

MaxTester 630

VDSL2/ADSL2+ Multi-play Test Set



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Units of Measurement

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

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Certification Information

North America Regulatory Statement

This unit was certified by an agency approved in both Canada and the United States of America. It has been evaluated according to applicable North American approved standards for product safety for use in Canada and the United States.

Electronic test and measurement equipment is exempt from FCC part 15, subpart B compliance in the United States of America and from ICES-003 compliance in Canada. However, EXFO Inc. makes reasonable efforts to ensure compliance to the applicable standards.

The limits set by these standards are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the user guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

European Community Declaration of Conformity



DECLARATION OF CONFORMITY

Application of Council Directive(s): 2004/108/EC – The EMC Directive
1999/5/EC – The R&TTE Directive
93/68/EEC – CE Marking
And their amendments

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Equipment Type/Environment: Test & Measurement / Industrial
Trade Name/Model No.: ADSL2+/VDSL2 Multiplay Testing / MaxTester 630

Standard(s) to which Conformity is declared:

EN 61010-1:2001 Edition 2.0 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

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

Manufacturer:

Stephen Bull, E. Eng
Vice-President Research and Development

400 Godin Avenue,
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June 4, 2012



1 **Introducing the MaxTester 630**

The MAX-630 is a handheld device designed for testing and installing multiplay services over DSL and Ethernet, between the service provider and the subscriber premises. It verifies that the customer's modem/router, equipment, and inside wiring are operating correctly. The dual Ethernet ports of the MAX-630 allow it to be used inside the home to test all the way to the end point of the service.

The MaxTester 630 test set case is an aluminum enclosure with rubber over mold, which makes it ideal for field use. Its display is a back-lit LCD featuring 480 x 800 resolution. A membrane keypad mounted on the face of the unit features a 14-button keypad used to operate the test set.

Key Features and Benefits

- Broadcom chipset
- IP login
- DSL testing
- User-defined automatic testing
- Dual Ethernet ports
- Customer modem replacement
- Color display with graphical analysis
- Battery powered
- Rugged and weatherproof handheld unit
- EXFO Connect compatible

Typical Applications

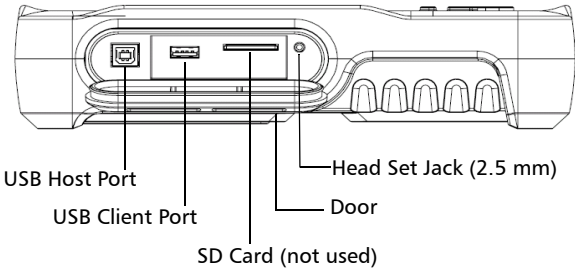
- ADSL2+ ATM/PTM and VDSL2 testing
- Optional ADSL2+ and VDSL2 bonding support
- Supports Ping, FTP, and Traceroute tests with optional support for Web Browser, VoIP and IPTV analysis
- Ethernet testing for qualifying FTTx service at the customer premises
- Configurable pass/fail results for automated testing
- Supports vectoring and G.INP for operators looking to mitigate self-FEXT (far end crosstalk) and promote DSL stability
- Proves IPv4 and IPv6 data flow between the network and the end equipment

Using the MaxTester

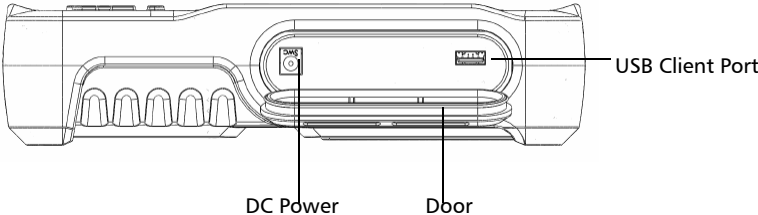
The MaxTester is tested IEC IP54 which means that it is not affected by dust or water splashing against the enclosure from any direction. This protection is only valid when both side doors are properly closed. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

The MaxTester is equipped with a series of interfaces shown in the following views:

