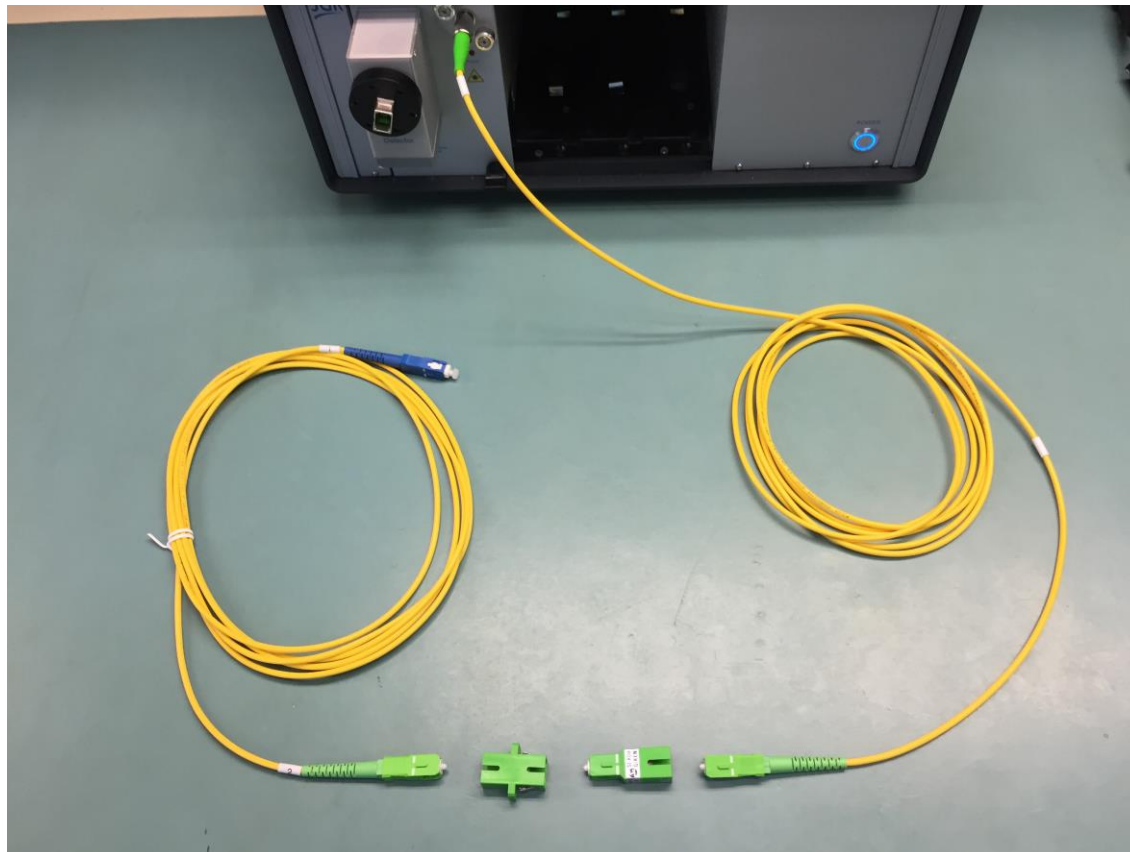
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Begin by doing a reference measurement with your master test jumper (MTJ). It must be at least 3m long. Pictured here is a 3m FC/APC-SC/APC MTJ.



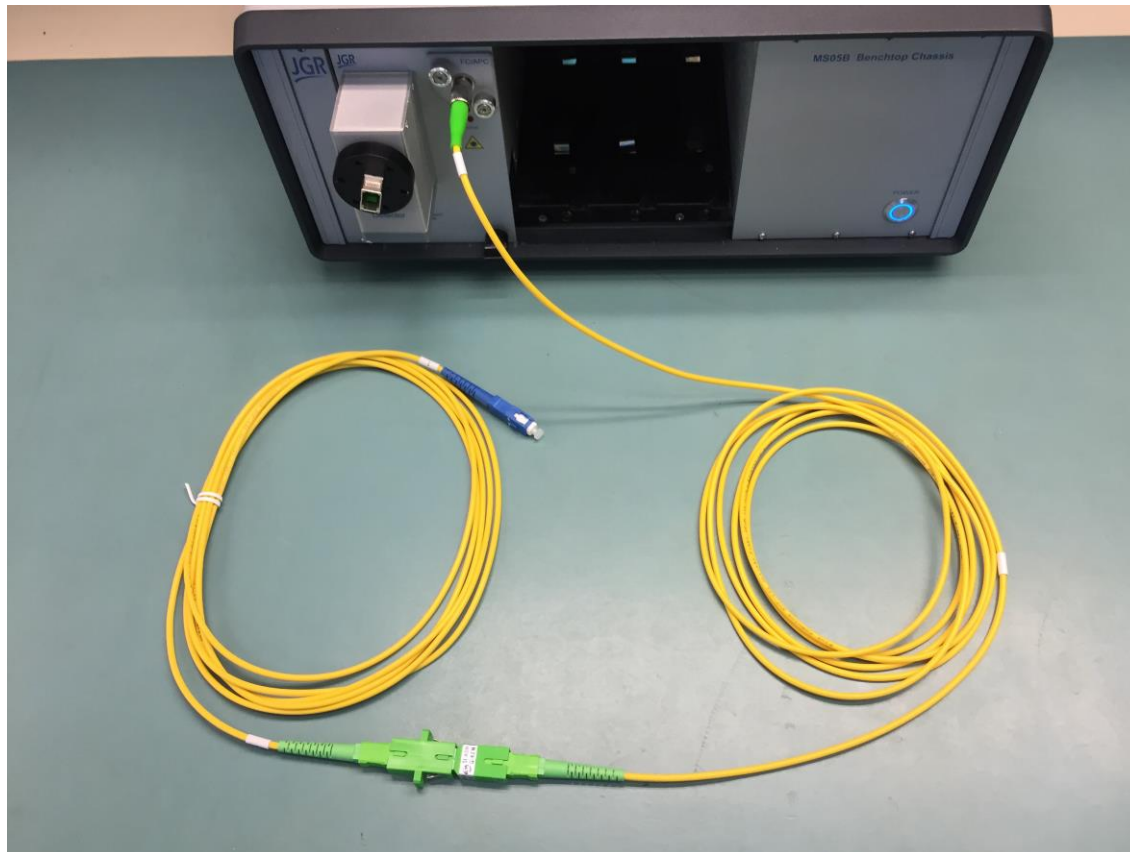
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Click “Start Single” to make a measurement. The software will pause and a pop-up will ask you to mandrel wrap your fiber. Instead, connect your MTJ to the attenuator and your attenuator to a receive jumper. The receive jumper must be at least 1.7m long.



