MS12001
Cable Assembly Test System

User Guide

JGR's Commerce And Government Entities (CAGE) code under the North Atlantic Treaty Organization (NATO) is 0L8C3.

The information contained in this publication is subject to change without notice.

Trademarks

JGR's trademarks have been identified as such. However, the presence or absence of such identification does not affect the legal status of any trademark.

Units of Measurement

Units of measurement in this publication conform to SI standards and practices.

Patents

The MS12001's Universal Interface is protected by US patent 6,612,750.

Version number 1.0.0

Contents

Certification Information

FCC Information

Electronic test equipment is exempt from Part 15 compliance (FCC) in the United States. However, compliance verification tests are systematically performed on most JGR equipment.

CE Information

Electronic test equipment is subject to the EMC Directive in the European Union. The EN61326 standard prescribes both emission and immunity requirements for laboratory, measurement, and control equipment. This unit has undergone extensive testing according to the European Union Directive and Standards.

1 Introducing the MS12001 Cable Assembly Test System

The MS12001 Cable Assembly Test System was designed to streamline production testing and quality control of patchcords and other fiber assemblies.

The system can perform automated insertion loss and reflectance measurements on both singlemode and multimode fiber-optic patchcords and fiber assemblies. It allows you to test patchcords as short as 1.8 meters without having to apply non-reflective terminations.

The system offers two configurations:

- *Standard*: requires more manipulation from the user.
- *High-throughput*: minimizes manipulations from the user, which reduces testing time.

The MS12001 Cable Assembly Test System can perform tests at one, two, three or four wavelengths. The MS12001 system may include one or two MS12 Loss Test Modules (RM). In a configuration with two MS12 modules, an MS7 Optical Switch is also required to select wavelengths from both MS12 Loss Test Modules.

Note: *You can use a configuration with two RMs for all of your tests. The appropriate test instructions can also be displayed in the interface. However, procedures for a configuration with one RM are provided through this user guide. Additionally, module connection graphics provided within the MS12001 Cable Assembly Test System software also depict a configuration with one RM. You can find the procedure and connection graphic for two RM setup in section* Connecting Two RMs and the RM Switch *on page 25.*

Step-by-Step Approach

Guided by your selection parameters, the software, based on Windows XP, controls the test procedure from start to finish. This systematic approach, combined with the possibility of adding a bar code reader, eliminates the risk of data entry and reporting errors. A footswitch can also be added to your system to speed up the test process.

System Overview

The Cable Assembly Test System is built around the MS platforms. For more information, refer to your MS platform user guide.

The Cable Assembly Test System comes in two hardware configurations, which maximize the test process of your fiber-optic assemblies. The necessary hardware varies depending on the selected configuration and on the patchcord or fiber-optic assembly being tested. The system modularity allows you to easily add modules without having to upgrade software.

- *Standard*: This configuration uses one MS12 Loss Test Module for multimode tests and one or two modules for singlemode tests. In some configurations, there is an optional switch with the same number of ports as the number of fibers in the DUT.
- *High-throughput*: This configuration speeds up the production of hybrid assemblies. High-throughput includes one or two MS12 modules and an optical switch with a number of ports corresponding to double the fibers included in the DUT. For testing simplex patchcords with a single MS12, an additional optional loss meter may be required.

Both Standard and High-throughput configurations can include two MS12 loss test modules coupled to one MS7 switch module dedicated to selecting test wavelengths.

IMPORTANT

Be careful when selecting which MS12 Loss Test Module you will use. Some of these modules are intended for IL measurement only (no reflectance measurements possible).

Modules described below are all the hardware that may be required to build the Cable Assembly Test System according to your test selection.

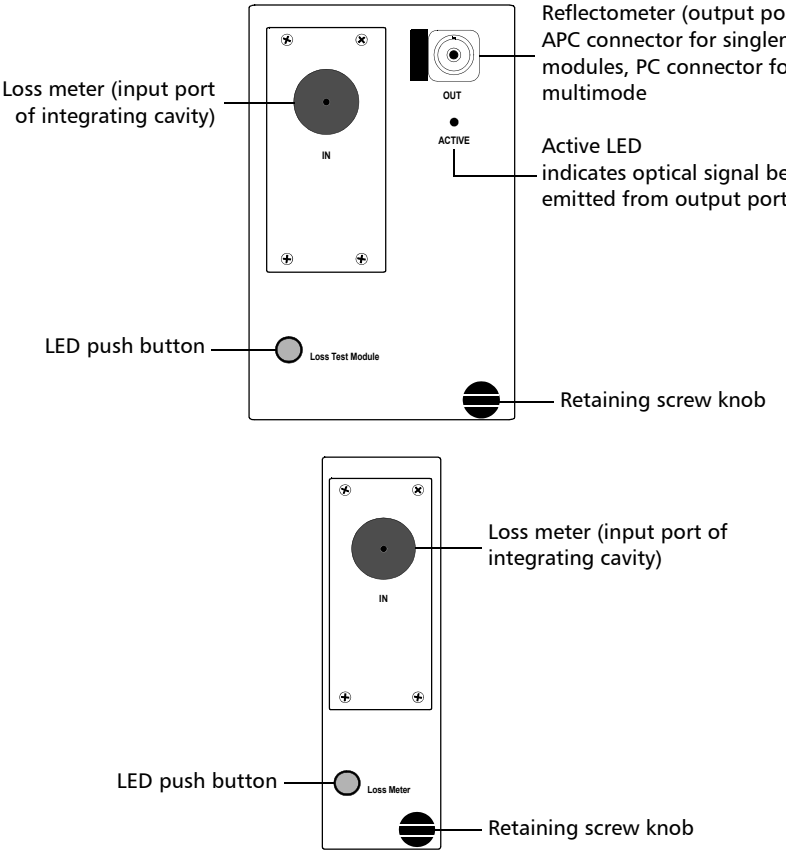
Modules	Features
MS12 Loss Test Module	➤ Two-slot module ➤ Combines a reflectometer and a loss meter in one module[a] ➤ Based on advanced time-domain reflectometry technology ➤ Comprises a wide-aperture integrating cavity ➤ Delivers insertion loss and reflection measurements ➤ Comprises an internal monitoring channel to compensate for any internal source power variation ➤ Comprises internal reflectance
MS12-PM01 Loss Meter	➤ Used as an additional loss meter in high-throughput configurations including a single MS12 Loss Test Module used for testing simplex patchcords ➤ Comprises a wide-aperture cavity ➤ Delivers insertion loss measurements
MS7 Optical Switch[b, c]	➤ Offers a choice of several configurations; refer to the corresponding documentation for details.-P ➤ Accurate and repeatable fiber-to-fiber switching

a. The MS12 Loss Test Module can also be purchased without the reflectometer (IL testing only).
b. When a two MS12 Loss Test Modules configuration is being used, one MS7 optical switch must be included to select test wavelengths from the reflectance meter (RM) modules. A second switch can also be included for selected DUTs. For an RM switch, a 1 x 2 switch is sufficient (see *Automatic Switch Configuration* on page 60).
c. For selecting DUTs for tests, you can also use an external switch (see *Configuring an External Switch* on page 28).

MS12 and MS12-PM01 Module Description

This section describes the MS12 and the MS12-PM01 modules. For a description of other modules used in the Cable Assembly Test System, refer to their respective user guides.

JGR has incorporated the integrating-cavity technology into the MS12 Loss Test Module and the MS12-PM01 Loss Meter (dedicated loss-test module). For more information on the integrating-cavity, see *Integrating Cavity* on page 382.



Test Features

The various hardware configurations allow you to perform insertion loss and reflectance measurements of the following types of fiber-optic components:

- *Simplex patchcord*: cable assembly with a single fiber and a connector at each end.
- *Duplex patchcord*: cable assembly with two fibers and two connectors at each end.
- *Bundle patchcord*: cable assembly with N fibers and N connectors at each end.
- *Fanout assembly*: cable assembly with N connectors at one end and a multifiber connector (for example, MTRJ and MTP) at the other end.
- *Multifiber-to-multifiber patchcord*: cable assembly with a single cable and a multifiber connector (for example, MTRJ and MTP) at each end.
- Other types of patchcords, including hybrid or non-hybrid.

The mandrel-free option allows you to test long fibers without a mandrel tool or other non-reflective termination method.

You can test fiber assemblies in three different manners:

- *Bidirectional* testing allows you to separately test both connectors. You obtain InsertionLoss_A, InsertionLoss_B, Reflectance_A, and Reflectance_B.
- *Unidirectional* testing allows you to simultaneously test both connectors. You obtain $\text{InsertionLoss}_{A+B}$, Reflectance_A and Reflectance_B, or Reflectance_{A+B}.
- *Connector A* or *Connector B (one connector only)* testing is particularly useful if you manufacture connectors, because it allows you to test individual connectors (not fiber assemblies).

Custom Access Levels

You can customize user access levels via the Supervisor Access feature, which allows you to specify the parameters that can be controlled by users.

Centralized Database

The application also comprises a centralized database that can be accessed through its own browser. This allows you to use the Cable Assembly Test System as a stand-alone system or to connect it to a local area network (LAN). This last feature makes the system particularly useful and efficient on the production floor. For larger plants, a configuration can be created and shared among several MS12001 workstations via a LAN.

Industry Standards

There are many North American and international standards describing, in detail, the different methods approved for testing the insertion loss and reflectance of passive components. As a supplement to the information provided in this user guide, JGR highly recommends that you consult the following standards:

- *TIA/EIA-455-34A FOTP-34*
  Interconnection Device Insertion Loss Test
- *TIA/EIA-455-50A FOTP-50*
  Light Launch Conditions for Long-Length Graded-Index Optical Fiber Spectral Attenuation Measurements.
- *TIA/EIA-455-171 FOTP-171*
  Attenuation by Substitution Measurement for Short—Length Multimode Graded—Index and Singlemode Optical Fiber Cable Assemblies
- *TIA/EIA-526-14A OFSTP-14*
  Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant.
- *TIA/EIA-568-A*
  Commercial Building Telecommunications Cabling Standard
- *IEC 61300-3-4-*
  Basic test and measurement procedures—Part 3-4: Examinations and measurements—Attenuation
- *IEC 61300-3-34-*
  Fiber-optic interconnecting devices and passive components-Basic test and measurement procedures—Part 3-34: Examinations and measurements—Attenuation of random mated connectors

Conventions

Before using the product described in this manual, you should understand the following conventions:

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in *death or serious injury*. Do not proceed unless you understand and meet the required conditions.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in *minor or moderate injury*. Do not proceed unless you understand and meet the required conditions.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in *component damage*. Do not proceed unless you understand and meet the required conditions.

IMPORTANT

Refers to information about this product you should not overlook.

2 Safety Information

The laser safety information in this chapter is only applicable to the MS12 Loss Test Module.

WARNING

Do not install or terminate fibers while a light source is active. Never look directly into a live fiber and ensure that your eyes are protected at all times.

WARNING

Use of controls, adjustments and procedures for operation and maintenance other than those specified herein may result in hazardous radiation exposure or impair the protection provided by this unit.

Your instrument is a Class 1 laser product in compliance with standards IEC 60825-1 and 21 CFR 1040.10. Laser radiation may be encountered at the output port.

The following label indicates that a product contains a Class 1 source:

3 Getting Started with Your Cable Assembly Test System

In this chapter, you will find information on hardware components and modules used in the MS12001 Cable Assembly Test System as well as directions on how to install your system and the application. Instructions on how to perform a basic test to make sure that your system is working properly are also given.

The Cable Assembly Test System has been configured and tested at the factory under normal conditions. However, before using it to test any patchcord, make sure that these requirements have been carried out:

- The MS platform controller and expansion units are properly installed as explained in your MS platform user guide.
- The necessary test modules are all present and correctly installed, as explained in *Preparing Hardware for System Configuration* on page 18.
- If you use a bar code reader or a footswitch, make sure that they are properly connected, as explained in *Installing a Bar Code Reader and a Footswitch* on page 14.
- The MS12001 Cable Assembly Test System application is installed, as explained in *Reinstalling or Upgrading the MS12001 Cable Assembly Test System Application* on page 30.

Installing a Bar Code Reader and a Footswitch

The Cable Assembly Test System design allows you to use a bar code reader and a footswitch.

- A bar code reader increases productivity and avoids typing. It allows you to enter serial numbers or names in dialog boxes without typing. When you read data with the bar code reader, the text information will be inserted at the cursor position, as if it was typed on the keyboard.
- The footswitch is a timesaver for your test procedure. It frees your hands by simulating a keyboard key (such as Enter) so that you can concentrate on optical manipulations.

Since this optional equipment is not part of the system itself, you must ensure that it meets certain conditions and that it is configured appropriately.

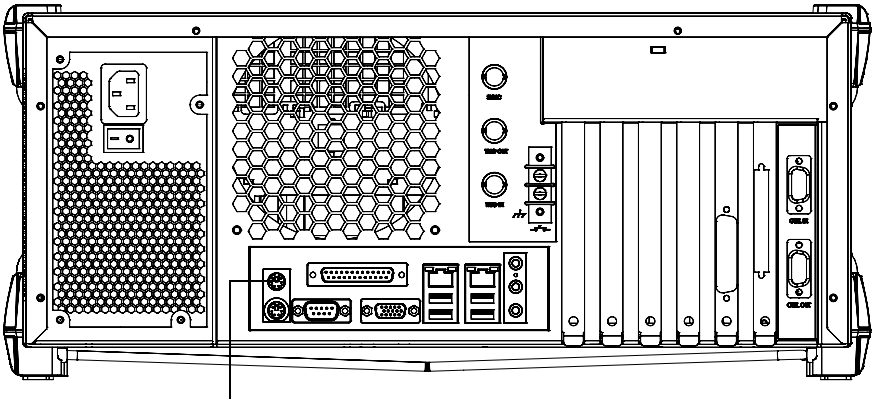
IMPORTANT

The information provided here only applies to the footswitch and bar code reader models provided by JGR. If you are using another model, refer to its documentation for information.

Required Connection Type

The footswitch or bar code reader must support the *Keyboard Wedge* connection type. This means that the equipment will be connected in parallel to the keyboard port of your MS controller unit.

MS Controller Unit Back Panel



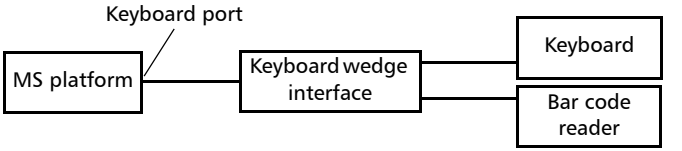
Connecting a Bar Code Reader and a Footswitch

The method to connect these optional instruments to MS platform controller units will depend on the equipment you have. For example, if you need to connect both a footswitch and a bar code reader, you may have to use a Y-type connector. Some possibilities are illustrated below.

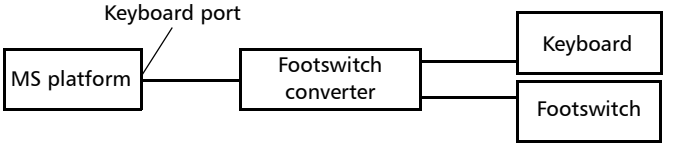
CAUTION

You must turn off the system before connecting a new component. Failure to do so may result in damage to the equipment.

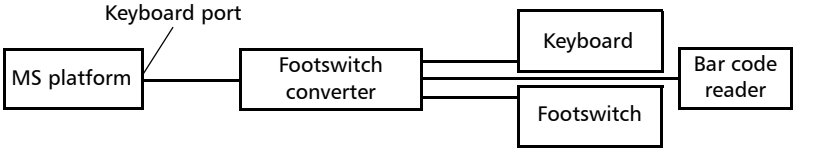
System with Bar Code Reader Only



System with Footswitch Only



System with Bar Code Reader and Footswitch



Configuring and Using the Bar Code Reader

IMPORTANT

You must configure the bar code reader so that a TAB code is added to the end of each scanned code. This TAB code will ensure that the software correctly interprets the bar codes.

For information on how to configure the bar code reader and how to use it to scan bar codes, refer to the user guide that came with your particular model.

Configuring and Using the Footswitch

IMPORTANT

You must configure the footswitch so that it is associated with the ENTER key. This will ensure that the footswitch takes advantage of the software design.

For information on how to configure and use the footswitch, refer to the user guide that came with your particular model.

Preparing Hardware for System Configuration

You must insert the appropriate modules according to the hardware configuration before using the MS12001 Cable Assembly Test System.

Note: *The system does not require a particular order for the modules, they can be inserted in any slot, at your convenience. However, the position of a pair of MS12 Loss Test Modules or of a pair of switch modules relatively to each other is important.*

All configurations of the MS12001 Cable Assembly Test System support testing using one or two MS12 Loss Test Modules (RMs).

Tests can be made at one, two, three, or four wavelengths. For tests at four wavelengths, your two RMs must provide two wavelengths each, and all four wavelengths must be different.

In configurations with one or two MS12 modules, the switch used for selecting the fibers of the DUTs is the DUT switch.

You must also set your MS12001 system for one or two RM modules. for more information, see *Setting Single or Multiple RM Configuration* on page 54.

CAUTION

JGR provides one test jumper and one reference jumper to perform your tests. You should handle them with care. Damaged connectors may lead to incorrect readings.

IMPORTANT

JGR recommends to remove unnecessary switches from your MS12001. If several switches are present in your system, when you change ruttiest setup, without notice, the system may automatically select a different DUT switch to provide the number of ports required for the test.

Choose a DUT switch that covers all of your testing needs, and leave only that one inserted in your system.

One MS12 Module Test Configuration

For tests made with one MS12 Loss Test Module, the first MS12 module detected with the appropriate test wavelengths will be used for testing.

When several optical switches are included in a one MS12 module setup, the first switch with the required number of ports that is detected will be used as the DUT switch.

Note: *By default, the MS12001 is configured for tests with one RM.*

Test Configuration	Modules Required with One MS12
Simplex standard Duplex standard Bundle standard	➤ One MS12 Loss Test Module
Simplex high-throughput Duplex high-throughput Bundle high-throughput	➤ One MS12 Loss Test Module ➤ One MS7 Optical Switch or GPIB-controlled switch ➤ One MS12-PM01 Loss Meter
Fanout standard	➤ One MS12 Loss Test Module ➤ One MS7 Optical Switch or GPIB-controlled switch
Fanout high-throughput	➤ One MS12 Loss Test Module ➤ One MS7 Optical Switch or GPIB-controlled switch ➤ One MS12-PM01 Loss Meter
Multifiber-to-multifiber standard	➤ One MS12 Loss Test Module ➤ One MS7 Optical Switch or GPIB-controlled switch
Multifiber-to-multifiber high-throughput	➤ One MS12 Loss Test Module ➤ One MS7 Optical Switch or GPIB-controlled switch

Two MS12 Modules Test Configuration

For tests made with two MS12 Loss Test Modules, the system verifies if the selected test wavelengths are available in the first MS12 module. When both RMs provide a same wavelength, the first RM will be used first. When only one RM provides a required wavelength, that RM will be used first regardless of its slot position in the system.

For example, if the first RM provides the 1490 nm wavelength and the second RM provides 1490 nm and 1625 nm wavelengths, the order of the selected RMs and wavelengths will be as follows: MS12 no. 1 (1490 nm) and MS12 no. 2 (1625 nm).

Should the first RM provide 1490 nm and 1625 nm wavelengths, and the second RM provide the 1490 nm wavelength, only the first RM will be selected and provide both wavelengths: MS12 no. 1 (1490 nm and 1625 nm). The second RM with the 1490 nm wavelength will simply not be used.

Thus, the order in which RM modules are inserted in your system is important when both RMs provide identical wavelengths.

If all test wavelengths are different on the two RMs, they will all be available for tests.

The order in which RM modules are inserted in your system is also important in regard to measurement monitoring at two wavelengths. Both monitored wavelengths must come from the same RM. For more information, see *Setting Monitoring Display Options* on page 68.

For tests made with two RMs, a 1 x 2 MS7 switch module must be included. This switch is the RM switch.

The RM switch is to be used exclusively for selecting test wavelengths provided by the two MS12 modules. The switch can be inserted in any slot of your MS platform controller or expansion units. The first switch detected in the system will be used as the RM switch.

The two RMs and the switch are to be connected. For more information, see *Connecting Two RMs and the RM Switch* on page 25.

When a DUT switch is also required for your tests, it must come after the RM switch in your test system.

When several optical switches are included in a two MS12 modules setup, the first switch with the required number of ports that is detected after the RM switch will be used as the DUT switch.

Note: *When testing simplex, duplex or bundle patchcords with a high-throughput MS12001 system with two MS12 modules, an MS12-PM01 Loss Meter is no longer required. JGR recommends to remove MS12-PM01 modules from your MS platform Controller or Expansion Units for testing cable assemblies.*

Test Configuration	Modules Required with Two MS12
Simplex standard Duplex standard Bundle standard	➤ Two MS12 Loss Test Modules ➤ One 1 x 2 MS7 Optical Switch (RM switch)
Simplex high-throughput Duplex high-throughput Bundle high-throughput Fanout standard Fanout high-throughput Multifiber-to-multifiber standard Multifiber-to-multifiber high-throughput	➤ Two MS12 Loss Test Modules[a] ➤ Two MS7 Optical Switches or one 1 x 2 MS7 Optical Switch (RM switch) and one GPIB-controlled switch (DUT switch)

a. In two RM high-throughput configurations for testing patchcords, since two loss meters are already available in the RMs through their Input ports, an MS12-PM01 Loss Meter is no longer required.

IMPORTANT

For multimode testing, be careful when selecting an MS12 Loss Test Module. Some are intended for IL measurement only (no reflectance measurements possible).

Connecting Two RMs and the RM Switch

When your MS12001 configuration includes two MS12 Loss Test Modules (RMs), an MS7 switch module, the RM switch, is used for selecting the RMs. The system is preset to use the first detected MS7 as the RM switch. Only an internal switch can be used as the RM switch.

The switch can be inserted in any of your MS platform controller or expansion unit's slots.

IMPORTANT

The MS7 Optical Switch used for selecting test wavelengths from two RMs is not tracked by the MS12001 system.

After changing the RM switch in your system, changing connectors, or disconnecting and reconnecting your RMs or patchcords and the switch, make sure you perform a new set of reference measurements to recalibrate the system.

A 1 x 2 MS7 switch module is sufficient as the RM switch. You can use a switch with more ports. In all cases, the switch's Input ports 1 and 2 have been predefined for connecting RM 1 and RM 2 respectively.

The switch's Input port configuration cannot be modified. Even when the first and second input port from the RM switch have been deactivated, they will remain active when used for RM switching and wavelength selection.

Note: *Promptly fix faulty ports and connectors on the RM switch or replace the switch to ensure accurate tests.*

In a two RM configuration, a second switch, either internal or external, can also be included for selecting DUTs when required. Also, the DUT switch must come after the RM switch. The DUT switch's ports can be deactivated or activated. For more information, *Activating/Deactivating Switch Ports* on page 130.

Note: *In a one RM configuration, the first internal or external switch detected will be used for selecting DUTs.*

Once an MS12001 has been configured with two RMs, you can keep this hardware setup even when testing at one or two wavelengths that requires only a single RM. Simply configure and save the appropriate test profiles. For more information, see *Setting Up Test Profiles* on page 89.

By leaving your system in a two RM configuration, you will only need to calibrate and reference your components once.

Whether your MS12001 system is for Standard or High-Throughput testing, with a two MS12 Loss Test Module configuration, the two loss meters found on the modules' Input ports will cover all of your testing needs.

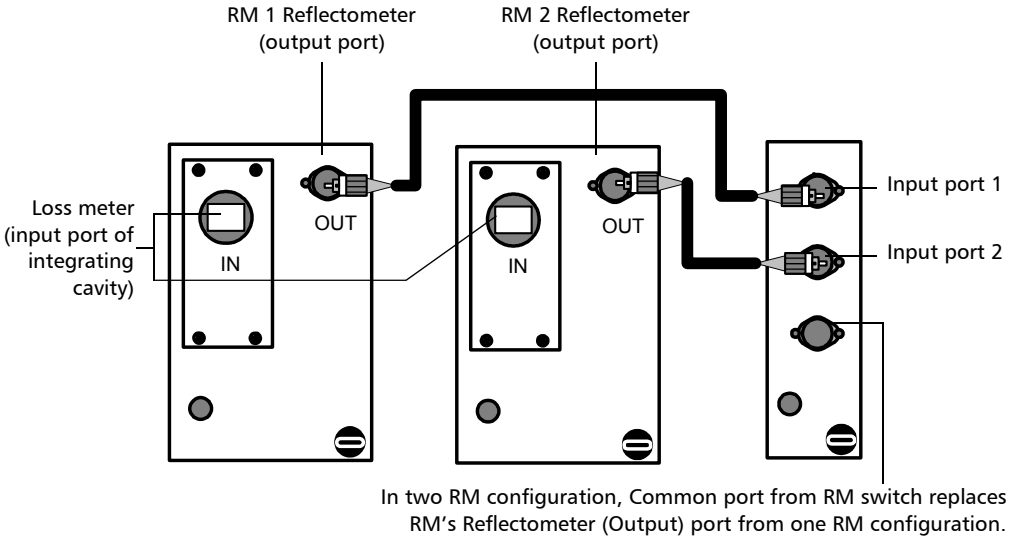
Note: *When testing simplex, duplex or bundle patchcords with a high-throughput MS12001 system with two MS12 modules, an MS12-PM01 Loss Meter is no longer required. JGR recommends to remove MS12-PM01 modules from your MS platform Controller or Expansion Units for testing cable assemblies.*

To connect your RMs and your switch:

Set up your connections as shown below:

- Connect the first MS12 Loss Test Module detected on your platform (RM 1) to the Input port 1 of the MS7 Switch Module.
- Connect the second MS12 Loss Test Module detected on your platform (RM 2) to the switch's Input port 2.

Note: *Use APC connectors for Reflectometer (Output) ports on both the RMs as well as for the Input ports 1 and 2 from the RM switch.*



In the connection diagrams provided in the *MS12001 User Guide* and in the application, when a switch module is included in the setup, it is always the DUT switch.

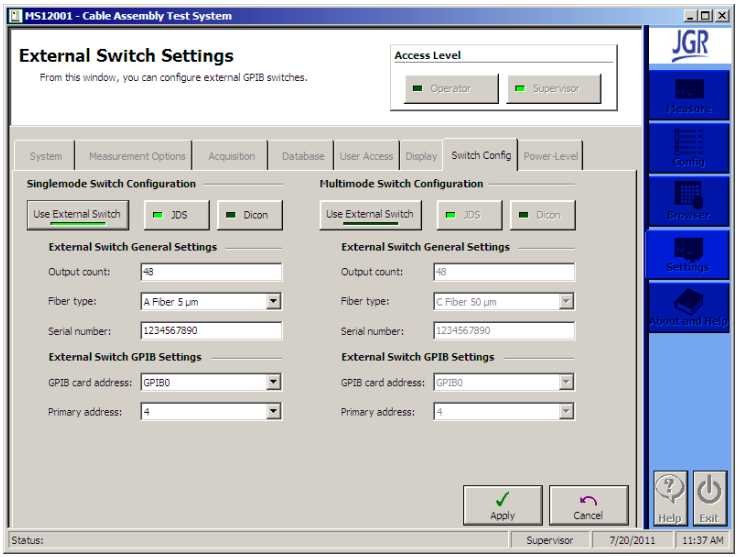
Configuring an External Switch

The external switches compatible with your MS12001 are JDS or Dicon controlled by GPIB. To use either switch, you have to configure it in the system.

Note: *When using two MS12 Loss Test Modules for testing, your external switch will mandatorily be used as a DUT switch for selecting the fibers to test. It will not be available for selecting RMs for test wavelengths.*

To configure your external switch:

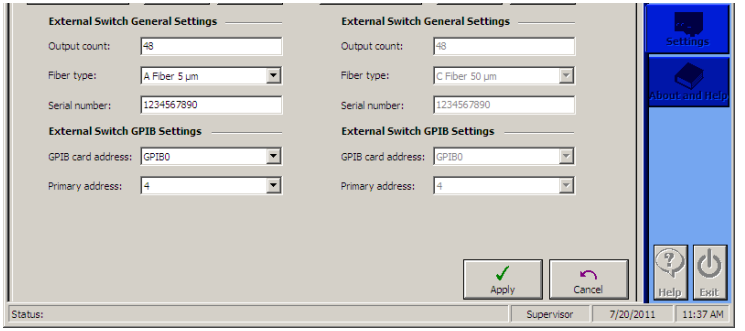
1. From the main window, click the **Settings** function tab.



2. From the **Settings** function tab, click the **Switch Config.** tab.
3. Under **Access Level**, click the **Supervisor** button.

   Make sure that you have the Supervisor access rights.

4. To select the switch mode, click the **Use external Switch** button under the singlemode or multimode section.
5. To select your switch type, click the **JDS** or the **Dicon** button.
6. Under **External Switch General Settings**, enter the right information in the **Output Count**, **Fiber Type** and **Serial Number** boxes.



7. Under **External Switch GPIB Settings**, in the **GPIB card address** box, type the address of your card.
8. In the **Primary Address** box, type the switch address.
9. Click **Apply** to save your settings.

Reinstalling or Upgrading the MS12001 Cable Assembly Test System Application

For the Cable Assembly Test System to function properly, the MS Manager software must be installed on your MS platforms.

Normally, you wouldn't have to install MS Manager or the Cable Assembly Test System application, except in particular circumstances (such as after having reinstalled Microsoft Windows).

Note: *JGR recommends upgrading all MS12001 system applications (central/server and client) to the same version.*

IMPORTANT

To avoid losing data, carefully follow the procedure below.

To reinstall or upgrade the Cable Assembly Test System application on an MS platform controller unit:

1. Uninstall the old Cable Assembly Test System application as follows:

1a. Using the application, back up your data as explained in *Backing Up Tests and Configurations* on page 299.

Make sure that the operation is successful before exiting the application and proceeding to next step.

1b. On the hard drive, remove the singlemode reference file as follows:

1c. Go to *C:|Documents and Settings|All Users|Application Data|JGR|MS12001* and delete the CATS.cfg file.

1d. On the hard drive, remove the default instructions file as follows:

Go to *C:|Documents and Settings|All Users|Application Data|JGR|MS12001* and delete the Instructions *Default.xml* file.

1e. If you have modified the original templates provided with your application (*Chart.xml*, *Label.xml*, *Report.xml*), without renaming them, first proceed a follows:

Go to *C:|Documents and Settings|All Users|Application Data|JGR|MS12001|Templates*, rename the templates, and copy them to a location of your choice.

Note: *Your templates may be located somewhere else if you have set your own path for the template files.*

1f. If you have customized the test instructions of your MS12001 software, proceed as follows:

On the hard drive, go to *C:|Documents and Settings|All Users|Application Data|JGR|MS12001* and copy the *Instructions Custom.xml* file to a location of your choice.

1g. If you have customized the settings of your MS12001 station's software, proceed as follows:

Go to *C:|Documents and Settings|All Users|Application Data|JGR|MS12001* and copy the *Settings.xml* file to a location of your choice.

1h. If you have customized the settings of your MS12001 Database Cleaner software, proceed as follows:

Go to *C:|Documents and Settings|All Users|Application Data|JGR|MS12001* and copy the *SettingsCleaner.xml* file to a location of your choice.

1i. In the Windows **Control Panel** dialog box, double-click **Add or Remove Programs** and, in the **Add or Remove Programs** dialog box, select the MS12001 software, and then click **Remove**.

2. Insert the MS12001 Cable Assembly Test System disk in the CD-ROM drive.

3. Ensure that MS Manager is already installed and that its version is up-to-date.

4. Install or upgrade MSDE as follows:

4a. From the CD, copy the *2) MSDE SP4* folder to a location of your choice on your MS platform controller unit.

IMPORTANT

You cannot start the installation or upgrade of MSDE directly from the CD.

You must first copy the MSDE folder to your MS platform controller unit.

4b. Verify if MSDE is already installed on your system:
On the Windows taskbar, click the **Start** button and select **Settings** >**Control Panel**. Double-click the **Administrative Tools** icon, then double-click the **Services** icon.

On the list, if you find **MSSQLSERVER** with its status set to **Started** and its startup type set to **Automatic**, you can *upgrade* MSDE. In all other cases, you must *install* it.

➤ If you need to upgrade MSDE: On the Windows taskbar, click the **Start** button and select **Run**. Use the **Browse** button to find the *UPGRADESP4.bat* file in the *MSDE SP4* folder you copied at step 4a.

OR

➤ If you need to install MSDE: On the Windows taskbar, click the **Start** button, select **Run**. Use the **Browse** button to find the *MSDE.bat* file in the *MSDE SP4* folder you copied at step 4a.

4c. Click **OK** to start the installation and follow the on-screen instructions.

5. Install the MS12001 software as follows:

5a. On the Windows taskbar, click the **Start** button and select **Run**.

5b. Use the **Browse** button to find the *setup.exe* file on the CD-ROM.

5c. Click **OK** to start the installation.

IMPORTANT

Keep the default names and paths suggested by the setup program. Otherwise, the application will not be able to link to your database (you will not be able to see the test results previously acquired).

5d. Click **OK** to start the wizard and follow the on-screen instructions.

6. Complete the upgrade as follows:

6a. If you have copied templates on step 1e, copy the files from the location you chose and paste them to *C:|Documents and Settings|All Users|Application Data|JGR|MS12001|Templates*.

6b. If you have copied the instructions file on step 1f, copy the file from the location you chose and paste it to *C:|Documents and Settings|All Users|Application Data|JGR|MS12001 Config*.

6c. If you have copied the Settings file on step 1g, copy the file from the location you chose and paste it to *C:|Documents and Settings|All Users|Application Data|JGR|MS12001 Config*.

6d. If you have copied the Database Cleaner Settings file on step 1h, copy the file from the location you chose and paste it to *C:|Documents and Settings|All Users|Application Data|JGR|MS12001 Config*.

6e. If you are using a CKT-30 Reflectance Reference instrument and the reflectance verification tool for verifying the reflectance of MS12 Loss Test Modules, copy the *CKT30Config.xml* file from *C:|Program Files|JGR|MS12001|Tools* and paste it to *C:|Documents and Settings|All Users|Application Data|JGR|MS12001 3250 Calibration*.

If you leave the *CKT30Config.xml* file in its previous location, the data already recorded will no longer be available.

IMPORTANT

Do not restore your database. This would overwrite the upgraded database structure. The database backup was made in step 1a in case problems occurred during the upgrade.

6f. Start the Cable Assembly Test System application.

6g. From the **Settings** function tab, select the **System** tab. Select the desired template files for your labels and reports. For more information, see *Setting Print and Export Parameters* on page 85.

IMPORTANT

If you intend to use the templates that you have renamed on step 1e, ensure to select them instead of the supplied *Label.xml* and *Report.xml* templates.

Note: *Additional templates are available specifically for testing at up to four wavelengths.*

6h. From the **Settings** function tab, select the **Measurement Options** tab.

6i. Under **Multiple RM Configuration**, select the desired hardware configuration.

For more information, see *Setting Single or Multiple RM Configuration* on page 54.

6j. From the **Database Browser**, make sure you see your test results (displayed according to the currently selected filter).

If you have defined your own customers, connectors, DUTs and/or tests with a previous software version, you should see them all from the **Config** function tab. Your filters will also be available.

Reinstalling or Upgrading the MS12001 Database Cleaner Application

The DataBase Cleaner application may be installed on a computer or directly on the MS controller unit. For more information, see *Installing the DataBase Cleaner* on page 408.

To reinstall or upgrade the Database Cleaner application on a controller unit or on a computer:

1. If you have customized the settings of your MS12001 Database Cleaner software, proceed as follows:

Go to *C:\Documents and Settings\All Users\Application Data\JGR\MS12001* and copy the *SettingsCleaner.xml* file to a location of your choice.

2. Uninstall the old Database Cleaner application as follows:

2a. In the **Windows Control Panel** dialog box, double-click **Add or Remove Programs**.

2b. From the **Add or Remove Programs** dialog box, select the MS12001 Database Cleaner software, and then click **Remove**.

3. Insert the MS12001 Cable Assembly Test System disk in the CD-ROM drive.

4. Install the MS12001 Database Cleaner software as follows:

4a. On the Windows taskbar, click the **Start** button and select **Run**.

4b. Use the **Browse** button to find the *setup.exe file* on the CD-ROM.

4c. Click **OK** to start the installation.

4d. Click **OK** to start the wizard and follow the on-screen instructions.

4e. You should keep default names and paths as suggested from the Setup program.

5. If you have copied the Database Cleaner Settings file at step 1, complete the upgrade by copying the file from the location you chose and paste it to *C:|Documents and Settings|All Users|Application Data|JGR|MS12001 Config*.

Installing the VSReport Designer Software

Predefined templates are provided with your MS12001 Cable Assembly Test System. You can tailor them to your needs using the VSReport Designer software (provided on the Cable Assembly Test System CD).

IMPORTANT

This software has not been installed at the factory. You must install it and register it if you want to customize your labels and reports.

Note: *JGR provides no documentation or support for VSReport Designer. If you need help, you will have to use the online help available in the software (you can print the desired help topics or view them on-screen).*

To install VSReport Designer on an MS platform controller unit:

1. Insert the MS12001 Cable Assembly Test System disk in the CD-ROM drive.
2. On the Windows taskbar, click the **Start** button and select **Run**.
3. Use the **Browse** button to find *VSVIEW 7.0 Reporting Edition\Install\view7setup.exe* file on the CD-ROM. Click **Open**.
4. Click **OK** to start the installation.

IMPORTANT

When prompted, choose Evaluation Copy. Otherwise, VSReport Designer could not be registered properly.

5. Simply follow the on-screen instructions. You should keep default names and paths as suggested from the Setup program.

IMPORTANT

The version you have just installed may not be the latest. You may download updates at http://www.componentone.com.

To register the VSReport Designer software:

1. On the Windows taskbar, click the **Start** button and select **Run**.
2. Use the **Browse** button to find *VSVIEW 7.0 Reporting Edition|License|c1lic.exe* file on the CD-ROM. Click **Open**.
3. Click **OK** to start the installation.
4. From the displayed dialog box, enter the license key in the **Serial Number** box. This license key will allow you to run the software on your system. It is provided in the jewel case, just under the MS12001 CD (you have to remove the CD from its case to see the license key).
5. When the confirmation message is displayed, click **OK**.

You are now able to customize your labels and reports with VSReport Designer, as explained in *Customizing Labels and Reports* on page 294.

Starting and Exiting the MS12001 Cable Assembly Test System Application

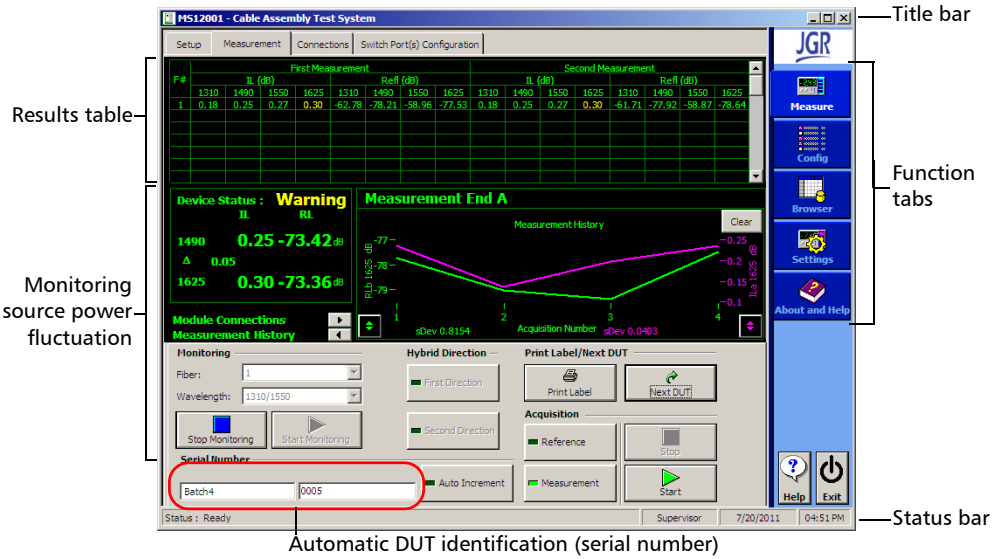
To start the Cable Assembly Test System application:

➤ On the Windows desktop, double-click the MS12001 Cable Assembly Test System icon.

OR

➤ From MS Manager, select the **Integrated Applications** function tab, then click the MS12001 Cable Assembly Test System button.

The application's main window is shown below:



To exit the Cable Assembly Test System application:

Click the **Exit** button located beneath the function tabs.

Note: *If the application has been started from MS Manager, closing MS Manager will also close the Cable Assembly Test System application.*

Setting User Permissions

Several folders contain files which are regularly updated by the MS12001 application, the DataBase Cleaner, and the reflectance verification tool.

Under Windows XP, a network administrator may wish to give users a *Write* permission to some or all of these folders. For example, a user with *Restricted User* access might need an extended access to some functions and applications.

The *Write* permission can be given for user accounts, for the following folders:

IMPORTANT

By default, upon installation of the MS12001 Cable Assembly Test System, the Write permission is given for the folders below for all users.

It is the network administrator's responsibility to control user permissions.

➤ *MS12001* folder: To allow users to perform power level adjustments and reference measurements. Permission must be given on the local path *C:|Documents and Settings|All Users|Application Data|JGR|MS12001*.

IMPORTANT

By default, upon installation of the MS12001 DataBase Cleaner, the Write permission is given to the MS12001 Config folder for all users.

It is the network administrator's responsibility to control user permissions.

- *MS12001 Config* folder: To be able to give users the Supervisor access level and/or access to the DataBase Cleaner Application. the Permission must be given on the local path *C:|Documents and Settings|All Users|Application Data|JGR|MS12001 Config*.
- *MS12001 3250 Calibration* folder: To allow users access to the reflectance verification tool. Permission must be given on the local path *C:|Documents and Settings|All Users|Application Data|JGR|MS12001 3250 Calibration*.

4 Setting Up System Parameters

This chapter covers the parameters that you must specify to determine how you want your application to manage your test sequences and results.

Defining Access Levels

The Cable Assembly Test System comprises the following access levels:

- Operator: allows you to perform complete tests and gives you access to specific function as defined by a supervisor.

  The Operator access level is assigned by default to all users.

- Supervisor: gives you access to all functions and allows you to select the functions that will be accessible to operators.

  The Supervisor access level can be protected by a password.

  The supervisor can change operators access rights to some functionalities such as overwriting results for a certain DUT or modifying the switch port configuration (port status, assigned connector).

Note: *Under Windows XP, for users without sufficient Write permissions, for example those in* Restricted User *mode, the Supervisor level may not be available. To be able to provide the Supervisor access level to such users, a Network Administrator must give their accounts the Write permission on* C:\Documents and Settings\All Users\Application Data\JGR\MS12001 Config.

For more information, see Setting User Permissions *on page 42.*

Entering the Supervisor Access Level

All users automatically access the MS12001 application with the Operator access level.

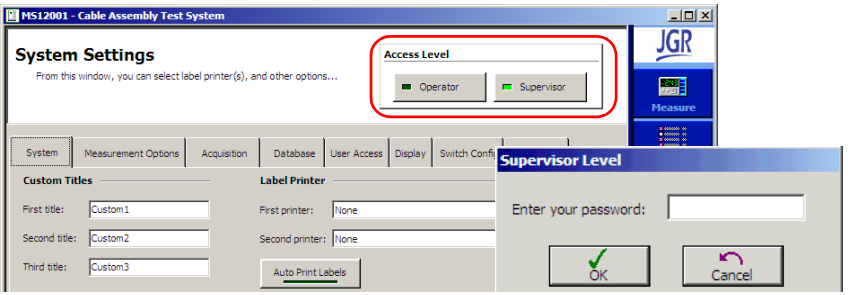
To be able to set up the system parameters, you must change your access level to Supervisor. The Supervisor access level allows you to change the password to that level and to select the functions that will be accessible to operators, give your operators the possibility of modifying some parameters, as well as to set or change all the other system parameters.

To enter the Supervisor access level, you must select that level and provide the set password.

To enter the supervisor access level:

1. Click the **Settings** function tab.
2. Under **Access Level**, click the **Supervisor** button.

   When you click the **Supervisor** button, the **Supervisor Level** dialog box opens, asking you for the supervisor password.



Note: *By default, there is no password. If you have never used a password, click* ***OK*** *to continue.*

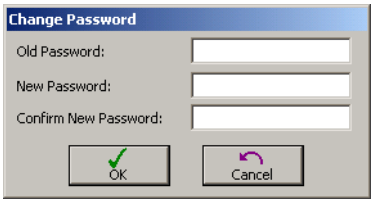
3. In the **Enter your password** box, type your password and click **OK**.

Changing the Password

Once a password has been set for accessing the Supervisor access level, it can be changed by any user with the Supervisor access level.

To change the password:

1. From the **Settings** function tab, select the **System** tab.
2. Ensure that you have the Supervisor access rights.
3. Click the **Change Password** button.



4. Enter the old password and then the new password.
5. Enter your new password again in the **Confirm New Password** box.
6. Click **OK**.

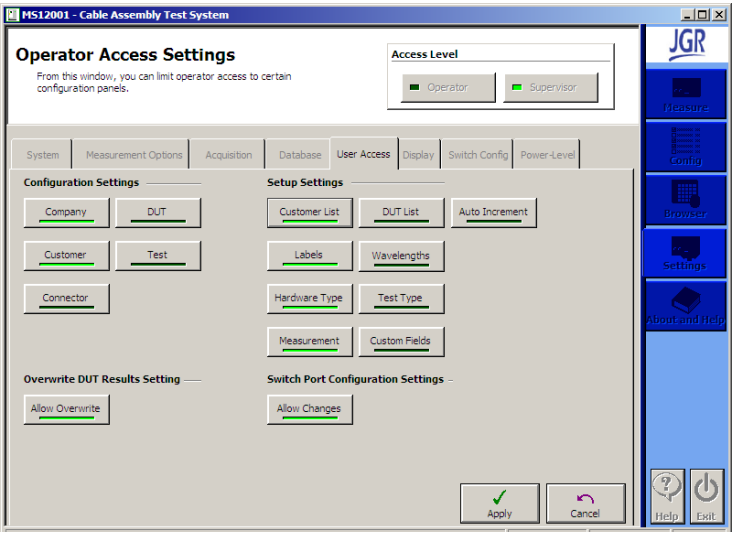
Modifying Operator Accesses

Operator accesses can be modified for some parameters and functionalities.

Note: *Only a user with Supervisor access level can modify operator accesses.*

To modify the Operator accesses:

1. From the **Settings** function tab, select the **User Access** tab.
2. Under **Configuration Settings** and **Setup Settings**, click the buttons corresponding to parameters for which you want to give access.



3. Click **Apply** to confirm your changes.

Note: *By default, all parameters on the **User Access** tab are unavailable to users with Operator accesses.*

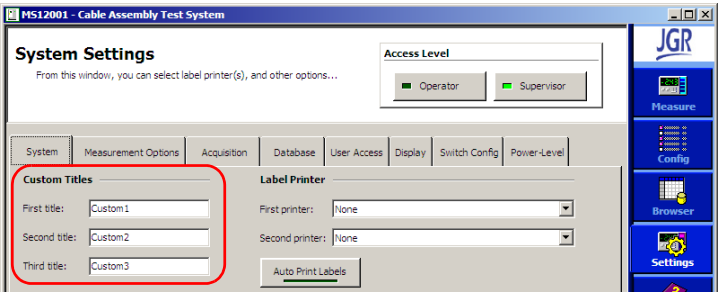
Defining Custom Field Names

You can specify names to identify the contents of custom fields. Custom fields are useful to add information to a setup.

Note: *This function requires Supervisor access rights.*

To define custom field names:

1. From the **Settings** function tab, select the **System** tab.
2. Under **Custom Titles**, enter the titles to use in their corresponding text boxes.



3. Click **Apply** to confirm your changes.

Defining Reflectance Sensitivity

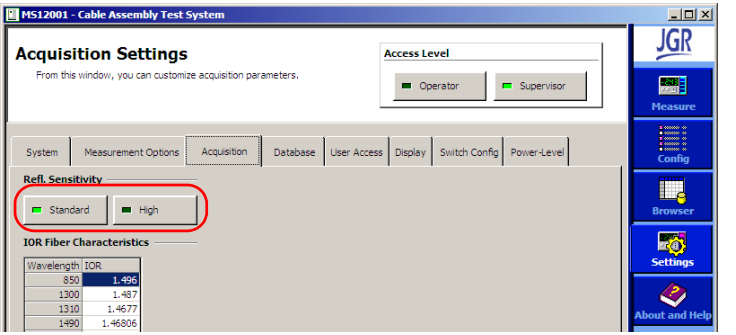
Reflectance sensitivity, high or standard, will determine the number of acquisitions made during the reflectance measurement. Since reflectance is using a technology similar to an OTDR, by selecting a “high” reflectance sensitivity, the number of acquisitions will be quadrupled.

This tool is useful when measuring reflectance values lower than –65 dB. It will take longer to get reflectance values in high reflectance sensitivity mode than in standard mode.

Note: *This function requires Supervisor access rights.*

To define reflectance sensitivity:

1. From the **Application Settings** function tab, select the **Acquisition** tab.
2. Click the button corresponding to the reflectance sensitivity you want.



3. Click **Apply** to confirm your changes.

Defining Reference Configuration

You can configure the method you use to take references. The application allows you to intervene manually between each reference. It may also determine the length of your master test jumper (MTJ) automatically or it may ask the operator to enter it manually.

For unidirectional testing, IL referencing can be done by either referencing only MTJ1 or referencing MTJ1 and MTJ2. When referencing only MTJ1, insertion loss of MTJ2 is included in the DUT insertion loss value.

Note: *MTJ2 corresponds to the master test jumper used between the DUT and the loss meter when performing unidirectional testing.*

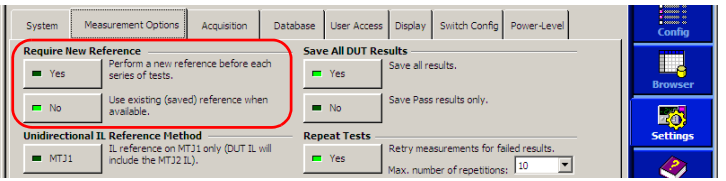
It is possible to configure the application to view one or two reflectance values. For more information, see *Selecting the Number of Reflectance Values* on page 58.

Note: *This function requires Supervisor access rights.*

To force referencing before each test session:

1. From the **Settings** function tab, select the **Measurement Options** tab.
2. Under **Require New Reference**, select whether you want to force a new reference or not.

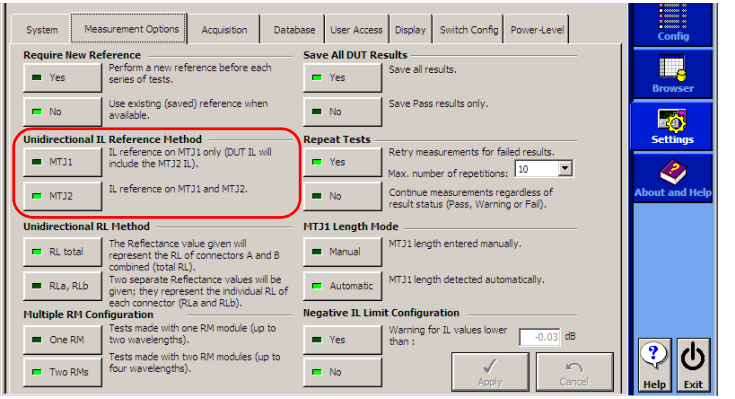
   If you choose not to force references, a previous reference will be used when available and you will be able to take measurements without referencing first.



3. Click **Apply** to confirm your changes.

To set up the IL reference method for unidirectional testing:

1. From the **Settings** function tab, select the **Measurement Options** tab.

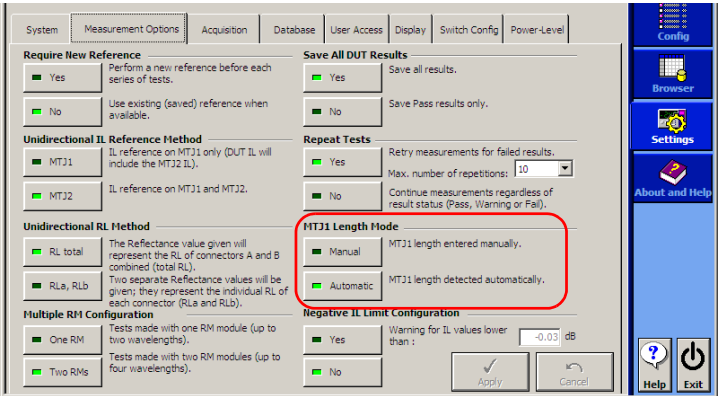


2. Under **Unidirectional IL Reference Methods**, select whether to reference using only MTJ1 or using both MTJ1 and MTJ2.