➤ **Left**



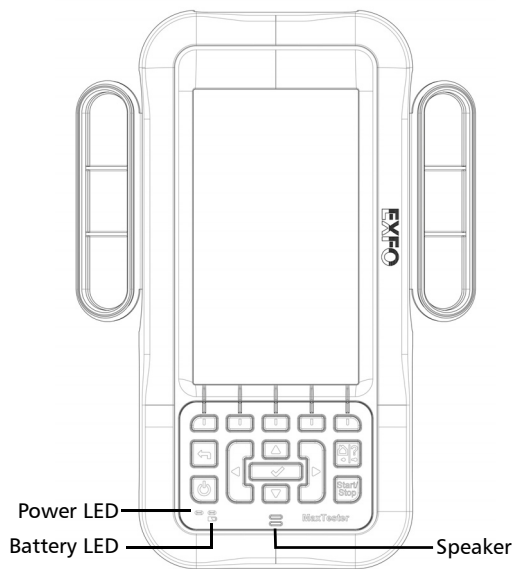
➤ **Right**



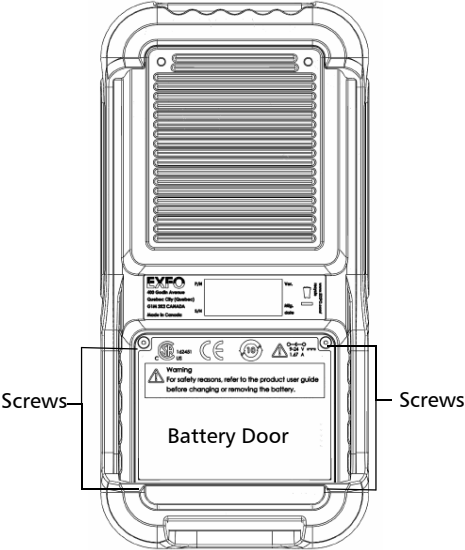
Introducing the MaxTester 630

Using the MaxTester

► Front



➤ Back



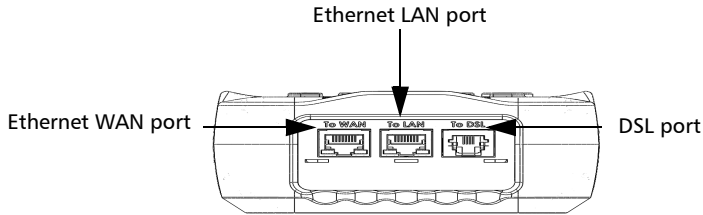
Note: The MAX-630 enclosure may become warm during normal use.

Introducing the MaxTester 630

Cable Connections

Cable Connections

The graphics below show the connectors on the MAX-630 device.



Note: When connecting a DSL cable to the DSL port, use the RJ-11 plug end of the 26 AWG cable provided with the unit. There is a 1500 V maximum transient voltage on telecom ports. Basic insulation is needed for external telecom circuits.

Note: For the connection setup, Annex B is on DSL pair 1 and Annex A is on pair 2. (Dual Annex A and B units only)

Conventions

Before using the product described in this guide, 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

The use of controls, adjustments and procedures other than those specified herein may result in exposure to hazardous situations or impair the protection provided by this unit.



IMPORTANT



When you see the following symbol on your unit , make sure that you refer to the instructions provided in your user documentation. Ensure that you understand and meet the required conditions before using your product.



IMPORTANT

Other safety instructions relevant for your product are located throughout this documentation, depending on the action to perform. Make sure to read them carefully when they apply to your situation.

Safety Information

Electrical Safety

Electrical Safety

The AC adapter/charger provided with this unit (18 W/9 V) is specifically designed to work with your MaxTester.



WARNING

- Use the AC/DC adapter/charger indoors only.
- Use only with a Class II AC/DC adapter, power limited output.
- On the AC/DC adapter, replacing detachable mains supply cords with inadequately rated cords, may result in overheating of the cord and create a fire risk.
- The adapter shall have the appropriate safety mark (e.g. UL, CSA, TUV, CE, etc.) that is acceptable to the authorities in the country where the equipment is to be used.



CAUTION

When using the MaxTester while connected to the AC/DC adapter/charger, make sure you do not position the equipment so that it is difficult to disconnect the adapter/charger from the AC mains.



WARNING

Use only accessories that meet EXFO specifications.

Equipment Ratings

Equipment Ratings	
Temperature	
➤ Operation	➤ 0 °C to 40 °C (32 °F to 104 °F)
➤ Storage	➤ -40 °C to 70 °C (-40 °F to 158 °F)
Relative humidity ^a	
➤ unit	➤ ≤ 95 % non-condensing
➤ AC adapter	➤ 0 % to 80 % non-condensing
Maximum operation altitude	3000 m (9842 ft)
Pollution degree	2 (when plugged to AC mains) ^b 3 (when operated from batteries) ^c
Overvoltage category	II
Input power ^d	
➤ unit	➤ --- 9-24 V; 18 W; 1.67 A
➤ AC adapter	➤ ~ 100 - 240 V; 50/60 Hz; 0.7 A

- a. Measured in 0 °C to 31 °C (32 °F to 87.8 °F) range, decreasing linearly to 50 % at 40 °C (104 °F).
- b. For indoor use only.
- c. Equipment is normally protected against exposure to direct sunlight, precipitations and full wind pressure.
- d. Not exceeding ± 10 % of the nominal voltage.

3 **Getting Started with the MaxTester**

Turning the Unit On/Off


When you turn the unit on, you may use it immediately under normal conditions. When the unit is turned off, it keeps the following parameters in its internal memory:

- Setup including system, application, and modem settings.
- Profiles consisting of:
 - Test parameters
 - User-defined thresholds
- Regional, LCD and energy-saving settings
- Test results saved internally vs. USB

There are two ways to turn off the MaxTester

- *Suspend*: the next time you turn your unit on, you will quickly return to your work environment.
- *Shutdown*: completely cuts power to the unit; 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 few hours or more.


To turn the unit on:


Press  to start. The unit initializes for a few seconds and displays the Home pane.

