User Guide

FTB-200

Compact Modular Platform

www.EXFO.com

Telecom Test and Measurement

EXPERTISE REACHING OUT

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Contents

Certification Information viii

1 Introducing the FTB-200 Compact Modular Platform 1

Main Features 1
LED Panel Description 4
Keypad Description 5
Card Reader and Ports 6
Power Sources 7
Conventions 8

2 Safety Information 9

Laser Safety Information 9
Units with Built-In VFL 10
Electrical Safety Information 11

3 Getting Started with Your Unit 13

Installing or Upgrading the Applications 13
Inserting and Removing Test Modules 15
Installing a USB Keyboard or Mouse 21
Configuring the Printer 22
Turning On or Off the Unit 24
Starting Module Applications 25
Accessing Microsoft Internet Explorer 26

4 Setting Up Your Unit 27

Recalibrating the Touchscreen 27
Adjusting Microphone and Speaker 28
Adjusting Brightness 29
Selecting the Language of Operation 30
Setting Date and Time Formats 31
Selecting the Startup Application 32
Configuring the Shortcut Buttons 34
Setting Other Parameters 34

5 Using the Built-In Power Meter and VFL 35
Accessing the Built-In Power Meter 35
Nulling Offsets 37
Setting Thresholds and Correction Factors 38
Setting Reference Values on Your Power Meter 40
Measuring Power or Loss 41
Reloading Power Meter Results 44
Clearing Power Measurements from the Display 45
Creating and Printing a Results Report 46
Identifying Fiber Faults Visually with the VFL 49

6 Inspecting Fibers with a Probe 51
Inspecting a Fiber End 51
Capturing an Image 53

7 Managing Data 55

8 Testing Network Connections 61
Performing a Ping Test 61
Performing a Trace Route Test 64
Exporting the Results 66

9 Maintenance 67
Cleaning Detector Ports 68
Recharging the Main Battery 69
Recalibrating the Battery 71
Replacing Batteries 74
Recalibrating the Unit 75
Recycling and Disposal (Applies to European Union Only) 76

10 Troubleshooting 77
Solving Common Problems 77
Restoring Your Unit to Normal Operation 79
Contacting the Technical Support Group 82
Transportation 83

11 Warranty 85
General Information 85
Liability 86
Exclusions 87
Certification 87
Service and Repairs 88
EXFO Service Centers Worldwide 89

A Technical Specifications 91
Index 93

Certification Information

F.C.C. Information

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

CSA Information

This unit is certified by the CSA (certificate number 162451) and was evaluated according to applicable CSA and UL standards (as confirmed by "C-US" mark) as well as applicable IEC standards for use in Canada, the United States, and other countries.

EXFO CE DECLARATION OF CONFORMITY

Application of Council Directive(s):	2006/95/EC - The Low Voltage Directive 2004/108/EC - The EMC Directive And their amendments
Manufacturer's Name:	EXFO Electro-Optical Engineering Inc.
Manufacturer's Address:	400 Godin Avenue Quebec, Quebec Canada, G1M 2K2 (418) 683-0211
Equipment Type/Environment:	Test & Measurement / Industrial
Trade Name/Model No.:	FTB-150 Compact OTDR and FTB-200 Compact Modular Platform

Standard(s) to which Conformity is Declared:

EN 61010-1:2001	**Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1: General Requirements.**
EN 61326-1:2006	**Electrical Equipment for Measurement, Control and Laboratory Use - EMC Requirements – Part 1: General requirements**
EN 60825-1:1994 +A2:2001 +A1:2002	**Safety of laser products – Part 1: Equipment classification, requirements, and user's guide**
EN 55022: 1998 +A2: 2003	**Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement**

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive and Standards.

Manufacturer
Signature:

Full Name: Stephen Bull, E. Eng
Position: Vice-President Research and Development
Address: 400 Godin Avenue, Quebec (Quebec), Canada, G1M 2K2
Date: February 03, 2009

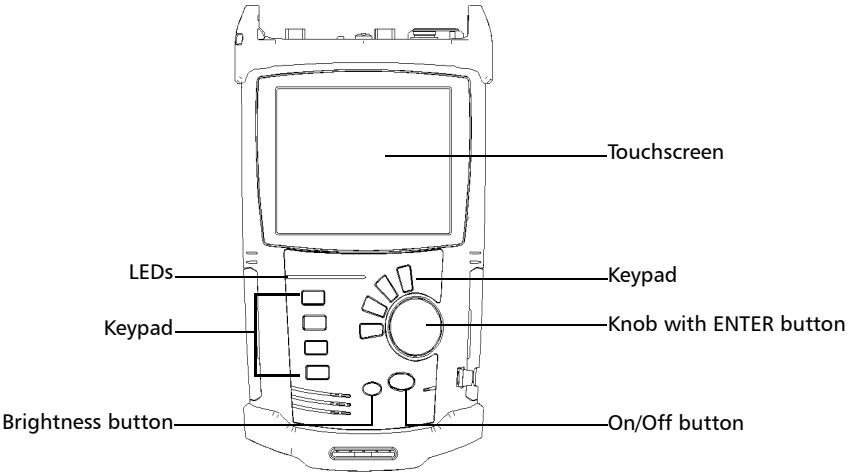
1 Introducing the FTB-200 Compact Modular Platform

Main Features

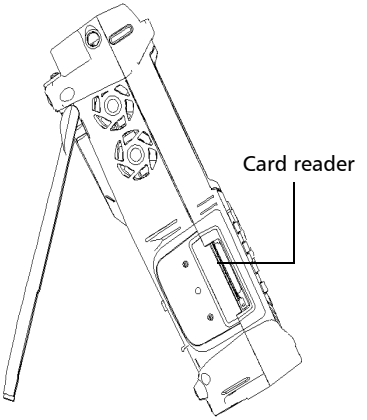
Your unit has the following characteristics:

- 2-slot platform
- Multitasking
- Touchscreen (LCD and touchscreen optimized for outdoor use available in option)
- USB ports (host and client)
- Ethernet port
- CompactFlash card reader
- Autonomy (8 hours)
- Windows CE
- Ruggedness (GR-196-CORE)
- Possibility to connect a probe
- Optional built-in power meter and VFL

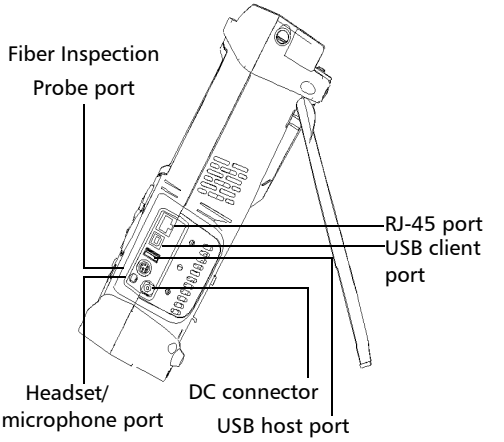
Front panel



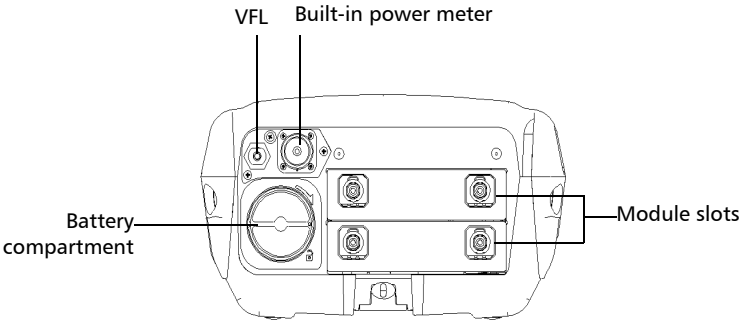
Left panel



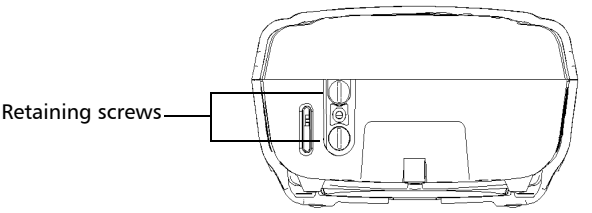
Right panel



Top panel



Bottom panel



LED Panel Description

The LED panel located on the front of the unit provides you with the status of your unit.

Note: *The function of certain LEDs vary with the applications.*

LED	Status	Meaning
⏻	Green	Unit is on.
	Off	Unit is off.
⊂	Green	Unit powered or not by AC and battery fully charged.
	Green, flashing	Battery is charging.
	Yellow, flashing	Unit is not powered by AC and battery is low.
	Red	Battery error.
	Off	Unit is off or unit is not powered by AC and battery level is above the “low-battery threshold”.
⚠	Flashing	Laser status LED At least one module emits an optical signal.
	Off	No modules emit signal.
✓|X	Green	Result status (from application currently displayed). Pass (result does not exceed the defined threshold)
	Red	Fail

Keypad Description

The keypad of your unit gives you access to various functions at all times. The table below shows an overview of their purpose.

Note: *The function of certain buttons vary with the applications.*

Button	Meaning
	First shortcut button. Starts the associated application (see *Configuring the Shortcut Buttons* on page 34).
	Second shortcut button. Starts the associated application or the built-in power meter application (see *Configuring the Shortcut Buttons* on page 34).
	Start fiber probe application.
	Switch from one task to another.
	Turn on and off your unit: ➤ Suspend: hold down button a few seconds until the unit beeps once. ➤ Shutdown: hold down button until the unit beeps twice. For more information, see *Turning On or Off the Unit* on page 24.
	Adjust screen brightness.
	Lock/Start acquisition/F1 button (depends on application).
	Mute/Move markers/F2 button (depends on application).
	Report/Next λ or trace/F3 button (depends on application).
	Save/F4 button (depends on application).

Card Reader and Ports

Your unit is equipped with a card reader (for Bluetooth wireless and CompactFlash cards) and communication ports (for probe, mouse, keyboard, hub, etc.).

- The card reader is located on the left panel of the unit.
- There are four ports, all located on the right panel of the unit:
  - 8-pin connector to connect the fiber inspection probe.
  - USB host port (type A connector) to connect USB memory drives, keyboards, mouse devices, etc.
  - USB client (secondary) port (type B connector) to connect a USB cable for data transfer between your unit and a computer.
  - RJ-45 port to connect your unit to an Ethernet network.

Power Sources

The unit operates with the following power sources:

- AC adapter/charger (connected to a standard power outlet–indoor use only).
- Rechargeable Lithium-Ion battery (automatically takes over if you disconnect the AC adapter/charger).

IMPORTANT

The unit will function only if the battery is present and the battery door is in place (even if you use it with the AC adapter/charger).

  - Possible to switch from AC adapter/charger to battery power or vice versa without affecting operation.
  - Automatic recharge when AC adapter/charger is connected.
- Rechargeable battery (for clock and RAM, used when Lithium-Ion battery and AC power are both unavailable). The clock battery has an autonomy of approximately 15 minutes after which the unit will restart exactly as if you performed a shutdown (button held down until the unit beeps twice).

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

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.

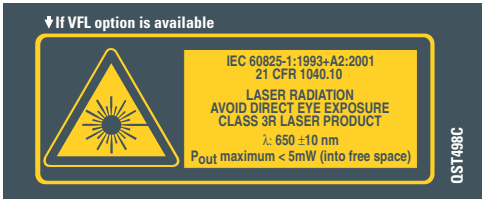
Laser Safety Information

The laser class of your unit depends on the modules that you use. Refer to the user guide or the online help of the different modules for the exact information.

Units with Built-In VFL

Your instrument is a Class 3R laser product in compliance with standards IEC 60825-1 : 2007 and 21 CFR 1040.10. It is potentially harmful in direct intrabeam viewing.

The following label(s) indicate that the product contains a Class 3R source:



Affixed to back of unit
(under the stand).

Electrical Safety Information

If you need to ensure that the unit is completely turned off, disconnect the power cable and remove the batteries.