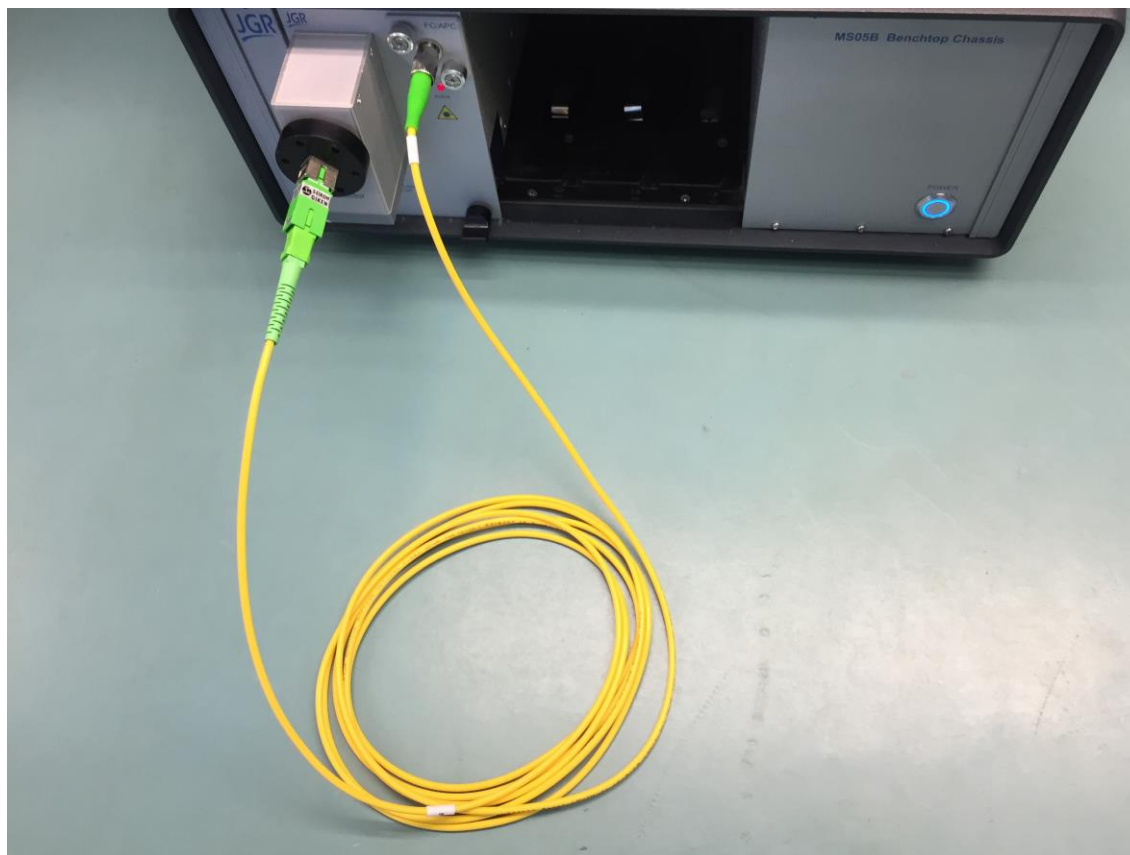
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Once connected as below, click OK. In this first part, the software is only measuring RL therefore you don't need to connect the receive jumper to the detector.



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The software will pause again and a pop-up will ask you to unwrap the mandrel. Instead, connect the attenuator directly in the detector as below. Click OK. It will now measure IL.



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The screenshot displays the MS12001 - Cable Assembly Test System software. 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 results for "First Measurement".

F#	IL (dB)	1310	1550	1310	1550
1	5.422		5.303	-82.61	-81.31

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 interface also includes a "Monitoring" section with "Fiber: 1" and "Wavelength: 1310/1550", and an "Acquisition" section with "Reference" and "Measurement" options. The status bar at the bottom shows "Status: Ready", "Supervisor", "17/08/2017", and "03:59 PM".

This attenuator failed our example specifications because the IL was too low.

Note that the IL shows as "pass". For an attenuator, this is a fail.