Getting Started with the MaxTester

Turning the Unit On/Off

To enter suspend mode:

Press  for about 2 seconds. The MaxTester will stay in suspend mode for 2 hours, after which it will automatically shutdown. This prevents complete battery discharge and ensures maximum battery performance.

Note: *If you have the touchscreen option, you will not be able to wake up the MaxTester just by touching the display, after putting the unit into suspend mode. You must press  to wake up the MaxTester.*

To perform a shutdown:





Hold down  for about 4 seconds. The shutdown process starts.


Note: *In both previous cases, if the power adapter is connected, the MaxTester will simulate either a fake suspend or fake shutdown in order to facilitate the charger.*

Using Menus and Keypad

You can access various tools from the keypad or menu. Menu options may differ depending on your unit configuration.

Home menu is where you can access **DSL/IP Tests**, **System Settings**, or **EXFO Connect**. Each test has a sub menu.

- To navigate through the items, use the arrow keys.
- To confirm a choice or enter a menu, press .
- To cancel an action or return to the previous item or pane, press .
- To return to the home pane, press .
- Press  once to return to the **Main** test menu or twice to return to the **Home** page.

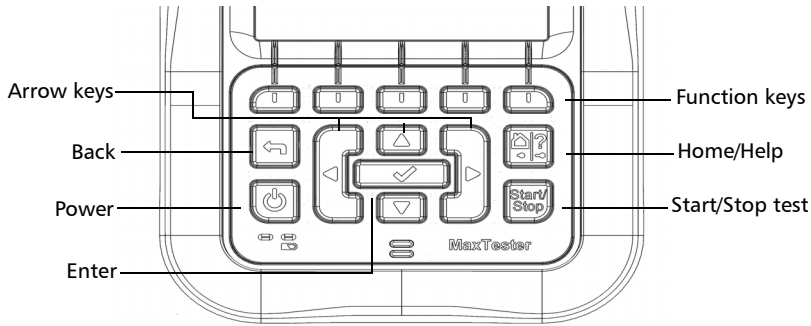
Note: Pressing  while a test is running will do nothing. The test can not be running in order to return to the main menu screen.

Note: You can also select an option directly by pressing the function keys corresponding to the on-screen buttons at the bottom of the screen. Alternatively, if you have the touchscreen option, any reference to pushing buttons on the keypad can be replaced in most cases by clicking/tapping the touchscreen.

Getting Started with the MaxTester

Keypad

Keypad



- Power button on the lower left side of the unit is used to power the unit on and off.
- Arrow keys navigate the screen to access and modify parameters.
- Function keys activate the corresponding on-screen function button.
- Home button brings you to the **Home** page of the MAX-630.

Using Online Help

Online help is available at any time. Most test operations pause while you view help, but will resume automatically when you exit help.

To access help about the current function at any time:

Press and hold the ? key.

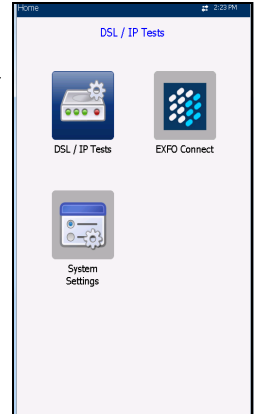
4 Setting Up the MAX-630

Home

Home presents the main menu page which allows you to navigate between **DSL/IP Tests**, **System Settings**, and **EXFO Connect** using the left/right arrow keys on the keypad.

Press **✓** to bring up the sub-menu of the selected icon:

- **DSL/IP Tests** opens the **DSL Main** menu for ADSL2+, VDSL2, and multiplay services testing applications.
- **System Settings** allow you to set the parameters of the unit such as language, date and time, and power scheme. You can also view installed options, and software and hardware revision information. Plus, **System Settings** provides access to **Upload Setup**.
- **EXFO Connect** opens to **EXFO Connect Client** and **Comms (Communications) Setup**.



Note: *If you have the touchscreen option, any reference to pushing buttons on the keypad can be replaced in most cases by clicking/tapping the touchscreen.*



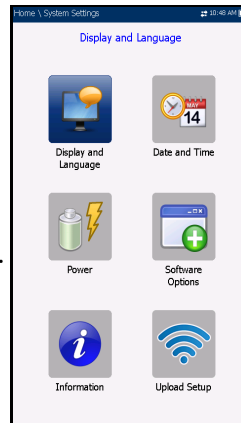
IMPORTANT

If your unit is a MAX-630/CoLT-350 with an A2XA/B modem and the System Image is higher than 2.11, the current version of software installed is not compatible with this unit. You **MUST** downgrade the software to version 2.11. Please refer to the README file in the 2.11 software distribution package on how to perform the downgrade. Please email support@exfo.com if you have any questions.

System Settings

System Settings presents a menu of items to setup the unit.