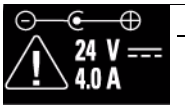
WARNING

- **the external power supply indoors only.**
- **Position the unit so that the air can circulate freely around it.**
- **Operation of any electrical instrument around flammable gases or fumes constitutes a major safety hazard.**
- **To avoid electrical shock, do not operate the unit if any part of the outer surface (covers, panels, etc.) is damaged.**
- **Only authorized personnel should carry out adjustments, maintenance or repair of opened units under voltage. A person qualified in first aid must also be present. Do not replace any components while power cable and battery are connected.**
- **Capacitors inside the unit may be charged even if the unit has been disconnected from its electrical supply.**

Equipment Ratings	
Temperature ➤ Operation ➤ Storage	 ➤ 0 °C to 50 °C[a] (32 °F to 122 °F) ➤ -40 °C to 60 °C[b] (-40 °F to 140 °F)
Relative humidity[c] ➤ unit ➤ AC adapter	 ➤ ≤ 95 % non-condensing ➤ 0 % to 80 % non-condensing
Maximum operation altitude	5000 m (16405 ft)
Pollution degree	2
Installation category	II
Power supply rating[d]	100 V to 240 V (50 Hz/60 Hz) maximum input current 1.6 A

a. With FTB-8XXX modules, the maximum operation temperature is 40 °C (104 °F).
b. With FTB-8XXX modules, the maximum storage temperature is 50 °C (122 °F).
c. Measured in 0 °C to 31 °C (32 °F to 87.8 °F) range, decreasing linearly to 50 % at 40 °C (104 °F).
d. Not exceeding ± 10 % of the nominal voltage.

The following label is affixed to the unit:



Located on unit's right panel

3 Getting Started with Your Unit

Installing or Upgrading the Applications

All the necessary applications have been preinstalled and configured at the factory. However, you may have to upgrade some applications when new versions become available or to reinstall them.

For the installation or upgrade, you will need:

- the installation CD (includes ActiveSync installation kit)
- a computer equipped with a USB port; Windows must be installed on the computer
- an FTB-200 unit
- a USB cable

Note: *For more information on the installation, refer to the Release Notes on the installation CD.*

To install or upgrade the applications:

1. Turn on the computer and insert the installation CD in the CD-ROM drive.
2. Follow the on-screen instructions. All the necessary components, including ActiveSync, will be installed on your computer.
3. Once the installation is complete, turn on your unit. If necessary, exit the modules' applications .
4. Connect the provided USB cable to the computer (type A end) and your unit (type B end). ActiveSync automatically opens and establishes the connection.
5. From the computer, on the Windows taskbar, click the **Start** button, then click **Programs** > **EXFO** > **Handheld Instrument Software Manager**.
6. Use **Add Programs** to install new versions. Follow the on-screen instructions. For more information, refer to the online help of the **Handheld Instrument Software Manager** (from the **Help** menu).
7. When installation is complete, simply disconnect the USB cable.

Inserting and Removing Test Modules

CAUTION

Never insert or remove a module while the FTB-200 Compact Modular Platform is turned on. This will result in immediate and irreparable damage to both the module and unit.

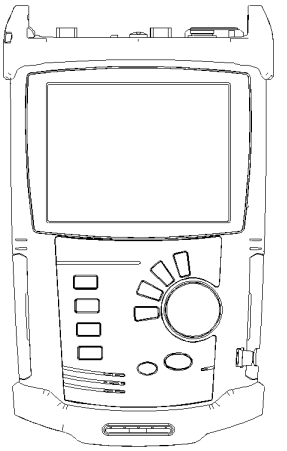
WARNING

When the laser safety LED ( ) is flashing, at least one of your modules is emitting an optical signal. Please check all modules, as it might not be the one you are currently using.

To insert a module into the FTB-200 Compact Modular Platform:

1. Turn off your unit.

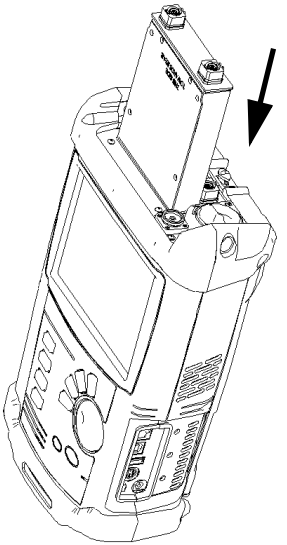
2. Position the unit so that its front panel is facing you.



3. Take the module and place it vertically so that the retaining screw hole is at the left of the connector pins.

CAUTION

Inserting a module upside down could result in permanent damage to the module, as the connector pins might be bent.



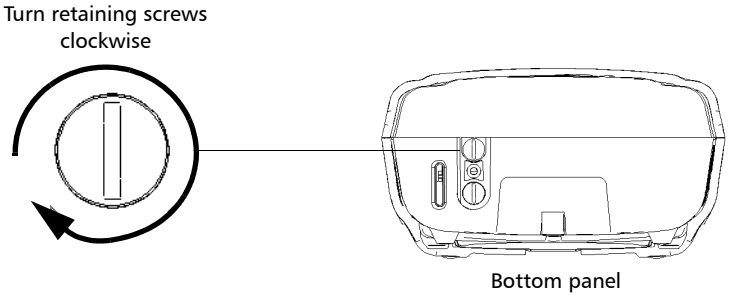
4. Insert the protruding edges of the module into the grooves of the unit's module slot.

5. Push the module all the way to the bottom of the slot, until the retaining screw makes contact with the unit casing.

6. Place the unit so that its bottom panel is facing you.

7. While applying slight pressure to the module, use a coin to turn the retaining screw clockwise until it is tightened.

This will secure the module into its “seated” position.

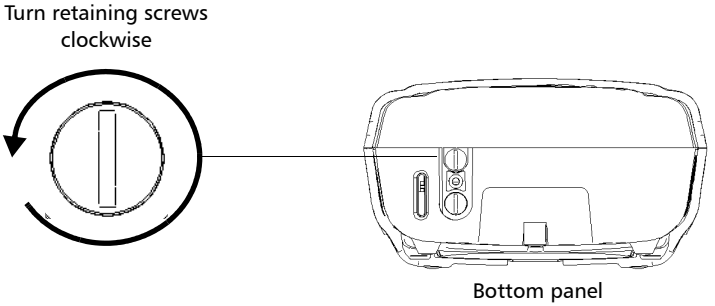


When you turn on the unit, the startup sequence will automatically detect the module.

To remove a module from the FTB-200 Compact Modular Platform:

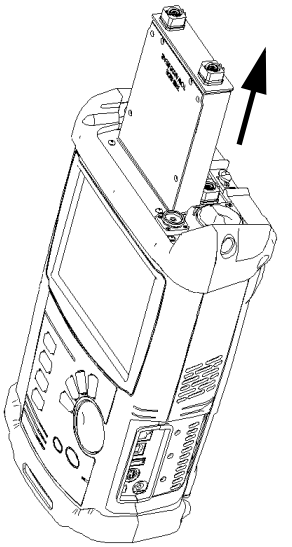
1. Turn off your unit.
2. Position the unit so that the bottom panel is facing you.
3. Using a coin, turn the retaining screw counterclockwise until it stops.

   The module will be slowly released from the slot.



4. Place the unit so that the top panel is facing you.

5. Hold the module by its sides or by the handle (*NOT by the connector*) and pull it out.



CAUTION

Pulling out a module by a connector could seriously damage both the module and connector. Always pull out a module by its casing.

6. Cover empty slots with the supplied protective covers.

Installing a USB Keyboard or Mouse

When you are required to enter alphanumeric data, an on-screen keyboard will be displayed. However, you can also use a hardware keyboard.

You can also add a mouse.

To install a USB keyboard or mouse on your unit:

Connect the keyboard or the mouse to the type A USB port, located on the right side of the unit.

Note: *It is not necessary to turn off the unit before connecting the keyboard or the mouse. The software will automatically detect its presence.*

Note: *Even if a keyboard is connected, the touchscreen keyboard will still be displayed when working in Toolbox CE.*

Your mouse or keyboard is automatically recognized and immediately usable.

Configuring the Printer

To print reports, you must configure the printer first. The unit supports the Printek MT2B printer only and communicates with it via Bluetooth.

Note: *Some applications may not offer print functions.*

If you want to print on a network printer or if you want to print other type of reports, you must transfer the desired files on a computer on which utilities such as the OTDR Viewer or Optical Report Viewer are installed.

To configure the printer:

1. Insert the Bluetooth wireless card (provided with the printer) into the unit's card reader. Ensure that the holes for the connector pins are towards the back of the card reader and that you see the label with a small arrow on top. The card should fit perfectly into the card reader.

CAUTION

Applying too much pressure on the card *will* cause irreparable damage to the card.

2. On your unit, go to the **Main Menu**, then select **Setup** > **Bluetooth Device Properties**.
3. From Bluetooth Manager, press **Scan Device** to launch printer detection. Wait a few seconds until items appear in the **Untrusted** list.
4. From the **Untrusted** list, select the first **Printek M2** item and press the **->** button.

5. When Bluetooth Manager prompts you to authenticate the device, answer **No**.

IMPORTANT

If you answer Yes, the application will not be able to use the printer.

6. Once the item is on the **Trusted** list, select it. Press **Active**. A red check mark appears at the side of the icon to confirm the activation.
7. Repeat steps 4 to 6 with the second **Printek M2** item.
8. Close Bluetooth Manager, then **Control Panel** and **File Manager**.

The printer is now ready to use.

CAUTION

Always use the card reader's eject button to remove the card from your unit.

Turning On or Off the Unit

There are two ways to turn off the unit:

- *Suspend*: the next time you turn your unit on, you will quickly return to your work environment (running applications will still be running).
- *Shutdown*: completely cuts power to the test modules and platform; the unit will perform a complete restart routine the next time you use it. You should perform a shutdown if you do not intend to use your unit for a week or more.

  After a shutdown, the unit will start in Toolbox CE or in the application you defined as the startup application.

To enter suspend mode:

Hold down the On/Off button a few seconds until the unit beeps once.

To perform a shutdown:

Hold down the On/Off button a few seconds until the unit beeps twice.

To turn on the unit:

Press the On/Off button.

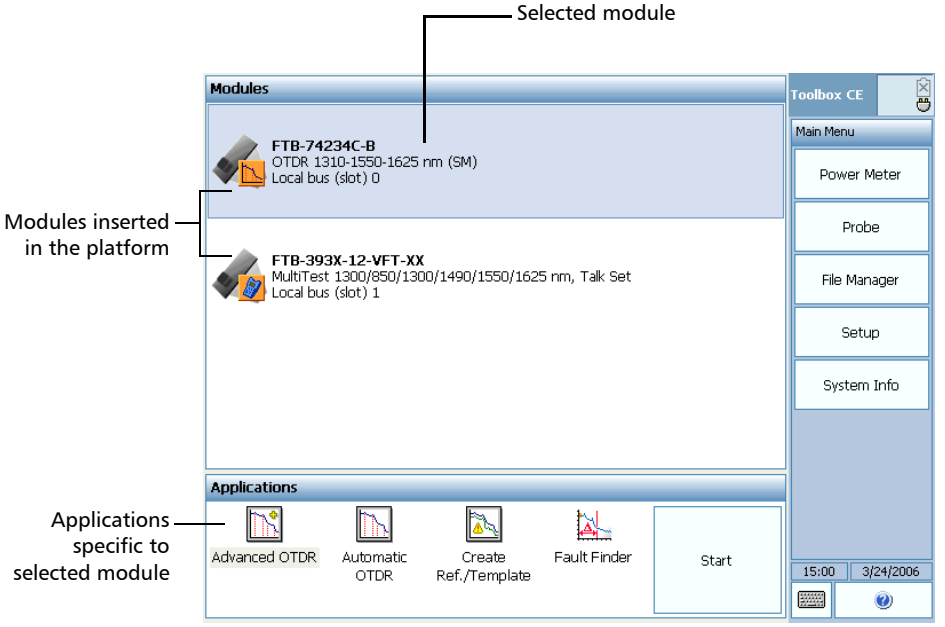
Starting Module Applications

Your modules can be configured and controlled from their dedicated applications in Toolbox CE.

To start a module application:

1. From Toolbox CE select the module to use.

It will turn blue to indicate that it is highlighted.



2. Under **Applications**, select an application, then press **Start**.

To start the Power Meter or Probe application:

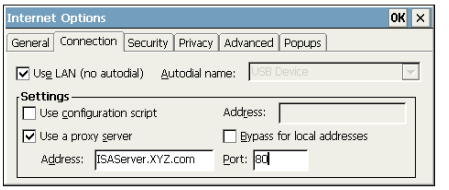
From **Main Menu**, press **Power Meter** or **Probe**.

Accessing Microsoft Internet Explorer

Provided that you have access to Internet, you can access it directly using Internet Explorer on your unit.