3. Click **Apply**.

To have the MTJ length detected automatically:

1. From the **Settings** function tab, select the **Measurement Options** tab.



2. Under **MTJ1 Length Mode**, select whether you want to enter the length yourself or let the system detect it automatically.

IMPORTANT

Be careful when you work in manual mode because your Cable Assembly Test System directly uses the values you provide. Consequently, entering an erroneous master test jumper length will lead to unreliable or incorrect reflectance results.

Setting Single or Multiple RM Configuration

You can set the MS12001 system to use one or two MS12 Loss Test Modules (RMs) for tests.

If you intend to use your system solely for multimode testing, since only one MS12 module is available, which provides both the 850 nm and 1300 nm wavelengths, the one RM configuration is appropriate.

Note: *By default, the MS12001 is configured for tests with one RM.*

If you intend to use your system all the time for singlemode testing with only one or two wavelengths that are available on a single MS12 Loss Test Module, the one RM configuration is also appropriate.

If you intend to test in singlemode with wavelengths provided by up to two MS12 modules, use the two RM configuration.

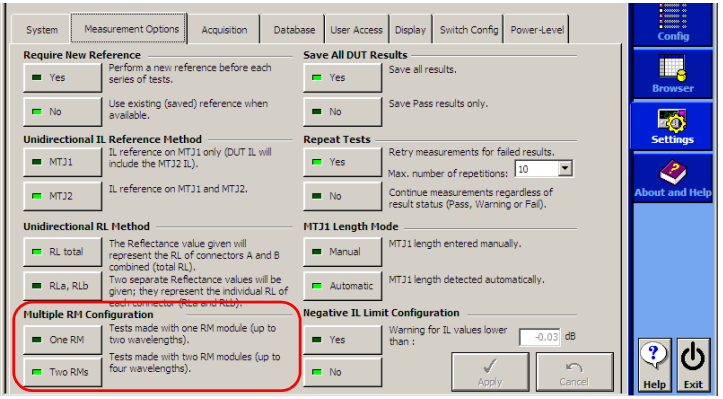
Your system is most flexible when set for using two RMs. You can perform test with one to four wavelengths without the need to configure, reference and calibrate the hardware again.

Even if some of your tests need only wavelengths from one RM, instead of reconfiguring the hardware, simply define appropriate test profiles. For more information, see *Setting Up Test Profiles* on page 89.

Select the label, report and chart templates that correspond to the RM configuration you have selected. For more information, see *Setting Print and Export Parameters* on page 85.

To select one or two RMs for tests:

1. From the **Settings** function tab, select the **Measurement Options** tab.



2. Under **Multiple RM Configuration**, select whether you want to use one or two RMs for tests.

Note: *After you have changed the RM configuration in your system, you must reinitialize the modules and reference the components again.*

When you have set the system for using two RMs, make sure you have properly connected your RMs and the MS7 switch module (RM switch) after you have installed your modules in the system. For more information, see *Connecting Two RMs and the RM Switch* on page 25.

IMPORTANT

The MS7 Optical Switch used for selecting test wavelengths from two RMs is not tracked by the MS12001 system.

After changing the RM switch in your system, changing connectors, or disconnecting and reconnecting your RMs or patchcords and the switch, make sure you perform a new set of reference measurements to recalibrate the system.

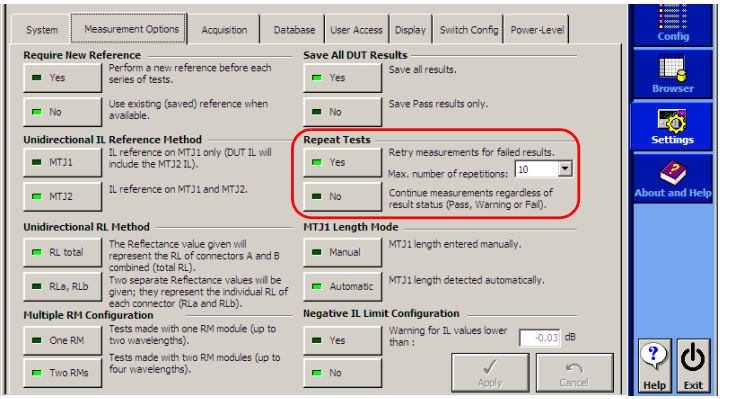
Handling Failed Tests

The application may allow the operator to retry any failed test. You can also limit the number of trials.

Note: *This function requires Supervisor access rights.*

To configure the handling of failed tests:

1. From the **Settings** function tab, select the **Measurement Options** tab.



2. Under **Repeat Tests**, select whether a failed test is to be retried or not and, if necessary, select the number of retries.
3. Click **Apply**.

Defining Results Storage

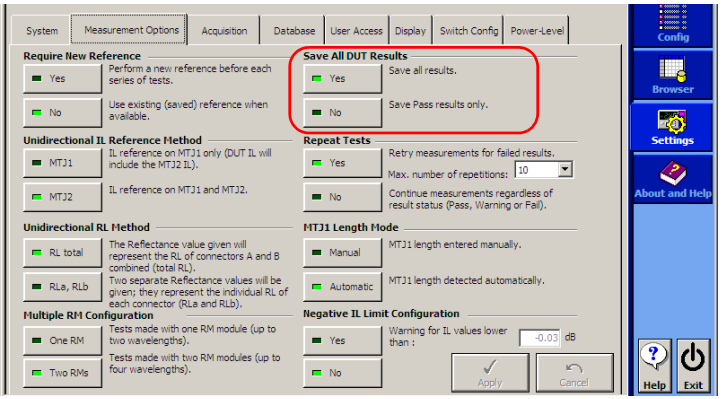
You have a choice of which test results will be saved. You can either save all results or you can save only the results that pass the test.

Note: *The application will not take this setting into account if you are working with hybrid patchcords with a standard configuration and bidirectional testing. Since the application allows batch testing, it must save* all *results to keep a correspondence between End A and End B results of the fiber assembly. However, your setting remains available for all other test types.*

Note: *This function requires Supervisor access rights.*

To select which results to save:

1. From the **Settings** function tab, select the **Measurement Options** tab.



2. Under **Save All DUT Results**, select whether to save all results or only results that pass the test.
3. Click **Apply**.

Selecting the Number of Reflectance Values

You can specify the way the Cable Assembly Test System will display reflectance results. You can choose to view one or two values.

- One reflectance value: The result corresponds to the sum of connectors A and B reflectance.

$$\text{Reflectance (dB)} = 10 \cdot \left[\log\left(\frac{P_{\text{reflected, connector A}}}{P_{\text{incident, connector A}}}\right) + \log\left(\frac{P_{\text{reflected, connector B}}}{P_{\text{incident, connector B}}}\right) \right]$$

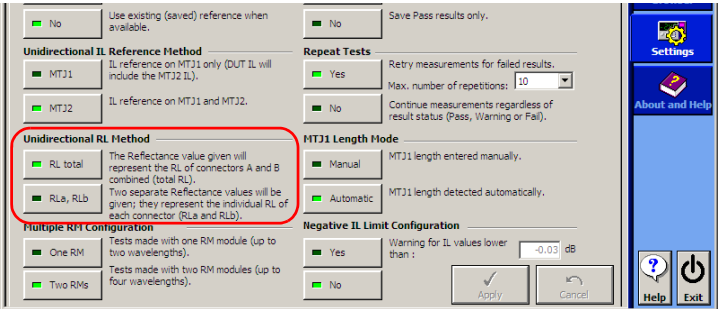
- Two reflectance values: the first value corresponds to connector A reflectance and the second to connector B reflectance. When the displayed results are exactly the same for both connectors, that means the application has returned the worst reflectance value obtained (either connector A or connector B value).

Note: *Regardless of your choice to display one or two reflectance values, the DUT status (pass or fail) is determined by the worst connector value. For example, if connector A is "Pass" and connector B is "Fail", the DUT will be marked as "Fail".*

Note: *This function requires Supervisor access rights.*

To select the number of reflectance values:

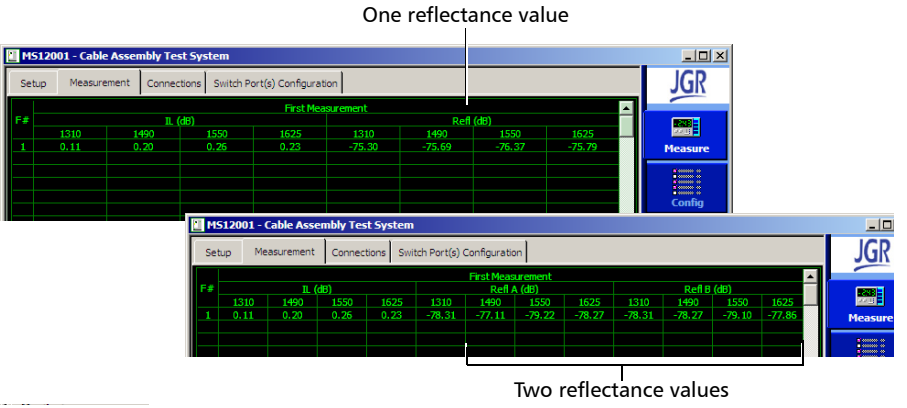
1. From the **Settings** function tab, select the **Measurement Options** tab.



2. Under **Unidirectional RL method**, select whether one or two reflectance values are displayed.

3. Click **Apply**.

The result table on the **Measurement** tab will be formatted according to your selection.



Automatic Switch Configuration

When operating in one RM configuration, the system automatically assigns the first detected optical switch which provides the required number of ports as the DUT switch. In such a case, make sure the first switch in your system is the one you are intending to use as the DUT switch.

When operating with two MS12 Loss Test Modules (RMs) in two RM configuration, the MS12001 system automatically assigns the first detected MS7 switch module as the RM switch.

The RM switch's Input port 1 is automatically set for selecting the first detected MS12 module's test wavelengths. The Input port 2 is automatically set for selecting the second MS12 module's wavelengths.

A switch with more than two Input ports can be used as the RM switch. However, only Input ports 1 and 2 will be used for selecting the wavelengths from the RMs.

Note: *The RM switch can be used only for selecting RMs, even when additional ports are available.*

A second switch may also be included for selecting DUTs to be tested. In two RM configuration, the switch detected in second in the system is assigned as the DUT switch.

Note: *A system in two RM configuration will use an external switch only as a DUT switch.*

Setting Resolution to Display

The application lets you determine the number of digits (resolution) that will be displayed for IL and reflectance values, including the monitoring values, as well as for master test jumper length. The Database Browser will take into account the settings that you make when displaying values.

Note: *The modification of resolution is for display purposes only; therefore, it does not affect the database content.*

Note: *The displayed values are rounded, not truncated.*

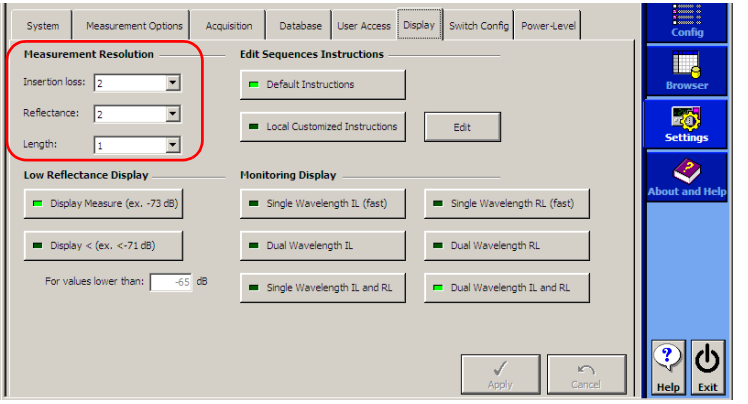
Note: *With a three-digit display resolution, IL monitoring or IL measurement values of 10 dBm or more are rounded to two digits.*

If you want to modify the format of values displayed in reports, you can use VSReport Designer (see *Customizing Labels and Reports* on page 294).

Note: *This function requires Supervisor access rights.*

To set display resolution:

1. From the **Settings** function tab, select the **Display** tab.



2. Under **Measurement Resolution**, select the desired resolutions for insertion loss, reflectance, and length.
3. Click **Apply** to confirm your changes.

Setting Display for Very Small Reflectance Values

The application allows you to define a threshold for the minimum reflectance value and to specify how it should display the reflectance values that go beyond this threshold.

The possibilities are:

- the value itself (for example, –78 dB)
- an indicator including the threshold value (for example, <–71 dB)

The Database Browser will take into account the settings that you make when displaying values.

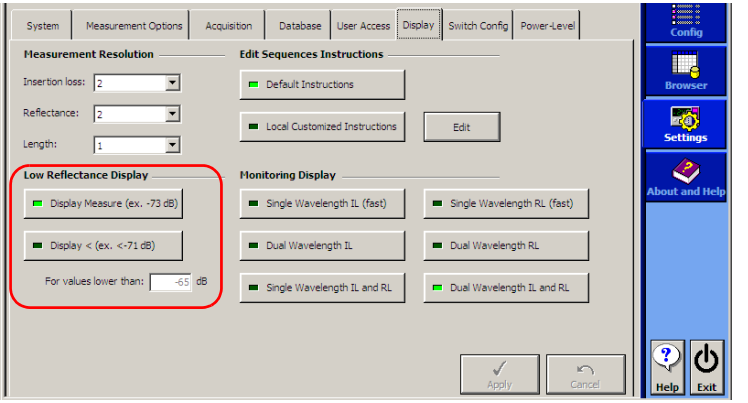
Note: *This modification is for display purposes only; therefore, it does not affect the database content nor the DUT status. The DUT status is function of the limits you specify (see* Defining Connector Types *on page 92), not of the indicator (for example, <–71 dB). The threshold value is rounded to one digit after the point when displayed in the results table.*

If you want to modify the format of the values appearing in the reports, you can use the VSReport Designer (see *Customizing Labels and Reports* on page 294).

Note: *This function requires Supervisor access rights.*

To set the display for small reflectance values:

1. From the **Settings** function tab, select the **Display** tab.

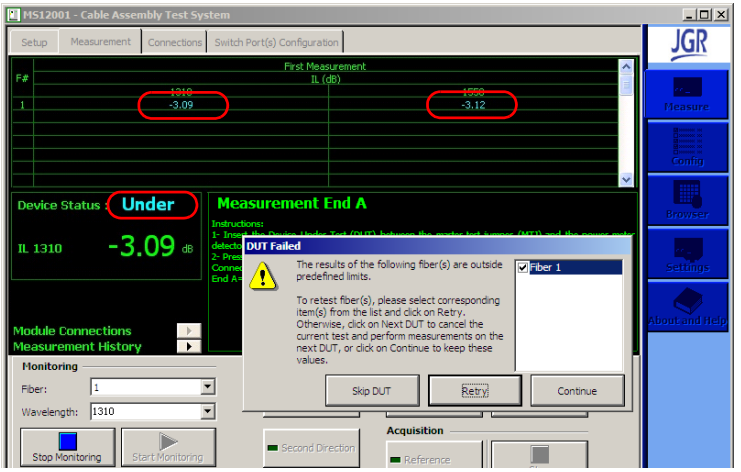


2. Select the desired display for small reflectance values.
3. Specify the threshold.
4. Click **Apply** to confirm your changes.

Enabling or Disabling the Warning for Low IL Values

You can enable or disable the detection of low IL values. When this feature is enabled, the application will warn you whenever the measured IL values are under the defined threshold. Typical values for the threshold are between –0.03 dB and –0.1 dB.

The application will display in blue the values that are too low and will provide a list of fibers on which such values have been measured. You will then be able to either re-test the fibers or skip the DUT.



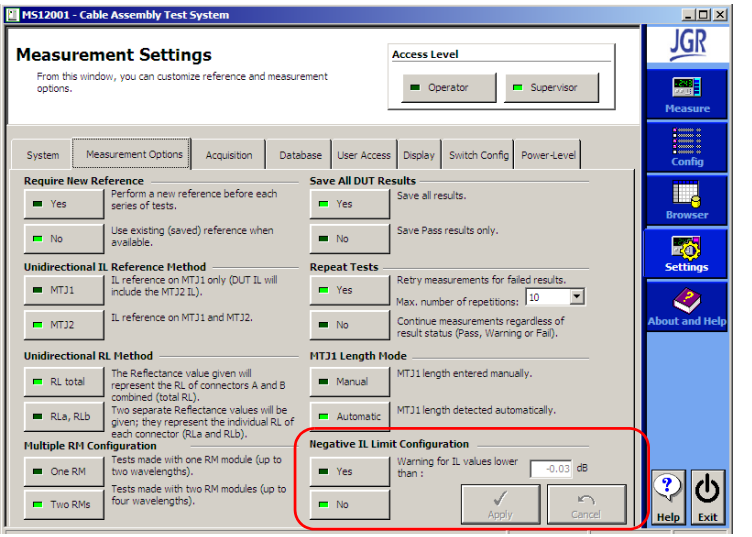
By default, the feature is not enabled.

Note: *This feature is intended to help you quickly identify potential problems; therefore, it does not affect the database content nor the DUT status. The DUT status is function of the limits you specify for the connector type (see* Defining Connector Types *on page 92).*

Note: *This function requires Supervisor access rights.*

To enable the warning for low IL values:

1. From the **Settings** function tab, select the **Measurement Options** tab.
2. Select **Yes**.

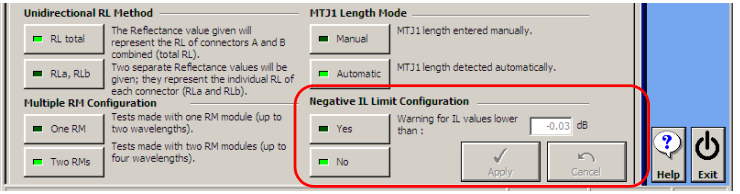


3. In the **Warning for IL values lower than** box, enter the threshold value.
4. Click **Apply** to confirm your changes.

To disable the warning for low IL values:

1. From the **Settings** function tab, select the **Measurement Options** tab.

2. Select **No**.

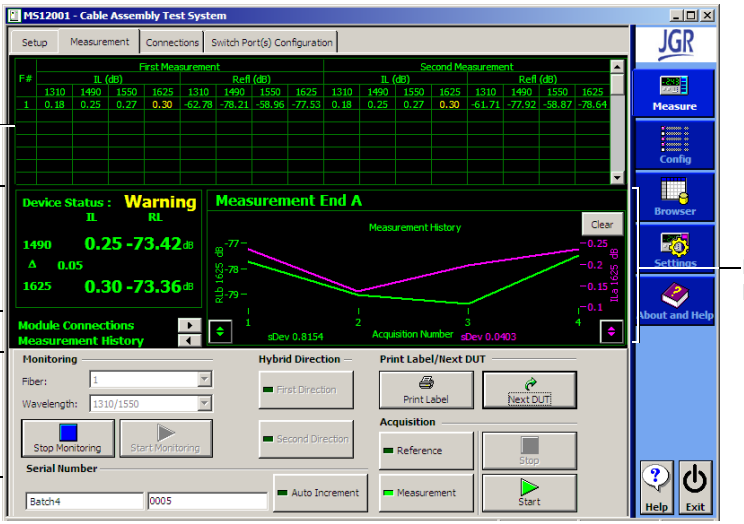


3. Click **Apply** to confirm your changes.

Setting Monitoring Display Options

The Cable Assembly Test System has *monitoring* functions that allow you to verify power variations while you test your connections.

The monitoring display can be found on the **Measurement** tab from the **Measure** function tab. For more information, see *Monitoring IL and RL References or Measurements* on page 109.



Monitoring options allow you to determine which values will be displayed in the monitoring display, as well as the options that will be available for the monitoring functions.

The following monitoring values can be displayed:

- Insertion loss (IL) values are displayed only if an IL measurement is performed in the test.
- Reflectance loss (RL) values are displayed only if such an option is selected, and an RL measurement is performed in the test.

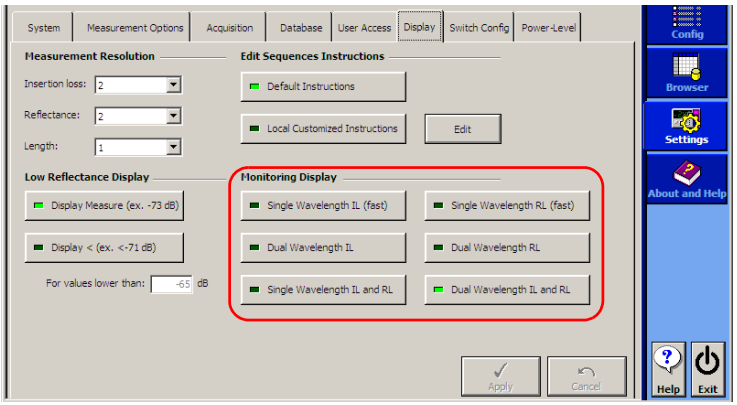
- When a single wavelength option is selected, monitoring values for IL and RL measurements are displayed for one test wavelength at a time, independently from the number of wavelengths selected for tests.
- When a dual wavelength option is selected, monitoring values for IL and RL measurements are displayed simultaneously for a pair of selected test wavelengths, providing they come from the same MS12 Loss Test Module.

Note: *Monitoring two wavelengths at the same time is possible only when both wavelengths come from the same RM. This is to prevent premature wearing of the RM switch.*

The measurement history graph can display up to a hundred IL and RL monitoring values, for one or two connectors. Once the maximum number of values is displayed, new monitoring values replace the oldest ones.

To set the monitoring display options:

1. From the **Settings** function tab, select the **Display** tab.



2. Under **Monitoring Display**, select the desired monitoring display option.
3. Click **Apply** to confirm your changes.

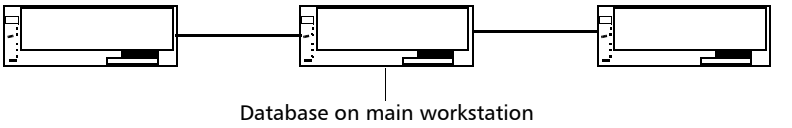
Configuring Database Connection

Before being able to use your database, you must configure its connection to the network. The possible configurations are:

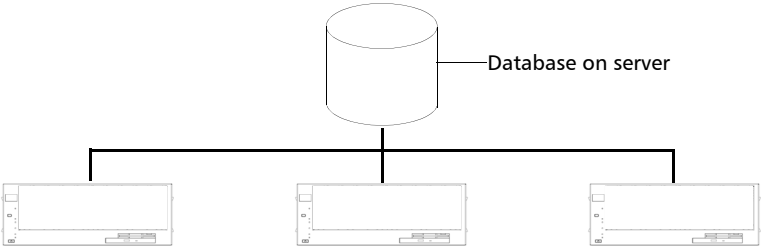
➤ Local (default configuration): the database is installed locally on each workstation (MS platform controller unit) and workstations are independent from one another.

Note: *Since each workstation is a stand-alone station, you will have to define connectors, DUTs, test profiles, etc. on each workstation.*

➤ Centralized: the database is installed on one workstation (MS platform controller unit) and is used by other workstations via a network link.



➤ Server-based: the database is installed on a stand-alone server and is used by all workstations (MS platform controller units) via a network link.



If the centralized or server-based database becomes unavailable because of a network problem, the Cable Assembly Test System will be able to work locally.

Note: *The database and the application have been updated to support two RM configuration and testing at up to four wavelengths. When your database configuration is centralized or server-based, JGR recommends updating all MS12001 system databases and applications, central or server-based and local, to the current version. If either the central/server-based system or a remote client system is not current, you will be able to record your results for each test wavelength from a remote application to a central or server-based database of a previous or current version, but you will not be able to retrieve these results for label, report or browser display from a local or remote application of a previous version.*

IMPORTANT

If you choose to work locally because the network is not accessible, be aware that

- **you won't have access to the connectors, DUTs, test profiles, etc. that you may have defined in the network database.**
- **all the results of the tests that will be performed locally will remain local. It is impossible to append the results of any database to the network database.**

Note: *This function requires Supervisor access rights.*

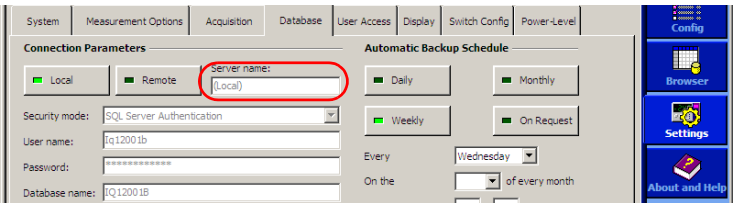
To configure the connection to the database:

1. From the **Settings** function tab, select the **Database** tab.
2. In the **Server Name** box, type the appropriate name. Use the following table to help you choose the appropriate value.

Database Configuration	If you are configuring	Server name will be
Local	any workstation	(Local)
Main workstation	the main workstation	(Local)
	the other workstations	main workstation's name
Server	the server itself	(Local)
	the other workstations	the server name

IMPORTANT

For the Cable Assembly Test System to work properly, ensure that you type the word *(Local)* exactly as it appears in the table above.



3. Type in the database file name. In the case of a network configuration, the database file name should be the one in the server.
4. Click **Apply** to confirm your settings.
5. Repeat steps 1 to 4 for each workstation.

Configuring Database Security Mode

When configuring a server-based database connection, the following security modes are available:

- SQL Server Authentication Mode
- Windows Authentication Mode

To configure the database security mode properly, JGR recommends that you contact your database administrator to know the exact server name, database name and security mode.

Note: *This function requires Supervisor access rights.*

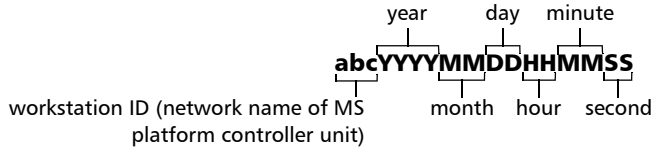
To configure the database security mode:

1. From the **Settings** function tab, select the **Database** tab.
2. From the **Security Mode** list, select the desired security mode.

3. Click **Apply** to confirm your settings.

Customizing DUT Serial Numbers

By default, you define your serial numbers (with or without Auto Increment option). However, you can configure the application to automatically generate non-editable serial numbers for each DUT. These serial numbers, also visible from the application, have the following format:



Note: *The time (date and time) is defined at the* beginning *of the test; therefore, it does not correspond to the time at which you save your test results.*

You can customize serial number generation using a specific .xml file. This file is created the very first time you start the application and updated to add any missing field when you upgrade the application.

To customize the way DUT serial numbers are generated:

1. Exit the Cable Assembly Test System application.
2. Go to C:\Documents and Settings\All Users\Application Data\JGR\MS12001 and open the *Settings.xml* file.

Note: *You can edit the file with a text editor such as* Notepad.exe *or an xml editor such as* XMLNotepad.exe *(free on the Internet).*

3. Modify the *SerialNumberMode* field by respecting uppercase and lowercase (for example, “True”), otherwise the application will not be able to use the file.
   - ➤ For automatic generation of unique serial numbers, enter True.
   - ➤ For generation of your own serial numbers, enter False.
4. Save and close the file.

The new settings will apply the next time you start the application.

Selecting Test Instructions

You can select whether you want the application to display the default instructions or the ones you customized previously (see *Customizing Test Instructions* on page 78).

The default test instructions provide procedures for testing in one or two RM configuration, depending on the way your system is set. For more information, see *Setting Single or Multiple RM Configuration* on page 54.

Note: *The module connection graphics provided in the MS12001 application depict a one MS12 configuration with two-wavelengths, whether the system is in one RM or two RMs configuration.*

IMPORTANT

The modified instructions remain local. If you want to use these instructions on several workstations (MS platform controller units), you will have to duplicate the configuration file on each workstation.

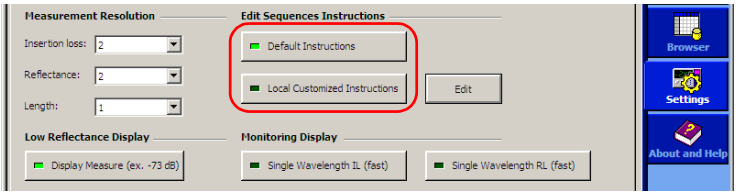
Note: *This function requires Supervisor access rights.*

Users will be able to display test instructions from the **Measurement** tab found on the **Measure** function tab. For more information, *Consulting the Measurement History Graph* on page 116.

To select a set of instructions:

1. From the **Settings** function tab, select the **Display** tab.

2. Select either **Default Instructions** or **Local Customized Instructions**, depending on your needs.



3. If you want to use custom instructions on several workstations, duplicate the *InstructionsDefault.xml* file as follows:

3a. On the hard disk of the current workstation, go to *C:|Documents and Settings|All Users|Application Data|JGR|MS12001 Config*.
Copy the *InstructionsDefault.xml* file. Use a floppy disk if the corresponding folder on the destination workstation is not shared.

3b. Paste the copied file in the corresponding folder of each workstation to configure.

Customizing Test Instructions

The MS12001 Cable Assembly Test System allows you to customize the sequence instructions (test steps) and some other generic messages that are displayed during tests. This is particularly useful if you work with special test configurations or if you want to write instructions in a language other than English.

Note: *The module connection graphics provided in the MS12001 application depict a one MS12 configuration with two-wavelengths, whether the system is in one RM or two RMs configuration.*

IMPORTANT

The modified instructions remain local. If you want to use these instructions on several workstations (MS platform controller units), see *Selecting Test Instructions* on page 76.

A message may appear in many different test configurations. For this reason, the application allows you to modify one instruction at a time or all instructions simultaneously. In the same way, it is always possible to return to default instructions; one instruction at a time or all instructions simultaneously.

The application also provides you with special keywords that can be inserted in the instructions. These keywords are updated automatically during tests to reflect your particular settings.

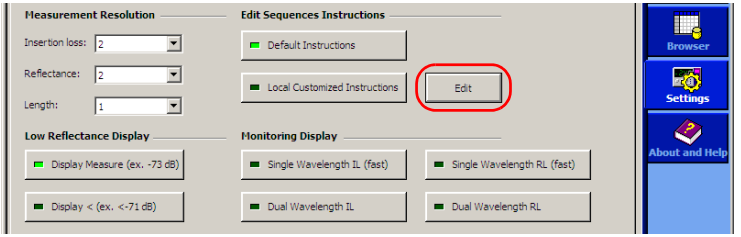
For example, if you insert the *%C1* keyword in an instruction, during a test including this instruction, it will be automatically replaced by the appropriate DUT connector on screen.

A complete list of the supported keywords is available in the application.

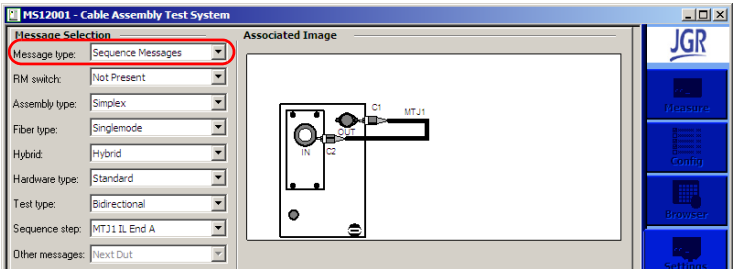
Note: *This function requires Supervisor access rights.*

To customize sequence (steps) instructions:

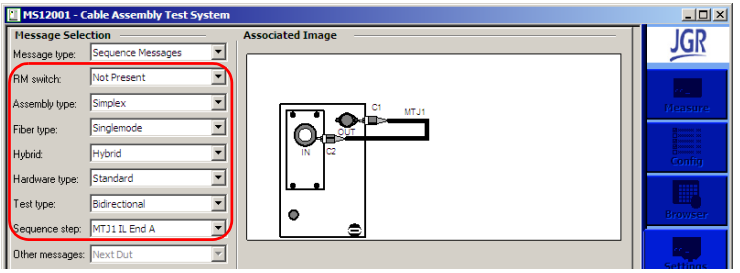
1. From the **Settings** function tab, select the **Display** tab.
2. Use the **Edit** button to access the customization window.



3. From the **Message Type** box, select **Sequence Messages**.

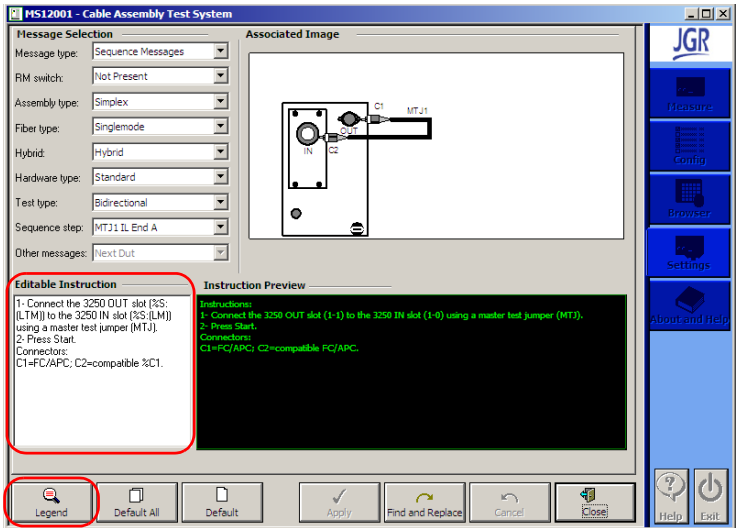


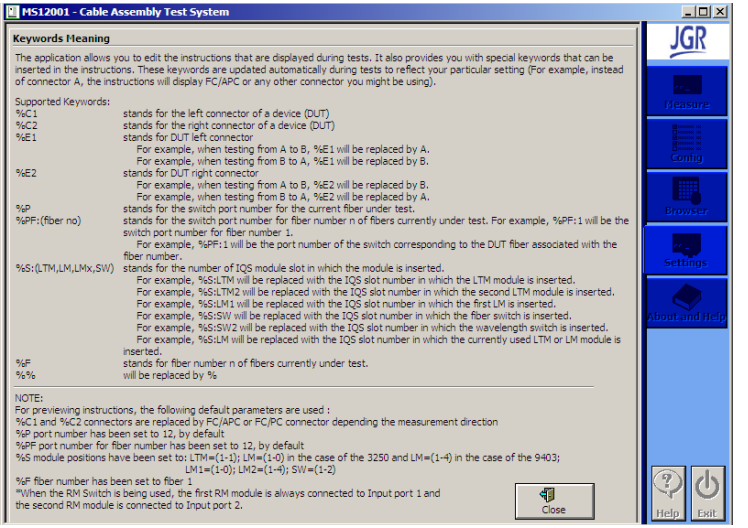
4. From the provided boxes, specify the information identifying the instructions to be modified (for example, RM switch not present, simplex, singlemode, hybrid, standard, unidirectional, MTJ1 EndA).



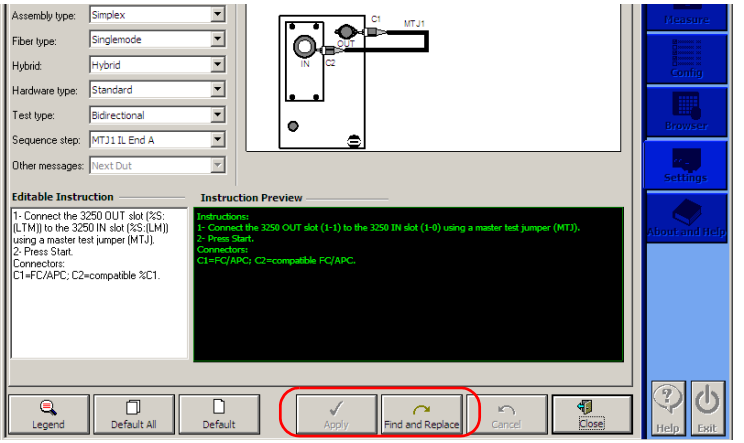
The corresponding graph is displayed.

5. From the **Editable Instruction** box, modify the instructions as needed. You can view the complete list of supported keywords by using the **Legend** button.





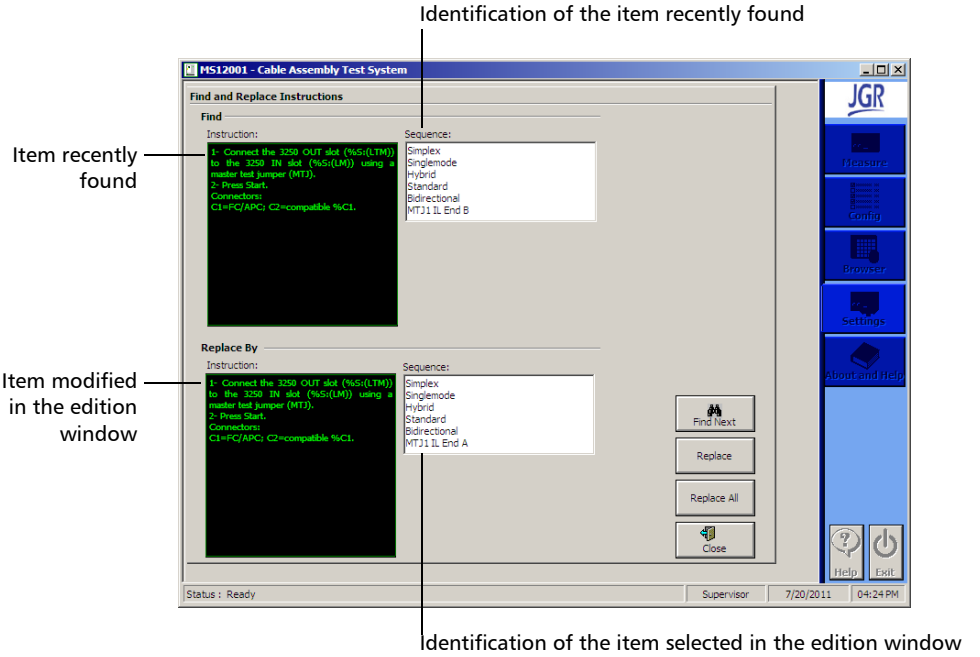
6. Since a message may appear in many different test configurations, if you want to apply changes to some or all of the configurations related to the current message, use the **Find and Replace** button. If you prefer to modify only the current message, use the **Apply** button.



7. If you selected **Find and Replace**, you can replace one item at a time by using the **Find Next** button to reach the desired instructions and then **Replace**. Repeat for all items to be modified.

OR

You can replace all items simultaneously with the **Replace All** button.

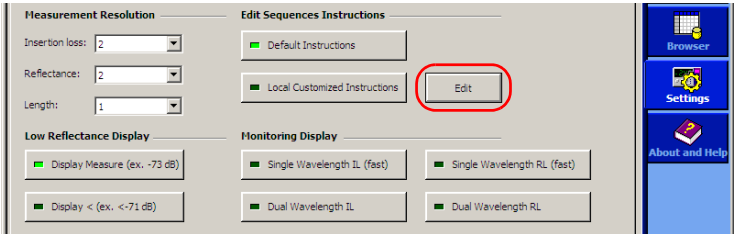


8. Use the **Close** button to return to the edition window. Your changes will be applied automatically.

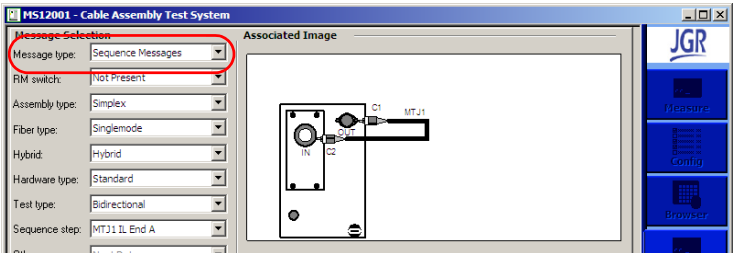
9. Use the **Close** button to return to the **Settings** function tab.

To customize generic messages:

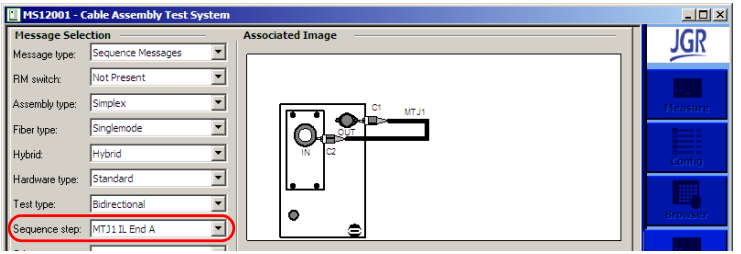
1. From the **Settings** function tab, select the **Display** tab.
2. Use the **Edit** button to access the customization window.



3. From the **Message Type** box, select **Other Messages**.



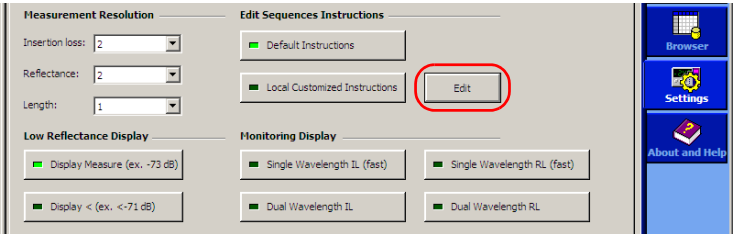
4. From the **Other Messages** box, select the message to be modified.



5. Use **Apply** to confirm your changes or **Cancel** to discard them.
6. Use the **Close** button to return to the **Settings** function tab.

To revert to default test instructions:

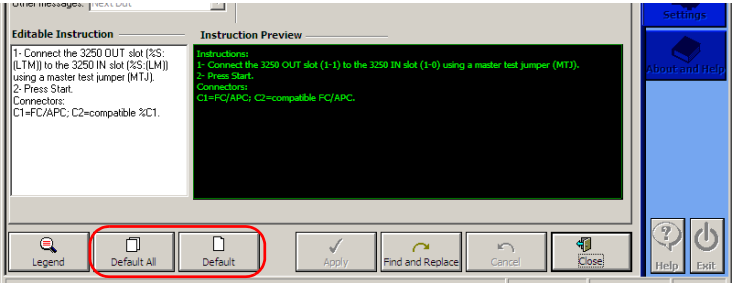
1. From the **Settings** function tab, select the **Display** tab.
2. Use the **Edit** button to access the customization window.



3. Use the **Default** button to revert only the current item to its default value

   OR

   Use the **Default All** button to revert all items to their default values. Answer Yes when the application will prompt you.

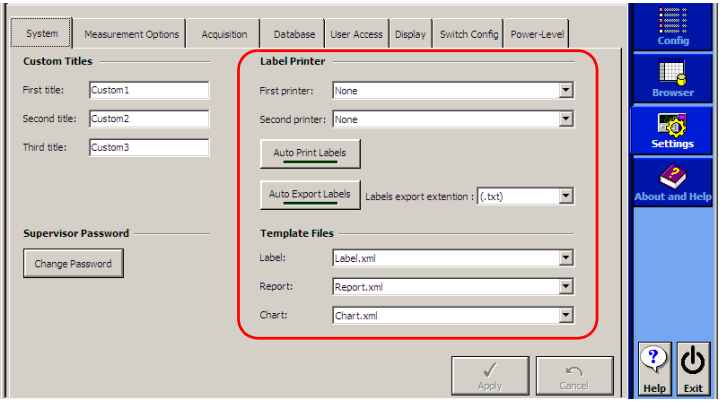


4. Use the **Close** button to return to the **Settings** function tab.

Setting Print and Export Parameters

In order to have your labels and reports printed and exported correctly, you must select a printer, a template file and a printing method. You may also configure the system to print or to export labels automatically when the operator completes a test (starts a test on a new DUT).

Note: *This function requires Supervisor access rights.*



IMPORTANT

You need to select a printer even if you only intend to export labels.

To select a printer:

1. From the **Settings** function tab, select the **System** tab.
2. Under **Label Printer**, select your printers.

   The first printer you select will print the first label and the second printer will print the second label.
3. Click **Apply** to confirm your settings.

To have labels printed automatically:

1. From the **Settings** function tab, select the **System** tab.
2. Under **Label Printer**, click the **Auto Print Labels** button.
3. Click **Apply** to confirm your settings.

To have labels exported automatically:

1. From the **Settings** function tab, select the **System** tab.
2. Under **Label Printer**, click the **Auto Export Labels** button.
3. In the **Labels Export Extension** list, select the file extension corresponding to the desired file format (html, pdf, text).

Note: *The application automatically generates a file name that corresponds to the DUT's serial number. The exported files are stored in the* My Documents *folder.*

4. Click **Apply** to confirm your settings.

To select label, report and chart template files:

1. From the **Settings** function tab, select the **System** tab.
2. Under **Templates Files**, select the templates you want to use for your labels, reports, and charts.

   For labels, you can choose between two template files:

   - *Label.xml*: Provides labels for measurements made at up to two wavelengths.

     When using the one RM configuration, select the *Label.xml* template.

   - *LabelExtended.xml*: Provides labels for measurements made at up to four wavelengths.

     When using the two RMs configuration, select the *LabelExtended.xml* template.

   For more information on system configuration with one or two RMs, see *Preparing Hardware for System Configuration* on page 18.
3. Click **Apply** to confirm your settings.

For more information on customizing templates, see *Customizing Labels and Reports* on page 294.

5 Setting Up Test Profiles

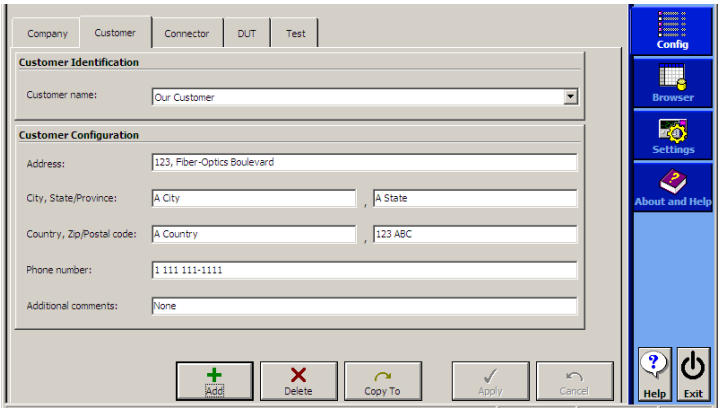
This chapter will allow you to define various test parameters. These configurations will be saved for future use.

Entering Customer and Company Information

You may identify the customers for whom you are testing DUTs as well as your company information. Here, you can enter names, addresses and other useful information.

To add information about a new customer:

1. Select the **Config** function tab, then select the **Customer** tab.



2. Click **Add** if you want to add entirely new information.

   OR

   Select an existing customer in the **Customer Identification** panel and click the **Copy to** button. A new customer file will be created with the duplicated information.

3. Enter your new customer's name in the **Customer Name** box.
4. Enter other contact data in the **Customer Configuration** panel.
5. Click **Apply** to save the information.

To modify an existing customer profile:

1. Select the **Config** function tab, then select the **Customer** tab.
2. Select the name of the customer profile you want to modify in the **Customer Name** box.
3. Modify the customer name or any other information as necessary.
4. Click **Apply** to save the modifications.

To delete an existing customer profile:

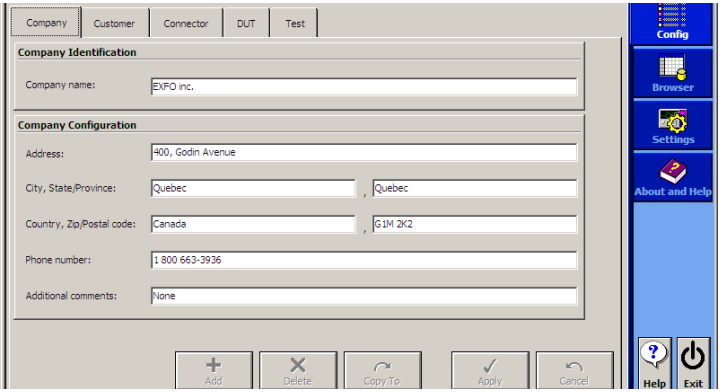
1. Select the name of the customer profile you wish to delete.
2. Click **Delete**. If this customer profile was associated with a test, the system will ask if you want to proceed or not.

IMPORTANT

The system will erase all traces of the customer you delete as well as all tests associated with it. Acquired data will remain available.

To set up your company's profile:

1. Select the **Config** function tab, then select the **Company** tab.



2. Enter information about your company.

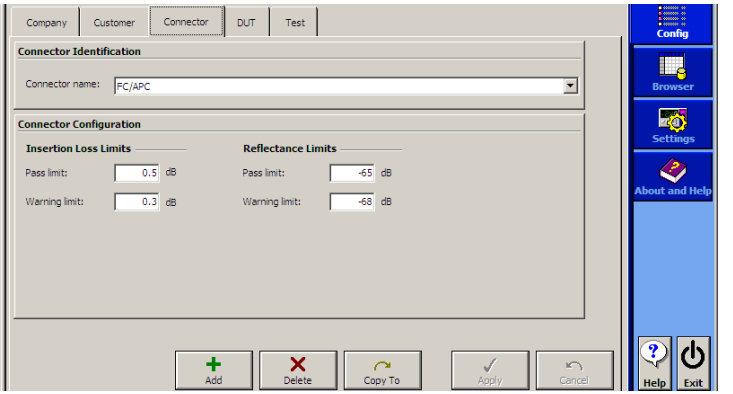
3. Click **Apply** to save the information.

Defining Connector Types

You can add a new connector type or modify information on an already registered model. The insertion loss and reflectance limits that you set up here will later determine when your tests pass or fail.

To add a new connector type:

1. Select the **Config** function tab, then select the **Connector** tab.



2. Click **Add** if you want to add entirely new information.

   OR

   Select an existing connector type from the **Connector Identification** panel and click the **Copy to** button. A new connector type will be created with the duplicated information.

3. Enter your new connector's name in the **Connector Name** box.
4. Enter insertion loss and reflectance thresholds in the **Connector Configuration** panel.
5. Click **Apply** to save the modifications.

Note: *Insertion loss limits should be between 0.01 and 99.99 dB. Reflectance limits should be between –0.01 and –99.99 dB. Make sure that warning limits are lower than pass limits.*

To modify an existing connector type:

1. Select the **Config** function tab, then select the **Connector** tab.
2. Select the name of the connector type you want to modify from the **Connector Name** box.
3. In the **Connector Configuration** panel, modify the insertion loss and reflectance limits as necessary.
4. Click **Apply** to save the modifications.

IMPORTANT

Tests and DUTs that use a modified connector will also be updated. Measurements acquired with the previous connectors will be saved.

To delete an existing connector type:

1. Select the name of the connector type you wish to delete.
2. Click **Delete**. If this connector type was associated with a DUT or test, the system will ask if you want to proceed or not.

Defining DUTs

You can add a new DUT or modify information on an already defined DUT. During DUT definition, you will specify the type of fiber to be tested. The MS12001 Cable Assembly Test System allows you to test:

- Singlemode fibers (core of 9 μm)
- Multimode fibers (core of 50 μm)
- Multimode fibers (core of 62.5 μm)

IMPORTANT

For multimode testing, if you intend to use a switch that does not match the fiber core, read *Multimode Fiber Launch Conditions* on page 386.

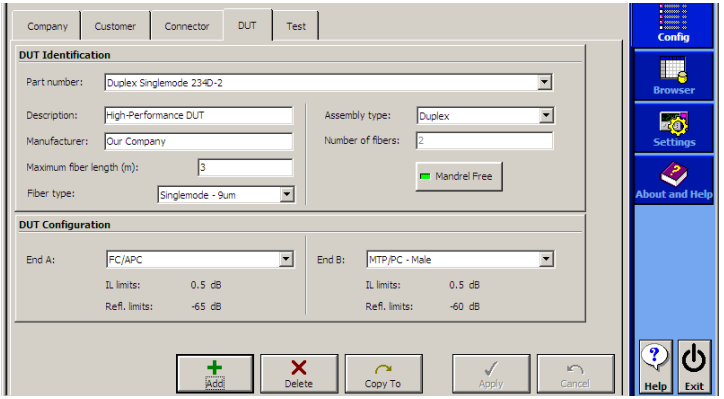
You will also indicate if the DUT can be used without a non-reflective termination or not. For more information, see *Non-Reflective Terminations* on page 387.

IMPORTANT

To avoid erroneous results, *singlemode* patchcords shorter than 1.8 meters cannot be considered mandrel-free. You will have to use non-reflective terminations (for more information on these methods, see *Non-Reflective Terminations* on page 387).

To add a new DUT type:

1. Select the **Config** function tab, then select the **DUT** tab.



2. Click **Add** if you want to add entirely new information.

OR

Select an existing DUT type from the **DUT Identification** panel and click the **Copy to** button. A new DUT type will be created with the duplicated information.

3. Enter your new DUT's part number in the **Part Number** box and enter the remaining parameters identifying your DUT.

Note: *Singlemode fiber length can be as long as 1500 m. It is highly recommended to specify the fiber length to optimize the pulse length and avoid unnecessary delays during the test.*

4. If your DUT can be tested without a non-reflective termination, click the **Mandrel-Free** button.

IMPORTANT

If you want to test *singlemode* fibers shorter than 1.8 meters, you must ensure that the mandrel-free option is not selected.