- **Display and Language** provides the setup for backlight, information on the title bar, language choice, and **Touchscreen Calibration** if your unit has the touchscreen option.
- **Date and Time** sets the date and time and format.
- **Power** displays the **BATTERY Status** and **Power Schemes**.
- **Software Options** allows you to enable/disable purchased feature options.
- **Information** displays information **About EXFO** and unit details pertaining to hardware/software/product info.
- **Upload Setup** allows you to enable and select an upload method using the following function keys:
 - **Upload Enable**
 - **FTP Setup**
 - **Wi-Fi Setup**
 - **Ethernet Setup**



To navigate between the system settings:







1. Press the up/down left/right arrow keys on the keypad to select an icon.
2. Press **✓** to confirm your selection.

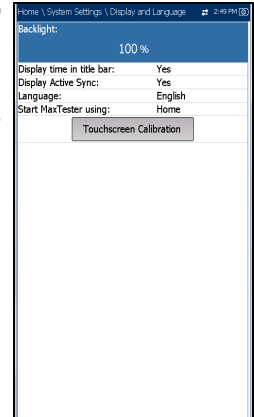
Display and Language

To fit your work environment, you may adjust the LCD brightness, display the time and Active Sync, and change the display language. If your unit has a touchscreen, you can also calibrate it here. The values are kept in memory when you turn the unit off.

Note: The LCD **Backlight** consumes battery power; more brightness, more power consumption.

To adjust the display settings:

1. From , select **System Settings**, and then **Display and Language**.
2. Use the up/down arrow keys to select the setting to change.
3. Press  to select it.
 - By using the up/down arrow keys, you can switch between preset brightness levels in the **Backlight** item. Press  to confirm.
 - To display the time and Active Sync in the title bar, enable the item. Press  after your selection to confirm.
 - Use the up/down arrow keys to navigate between the available languages, then press  to select it. You will be prompted to restart your unit.
 - To set which **Home** page the unit defaults to when pressing , highlight **Start MaxTester using:** and select from the list.
 - **Touchscreen Calibration** button is only present if your unit has a touchscreen and the functionality is enabled. To calibrate the touchscreen, press/tap/click the button to open a popup window and select **Yes** or **No**. This screen will automatically display during power up, if calibration was never conducted and the data file is not available in memory.



Date and Time

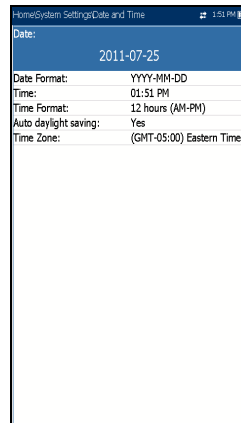
When saving results, the unit also saves the corresponding **Date** and **Time**.

You can enter the date according to the following formats:




- yyyy-mm-dd
- dd-mm-yyyy
- mm-dd-yyyy



The time can be set according to the 12- or 24-hour formats.

You can also modify the time zone and enable an option so that your unit automatically adjusts the time for the daylight saving period.



To set the date and time:

1. Press , select **System Settings**, and then **Date and Time**.
2. Use the arrows to select any of the date or time settings.
3. Press  to enable the modification controls.
 - For the date and time, an edit screen is displayed with descriptive function keys. Use the arrow keys to modify the number values, then press  to confirm the change and go back to the previous screen.

Press  to go back to the previous screen without saving the new value.
 - For the time format, auto daylight saving and time zone values, use the arrow keys to select the desired value, then press  to confirm the change.

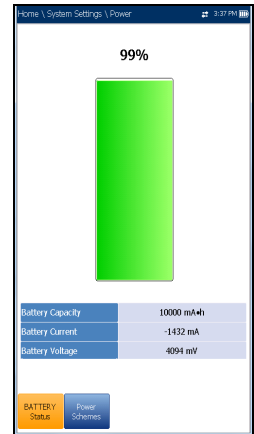
Power

Battery Status

The **BATTERY Status** pane indicates the current power level for the battery.


Note: *The battery level might not display after a system upgrade but will become available again after the next full charge.*

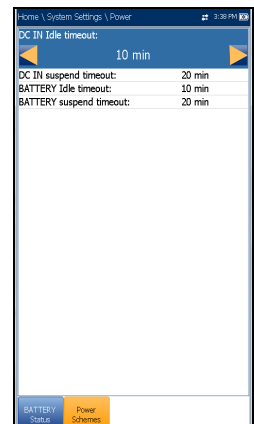
The chart below the power level allows you to view the following battery measurements: capacity, current, and voltage.



Power Schemes

You can set your unit to automatically switch to suspend mode independently for the battery or DC power modes. This is useful for example if you want to save battery power but do not want to be hindered by unwanted switches between modes when using DC power.

- Power off completely shuts down the unit's power.
- Power suspend puts the unit in sleep mode; you can wake up the system by pressing .
- **DC IN/BATTERY Idle timeout** allows you to set the time duration for the unit to idle (no keys pressed or test being run) before turning off the LCD.
- **DC IN/BATTERY suspend timeout** allows you to set the time duration for the unit to enter sleep mode.