To set up the Internet Access:

1. From the **Main Menu**, press **Setup**, then select **Internet Options**.
2. Go to the **Connection** tab.



3. Modify the settings using the information given to you by your network administrator.
4. Press **OK** to return to the **Control Panel** window.

To access Internet Explorer:

1. From Toolbox CE, select the **Programs** tab.
2. Select the corresponding icon to access the browser.

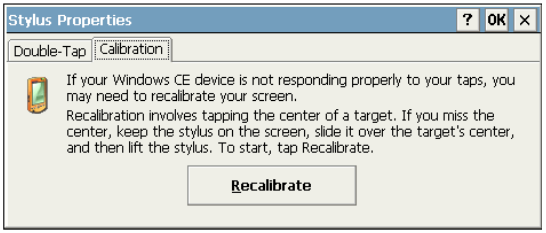
4 Setting Up Your Unit

Recalibrating the Touchscreen

If you notice the touchscreen does not behave in the way it used to (for example, it is now difficult to select items) it probably needs a recalibration.

To recalibrate the touchscreen:

1. From the **Main Menu**, press **Setup**, then select **Stylus**.
2. Go to the **Calibration** tab and follow the instructions.

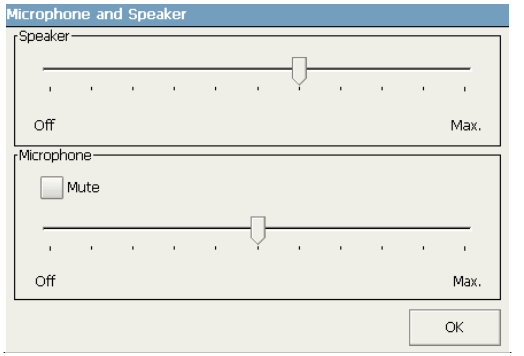


Adjusting Microphone and Speaker

To fit your work environment, you may adjust the microphone and speaker. Values are kept in memory when you turn the unit off.

To adjust microphone and/or speaker:

1. From the **Main Menu**, press **Setup**, then select **Microphone and Speaker**.
2. Use the slider to adjust the sound of your microphone and/or speaker.
3. Press **OK** to return to the **Control Panel** window.



Adjusting Brightness

To fit your work environment, you may adjust the LCD brightness. Values are kept in memory when you turn the unit off.

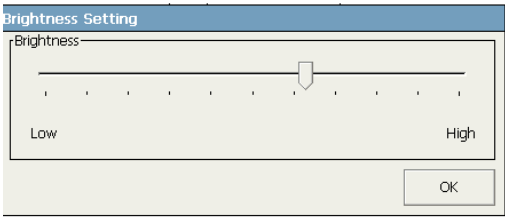
Note: *These settings do not apply to a fiber inspection probe display.*

To adjust the display brightness:

Press the ☼ key repeatedly to switch between brightness levels.

OR

1. From the **Main Menu**, press **Setup**, then select **Brightness**.
2. Move the slider until the screen appearance is to your liking.



If you select the lowest brightness setting, the backlight will be completely deactivated. Press the ☼ button to reactivate it.

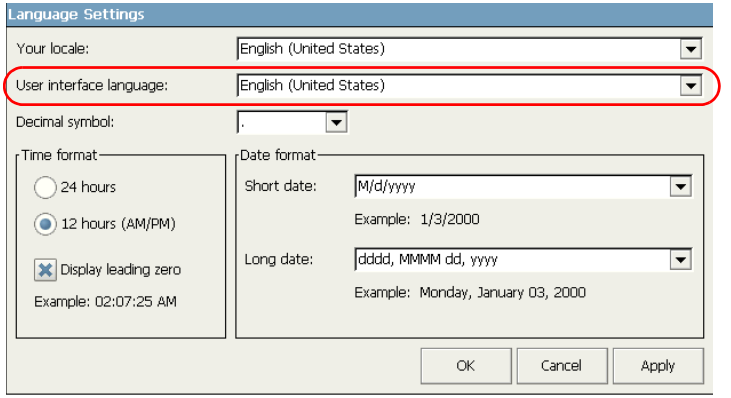
3. Press **OK** to return to the **Control Panel** window.

Selecting the Language of Operation

You may display the user interface in one of the available languages (default is English). If other languages become available in the future, you could access them by replacing the unit software (see *Installing or Upgrading the Applications* on page 13). Values are kept in memory when you turn the unit off.

To select a new interface language:

1. From the **Main Menu**, press **Setup**, then select **Language Settings**. Modify the settings.



2. Press **OK** to return to the **Control Panel** window.

   Once you have modified the **User interface language**, you will be prompted to restart your unit.

Note: *Modifying the language of operation will affect the Windows CE language setting and vice versa.*

Setting Date and Time Formats

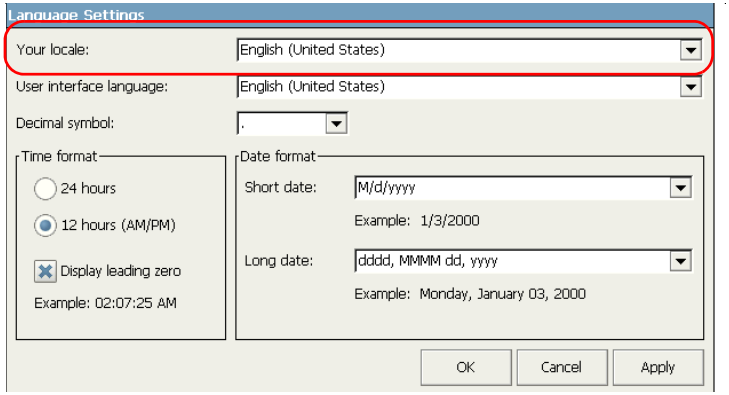
The current date and time are displayed at the bottom of the **Main Menu**. When saving results, the unit also saves the corresponding date and time.

Note: *A dedicated clock battery keeps the date and time accurate. For details, see* Replacing Batteries *on page 60.*

Note: *Modifying locale, date and time settings will affect some of the Windows CE settings and vice versa.*

To set date and time formats:

1. From the **Main Menu**, press **Setup**, then select **Language Settings**.
2. From **Your locale**, select the desired language. This will determine the date formats available for the short and long dates.



3. Modify the settings.
4. Press **OK** to return to the **Control Panel** window.

Selecting the Startup Application

The first time you start your unit, Toolbox CE is displayed. However, you can configure your unit to automatically start in any of the available applications.

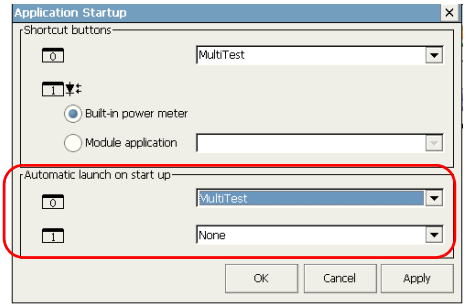
The selected application will start automatically the next time you turn on your unit after a shutdown (not suspend mode). For more information, see *Turning On or Off the Unit* on page 24.

Note: *The startup application you select will also be used after a power failure.*

If the specified application cannot be started (for example, in the FTB-200, the required module is not present in the unit or is not inserted in the same slot), the startup application setting is automatically reset to **None**. You will have to select the application again when the module is inserted into the unit.

To select a startup application:

1. From the **Main Menu**, press **Setup**, then select **Application Startup**.
2. Under **Device power on**, select the application or applications you want to start automatically when you turn on your unit.



Note: *The Power Meter application is only available if you purchased this option with your unit.*

3. Press **Apply,** then **OK** to return to the **Control Panel** window.

Configuring the Shortcut Buttons

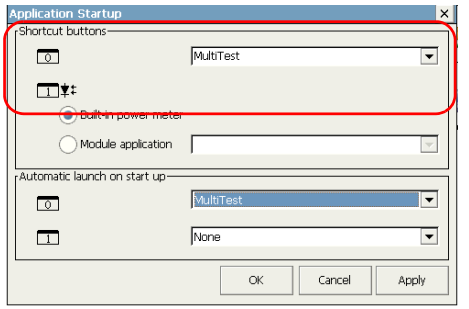
You can start a particular application directly by pressing one of the shortcut buttons. You can determine which application each of these shortcut buttons will start.

There are two shortcut buttons:

- one to start an application related to the module in slot 0
- another to start either the built-in power meter application (if your unit is equipped with this option) or an application related to the module in slot 1.

To configure the shortcut buttons:

1. From the **Main Menu**, press **Setup**, then select **Application Startup**.
2. Under **Shortcut buttons**, associate the application to each button.



3. Press **Apply** to confirm your changes**,** then **OK** to return to the **Control Panel** window.

Setting Other Parameters

You can also configure other parameters via the **Control Panel** window, refer to Microsoft Windows CE documentation.

5 Using the Built-In Power Meter and VFL

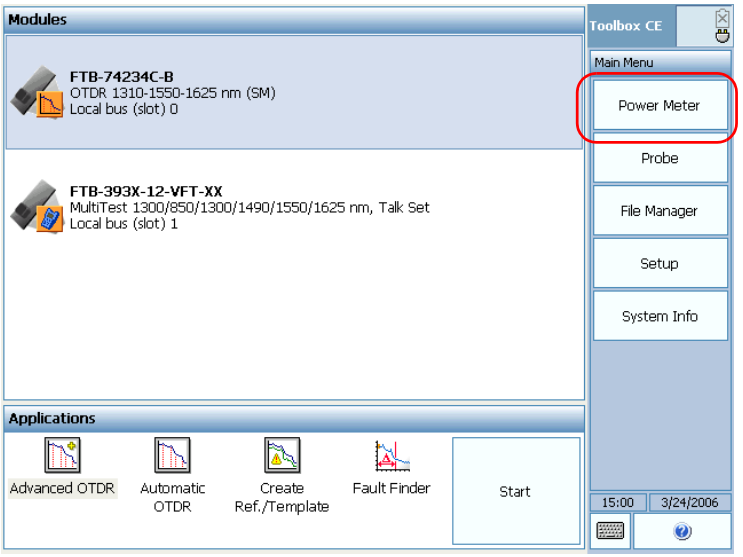
The FTB-200 Compact Modular Platform can be equipped with an optical power meter to measure absolute power (dBm or W) or insertion loss (dB). The power meter can detect modulated signals (1 kHz, 2 kHz, and 270 Hz).

The FTB-200 can also include a visual fault locator (VFL) to inspect or identify fibers.

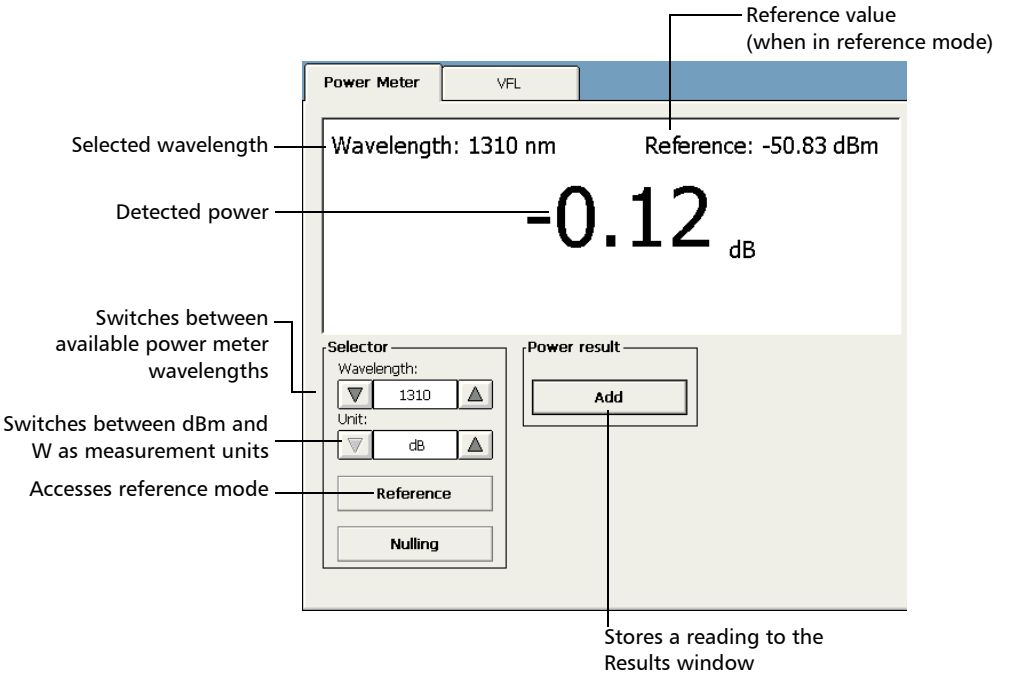
Accessing the Built-In Power Meter

From the **Main Menu**, press **Power Meter**.