5. From the **DUT Configuration** panel, select the appropriate connectors for both ends. Connector properties are shown as a reference but can be modified as explained in *Defining Connector Types* on page 92.
6. Click **Apply** to save the modifications.

To modify an existing DUT type:

1. Select the **Config** function tab, then select the **DUT** tab.
2. Select the part number of the DUT you want to modify from the **Part Number** box.
3. Modify the identification and connector types as necessary.
4. Click **Apply** to save the modifications.

IMPORTANT

Tests that use the modified DUT will also be updated. Measurements acquired with the previous DUT remain available.

To delete an existing DUT type:

1. Select the part number of the DUT type you wish to delete.
2. Click **Delete**. If this DUT was associated with a test, the system will ask if you want to proceed or not.

IMPORTANT

The system will erase all traces of the DUT in the current test. Acquired data will remain available.

Entering Test Information

Using DUTs, connector types and customer data defined in the application, you may set up test profiles for future use.

The offered wavelengths depend on the fiber type specified during DUT definition (see *Defining DUTs* on page 94). For instance, a singlemode fiber can be tested at three different wavelengths and a multimode fiber, at two wavelengths.

IMPORTANT

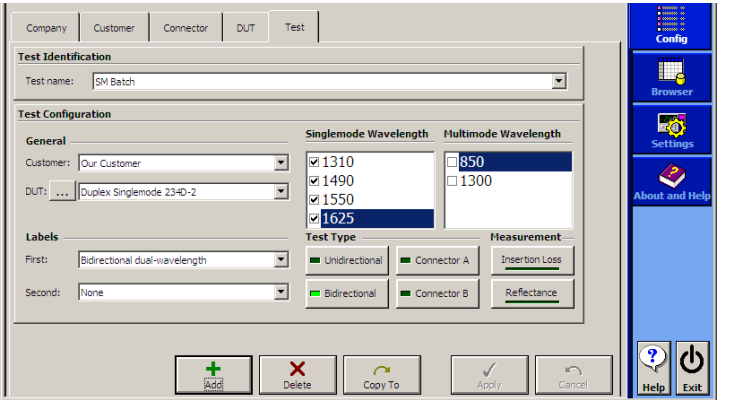
For multimode testing, if your test profile contains reflectance, be careful when selecting which MS12 Loss Test Module you will use. Some of these modules are intended for IL measurement only (no reflectance measurements possible).

IMPORTANT

If you want to test multimode fibers shorter than 1.8 meters, JGR recommends that you select the unidirectional test type.

To create a test profile:

1. Select the **Config** function tab, then select the **Test** tab.



2. Click **Add** if you want to add entirely new information.

OR

Select an existing test profile from the **Test Identification** panel and click the **Copy to** button. A new test profile will be created with the duplicated information.

3. Enter your new test profile's name in the **Test Name** box.

4. Select the test parameters in the **Test Configuration** panel. For more information about test types and measurement parameters, see *Test Features* on page 6.

Note: *To be able to perform a test set with more than two wavelengths or with two wavelengths that are found on separate MS12 Loss Test Modules, your MS12001 must include two MS12 Loss Test Modules which provide the appropriate wavelengths, as well as an MS7 Optical Switch with 1 x 2 switch ports for selecting the test wavelengths. For more information, see* Connecting Two RMs and the RM Switch *on page 25.*

5. Click **Apply** to save the modifications.

To modify an existing test profile:

1. Select the **Config** function tab, then select the **Test** tab.
2. Select the name of the test profile you want to modify from the **Test Name** box.
3. Modify the identification and parameters as necessary.
4. Click **Apply** to save the modifications.

IMPORTANT

Measurements taken using the "original" profile remain available.

To delete an existing test profile:

1. Select the name of the test profile you wish to delete.

IMPORTANT

The system will erase all traces of the test. Acquired data will remain available.

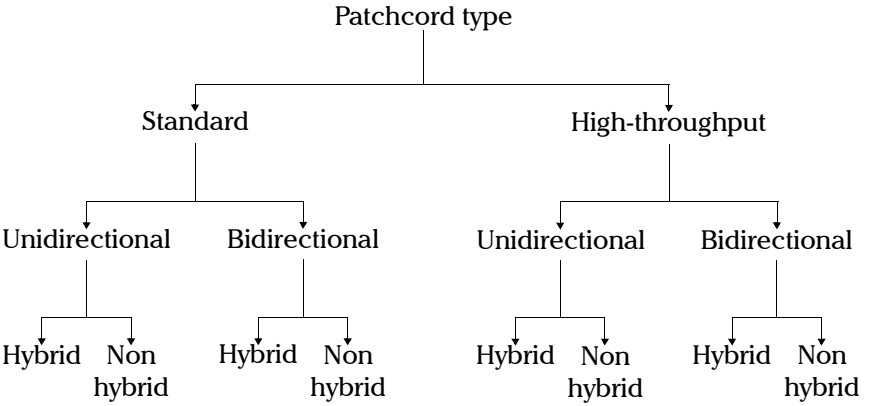
2. Click **Delete**.

6 Preparing Your Test Sequence

Before performing a sequence of tests with the MS12001 Cable Assembly Test System, you must understand what a test sequence is and how to set up the test parameters. You must also know how to reference master test jumpers.

Overview of Possible Test Sequences

The following diagram gives you an overview of the types of patchcords, configurations and tests presented in the next chapters.

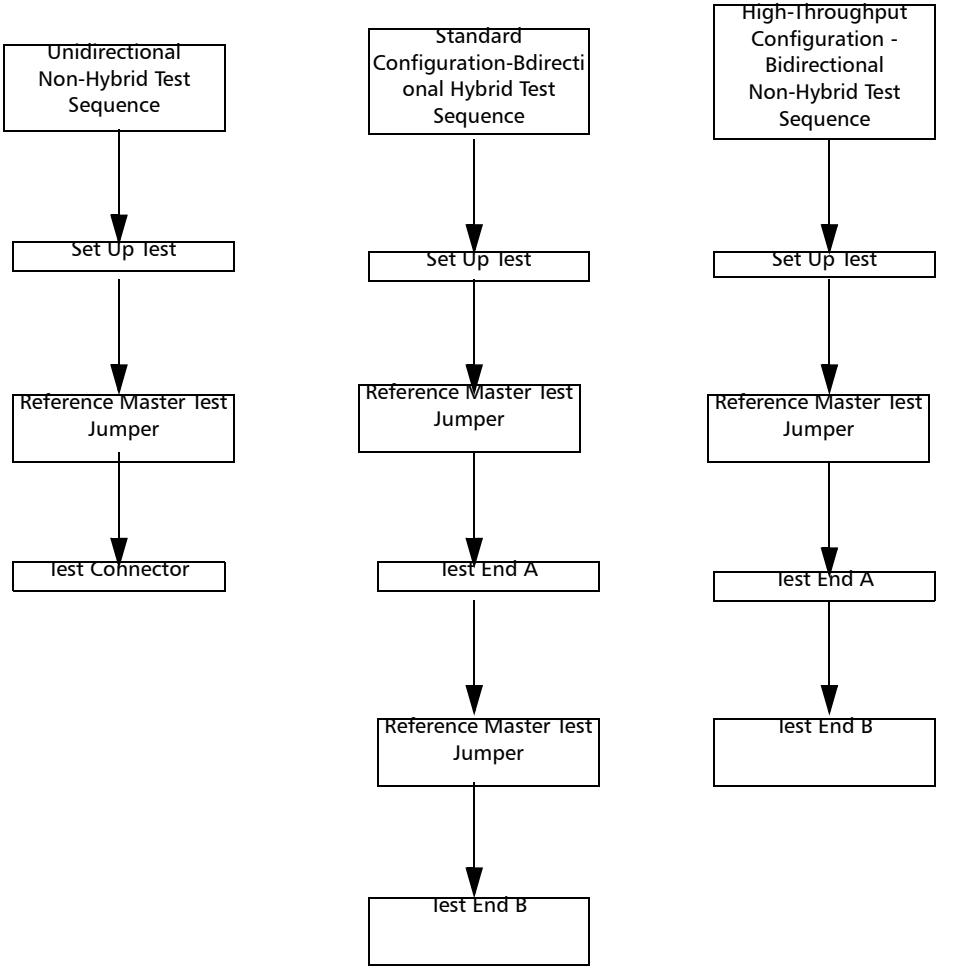


The Cable Assembly Test System can test the following patchcord types:

- Simplex: see *Testing Simplex Patchcords* on page 139.
- Duplex: see *Testing Duplex Patchcords* on page 173.
- Bundle: see *Testing Bundle Patchcords* on page 213.
- Fanout: see *Testing Fanout Patchcords* on page 217.
- MTP/MTRJ: see *Testing Multifiber Patchcords* on page 243.

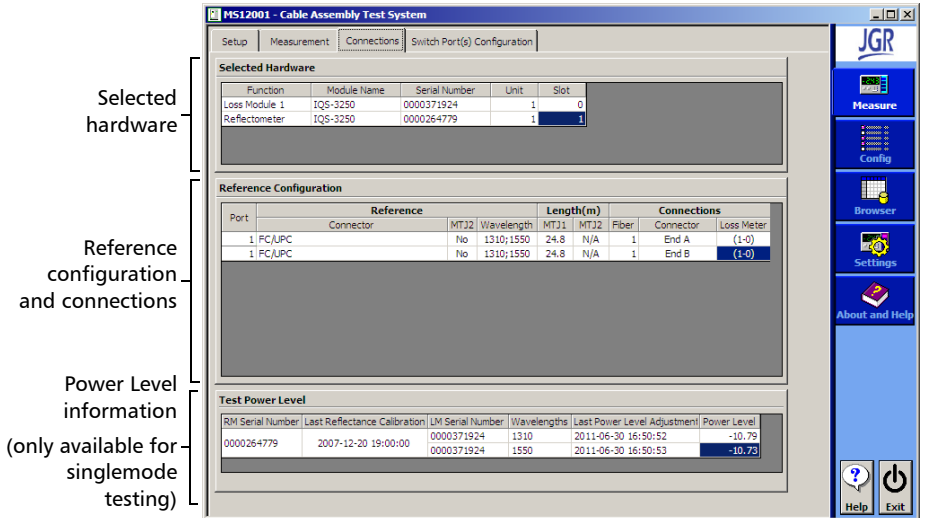
Note: *Fanout patchcords are hybrid by definition. The gray boxes in the above diagram indicate that the corresponding configurations do not exist for fanout.*

Here are examples of test sequences to show how the references interact with measurements.



Throughout your test sequences, you are always able to verify if your connections were made properly. The Connections tab gives you information about:

- Selected hardware: serial number and position of the modules.
- Connections: fiber and connectors tested and module to which it is connected.
- References taken: the master test jumper that was referenced as well as its length, the connector that was referenced, and the wavelength at which the test was done.



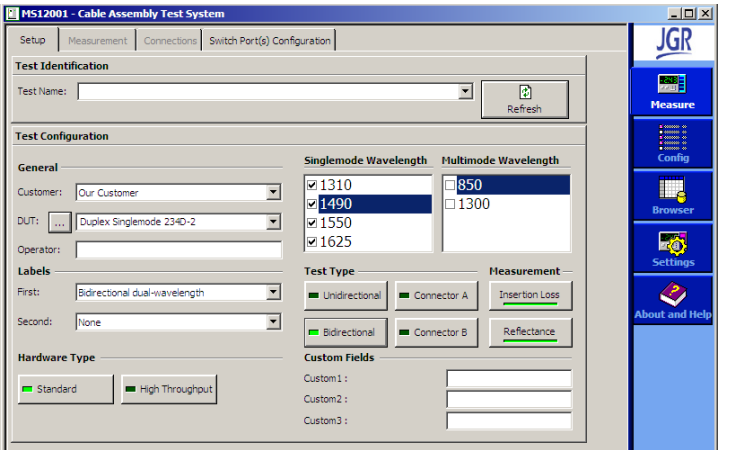
Note: *You can access the Connections tab when your system is set to single RM configuration. When the system is set to two RM configuration, the tab is unavailable.*

Setting Up Your Test

The parameters defining the available test profiles have been previously set up by the supervisor (see *Setting Up Test Profiles* on page 89). Regardless of the type of patchcords you intend to test, the procedure remains the same; you must either select the test profile that applies to your patchcords or define new test parameters manually.

To set up a test:

1. From the **Measure** function tab, click the **Setup** tab.



2. Select the desired test profile in the **Test Name** box.

   OR

   Set up your own test by defining the parameters you need.

IMPORTANT

If you manually define your test parameters, they will be lost once you close the application. The test results will be saved in the database, but they will remain associated to a test with no name.

Note: *To be able to perform a test set with more than two wavelengths or with two wavelengths that are found on separate MS12 Loss Test Modules, your MS12001 must include two MS12 Loss Test Modules which provide the appropriate wavelengths, as well as an MS7 Optical Switch with 1 x 2 switch ports for selecting the test wavelengths. For more information, see* Connecting Two RMs and the RM Switch *on page 25.*

IMPORTANT

When testing hybrid patchcords, standard configuration and bidirectional testing, JGR recommends to define a complete test profile (with a name). This way, you will be able to test End A and End B in distinct test sessions (after closing the application or changing the setup).

To avoid losing data if you omit to give your test a name, you will be forced to complete test on both End A and End B before performing another action.

3. In the **Test Configuration** panel, specify the following parameters:

- ➤ Hardware Type
- ➤ Custom Fields
- ➤ Operator

Note: *The application will use the first two MS12 Loss Test modules available in the system. For example, if you have three MS12 Loss Test modules, one in slot 1, one in slot 2 and one in slot 9, the application will register the first two where it will find the required test wavelengths. The required test wavelengths found on the first registered module will be used in the first place. Those available on the second module will be used only if not found on the first module.*

Cleaning and Connecting Optical Fibers

IMPORTANT

To ensure maximum power and to avoid erroneous readings:

- **Always inspect fiber ends and make sure that they are clean as explained below before inserting them into the port. JGR is not responsible for damage or errors caused by bad fiber cleaning or handling.**
- **Ensure that your patchcord has appropriate connectors. Joining mismatched connectors will damage the ferrules.**

To connect the fiber-optic cable to the port:

1. Inspect the fiber using a fiber inspection microscope. If the fiber is clean, proceed to connecting it to the port. If the fiber is dirty, clean it as explained below.

2. Clean the fiber ends as follows:

2a. Gently wipe the fiber end with a lint-free swab dipped in isopropyl alcohol.

2b. Use compressed air to dry completely.

2c. Visually inspect the fiber end to ensure its cleanliness.

3. Carefully align the connector and port to prevent the fiber end from touching the outside of the port or rubbing against other surfaces.

   If your connector features a key, ensure that it is fully fitted into the port's corresponding notch.

4. Push the connector in so that the fiber-optic cable is firmly in place, thus ensuring adequate contact.

   If your connector features a screwsleeve, tighten the connector enough to firmly maintain the fiber in place. Do not overtighten, as this will damage the fiber and the port.

Note: *If your fiber-optic cable is not properly aligned and/or connected, you will notice heavy loss and reflection.*

Testing Reflectance on Short Fibers

The MS12001 Cable Assembly Test System allows you test reflectance even on short fibers (<1.8 meters) by following the guidelines provided in the table below. For more information on the returned values, see *Selecting the Number of Reflectance Values* on page 58.

For...	Actions	Results
Singlemode fibers	➤ Deactivate the mandrel-free option. ➤ Select a *bidirectional* test. ➤ Use a non-reflective termination method. JGR recommends that you use the mandrel-wrap technique. For more information on the possible methods, see *Non-Reflective Terminations* on page 387.	One result at a time will be returned (connector A, then connector B).
Multimode fibers	➤ Select a *unidirectional* test. ➤ Select to display two results. For more information, see *Selecting the Number of Reflectance Values* on page 58. ➤ Do NOT use a non-reflective termination.	Two results will be returned.

Monitoring IL and RL References or Measurements

The Cable Assembly Test System has a Monitoring feature to allow you to verify power variations while you test your connections for IL and RL variations while referencing master test jumpers or testing DUTs.

The options selected for setting up the monitoring display will determine which options will be available from several monitoring commands, as well as the measurement values displayed. For more information, see *Setting Monitoring Display Options* on page 68.

Monitoring options for the measurement history graph are also determined by the test setup. For more information, see *Setting Up Your Test* on page 104.

The selected monitoring display options also have an impact on the monitoring speed:

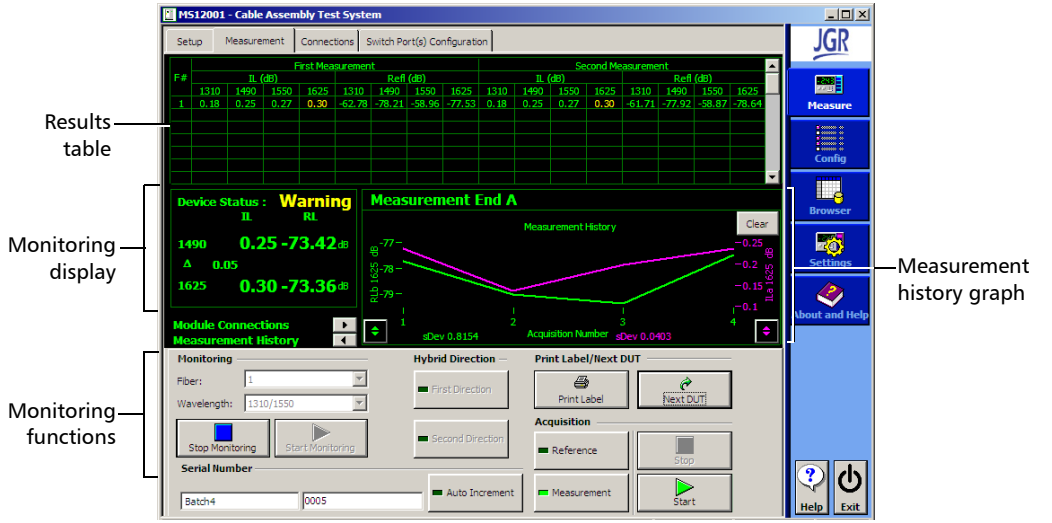
- Monitoring a single wavelength for IL measurement. This is the fastest available monitoring option.
- Monitoring IL and RL. This option is slower than for IL alone.
- Monitoring a two wavelengths. This is the slowest monitoring option.

Note: *Monitoring two wavelengths at the same time is possible only when both wavelengths come from the same RM. This is to prevent premature wearing of the RM switch.*

Monitoring is performed continuously, from the time your modules have been initialized until you exit the application. You can also manually stop monitoring your measurement values at any time, and then resume by activating the appropriate commands.

Note: *Monitoring automatically stops after the system has been inactive for five minutes. As soon as you begin referencing or taking measurements again, monitoring automatically restarts.*

Monitoring can be stopped manually by clicking the **Stop Monitoring** button under **Monitoring**. To restart monitoring, click the **Start Monitoring** button.



CAUTION

Check for the laser warning label under the function tabs on the main window. When the laser is on, the warning label appears.

The *monitoring* functions are grouped on the **Measurement** tab accessible from the **Measure** function tab:

- Monitoring functions:

  Provide commands to display the measurement values for the desired DUT fibers and test wavelengths, as well as to stop or start monitoring. For more information, see *Changing Your Monitoring Setup* on page 113.

- Monitoring display:

  Shows the IL and RL values detected in real time, for the one or two wavelengths being monitored. For more information, see *Monitoring the Detected IL and RL* on page 115.

- Measurement history graph:

  Displays the IL and RL measurements from the A and B connectors, or sometimes a general IL or RL measurement, recorded in the database. A standard deviation value is also displayed. It is calculated from the measurements recorded during your tests.

  The measurement history graph is not used to monitor the referencing of master test jumpers.

  For more information, see *Consulting the Measurement History Graph* on page 116.

Note: *With a three-digit display resolution, IL monitoring or IL measurement values of 10 dBm or more are rounded to two digits.*

Monitoring References

To monitor references, you use the following sections of the **Measurement** tab:

- The monitoring functions (for more information, see *Changing Your Monitoring Setup* on page 113).
- The monitoring display (for more information, see *Monitoring the Detected IL and RL* on page 115).

IMPORTANT

During referencing, monitoring allows you to make sure that connections were properly made. The power is only used as a guidance, for it has not been calibrated to give absolute values (dBm).

The monitored values and the results differ for singlemode and multimode fibers.

For	Monitoring Displays	For MTJ1, table shows	For MTJ2, table shows
Singlemode	Power read (only as a guidance)	Insertion loss of the complete optical path. *One RM configuration*: From the output port of the MS12 Loss Test Module to the input port of the MS12-PM01 Loss Module. *Two RM configuration*: From the output port of the MS12 Loss Test Module to the input port of the MS12 Loss Test Module selected for the test.	Insertion loss of MTJ2
Multimode	Power read (only as a guidance)	A calculated value that will be used later by the system	Insertion loss of MTJ2

Monitoring Measurements

To monitor measurements, you use the following sections of the **Measurement** tab:

- The monitoring functions (for more information, see *Changing Your Monitoring Setup* on page 113).
- The monitoring display (for more information, see *Monitoring the Detected IL and RL* on page 115).
- The measurement history graph (for more information, see *Consulting the Measurement History Graph* on page 116).

The monitored values and the results differ for singlemode and multimode fibers.

For	Monitoring Displays	In unidirectional, table shows	In bidirectional, table shows
Singlemode and multimode	*Unidirectional testing*: Insertion loss of the DUT and reflectance of connector A and B. *Bidirectional testing*: Insertion loss and reflectance of connector A or B (the one connected to MTJ1).	Insertion loss of the DUT and reflectance of connector A and B.	Insertion loss and reflectance of connector A and insertion loss and reflectance of connector B.

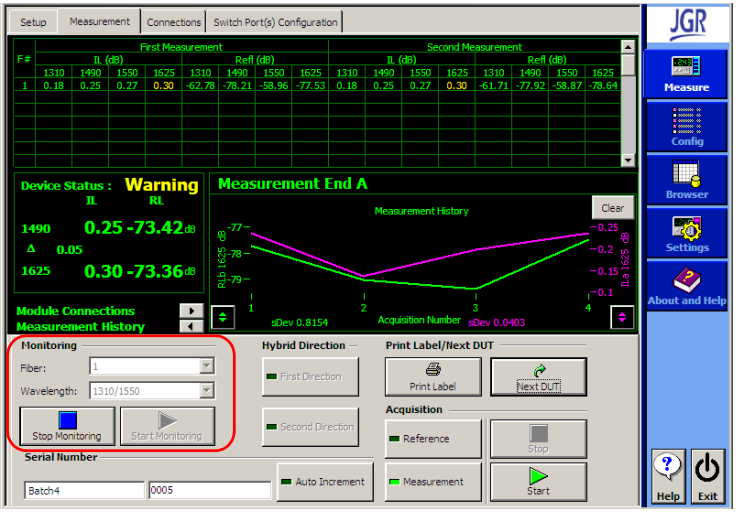
Changing Your Monitoring Setup

The monitoring functions allow you to select the fiber and the wavelengths to be monitored. You can also manually stop or start monitoring your reference or IL and RL measurements.

The fiber numbers in the **Fiber** list is determined by the number of fibers of the DUT you have defined in your test setup. For more information, see *Defining DUTs* on page 94.

To select the fiber to monitor:

1. Under **Monitoring**, in the **Fiber** list, select the fiber number.



2. In the **Wavelength** list, select the wavelength or pair of wavelengths to appear in the monitoring display.

The choice of wavelengths in the **Wavelength** list varies according to the monitoring display options. For more information, see *Setting Monitoring Display Options* on page 68. Moreover, only the wavelengths included in the test are available for selection.

If a single wavelength monitoring option has been selected, the wavelengths can only be selected one at a time.

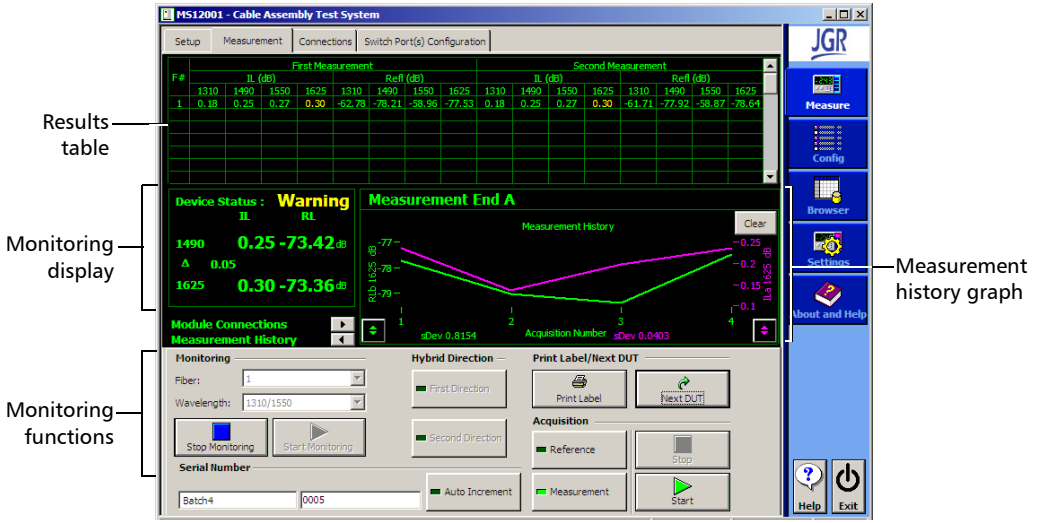
If a dual wavelength monitoring option has been selected, the wavelengths available on the RMs from your system are displayed.

Note: *Monitoring two wavelengths at the same time is possible only when both wavelengths come from the same RM. This is to prevent premature wearing of the RM switch.*

Monitoring the Detected IL and RL

The monitoring display shows in real time the power value read by the insertion loss meter or the reflectance meter.

The values displayed in the monitoring display change according to the monitoring display options selected in the system parameters. For more information, see *Setting Monitoring Display Options* on page 68.



The monitoring display can provide monitoring values for one IL, two IL, one IL and one RL, or two IL and two RL.

When monitoring two wavelengths at the same time, the monitored values may be slightly different due to switching between the two wavelengths. However, the measure will not be affected.

When a dual-wavelength IL option is selected, the power difference (delta) calculated between the IL values for the two wavelengths is displayed.

You can use the power difference of the IL to identify inappropriate mechanical or optical constraints on a DUT.

Consulting the Measurement History Graph

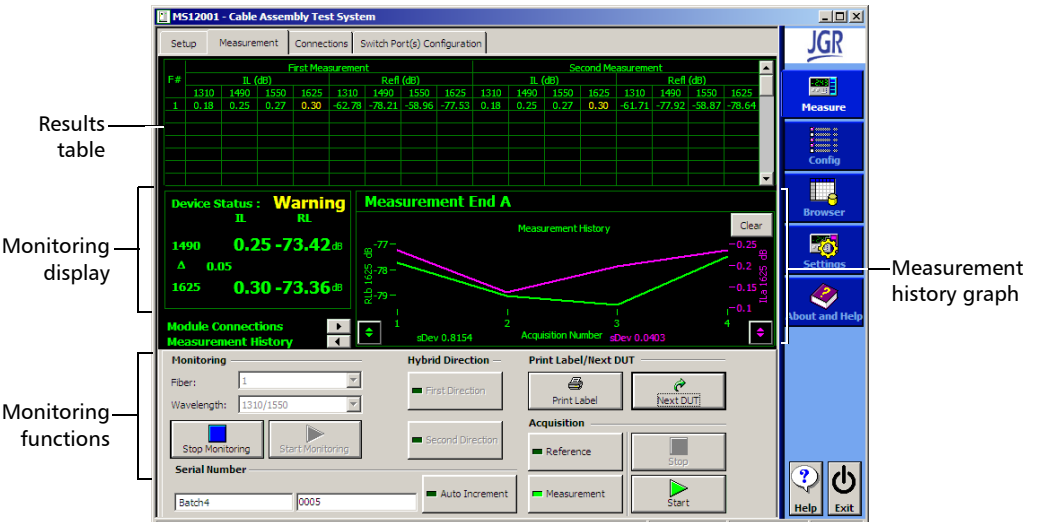
The measurement history graph displays graphs of the IL and RL measurements recorded in the database, as specified by the wavelength, test type and measurement options from the Setup tab found on the Measure function tab.

The measurement history graph provides you with a trend in the measurements you have already recorded. Since the measurements from the results table are not recorded in the database, they are not included in the measurement history graph.

Up to the latest one hundred measurements recorded in your database while your system remains open can be shown in the graph. While testing, you can also clear the graph of values.

The measurements available for display change according to your setup. For more information, see *Setting Up Your Test* on page 104.

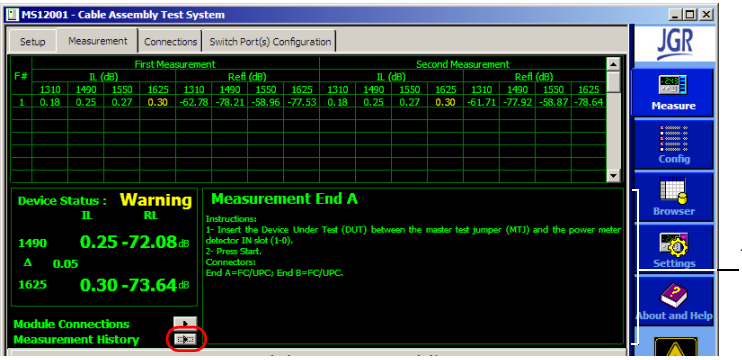
Note: *Master test jumper references are not displayed in the history graph.*



In place of the measurement history graph, you can display test instructions. For more information, see *Selecting Test Instructions* on page 76.

To toggle the display between the history graph and the test instructions:

Click the arrow button next to **Measurement History**.



Above the measurement history graph or your test instructions, you can display connection diagrams. For more information on displaying connection diagrams, see *Displaying/Hiding Connection Diagrams* on page 136.

On the lower left and lower right corners of the measurement history graph, you can display sets of measurements for the wavelengths, IL or RL, and connectors specified in your test setup.

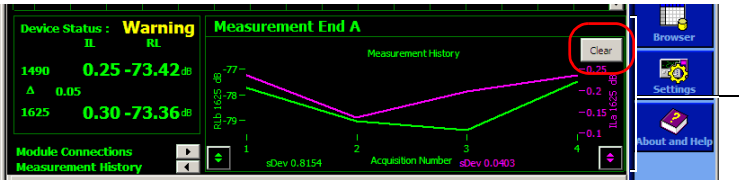
With one measurement set selected on one side of the graph, the other sets available from your test can be selected from the other side. The measurement set selected from the left-hand side is displayed in green. The one selected from the right-hand side is displayed in magenta.

To select measurement sets in the measurement history graph:

In the lower-right or lower-left corner of the measurement history graph, click the arrow button to open the measurement list, and select the desired measurement set.

For each set of measurements displayed in the measurement history graph, a standard deviation value is automatically calculated and displayed. For more information, see *Standard Deviation Calculation* on page 119.

You can clear the measurement history graph of values to refresh the measurements that are being monitored.



To clear the measurement history graph:

Click the **Clear** button.

Standard Deviation Calculation

A standard deviation value is calculated for each set of measurements defined in your test setup. In the measurement history graph, the standard deviation is displayed for each selected measurement set.

The standard deviation calculated is a discreet probability.

Up to a hundred values from your measurements are being used for calculating the standard deviation. The latest one hundred measurement values recorded in the system database are being used for calculation.

If variable x takes a finite number of values x_1, ..., x_n, with respective probabilities p_1, ..., p_n (under the condition $\sum_{i=1}^{n} p_i = 1$),

the standard deviation is given by

$$\sigma = \sqrt{\sum_{i=1}^{n} P_i \cdot (x_i - \bar{x})^2} = \sqrt{\left(\sum_{i=1}^{n} P_i \cdot x_i^2\right) - \bar{x}^2}$$

where

$$\sum_{i=1}^{n} P_i \cdot x_i$$

More specifically, if the law of x is uniform on an ensemble of finite values, we have

$$\sigma_x = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(x_i - \bar{x})^2} = \sqrt{\frac{1}{n}\left(\sum_{i=1}^{n} x_i^2\right) - \bar{x}^2}$$

where

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Note: *You can also calculate the standard deviation for your measurements with the help of a report, since all of the necessary data is recorded in the test database. For more information, see Customizing Labels and Reports* on page 294.

Referencing Master Test Jumpers

Referencing master test jumpers is an essential part of the testing process. JGR recommends that you reference your master test jumpers at least before each batch of patchcords.

Note: *Under Windows XP, to allow users without sufficient Write permissions to perform reflectance measurements, for example those in Restricted User mode, a Network Administrator must give them the Write permission to their accounts on* C:\Documents and Settings\Application\Data\MS12001.

For more information, see Setting User Permissions *on page 42.*

Note: *If you are testing in multimode, reflectance only, and you cannot connect your master test jumper to the detector, it is normal that you receive a message indicating that the input power is too low. In this case, simply ignore the warning and go on with the test.*

The major difference between referencing singlemode and multimode fibers is reflectance. With multimode fibers, the reflectance reference is performed using a fiber-to-air interface (one end of the patchcord remains in the air), during a separate step.

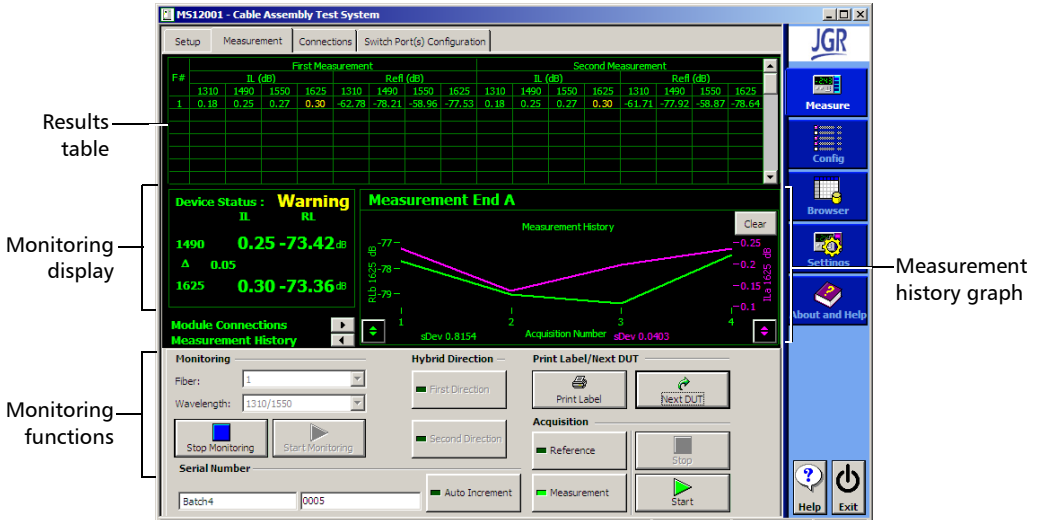
IMPORTANT

For accurate results with multimode testing, you must use master test jumpers of 3 meters or more.

The Cable Assembly Test System has monitoring functions to allow you to verify power variations while you test your connections. For more information, see *Monitoring IL and RL References or Measurements* on page 109.

IMPORTANT

During referencing, monitoring allows you to make sure that connections were properly made. The power is only used as a guidance, for it has not been calibrated to give absolute values (dBm).



CAUTION

Check for the laser warning label on the right side of the screen. When the laser is on, the warning sign appears.

Performing a Reflectance Reference

This operation only applies to multimode fibers.

This step is performed to calibrate the internal reflection of the MS12 Loss Test Module. This calibration is based on the fact that Fresnel reflections occurring at a fiber-to-air interface correspond to a known constant.

IMPORTANT

To obtain accurate results, always ensure that

- **your fibers are clean and properly connected. For more information, see *Cleaning and Connecting Optical Fibers* on page 106.**
- **during the reflectance reference, the end of the master test jumper (that has to remain in the air) is far from any reflecting surface.**

To perform a reflectance reference on a master test jumper:

1. From the **Measure** function tab, select the **Measurement** tab.
2. Click the **Reference** button.
3. Connect your master test jumper(s).
4. Click **Start** to launch the acquisition.

Note: *The master test jumper (MTJ) length will also be detected during this operation.*

Performing an IL Reference

This operation applies to both singlemode and multimode fibers.

An insertion loss reference measurement is performed to compensate for any loss in the system (for example, connections, switches) or in the master test jumpers. It also allows you to take the source power into account.

IMPORTANT

To obtain accurate results, always ensure that your fibers are clean and properly connected (see *Cleaning and Connecting Optical Fibers* on page 106).

To reference a master test jumper in bidirectional testing:

IMPORTANT

If you are testing multimode fibers and have selected a reflectance measurement, go directly to step 3 to avoid losing the results of the reflectance reference you have just performed.

1. From the **Measure** function tab, select the **Measurement** tab.
2. Click the **Reference** button.
3. Connect your master test jumper(s).
4. Click **Start** to launch the acquisition.

Note: *The master test jumper (MTJ) length will also be detected during this operation if you are testing singlemode fibers and have selected a reflectance measurement.*

To reference a master test jumper in unidirectional testing (when you can connect MTJ1 and MTJ2 together):

IMPORTANT

In unidirectional testing, the second master test jumper must have a UPC end to connect to the input port of the MS12 Loss Test Module.

IMPORTANT

If you are testing multimode fibers and have selected a reflectance measurement, go directly to step 3 to avoid losing the results of the reflectance reference you have just performed.

1. From the **Measure** function tab, select the **Measurement** tab.
2. Click the **Reference** button.
3. Connect your first master test jumper (MTJ1).
4. Click **Start** to launch the acquisition.

Note: *The length of the first master test jumper (MTJ1) will also be detected during this step if you are testing singlemode fibers and have selected a reflectance measurement.*

5. Connect your second master test jumper (MTJ2).
6. Click **Start** to launch the acquisition.

Note: *If you have chosen to consider the insertion loss of MTJ2 (see* Defining Reference Configuration *on page 51), IL will be measured and the length of MTJ2 will be detected if the reflectance measurement has been selected. If you have chosen NOT to consider the insertion loss of MTJ2, only its length will be detected.*

To reference a master test jumper in unidirectional testing (when you cannot connect MTJ1 and MTJ2 together):

IMPORTANT

In unidirectional testing, the second master test jumper must have a UPC end to connect to the input port of the MS12 Loss Test Module.

IMPORTANT

If you are testing multimode fibers and have selected a reflectance measurement, go directly to step 3 to avoid losing the results of the reflectance reference you have just performed.

1. From the **Measure** function tab, select the **Measurement** tab.
2. Click the **Reference** button.
3. Connect your first master test jumper (MTJ1).
4. Click **Start** to launch the acquisition.

Note: *The length of the first master test jumper (MTJ1) will also be detected during this operation if you are testing singlemode fibers and have selected a reflectance measurement.*

5. Connect your second master test jumper (MTJ2).
6. Click **Start**. When requested, enter the second master test jumper length in the box.

Note: *The master test jumper length should include only the length of MTJ2, and not that of the entire optical path.*

Adjusting Power Level

Note: *Power level adjustment applies only to singlemode testing.*

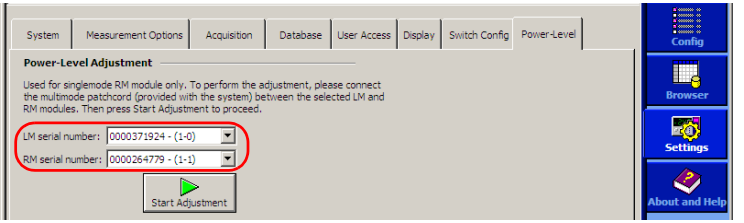
This operation is performed to adjust the power level of loss modules, according to the differences between loss modules (LM) and reflectance modules (RM) power levels.

Power must be adjusted between all LMs and each RM from your system, including when an optical switch is being used for selecting the test wavelengths in two RM configuration.

This step is mandatory and should be performed every month on all LMs in the system or each time modules are moved. The system will prompt you if the power level has never been adjusted with the current hardware.

To adjust the power level:

1. From the **Settings** function tab, select the **Power-Level** tab.
2. Choose the desired loss module from the **LM Serial Number** box.



3. Choose the desired reflectance module from the **RM Serial Number** box.

Note: *Multimode RM will not appear on the provided list since power level adjustment is only intended for singlemode fibers.*

4. Connect your multimode reference jumper (supplied by JGR) as indicated on the screen.
5. Select **Start Adjustment** to start the power level adjustment.
6. Repeat steps 2 to 5 with each loss module that will be used in the system.

Activating/Deactivating Switch Ports

It is possible to identify switch ports as defective so that the application won't use them during testing. This allows you to continue working with the operational ports without being blocked by the defective ones. You can easily reactivate a port to make it available again.

IMPORTANT

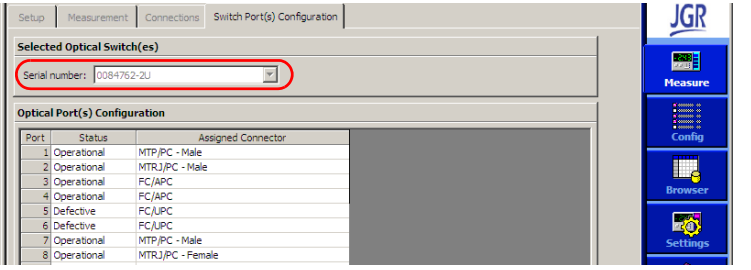
Activating or deactivating switch ports will automatically stop the current test. Modules in the system are also reinitialized.

Note: *You can activate or deactivate switch ports from all optical switches available in the system. However, automatic port activation or deactivation will occur only when a switch is being used for selecting DUTs.*
When a switch is being used for selecting RMs for test wavelengths, Input ports 1 and 2 are preset to be connected to RM 1 and RM 2 respectively. If switch Input ports 1 and 2 are deactivated for the RM switch, the system will inform the user that ports are defective. Defective Input ports 1 and 2 will have to be fixed to be able to perform tests with the system.

To deactivate switch ports:

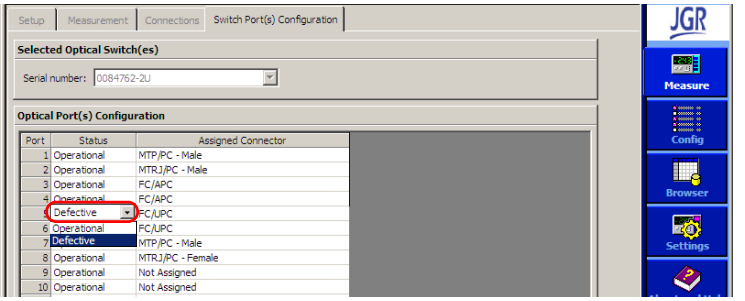
1. From the **Measure** function tab, select the **Switch Port(s) Configuration** tab.

2. From the **Serial Number** box, select the switch to use in your system.



Note: *A switch will appear on the list only if it has been used in at least one test performed with the MS12001 Cable Assembly Test System.*

3. In the provided switch port table, find the line corresponding to the port number you wish to deactivate.



4. From the associated **Status** column, change the status to *Defective*.

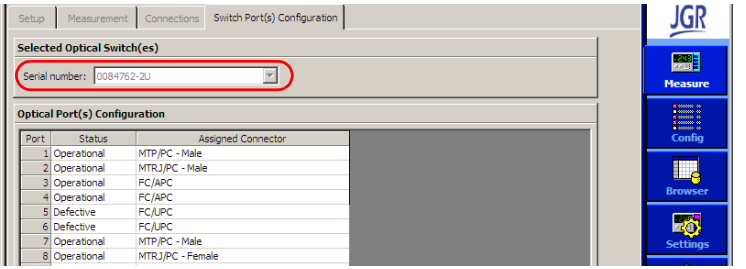
5. Repeat steps 3 to 4 for each port you wish to deactivate.

6. Click **Apply** to confirm.

To reactivate a switch port:

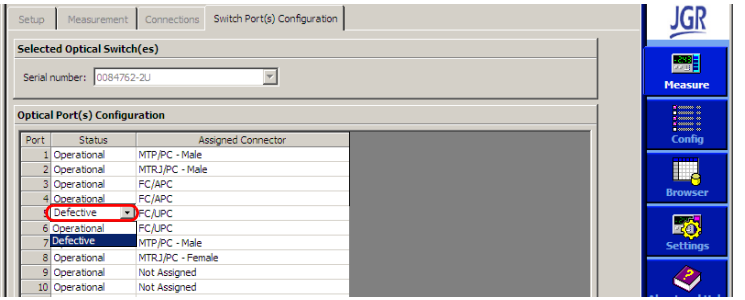
1. From the **Measure** function tab, select the **Switch Port(s) Configuration** tab.

2. From the **Serial Number** box, select the switch to use in your system.



Note: *A switch will appear on the list only if it has been used in at least one test performed with the MS12001 Cable Assembly Test System.*

3. In the provided switch port table, find the line corresponding to the port number you wish to reactivate.



4. From the associated **Status** column, change the status to *Operational*.

5. Repeat steps 3 to 4 for each port you wish to reactivate.

6. Click **Apply** to confirm.

Associating Switch Ports with Connector Types

To avoid disconnecting master test jumpers from the switch, the MS12001 Cable Assembly Test System allows you to associate switch ports with specific connector types. You can also easily remove the association with connectors to make the switch ports independent again.

If no switch ports are associated with a specific connector type, the ports, marked as *Operational* (see *Activating/Deactivating Switch Ports* on page 130), will be used sequentially.

If at least one port is associated with a specific connector type, the application will use:

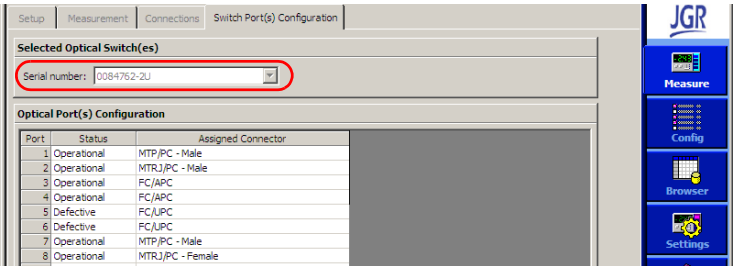
- First: the ports marked as *Operational*, associated with the desired connector type.
- Second: ports marked as *Operational*, not associated with a connector type.
- Third: ports marked as *Operational*, associated with other connector types.

Note: *This function requires Supervisor access rights. For more information, see* Setting User Permissions *on page 42.*

To associate switch ports with connector types:

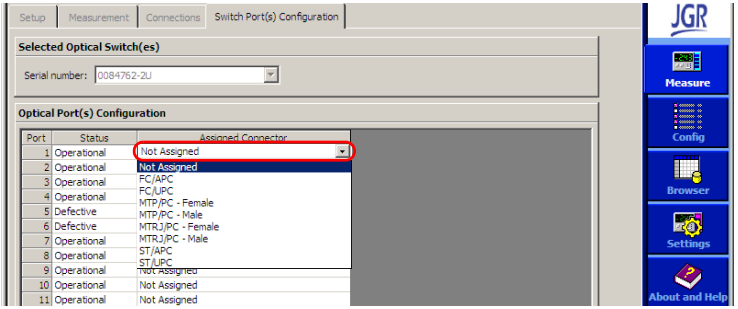
1. From the **Measure** function tab, select the **Switch Port(s) Configuration** tab.

2. From the **Serial Number** box, select the switch to use in your system.



Note: *A switch will appear on the list only if it has been used in at least one test performed with the MS12001 Cable Assembly Test System.*

3. In the port table, find the port number you want to associate to a connector type.



4. In the **Assigned Connector** column, select the connector type.
5. Repeat steps 3 and 4 for each port you want to associate with a connector type.
6. Click **Apply** to confirm.

To remove the association with a connector type:

Follow the exact steps as for associating a port with a connector, but at step 4, change the assigned connector to *Not Assigned*.

Displaying/Hiding Connection Diagrams

The MS12001 Cable Assembly Test System allows you to view images indicating how to connect the patchcords. You will notice that these images contain symbols such as C1, C2, etc.

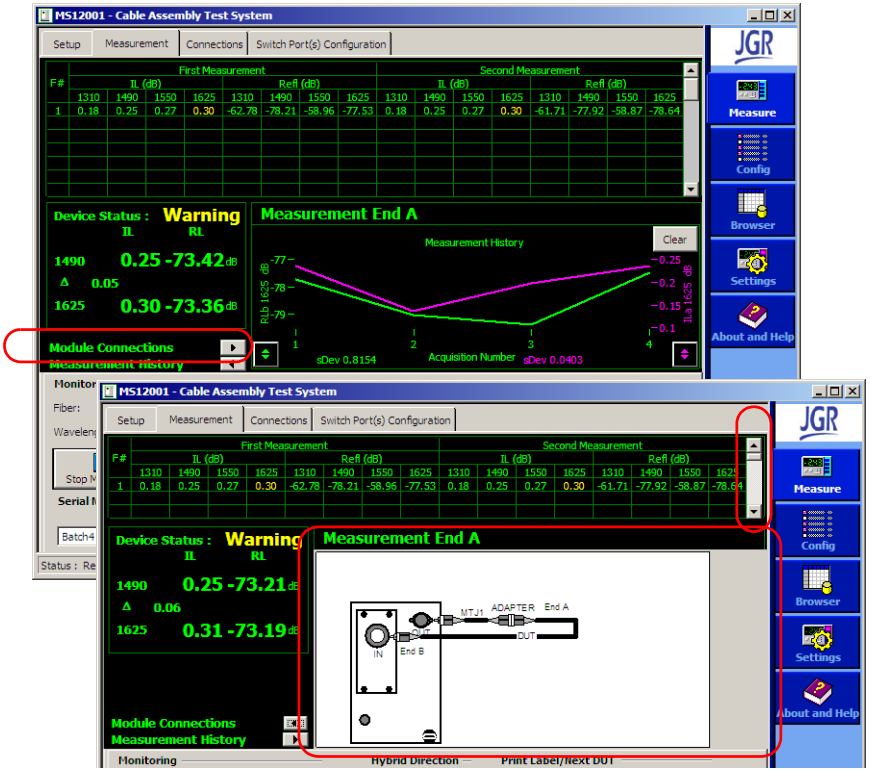
Note: *Diagrams are for guidance only. The actual connectors or port position can differ. Connection diagrams show one RM configuration, even when your system is set to the two RM configuration with a RM switch. In the diagrams, a switch module that is part of the setup is always being used as the DUT switch. For more information on how to use connection diagrams on two RM setup, see* Connecting Two RMs and the RM Switch *on page 25.*

During a test, the application displays a legend with a correspondence between these symbols and the connectors you are actually using.

When the connection diagram is displayed, only the last four results are shown in the table. You have to use the provided scroll bar to view the previous ones. It is always possible to hide the diagram to view the full results table.

To display or to hide the connection diagram:

1. From the **Measure** function tab, select the **Measurement** tab.
2. Click the **Module Connections** arrow to display or to hide the connection diagram.



The connection diagram replaces the measurement history graph.

To view the results from the table, you may use the scroll bar on the right-hand side of the results table.

7 Testing Simplex Patchcords

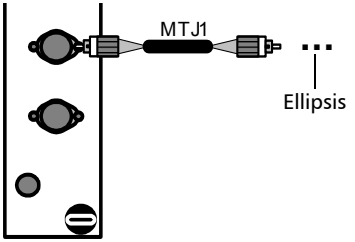
This chapter will guide you through the steps required to test simplex patchcords with the MS12001 Cable Assembly Test System.

Note: *You can use a configuration with two RMs for all of your tests. The appropriate test instructions can also be displayed in the interface. However, procedures for a configuration with one RM are provided through this user guide. Additionally, module connection graphics provided within the MS12001 Cable Assembly Test System software also depict a configuration with one RM. You can find the procedure and connection graphic for two RM setup in section* Connecting Two RMs and the RM Switch *on page 25.*

A simplex patchcord is a cable assembly with a single fiber and a connector at each end, as shown below.

Once your test is set up, you will be ready to test your patchcords. For an overview of the test sequence and preparation, see *Preparing Your Test Sequence* on page 101.

Note: *Some of the figures presented in this chapter include ellipses. These symbols indicate that you must repeat an action several times.*



IMPORTANT

To obtain accurate results, always ensure that your fibers are clean and properly connected (see *Cleaning and Connecting Optical Fibers* on page 106).

Note: *If you are testing in multimode, reflectance only, and you cannot connect your DUT to the detector, it is normal to receive a message indicating that input power is too low. Simply ignore the warning and go on with the test.*

The Cable Assembly Test System has monitoring functions to allow you to verify power variations while you test your connections. For more information, see *Monitoring IL and RL References or Measurements* on page 109.

Testing Non-Hybrid Patchcords, Standard Configuration and Bidirectional Testing

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

To test your patchcord:

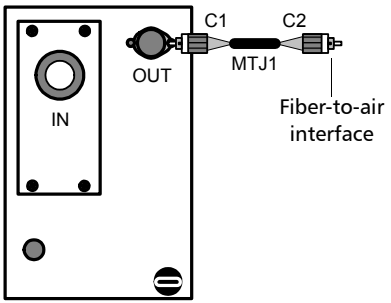
1. Set up your test parameters as explained in *Setting Up Your Test* on page 104.