Setting Up the MAX-630




Power

Note: *Setting the **DC IN suspend timeout** to the lowest value and not to **Never** ensures the unit enters suspend mode while the charger is connected. Battery charging time is quickest when the unit is in suspend mode.*

Default Power Scheme settings are:

- LCD backlight turns off after system idles (no keys pressed) for 10 minutes.
- Unit switches to suspend mode after timeout: 10 min.

To change the power scheme settings:

1. Press , select **System Settings**, and then **Power**.
2. Select the **Power Schemes** tab.
3. Under **DC IN** or **BATTERY**, use the arrow keys to select **Idle/suspend timeout** modes. Press  to view the list of available choices or use the left/right arrow keys.
4. Select a new value, then press  to confirm the choice. Repeat for the other modes as needed.

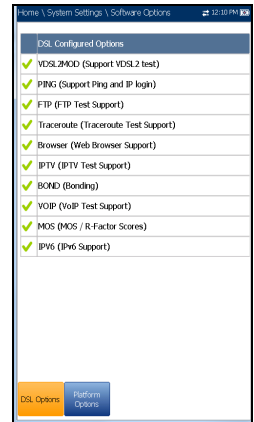
Software Options

To activate a newly purchased option key on your MaxTester, please see the *Software Options* procedures in the *MaxTester CQ-DSL Release Notes* that accompanied your unit.

DSL Options

This screen lists all the **DSL Configured Options** which are present on the unit. Possible options are as follow:

- **VDSL2MOD (Support VDSL2 test)**
- **PING (Support Ping and IP login)**
- **FTP (FTP Test Support)**
- **Traceroute (Traceroute Test Support)**
- **Browser (Web Browser Support)**
- **IPTV (IPTV Test Support)**
- **BOND (Bonding)**
- **VOIP (VoIP Test Support)**
- **MOS (MOS / R-Factor Scores)**
- **IPV6 (IPv6 Support)**



Platform Options

This screen lists all the **Platform Configured Options** which are present on the unit. Possible options are:

- **FTP Result Upload**
- **Touchscreen Support**



Information

About EXFO

The **About** tab contains contact information should you require technical assistance.

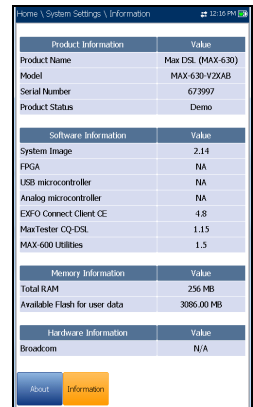


MAX-630 Information

The **Information** tab displays information about the product, software, and memory installed on the device. The page also identifies hardware information.

To view the complete version numbers of the software installed on the device:

1. Press the **Information** tab again.
2. Press the tab again to return to the original value.



Upload Setup

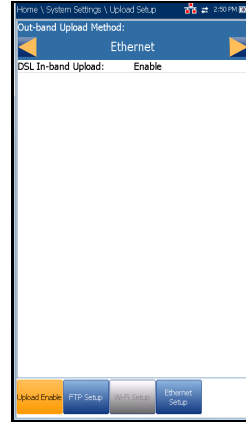
Upload Enable

The **Upload Enable** function allows you to upload your test result files.

The **Out-band Upload Method** allows you to use one of the following methods:

- **Wi-Fi** allows you to upload files from the MaxTester via a Wi-Fi hotspot/router and is available from the following results pages:
 - **Upload/Save Result** tab
 - **Result Manager/Upload**

Note: Only channels 1 to 11 are supported on the Wi-Fi hotspot/router.



A Wi-Fi symbol, in the top right-hand corner of the navigation bar, identifies whether or not a connection is present. The Wi-Fi status is indicated as follows:

- Green icon indicates that the MaxTester is connected with a Wi-Fi hotspot.




- Yellow icon indicates that the Wi-Fi dongle is powered up and ok, but that the MaxTester is not connected to any Wi-Fi hotspot.






- Red icon indicates a problem with the Wi-Fi (dongle not attached, etc.).



- **Ethernet** is the default upload and if selected, displays an ethernet icon  in the top right-hand corner of the navigation bar. It identifies whether or not a connection is present displaying a green or yellow icon similar to the Wi-Fi symbol described above.
- **Disable Upload** option disables uploading your files via Wi-Fi or Ethernet. You can export results to a USB memory device.

The **DSL In-band Upload** method supports DSL or Ethernet, and can be set to either **Enable** or **Disable**.

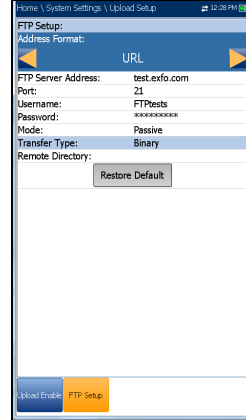
To select the Upload method:

1. Press , select **System Settings**, and then **Upload Setup**.
2. Select the **Upload Enable** tab.
3. Use the left/right arrow keys.
OR
4. Press  to view the list of available choices.
5. Use the up/down arrow keys to make your selection and press  to confirm.