Note: *Some buttons are not displayed when you first access the Power Meter application, but will be displayed after you press* ***Add*** *for the first time or after you open a file.*



Below is a description of the Power Meter buttons and functions.



Nulling 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 unit is equipped with an offset nulling function.

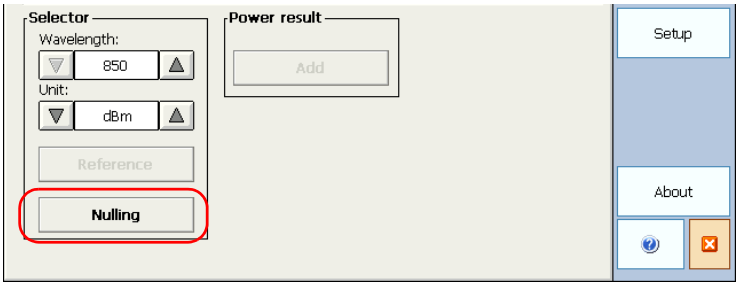
Your unit has been designed not to require offset nulling under normal operation, but you should perform it whenever environmental conditions change significantly or when measuring very low power values.

IMPORTANT

Light must not reach the detector when nulling offsets. Always use an EUI or protective screw cap. Do not use a soft rubber cover.

To perform an offset nulling operation:

1. From the **Power Meter** tab, press **Nulling**.



2. Tighten the protective cap on the power meter port, then press **OK.**

The nulling process takes approximately 5 seconds.

Setting Thresholds and Correction Factors

You can define thresholds to specify acceptable power or loss values for each wavelength. Thresholds are usually supplied by system manufacturers and depend on the system deployed.

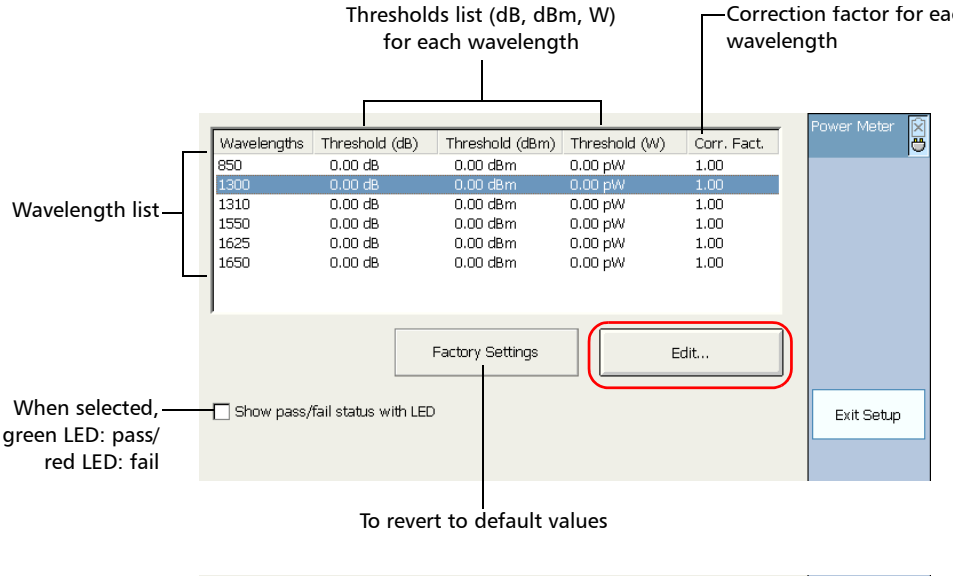
When a measurement is below a threshold, the ↧ symbol appears in red beside the measurement, in the **Results** list.

IMPORTANT

If you revert to factory settings, you will erase all your thresholds, correction factors and reference values.

To set power or loss thresholds:

1. From the **Power Meter** tab, press **Setup**.
2. From the **Threshold and Correction Factor** list, select the wavelength for which you want to set a threshold and a correction factor.



3. Press **Edit** and modify thresholds for the selected wavelength. For the watt (W) threshold, select the desired order of magnitude.
4. Select the **Show Pass/Fail Status with LED** check box to activate the pass/fail LED on your unit.

Note: *Threshold values with dB, dBm or dBm/dB units will be converted to a negative value if you entered a positive value.*

5. Press **OK** to close the dialog box, then press **Exit Setup** to confirm the new thresholds.

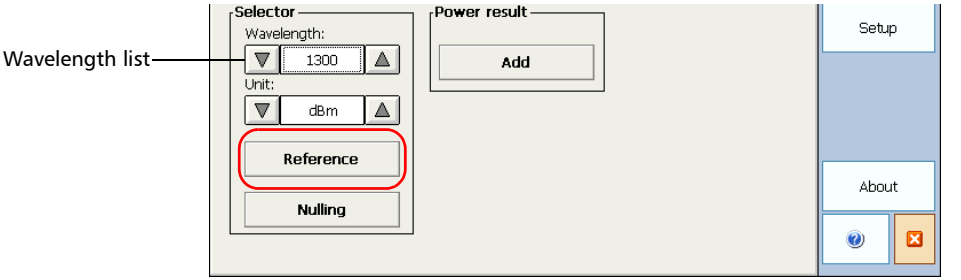
Setting Reference Values on Your Power Meter

In Reference mode, your unit displays the loss created by the fiber under test only, since it subtracts a reference value from the measured power.

You can set a different reference value for each wavelength. A reference value remains in memory until a new one is stored at the same wavelength.

To set reference values to use in Reference mode:

1. Check your fibers and clean them properly.
2. Using the proper adapter and test jumpers, connect a light source to your power meter.
3. From the **Power Meter** tab, use the up/down arrows to select a wavelength. Activate the source at the same wavelength.



4. Press **Reference** to save the current power value as the new reference. It will appear on the right-hand corner of the data display.

Measuring Power or Loss

Measuring absolute power or link loss is done the same way, except for the referencing step. You can take power or loss measurements and save them for further analysis.

To perform power or loss measurements:

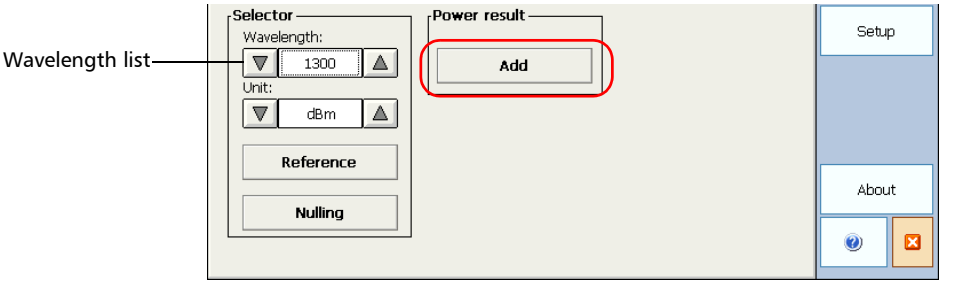
1. If necessary, perform an offset nulling (see *Nulling Offsets* on page 37).
2. Check your fibers and clean them properly.
3. For loss measurements, reference your power meter to a light source (see *Setting Reference Values on Your Power Meter* on page 40), then deactivate the light source.
4. If you have used a single reference patchcord, disconnect it *from the power meter port only*, then attach a second reference patchcord to the power meter.

   OR

   If you have used two reference patchcords, disconnect both of them at the bulkhead.

5. Using bulkhead adapters or the system patch panels, connect a fiber under test to reference patchcord attached to the light source and power meter.

6. From the **Power Meter** tab, use the up/down arrows to select a wavelength. Activate the source at the same wavelength.



7. Add the displayed values to the **Results** list by pressing **Add**.

8. Repeat the procedure for other wavelengths.

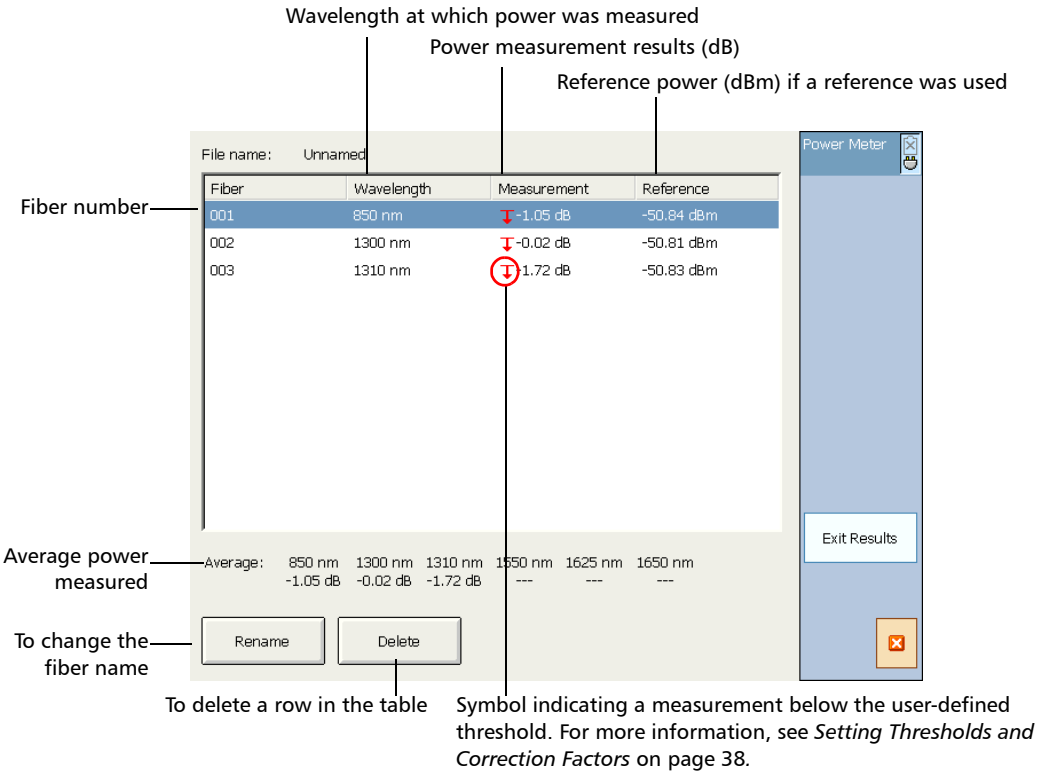
9. Once the analysis is complete, press **Quick Save**. You can also access the **Save File** dialog box in the **Storage** window.

IMPORTANT

If you specify a name that already exists, the original file will be overwritten and only the new file will be available.

To view and edit power measurements:

1. From the **Power Meter** tab, press **Results**. All your measurements are displayed in the order they were performed.
2. Press **Rename** to rename the fiber or press **Delete** to remove the selected value from the list.



3. Press **Exit Results** to return to the **Power Meter** tab.
4. Once the analysis is complete, press **Quick Save**.You can also access the **Save File** dialog box in the **Storage** window.

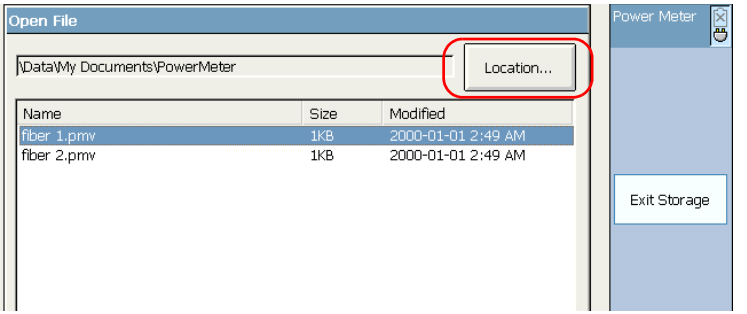
Note: *If you press **Add** while using another measurement unit, you will have to save previous values first.*

Reloading Power Meter Results

By reloading results on your unit, you can change the file location, but you cannot reload files from another unit. To do so, transfer data to a computer, then use the Optical Test Report Viewer.

To reload Power Meter results:

1. From the **Power Meter** tab, press **Storage**, then **Open Files**.
2. If necessary, change the location from which the file should be reloaded.



3. From the given list of files, select the file to reload.

   Confirm with **OK**.

   If you have already performed power measurements but not saved your work, you will be asked to save it. Then, you will be able to reload a new file afterwards.