2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click the **Reference** button.

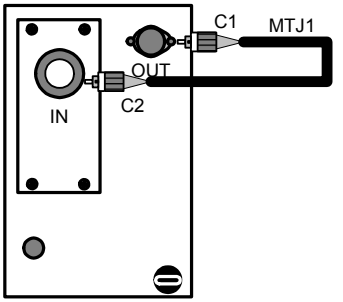
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

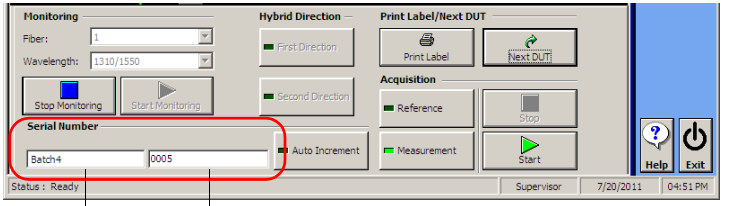
4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

5. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

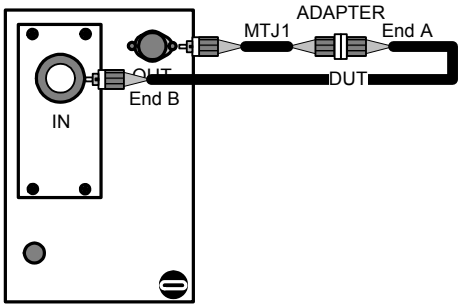
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

6. Measure End A of your DUT.

6a. Click the **Measurement** button.

6b. Set up your connections as shown below.

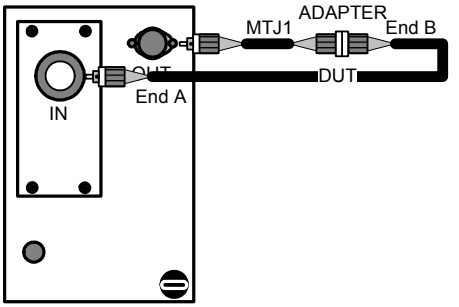


6c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

7. Measure End B of your DUT.

7a. Set up your connections as shown below.



7b. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

8. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

9. Click **Next DUT** to go on to the following DUT.

Testing Hybrid Patchcords, Standard Configuration and Bidirectional Testing

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

To test your patchcord:

1. Set up your test parameters as explained in *Preparing Your Test Sequence* on page 101.

IMPORTANT

When testing hybrid patchcords, standard configuration and bidirectional testing, JGR recommends to define a complete test profile (with a name). This way, you will be able to test End A and End B in distinct test sessions (after closing the application or changing the setup).

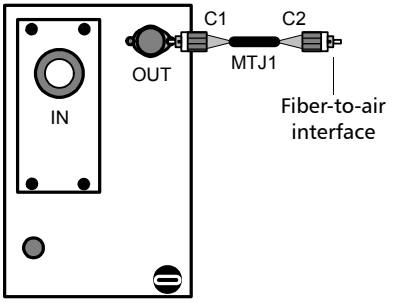
To avoid losing data if you omit to give your test a name, you will be forced to complete test on both End A and End B before performing another action.

2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click on the **Reference** button.

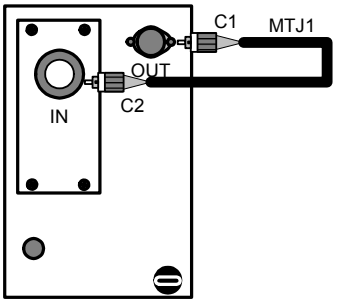
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

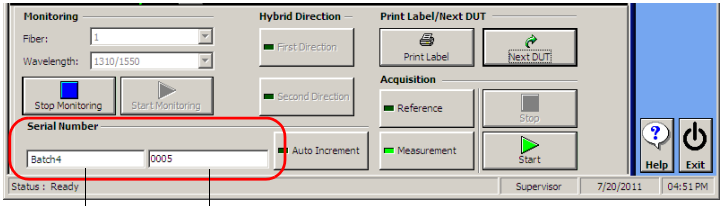
4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

5. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

Must be numeric if used with the Auto Increment Option

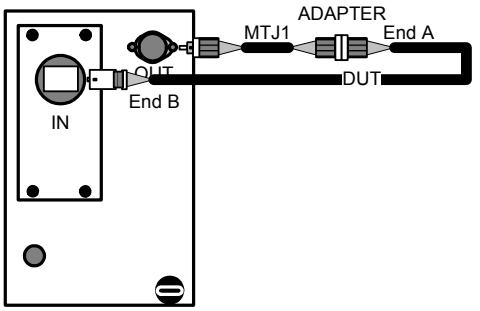
Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

6. Under **Hybrid Direction**, click **First Direction**.

7. Measure End A of your DUT.

7a. Click the **Measurement** button.

7b. Set up your connections as shown below.



7c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

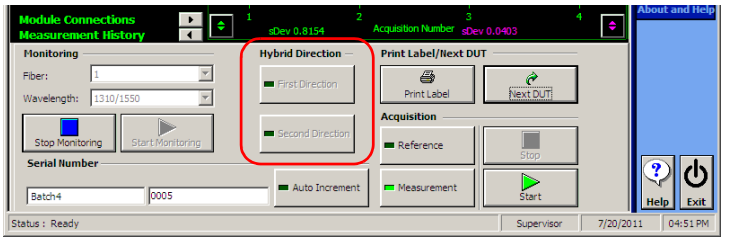
You can view results with the Database Browser without losing any information.

8. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

9. Click **Next DUT** to go on to the following DUT. If you click **Next DUT** without having tested the DUT, it will be written as "*Not completed*" in the database.

Note: *To speed up the process, you can test connector A of a batch of fibers before switching to connector B.*

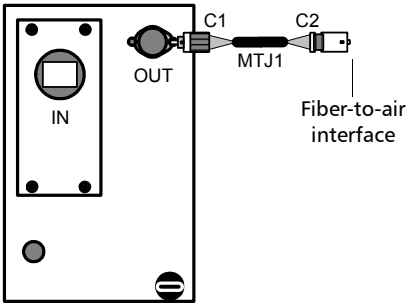
10. If you have completed the test for End A of your batch of patchcords, click **Second Direction**, under **Hybrid Direction**, to test End B.



11. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

11a. Click the **Reference** button.

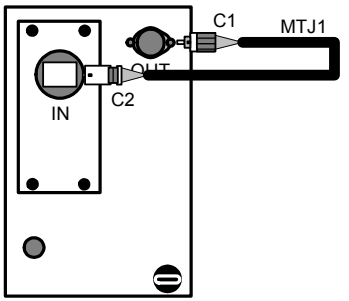
11b. Set up your connections as shown below.



11c. Click **Start** to start the reference acquisition.

12. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

12a. Set up your connections as shown below.



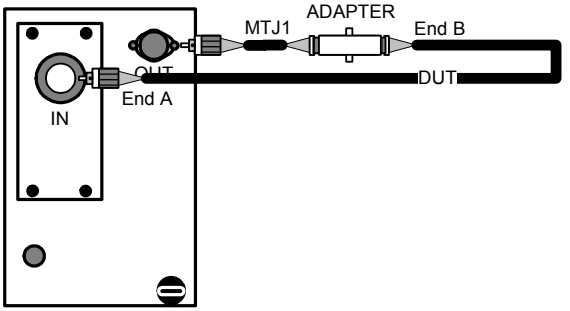
12b. Click **Start** to start the reference acquisition.

13. Verify the DUT serial number given by the system to make sure you are testing the right DUT.

14. Measure End B of your DUT.

14a. Click the **Measurement** button.

14b. Set up your connections as shown below.



14c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

15. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

16. Click **Next DUT** to go on to the next DUT. If you click **Next DUT** without having tested the DUT, it will be written as "*Skipped*" in the database.

Testing Patchcords, Standard Configuration and Unidirectional Testing

IMPORTANT

The second master test jumper must have a UPC end to connect to the input port of the MS12 Loss Test Module.

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

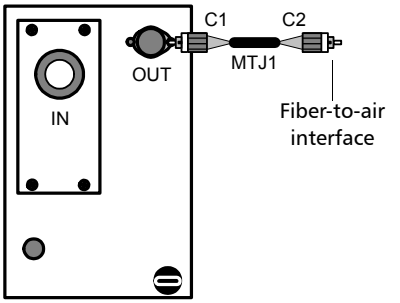
To test hybrid or non-hybrid patchcords:

1. Set up your test parameters as explained in *Setting Up Your Test* on page 104.
2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click the **Reference** button.

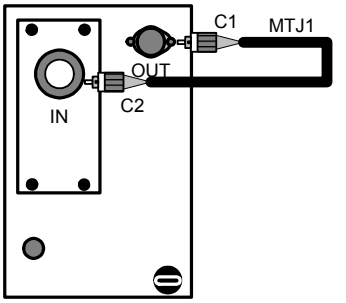
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

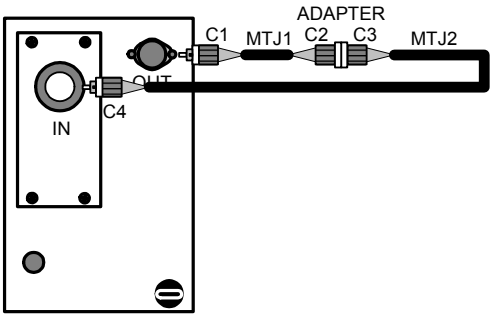
4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

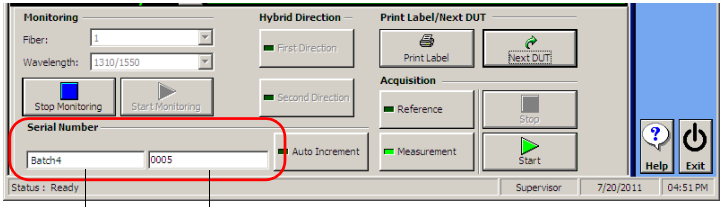
5. Reference your master test jumper 2 for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

5a. Set up your connections as shown below.



5b. Click **Start** to start the reference acquisition.

6. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

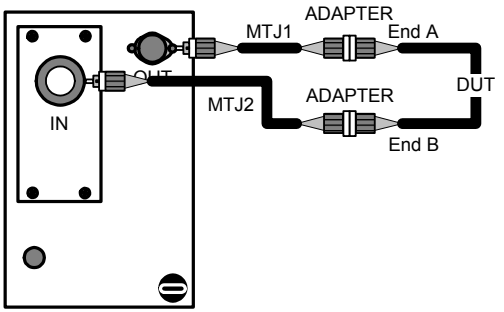
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

7. Measure your DUT.

7a. Click the **Measurement** button.

7b. Set up your connections as shown below.



7c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

8. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

9. Click **Next DUT** to go on to the following DUT.

Testing Non-Hybrid Patchcords, High-Throughput Configuration and Bidirectional Testing

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

Note: *The switch module shown in connection diagrams is the DUT switch.*

To test your patchcord:

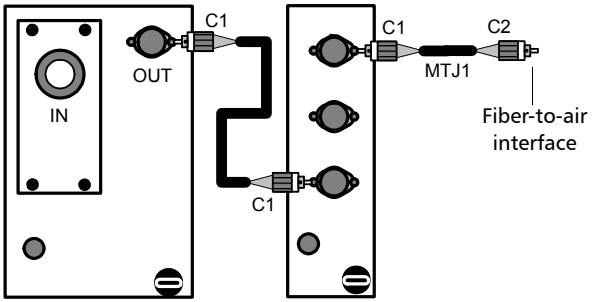
1. Set up your test parameters as explained in *Setting Up Your Test* on page 104.

2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click the **Reference** button.

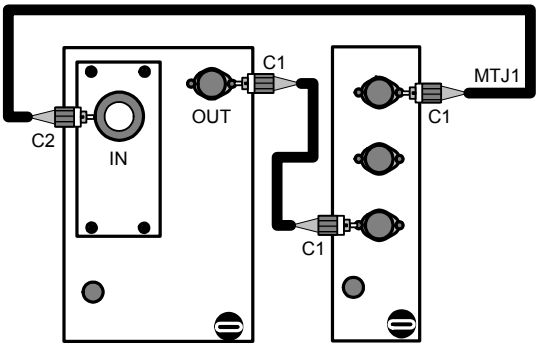
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

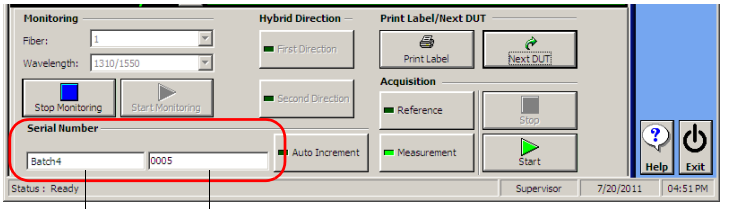
4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

5. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

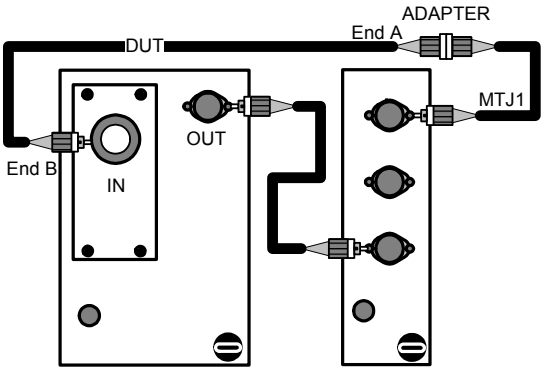
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

6. Measure End A of your DUT.

6a. Click the **Measurement** button.

6b. Set up your connections as shown below.

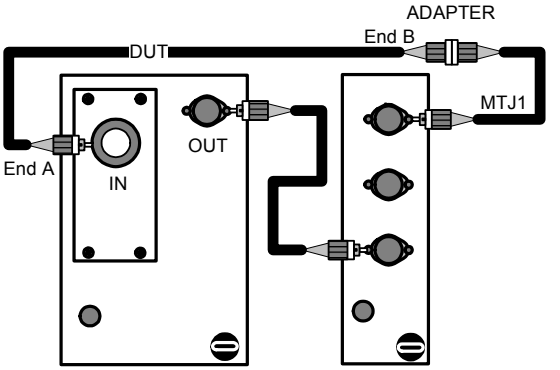


6c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

7. Measure End B of your DUT.

7a. Set up your connections as shown below.



7b. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

8. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

9. Click **Next DUT** to go on to the following DUT.

Testing Hybrid Patchcords, High-Throughput Configuration and Bidirectional Testing

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

Note: *The switch module shown in connection diagrams is the DUT switch.*

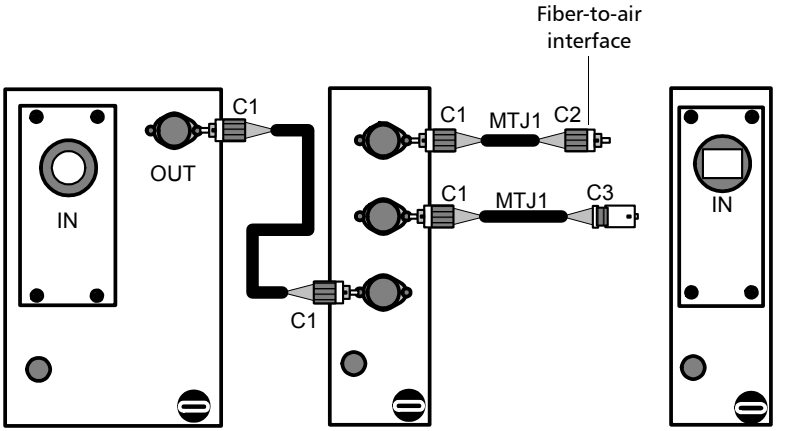
To test your patchcord:

1. Set up your test parameters as explained in *Setting Up Your Test* on page 104.
2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click the **Reference** button.

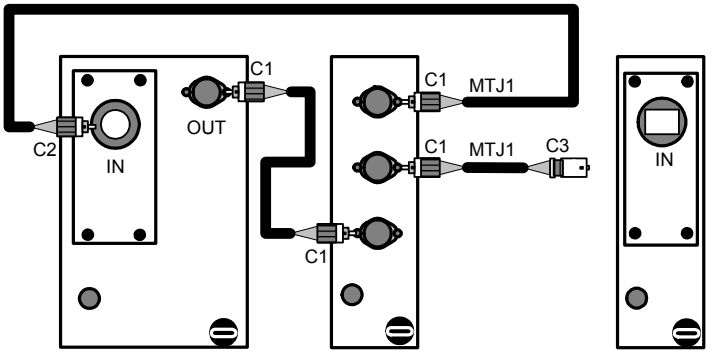
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

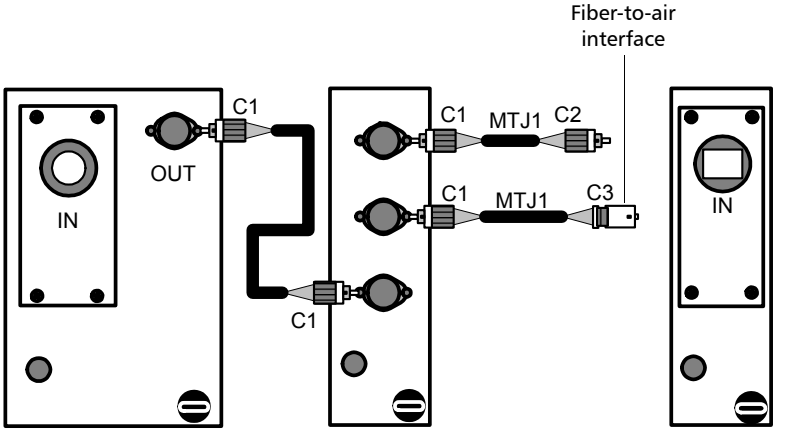
4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

5. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

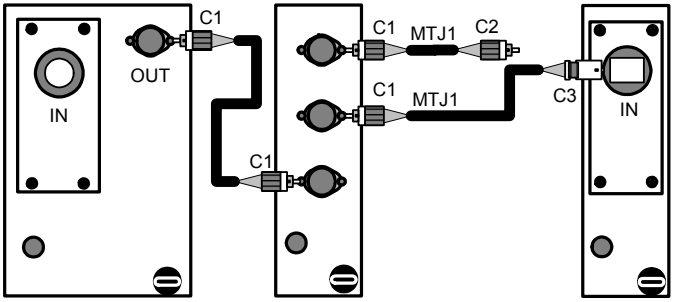
5a. Set up your connections as shown below.



5b. Click **Start** to start the reference acquisition.

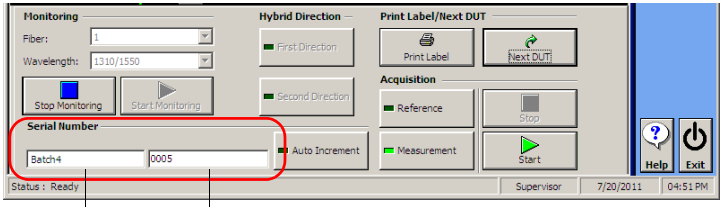
6. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

6a. Set up your connections as shown below.



6b. Click **Start** to start the reference acquisition.

7. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

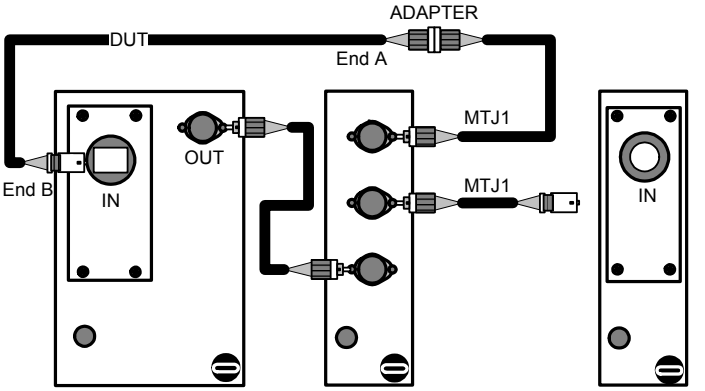
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

8. Measure End A of your DUT.

8a. Click the **Measurement** button.

8b. Set up your connections as shown below.

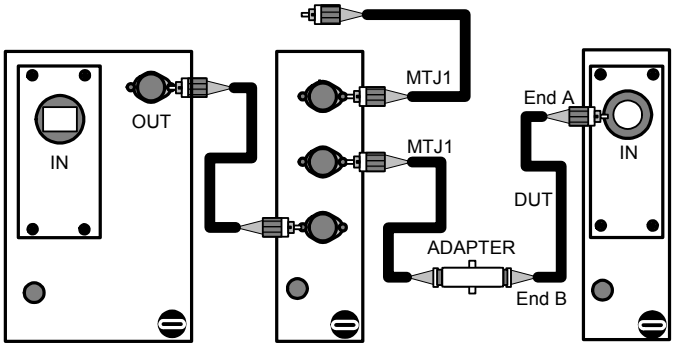


8c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

9. Measure End B of your DUT.

9a. Set up your connections as shown below.



9b. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

10. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

11. Click **Next DUT** to go on to the following DUT.

Testing Patchcords, High-Throughput Configuration and Unidirectional Testing

IMPORTANT

The second master test jumper must have a UPC end to connect to the input port of the MS12 Loss Test Module.

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

Note: *The switch module shown in connection diagrams is the DUT switch.*

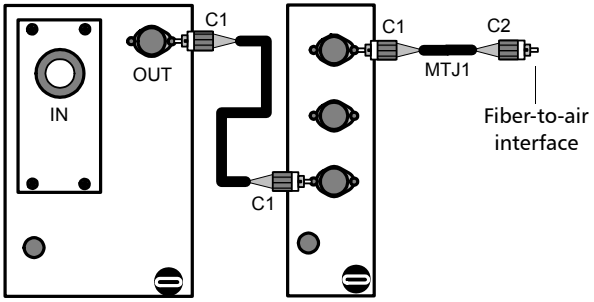
To test hybrid or non-hybrid patchcords:

1. Set up your test parameters as explained in *Setting Up Your Test* on page 104.
2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click the **Reference** button.

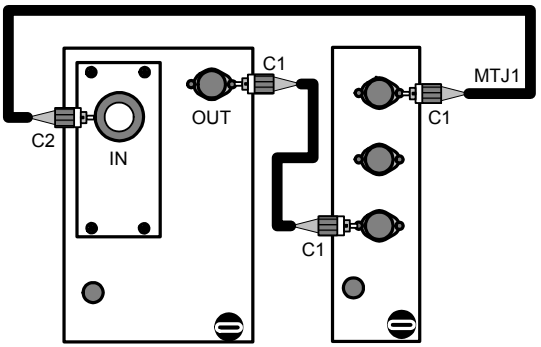
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

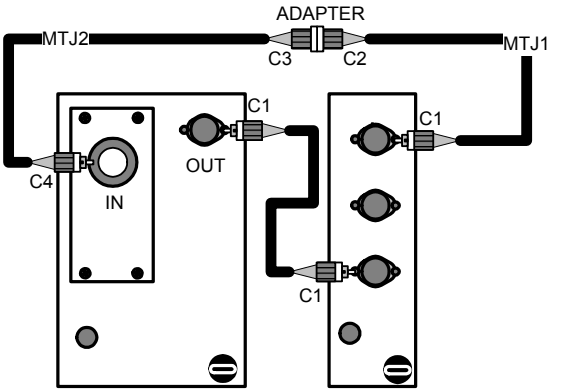
4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

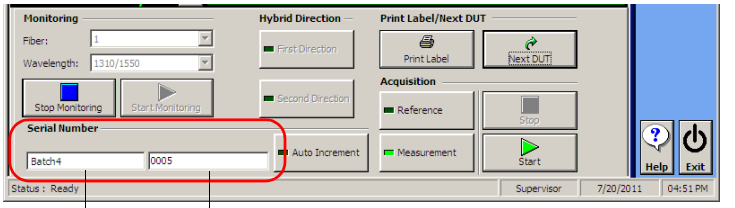
5. Reference your master test jumper 2 for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

5a. Set up your connections as shown below.



5b. Click **Start** to start the reference acquisition.

6. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

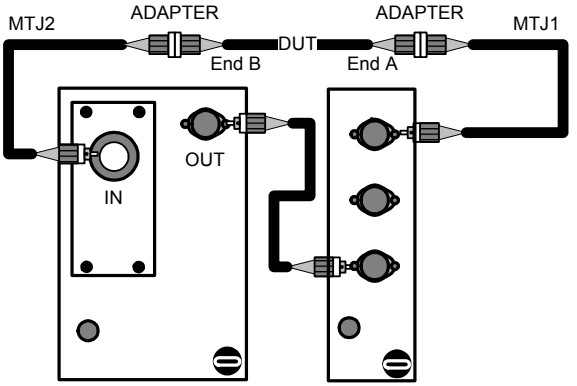
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

7. Measure your DUT.

7a. Click the **Measurement** button.

7b. Set up your connections as shown below.



7c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

8. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

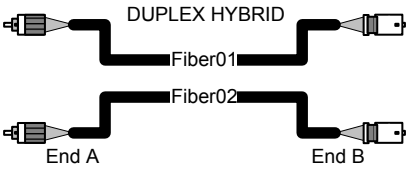
9. Click **Next DUT** to go on to the following DUT.

8 Testing Duplex Patchcords

This section will guide you through the steps required to test duplex patchcords with the MS12001 Cable Assembly Test System.

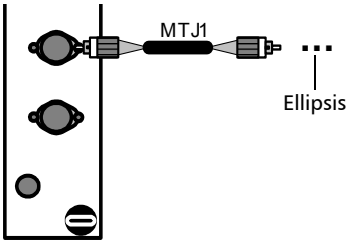
Note: *You can use a configuration with two RMs for all of your tests. The appropriate test instructions can also be displayed in the interface. However, procedures for a configuration with one RM are provided through this user guide. Additionally, module connection graphics provided within the MS12001 Cable Assembly Test System software also depict a configuration with one RM. You can find the procedure and connection graphic for two RM setup in section* Connecting Two RMs and the RM Switch *on page 25.*

A duplex patchcord is a cable assembly with two fibers and two connectors at each end.



Once your test is set up, you can test your patchcords. For an overview of the test sequence and preparation, see *Preparing Your Test Sequence* on page 101.

Note: *Some of the figures presented in this chapter include ellipses. These symbols indicate that you must repeat an action several times.*



IMPORTANT

To obtain accurate results, always ensure that your fibers are clean and properly connected (see *Cleaning and Connecting Optical Fibers* on page 106).

Note: *If you are testing in multimode, reflectance only, and you cannot connect your DUT to the detector, it is normal to receive a message indicating that input power is too low. Simply ignore the warning and go on with the test.*

The Cable Assembly Test System has monitoring functions to allow you to verify power variations while you test your connections. For more information, see *Monitoring IL and RL References or Measurements* on page 109.

Testing Non-Hybrid Patchcords, Standard Configuration and Bidirectional Testing

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

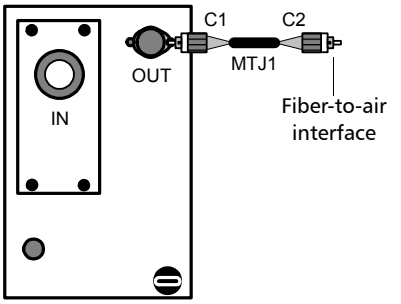
To test your patchcords:

1. Set up your test parameters as explained in *Setting Up Your Test* on page 104.
2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click the **Reference** button.

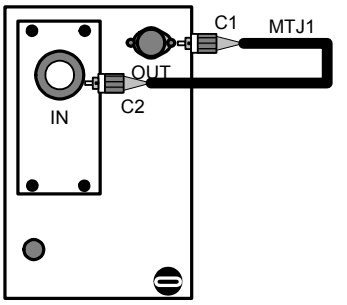
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

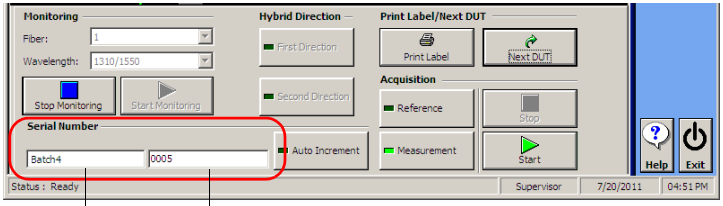
4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

5. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

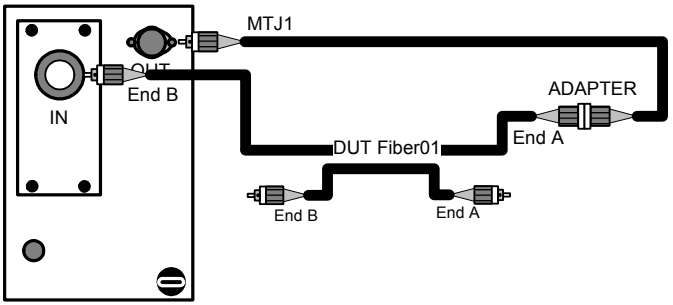
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

6. Measure End A of fiber 1 of your DUT.

6a. Click the **Measurement** button.

6b. Set up your connections as shown below.

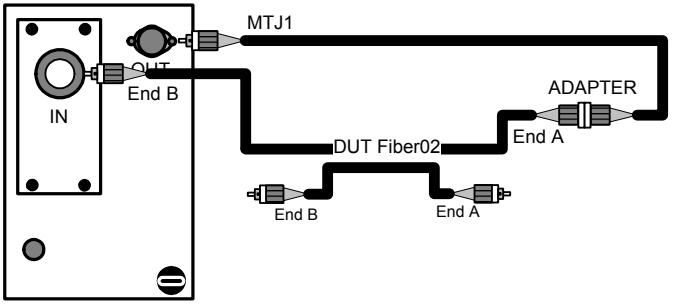


6c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

7. Measure End A of fiber 2 of your DUT.

7a. Set up your connections as shown below.

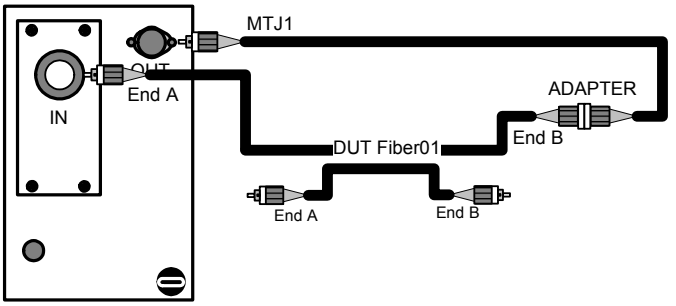


7b. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

8. Measure End B of fiber 1 of your DUT.

8a. Set up your connections as shown below.

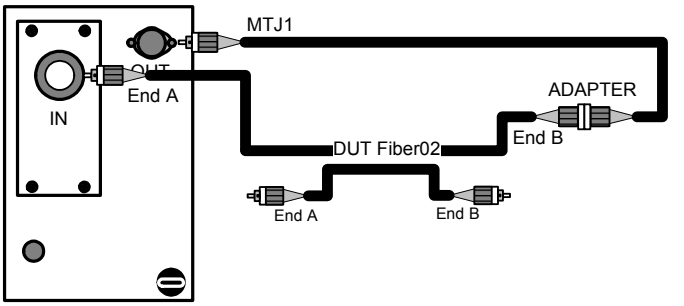


8b. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

9. Measure End B of fiber 2 of your DUT.

9a. Set up your connections as shown below.



9b. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

10. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

11. Click **Next DUT** to go on to the following DUT.

Testing Hybrid Patchcords, Standard Configuration and Bidirectional Testing

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

To test your patchcord:

1. Set up your test parameters as explained in *Preparing Your Test Sequence* on page 101.

IMPORTANT

When testing hybrid patchcords, standard configuration and bidirectional testing, JGR recommends to define a complete test profile (with a name). This way, you will be able to test End A and End B in distinct test sessions (after closing the application or changing the setup).

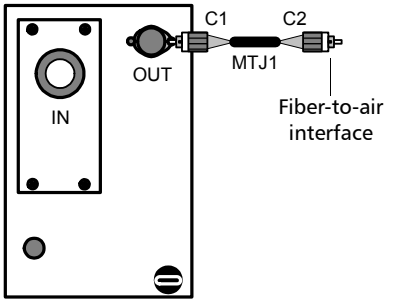
To avoid losing data if you omit to give your test a name, you will be forced to complete test on both End A and End B before performing another action.

2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click on the **Reference** button.

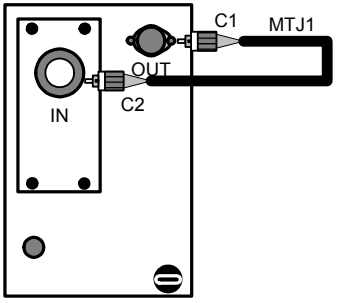
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

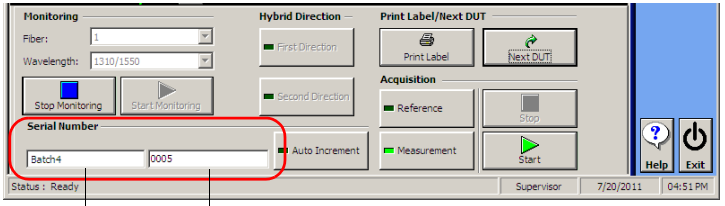
4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

5. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

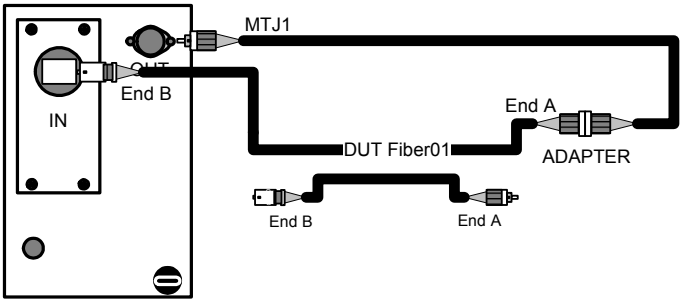
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

6. Measure End A of fiber 1 of your DUT.

6a. Click the **Measurement** button.

6b. Set up your connections as shown below.

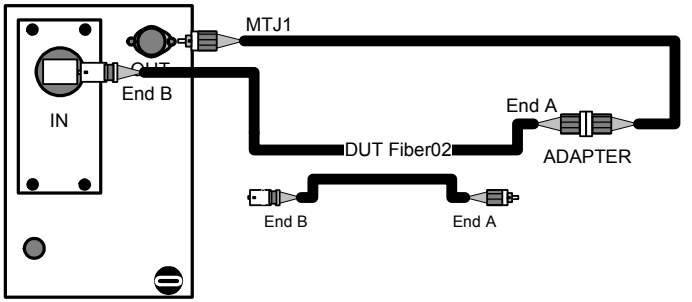


6c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

7. Measure End A of fiber 2 of your DUT.

7a. Set up your connections as shown below.



7b. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

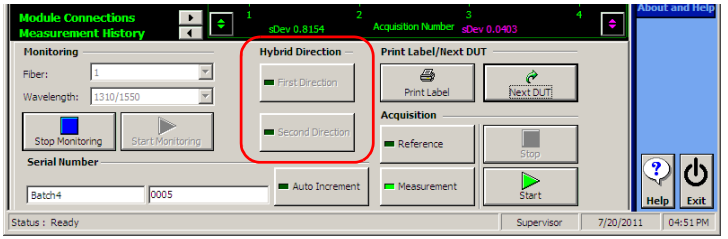
You can view results with the Database Browser without losing any information.

8. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

9. Click **Next DUT** to go on to the following DUT. If you click **Next DUT** without having tested the DUT, it will be written as "*Not completed*" in the database.

Note: *To speed up the process, you can test the connectors A of a batch of fiber before switching to End B.*

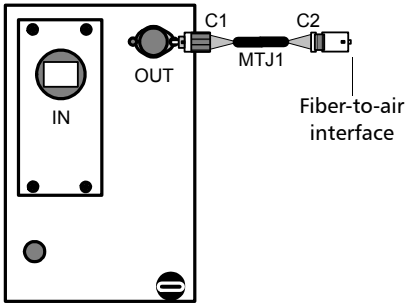
10. If you have completed the test for End A of your batch of patchcords, click **Second Direction**, under **Hybrid Direction**, to test End B.



11. If you are testing multimode fibers, reference End B of your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

11a. Click the **Reference** button.

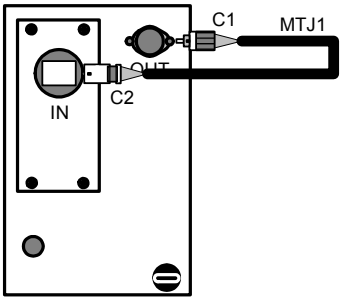
11b. Set up your connections as shown below.



11c. Click **Start** to start the reference acquisition.

12. Reference End B of your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

12a. Set up your connections as shown below.



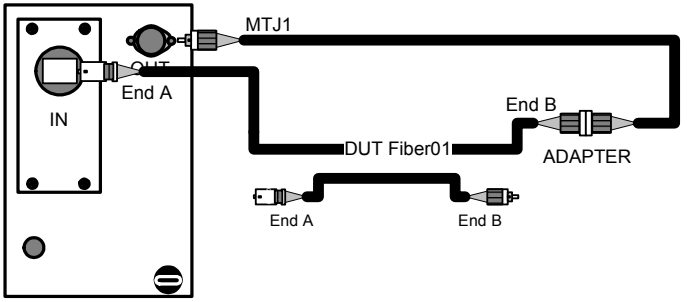
12b. Click **Start** to start the reference acquisition.

13. Verify the DUT serial number given by the system to make sure you are testing the right DUT.

14. Measure End B of fiber 1 of your DUT.

14a. Click the **Measurement** button.

14b. Set up your connections as shown below.

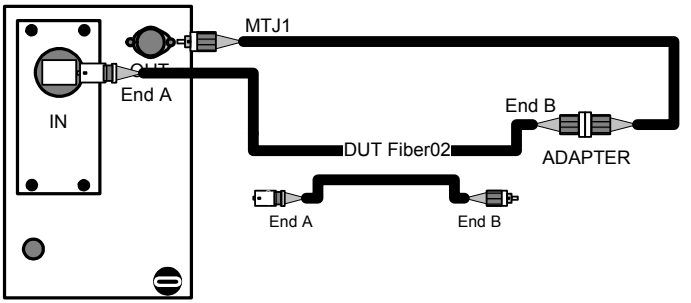


14c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

15. Measure End B of fiber 2 of your DUT.

15a. Set up your connections as shown below.



15b. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

16. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

17. Click **Next DUT** to go on to the next DUT. If you click **Next DUT** without having tested the DUT, it will be written as "*Skipped*" in the database.

Testing Patchcords, Standard Configuration and Unidirectional Testing

IMPORTANT

The second master test jumper must have a UPC end to connect to the input port of the MS12 Loss Test Module.

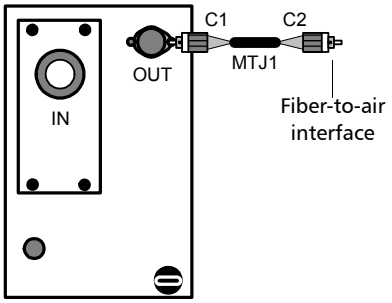
The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

To test hybrid or non-hybrid patchcords:

1. Set up your test parameters as explained in *Setting Up Your Test* on page 104.
2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.
3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

   3a. Click the **Reference** button.

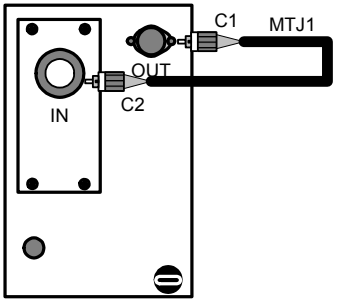
   3b. Set up your connections as shown below.



   3c. Click **Start** to start the reference acquisition.

4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

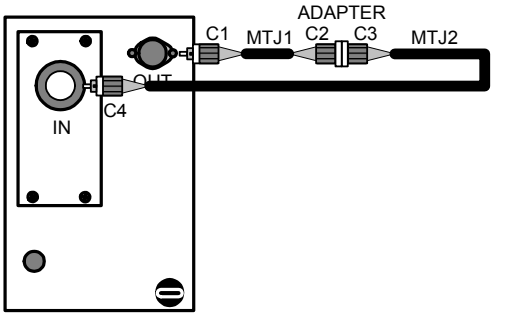
4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

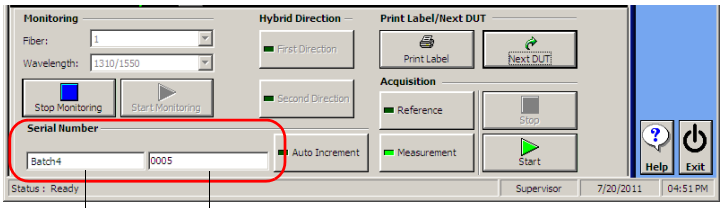
5. Reference your master test jumper 2 for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

5a. Set up your connections as shown below.



5b. Click **Start** to start the reference acquisition.

6. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

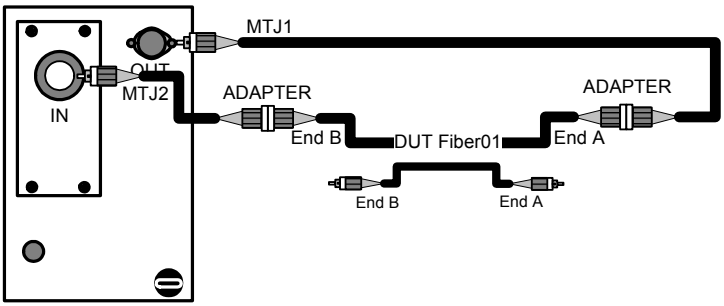
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

7. Measure fiber 1 of your DUT.

7a. Click the **Measurement** button.

7b. Set up your connections as shown below.

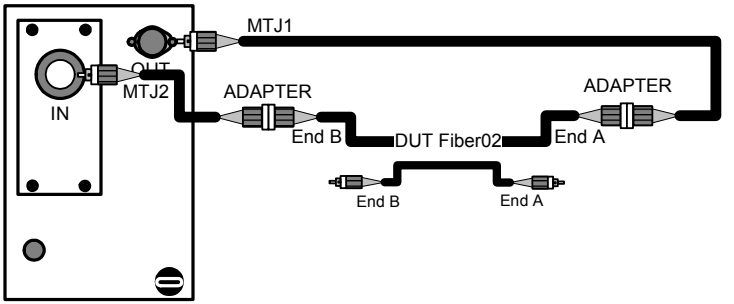


7c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

8. Measure fiber 2 of your DUT.

8a. Set up your connections as shown below.



8b. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

9. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

10. Click **Next DUT** to go on to the following DUT.

Testing Non-Hybrid Patchcords, High-Throughput Configuration and Bidirectional Testing

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

Note: *The switch module shown in connection diagrams is the DUT switch.*

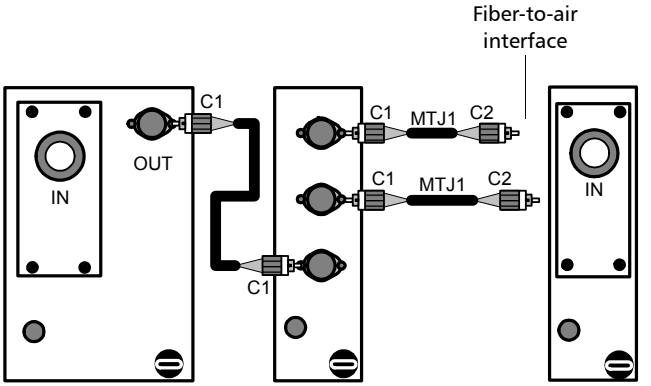
To test your patchcords:

1. Set up your test parameters as explained in *Setting Up Your Test* on page 104.
2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click the **Reference** button.

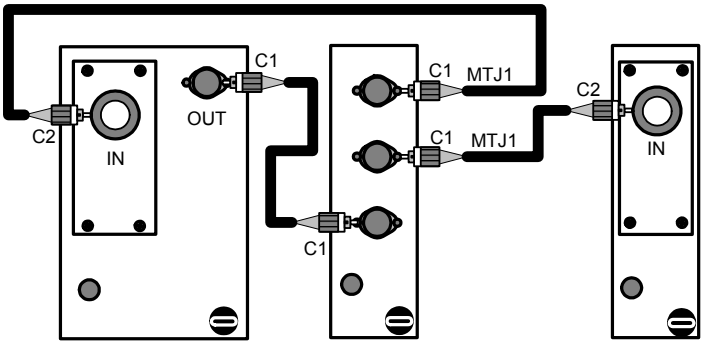
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

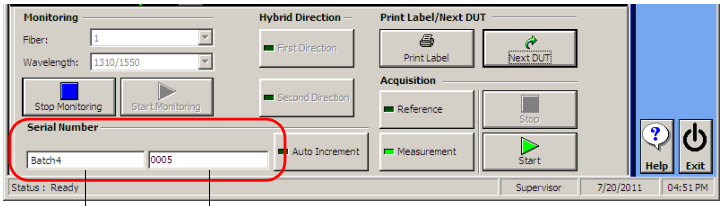
4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

5. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

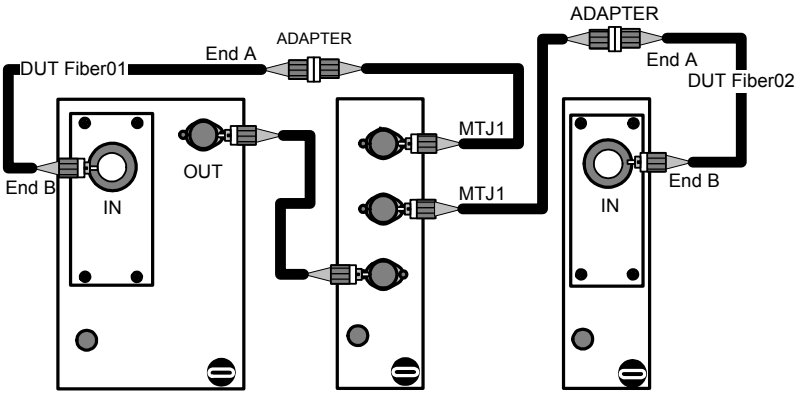
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

6. Measure End A of your DUT.

6a. Click the **Measurement** button.

6b. Set up your connections as shown below.

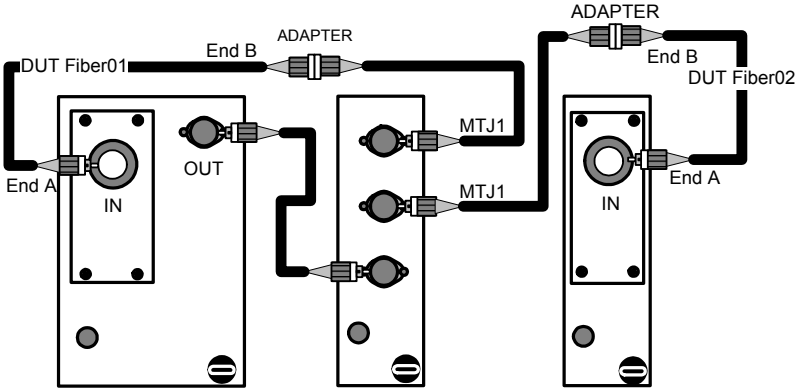


6c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

7. Measure End B of your DUT.

7a. Set up your connections as shown below.



7b. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

8. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

9. Click **Next DUT** to go on to the following DUT.

Testing Hybrid Patchcords, High-Throughput Configuration and Bidirectional Testing

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

Note: *The switch module shown in connection diagrams is the DUT switch.*

To test your patchcords:

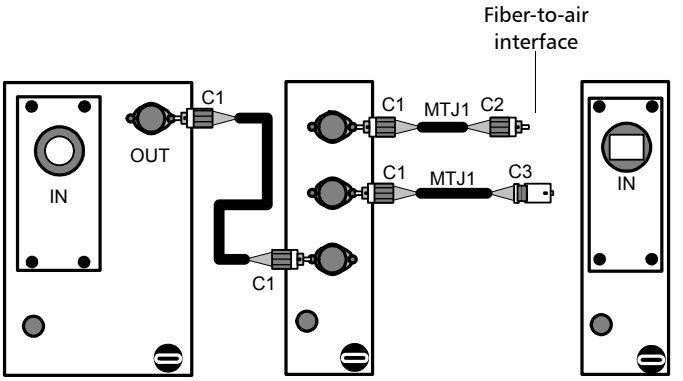
1. Set up your test parameters as explained in *Setting Up Your Test* on page 104.

2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click the **Reference** button.

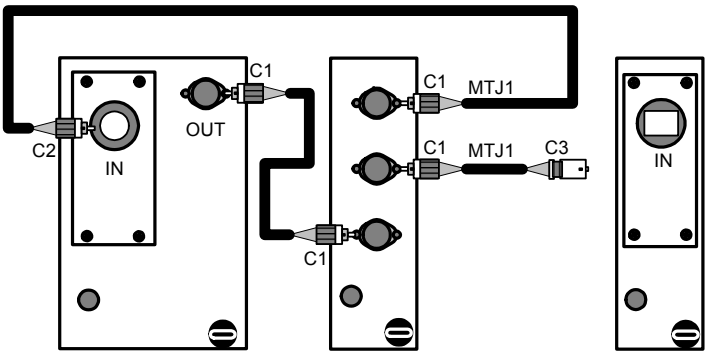
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

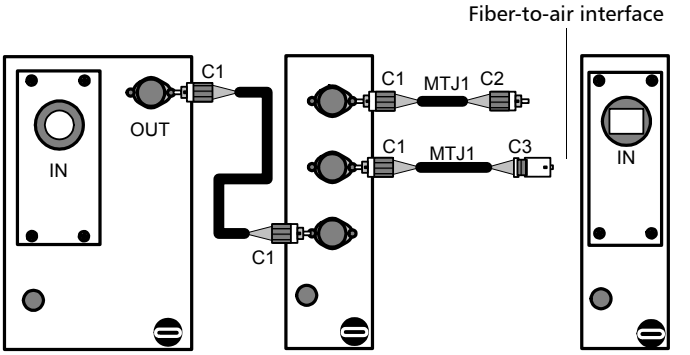
4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

5. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

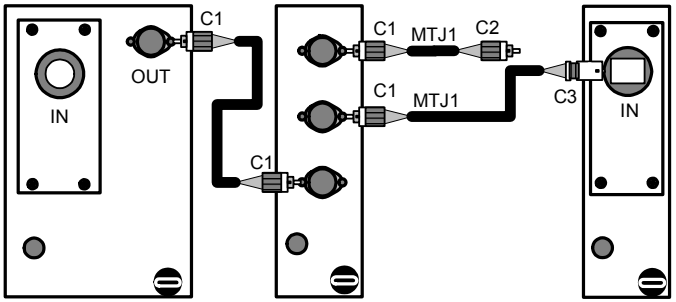
5a. Set up your connections as shown below.



5b. Click **Start** to start the reference acquisition.

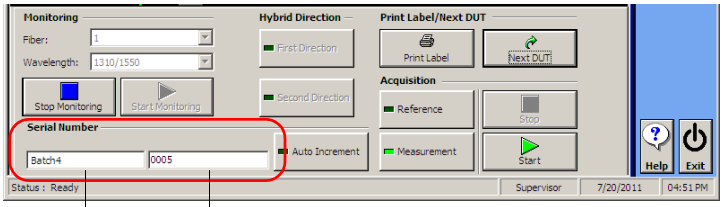
6. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

6a. Set up your connections as shown below.



6b. Click **Start** to start the reference acquisition.

7. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

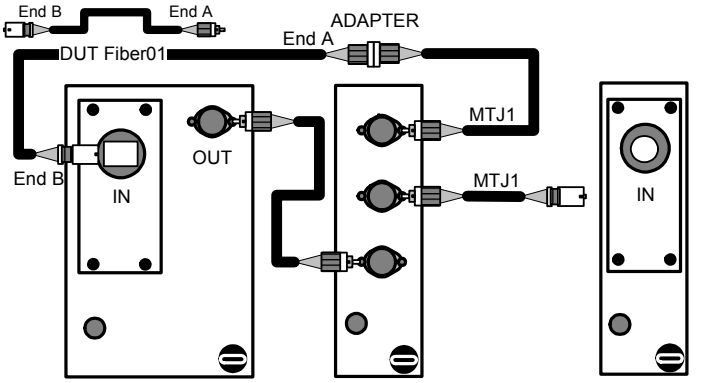
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

8. Measure End A of fiber 1 of your DUT.

8a. Click the **Measurement** button.

8b. Set up your connections as shown below.