FTP Setup

The **FTP Setup** function allows you to configure the file transfer information using the following:

- **Address Format** allows you to select the FTP server address type:
 - **IP Address**
 - **URL**
- **FTP Server Address** allows you to set either the IP Address or URL.
- **Port** is a fixed numeric value for the signalling port used to establish an IP network session.
- **Username/Password** is your login ID and password.
- **Mode** is either **Active** or **Passive** for the file transfer mode.
- **Transfer Type** is set to **Binary**, transferring files as a binary stream of data.
- **Remote Directory** can be used to specify the file upload directory on the FTP server, for example, dir1/dir2. If this field is left empty, the FTP upload will save the result file at root directory on FTP server.
- **Restore Default** button allows you to reset the entries to their defaults.



To configure the setup options:

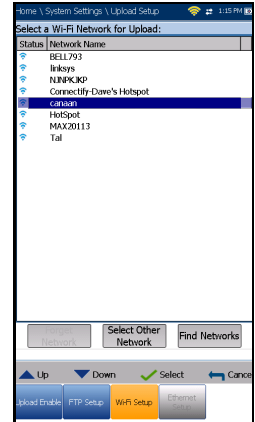
1. Press the up/down arrows to select the desired parameter.
2. Press the left/right arrow keys to view and select the options.
OR
3. Press ✓ on a value to open a list box of options or the alphanumeric editor screen and use the navigation keys to scroll through.
4. Press ✓ to confirm the value.

Wi-Fi Setup

The **Wi-Fi Setup** pages allows you to connect your MaxTester to a Wi-Fi network.

- **Select a Wi-Fi Network for Upload** lists the available secure Wi-Fi networks in range and presently connected. (Unsecured Wi-Fi networks are not supported.) The last three networks that were connected are also listed, whether or not they are presently connected to the MaxTester.

Note: *If you select a network from the list of previously selected networks (last 3), the MaxTester will try to join that network using the credentials saved for the selected network.*



- **Status** displays a Wi-Fi symbol if the device is connected, and is dynamically updated with the present connectivity state of the networks.
- **Network Name** is the Wi-Fi network name.
- A third, right-hand column displays a checkmark indicating the network selected for upload.
- **Forget Network** button removes a previously joined network from the list.
- **Select Other Network** button opens a new page allowing you to search for a specific network.
- **Find Networks** button searches for available networks.

Note: *Only Wi-Fi channels 1-11 are supported.*

Setting Up the MAX-630

Upload Setup

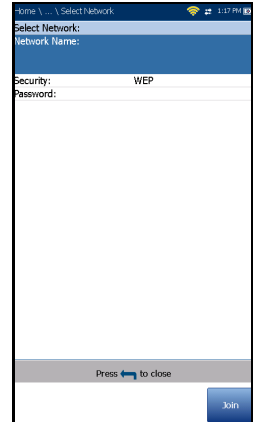
To connect your MaxTester to a Wi-Fi network:

- 1.** Press the down arrow key to highlight the list box and press ✓ to get into the list.
- 2.** In the list, press the up/down arrows to select the desired network.
- 3.** Press ✓ to confirm a network and open the alphanumeric editor screen to enter your **Password**.
- 4.** Press ↵ to come out of the list.
- 5.** Press the down and left/right arrow keys to highlight the network buttons and press ✓.

Select Network

The **Select Network** page allows you to search for a specific Wi-Fi network.

- **Network Name** opens the alphanumeric editor screen allowing you to enter the name of the desired Wi-Fi network.
- **Security** lists the following wireless security protocols:
 - **WEP** (Wired Equivalent Privacy)
 - **WPA** (Wi-Fi Protected Access)
 - **WPA2** (Wi-Fi Protected Access version 2)



Note: *When using WPA encryption, some specific routers may have performance issues with the supplied Wi-Fi dongle. In this case, please use WPA2 encryption.*

- **Password** opens the alphanumeric editor screen allowing you to enter the desired Wi-Fi network's password. Join function key replaces Done on the editor screen.
- **Join** function key allows your MaxTester to connect to the other network and it becomes the selected/preferred upload network.

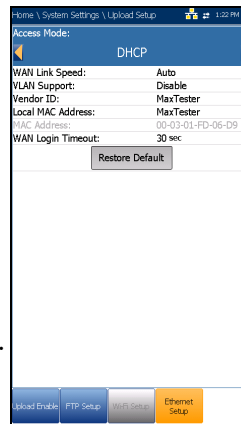
To configure the other network parameters:

1. Press the up/down arrow keys to highlight the desired parameter.
2. Press the left/right arrow keys to view and select the options.
OR
3. Press ✓ on a value to open a list box of options or the alphanumeric editor screen and use the navigation keys to scroll through.
4. Press ✓ to confirm the value.
5. Press the **Join** function key to connect to the other Wi-Fi network.