4. To view the reloaded file, press **Exit Storage**. Then, from the **Power Meter** tab, press **Results**. The power measurements are displayed on the results list.

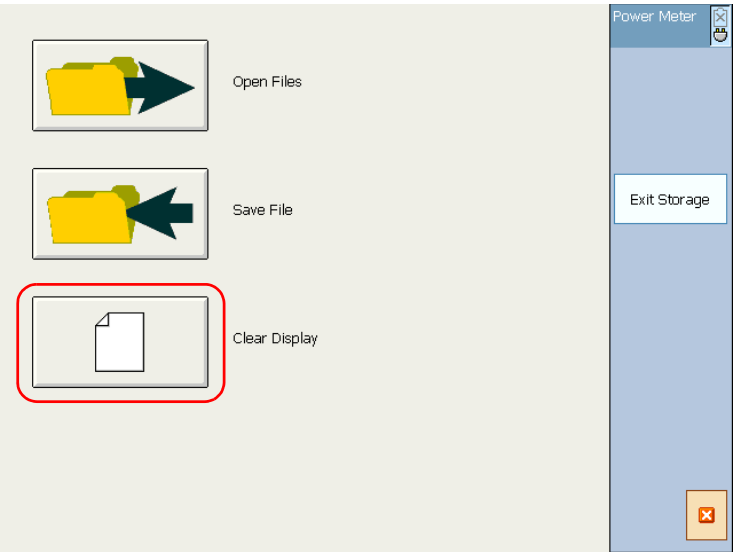
Clearing Power Measurements from the Display

If a measurement does not meet your requirements, you can clear the display and start over.

Note: *Clearing measurements from the display does not delete them from the disk (if they were saved previously).*

To clear power measurements:

1. From the **Power Meter** tab, press **Storage**, then **Clear Display**.



If you have already performed power measurements (but not saved them), the application will prompt you to save the current data.

Select **Yes** to save the file. For more information on saving results, see *Reloading Power Meter Results* on page 44.

2. Press **Exit Storage**.

Creating and Printing a Results Report

A report is available to keep notes on the measures, the location of the tested fiber, the type of job performed and general comments. This information will be saved, with your measurements, in the power meter results file.

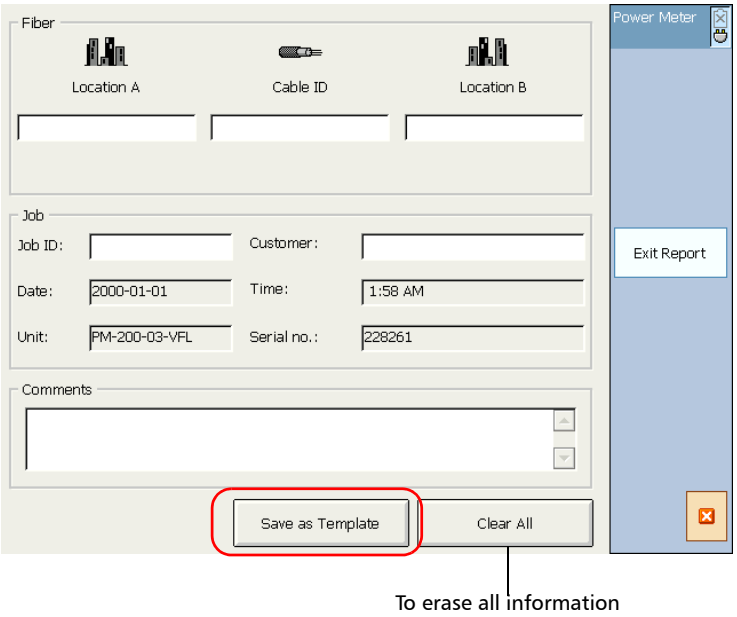
To speed up information entry, once you have provided the required data, you may keep the contents as a template that will be used for all new results.

You can print two types of report:

Type of report	Summarized	Detailed
Cable information	X	X
Job information	X	X
Result table	X	X
Average table		X
Comments		X

To create a power meter result report:

1. From the **Power Meter** tab, press **Report**.
2. Enter the relevant information.



You can save the information as a template by pressing **Save as Template**.

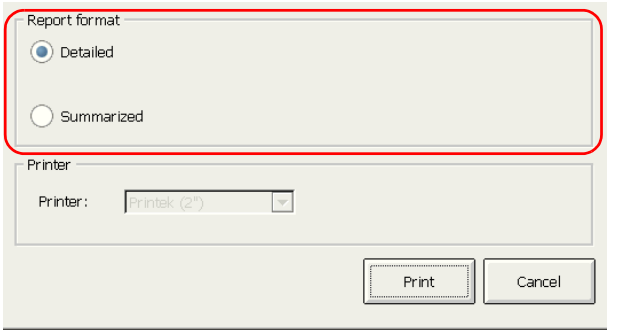
3. Press **Exit Report** to return to the **Power Meter** tab.

To clear all the information from the Report window:

Press **Clear All**, then **Exit Report**.

To print a power measurement report:

1. Connect a printer to your Compact Modular Platform. For more information, see *Configuring the Printer* on page 22.
2. From **Power Meter** tab, press **Print**.
3. Select the report format.



4. Press **Print**. You will automatically return to the **Power Meter** tab.

Identifying Fiber Faults Visually with the VFL

The visual fault locator (VFL) helps you identify bends, faulty connectors, splices and other causes of signal loss. It can also help the person at the other end of the link to identify the fiber under test, which could be particularly useful when working with cables containing many fibers.

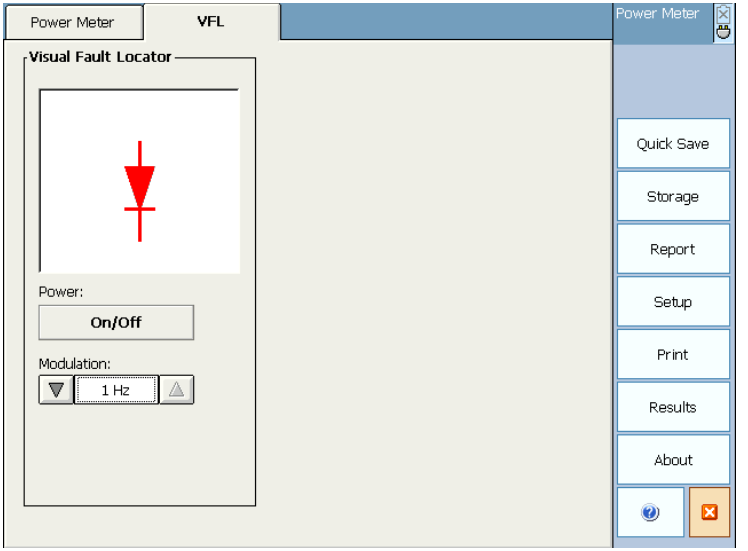
From its dedicated port, the VFL emits a red signal which becomes visible at the location of a fault on the fiber. This signal can be continuous (CW, the default) or blinking (1 Hz).

WARNING

When the VFL is active, the VFL port emits visible laser radiation. Avoid exposure and do not stare directly into the beam. Protect any unused port with a cap.

To activate the VFL and inspect a fiber:

1. Clean the connectors properly.
2. Connect the fiber under test to the VFL port.
3. From the **Main Menu**, press **Power Meter,** then select the **VFL** tab.
4. Press **ON/OFF** to activate the VFL.



5. Use up/down arrows to switch between blinking (1 Hz) and continuous (CW) signals
6. Without looking directly into the beam, examine the fiber. If light is coming out of the rubber jacket or on the side of the ferrule, the fiber is defective.
7. Press **ON/OFF** to deactivate the VFL.

6 Inspecting Fibers with a Probe

The fiber inspection probe (FIP) is used to find dirty or damaged connectors by displaying an enlarged view of the connector surface.

The following common features of fiber inspection probes are supported by the FTB-200 Compact Modular Platform:

- Magnification control: supports 200x, 400x or other zoom factors.
- Focus control: fine-tunes the display quality.
- Image capture: freezes the image on the unit display by pressing a button.

For more information, refer to the user guide that came with your probe.

Inspecting a Fiber End

The fiber inspection probe facilitates the examination of patchcord connectors. You can connect your fiber inspection probe to your unit to view fiber ends.

IMPORTANT

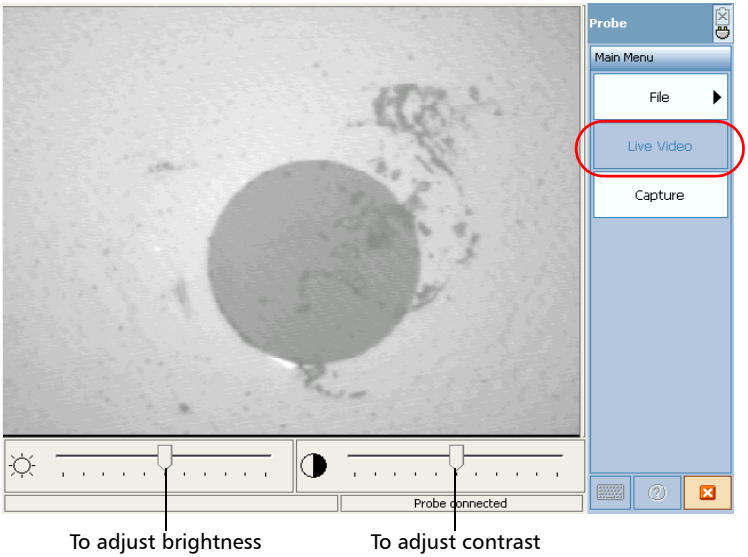
You must connect the probe to your unit for the probe to be detected. Otherwise, you will have to restart the application.

To inspect a fiber end:

1. Connect the probe to the probe port on the right side of the unit, using an adapter if necessary. *You cannot connect the probe to the USB port.*
2. Activate the probe display using one of the following:
   - From the **Main Menu**, press **Probe**.
   - Press the **Probe** button on the unit keypad.

3. Connect the fiber end or the connector to the probe.

4. Press **Live Video**.



5. Adjust brightness and contrast by using the sliders.

6. Adjust the focus by using the focus control knob on your probe.

Capturing an Image

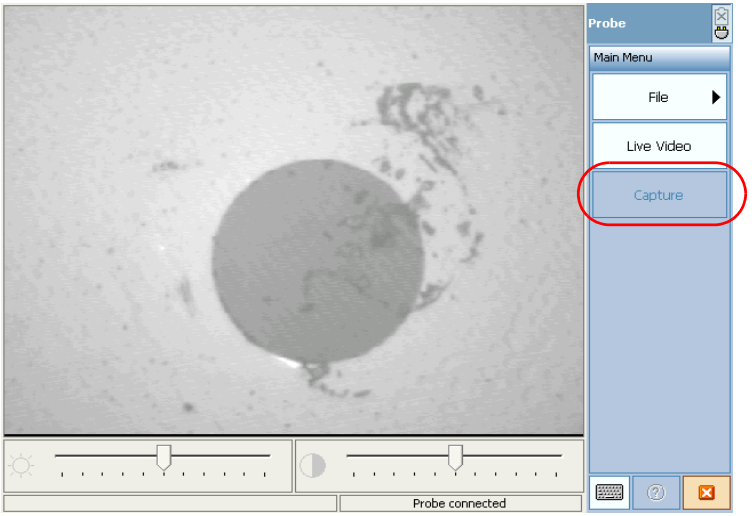
While you are inspecting a fiber, you can capture an image and save it on your unit as a JPEG or BMP file. You can transfer image files to a computer and add them to your reports.

When you save a capture, the application suggests a file name of the form *ProbeNNN* (where NNN is the first unused number in the folder, starting at 000).

Note: *If you delete a file, its name becomes available for the next file to save.*

To capture an image:

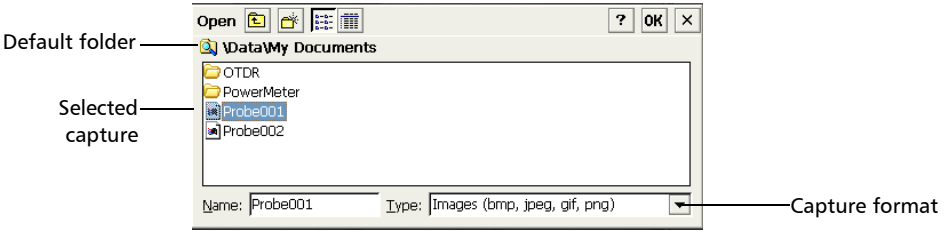
1. In Live Video mode, use focus, brightness, and contrast to adjust the image.
2. Press **Capture**.