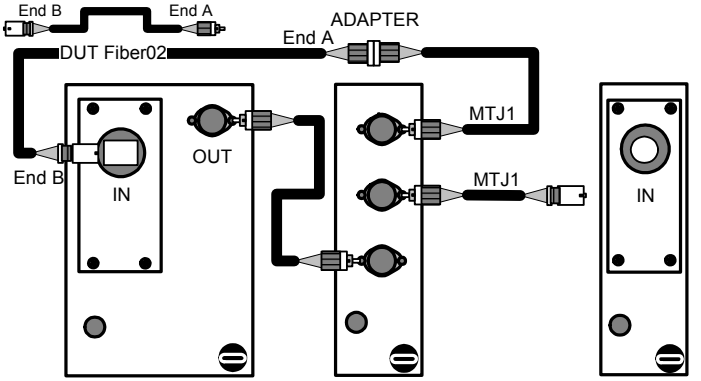


8c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

9. Measure End A of fiber 2 of your DUT.

9a. Set up your connections as shown below.

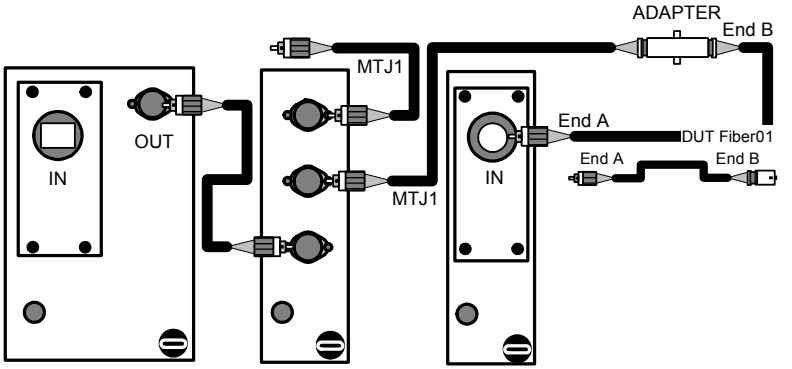


9b. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

10. Measure End B of fiber 1 of your DUT.

10a. Set up your connections as shown below.

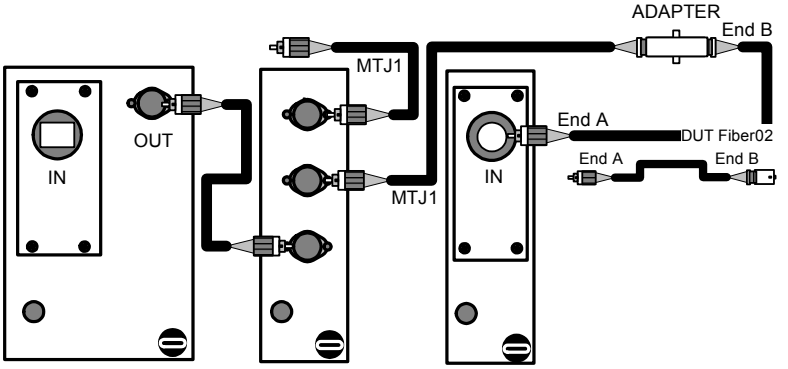


10b. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

11. Measure End B of fiber 2 of your DUT.

11a. Set up your connections as shown below.



11b. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

12. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

13. Click **Next DUT** to go on to the following DUT.

Testing Patchcords, High-Throughput Configuration and Unidirectional Testing

IMPORTANT

In unidirectional testing, the second master test jumper must have a UPC end to connect to the input port of the MS12 Loss Test Module.

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

Note: *The switch module shown in connection diagrams is the DUT switch.*

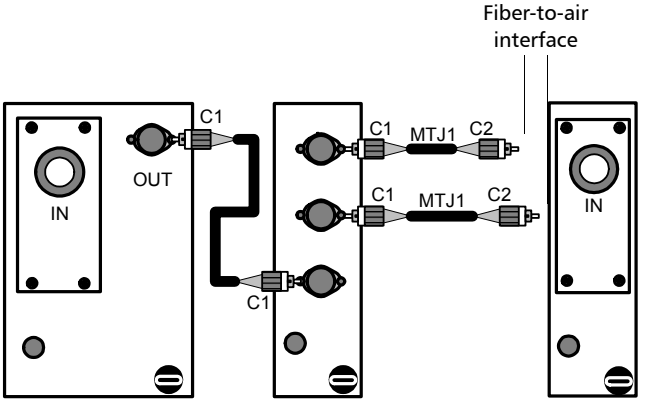
To test hybrid or non-hybrid patchcords:

1. Set up your test parameters as explained in *Setting Up Your Test* on page 104.
2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click the **Reference** button.

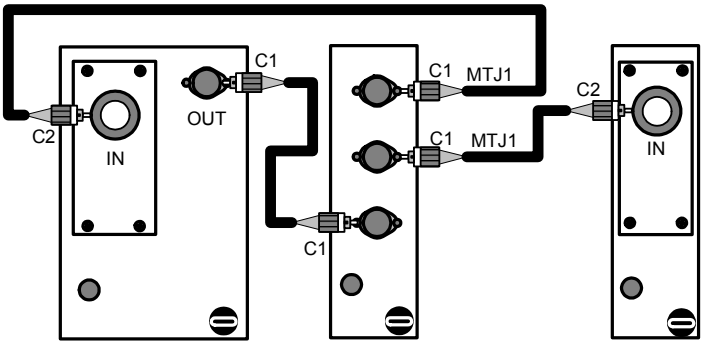
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

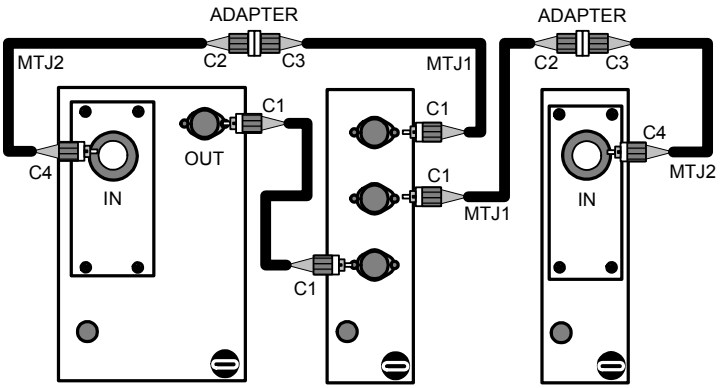
4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

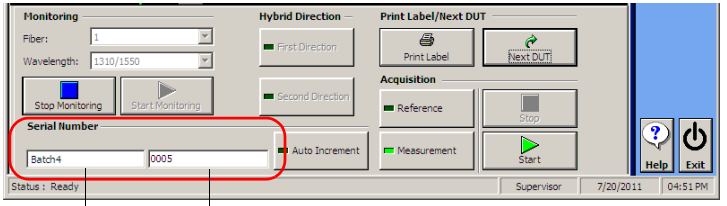
5. Reference your master test jumper 2 for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

5a. Set up your connections as shown below.



5b. Click **Start** to start the reference acquisition.

6. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

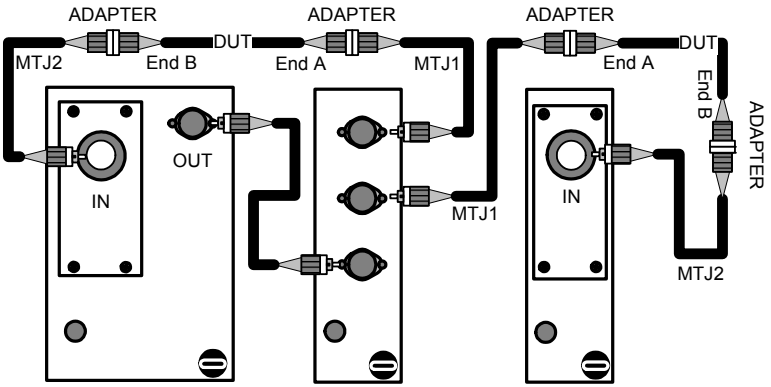
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

7. Measure your DUT.

7a. Click the **Measurement** button.

7b. Set up your connections as shown below.



7c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

8. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

9. Click **Next DUT** to go on to the following DUT.

9 Testing Bundle Patchcords

This section will guide you through the steps required to test bundle patchcords with the MS12001 Cable Assembly Test System.

Note: *You can use a configuration with two RMs for all of your tests. The appropriate test instructions can also be displayed in the interface. However, procedures for a configuration with one RM are provided through this user guide. Additionally, module connection graphics provided within the MS12001 Cable Assembly Test System software also depict a configuration with one RM. You can find the procedure and connection graphic for two RM setup in section* Connecting Two RMs and the RM Switch *on page 25.*

A bundle patchcord is a cable assembly with N fibers and N connectors at each end.

Once your test is set up, you will be ready to test your patchcords. For an overview of the test sequence and preparation, see *Preparing Your Test Sequence* on page 101.

IMPORTANT

To obtain accurate results, always ensure that your fibers are clean and properly connected (see *Cleaning and Connecting Optical Fibers* on page 106).

The Cable Assembly Test System has monitoring functions to allow you to verify power variations while you test your connections. For more information, see *Monitoring IL and RL References or Measurements* on page 109.

Testing Non-Hybrid Patchcords, Standard Configuration and Bidirectional Testing

The procedure to test bundle patchcords is the same as for simplex patchcords. Refer to *Testing Non-Hybrid Patchcords, Standard Configuration and Bidirectional Testing* on page 141 and repeat the test sequence for each fiber.

Testing Hybrid Patchcords, Standard Configuration and Bidirectional Testing

The procedure to test bundle patchcords is the same as for simplex patchcords. Refer to *Testing Hybrid Patchcords, Standard Configuration and Bidirectional Testing* on page 145 and repeat the test sequence for each fiber.

Testing Patchcords, Standard Configuration and Unidirectional Testing

The procedure to test bundle patchcords is the same as for simplex patchcords. Refer to *Testing Patchcords, Standard Configuration and Unidirectional Testing* on page 153 and repeat the test sequence for each fiber.

Testing Non-Hybrid Patchcords, High-Throughput Configuration and Bidirectional Testing

The procedure to test bundle patchcords is the same as for simplex patchcords. Refer to *Testing Non-Hybrid Patchcords, High-Throughput Configuration and Bidirectional Testing* on page 157 and repeat the test sequence for each fiber.

Testing Hybrid Patchcords, High-Throughput Configuration and Bidirectional Testing

The procedure to test bundle patchcords is the same as for simplex patchcords. Refer to *Testing Hybrid Patchcords, High-Throughput Configuration and Bidirectional Testing* on page 161 and repeat the test sequence for each fiber.

Testing Patchcords, High-Throughput Configuration and Unidirectional Testing

The procedures to test bundle patchcords is the same as for simplex patchcords. Refer to *Testing Patchcords, High-Throughput Configuration and Unidirectional Testing* on page 168 and repeat the test sequence for each fiber.

10 Testing Fanout Patchcords

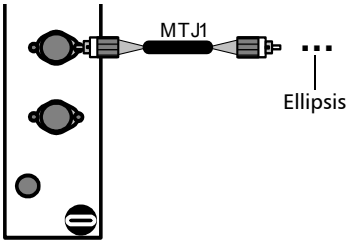
This section will guide you through the steps required to test fanout patchcords with the MS12001 Cable Assembly Test System.

Note: *You can use a configuration with two RMs for all of your tests. The appropriate test instructions can also be displayed in the interface. However, procedures for a configuration with one RM are provided through this user guide. Additionally, module connection graphics provided within the MS12001 Cable Assembly Test System software also depict a configuration with one RM. You can find the procedure and connection graphic for two RM setup in section* Connecting Two RMs and the RM Switch *on page 25.*

A fanout patchcord is a cable assembly with N connectors at one end and a multifiber connector at the other end.

Once your test is set up, you will be ready to test your patchcords. For an overview of the test sequence and preparation, see *Preparing Your Test Sequence* on page 101.

Note: *Some of the figures presented in this chapter include ellipses. These symbols indicate that you must repeat an action several times.*



IMPORTANT

To obtain accurate results, always ensure that your fibers are clean and properly connected (see *Cleaning and Connecting Optical Fibers* on page 106).

Note: *If you are testing in multimode, reflectance only, and you cannot connect your DUT to the detector, it is normal to receive a message indicating that input power is too low. Simply ignore the warning and go on with the test.*

The Cable Assembly Test System has monitoring functions to allow you to verify power variations while you test your connections. For more information, see *Monitoring IL and RL References or Measurements* on page 109.

Testing Patchcords, Standard Configuration and Bidirectional Testing

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

Note: *The switch module shown in connection diagrams is the DUT switch.*

To test your patchcords:

1. Set up your test parameters as explained in *Preparing Your Test Sequence* on page 101.

IMPORTANT

When testing hybrid patchcords, standard configuration and bidirectional testing, JGR recommends to define a complete test profile (with a name). This way, you will be able to test End A and End B in distinct test sessions (after closing the application or changing the setup).

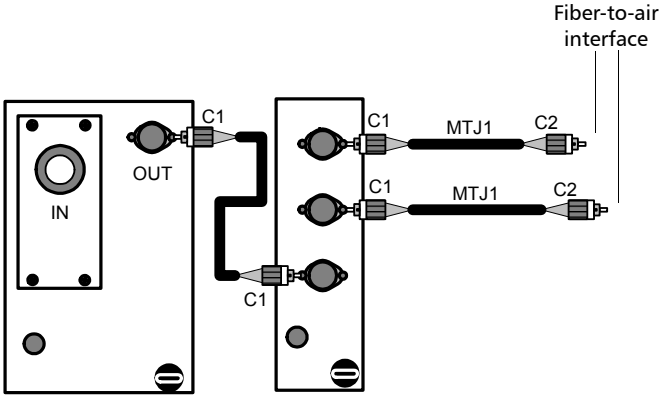
To avoid losing data if you omit to give your test a name, you will be forced to complete test on both End A and End B before performing another action.

2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click on the **Reference** button.

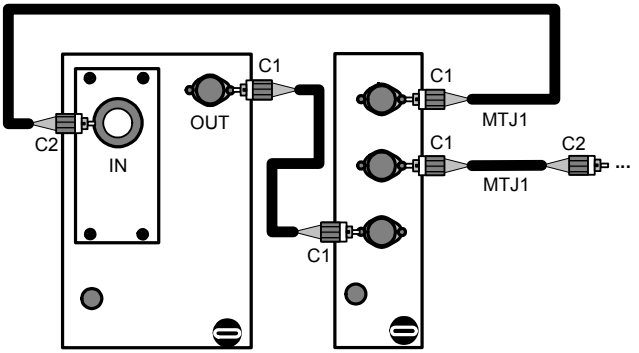
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

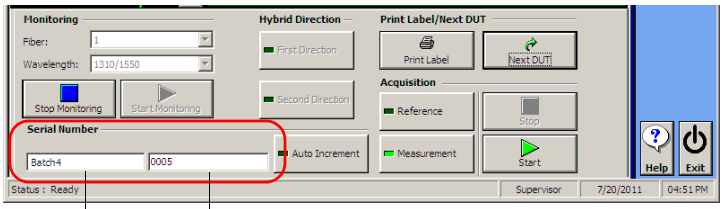
4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

5. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

Must be numeric if used with the Auto Increment Option

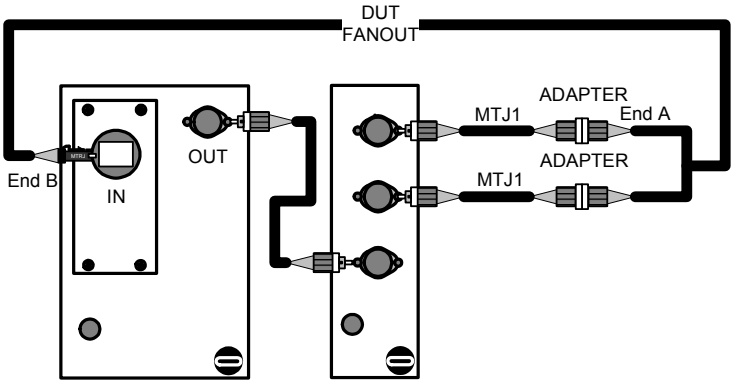
Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

6. Click the **First Direction** button under **Hybrid Direction.**

7. Measure your DUT from Fanout to Multifiber.

7a. Click the **Measurement** button.

7b. Set up your connections as shown below.



7c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

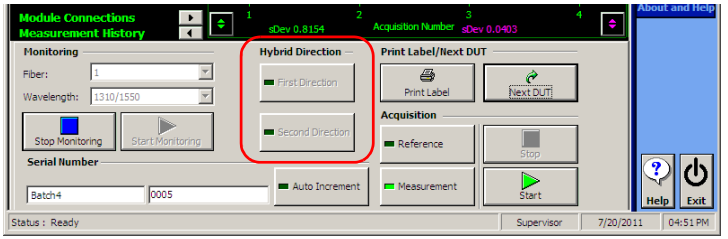
You can view results with the Database Browser without losing any information.

8. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

9. Click **Next DUT** to go on to the following DUT. If you click **Next DUT** without having tested the DUT, it will be written as "*Not completed*" in the database.

Note: *To speed up the process, you can test the connectors A of a batch of fiber before switching to End B.*

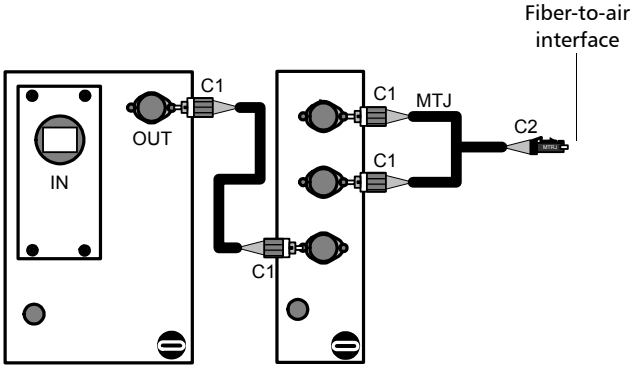
10. If you have completed the test for End A of your batch of patchcords, click **Second Direction**, under **Hybrid Direction**, to test End B.



11. If you are testing multimode fibers, reference End B of your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

11a. Click the **Reference** button.

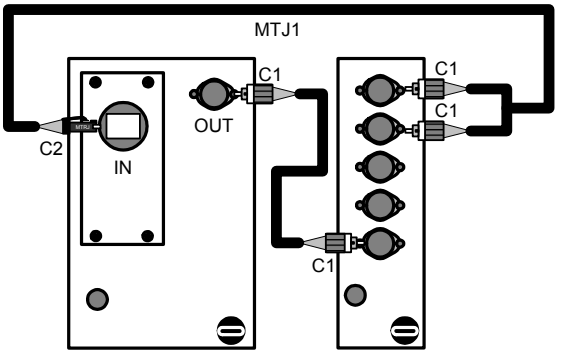
11b. Set up your connections as shown below.



11c. Click **Start** to start the reference acquisition.

12. Reference End B of your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

12a. Set up your connections as shown below.



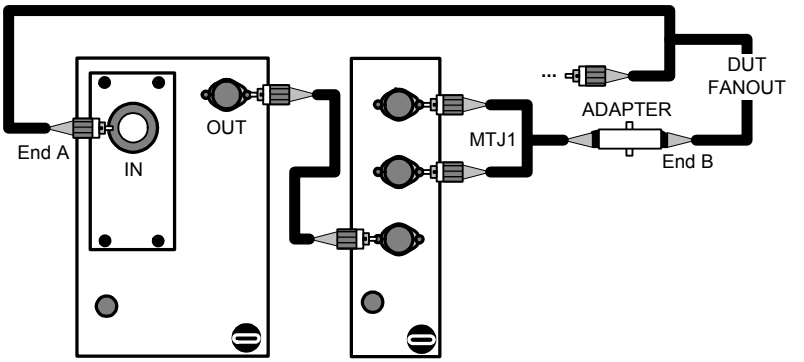
12b. Click **Start** to start the reference acquisition.

13. Verify the DUT serial number given by the system to make sure you are testing the right DUT.

14. Measure your DUT from Multifiber to Fanout.

14a. Click the **Measurement** button.

14b. Set up your connections as shown below.



14c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

15. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

16. Click **Next DUT** to go on to the next DUT. If you click **Next DUT** without having tested the DUT, it will be written as "*Skipped*" in the database.

Testing Patchcords, Standard Configuration and Unidirectional Testing

IMPORTANT

The second master test jumper must have a UPC end to connect to the input port of the MS12 Loss Test Module.

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

Note: *The switch module shown in connection diagrams is the DUT switch.*

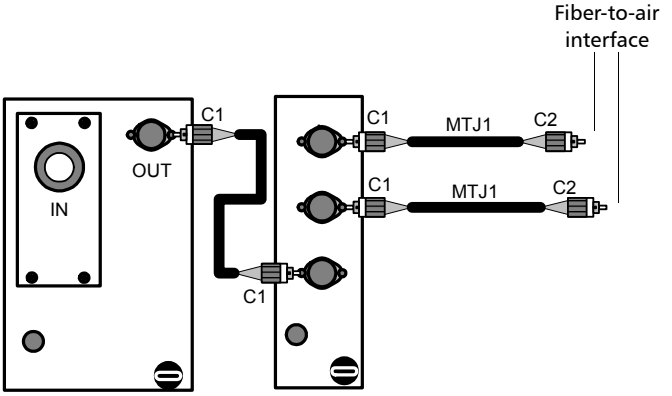
To test your patchcord:

1. Set up your test parameters as explained in *Setting Up Your Test* on page 104.
2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click the **Reference** button.

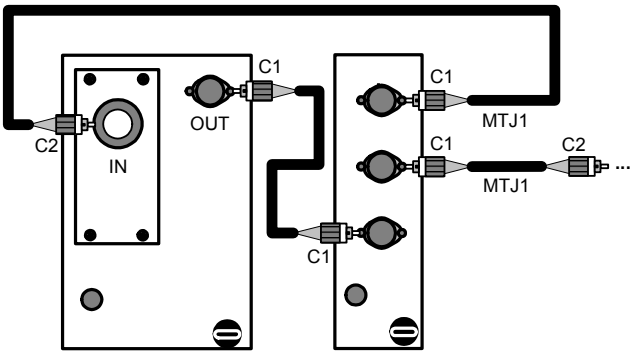
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

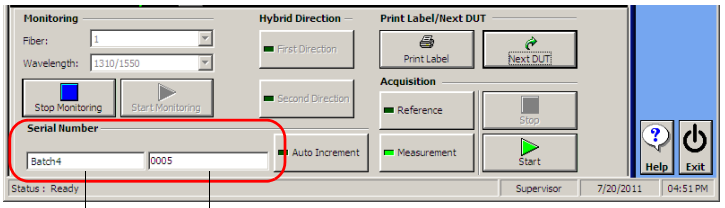
4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

5. When requested by the application, enter the length of MTJ2.

6. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

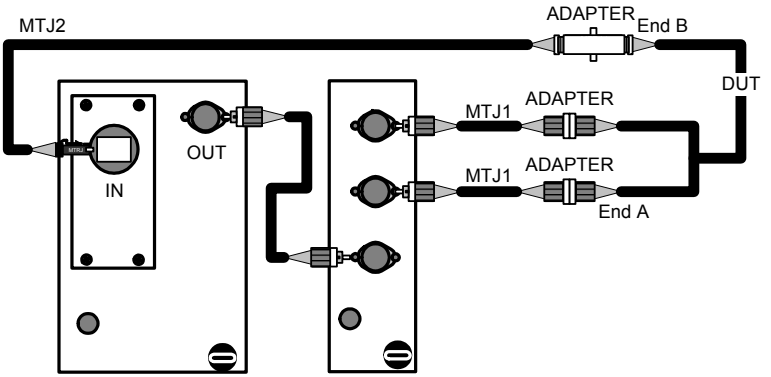
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

7. Measure your DUT from Fanout to Multifiber.

7a. Click the **Measurement** button.

7b. Set up your connections as shown below.



7c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

8. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

9. Click **Next DUT** to go on to the following DUT.

Testing Patchcords, High-Throughput Configuration and Bidirectional Testing

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

Note: *The switch module shown in connection diagrams is the DUT switch.*

To test your patchcord:

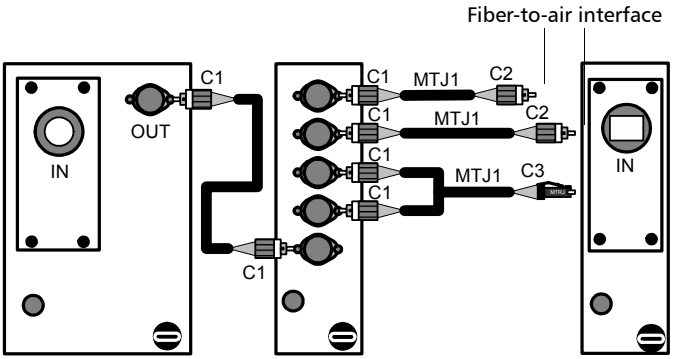
1. Set up your test parameters as explained in *Setting Up Your Test* on page 104.

2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click the **Reference** button.

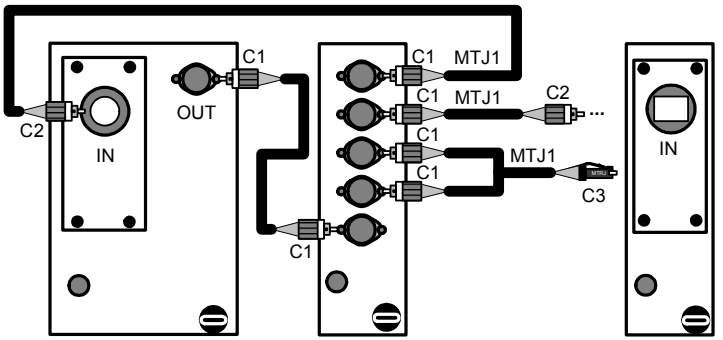
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

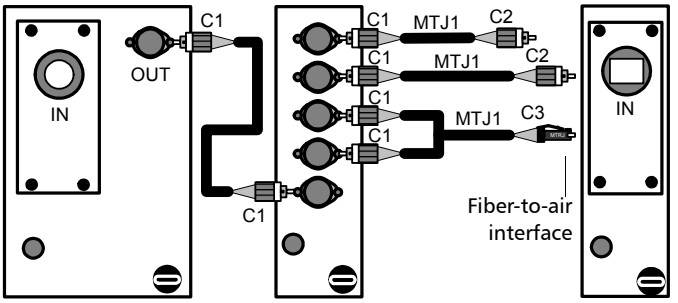
4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

5. If you are testing multimode fibers, reference your fanout master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

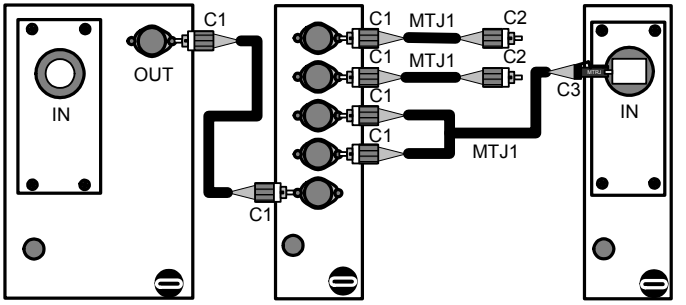
5a. Set up your connections as shown below.



5b. Click **Start** to start the reference acquisition.

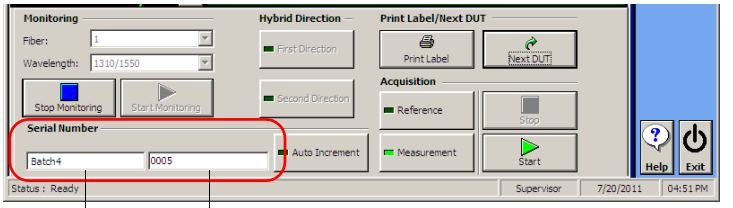
6. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

6a. Set up your connections as shown below.



6b. Click **Start** to start the reference acquisition.

7. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

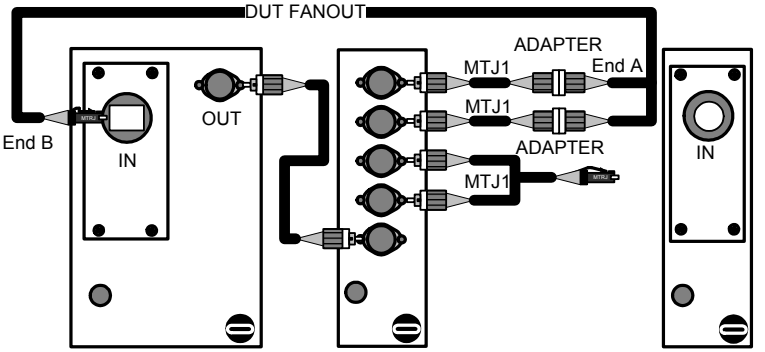
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

8. Measure your DUT from Fanout to Multifiber.

8a. Click the **Measurement** button.

8b. Set up your connections as shown below.

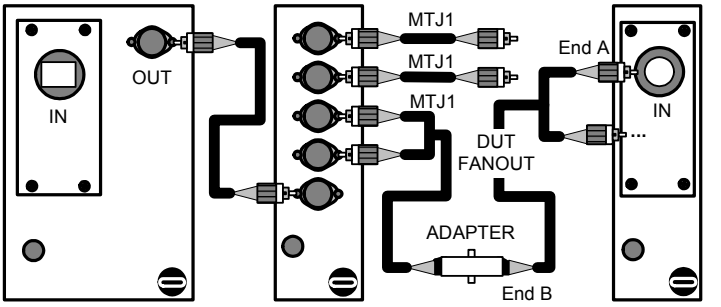


8c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

9. Measure your DUT from Multifiber to Fanout.

9a. Set up your connections as shown below.



9b. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

10. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

11. Click **Next DUT** to go on to the following DUT.

Testing Patchcords, High-Throughput Configuration and Unidirectional Testing

IMPORTANT

The second master test jumper must have a UPC end to connect to the input port of the MS12 Loss Test Module.

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

Note: *The switch module shown in connection diagrams is the DUT switch.*

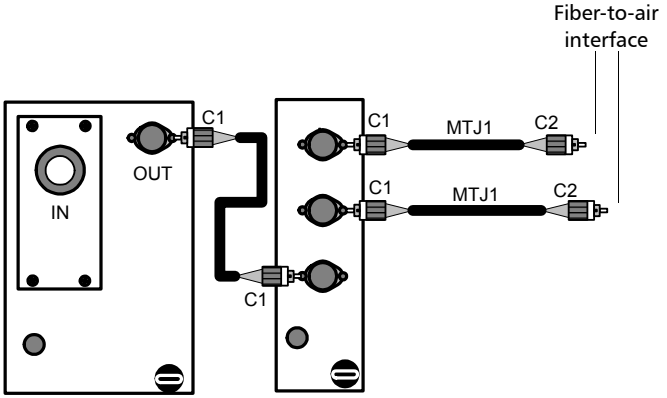
To test your patchcord:

1. Set up your test parameters as explained in *Setting Up Your Test* on page 104.
2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click the **Reference** button.

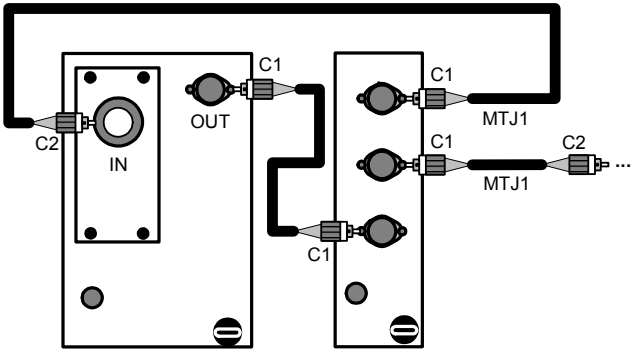
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

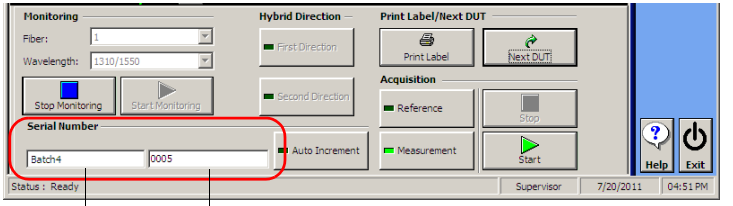
4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

5. When requested by the application, enter the length of MTJ2.

6. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

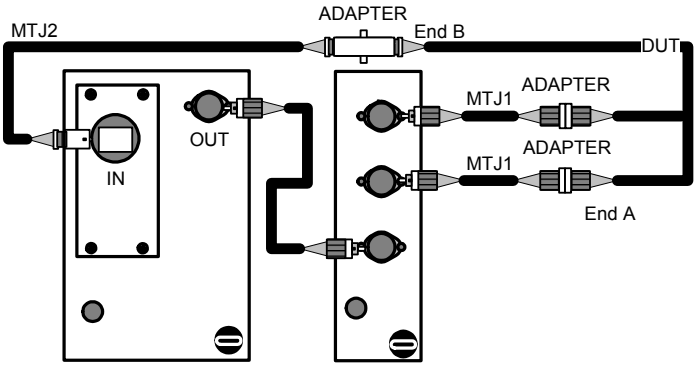
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

7. Measure your DUT from Fanout to Multifiber.

7a. Click the **Measurement** button.

7b. Set up your connections as shown below.



7c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

8. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

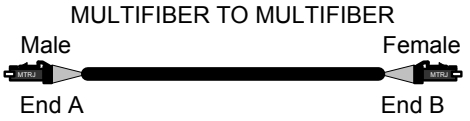
9. Click **Next DUT** to go on to the following DUT.

11 Testing Multifiber Patchcords

This section will guide you through the steps required to test multifiber patchcords with the MS12001 Cable Assembly Test System.

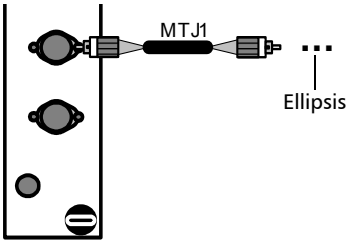
Note: *You can use a configuration with two RMs for all of your tests. The appropriate test instructions can also be displayed in the interface. However, procedures for a configuration with one RM are provided through this user guide. Additionally, module connection graphics provided within the MS12001 Cable Assembly Test System software also depict a configuration with one RM. You can find the procedure and connection graphic for two RM setup in section* Connecting Two RMs and the RM Switch *on page 25.*

A multifiber patchcord is a cable assembly with a multifiber connector (MTP or MTRJ) at each end.



Once your test is set up, you will be ready to test your patchcords. For an overview of the test sequence and preparation, see *Preparing Your Test Sequence* on page 101.

Note: *Some of the figures presented in this chapter include ellipses. These symbols indicate that you must repeat an action several times.*



IMPORTANT

To obtain accurate results, always ensure that your fibers are clean and properly connected (see *Cleaning and Connecting Optical Fibers* on page 106).

Note: *If you are testing in multimode, reflectance only, and you cannot connect your DUT to the detector, it is normal to receive a message indicating that input power is too low. Simply ignore the warning and go on with the test.*

The Cable Assembly Test System has monitoring functions to allow you to verify power variations while you test your connections. For more information, see *Monitoring IL and RL References or Measurements* on page 109.

Testing Non-Hybrid Patchcords, Standard Configuration and Bidirectional Testing

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

Note: *The switch module shown in connection diagrams is the DUT switch.*

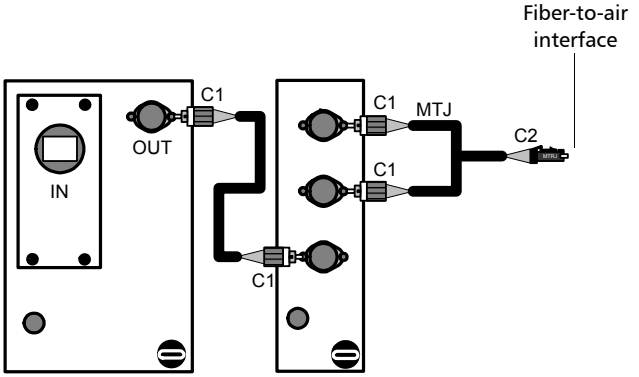
To test your patchcords:

1. Set up your test parameters as explained in *Setting Up Your Test* on page 104.
2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click the **Reference** button.

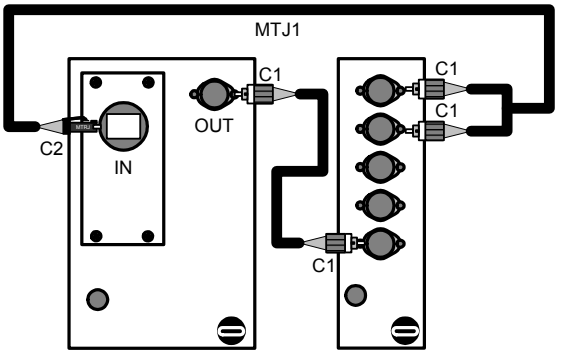
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

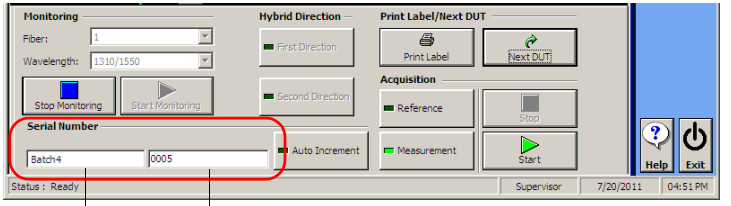
4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

5. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

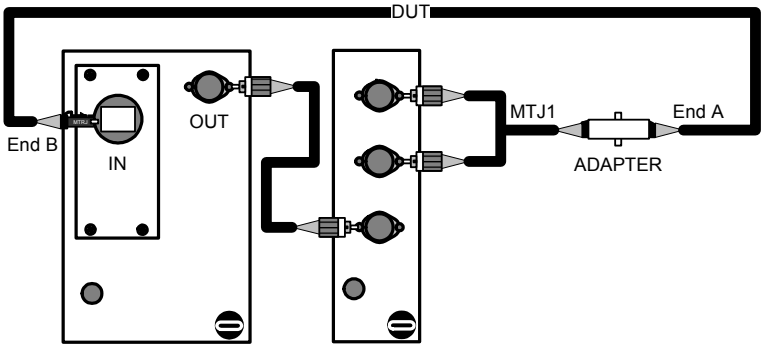
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

6. Measure End A of your DUT.

6a. Click the **Measurement** button.

6b. Set up your connections as shown below.

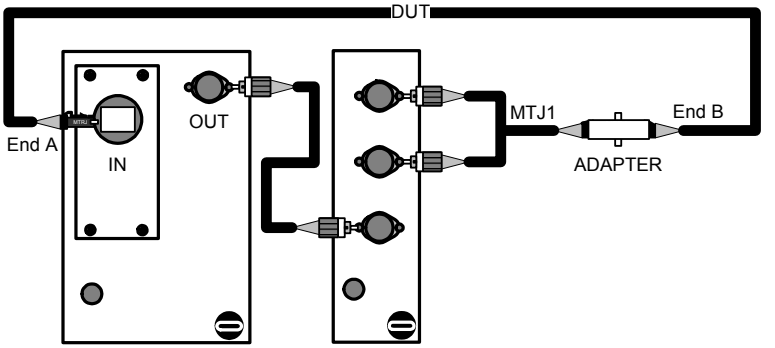


6c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

7. Measure End B of your DUT.

7a. Set up your connections as shown below.



7b. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

8. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

9. Click **Next DUT** to go on to the following DUT.

Testing Hybrid Patchcords, Standard Configuration and Bidirectional Testing

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

Note: *The switch module shown in connection diagrams is the DUT switch.*

To test your patchcord:

1. Set up your test parameters as explained in *Preparing Your Test Sequence* on page 101.

IMPORTANT

When testing hybrid patchcords, standard configuration and bidirectional testing, JGR recommends to define a complete test profile (with a name). This way, you will be able to test End A and End B in distinct test sessions (after closing the application or changing the setup).

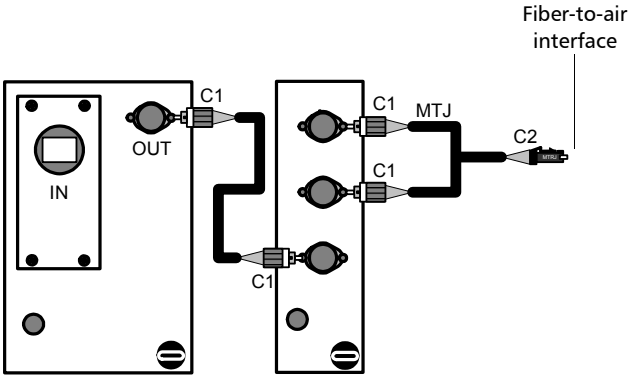
To avoid losing data if you omit to give your test a name, you will be forced to complete test on both End A and End B before performing another action.

2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click on the **Reference** button.

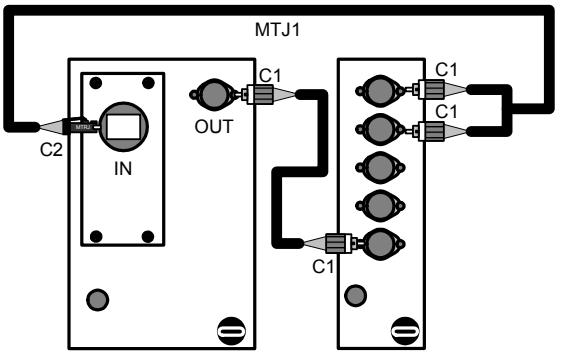
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

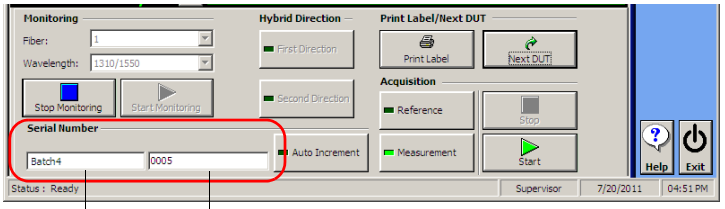
4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

5. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

Must be numeric if used with the Auto Increment Option

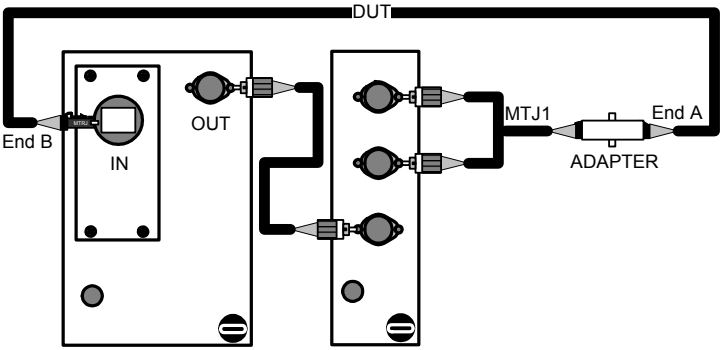
Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

6. Under **Hybrid Direction**, click **First Direction**.

7. Measure End A of your DUT.

7a. Click the **Measurement** button.

7b. Set up your connections as shown below.



7c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

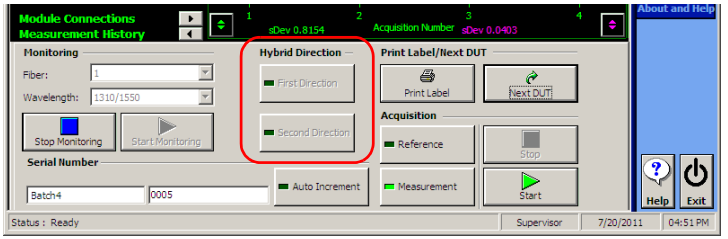
You can view results with the Database Browser without losing any information.

8. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

9. Click **Next DUT** to go on to the next DUT. If you click **Next DUT** without having tested the DUT, it will be written as "*Skipped*" in the database.

Note: *To speed up the process, you can test the connectors A of a batch of fiber before switching to End B.*

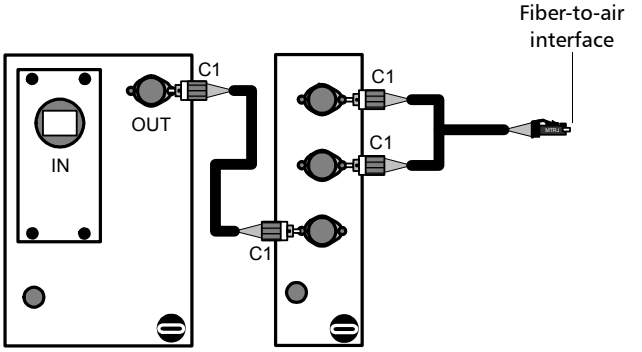
10. If you have completed the test for End A of your batch of patchcords, click **Second Direction**, under **Hybrid Direction**, to test End B.



11. If you are testing multimode fibers, reference End B of your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

11a. Click the **Reference** button.

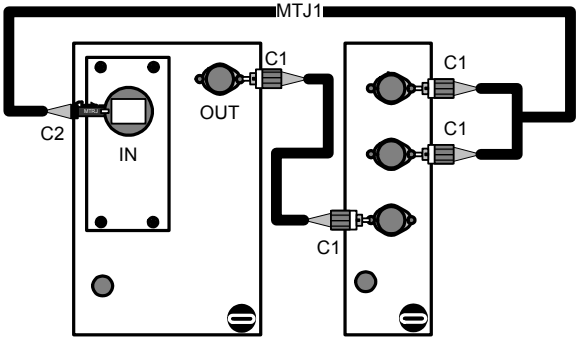
11b. Set up your connections as shown below.



11c. Click **Start** to start the reference acquisition.

12. Reference End B of your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

12a. Set up your connections as shown below.



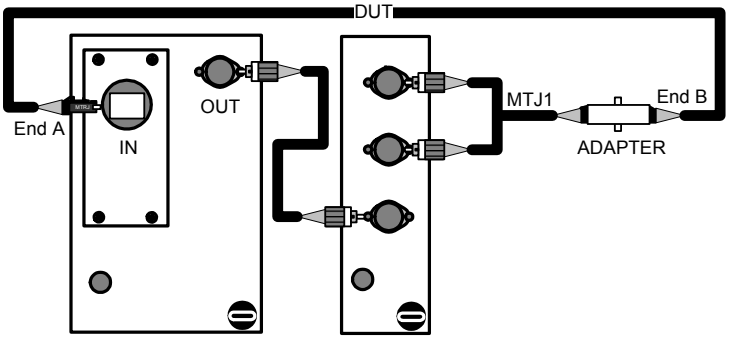
12b. Click **Start** to start the reference acquisition.

13. Verify the DUT serial number given by the system to make sure you are testing the right DUT.

14. Measure End B of your DUT.

14a. Click the **Measurement** button.

14b. Set up your connections as shown below.



14c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

15. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

16. Click **Next DUT** to go on to the next DUT. If you click **Next DUT** without having tested the DUT, it will be written as "*Skipped*" in the database.

Testing Patchcords, Standard Configuration and Unidirectional Testing

IMPORTANT

The second master test jumper must have a UPC end to connect to the input port of the MS12 Loss Test Module.

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

Note: *The switch module shown in connection diagrams is the DUT switch.*

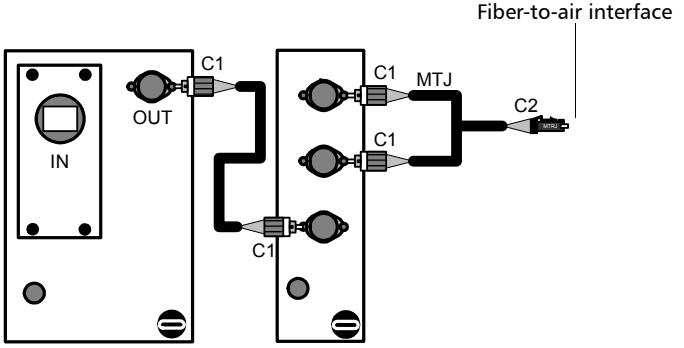
To test hybrid or non-hybrid patchcords:

1. Set up your test parameters as explained in *Setting Up Your Test* on page 104.
2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click the **Reference** button.

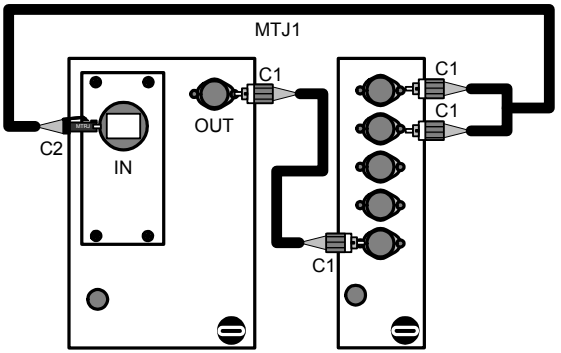
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

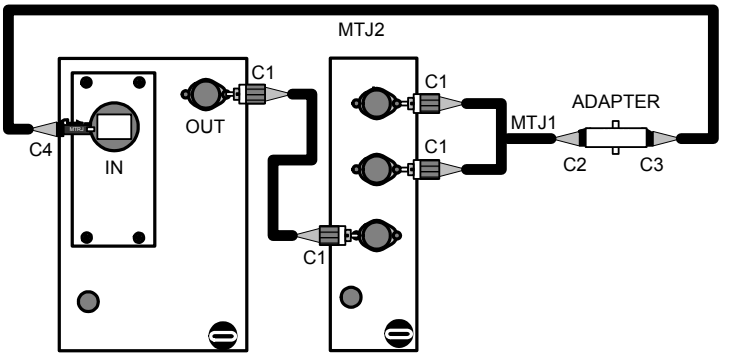
4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

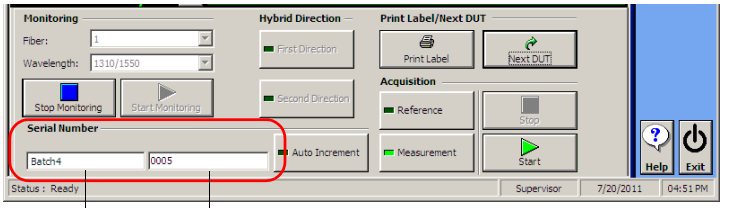
5. Reference your master test jumper 2 for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

5a. Set up your connections as shown below.



5b. Click **Start** to start the reference acquisition.

6. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

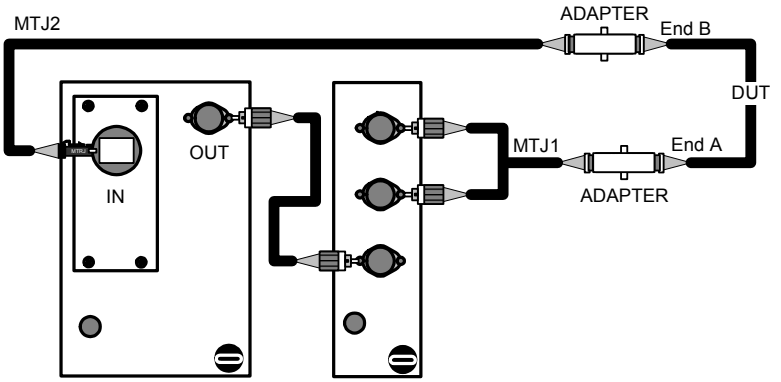
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

7. Measure your DUT.

7a. Click the **Measurement** button.

7b. Set up your connections as shown below.



7c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

8. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

9. Click **Next DUT** to go on to the following DUT.

Testing Non-Hybrid Patchcords, High-Throughput Configuration and Bidirectional Testing

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

Note: *The switch module shown in connection diagrams is the DUT switch.*

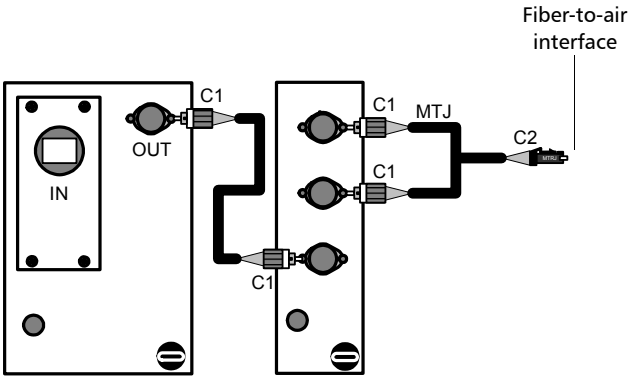
To test patchcords:

1. Set up your test parameters as explained in *Setting Up Your Test* on page 104.
2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click the **Reference** button.