Ethernet Setup

The **Ethernet Setup** function allows you to configure the line and access modes, etc for an Ethernet connection, using the following parameters:

- **Access Mode** options are **DHCP**, **Static**, or **PPPoE**.
- **WAN Link Speed** is a choice between **Auto** (negotiated during the link establishment), **100** or **10 Mbit/s**.
- **WAN Connect Mode** is **Full-** or **Half-Duplex**, when **Link Speed** is set to either **100** or **10 Mbit/s**.
- **VLAN Support** enables the unit to tag/untag ethernet frames.
- **VLAN ID** is a virtual local area network (VLAN) tag ranging from 0 through 4094. The entry is available only when **VLAN Support** is **Enable**.
- **Vendor ID** is the name of the unit. This entry is available only when **Access Mode** is **DHCP**.
- **Local Mac Address** is the *internal* MAC address of the unit: either **MaxTester** or **User Defined**.
- **Mac Address** is a specific MAC address, in a hexadecimal format, if **User Defined** was selected for the previous parameter. This entry is available only when **Access Mode** is **DHCP** or **Static**.
- **WAN Login Timeout** is a numeric setup entry.



The following parameters are available only when **Access Mode** is **PPPoE**.

- **Login Name/Password** is your user ID and password.
- **Obtain IP** is either **Dynamic** where the access concentrator or broadband remote access server assigns a temporary IP address to the unit, or **Static** where you enter the IP address of the unit.

The following parameters are available only when **Access Mode** is **Static**.

- **IP Address** is the address for the unit that is actively connected to your network or the internet at the time of login.
- **Gateway** is the IP address of the default gateway.
- **Subnet Mask** is the network address used to identify if the IP address is within the same wide area network.
- **DNS1** is the address of the primary domain name server to be used by the unit. If DNS is unavailable, enter 0.0.0.0.
- **DNS2** is the address of the secondary domain name server to be used by the unit. If DNS is unavailable, enter 0.0.0.0.
- **Restore Default** button allows you to reset the entries to their defaults.

To configure the setup options:

1. Press the up/down arrows to select the desired parameter.
2. Press the left/right arrow keys to view and select the options.

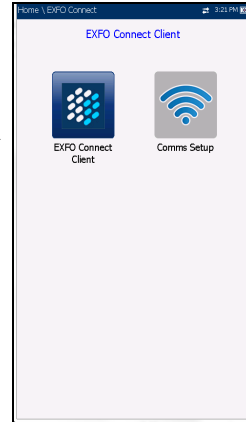
OR

3. Press ✓ on a value to open a list box of options or the alphanumeric editor screen and use the navigation keys to scroll through.
4. Press ✓ to confirm the value.

EXFO Connect

The **EXFO Connect** menu presents the following 2 sub-menus:

- **EXFO Connect Client (ECC)** opens to the main menu page which allows you to navigate between the ECC interfaces. Please refer to the *ECC User Guide* for more information.
- **Comms Setup** allows you to configure the **EXFO Connect** communications upload setup.



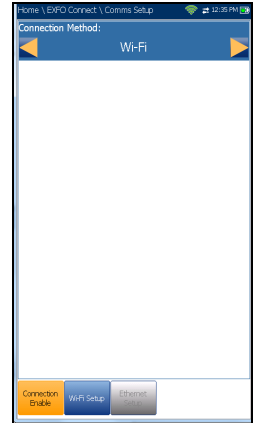
Comms Setup

Connection Enable

The **Connection Enable** tab allows you to choose the **Connection Method** for upload.

- **Wi-Fi**
- **Ethernet**
- **Disable Connection** option disables uploads via Wi-Fi or the Ethernet.

When **Wi-Fi** or **Ethernet** are selected, their respective icons are displayed in the top right-hand corner of the navigation bar. The status of whether or not a connection is present is indicated by the colour of the icon: green, yellow, or red.

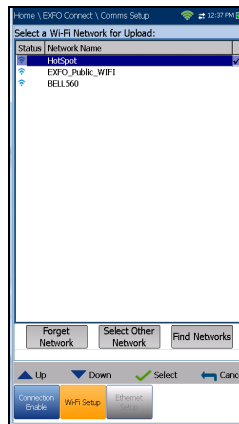


Setting Up the MAX-630

Comms Setup

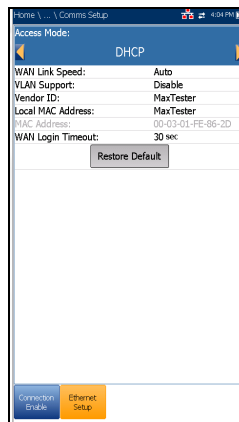
Wi-Fi Setup

The **Wi-Fi Setup** function for **Comms Setup** is the same as in the **System Settings/Upload Setup**. Please see *Wi-Fi Setup* on page 31.



Ethernet Setup

The **Ethernet Setup** function for **Comms Setup** is the same as in the **System Settings/Upload Setup**. Please see *Ethernet Setup* on page 34.