3. Press **File**, then **Save As** and select a file name and location for your capture.
4. Return to Live Video mode by pressing **Main Menu**.

To view a capture:

1. Press **File**, and then **Open**.
2. Open the folder in which your captures are saved.



3. Double click on the capture you want to view.
4. Return to Live Video mode by pressing **Main Menu**.

   Repeat steps 1 to 3 to view other captures.

7 Managing Data

You can copy, move, rename, delete files and folders directly on your unit.

You can transfer files from your unit to a USB memory drive, a CompactFlash card or a computer. You can also transfer data from a storage device or a computer to your unit.

Your unit is equipped with 2 types of USB ports:

- USB host port (type A connector) to connect USB memory drives
- USB secondary port (type B connector) to transfer data directly between your unit and a computer using a USB cable.

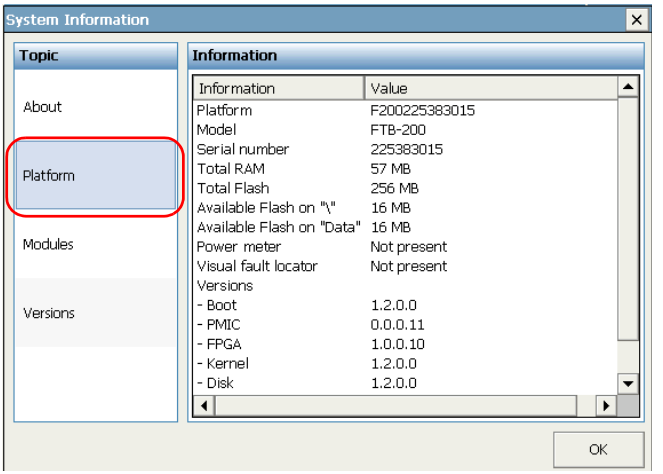
IMPORTANT

To avoid any problems and prevent malfunctioning, use only the USB drives approved by EXFO Electro-Optical Engineering Inc.

To view the free disk space on your unit:

1. From **Main Menu**, press **System Info**.
2. Select **Platform**.

   The free disk space is displayed next to **Available Flash** items.



3. When you have finished, close **System Information**.

To manage files or folders on your unit only:

From **Main Menu**, select **File Manager**.

To transfer files or folders between your unit and a CompactFlash card or a USB memory drive:

Note: *Ensure that the CompactFlash card holes for the connector pins are towards the back of the card reader and that you see the label with a small arrow on top.*

1. Insert the CompactFlash card into the card reader until it stops.

CAUTION

Applying too much pressure on the card will cause irreparable damage to the card.

OR

Connect the USB memory drive to the USB port.

2. From **Main Menu**, select **File Manager**.

   The list of available drives and folders should include the card (**Storage Card**) or the memory drive (**Removable Disk**). You can now manage your files and folders as you wish.

Note: *If you do not see the card or the memory drive, close File Manager and reopen it.*

3. When you have finished, remove the card or the memory drive.

CAUTION

Always use the card reader's eject button to remove the card from your unit.

To transfer files or folders between your unit and a computer:

IMPORTANT

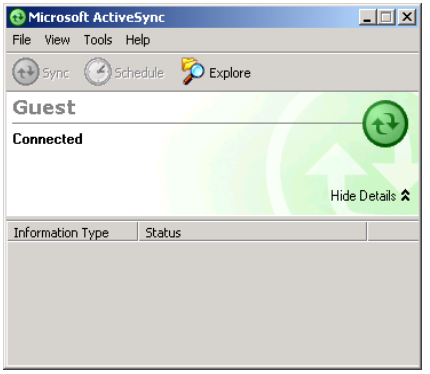
You must install Microsoft ActiveSync on the computer you want to use with your unit. Otherwise, you will not be able to transfer data.

Before connecting your unit to a computer, you have to install the required software on the computer. For more information on the installation, refer to the Release Notes on the installation CD.

1. If it is not already done, install Microsoft ActiveSync.
2. Connect the USB cable to the computer (type A end) and your unit (type B end).

Note: *The computer and your unit do not need to be off when you connect the cable.*

3. Once ActiveSync indicates that the computer and your unit are connected, right-click the ActiveSync icon then select **Explore** to access the files and folders stored on your unit.



OR

On the computer desktop, double-click **My Computer**, then **Mobile Device** to access the files and folders stored on your unit.

You can now manage your files and folders as you wish.

4. When you have finished, simply disconnect the USB cable.

8 Testing Network Connections

The two most common basic tests widely used in networking are the *ping* test and the *trace route* test. With these tests, you can ensure that IP packets travel as expected from a local host to a remote host and vice versa.

Performing a Ping Test

The ping test is a basic test that measures the average time it takes for a packet to reach the remote host. With this test, you can quickly verify that the remote host functions properly.

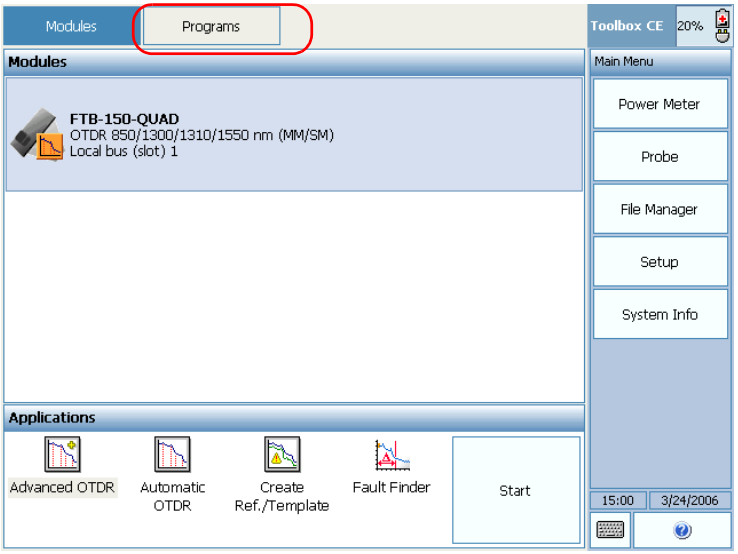
The ping test has six common parameters:

- The URL (IP address)
- The number of packets to send
- The packet size
- The maximum time allowed for a packet to reach the remote host
- The maximum number of hops allowed for reaching the remote host (TTL)
- A flag to indicate whether a packet can be fragmented.

When the test is complete, you can export the results. You can later import the generated text file (tab-delimited) directly into Microsoft Excel.

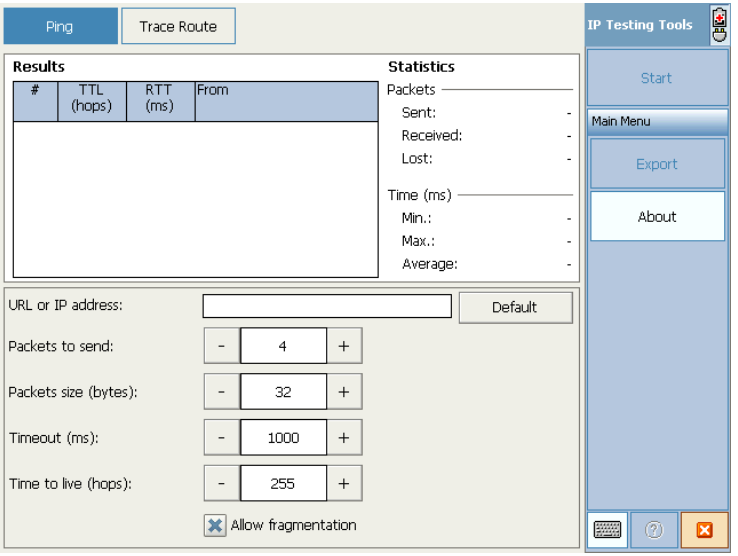
To perform a ping test:

1. From Toolbox CE, select the **Programs** tab, then select **IP Testing Tools**.



2. From **IP Testing Tools**, select the **Ping** tab.

3. Enter an URL or an IP address to reach. You can press the **Default** button to use the unit's default ping address. The default value cannot be configured.



4. Set the parameters:

- ➤ Packet size
- ➤ Number of packets to send
- ➤ Timeout limit
- ➤ TTL limit
- ➤ Clear the **Allow fragmentation** check box if you prefer sending complete packets to the host.

5. Press the **Start** button.

You can stop a ping test at any time by pressing the **Stop** button.

Performing a Trace Route Test

The trace route test is used to evaluate the average number of nodes that are required to reach the final host. It is often use to troubleshoot networks (identify routing problems or accesses blocked by firewalls).

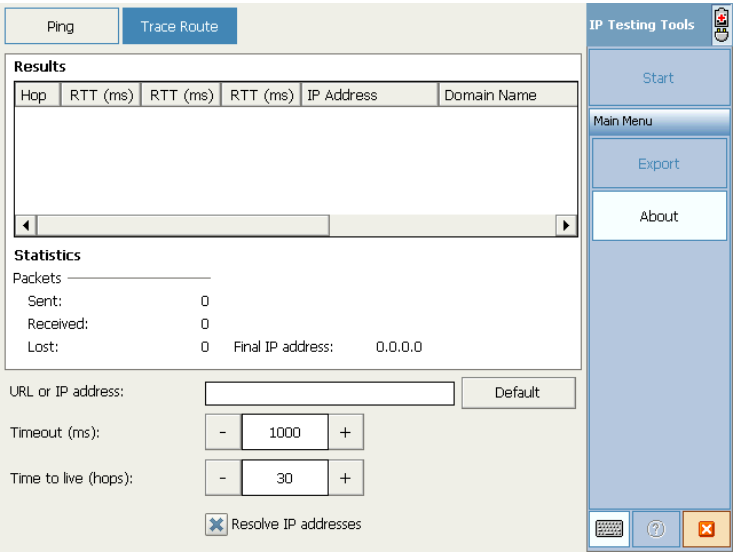
This trace route test utility enables you to:

- Enter a remote host address.
- Set the maximum time allowed for a packet to reach the remote host.
- Set the maximum number of hops allowed for reaching the remote host (TTL).
- Choose whether to resolve DNS for the IP address or not.

When the test is complete, you can export the results. You can later import the generated text file (tab-delimited) directly into Microsoft Excel.

To perform a Trace Route test:

1. From **IP Testing Tools**, select the **Trace Route** tab.
2. Enter an URL or an IP address to reach. You can press the **Default** button to use the unit's default trace route address. The default value cannot be configured.



3. Set the other parameters:
   - ➤ Timeout limit
   - ➤ TTL limit
   - ➤ Select or clear the **Resolve IP addresses** check box if you want to get the host name for the corresponding IP address of nodes.
4. Press the **Start** button.

You can stop a trace route test at any time by pressing the **Stop** button.

Exporting the Results

When a test is complete, you can export the results of the current test page. If you want to keep your results for future use, you must export them because result files cannot be opened directly from your unit.

Results are sent to a text file. Fields are separated by the "TAB" character to simplify the importation into a Microsoft Excel worksheet.

By default, the application suggests a file name:

- For ping test:

  Ping for [URL] on [YEAR]_[MONTH]_[DAY].txt

- For trace route tests:

  Trace Route for [URL] on [YEAR]_[MONTH]_[DAY].txt

Where:

- [URL] is the entered URL or IP address,
- [YEAR] is the year of the test,
- [MONTH] is the month of the test,
- [DAY] is the day of the test.

Example:

For a ping test at www.yoursite.org made on January 3rd, 2006, the suggested filename would be:

Ping for www.yoursite.org on 2006_01_03.txt

To export results:

Press the **Export** button. If necessary, modify the suggested file name.

9 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 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.

Recharging the Main Battery

The main Lithium-Ion battery will last about 8 hours in normal operation. The clock battery is recharged automatically along with the main battery.

➤ In Toolbox CE, the charge status is shown above **Main Menu**.