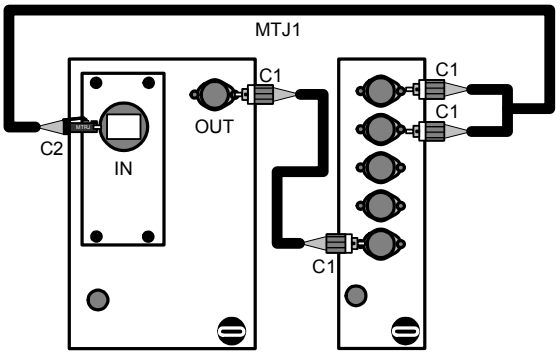
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

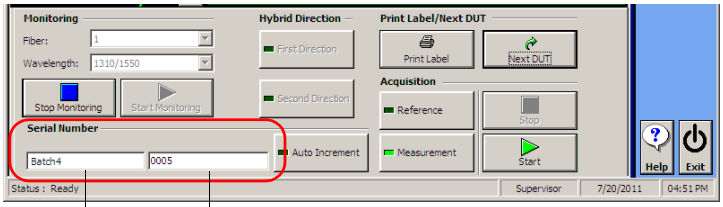
4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

5. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

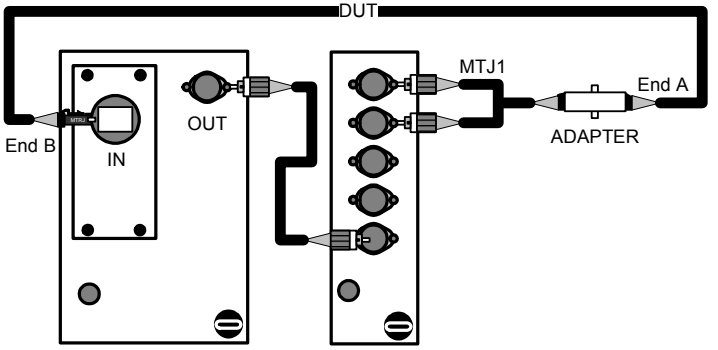
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

6. Measure End A of your DUT.

6a. Click the **Measurement** button.

6b. Set up your connections as shown below.

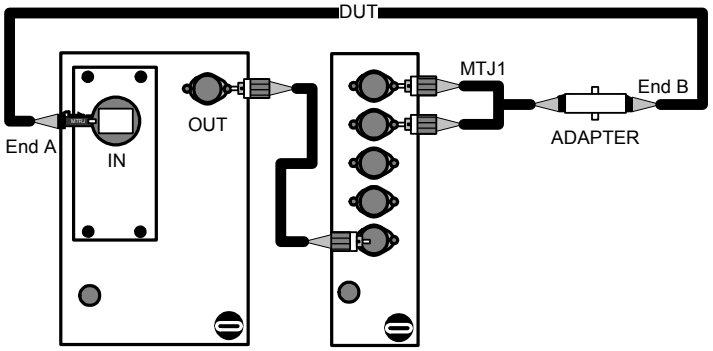


6c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

7. Measure End B of your DUT.

7a. Set up your connections as shown below.



7b. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

8. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

9. Click **Next DUT** to go on to the following DUT.

Testing Hybrid Patchcords, High-Throughput Configuration and Bidirectional Testing

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

Note: *The switch module shown in connection diagrams is the DUT switch.*

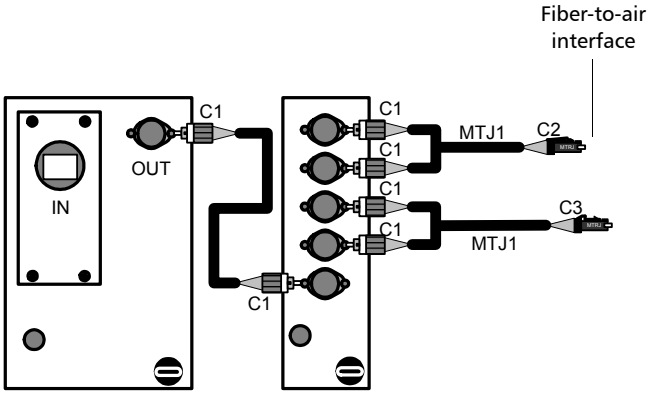
To test your patchcord:

1. Set up your test parameters as explained in *Setting Up Your Test* on page 104.
2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click the **Reference** button.

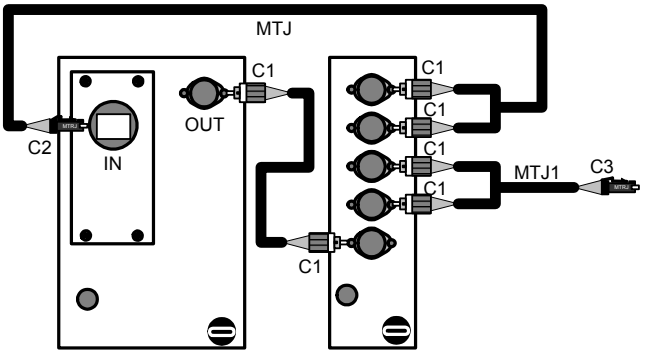
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

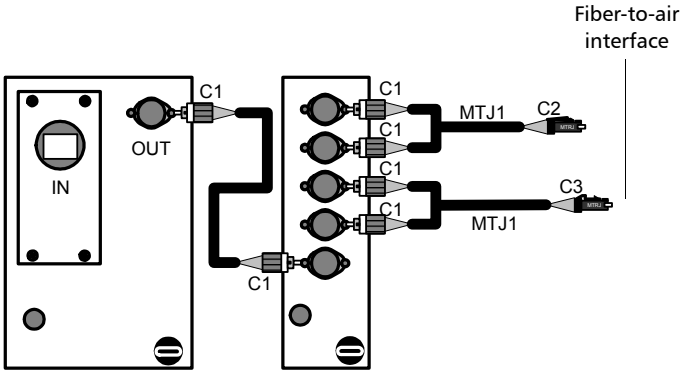
4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

5. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

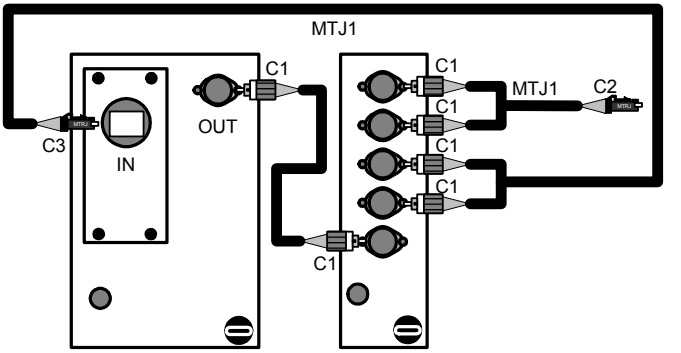
5a. Set up your connections as shown below.



5b. Click **Start** to start the reference acquisition.

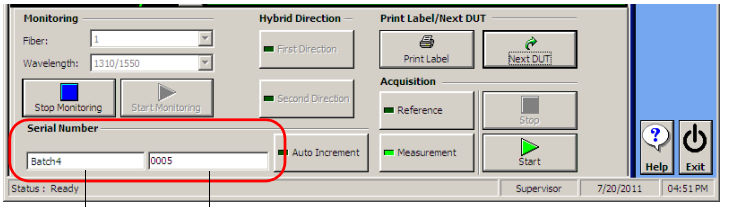
6. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

6a. Set up your connections as shown below.



6b. Click **Start** to start the reference acquisition.

7. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

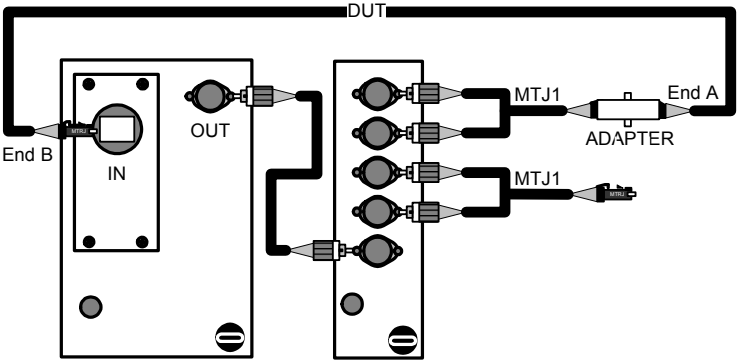
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

8. Measure End A of your DUT.

8a. Click the **Measurement** button.

8b. Set up your connections as shown below.

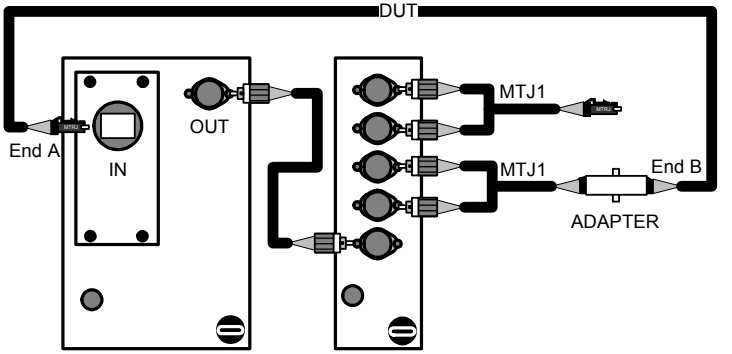


8c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

9. Measure End B of your DUT.

9a. Set up your connections as shown below.



9b. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

10. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

11. Click **Next DUT** to go on to the following DUT.

Testing Patchcords, High-Throughput Configuration and Unidirectional Testing

IMPORTANT

The second master test jumper must have a UPC end to connect to the input port of the MS12 Loss Test Module.

The following procedure shows one RM configuration. For two RM configuration, use the Common port on the RM switch instead of the Reflectometer (Output) port on the MS12 module.

Note: *The switch module shown in connection diagrams is the DUT switch.*

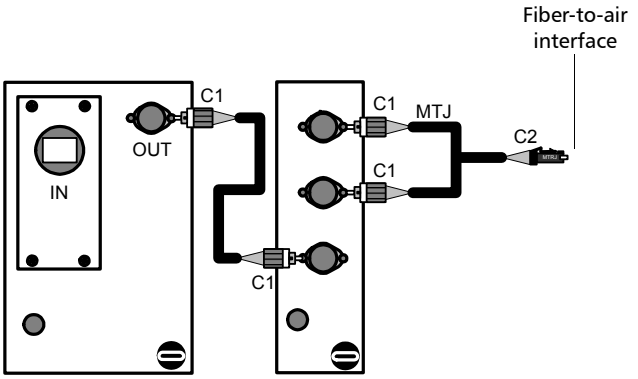
To test your patchcords:

1. Set up your test parameters as explained in *Setting Up Your Test* on page 104.
2. From the **Measure** function tab, select the **Measurement** tab to be able to perform references and tests.

3. If you are testing multimode fibers, reference your master test jumper for reflectance. You should have read *Referencing Master Test Jumpers* on page 122 first.

3a. Click the **Reference** button.

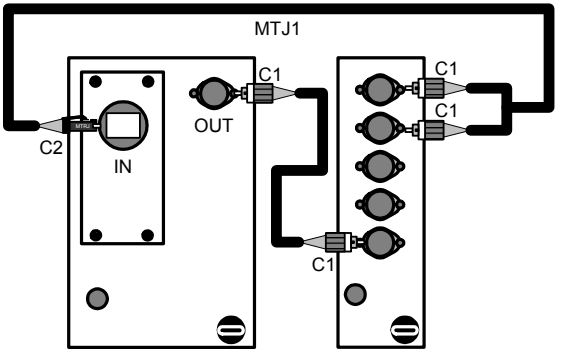
3b. Set up your connections as shown below.



3c. Click **Start** to start the reference acquisition.

4. Reference your master test jumper for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

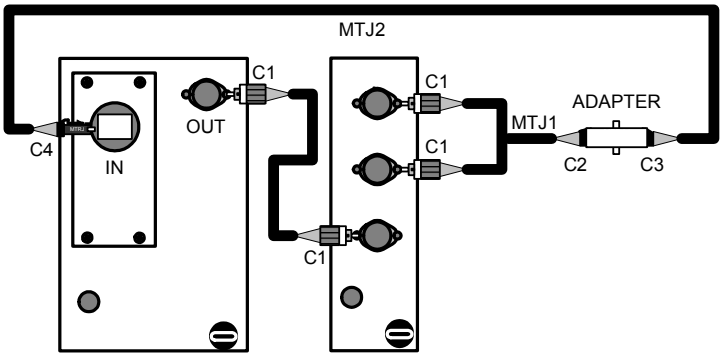
4a. Set up your connections as shown below.



4b. Click **Start** to start the reference acquisition.

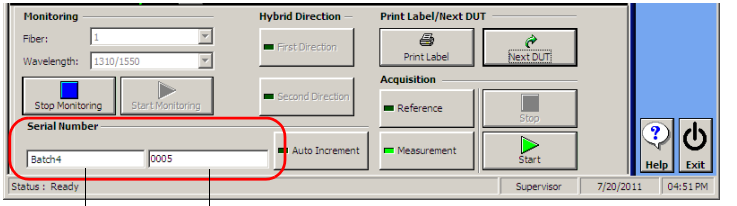
5. Reference your master test jumper 2 for insertion loss. You should have read *Referencing Master Test Jumpers* on page 122 first.

5a. Set up your connections as shown below.



5b. Click **Start** to start the reference acquisition.

6. Enter the DUT serial number in the **Serial Number** box.



Fixed part

Alphanumeric

Incremental part

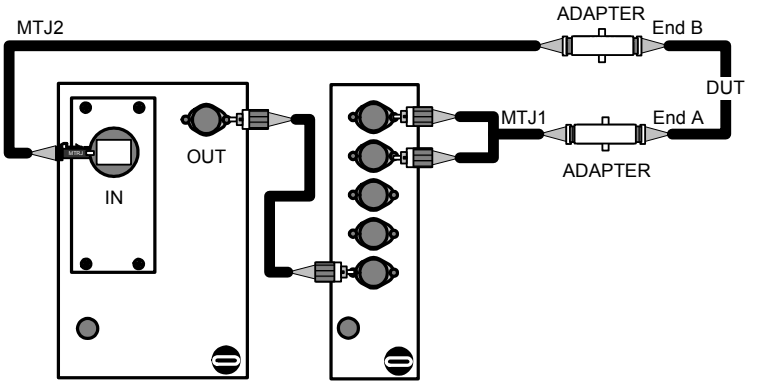
Must be numeric if used with the Auto Increment Option

Note: *If you configured the application to generate unique serial numbers automatically, you cannot modify these numbers from the application. For more information, see* Customizing DUT Serial Numbers *on page 74.*

7. Measure your DUT.

7a. Click the **Measurement** button.

7b. Set up your connections as shown below.



7c. Click **Start** to start the acquisition.

Note: *If you have not selected the mandrel-free option (see* Defining DUTs *on page 94), the application will ask you to mandrel-wrap and straighten your fiber.*

IMPORTANT

To avoid losing data, be sure to click Print Label or Next DUT before performing other actions such as modifying the test setup or configuring switch ports.

You can view results with the Database Browser without losing any information.

8. Once your results are all acquired, you can print labels or reports. For more information, see *Printing Labels and Reports* on page 292.

9. Click **Next DUT** to go on to the following DUT.

12 Managing Results

This chapter presents various tools that will allow you to view, print and export test information and results obtained with the Cable Assembly Test System.

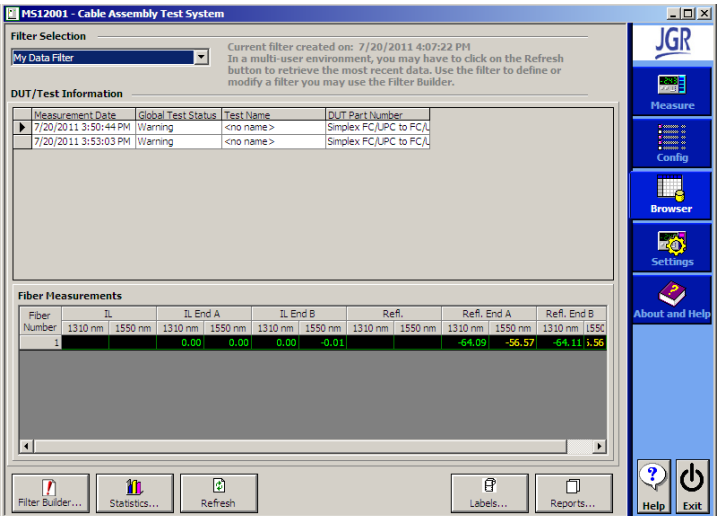
Browsing through the Database

The database browser gives you access to the whole contents of the database and allows you to view, print and export only the desired information by using customizable filters.

To browse through the database:

1. Click the **Browser** function tab to access the database main window.
2. Select a filter from the list. If the list is empty, you may define one with the filter builder (see *Customizing the Database Browser Information* on page 284). Once a filter is selected, the DUT and fiber measurement tables are updated automatically.

Note: *You may have to use the **Refresh** button to display the most recent data.*



Customizing the Database Browser Information

Customization of the information presented in the upper table of the Database Browser can be made using filters. Filters define which portion of the acquired data will be displayed (see *Browsing through the Database* on page 283).To consult examples of the filter builder, see *Filter Builder Examples* on page 397.

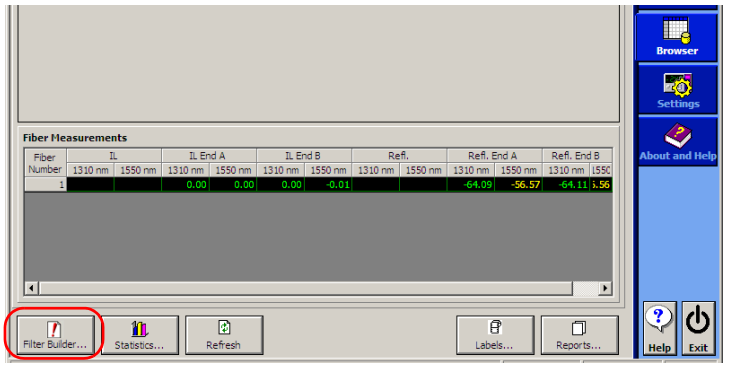
You can tailor the information to your needs by determining the columns to be displayed and their order of appearance. You can also indicate the order of appearance of the rows by defining a sorting criteria. A sorting criteria specifies columns (fields) into which the table must be sorted and the type of sorting (either ascending or descending) needed.

Note: *If you want to modify the display format of the results appearing in the fiber results table, see* Setting Resolution to Display *on page 61 and* Setting Display for Very Small Reflectance Values *on page 63.*

Note: *Operators can add new filters, but cannot modify existing ones.*

To add a new filter:

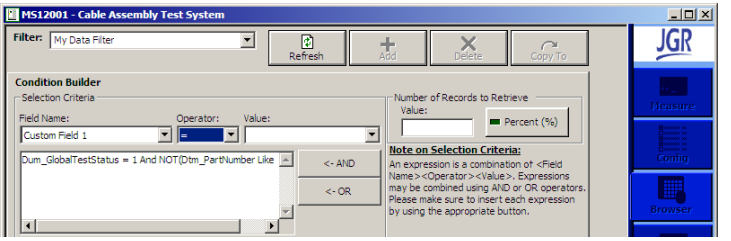
1. From the **Browser** function tab, click the **Filter Builder** button.



2. From the filter builder window, click **Add** if you want to add entirely new information.

   OR

   Select an existing filter from the **Filter** box and click the **Copy To** button. A new filter will be created with the duplicated information.



3. From the **Condition builder** panel, you can define the data selection criteria. For more information, see *Defining Criteria* on page 288.

   3a. Select a field name from the list.

   3b. Select a comparison operator from the **Operator** box**.**

   3c. Select the value to which the selected field should be compared. If there is no value available, simply type one in.

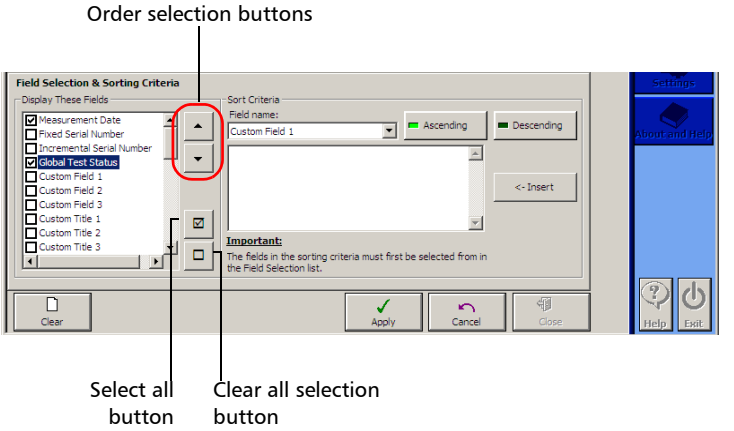
   3d. Insert the condition you have built in the **Selection** box using the **<– AND** or **<– OR** button. When required, you may also insert parenthesis in your expression by typing them directly in the selection box.

Note: *For a single condition, you can use any of the two buttons.*

4. If you want to define a compound criterion, repeat step 3 for each condition you want to include.

5. If necessary, enter a value to restrain the amount of data to be displayed. You can also specify this value in percentage by clicking on the **Percent %** button.

6. Under **Display These Fields**, in the list, select the columns to be displayed in the results table by selecting the check box next the desired fields.



You can define the order in which the columns will be displayed by selecting the corresponding field in the list and by moving it with the up and down arrows.

7. If necessary, you can define sort criteria that determine how the current filter should display the data.

7a. In the list, select a field.

7b. Click the **Ascending** or **Descending** button to apply, to the selected, the sorting order.

7c. Click **Insert** to enter the sorting criteria.

8. Click **Apply** to save the filter.

Note: *In a multi-user environment, you can make the current filter available to all other workstations or keep it local (current workstation). In a local environment, filters always remain local (specific workstation only).*

Note: *You can quickly empty all fields and boxes by clicking **Clear**.*

To modify an existing filter:

1. From the **Browser** function tab, click the **Filter Builder** button.
2. From the **Filter** box, select the name of the filter you want to modify.
3. Modify the information and click **Apply** to save the modifications.

To delete an existing filter:

1. From the **Browser** function tab, click the **Filter Builder** button.
2. From the **Filter** box, select the name of the filter you want to modify.
3. Click **Delete**.

Defining Criteria

You can specify on which criteria you want the data to be based on. Criteria are conditions that are used to extract specific information from all the available data records.

Note: *The* like *operator is a special operator that can be inserted in a criterion with characters called "wildcards". It allows you to use only a part of a string as the search condition. For example, to see the results for all APC connectors, you can use LIKE '%APC%' where % acts as a wildcard character that replaces any combination of characters that could appear before or after "APC". For more information on this operator or on the supported wildcards, refer to SQL Server documentation.*

It is possible to combine single criteria into compound criteria using the OR and AND keywords.

- OR: results that meet *at least one* of the criteria will be displayed.

  For example, you can use this keyword to see results related to the customer named *ABC* and those related to the customer named *MyCustomer*.

- AND: results that meet *all of the criteria* will be displayed.

  For example, you can use this keyword to see the IL results above 0.25, obtained for the customer *ABC*.

You can also specify a value to limit the number of data records that will be displayed.

For example, if you enter 50, the first 50 data records corresponding to the current filter selection will be listed. You can also use this function with a percentage. In this case, the first 50 % of the current filter selection will appear.

Printing Statistics Charts

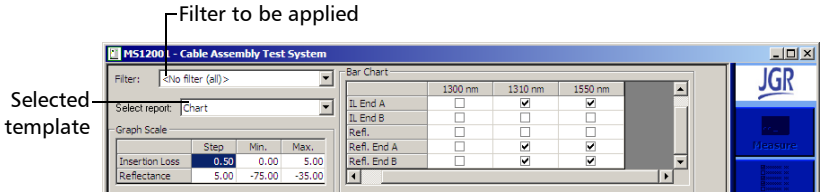
The MS12001 Cable Assembly Test System allows you to view and print statistics charts according to the displayed data and the selected template. There are two different templates:

- Chart: displays distribution charts only
- Chart by category: displays distribution charts, as well as standard deviation, average, minimum and maximum values, variance.

The chart reports can also be exported to HTML (.htm) format.

To print statistics:

1. From the **Browser** function tab, click the **Statistics** button
2. In the **Filter** box, select the filter to be applied to the results.



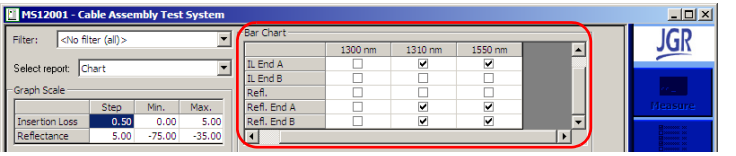
3. From the **Select Report** box, select the template you want to use to view results.

Note: *Templates provided for statistics are not customizable.*

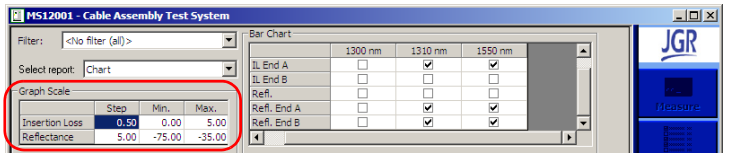
4. Select which measurements you want to include in the chart by selecting the corresponding check boxes under **Bar Chart**.

IMPORTANT

Ensure that you select wavelengths that correspond to the type of fiber you are testing (1310 nm, 1490 nm, 1550 nm, 1625 nm for fibers with a core of 50 µm and 850 nm, 1300 nm for fibers with a core of 62.5 µm). Otherwise, no results will be displayed.

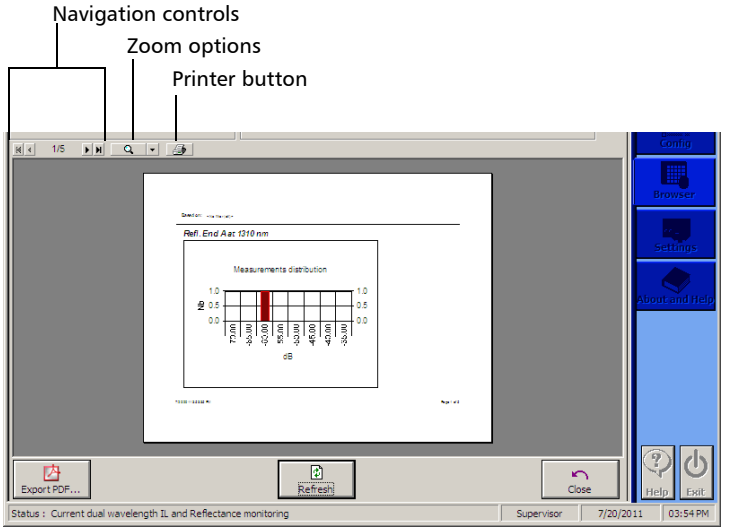


5. Under **Graph Scale**, you can define how data will be distributed.



For example, in the illustration above, the insertion loss results will be distributed into categories of 0.5 dB in the range of 0 to 5 dB (that is, for each category, you can display the average value, the minimum value, and the maximum value).

6. Click **Refresh** to view your data.



To browse through the document:

Use the and buttons.

You can also adjust the zoom factor with the button.

To print the document:

Use the button to send it to the printer.

To export your report:

Click the **Export PDF** button.

To go back to the database browser:

Click **Close**.

Printing Labels and Reports

The MS12001 Cable Assembly Test System allows you to view and print identification labels and reports according to the displayed data and the selected template. The labels and reports can also be exported to these formats:

- HTML (.htm)
- PDF (.pdf)
- Text (.txt): Only the *tabular* reports (not labels nor reports containing graphs) provided by JGR were designed to be exported into a format that can be used in Microsoft Excel without modifications. It is your responsibility to ensure that custom reports are exported correctly.

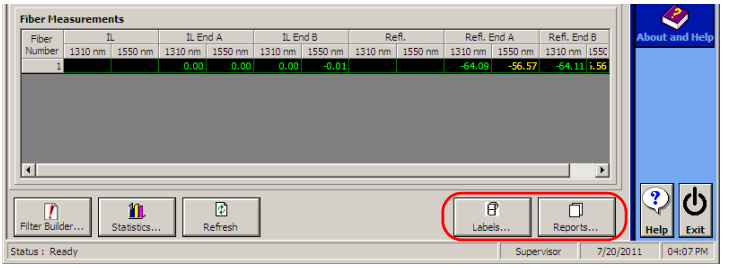
Note: *The structure of the provided templates may vary without notice, from one version of the Cable Assembly Test System software to another.*

To print a label or a report:

1. Click the **Browser** function tab.
2. Click the **Labels** button

   OR

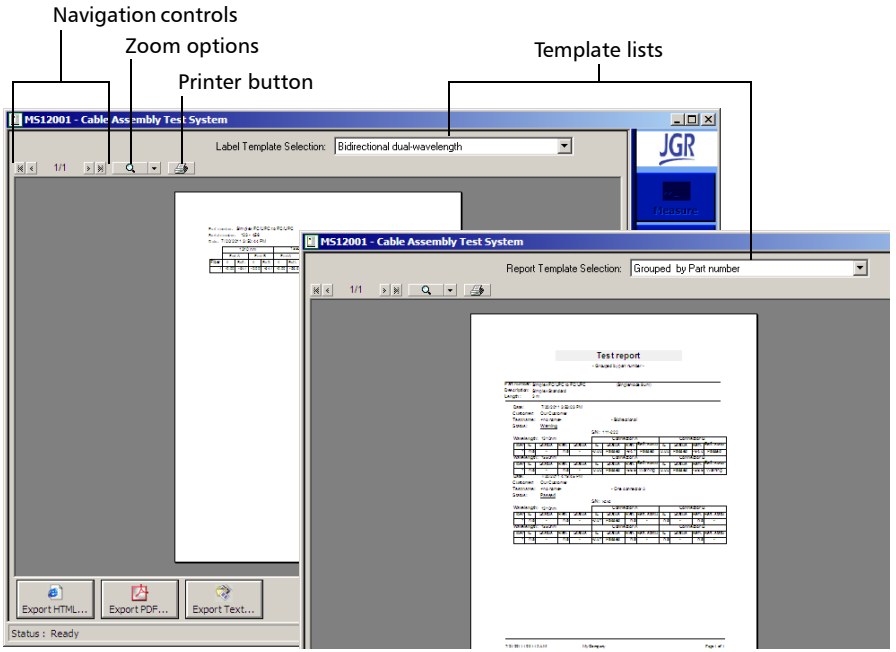
   Click the **Reports** button.



3. Select a template.

   A preview of your label or report appears.

Note: *You cannot create new templates directly from this window. For more information, see* Customizing Labels and Reports *on page 294.*



To browse through the document:

Use the and buttons.

You can also adjust the zoom factor with the button.

To print the document:

Use the button to send it to a printer.

To export your label or report:

Click the button corresponding to the desired format.

To go back to the database browser:

Click **Close**.

Customizing Labels and Reports

Predefined templates are provided with your MS12001 Cable Assembly Test System. However, it is possible to tailor them to your needs by using the VSReport Designer software.

Note: *No user guide is provided with the VSReport Designer software. If you need help, you will have to use the help feature directly from the software.*

The various templates are grouped into .xml files according to their types:

- *Label.xml* (for labels)
- *LabelExtended.xml* (for labels that include 4 wavelengths)
- *Chart.xml* (for reports including graphs)
- *Report.xml* (for reports)

Before being able to customize the templates, ensure that VSReport has been previously installed on your MS platform controller unit. For information on installation of the VSReport Designer, see *Installing the VSReport Designer Software* on page 39.

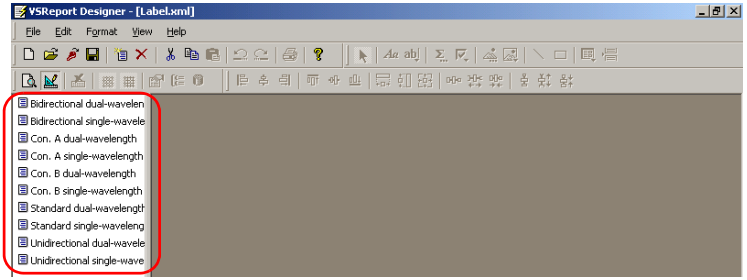
To customize a template:

1. Start the VSReport Designer. On the Windows taskbar, click the **Start** button, select **Programs** > **ComponentOne ActiveX Controls** > **VSView 7.0** > **Reporting Edition** > **Report Designer**.
2. From the **VSReport Designer** main window, open the desired file. The .xml files can be found under:

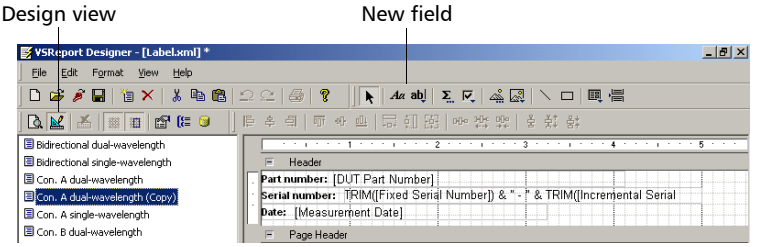
   C:\Documents and Settings\All Users\JGR\MS12001\Templates

Note: *To quickly adapt a template to your needs, you can simply copy an existing one, rename it and modify it.*

3. On the list located on the left side of the window, double-click the template to be modified.



4. From the design view window, customize the template's appearance and content.



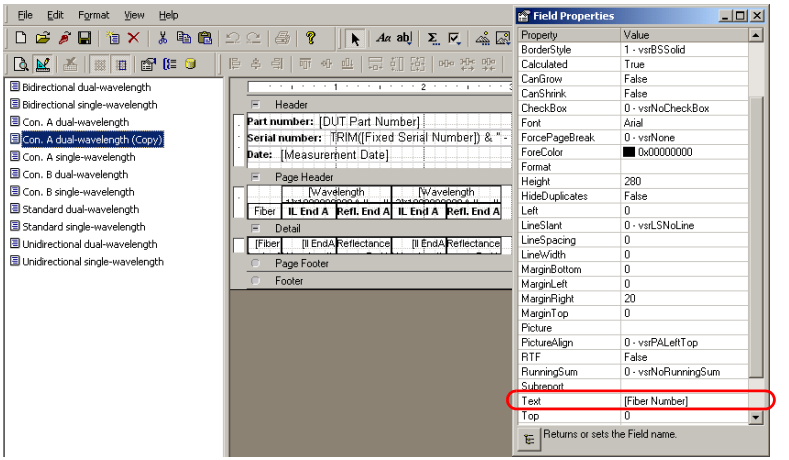
In order for the Cable Assembly Test System to automatically display the appropriate information, make sure that the new fields are inserted this way:

4a. Create an empty field in the appropriate section of the report.

4b. Select the new field, right-click it, and select **Properties**.

4c. In the **Field Properties** dialog box, double-click the **Text** property.

Once the value has been selected, type the name of the desired data field exactly as it appears in *Data Dictionary* on page 389.

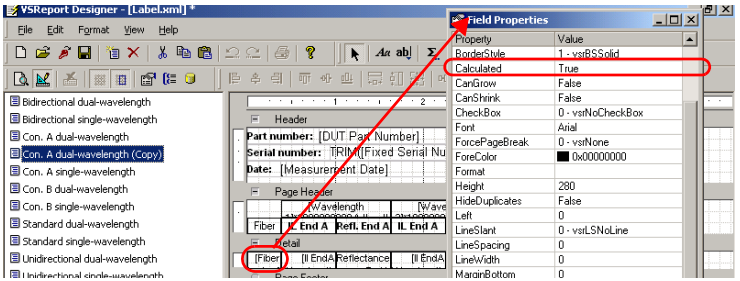


IMPORTANT

The Cable Assembly Test System will only recognize the fields that have text properties matching the names provided in the data dictionary.

4d. In the **Field Properties** dialog box, double-click the **Calculated** property to set it to *True*.

This way, the Cable Assembly Test System will recognize the new field as a data field instead of a simple text line.



5. When you are done with the changes, save your work and close VSReport Designer.

13 Backing Up and Restoring Databases

The MS12001 Cable Assembly Test System provides you with tools to help you back up your test information and results and to restore them when necessary.

IMPORTANT

It is impossible to append results to any database (local or network) of the MS12001 Cable Assembly Test System. For this reason, if the database you normally use becomes unavailable because of a network problem and you think of working locally, read *Configuring Database Connection* on page 70.

Backing Up Tests and Configurations

The MS12001 Cable Assembly Test System provides tools to perform backups of your databases. You can use these backups when you need to restore data. For information on data recovery, see *Restoring Tests and Configurations* on page 303.

Backups include the following elements:

- configuration (company, customers, connectors, DUT, test profiles); see *Setting Up Test Profiles* on page 89
- test results
- backup parameters (see procedures in this section)

Two types of backups are offered:

- Manual: The supervisor performs backups manually with the provided tools. For more information, see *Manual Database Backup* on page 424.
- Automatic: The system can automatically perform backups, according to the settings previously entered by the supervisor. Automatic backups can be performed once a day, once a week or once a month. By default, backups are performed weekly, on Wednesdays at 12:15 PM.

IMPORTANT

All backups have an expiration date, after which they are automatically deleted from the disk. It is your responsibility to set the number of days the system should keep backups available.

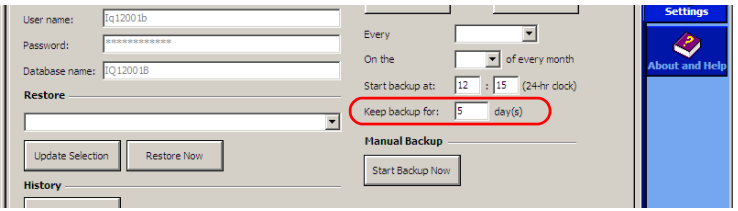
IMPORTANT

To avoid problems in case of a major crash, JGR recommends that you copy the backups to another disk regularly. Backups can be found under C:\Program Files\Microsoft SQL Server\MSSQL\Backup. This path cannot be modified from the Cable Assembly Test System.

To perform a manual backup:

1. From the **Settings** function tab, select the **Display** tab.
2. Ensure that you are in Supervisor mode.

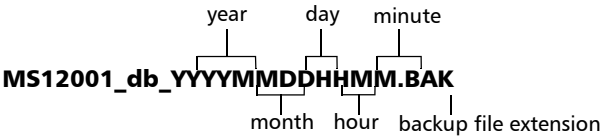
3. In the **Keep backup for** box, enter a value for the expiration delay. You can enter any value from 1 to 9999 (days).



4. Click the **Start Backup Now** button to start the process. click **OK** to close the dialog box.

5. Wait a few seconds for the process to be complete. click **Show History** to see information confirming that the backup operation was successful. For more information on operation history, see *Viewing Backup and Database Recovery History* on page 305.

Note: *It is useless to click the **Start Backup Now** button until the current backup is complete, since the system can perform only one backup per minute. This is related to the way the Cable Assembly Test System automatically names backup files:*

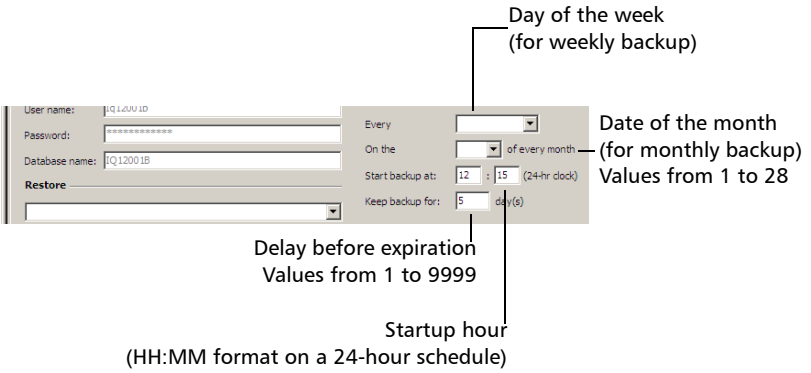


6. Click **Update Selection** to add the new backup to the **Backup Selection** box.

Note: *If you always want to perform backups yourself, click the **On Request** button to select this backup mode. click **Apply** to save your settings.*

To configure the system for automatic backups:

1. From the **Settings** function tab, select the **Display** tab.
2. Ensure that you are in Supervisor mode.
3. Click the button corresponding to the type of backup you need: **Daily**, **Weekly** or **Monthly**.
4. Set the requested parameters. The requested parameters vary depending on the type of backup you have selected.



5. Click **Apply** to save your settings.

Note: *Even if you have set automatic backups, you can use the **Start Backup Now** button to perform a manual backup whenever the need arises.*

Restoring Tests and Configurations

The MS12001 Cable Assembly Test System allows you to restore databases from previous backups.

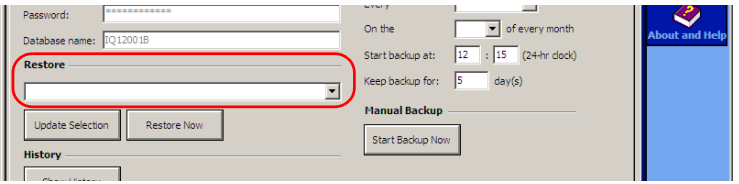
Note: *This function requires Supervisor access level.*

IMPORTANT

The restoring process will overwrite the current database with data from the selected backup file. You will lose all data saved between the date the backup was performed and the current date. For information on backups, see *Backing Up Tests and Configurations* on page 299.

To restore a database:

1. If you are using the MS12001 Cable Assembly Test System in a multi-user environment, ensure that all the workstations (except the one you will be using to start the process) have closed the Cable Assembly Test System application before you start the operation.
2. From the **Settings** function tab, select the **Display** tab.
3. From the **Backup Selection** box, choose which backup will be restored.



4. Click the **Restore Now** button. click **OK** to confirm.

   A message appears, giving you details about the restoring process. click **OK**. The MS12001 Cable Assembly Test System application will terminate.

5. After a few minutes, restart the MS12001 Cable Assembly Test System application.

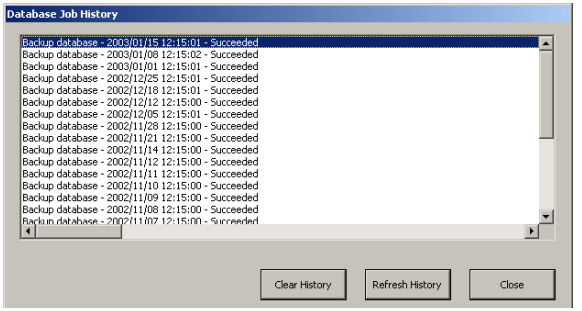
Note: *The time required to complete the operation may vary, depending on the amount of data being restored.*

Note: *If the restoring process is still running, you will be notified and the application will not start.*

Viewing Backup and Database Recovery History

All backup and restoring operations are logged whether the operations were successful or not. When problems occur (for example, disk full), they are also indicated.

Note: *A detailed report of backup jobs executed over the last 30 days can be found under C:\Program Files\Microsoft SQL Server\MSSQL\.*



Note: *This function requires Supervisor access level.*

To view the backup and database recovery history:

1. From the **Settings** function tab, select the **Display** tab.
2. click **Show History** to display information.
3. click **Refresh History** to ensure the latest information is displayed.

To empty the contents of the history list:

From the **Database Job History** dialog box, click **Clear History**.

Note: *Emptying the history list will not delete the backup files.*

To exit the backup and database recovery history:

Click **Close**.

14 Using the Reflectance Verification Tool

Result accuracy is influenced by the internal reflectance values of the *MS12 Loss Test Module* used in your system.

Note: *This tool is intended for singlemode MS12 Loss Test Modules only.*

The reflectance verification tool has been designed to detect changes in reflectance, ensuring that you get the best possible results from your MS12001 Cable Assembly Test System.

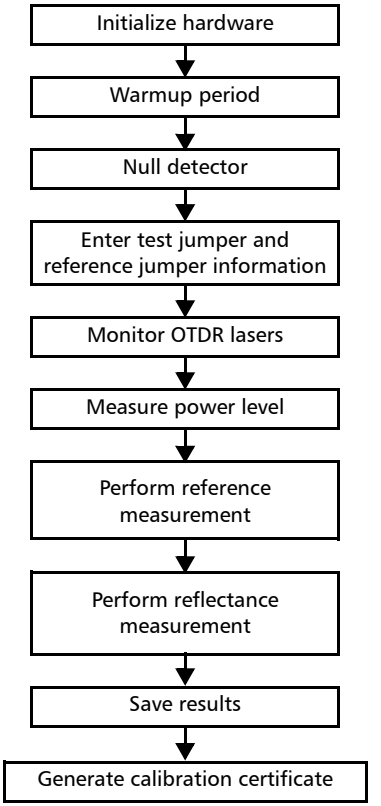
The reflectance verification is accomplished by comparing the values obtained from the MS12 Loss Test Module to the values taken from the CKT-30 Reflectance Reference instrument, acting as a reference.

This tool consists of a wizard that proposes a step-by-step approach, where each step must be performed correctly before gaining access to the next step. This tool also allows you to move to a previous step if you need to perform this procedure again.

Note: *Under Windows XP, for users without sufficient Write permissions to be able to access the reflectance verification tool, for example those in Restricted User mode, a Network Administrator must give them the Write permission to their accounts*
on C:\Documents and Settings\All Users\Application Data\JGR\MS12001 3250 Calibration.

For more information, see Setting User Permissions *on page 42.*

The following diagram illustrates the steps of a typical reflectance verification sequence that can be performed with the tool.



Preparing Hardware for Reflectance Testing

To perform a verification, you will need:

- the MS12 Loss Test Module (to be tested)
- a CKT-30 Reflectance Reference instrument
- a multimode reference jumper (supplied by JGR)
- a singlemode test jumper (supplied by JGR)

CAUTION

Never insert or remove a module while the controller or expansion unit is powered on. This will result in immediate and irreparable damage to both the module and unit.

CAUTION

Handle the reference jumper and the test jumper with care. Damaged connectors may lead to incorrect readings.

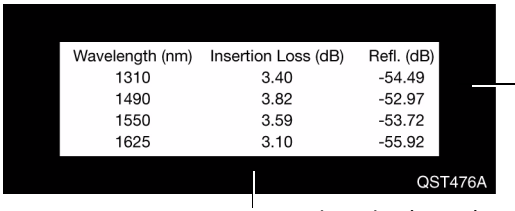
To prepare for the reflectance verification:

1. Ensure that you have inserted the MS12 Loss Test Module in your system.

2. Note the following information about the CKT-30 Reflectance Reference instrument, as you will need it during the verification process.

- ➤ Serial number
- ➤ Calibration date
- ➤ IL and reflectance values at 1310 nm
- ➤ IL and reflectance values at 1490 nm
- ➤ IL and reflectance values at 1550 nm
- ➤ IL and reflectance values at 1625 nm

All the required information can be found on a label affixed on the side panel of your CKT-30 Reflectance Reference instrument.



3. Insert the CKT-30 Reflectance Reference instrument in your system.

Starting and Exiting the Application

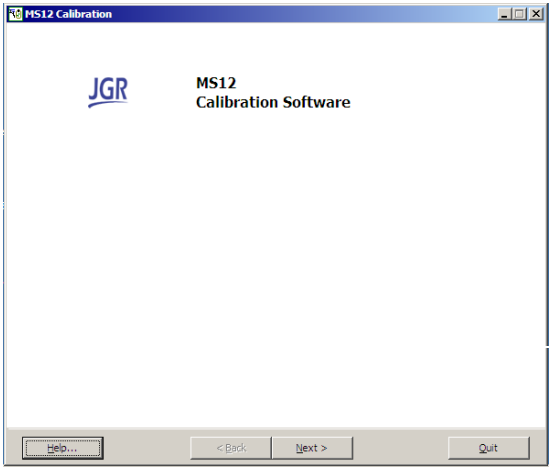
To start the application:

1. On the hard disk of your MS platform controller unit, find C:\Program Files\JGR\MS12001\Tools and double-click Instrument3250Calibration.exe.

   Upon starting the application, a message may appear, indicating that the regional settings of your system were temporarily changed. This change consists in using a period for the decimal symbol and using the YYYY-MM-DD date format.

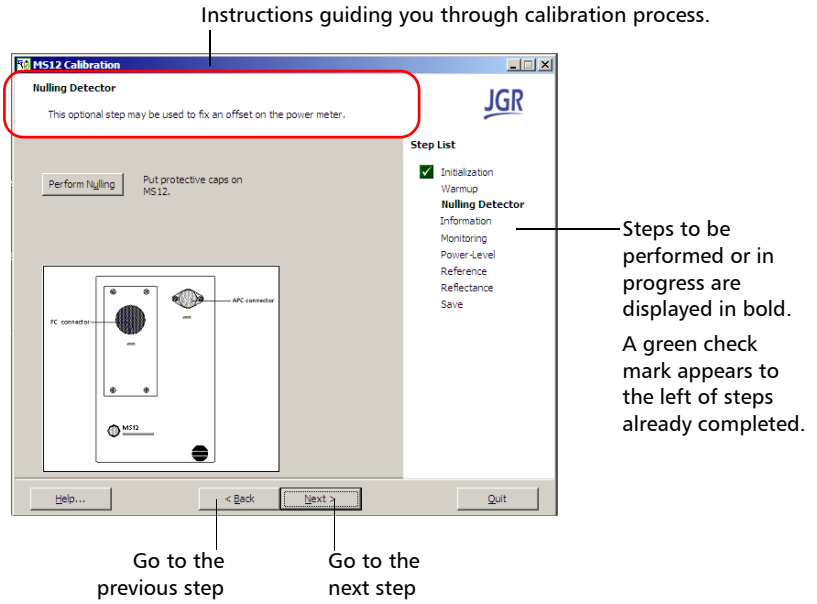
2. Click **OK**.

   The **MS12 Calibration** welcome window is displayed.



3. Click **Next** to continue.

All windows in the procedure present the information using a common pattern.



Closing any application that is not currently being used is a good way to free up system memory.

To close the application:

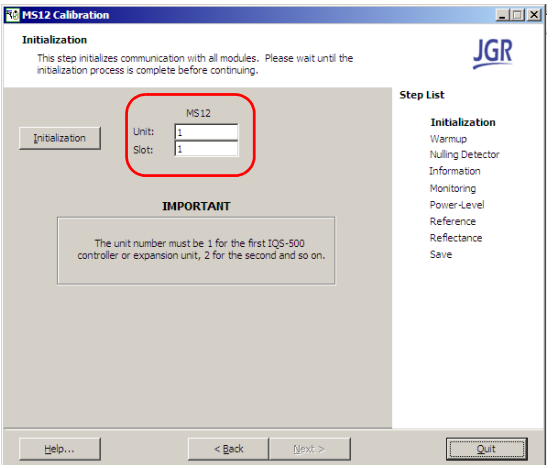
➤ Click ☒ (in the top right corner of the window).

➤ Click the **Quit** button located at the bottom of the window.

Note: *It is possible to close the application at any step of the verification process. However, a confirmation message will be displayed, except if you have reached the last window (indicating that all steps have been successfully completed).*

Initializing Hardware

Once the required modules have been properly inserted into the system, a hardware detection is necessary before being able to perform a reflectance verification.



To perform the initialization:

1. Fill in the fields with information about the MS12 Loss Test Module.

IMPORTANT

The unit number is usually 1 for the MS platform controller unit, 2 for the first expansion unit and so on. As the expansion units are daisy chained, their positions are indicated on the unit's position display. For more information, refer to the *MS platform* platform user guide.

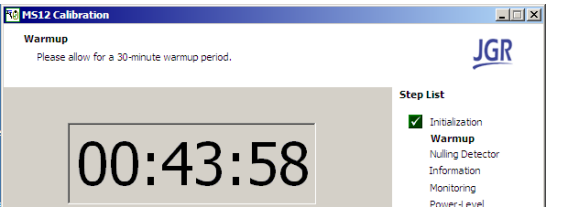
Note: *Since the MS12 Loss Test Module is a two-slot instrument, the slot position corresponds to the second slot number (for example, if the instrument takes both slots 4 and 5, the value to be entered in the **Slot** box is 5.)*

2. Click the **Initialization** button to start the process.

3. When the initialization is complete, click **Next**.

IMPORTANT

To optimize results accuracy, JGR recommends that you let the system warm up for 30 minutes before going further into the verification process.



Note: *The timer will not automatically stop after 30 minutes. It is your responsibility to go to the next step after the warmup period is over.*

4. click **Next** to continue with the verification process.

Nulling Electrical Offsets

Temperature and humidity variations affect the performance of electronic circuits and optical detectors, which can offset measurement results. To compensate for this offset, the MS12001 is equipped with an offset nulling function.

JGR recommends performing a nulling of the electrical offsets whenever environmental conditions change.

IMPORTANT

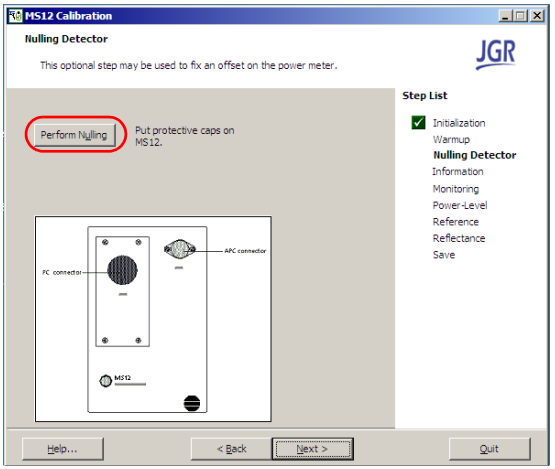
Light must not reach the detector when nulling offsets.

This operation allows you to null the electrical offsets on the internal power meter of the MS12 Loss Test Module. A correction factor is determined and applied to any future measurement.

Note: *This step is optional. To skip it, click **Next**.*

To perform a nulling:

1. Put protective caps on the detector and output ports of the Loss Test Module.

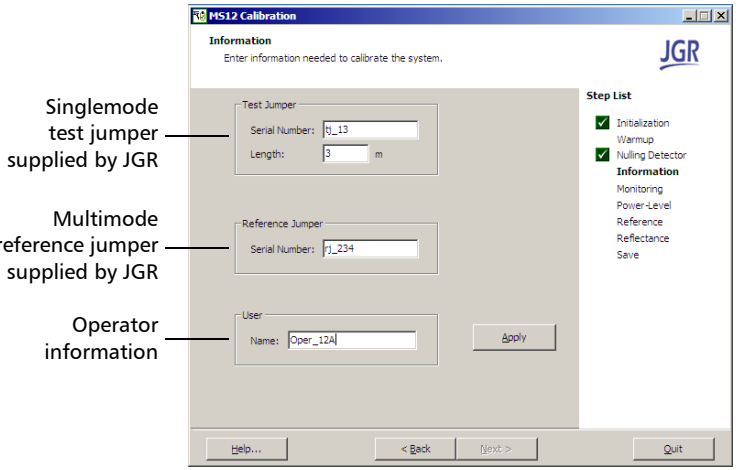


2. Click the **Perform Nulling** button to start the null measurement.

When the operation is complete, click **Next**.

Entering Test Information

In order to perform a reflectance verification, you need to specify which patchcords will be used.



To enter information for the reflectance verification:

1. Under **Test Jumper**, enter the serial number and the length of the singlemode test jumper you will be using.
2. Under **Reference Jumper**, in the **Serial Number** box, enter the serial number for the multimode reference jumper you will be using.
3. Under **User**, in the **Name** box enter the operator's name.

Note: *All parameters must be defined before going on with the verification process.*

4. Click **Save** to enter the values in the system.
5. Click **Next**.

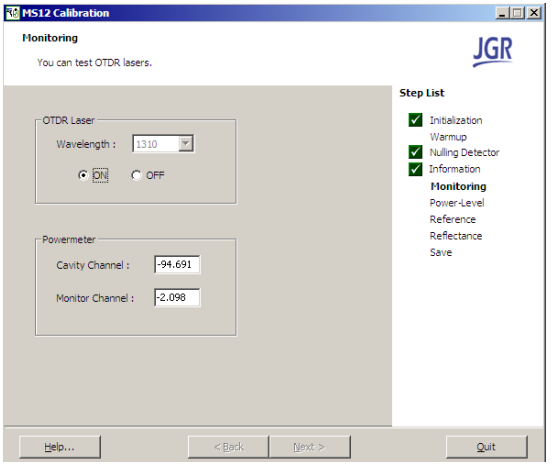
Monitoring Internal OTDR Lasers

Monitoring allows you to view, in real time, the values obtained for the cavity and monitor channels, according to the selected wavelength.

Note: *This procedure is optional.*

To monitor OTDR lasers:

1. In the **Wavelength** list, select the desired wavelength.



Note: *The **OFF** option must be selected to be able to select a wavelength.*

Note: *The available wavelengths correspond to the wavelengths supported by the instrument's internal OTDR.*

2. Select the **ON** option.

The cavity and monitor channel values change accordingly.

3. Repeat steps 1 and 2 for all the wavelengths you want to monitor.

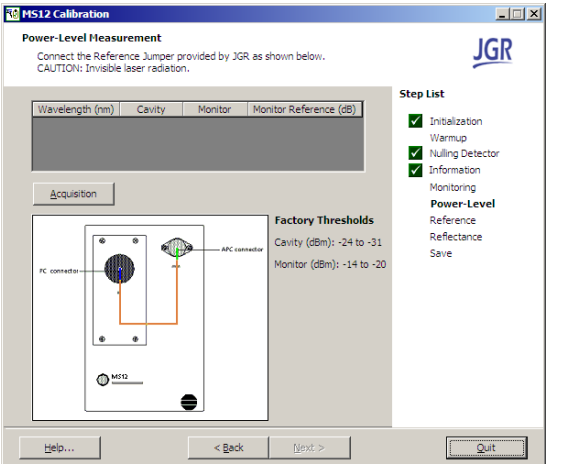
4. When you are done, select the **OFF** option and click **Next**.

Measuring the Power Level

This procedure allows you to measure the power level of the MS12 Loss Test Module by using the multimode reference jumper.

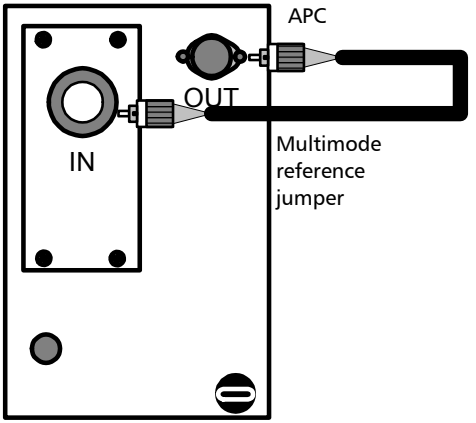
WARNING

Invisible laser radiation is emitted from the output port.



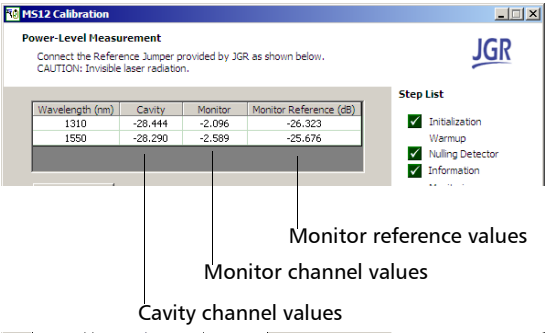
To measure the instrument's power level:

1. Connect the *FC/PC* end of the multimode reference jumper to the detector (In) port of the MS12 Loss Test Module and the *FC/APC* end to the output (Out) port as shown below.



2. Click **Acquisition**.

The obtained values are displayed in the **Monitor Reference (dB)** column of the result table. These values correspond to the difference between the cavity channel values and the monitor channel values.



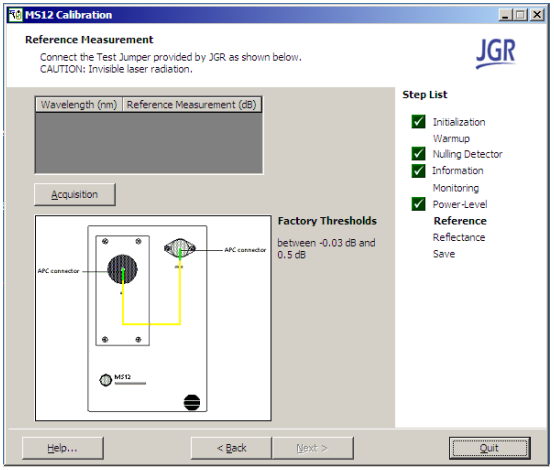
3. Click **Next**.

Performing a Reference Measurement

This procedure allows you to perform an IL reference measurement on the singlemode test jumper.

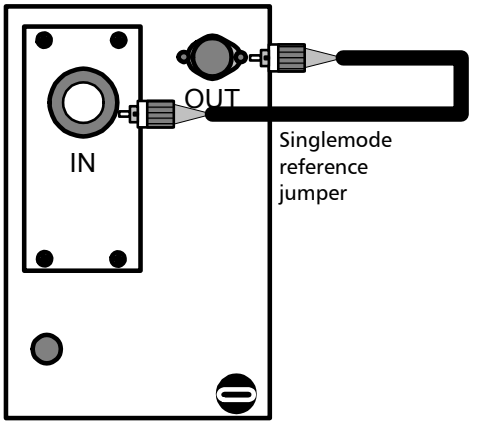
WARNING

Invisible laser radiation is emitted from the output port.



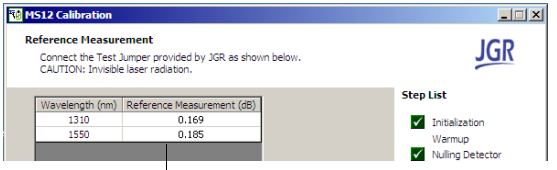
To perform a reference measurement:

1. Connect the singlemode patchcord to the detector (In) port of the MS12 Loss Test Module and to the output (Out) port as shown below.



2. Click **Acquisition**.

The obtained values are displayed in the **Measure (dB)** column of the result table.



Measured reference values

3. Click **Next**.

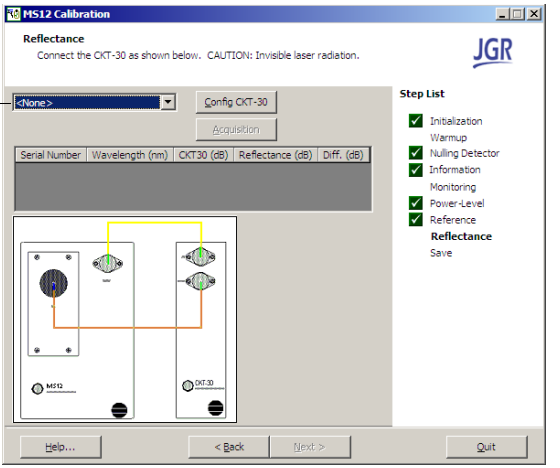
Performing Reflectance Measurement

This step allows you to perform a reflectance measurement on the MS12 Loss Test Module by using a CKT-30 Reflectance Reference instrument, the singlemode test jumper and the multimode reference jumper provided by JGR.

WARNING

Invisible laser radiation is emitted from the MS12 Loss Test Module's output port.

Predefined CKT-30 Reflectance Reference instruments



To perform a reflectance measurement:

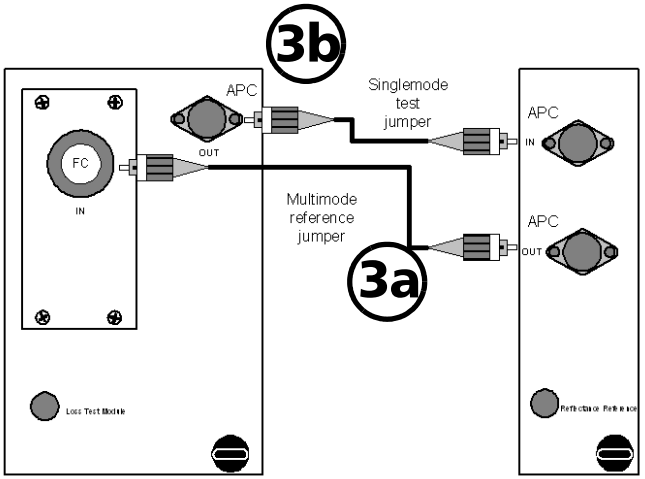
1. If your CKT-30 Reflectance Reference instrument has not been configured (its serial number does not appear in the box), you must define it. For more information, see *Managing CKT-30 Configurations* on page 325.

2. If necessary, select the serial number of the instrument you intend to use in the box containing the predefined CKT-30 Reflectance Reference instruments.

3. Connect the patchcords:

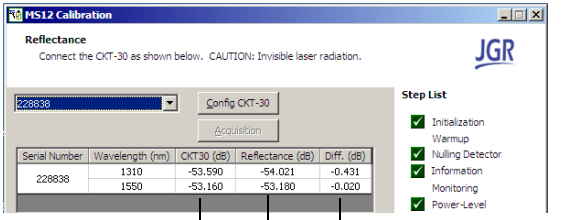
3a. Connect the *FC/PC* end of the multimode reference jumper to the detector (In) port of the Loss Test Module and the *FC/APC* end to the output (Out) port of the CKT-30 Reflectance Reference instrument.

3b. Connect the singlemode test jumper to the output (Out) port of the Loss Test Module and to the input (In) port of the CKT-30 Reflectance Reference instrument.



4. Click **Acquisition**.

The obtained values correspond to the difference between the reflectance values of the CKT-30 Reflectance Reference and Loss Test Module reflectance values.



Difference

Loss Test Module reflectance values

CKT-30 Reflectance Reference values

5. Click **Next**.

IMPORTANT

Your MS12 Loss Test Module is within published specifications if

$$|\text{obtained difference}| \leq 0.5 \text{ dB}$$

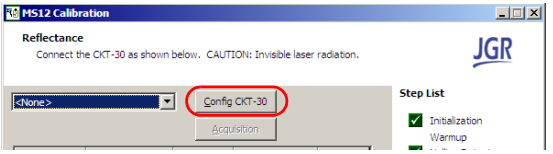
otherwise, please contact JGR (see *Contacting the Technical Support Group* on page 345).

Managing CKT-30 Configurations

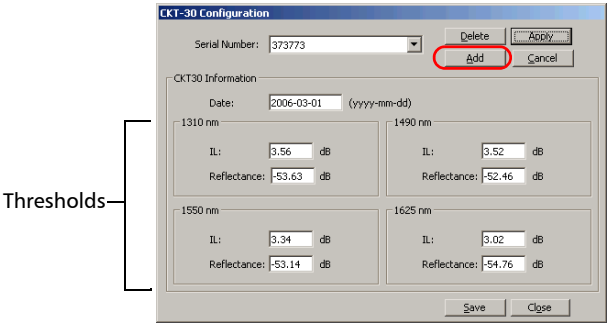
The MS12001 Cable Assembly Test System allows you to define thresholds for your CKT-30 instruments. You can create new configurations, modify existing ones or delete them.

To add a new CKT-30 configuration:

1. From the reflectance measurement step, click the **Config CKT-30** button.



2. In the **CKT-30 Configuration** dialog box, click the **Add** button to create a new configuration.



3. In the **Serial Number** box, enter the CKT-30 serial number.
4. Enter the required information in the appropriate boxes.

Note: *If you have not previously taken note of the different values, you can find all the required information on the label affixed on the side panel of your CKT-30 Reflectance Reference instrument. Since the CKT-30 Reflectance Reference is a special instrument, you can remove it from the system without turning the MS platform controller or expansion unit off.*

5. Click **Apply** to confirm your changes.

IMPORTANT

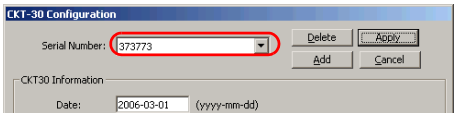
If you omit to click the Save button, all the changes you have made will be lost.

6. Click **Save** to save all the changes that you have made (to one or more configurations).

   Clicking **Close** discards the changes and returns you to the main window.

To modify an existing CKT-30 configuration:

1. From the reflectance measurement step, click the **Config CKT-30** button.
2. From the **Serial Number** box, select the serial number of the CKT-30 instrument for which you want to modify the configuration.



3. Enter the required information in the appropriate boxes.
4. Click **Apply** to confirm your changes.

IMPORTANT

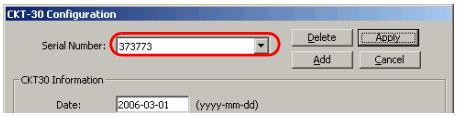
If you omit to click the Save button, all the changes you have made will be lost.

5. Click **Save** to save all the changes that you have made (to one or more configurations).

   Clicking **Close** discards the changes and returns you to the main window.

To delete a CKT-30 configuration:

1. From the reflectance measurement step, click the **Config CKT-30** button.
2. From the **Serial Number** box, select the serial number of the CKT-30 instrument for which you want to delete the configuration.



IMPORTANT

If you omit to click the Save button, all the changes you have made will be lost.

3. Click **Save** to save all the changes that you have made (to one or more configurations).

   Clicking **Close** discards the changes and returns you to the main window.

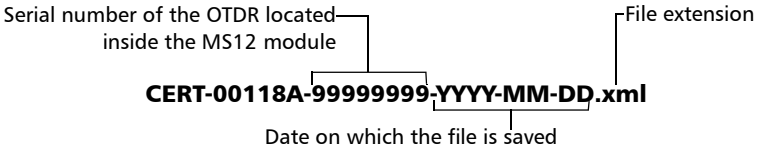
Managing the Verification Results

➤ Once the verification is complete, you can save the reflectance verification results for future use. The results are saved to a *.MDB* file, which is the standard Microsoft Access database format.

The default name for the database file corresponds to the serial number of the OTDR located inside the MS12 Loss Test Module, but you can change it to a name of your choice.

➤ Once you have saved the results, you can also generate an official calibration certificate with the status of the verification.
This certificate is issued in .xml format, and it can be opened directly with Microsoft Excel.

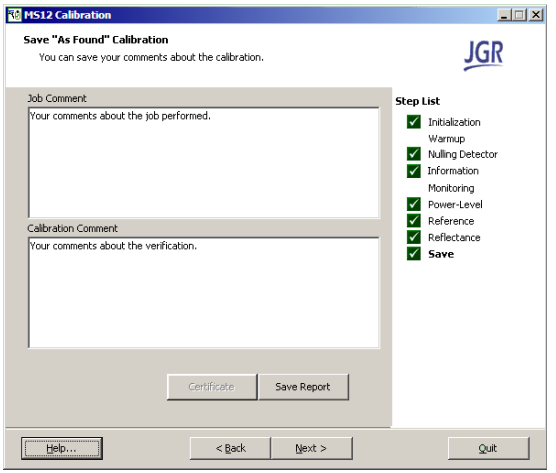
The application automatically names certificate files as follows:



All the calibration certificates that you create are saved in the *C:\Documents and Settings\All Users\Application Data\JGR\MS12001 3250 Calibration* folder.

To manage the results:

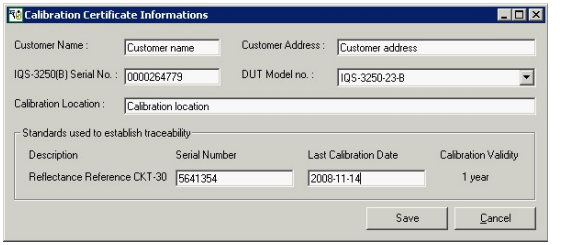
1. Click **Save Report.** This will save the reflectance verification results to a database and enable you to generate a calibration certificate if desired.



2. If you want to generate a calibration certificate with the status of the verification, proceed as follows:

2a. Click **Reflectance Certification**.

2b. Enter the information or modify it as required.



Note: *Customer name and address, as well as calibration location are not mandatory, which means you can leave the corresponding boxes blank if you prefer.*

Note: *A calibration is valid for a period of one year. If you modify the calibration date, ensure that it is less than one year from the current date and that it is presented in the* YYYY-MM-DD *format.*

IMPORTANT

If you create more than one calibration certificate per day for a specific module (that is, with the exact same serial number), only the most recent certificate will be available.

2c. Click **Save**.

The new calibration certificate is saved automatically.

Viewing Test Results

Databases generated with this verification tool can be opened with Microsoft Access. JGR provides a sample report that you can generate with the reflectance verification data.

To view this report:

1. Using Access, open the desired database.
2. Under **Reports** (located on the left of the main window), double-click **Report Calibration**.

Note: *This report can be tailored to your needs by toggling to design mode in Access.*

15 Maintenance

To help ensure long, trouble-free operation:

- Always inspect fiber-optic connectors before using them and clean them if necessary.
- Keep the unit free of dust.
- Clean the unit casing and front panel with a cloth slightly dampened with water.
- Store unit at room temperature in a clean and dry area. Keep the unit out of direct sunlight.
- Avoid high humidity or significant temperature fluctuations.
- Avoid unnecessary shocks and vibrations.
- If any liquids are spilled on or into the unit, turn off the power immediately, disconnect from any external power source, remove the batteries and let the unit dry completely.

WARNING

Use of controls, adjustments, and procedures for operation and maintenance other than those specified herein may result in hazardous radiation exposure.

Cleaning Fixed Connectors

Regular cleaning of connectors will help maintain optimum performance. *Do not try to disassemble the unit. Doing so would break the connector.*

To clean fixed connectors:

1. Fold a lint-free wiping cloth in four to form a square.
2. Moisten the center of the lint-free wiping cloth with *only one drop* of isopropyl alcohol.

IMPORTANT

Alcohol may leave traces if used abundantly. Avoid contact between the tip of the bottle and the wiping cloth, and do not use bottles that distribute too much alcohol at a time.

3. Gently wipe the connector threads three times with the folded and moistened section of the wiping cloth.

IMPORTANT

Isopropyl alcohol takes approximately ten seconds to evaporate. Since isopropyl alcohol is not absolutely pure, evaporation will leave microscopic residue. Make sure you dry the surfaces before evaporation occurs.

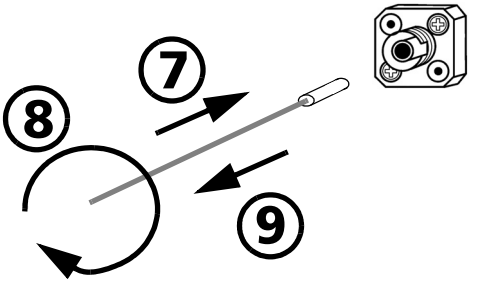
4. With a dry lint-free wiping cloth, gently wipe the same surfaces three times with a rotating movement.
5. Throw out the wiping cloths after one use.

6. Moisten a cleaning tip (2.5 mm tip) with *only one drop* of isopropyl alcohol.

IMPORTANT

Alcohol may leave traces if used abundantly. Avoid contact between the tip of the bottle and the cleaning tip, and do not use bottles that distribute too much alcohol at a time.

7. Slowly insert the cleaning tip into the connector until it reaches the ferrule inside (a slow clockwise rotating movement may help).



8. Gently turn the cleaning tip one full turn.

9. Continue to turn as you withdraw the cleaning tip.

10. Repeat steps 7 to 9, but this time with a dry cleaning tip (2.5 mm tip provided by JGR).

Note: *Make sure you don't touch the soft end of the cleaning tip and verify the cleanliness of the cotton tip.*

11. Throw out the cleaning tips after one use.

Cleaning UI Connectors

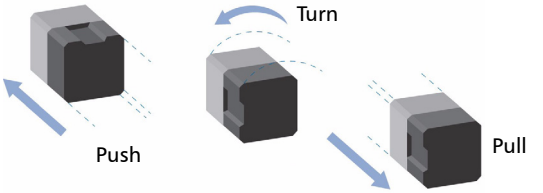
Regular cleaning of UI connectors will help maintain optimum performance. There is no need to disassemble the unit.

IMPORTANT

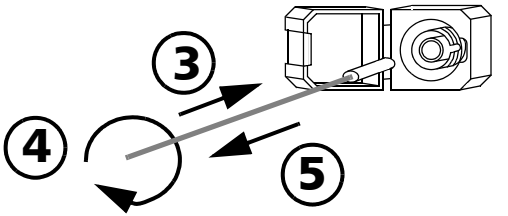
If any damage occurs to internal connectors, the module casing will have to be opened and a new calibration will be required.

To clean UI connectors:

1. Remove the UI from the instrument to expose the connector baseplate and ferrule.



2. Moisten a 2.5 mm cleaning tip with *one drop* of isopropyl alcohol (alcohol may leave traces if used abundantly).
3. Slowly insert the cleaning tip into the UI adapter until it comes out on the other side (a slow clockwise rotating movement may help).



4. Gently turn the cleaning tip one full turn, then continue to turn as you withdraw it.

5. Repeat steps 3 to 4 with a dry cleaning tip.

Note: *Make sure you don't touch the soft end of the cleaning tip.*

6. Clean the ferrule in the connector port as follows:

6a. Deposit *one drop* of isopropyl alcohol on a lint-free wiping cloth.

IMPORTANT

Isopropyl alcohol may leave residues if used abundantly or left to evaporate (about 10 seconds).

Avoid contact between the tip of the bottle and the wiping cloth, and dry the surface quickly.

6b. Gently wipe the connector and ferrule.

6c. With a dry lint-free wiping cloth, gently wipe the same surfaces to ensure that the connector and ferrule are perfectly dry.

6d. Verify connector surface with a portable fiber-optic microscope or inspection probe.

WARNING

Verifying the surface of the connector WHILE THE UNIT IS ACTIVE WILL result in permanent eye damage.

7. Put the UI back onto the instrument (push and turn clockwise).

8. Throw out cleaning tips and wiping cloths after one use.

Cleaning Detector Ports

Regular cleaning of detectors will help maintain measurement accuracy.

IMPORTANT

Always cover detectors with protective caps when unit is not in use.

To clean detector ports:

1. Remove the protective cap and adapter (FOA) from the detector.
2. If the detector is dusty, blow dry with compressed air.
3. Being careful not to touch the soft end of the swab, moisten a cleaning tip with *only one drop* of isopropyl alcohol.

IMPORTANT

Alcohol may leave traces if used abundantly. Do not use bottles that distribute too much alcohol at a time.

4. While applying light pressure (to avoid breaking the detector window), gently rotate the cleaning tip on the detector window.
5. Repeat step 4 with a dry cleaning tip or blow dry with compressed air.
6. Discard the cleaning tips after one use.

Recalibrating the Unit

Manufacturing and service center calibrations are based on the ISO/IEC 17025 Standard, which states that calibration documents must not contain a recommended calibration interval, unless this has been previously agreed upon with the customer.

Validity of specifications depends on operating conditions. For example, the calibration validity period can be longer or shorter depending on the intensity of use, environmental conditions and unit maintenance. You should determine the adequate calibration interval for your unit according to your accuracy requirements.

Under normal use, JGR recommends calibrating your unit every year.

Recycling and Disposal (Applies to European Union Only)

Recycle or dispose of your product (including electric and electronic accessories) properly, in accordance with local regulations. Do not dispose of it in ordinary garbage receptacles.

This equipment was sold after August 13, 2005 (as identified by the black rectangle).

- Unless otherwise noted in a separate agreement between JGR and a customer, distributor, or commercial partner, JGR will cover costs related to the collection, treatment, recovery, and disposal of end-of-lifecycle waste generated by electronic equipment introduced after August 13, 2005 to an European Union member state with legislation regarding Directive 2002/96/EC.
- Except for reasons of safety or environmental benefit, equipment manufactured by JGR, under its brand name, is generally designed to facilitate dismantling and reclamation.

16 Troubleshooting

Solving Common Problems

Before calling JGR's technical support, you may want to consider the following solutions to problems that could occur.

Problem	Possible Cause	Solution
My network database is not accessible.	➤ Network is down. ➤ Access rights for the folder containing the database have been modified.	➤ Solve the network problem and try again. ➤ Work locally. If you choose to work on a local database, to avoid problems, read *Configuring Database Connection* on page 70.
The results differ from the expected values.	➤ Connectors or fibers are dirty. ➤ Fibers are not properly connected.	➤ See *Cleaning and Connecting Optical Fibers* on page 106. ➤ See *Maintenance* on page 333. ➤ Consult the sections concerning your particular test type.

Problem	Possible Cause	Solution
Heavy losses can be noticed.	➤ Connectors do not match. ➤ Fibers are not properly connected. ➤ In two RM configuration, the RMs may be connected to the wrong Input ports on the RM switch.	➤ See *Cleaning and Connecting Optical Fibers* on page 106. ➤ See *Connecting Two RMs and the RM Switch* on page 25.
During reference or measurement, the application displays a message indicating that power is too low.	In most cases, fibers are not properly connected. However, if you are testing in multimode, reflectance only, and you cannot connect your DUT to the detector, it is normal that you receive this message. In this case, you can simply go on with the test.	
During reference or measurement, the application displays a message asking to verify if the loss module selected is available, and that the loss module and the reflectance module are from the same MS12 module.	The loss module may already be used by another application, such as the MS Manager, LabView, or Microsoft Visual Basic.	Free the loss module from the other application. For example, use the instrument control configuration utility from the MS Manager to set platform startup to local.

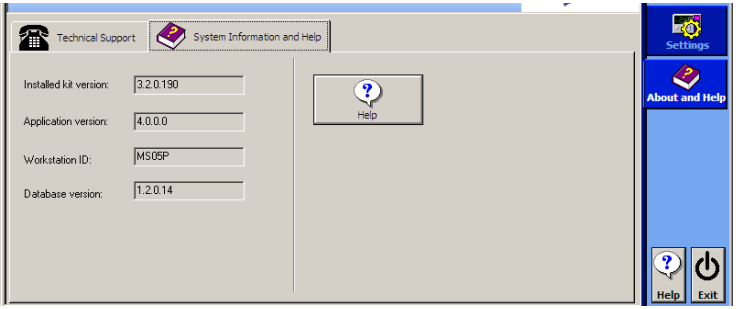
Problem	Possible Cause	Solution
During reference or measurement, the application displays a message indicating that testing at two RMs cannot be performed.	➤ The RM configuration may be wrong. ➤ The test wavelengths set for the test may not be available from the RMs included in the system. ➤ The number of ports available on the DUT switch may be insufficient.	➤ Verify that the setting for testing with two RMs is activated. See *Setting Single or Multiple RM Configuration* on page 54. ➤ Verify the test wavelengths provided by the one or two RMs, as well as those that are configured for the selected test. ➤ Verify that the right switch is being used for testing the DUTs. See *Automatic Switch Configuration* on page 60. ➤ Verify that the DUT switch provides the appropriate number of ports. Remember that when testing in high-throughput configuration, the switch must provide twice the number of ports than the number of DUTs to test. See *Activating/Deactivating Switch Ports* on page 130.

Viewing Online Documentation

An online version of the MS12001 Cable Assembly Test System user guide is conveniently available at all times from the application.

To access the online user guide:

1. Click the **About and Help** function tab.
2. Click **Help**.



Contacting the Technical Support Group

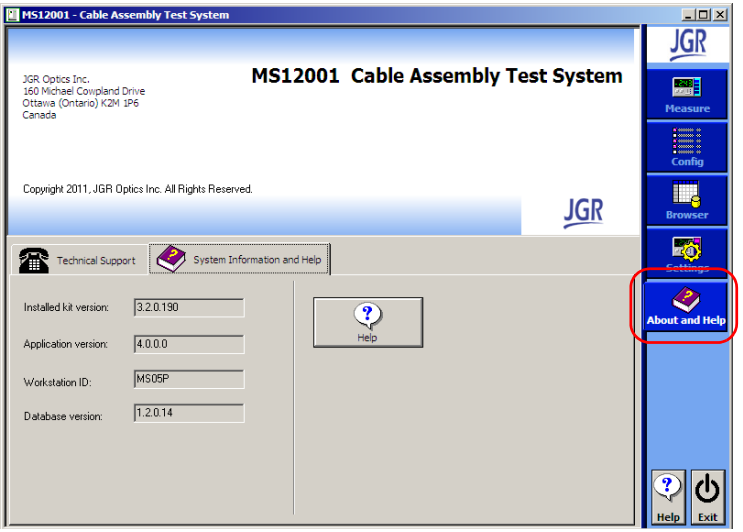
All inquiries regarding service, calibration and technical assistance should be directed to the Customer Service department:

JGR Optics
160 Michael Cowpland Drive
Ottawa (Ontario) K2M 1P6
Tel: 613-599-1000
Fax: 613-599-1099

Tel.: 1 613 599-1000
Fax: 1 613 599-1099
info@jgroptics.com

To accelerate the process, please have information such as the name and the serial number (see the product identification label), as well as a description of your problem, close at hand.

You may also be requested to provide software and module version numbers. This information, as well as technical support contact information, can be found in the **About and Help** function tab.



- Select the **Technical Support** tab to view phone numbers and active Internet links to JGR's Technical Support Group. Use these links to send an information request by email or to access JGR's web site.
- Select the **Module Information** tab to view the module identification, serial number and firmware version.

Transportation

Maintain a temperature range within specifications when transporting the unit. Transportation damage can occur from improper handling. The following steps are recommended to minimize the possibility of damage:

- Pack the unit in its original packing material when shipping.
- Avoid high humidity or large temperature fluctuations.
- Keep the unit out of direct sunlight.
- Avoid unnecessary shocks and vibrations.

A SCPI Command Reference

IMPORTANT

Since the MS controllers and expansion units can house many instruments, you must explicitly specify which instrument you want to remotely control in your MS12001 system.

You must add the following mnemonic *at the beginning of any command or query* that you send to an instrument within the MS12001 system:

LINStrument<LogicalIndex>:

where *<LogicalIndex>* corresponds to the identification number of the MS12001. Typically, this logical index is *12001 (*as returned by the *:INSTrument:CATalog:FULL?* query, described in the MS platform user guide).

Note: *For information about the data types (for input and output), refer to the MS plaftorm user guide.*

Note: *For information on how to send commands or queries to instruments that* are not *part of the MS12001 system, refer to your platform user guide.*

Quick Reference Command Tree

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Product-Specific Commands—Description

:CONFigure:LM:CHANnel	
Description	This command specifies the channel number of the LM that is currently selected (from the group of MS12-PM01 modules).
Syntax	:CONFigure:LM:CHANnel<wsp><Channel>
Parameter(s)	*Channel:* The program data syntax for <Channel> is defined as a <DECIMAL NUMERIC PROGRAM DATA> element. Corresponds to the channel number of the LM module that is currently selected (from the group of MS12-PM01 modules). By default, this value is set to 1, which corresponds to the measurement channel of an LM that is part of an MS12 module.

:CONFigure:LM:CHANnel?

Description	This query returns the channel number of the LM that is currently selected (from the group of MS12-PM01 modules).
Syntax	:CONFigure:LM:CHANnel?
Parameter(s)	None
Response Syntax	<Channel>
Response(s)	*Channel:* The response data syntax for <Channel> is defined as a <NR1 NUMERIC RESPONSE DATA> element. Returns the channel number of the LM that is currently selected (from the group of MS12-PM01 modules).

:CONFigure:POWer:LEVel

Description	This command specifies the new power level coefficient that will be associated with the RM that is currently selected (from the group of MS12 modules) and with the LM that is currently selected (from the group of MS12-PM01 modules), for the wavelength that is currently selected.
Syntax	:CONFigure:POWer:LEVel<wsp><PowerLevel>
Parameter(s)	*PowerLevel:* The program data syntax for <PowerLevel> is defined as a <DECIMAL NUMERIC PROGRAM DATA> element. Represents the new power level coefficient corresponding to the RM and LM that are currently selected, for the current wavelength.

:CONFigure:WAVelength

Description	This command specifies the wavelength, in meters (m), for the RM that is currently selected (from the group of MS12 modules).
Syntax	:CONFigure:WAVelength<wsp><Wavelength>
Parameter(s)	*Wavelength:* The program data syntax for <Wavelength> is defined as a <NONDECIMAL NUMERIC PROGRAM DATA> element. Corresponds to the wavelength, in meters (m), for the RM that is currently selected.

:CONFigure:WAVelength?

Description	This query returns the current wavelength, in meters (m), for the RM that is currently selected (from the group of MS12 modules).
Syntax	:CONFigure:WAVelength?
Parameter(s)	None
Response Syntax	<Wavelength>
Response(s)	*Wavelength:* The response data syntax for <Wavelength> is defined as a <NR3 NUMERIC RESPONSE DATA> element. Returns the current wavelength, in meters (m), for the RM that is currently selected (from the group of MS12 modules).

:DEFine:LM:GROup?

Description	This query returns a list of the serial numbers of all LM modules that are part of the MS12-PM01 modules group.
Syntax	:DEFine:LM:GROup?
Parameter(s)	None
Response Syntax	<LmSerialNumberList>
Response(s)	*LmSerialNumberList:* The response data syntax for <LmSerialNumberList> is defined as a <DEFINITE LENGTH ARBITRARY BLOCK RESPONSE DATA> element. Returns a list of the serial numbers of all LM modules that are part of the MS12-PM01 module group.

:DEFine:LM:GROup:ADD

Description	This command adds an LM to the group of MS12-PM01 modules. This group will be taken into account during the initialization.
Syntax	:DEFine:LM:GROup:ADD<wsp><LmPosition>
Parameter(s)	*LmPosition:* The program data syntax for <LmPosition> is defined as a <STRING PROGRAM DATA> element. Corresponds to the unit and slot number of the LM. Always begin with 0.0..
Example(s)	DEF:LM:GROU:ADD 0.0.1.0

:DEFine:RM:GROup?

Description	This query returns a list of the serial numbers of all RM modules that are part of the group of MS12 modules.
Syntax	:DEFine:RM:GROup?
Parameter(s)	None
Response Syntax	<RmSerialNumberList>
Response(s)	*RmSerialNumberList:* The response data syntax for <RmSerialNumberList> is defined as a <DEFINITE LENGTH ARBITRARY BLOCK RESPONSE DATA> element. Returns a list of the serial numbers of all RM modules that are part of the MS12 module group.

:DEFine:RM:GROup:ADD

Description	This command adds an RM to the group of MS12 modules. This group will be taken into account during the initialization. The LM module that is part of the MS12 will be added to the configuration of the system automatically.
Syntax	:DEFine:RM:GROup:ADD<wsp><RmPosition>
Parameter(s)	*RmPosition:* The program data syntax for <RmPosition> is defined as a <STRING PROGRAM DATA> element. Corresponds to the unit and slot number of the RM. Always begin with 0.0..
Example(s)	DEF:RM:GROU:ADD 0.0.1.1

:DELete:LM:GROup	
Description	This command deletes the group of MS12-PM01 modules.
Syntax	:DELete:LM:GROup
Parameter(s)	None

:DELete:RM:GROup

Description	This command deletes the group of MS12 modules.
Syntax	:DELete:RM:GROup
Parameter(s)	None

:FETCh:POWer:LEVel?

Description	This query returns the power level coefficient that is associated with the RM that is currently selected (from the group of MS12 modules) and with the LM that is currently selected (from the group of MS12-PM01 modules), for the current wavelength.
Syntax	:FETCh:POWer:LEVel?
Parameter(s)	None
Response Syntax	<PowerLevel>
Response(s)	*PowerLevel:* The response data syntax for <PowerLevel> is defined as a <NR3 NUMERIC RESPONSE DATA> element. Returns the power level coefficient that is associated with the RM and LM that are currently selected, for the current wavelength.

:INITialize

Description	This command starts the initialization of the modules that are associated with the system configuration. This operation is asynchronous because the initialization of all the modules (from the MS12 and MS12-PM01 groups) takes a few minutes. You should ensure that the status of the instrument switches from BUSY to READY, using the STATus? query.
Syntax	:INITialize
Parameter(s)	None

:LM:SELect

Description	This command selects an LM (from the group of MS12-PM01 modules) using its serial number.
Syntax	:LM:SELect<wsp><LmSerialNumber>
Parameter(s)	*LmSerialNumber:* The program data syntax for <LmSerialNumber> is defined as a <STRING PROGRAM DATA> element. Corresponds to the serial number of the LM that will be selected (from the group of MS12-PM01 modules).

:LM:SELect?

Description	This query returns the serial number of the LM that is currently selected (from the group of MS12-PM01 modules).
Syntax	:LM:SELect?
Parameter(s)	None
Response Syntax	<LmSerialNumber>
Response(s)	*LmSerialNumber:* The response data syntax for <LmSerialNumber> is defined as a <STRING RESPONSE DATA> element. Returns the serial number of the LM that is currently selected (from the group of MS12-PM01 modules).

:MEASure:POWer:LEVel

Description	This command determines the power level coefficient and configures it automatically. This coefficient will be used only when performing IL measurements on singlemode fibers. The measurement will be performed according to the selected RM (from the MS12 module group) and the selected LM (from the MS12-PM01 module group), at the selected wavelength. Important: You must connect the RM directly to the LM and use a special fiber to perform the measurement.
Syntax	:MEASure:POWer:LEVel
Parameter(s)	None

:READ:COMPonent:POSition?

Description

This command calculates the distance between the A connector and the component position, identified as C point. This service is only applicable when doing component testing measurements.

Syntax

:READ:COMPonent:POSition?<wsp><Mtj1Il>,<Mtj1Length>

Parameter(s)

➤ *Mtj1Il:*

The program data syntax for <Mtj1Il> is defined as a <DECIMAL NUMERIC PROGRAM DATA> element.

Corresponds to the insertion loss (IL) of the Master Test Jumper 1 (MTJ1), in decibels (dB).

➤ *Mtj1Length:*

The program data syntax for <Mtj1Length> is defined as a <DECIMAL NUMERIC PROGRAM DATA> element.

Corresponds to the length of the Master Test Jumper 1 (MTJ1), in meters (m).

Response Syntax

<Length>

Response(s)

Length:

The response data syntax for <Length> is defined as a <NR3 NUMERIC RESPONSE DATA> element.

Returns the distance between the A connector and the compenent under test, in meters (m).

:READ:IL?

Description	This command measures the insertion loss (IL) of singlemode or multimode fibers. The measurement will be performed according to the selected RM (from the MS12 module group) and the selected LM (from the MS12-PM01 module group), at the selected wavelength. When the measurements are performed on singlemode fibers, the power level coefficient will also be taken into account.
Syntax	:READ:IL?
Parameter(s)	None
Response Syntax	<IL>
Response(s)	*IL:* The response data syntax for <IL> is defined as a <NR3 NUMERIC RESPONSE DATA> element. Returns the insertion loss value, in decibels (dB).

:READ:INTermal:REFLectance?

Description	This query returns the internal reflectance value of the module. This value will be taken into account when performing reflectance measurements on multimode fibers.
Syntax	:READ:INTermal:REFLectance?<wsp><IL>
Parameter(s)	*IL:* The program data syntax for <IL> is defined as a <DECIMAL NUMERIC PROGRAM DATA> element. Corresponds to the insertion loss (IL), in decibels (dB).
Response Syntax	<Reflectance>
Response(s)	*Reflectance:* The response data syntax for <Reflectance> is defined as a <NR3 NUMERIC RESPONSE DATA> element. Returns the internal reflectance value of the module for a multimode fiber.

:READ:LENGth?

Description	This command measures the fiber length between the RM and LM. The measurement will be performed according to the selected RM (from the group of MS12 modules) and LM (from the group of MS12-PM01 modules), at the selected wavelength.
Syntax	:READ:LENGth?<wsp><IL>
Parameter(s)	*IL:* The program data syntax for <IL> is defined as a <DECIMAL NUMERIC PROGRAM DATA> element. Corresponds to the insertion loss (IL), in decibels (dB).
Response Syntax	<Length>
Response(s)	*Length:* The response data syntax for <Length> is defined as a <NR3 NUMERIC RESPONSE DATA> element. Returns the length, in meters (m).

:READ:MM:REFLectance?

Description	This command measures the reflectance on a multimode fiber. The measurement will be performed according to the selected RM (from the group of MS12 modules) and LM (from the group of MS12-PM01 modules), at the selected wavelength.
Syntax	:READ:MM:REFLectance?<wsp><IL>,<Internal Reflectance>,<Length>

:READ:MM:REFLectance?

Parameter(s)

➤ *IL:*

The program data syntax for <IL> is defined as a <DECIMAL NUMERIC PROGRAM DATA> element.

Corresponds to the insertion loss (IL), in decibels (dB).

➤ *InternalReflectance:*

The program data syntax for <InternalReflectance> is defined as a <DECIMAL NUMERIC PROGRAM DATA> element.

Corresponds to the internal reflectance value of the module that was determined using the READ:INTernal:REFLectance? query during the configuration process. This value is expressed in decibels (dB).

➤ *Length:*

The program data syntax for <Length> is defined as a <DECIMAL NUMERIC PROGRAM DATA> element.

Corresponds to the distance, in meters (m), at which you want to perform the reflectance measurement.

Response Syntax <Reflectance>

:READ:MM:REFLectance?

Response(s)

Reflectance:

The response data syntax for <Reflectance> is defined as a <NR3 NUMERIC RESPONSE DATA> element.

Returns the reflectance value on the multimode fiber, in decibels (dB).

:READ:SM:REFLectance?

Description	This command measures the reflectance on a singlemode fiber. The measurement will be performed according to the selected RM (from the group of MS12 modules) and LM (from the group of MS12-PM01 modules), at the selected wavelength.
Syntax	:READ:SM:REFLectance?<wsp><IL>,<Length>

:READ:SM:REFLectance?

Parameter(s)

➤ *IL:*

The program data syntax for <IL> is defined as a <DECIMAL NUMERIC PROGRAM DATA> element.

Corresponds to the insertion loss (IL), in decibels (dB).

➤ *Length:*

The program data syntax for <Length> is defined as a <DECIMAL NUMERIC PROGRAM DATA> element.

Corresponds to thedistence, in meters (m), at which you want to perform the reflectance measurement.

Response Syntax

<Reflectance>

Response(s)

Reflectance:

The response data syntax for <Reflectance> is defined as a <NR3 NUMERIC RESPONSE DATA> element.

Returns the reflectance value on the singlemode fiber at the desired distance. The value is expressed in decibels (dB).

:RM:SELect

Description	This command selects an RM (from the group of MS12 modules), using its serial number.
Syntax	:RM:SELect<wsp><RmSerialNumber>
Parameter(s)	*RmSerialNumber:* The program data syntax for <RmSerialNumber> is defined as a <STRING PROGRAM DATA> element. Corresponds to the serial number of the RM that will be selected (from the group of MS12 modules).

:RM:SELect?

Description	This query returns the serial number of the RM that is currently selected (from the group of MS12 modules).
Syntax	:RM:SELect?
Parameter(s)	None
Response Syntax	<RmSerialNumber>
Response(s)	*RmSerialNumber:* The response data syntax for <RmSerialNumber> is defined as a <STRING RESPONSE DATA> element. Returns the serial number of the RM that is currently selected.

:RM:SNUMber?

Description	This query returns the serial number of the RM whose wavelength corresponds to the wavelength that is passed as a parameter.
Syntax	:RM:SNUMber?<wsp><Wavelength>
Parameter(s)	*Wavelength:* The program data syntax for <Wavelength> is defined as a <NONDECIMAL NUMERIC PROGRAM DATA> element. Corresponds to the wavelength, in meters (m).
Response Syntax	<RmSerialNumber>
Response(s)	*RmSerialNumber:* The response data syntax for <RmSerialNumber> is defined as a <STRING RESPONSE DATA> element. Returns the serial number of the RM.

:RM:WAVelength:LIST?

Description	This query returns a list of wavelengths at which the instrument will be able to perform a measurement, according to the RM module that is currently selected.
Syntax	:RM:WAVelength:LIST?
Parameter(s)	None
Response Syntax	<Wavelengths>
Response(s)	*Wavelengths:* The response data syntax for <Wavelengths> is defined as a <NR3 NUMERIC RESPONSE DATA> element. Returns a list of the wavelengths at which the instrument will be able to perform measurements according to the currently selected RM.

:STATus?

Description	This query returns a value indicating the status of the switch (READY, BUSY, etc.). This command is an event and has no associated *RST condition or query form.
Syntax	:STATus?
Parameter(s)	None
Response Syntax	<Status>
Response(s)	*Status:* The response data syntax for <Status> is defined as a <CHARACTER RESPONSE DATA> element. The <Status> response represents the module state, where: UNINITIALIZED, means the module is not initialized. INITINPROGRESS, means the module initialization is in progress, READY, means the module is ready, BUSY, means the module is busy, DISCONNECTED, means the module is disconnected, DEFECTIVE, means the module is defective and UNCONFIGURED, means the module is not configured.

:WAVelength:LIST?

Description	This query returns a list of the wavelengths that are available, based on the MS12 modules that were used during the initialization.
Syntax	:WAVelength:LIST?
Parameter(s)	None
Response Syntax	<Wavelengths>
Response(s)	*Wavelengths:* The response data syntax for <Wavelengths> is defined as a <DEFINITE LENGTH ARBITRARY BLOCK RESPONSE DATA> element. Returns a list of the available wavelengths, in meters (m).

B Basic Theory

Passive fiber-optic cable assemblies, patchcords, pigtails and connectors are normally tested to verify the insertion loss and reflection they will introduce when used in an optical transmission system. The MS12001 Cable Assembly Test System is designed for production testing of all types of connectors and cable assemblies.

Insertion Loss Measurement

Based on advanced time domain technology and the wide aperture integrating cavity detector, the MS12 Loss Test Module will deliver accurate and repeatable IL and reflectance measurements. The internal monitoring channel ensures accurate IL measurements by compensating for any source power variations. The insertion loss measurement has been developed in accordance with the TIA/EIA-455-34A Standard FOTP-34A, “Interconnection Device Insertion Loss Test”.

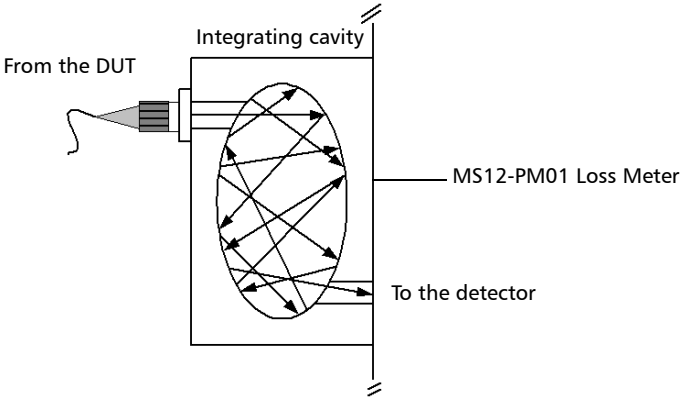
Internal Monitor Detector

During the insertion loss measurement, the laser is activated in continuous wave (CW) mode. The internal monitoring detector is used to compensate for any source power fluctuations. This is important because, during fast dual-wavelength IL and reflectance measurements, the source is constantly changing wavelength and mode (pulsed to CW).

As you can see, this method provides the most accurate results possible, since it is taking into account all the variation of power during every measurement as well as during the referencing. The MS12001 references are good for as long as the optical path remains undisturbed.

Integrating Cavity

The main advantage of using an integrating cavity in combination with a detector is that the power measurement will be independent of the fiber's numerical aperture and alignment, since the cavity has a large aperture which is equivalent to a wide-area detector of ~ 12 mm in diameter. The cavity is deal or quick, reliable and repeatable power measurements for all current single ferrule polish (PC or APC) and multifiber connectors.



Reflectance Measurement

When light is emitted into a fiber-optic component (for example, connector, fiber, coupler, etc.) some of the energy is transmitted, some is absorbed and some is reflected. In fiber-optic systems, reflected light is due to Fresnel reflections and Rayleigh scattering. Fresnel reflections occur at discrete components and are a result of air gaps, misalignment, and non-matching refractive indexes. Rayleigh scattering is due to the variations in material density and compositional fluctuations occurring during fiber manufacturing. This is creating random homogeneities that rise to refractive index variations.

Reflectance is the ratio of reflected power to incident power due to a single interface.

$$\text{Reflectance (dB)} = 10 \cdot \log\left(\frac{P_{\text{reflected}}}{P_{\text{incident}}}\right)$$

Note: *Reflectance is described as a negative quantity when expressed in dB.*

Keep in mind that the definition of reflectance differs slightly from optical return loss (ORL). ORL refers to the total effect of multiple reflections and scattering events within a fiber-optic system.

Reflectance of transmission systems, equipment and connectors are measured because reflected power is undesirable:

- It contributes to overall power loss.
- High-performance laser transmitters are very sensitive to reflected light. Laser stability and system signal-to-noise ratio can be significantly degraded. Under extreme conditions, the laser transmitter can be damaged.
- Reflected light can be re-reflected in the forward direction. These forward-propagating reflections lag behind the original signal and cause problems with communication and video signal processing.

Almost every singlemode connector used throughout the telecom industry is tested for insertion loss and reflectance. Connectors and patchcords are used in all segments: DWDM, Metro, CWDM, WDM, CATV, Metro Access, LAN, long-haul, submarine systems, PON, FTTX and others.

The new Cable Assembly Test System targets the suppliers of these cable assemblies, and is the highest-performance system available for high-volume production testing.

Internal Reflection Reference

During the reflectance measurement, the laser is activated in pulsed mode. The MS12 Loss Test Module's internal reflectance reference is used to provide a known reflection peak corresponding to a known absolute reflection. It also will allow the instrument to correct for variations in the power of the laser source. The reference reflection's peak range approaches the values expected for typical connector reflectance, thus ensuring that all measurements are made in an excellent linearity range.

IMPORTANT

To obtain accurate results when testing multimode fibers, ensure that during reflectance reference,

- **your master test jumpers are clean**
- **the end of the master test jumper that has to remain in the air is far from any reflecting surface.**

Multimode Fiber Transmission

In a multimode fiber, light can travel through many possible optical paths. These paths are referred to as “modes”. All modes are not equal: they have different propagating characteristics and sensitivities to external perturbations such as bends and splices.

- The lower (low-order) modes are excited by emitting light near the central axis of the fiber. They are also often called “tightly coupled modes”.
- The higher order modes have a significant part of their power close to the cladding or even in the cladding itself. They are also called “loosely coupled modes”.

  For these very high order modes, losses are high, even for a bend radius of a few centimeters. However, for graded-index fibers of 50 or 62.5 μm core, it is possible to filter out more loss modes with a “mode filter”. A mode filter consists in performing a mandrel wrap of a few turns with a radius of 1.7 to 2.5 cm on these fibers. When there is a fiber-to-fiber connection (splice or other interface), these higher order modes will be the most attenuated.