➤ The unit also indicates the charge status with LED on its front panel (see *LED Panel Description* on page 4):

Status LED	Battery Charge Status
Green	Fully charged
Green, flashing	Charging
Yellow	Low
Red	Error

IMPORTANT

- **Batteries are not charged at the factory. Fully charge them (about 3 hours) before using the unit for the first time.**
- **The time required to charge batteries depends on various factors such as the type of modules currently in use and the ambient temperature.**
- **Never store at temperatures above 60 °C (140 °F).**
- **Charge only with specified charger.**
- **Depending on the way the unit is used, after a while, the charge status icon may no longer correspond to the actual power level of the battery (for example, icon indicates that power level is sufficient, but unit turns off because battery is too weak). A complete calibration cycle will be necessary (see *Recalibrating the Battery* on page 71).**

To recharge the main battery:

Connect the unit to a power outlet using the AC adapter/charger. The charge cycle will start and end automatically.

Recalibrating the Battery

Depending on the way the unit is used, after a while, the charge status icon may no longer correspond to the actual power level of the battery (for example , icon indicates that power level is sufficient, but unit turns off because battery is too weak). A complete calibration cycle will be necessary.

You can perform a recalibration with the battery calibration utility:

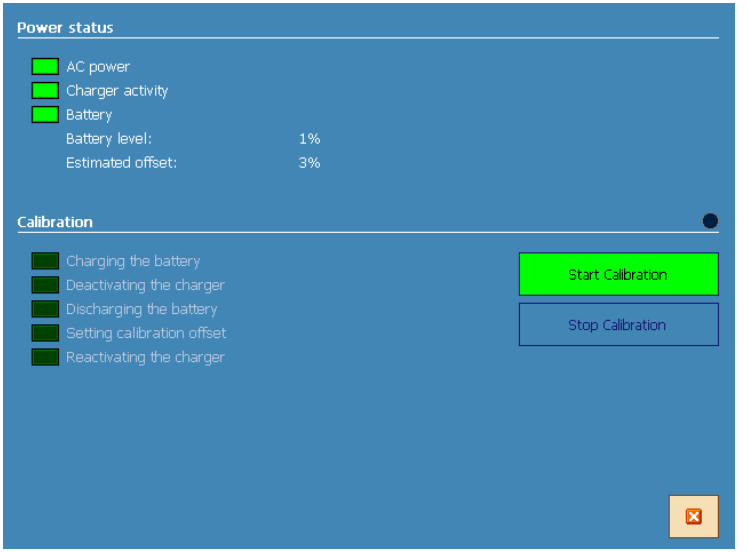
- The utility will charge the battery until it is full.
- It will then discharge the battery completely.
- You will have to let the battery recharge completely.

The whole calibration process can take several hours. You can stop the process at any time, but the battery will still need calibration.

When a calibration step is underway, the LED preceding the step name appears in yellow. When a step is complete, the LED turns to green.

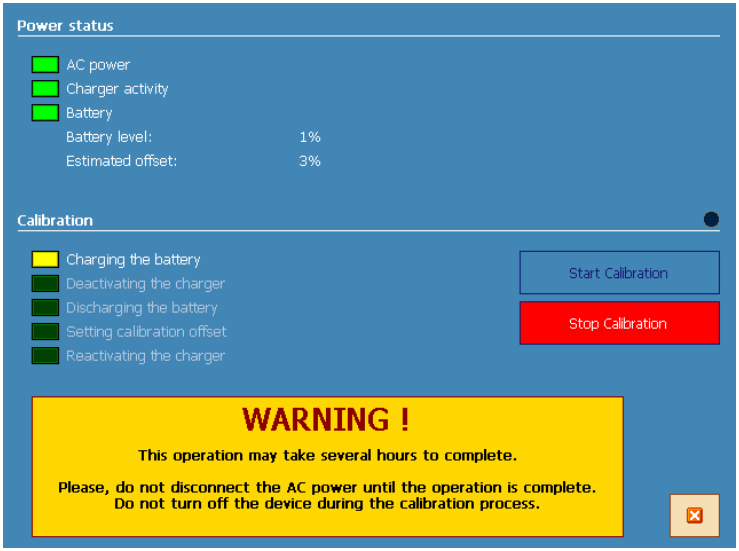
To recalibrate the batteries:

1. From the **Main Menu**, select **Setup**, and then **Battery Calibration**.



2. Connect the AC adapter/charger to your unit.
3. Press the **Start Calibration** button (the **Stop Calibration** button will become available).

   Once calibration is complete, the **Start Calibration** button becomes available again.



Replacing Batteries

Your unit uses a battery that has been especially designed for EXFO. For this reason, you can only replace the main battery with a similar one:

- Battery manufacturer: Inspired Energy
- Part number: L08D185A
- Rating: Li-Ion, 14.Vdc, 4800 mAh

You can only purchase new batteries from EXFO.

WARNING

Do not throw batteries into fire or water and do not short-circuit the battery's electrical contacts. Do not disassemble.

To replace the main battery:

1. If you do not have a replacement battery, contact EXFO to purchase a new one.
2. Turn off the unit.

   If you let the unit in suspend mode (see *Turning On or Off the Unit* on page 24), you have to change the main battery within 15 minutes. Otherwise, the unit will not be able to revert to your exact work environment (equivalent of a shutdown).
3. Open the battery compartment door located at the top of the unit (turn the cap counterclockwise and pull it away).
4. Replace the battery.
5. Close the battery compartment door.

Note: *You cannot replace the clock battery yourself.*

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, EXFO 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 EXFO and a customer, distributor, or commercial partner, EXFO 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 EXFO, under its brand name, is generally designed to facilitate dismantling and reclamation.

For complete recycling/disposal procedures and contact information, visit the EXFO Web site at www.exfo.com/recycle.

10 Troubleshooting

Solving Common Problems

Problem	Cause	Solution
Unit does not turn on.	Battery is discharged.	➤ Charge the battery. ➤ Replace the battery with a fully charged one. ➤ Connect the unit to an external power supply using the AC adapter/charger.
	Unit is not connected to an external power supply.	Connect the unit to an external power supply using the AC adapter/charger.
	External power supply is unplugged.	Make sure the external power supply is plugged in at both ends.
	Battery door is not in place or is defective.	Replace the battery door properly.
Unit screen is dark.	Unit's backlight is off.	Press the backlight button.
	Battery is discharged and unit has shut down.	➤ Charge the battery. ➤ Replace the battery with a fully charged one. ➤ Connect the unit to an external power supply using the AC adapter/charger.
External keyboard is not working.	External keyboard has not been detected.	➤ Unplug the keyboard and then plug it again. ➤ Turn off the unit, plug in the keyboard, and turn on the unit.
Screen characters are dim.	Brightness is not set properly.	Adjust brightness.

Problem	Cause	Solution
One of the application is not responding.		Press ⏻ and hold it down until the unit beeps twice or the corresponding LED turns to red to shutdown the unit, then turn it on again to reset it.
Impossible to calibrate the touchscreen via the **Stylus** control panel.	Screen calibration is very poor.	➤ Press ⏻ and hold it down until the unit beeps twice or the corresponding LED turns to red to shutdown the unit. ➤ Press simultaneously ⏻ and 0 to enter the Maintenance mode. ➤ You will be prompted to keep connected on DC connector and to run on fully charged batteries. Press **OK**. ➤ Select Recalibrate Touch Screen of Press F1.
Unit's operating time is reduced.	Battery is probably worn out.	Replace the battery.
	Battery was not fully charged.	➤ Charge the battery. ➤ Perform a complete battery calibration cycle[a].
Battery indicator remains low after a full charge.	Battery is not completely charged.	Perform a complete battery calibration cycle[a].
Your unit is not responding.		Restore your unit. To do so, see Restoring Your Unit to Normal Operation section.

a. A complete battery calibration cycle consists of a full charge, immediately followed by a full discharge, then followed by a full charge.

Restoring Your Unit to Normal Operation

If you ever encounter major problems with your FTB-200 Compact Modular Platform (for example, you cannot start your unit) you can restore your unit to normal operation from the maintenance mode. For current updates, use the Handheld Instrument Software Manager (HISM).

The restoration options are described below:

- **Restore Registry**: The unit will restart in normal mode using the last installation software registry that was saved.
- **Restore System Partition**: The unit will restart in normal mode. However, you will have to reinstall the system disk and your applications using HISM.
- **Restore System Partition From USB Flash Drive**: The unit will restart in normal mode. However, you will have to reinstall the system disk and your applications using HISM.
- **Restore System Partition From CompactFlash card**: The unit will restart in normal mode. However, you will have to reinstall the system disk and your applications using HISM.

To restore the system registry:

1. Shut down your unit by pressing ⏻ and holding it down until the unit beeps twice .
2. Press simultaneously ⏻ and 0 to enter the maintenance mode. The window will be displayed after about 30 seconds.
3. Select **Restore Registry**.
4. When the application prompts you, select **Yes** to start the process.

Your unit may restart several times during the installation.

If the operation was successful, you can now use your unit. If your unit still does not work properly, try restoring the system partition.

To restore the system partition:

1. Shut down your unit by pressing ⏻ and holding it down until the unit beeps twice .
2. Press simultaneously ⏻ and 0 to enter the maintenance mode. The window will be displayed after about 30 seconds.
3. Select **Restore System Partition**.
4. When the application prompts you, select **Yes** to start the process.
5. Once the process is complete, reinstall the system disk and your applications using HISM.

Your unit may restart several times during the installation.

If the operation was successful, you can now use your unit. If your unit still does not work properly, try restoring the system partition from a USB memory drive or a CompactFlash card.

To restore the system partition from a USB memory drive or a CompactFlash card:

1. Shut down your unit by pressing ⏻ and holding it down until the unit beeps twice .
2. Insert the installation CD in the computer CD-ROM drive.
3. On the CD, go to the Utilities and User Documentation folder, and then go to the System Image folder and copy its contents to the first level of the USB memory drive or CompactFlash card.
4. Press simultaneously ⏻ and 0 to enter the maintenance mode. The window will be displayed after about 30 seconds.
5. Select **Restore System Partition From USB Flash Drive.**

   OR

   Select **Restore System Partition From CompactFlash card**.

   The application will search for the required .bex file.
6. Select the desired file, and then select **Restore**.
7. When the application prompts you, select **Yes** to start the process.
8. Once the process is complete, reinstall the system disk and your applications using HISM.

Your unit will restart several times. This operation takes 5 to 7 minutes to complete and is done when Toolbox CE is displayed.

If your unit still does not work properly, contact EXFO's technical support group.

Contacting the Technical Support Group

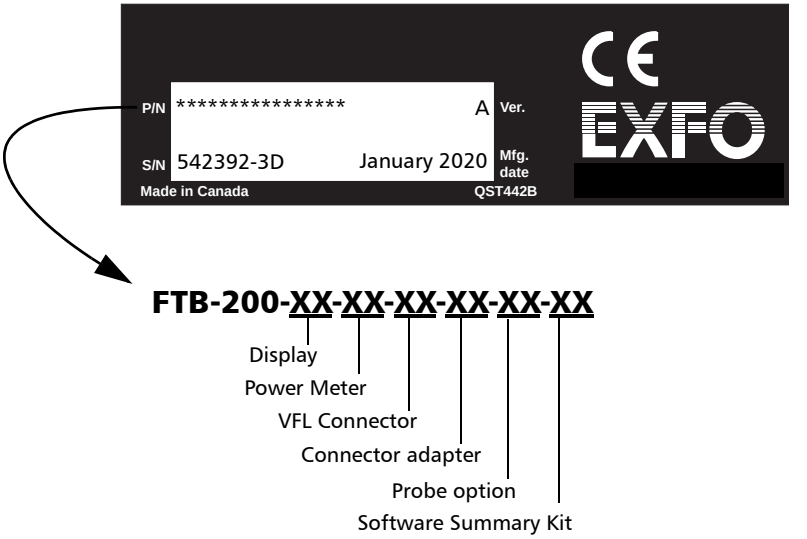
To obtain after-sales service or technical support for this product, contact EXFO at one of the following numbers. The Technical Support Group is available to take your calls from Monday to Friday, 8:00 a.m. to 7:00 p.m. (Eastern Time in North America).

For detailed information about technical support, visit the EXFO Web site at www.exfo.com.

Technical Support Group
400 Godin Avenue
Quebec (Quebec) G1M 2K2
CANADA

1 866 683-0155 (USA and Canada)
Tel.: 1 418 683-5498
Fax: 1 418 683-9224
support@exfo.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.



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.

11 Warranty

General Information

EXFO Electro-Optical Engineering Inc. (EXFO) warrants this equipment against defects in material and workmanship for a period of one year from the date of original shipment. EXFO also warrants that this equipment will meet applicable specifications under normal use.