Multimode Fiber Launch Conditions

The type of light source and the type of the optical components being used will influence the launch conditions and, consequently, the results the system will return.

➤ When light from an optical source (surface- or edge-emitting LED, laser, VCSEL, light coming from another fiber, etc.) is coupled into a multimode fiber, the light launch conditions determine which modes will be excited or "filled" and to what extent.

An overfilled fiber means that a large a portion of the power is launched into the high-order modes. If you measure the connector loss under these conditions, you will likely obtain a conservative result that is, higher measured loss than a test with underfilled launch conditions. On the other hand, if you test under restricted or significantly underfilled launch conditions, the test results will be overly optimistic (very low loss) and you may not be able to identify defective connectors.

In the Cable Assembly Test System, LEDs are used for the insertion loss (IL) measurement.

➤ The type of the optical components being used can also change the launch conditions.

IMPORTANT

When an optical component (switch or coupler) is inserted before the device under test, it is your responsibility to ensure that the launch conditions are not modified.

C Non-Reflective Terminations

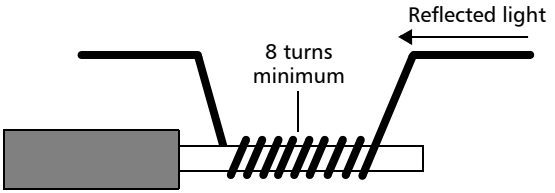
Non-reflective terminations are required during some steps of your test. The common techniques for providing a non-reflective termination are:

- mandrel-wrapping (for singlemode fibers only)
- termination connector (for singlemode fibers only)
- index-matching gel or fluid
- gel block

Mandrel-Wrap

Note: *This technique applies to singlemode fibers only.*

A mandrel-wrap is created by wrapping the fiber a minimum of eight turns (very important at 1310 nm) around the supplied mandrel tool (or other cylinder of similar diameter). It is the recommended method to test singlemode fibers shorter than 1.8 meters.



The mandrel-wrap introduces sufficient attenuation so that any reflections originating from beyond the termination point are negligible.

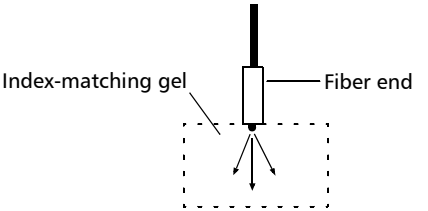
Termination Connector

Note: *This technique applies to singlemode fibers only.*

A termination connector is a connector with a short length of fiber terminated in either an index-matching material or in a permanent mandrel. When you require a non-reflective termination, simply connect the termination connector. Obviously, since it is a connector, there will always be a reflection due to the connector interface.

Index-Matching Gel or Fluid

An index-matching gel or fluid is an optically transparent material with the same refractive index as that of the fiber. If access to a fiber end is available, a near-perfect termination can be produced by inserting the fiber end into the index-matching compound, in which case optical energy is coupled into the material and reflections are almost completely suppressed.



Gel Block

A gel block is an index-matching material. To terminate a connector, simply press the ferrule on the gel block. Gel blocks typically provide between –50 dB and –55 dB reflection when using non-angled connectors. The main advantage of a gel block over other index-matching materials is that no cleaning is required after use.

D Data Dictionary

This chapter gives you a detailed list of the various data fields that can be used with VSReport Designer to customize your labels and reports. For information on label and report customization, see *Customizing Labels and Reports* on page 294.

Data Fields for Label Customization

Data Field	Type	Remarks
[Custom Field 1]	Character (max. 50)	
[Custom Field 2]	Character (max. 50)	
[Custom Field 3]	Character (max. 50)	
[Custom Title 1]	Character (max. 25)	
[Custom Title 2]	Character (max. 25)	
[Custom Title 3]	Character (max. 25)	
[Customer Name]	Character (max. 50)	
[Operator Name]	Character (max. 50)	
[Test Name]	Character (max. 50)	
[Fixed Serial Number]	Character (max. 50)	
[Incremental Serial Number]	Character (max. 50)	
[Wavelength 1]	Numeric	
[Wavelength 2]	Numeric	
[Wavelength 3]	Numeric	
[Wavelength 4]	Numeric	
[DUT Description]	Character (max. 34)	
[DUT Length]	Numeric	
[DUT Manufacturer]	Character (max. 50)	
[DUT Part Number]	Character (max. 34)	

Data Field	Type	Remarks
[Measurement Date]	Date time	
[Fiber Number]	Numeric	
[Workstation ID]	Character (max. 50)	
[IL Wavelength 1]	Numeric	
[IL Wavelength 2]	Numeric	
[IL Wavelength 3]	Numeric	
[IL Wavelength 4]	Numeric	
[IL EndA Wavelength 1]	Numeric	
[IL EndA Wavelength 2]	Numeric	
[IL EndA Wavelength 3]	Numeric	
[IL EndA Wavelength 4]	Numeric	
[IL EndB Wavelength 1]	Numeric	
[IL EndB Wavelength 2]	Numeric	
[IL EndB Wavelength 3]	Numeric	
[IL EndB Wavelength 4]	Numeric	
[Reflectance Wavelength 1]	Numeric	
[Reflectance Wavelength 2]	Numeric	
[Reflectance Wavelength 3]	Numeric	
[Reflectance Wavelength 4]	Numeric	
[Reflectance EndA Wavelength 1]	Numeric	
[Reflectance EndA Wavelength 2]	Numeric	
[Reflectance EndA Wavelength 3]	Numeric	
[Reflectance EndA Wavelength 4]	Numeric	
[Reflectance EndB Wavelength 1]	Numeric	

Data Field	Type	Remarks
[Reflectance EndB Wavelength 2]	Numeric	
[Reflectance EndB Wavelength 3]	Numeric	
[Reflectance EndB Wavelength 4]	Numeric	

Data Fields for Report Customization

Data Field	Type	Remarks
[Measurement Date]	Date time	
[Fixed Serial Number]	Character (max. 50)	
[Incremental Serial Number]	Character (max. 50)	
[Global Test Status]	Numeric	
[Custom Field 1]	Character (max. 50)	
[Custom Field 2]	Character (max. 50)	
[Custom Field 3]	Character (max. 50)	
[Custom Title 1]	Character (max. 25)	
[Custom Title 2]	Character (max. 25)	
[Custom Title 3]	Character (max. 25)	
[Operator Name]	Character (max. 50)	
[Workstation Id]	Character (max. 50)	
[Wavelength]	Numeric	

Data Field	Type	Remarks
[IL Status]	Character	Fiber measurement IL status “Not Completed” “Passed” “Warning” “Failed” “Skipped”
[IL]	Numeric	
[IL EndA]	Numeric	
[IL EndA Status]	Character	Fiber measurement IL status “Not Completed” “Passed” “Warning” “Failed” “Skipped”
[Il EndB]	Numeric	
[IL EndB Status]	Character	Fiber measurement IL status “Not Completed” “Passed” “Warning” “Failed” “Skipped”
[Reflectance]	Numeric	

Data Field	Type	Remarks
[Reflectance Status]	Character	Fiber measurement IL status “Not Completed” “Passed” “Warning” “Failed” “Skipped”
[Reflectance EndA]	Numeric	
[Reflectance EndA Status]	Character	Fiber measurement IL status “Not Completed” “Passed” “Warning” “Failed” “Skipped”
[Reflectance EndB]	Numeric	
[Reflectance EndB Status]	Character	Fiber measurement EndB Status “Not Completed” “Passed” “Warning” “Failed” “Skipped”
[Test Name]	Character (max. 50)	
[Test Type]	Character	Test type “Bidirectional” “Unidirectional” “One connector A” “One connector B”

Data Field	Type	Remarks
[Test Reflectance]	Character	“Yes” “No”
[Test IL]	Character	“Yes” “No”
[Customer Name]	Character (max. 50)	
[DUT Part Number]	Character (max. 34)	
[DUT Description]	Character (max. 34)	
[DUT Manufacturer]	Character (max. 50)	
[DUT Mode]	Character	“Singlemode” “Multimode”
[DUT Length]	Numeric	
[DUT Device Type]	Character	DUT type “Simplex” “Duplex” “Bundle” “Multifiber-Multifiber” “Fanout-Multifiber”
[DUT Mandrel-Free]	Character	Is the DUT mandrel free? “No” “Yes”
[Fiber Number]	Numeric	
[EndA Connector Name]	Character (max. 50)	
[EndA IL Pass Limit]	Numeric	
[EndA IL Warning Limit]	Numeric	
[EndA Reflectance Pass Limit]	Numeric	

Data Field	Type	Remarks
[EndA Reflectance Warning Limit]	Numeric	
[EndB Connector Name]	Character (max. 50)	
[EndB IL Pass Limit]	Numeric	
[EndB IL Warning Limit]	Numeric	
[EndB Reflectance Pass Limit]	Numeric	
[EndB Reflectance Warning Limit]	Numeric	

E Filter Builder Examples

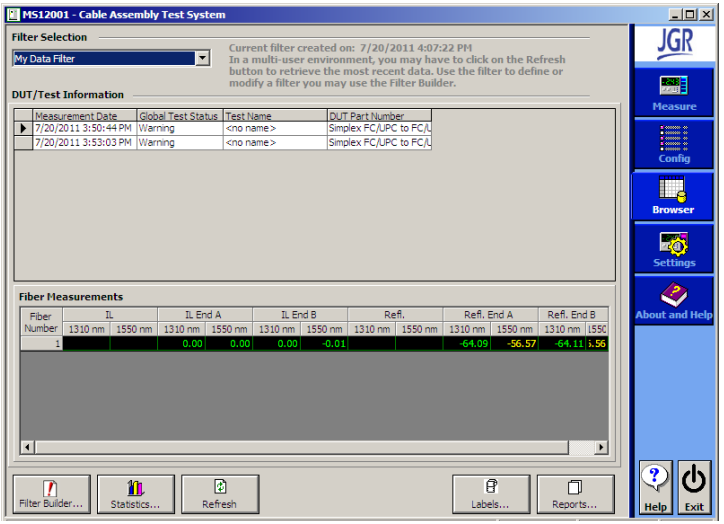
Customizing the information presented in the upper table of the Database Browser can be made using filters. Filters define which portion of the acquired data will be displayed (see *Browsing through the Database* on page 283). The following procedures will help you build the filters needed to display your results.

Displaying Results that Have Failed

You can view the results that failed by building a specific filter. This example explains how to build such filter.

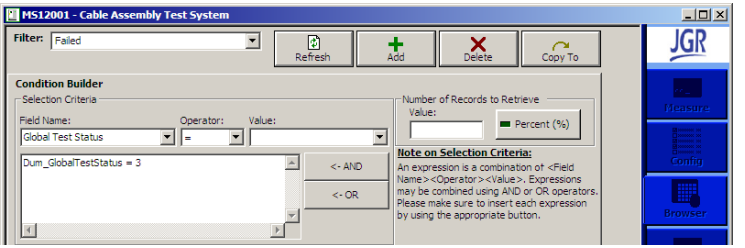
To display the results having a failed status:

1. From the main window, click the **Browser** function tab.



2. Click the **Filter Builder** button.
3. From the filter builder window, click **Add**.

4. In the **Filter** box, name your filter **Failed**.



5. Under **Condition Builder**, define the data selection criteria as follows:

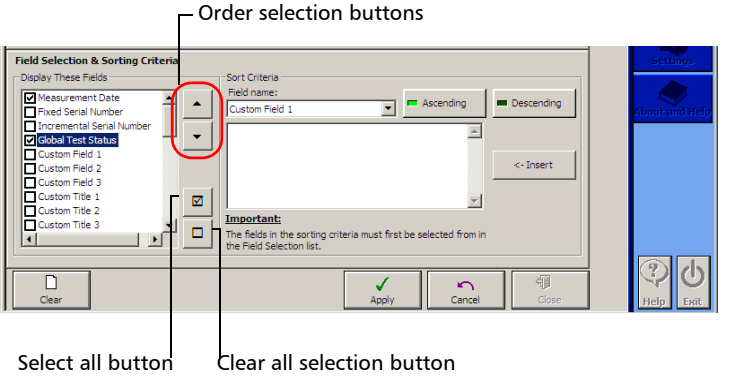
5a. In the **Field Name** list, select **Global Test Status**.

5b. In the **Operator** list, select **=**.

5c. In the **Value** list, select **Failed**.

5d. In the list on the left, apply the condition to the expressions using the **<– AND** and **<– OR** buttons.

6. Under **Display These Fields**, select the check box next to the items you want to display in the columns.



You can define the order in which the columns will be displayed by selecting the corresponding item in the list and by moving it with the up and down arrows.

7. You can define criteria that determine how the current filter should display the data. Define criteria by the measurement date:

7a. Under **Display These Fields,** select **Measurement Date**.

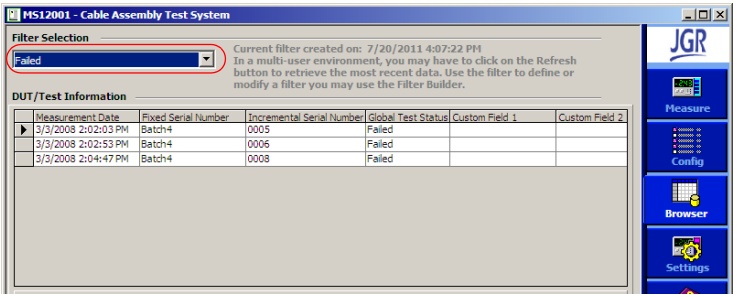
7b. Click **Ascending** to apply to the current field by clicking on the corresponding buttons.

7c. Click **Insert** to register the sorting criteria.

Note: *You can quickly empty all boxes by clicking **Clear**.*

8. Click **Apply** to save the filter.

The **DUT/Test Information** table appears.



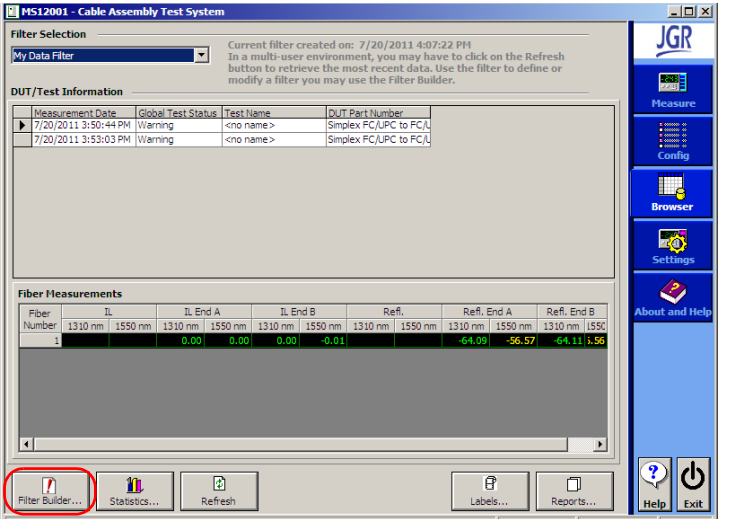
9. In the **Filter** list, select **Failed** to display your results.

Displaying Results for Serial Numbers

You can view the results associated with a serial number by building a specific filter.

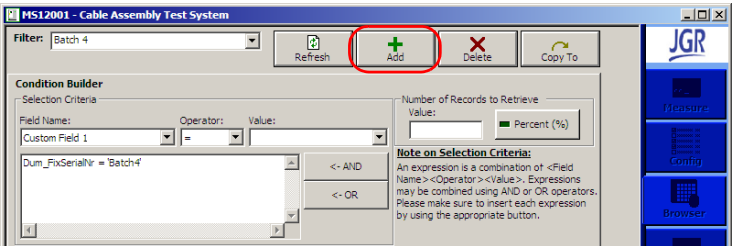
To display results associated with a serial number:

1. From the main window, click the **Browser** function tab.

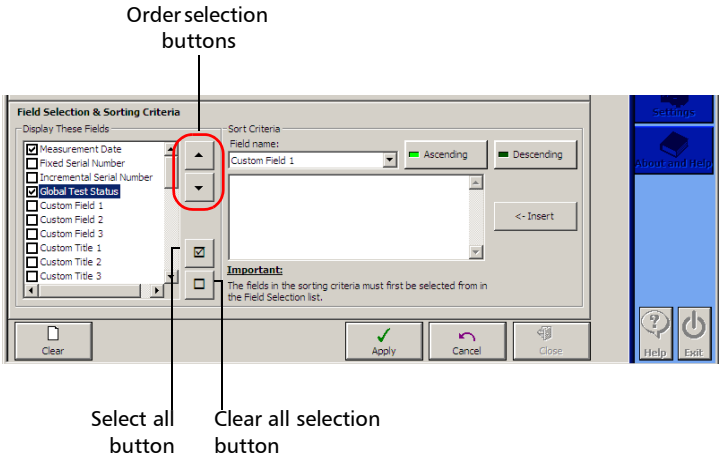


2. Click the **Filter Builder** button.

3. From the filter builder window, click **Add**.



4. In the **Filter** box, enter the name of your filter (**Batch 4** in this example).
5. Under **Condition Builder**, define the data selection criteria as follows:
   - **5a.** In the **Field Name** list, select **Fixed Serial Number**.
   - **5b.** In the **Operator** list, select **=**.
   - **5c.** In the **Value** list, select the desired batch.
   - **5d.** In the list on the left, apply the condition to the expressions using the **<– AND** and **<– OR** buttons.
6. Under **Display These Fields**, select the check box next to the items you want to display in the columns.



You can define the order in which the columns will be displayed by selecting the corresponding field in the list and by moving it with the up and down arrows.

7. You can define criteria that determine how the current filter should display the data. Define criteria by the measurement date:

7a. Under **Display These Fields,** select **Measurement Date**.

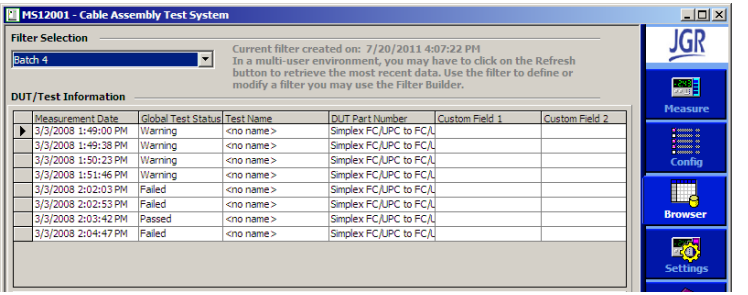
7b. Click **Ascending** to apply to the current field by clicking the corresponding buttons.

7c. Click **Insert** to register the sorting criteria.

Note: *You can quickly empty all fields and boxes by clicking **Clear**.*

8. Click **Apply** to save the current filter.

The **DUT/Test Information** table appears.



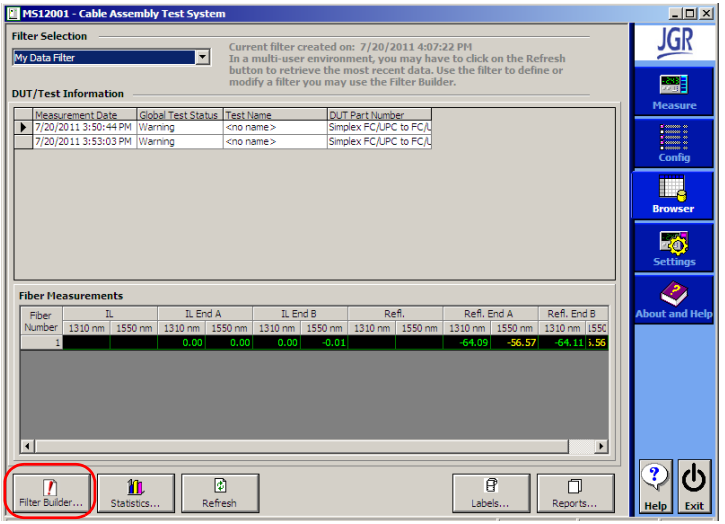
9. Under **Filter Selection**, in the list, select the desired batch (**Batch 4** in this example) to display your results.

Displaying Results for a Time Interval

You can view the results of tests that were made within a specific time interval by building a specific filter.

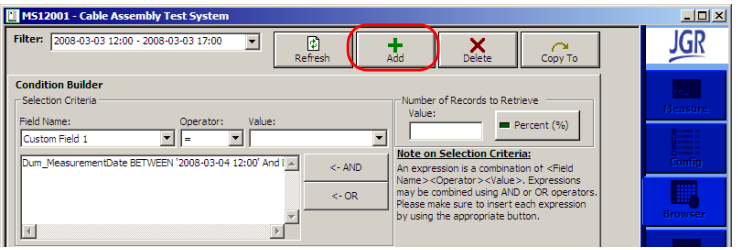
To display results for a time interval:

1. From the main window, click the **Browser** function tab.

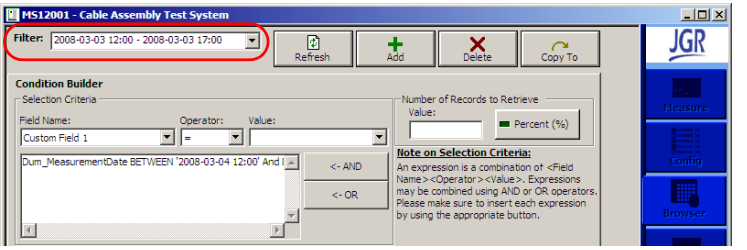


2. Click the **Filter Builder** button.

3. From the filter builder window, click **Add**.



4. In the **Filter** list, enter the filter name according to the beginning and end date of the test results as shown below.



5. Under **Condition Builder**, define the data selection criteria as follows:

5a. In the **Field Name** list, select **Measurement Date**.

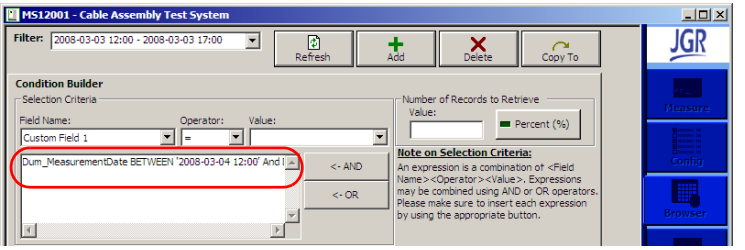
5b. In the **Operator** list, select **=**.

5c. In the **Value** list, select a temporary value.

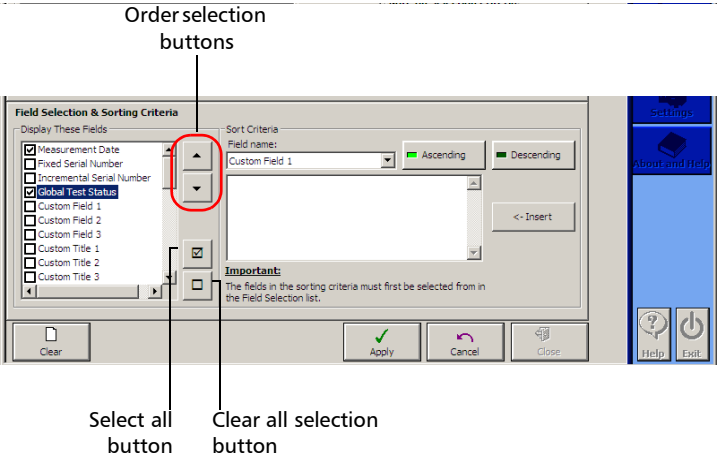
5d. Insert the condition you have built in the selection box using the **<– AND** or **<– OR** button. If you want to define a compound criterion, repeat step 5 for each condition you want to include.

5e. Replace the **=** sign by typing **BETWEEN** over it.

5f. Replace the temporary value by entering the date interval you wish to use as a criteria following the pattern as shown below:



6. Under **Display These Fields**, select the check box next to the items you want to display in the columns.



You can define the order in which the columns will be displayed by selecting the corresponding field in the list and by moving it with the up and down arrows.

7. You can define criteria that determine how the current filter should display the data. Define criteria by the measurement date:

7a. Under **Display These Fields,** select **Measurement Date**.

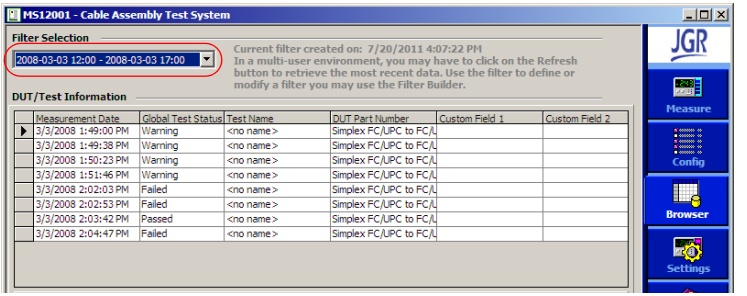
7b. Click **Ascending** to apply to the current field by clicking on the corresponding buttons.

7c. Click **Insert** to register the sorting criteria.

Note: *You can quickly empty all fields and boxes by clicking on **Clear**.*

8. Click **Apply** to save the current filter.

The **DUT/Test Information** table appears.



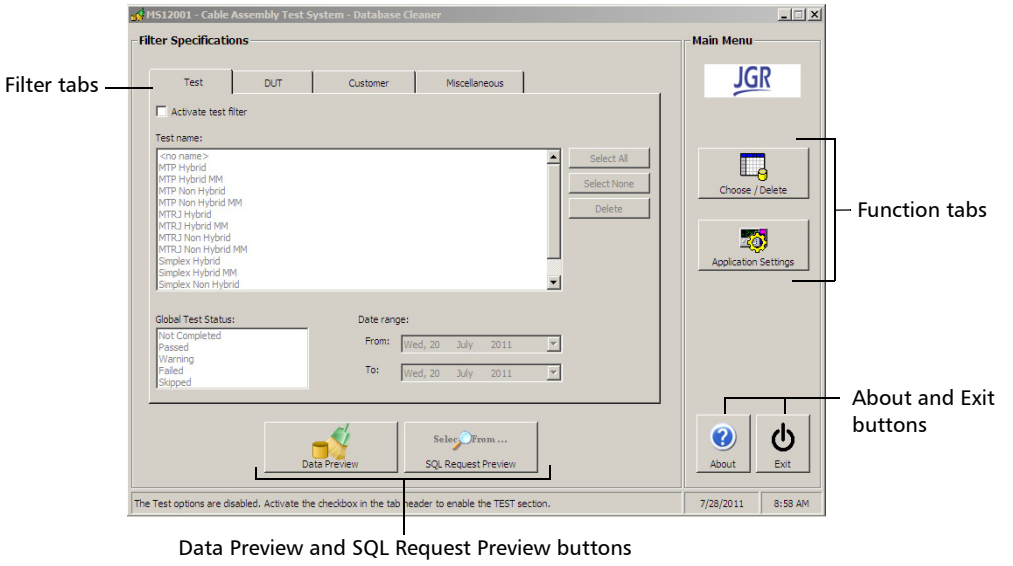
9. In the **Filter** list, select the desired date interval to display your results.

F Using the DataBase Cleaner

Overview

The MS12001 Cable Assembly Test System DataBase Cleaner software was designed to manage patchcord test records. The accumulation of test records may slow down your system and possibly lead to a loss of data. The DataBase Cleaner enables you to keep the database as small as possible by deleting obsolete records.

Main Window



Note: *Under Windows XP, for users without sufficient Write permissions, for example those in Restricted User mode, to be able to access the DataBase Cleaner application, a Network Administrator must give them the Write permission to their accounts*
on C:\Documents and Settings\All Users\Application Data\JGR\MS12001 Config.

For more information, see Setting User Permissions *on page 42.*

From the **Main Menu** you access the two function tabs:

- The **Choose/Delete** function tab allows you to access the main window where you can delete test records according to your selection of test parameters.

  The first time you delete a test record, the DataBase Cleaner automatically generates a backup of the whole database. This backup can be used to restore the database to its initial state.

- The **Application Settings** function tab allows you to set the DataBase Cleaner password, restore deleted databases, make manual backups and define the network connection parameters of the system.

Installing the DataBase Cleaner

The DataBase Cleaner application is located on the CD delivered with the MS12001 software. It may be installed on a computer or directly on the MS platforms controller unit.

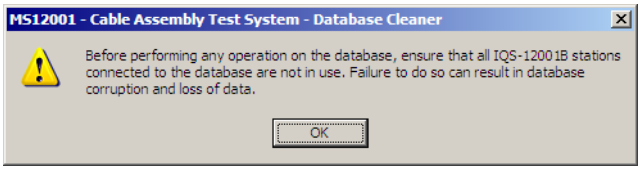
To install the DataBase Cleaner:

1. Insert the installation CD in the CD-ROM drive of your computer or MS platforms controller unit.
2. On the CD, double-click the folder named **MS12001 DataBase Cleaner**.
3. Double-click the **setup.exe** file and follow the instructions appearing on the screen.

   The DataBase Cleaner application will be automatically installed on the same folder as your MS12001 Cable Assembly Test System software.

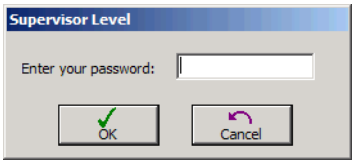
Starting and Exiting the DataBase Cleaner

To avoid potential corruption or loss of data, each time the DataBase Cleaner is started, a message reminds you to ensure that other active networked stations running the MS12001 are not in use.



To start the DataBase Cleaner application:

1. On the Windows taskbar, click the **Start** button, and point to **Programs**.
2. Point to **JGR**, and then click **MS12001 DataBase Cleaner**.
3. In the **Supervisor Level** dialog box, in the **Enter your password** box, type the same password used to open the MS12001 Cable Assembly Test System.



4. Click **OK**.

To exit the DataBase Cleaner application:

On the **Main Menu**, click the **Exit** button.

OR

On the title bar, click  .

Changing the Password

You must have supervisor access level rights to change the password.

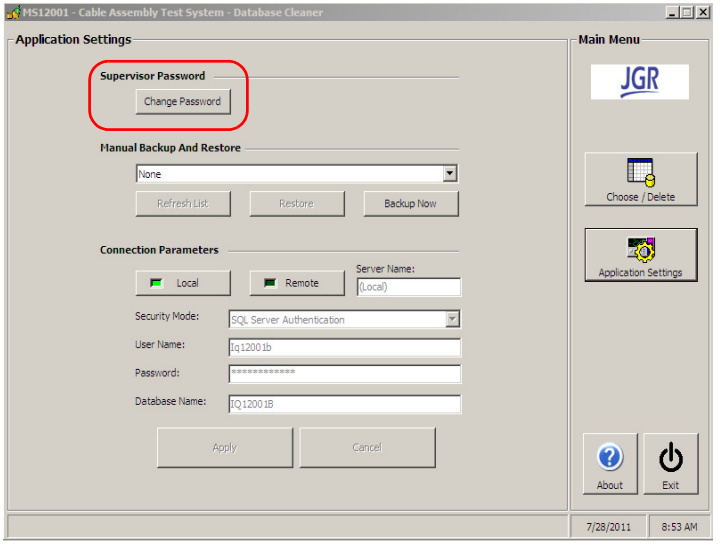
IMPORTANT

The DataBase Cleaner uses the same password as the MS12001 Cable Assembly Test System.

Changing the password to the DataBase Cleaner also changes the password to the MS12001 Cable Assembly Test System.

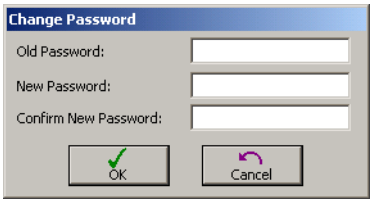
To change the password:

1. From the **Application Settings** function tab, under **Supervisor Password**, click **Change Password**.



2. In the **Change Password** dialog box, using either the computer keyboard or the on-screen keyboard. type the old and new passwords.

The password must have at least 6 characters.



3. Click **OK**.

Working Locally or Remotely

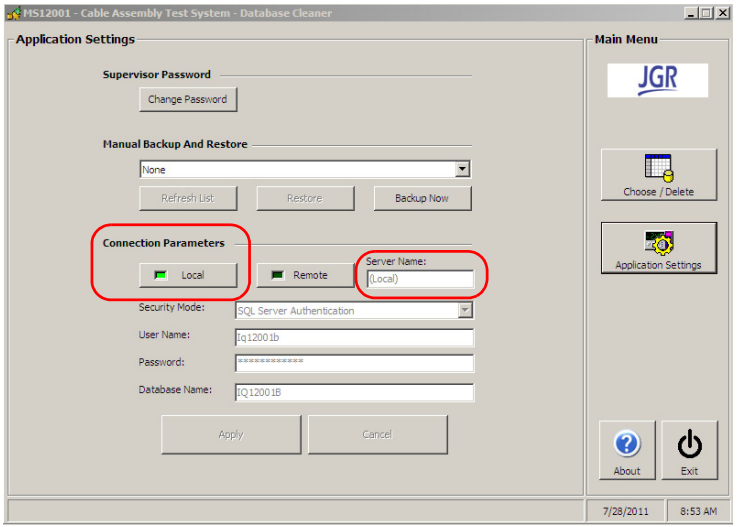
To access the database you want to work on, you need to select the workstation or server name. For remote use, you also need to select the network security mode.

For further details, refer to sections *Configuring Database Connection* and *Configuring Database Security Mode* of the MS12001 user guide.

To work locally:

1. From the **Application Settings** function tab, under **Connection Parameters**, click **Local**.

   The word **(Local)** appears in the **Server Name** box.



2. Click **Apply** to confirm your selection.

To work remotely:

1. From the **Application Settings** function tab, under **Connection Parameters**, click **Remote**.
2. In the **Server Name** box, type one of the following:
   - ➤ the main workstation name for a centralized system configuration.
   - ➤ the server name for a server-based configuration.
3. In the **Security Mode** list, select **SQL Server Authentication** or **Windows Authentication**.

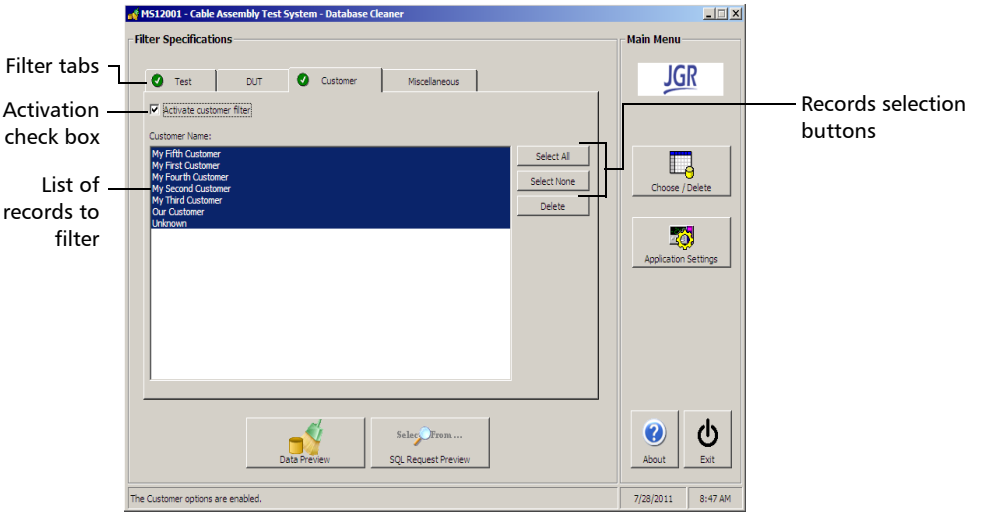
Note: *The security mode of the network connection is identical to that of the MS12001 Cable Assembly Test System.*

4. Click **Apply** to confirm your selection.

Deleting Test Records

The DataBase Cleaner includes the same test parameters as the MS12001 Cable Assembly Test System.

Test records are deleted by building a filter according to a selection of test parameters. Clicking the **Choose/Delete** function tab gives you access to the filter specifications of the main window.



The first time you delete a test record, the DataBase Cleaner automatically generates a backup of the database.

Subsequent record deletions made during the same cleaning session are not saved. You will lose all changes made since the last backup.

Building a Filter and Deleting Records

You can delete test records according to **Test**, **DUT**, **Customer**, and **Custom** parameters. The **Custom** parameters are available on the **Miscellaneous** tab.

Whenever you delete a record, a message appears on the screen asking you to confirm the operation.

Once your filter is complete, you can delete the selected records according to three methods:

Item	Delete	Delete All Entries	Delete Selected
Test record folder	Folder deleted	Folder retained	Folder retained
Data	All records deleted	All records deleted	Selected records deleted

To build a filter:

1. From the **Main Menu**, click the **Choose/Delete** function tab.
2. Under **Filter Specifications**, click the tab containing the type of parameters you want to delete.
3. Select the **Activate filter** check box to access the test records of the selected tab.

   A green circle on the tab header indicates that it is activated. You can build a filter by activating a single or several filter tabs.

4. Initially, all entries of an activated tab are highlighted.
   - ➤ To deselect all records, click **Select None**.
   - ➤ To select a few records, use the left button of your mouse. Use check boxes, lists, and text boxes to select the test records to be deleted.
   - ➤ To select all test records, click **Select All**.
5. Repeat steps 2 to 4 for all applicable filter tabs.

IMPORTANT

To avoid deleting the wrong test records, before clicking the Delete button of the main window, make sure that only the filter tabs containing the test records you really want to dispose of are activated.

IMPORTANT

The first time you delete a test record, the DataBase Cleaner automatically generates a backup of the database. The name of the backup is composed of the date and time of deletion.

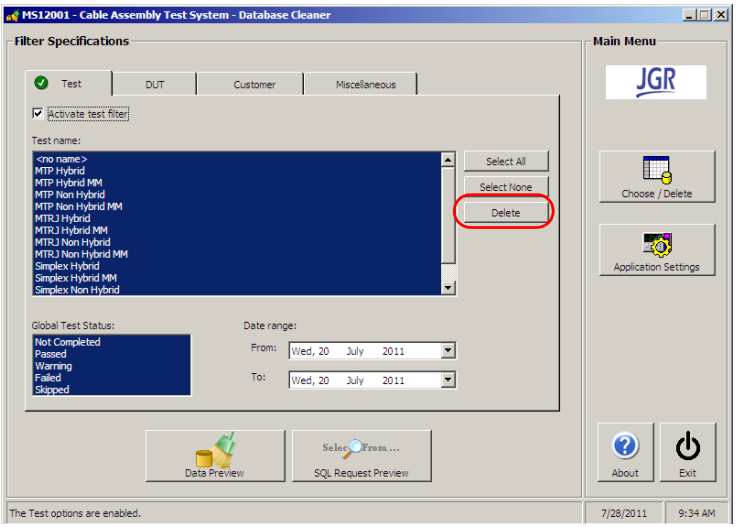
You should log the name of the backup for future reference.

The next time you delete records during the same session, no new backup is created.

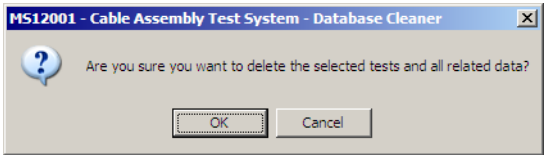
You may recover any deleted records from the backup created during this data cleaning session using the Restore function.

To delete both the test record folder and its entire contents:

1. From the main window, click **Delete**.



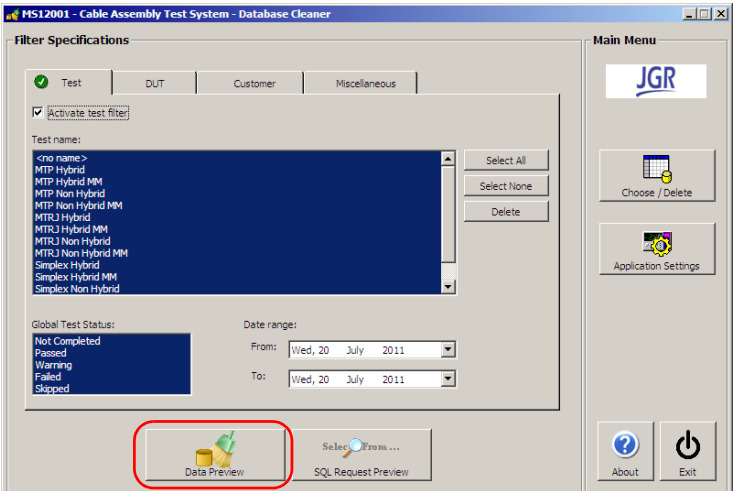
The following message appears.



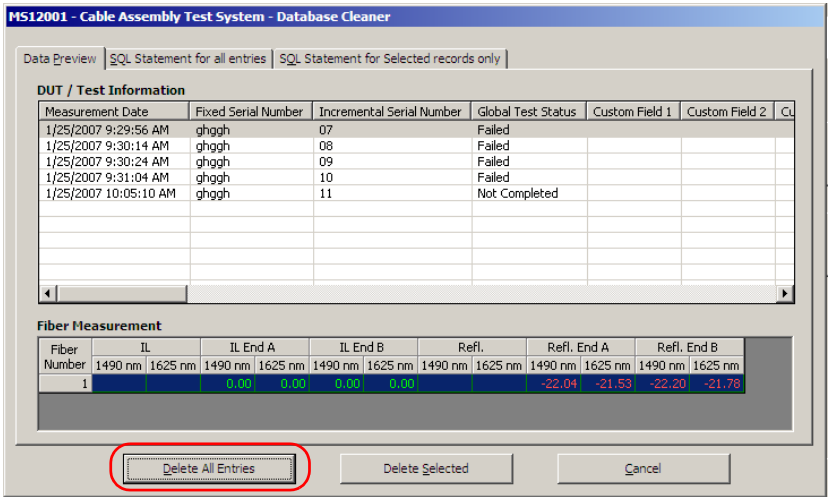
2. Click **OK** to confirm or **Cancel** to return to the main window.

To delete all test records and keep the empty test record folder:

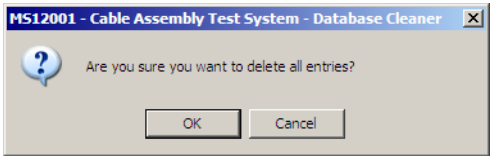
1. From the main window, click **Data Preview**.



2. In the **MS12001 - Cable Assembly Test System - DataBase Cleaner** dialog box, click **Delete All Entries**.



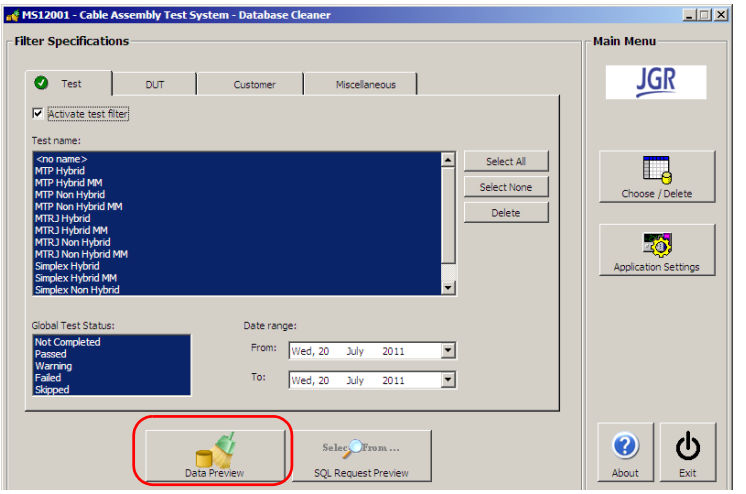
The following message appears.



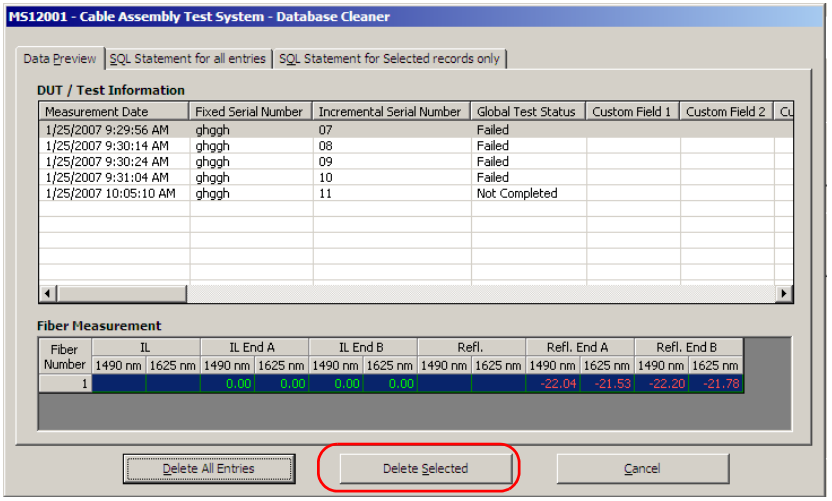
3. Click **OK** to confirm or **Cancel** to return to the main window.

To delete selected records only:

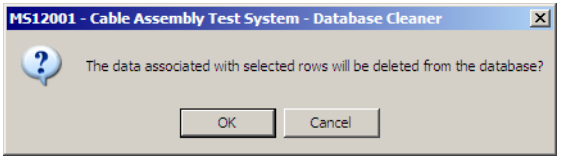
1. From the main window, click **Data Preview**.



2. In the **MS12001 - Cable Assembly Test System - DataBase Cleaner** dialog box, click **Delete Selected**.



The following message appears.



3. Click **OK** to confirm or **Cancel** to return to the main window.

Restoring Records

The **Restore** function allows you to recover deleted records contained in a backup.

However, you cannot recover records deleted since the last backup.

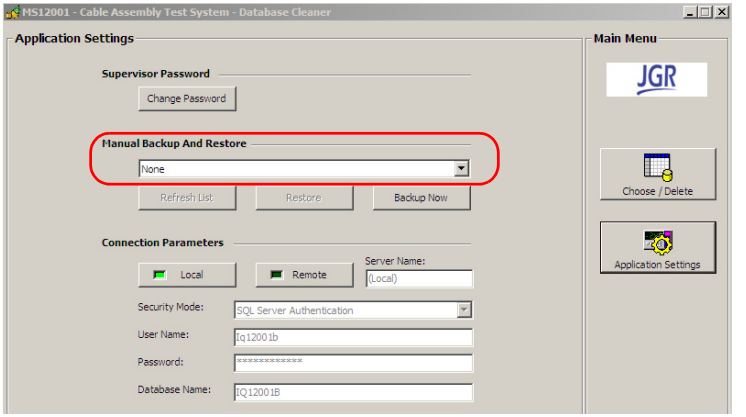
IMPORTANT

The restoring process will overwrite the current database with data from the selected backup file. You will lose all data saved between the last backup and the current date and time.

For information on backups, see *Backing Up Tests and Configurations* on page 299.

To restore records:

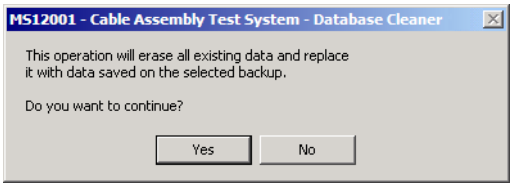
1. From the **Application Settings** function tab, in the list under **Manual Backup and Restore**, select the backup you want to restore.



   If the desired backup does not appear in the list, click **Refresh List** to update the list of available choices.

2. Click the **Restore** button.

The following message appears.



3. Click **Yes** to proceed with the restoring operation or **No** to return to the main window.

Once the restoring procedure is started, a message box informs you that the DataBase Cleaner application will be closed. You must wait a few minutes before restarting it.

Manual Database Backup

At any time, you can make a backup of the database you are working on.

For further details, see *Backing Up and Restoring Databases* on page 299.

To make a manual backup:

1. From the **Application Settings** function tab, under **Manual Backup and Restore**, click **Backup Now**.

   A message appears to confirm the backup operation.

2. Click **OK** to confirm or **Cancel** to return to the main window.

IMPORTANT

All backups have an expiry date, after which they are automatically deleted from the disk. Use the MS12001 Cable Assembly Test System software (not the DataBase Cleaner application) to set the number of days for which backups will remain available.

IMPORTANT

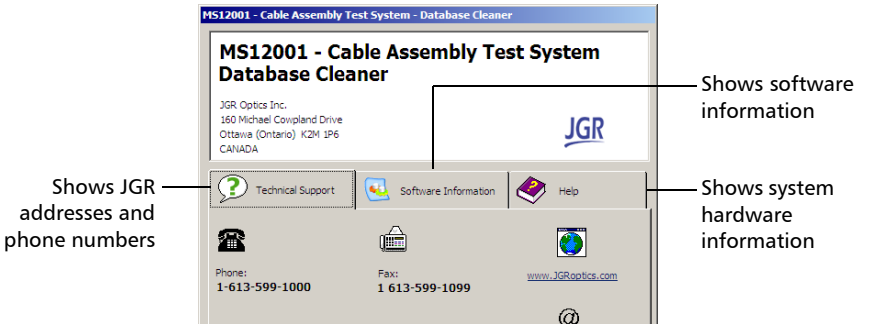
To avoid problems in case of a major crash, JGR recommends to copy backups regularly to another disk. Backups can be found under C:\Program Files\Microsoft SQL Server\MSSQL\Backup. This path cannot be modified from the Cable Assembly Test System.

System Information and Technical Support

Information about the DataBase Cleaner software and technical support is available from the **Main Menu**.

To view system and technical support information:

On the **Main Menu**, click **About**.



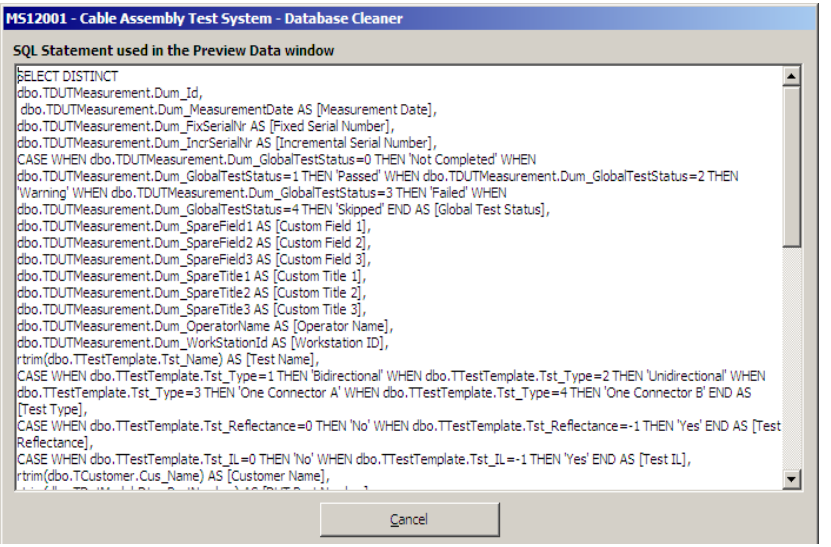
Creating Your Own Database Management Code

If you have several MS12001 Cable Assembly Test Systems containing a large number of records to manage and want to create your own database management code, you can copy the instructions used by the DataBase Cleaner software.

To access the code to create your own data preview tables:

On the main window, click **SQL Request Preview**.

The following window opens.

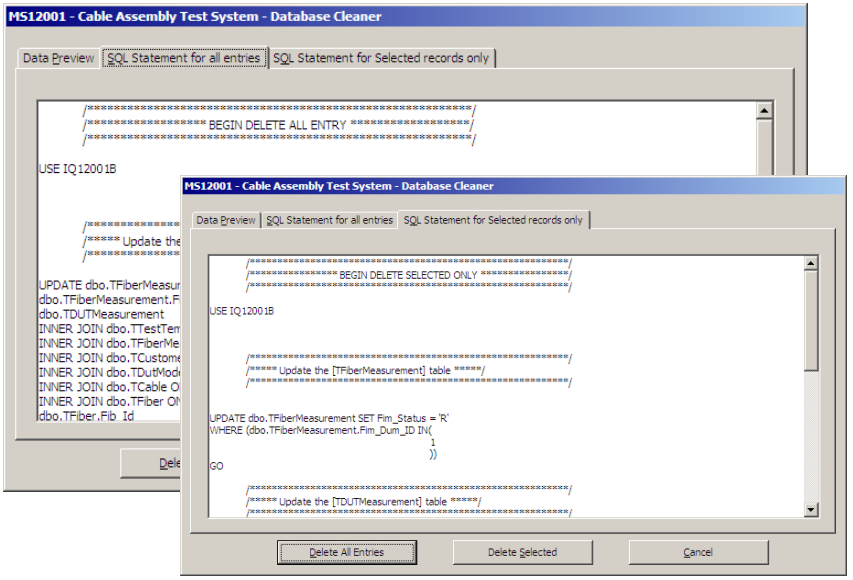


To access the SQL code to create your own instructions to delete records:

1. From the main window, click **Data Preview**.
2. Click **SQL Statement for all entries** to access the code to delete all records.

   OR

   Click **SQL Statement for Selected records only** to access the code to delete selected records.



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