During the warranty period, EXFO will, at its discretion, repair, replace, or issue credit for any defective product, as well as verify and adjust the product free of charge should the equipment need to be repaired or if the original calibration is erroneous. If the equipment is sent back for verification of calibration during the warranty period and found to meet all published specifications, EXFO will charge standard calibration fees.

IMPORTANT

The warranty can become null and void if:

- **unit has been tampered with, repaired, or worked upon by unauthorized individuals or non-EXFO personnel.**
- **warranty sticker has been removed.**
- **case screws, other than those specified in this guide, have been removed.**
- **case has been opened, other than as explained in this guide.**
- **unit serial number has been altered, erased, or removed.**
- **unit has been misused, neglected, or damaged by accident.**

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL EXFO BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

Liability

EXFO shall not be liable for damages resulting from the use of the product, nor shall be responsible for any failure in the performance of other items to which the product is connected or the operation of any system of which the product may be a part.

EXFO shall not be liable for damages resulting from improper usage or unauthorized modification of the product, its accompanying accessories and software.

Exclusions

EXFO reserves the right to make changes in the design or construction of any of its products at any time without incurring obligation to make any changes whatsoever on units purchased. Accessories, including but not limited to fuses, pilot lamps, batteries and universal interfaces (EUI) used with EXFO products are not covered by this warranty.

This warranty excludes failure resulting from: improper use or installation, normal wear and tear, accident, abuse, neglect, fire, water, lightning or other acts of nature, causes external to the product or other factors beyond the control of EXFO.

IMPORTANT

EXFO will charge a fee for replacing optical connectors that were damaged due to misuse or bad cleaning.

Certification

EXFO certifies that this equipment met its published specifications at the time of shipment from the factory.

Service and Repairs

EXFO commits to providing product service and repair for five years following the date of purchase.

To send any equipment for service or repair:

1. Call one of EXFO's authorized service centers (see *EXFO Service Centers Worldwide* on page 89). Support personnel will determine if the equipment requires service, repair, or calibration.
2. If equipment must be returned to EXFO or an authorized service center, support personnel will issue a Return Merchandise Authorization (RMA) number and provide an address for return.
3. If possible, back up your data before sending the unit for repair.
4. Pack the equipment in its original shipping material. Be sure to include a statement or report fully detailing the defect and the conditions under which it was observed.
5. Return the equipment, prepaid, to the address given to you by support personnel. Be sure to write the RMA number on the shipping slip. *EXFO will refuse and return any package that does not bear an RMA number.*

Note: *A test setup fee will apply to any returned unit that, after test, is found to meet the applicable specifications.*

After repair, the equipment will be returned with a repair report. If the equipment is not under warranty, you will be invoiced for the cost appearing on this report. EXFO will pay return-to-customer shipping costs for equipment under warranty. Shipping insurance is at your expense.

Routine recalibration is not included in any of the warranty plans. Since calibrations/verifications are not covered by the basic or extended warranties, you may elect to purchase FlexCare Calibration/Verification Packages for a definite period of time. Contact an authorized service center (see *EXFO Service Centers Worldwide* on page 89).

EXFO Service Centers Worldwide

If your product requires servicing, contact your nearest authorized service center.

EXFO Headquarters Service Center
400 Godin Avenue
Quebec (Quebec) G1M 2K2
CANADA

1 866 683-0155 (USA and Canada)
Tel.: 1 418 683-5498
Fax: 1 418 683-9224
quebec.service@exfo.com

EXFO Europe Service Center
Omega Enterprise Park, Electron Way
Chandlers Ford, Hampshire S053 4SE
ENGLAND

Tel.: +44 2380 246810
Fax: +44 2380 246801
europe.service@exfo.com

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National Highway 107,
Xixiang, Bao An District,
Shenzhen, China, 518126

Tel: +86 (755) 2955 3100
Fax: +86 (755) 2955 3101
beijing.service@exfo.com

A Technical Specifications

IMPORTANT

The following technical specifications can change without notice. The information presented in this section is provided as a reference only. To obtain this product's most recent technical specifications, visit the EXFO Web site at *www.exfo.com*.

SPECIFICATIONS [a]

Display	Touchscreen, color, 640 x 480 TFT 163 mm (6 7/16 in)
Interfaces	USB A main
	USB B remote
	RJ-45 LAN 10/100 Mbit/s
	Compact Flash
	Fiber inspection probe connector port (video)
Storage	Internal 80 MB (Flash)
	USB sticks 1 GB and 2 GB (optional)
	Compact Flash cards (optional)
Batteries [b]	Rechargeable Li-Ion
	8 h of operation as per Bellcore TR-NWT-001138
Power Supply	AC/DC adapter, input 100-240 VAC, 50-60 Hz, 2 A max, output: 24 VDC, 90 W

GENERAL SPECIFICATIONS

Temperature		
	operating	–5 °C to 50 °C (23 °F to 122 °F)
	storage [c]	–40 °C to 70 °C (–40 °F to 158 °F)
Relative humidity	0 % to 95 % non-condensing	
Size (H x W x D)	322 mm x 197 mm x 109 mm	(12 17/16 in x 7 3/4 in x 4 5/16 in)
Weight	2.5 kg	(5.4 lb)
Vibration	< 1.5 g at 10 Hz to 500 Hz (on three main axes)	
Mechanical shock	< 760 mm on six sides and eight main edges (according to GR-196-CORE)	

ACCESSORIES

FP1	FP1 200X Fiber Inspection Probe
FP5	FP5 400X Fiber Inspection Probe
GP-10-072	Semi-rigid FTB-200 carrying case
GP-302	USB mouse
GP-308	DC car adapter/inverter
GP-2001	USB keyboard
GP-2011	Compact Flash Ethernet WiFi card
GP-2012	Compact Flash Bluetooth card
GP-2014	Compact Flash memory 1 GB card
GP-2015	Compact Flash memory 2 GB card
GP-2016	10 feet RJ-45 LAN cable
GP-2017	Spare FTB-200 battery
GP-2019	USB micro drive standard capacity
GP-2021 (A-E-I-J-S-U)	Spare AC charger (requires AC external adapter/charger). Specify: A–North America, E–Europe, I–India, J–Japanese, S–Australia and New-Zealand, U–United-Kingdom
GP-2023	Spare neck strap
GP-2024	Spare belt strap
GP-2025	Spare battery door
GP-2027	Portable printer
GP-2028	Computer security cable kit

PM-200 BUILT-IN POWER METER SPECIFICATIONS [d]

Calibrated wavelengths (nm)		850, 1300, 1310, 1490, 1550, 1625, 1650
Power range (dBm)		10 to –86 (InGaAs) 26 to –64 (GeX)
Uncertainty (%) [e]		±5 % ± 3 pW (InGaAs) ±5 % ± 0.4 nW (GeX)
Display resolution (dB)	InGaAs	0.01 = max to –76 dBm 0.1 = –76 dBm to –86 dBm 1 = –86 dBm to min
	GeX	0.01 = max to –54 dBm 0.1 = –54 dBm to –64 dBm 1 = –64 dBm to min
Automatic offset nulling range [f]		Max power to –63 dBm for InGaAs Max power to –40 dBm for GeX
Tone detection (Hz)		270/1000/2000

VISUAL FAULT LOCATOR (VFL) (OPTIONAL)

Laser, 650 nm ± 10 nm

CW

Typical P_{out} in 62.5/125 µm: 3 dBm (2 mW)

Notes

a. All specifications valid at 23 °C (73 °F).

b. Standard recharge time is 3 h.
Recharge temperature: 0 °C to 35 °C (32 °F to 95 °F).

c. Not including internal batteries.
Battery maximum storage temperature: 60 °C (140 °F).

d. At 23 °C ± 1 °C, 1550 nm and FC connector.
With modules in idle mode. Battery operated.

e. Up to 5 dBm.

f. For ±0.05 dB, from 18 °C to 28 °C.

Index

A

AC LED 4
AC requirements 12
accessing power meter 35
after-sales service 82
application, starting 25

B

battery
  charge status 69
  clock 7, 31
  LED 4
  maintenance recommendations 69
  recharging 70
  replacing or removing 74

C

calibrating the touchscreen 27
calibration
  certificate 75
  interval 75
Canadian Standards Association (CSA) viii
cancelling dark current effects 37
capacitors 11
car outlet, charging battery with 70
caution
  of personal hazard 8
  of product hazard 8
certification information viii
changing batteries 74
circuit performance 37
cleaning
  detector ports 68
  front panel 67
clearing power meter display 45
clock battery. *see* battery
cold shutdown 24
conventions, safety 8
CR2032-type battery. *see* battery
CSA viii
current, electrical 12
customer service 88

D

dark current effects, eliminating 37
description
  keypad 5
  LED panel 4
detecting module 18
detector port, cleaning 68

E

electronic offsets, eliminating 37
equipment returns 88
Explorer, Internet 26

F

fiber, measuring optical power 41
front panel, cleaning 67
FTB-200 shutting down 24

H

hard drive LED 4
hazard, laser radiation 9

I

identification label 82
indoor use 11
input current 12
inserting a module 15
installing unit 11
intermittent signal 50
Internet Explorer 26

K

keypad description 5

L

label, identification 82
laser safety information 9
laser safety LED 4
LED panel description 4

M

maintenance
  battery 69
  detector ports 68
  front panel 67
  general information 67
maximum input current 12
measurement, with power meter 41
module
  detection 18
  insertion 15
  removal 15

O

offset nulling 37
optical detector performance 37
option used at start-up 32

P

performing
  null measurement 37
  optical power measurement 41
power button 5
power LED 4
power meter
  accessing 35
  buttons description 36
  creating a report 46
  measurement 41
  printing a report 48
  recalling results 44
  reference values 40
  results 43
  setting thresholds 38
  thresholds 38
power meter, clearing the display 45
power source, AC 12
product
  identification label 82
  specifications 91
protective cap 68

R

radiation hazard, laser 9
recalibration 75
recalling results, power meter 44
reference
  mode 40
  values, setting 40
reference, zero power 37
removing a module 15
repairing unit 11
replacing or removing battery 74
report
  creating for power meter results 46
  printing 48
restore
  system partition 80
  system partition, CompactFlash card 81
  system partition, USB memory drive 81
  system registry 79
  unit 79
return merchandise authorization (RMA) 88

S

safety
  caution 8
  conventions 8
  information 9
  warning 8
service and repairs 88

service centers 89
setting
power thresholds (power meter) 38
reference values 40
shipping to EXFO 88
shutdown
cold vs. warm 24
FTB-200 24
signal, modulating 50
software. *see* application
specifications, product 91
start-up option 32
storage requirements 67
symbols, safety 8

T

technical specifications 91
technical support 82
temperature for storage 67
thresholds
power 38
setting, power meter 38
touchscreen calibration 27
transportation requirements 67, 83

U

unit
installing 11
repairing 11
restoring 79
ventilation 11
unit recalibration 75

V

ventilation 11
VFL
modulating signal 50
operation and display 50
performing a test 50

W

warm shutdown 24
warranty
certification 87
exclusions 87
general 85
liability 86
null and void 85

Z

zero-power reference 37

NOTICE
通告

CHINESE REGULATION ON RESTRICTION OF HAZARDOUS SUBSTANCES
中国关于危害物质限制的规定

NAMES AND CONTENTS OF THE TOXIC OR HAZARDOUS SUBSTANCES OR ELEMENTS CONTAINED IN THIS EXFO PRODUCT
包含在本 **EXFO** 产品中的有毒有害物质或元素的名称和含量

O	Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。
X	Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。

Part Name 部件名称	Toxic or hazardous Substances and Elements 有毒有害物质和元素					
	Lead 铅 (Pb)	Mercury 汞 (Hg)	Cadmium 隔 (Cd)	Hexavalent Chromium 六价铬 (Cr VI)	Polybrominated biphenyls 多溴联苯 (PBB)	Polybrominated diphenyl ethers 多溴二苯醚 (PBDE)
Enclosure 外壳	O	O	O	O	O	O
Electronic and electrical sub-assembly 电子和电子组件	X	O	X	O	X	X
Optical sub-assembly[a] 光学组件 [a]	X	O	O	O	O	O
Mechanical sub-assembly[a] 机械组件 [a]	O	O	O	O	O	O

a. If applicable.
闆稙骀钐祤塞粒粒。

MARKING REQUIREMENTS
标注要求

Product 产品	Environmental protection use period (years) 环境保护使用期限 (年)	Logo 标志
This Exfo product 本 EXFO 产品	10	
Battery[a] 电池 [a]	5	

a. If applicable.
闆稙骀钌祤塞粒。

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