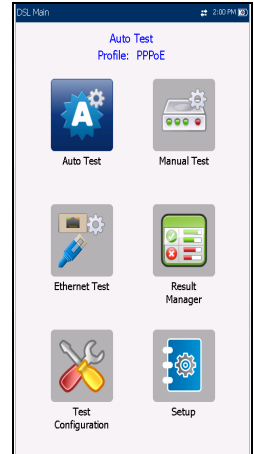


5 **Setting Up DSL/IP Tests**

DSL Main Menu Page

DSL Main presents the main menu page which allows you to navigate to each icon using the up/down left/right arrow keys on the keypad. Press **✓** to bring up the sub-menu of the selected icon:

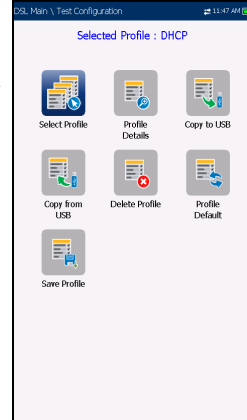
- For Auto, Manual, or Ethernet, the test will start and the screen control will navigate to the **Result Summary** page.
- **Result Manager** opens a list of file names previously saved tests, to view, export, or delete results.
- **Test Configuration** provides the utilities to configure test parameters.
- **Setup** opens a sub-menu displaying the following:
 - **Modem Settings** allows you to set the display and power parameters of the modem.
 - **Application Settings** allows you to preset the unit with specific DSL measurement values.
 - **VoIP Phone Book** allows you to manage phone numbers relevant to performing VoIP tests.



Test Configuration

The MaxTester supports 3 types of test applications: **Auto Test**, **Manual Test**, and **Ethernet Test**. Configuration parameters for all 3 test applications are saved into a test configuration profile. A default profile is provided with a predefined set of parameters for all test applications.

- **Select Profile** lists saved available profiles. The current active profile is shown in the upper information header. At power up, settings are read from the last loaded profile.
- **Profile Details** lists the 3 types of tests for configuration:
 - **Auto Test Setup**
 - **Manual Test Setup**
 - **Ethernet Test Setup**
- **Copy to USB** allows you to copy all profiles found in the internal memory to an external USB device. If the profile name already exists in the destination folder, Copy (x) will be appended to the profile name, where x corresponds to the number of copies starting from 1.
- **Copy from USB** allows you to copy all profiles found on an external USB device to the unit.
- **Delete Profile** allows you to delete a profile (except the default profile) on the unit.
- **Profile Default** resets the current test setup to the factory default profile. If selected, a dialogue box pops up to confirm that all single and auto test settings will revert to factory test settings.
- **Save Profile** opens the alphanumeric editor screen allowing you to create a new profile name and copy all parameters from the currently loaded profile.

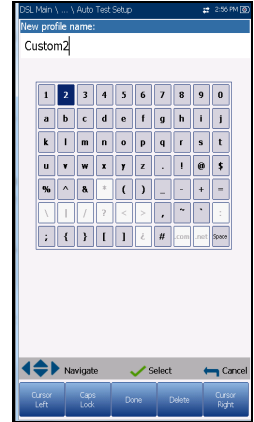


Setup Profile Name

This alphanumeric editor screen allows you to change parameter values and save changes to a new name.

To use the editor screen:

1. Press the up/down left/right arrows to navigate the on-screen keyboard.
2. Press ✓ to confirm each selection.
3. Use the on-screen function buttons to create or edit the name.

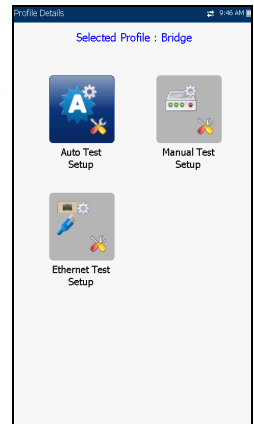


Profile Details Menu

You can view any of your saved profiles on the MaxTester from the **Profile Details** menu by selecting the desired test setup icon. This sub-menu displays an icon for each test: Auto Test, Manual, and Ethernet.

To select a test:

1. Press the up/down left/right navigation keys to select the desired icon.
2. Press ✓ to display the test profile details.

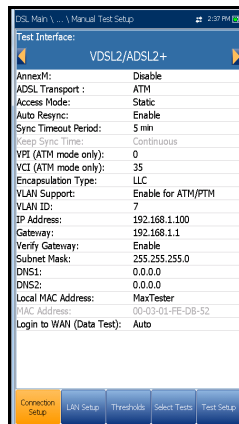


Connection Setup

The **Connection Setup** tab allows you to configure the line and access modes, etc of your test dependent on your unit's **Software Options** and model **Information**.

The **A2XAA** or **V2XAA** unit does Annex A and Bonding. Annex A is on pair 1 and bonding uses pair 1 and pair 2.

- The **Test Interface** setup options for **A2XAA** or **V2XAA** modules are the following:
 - **ADSL2+** - if VDSL2 option disabled.
 - **VDSL2/ADSL2+** - if VDSL2 option enabled
 - **ADSLMulti** supports G.DMT, T1.413, and G.Lite.
 - **ADSL2+ Bonding** - if VDSL2 option disabled, Bonding option enabled.
 - **VDSL2/ADSL2+ Bonding** - if VDSL2 and Bonding options enabled.
 - **VDSL2-30a** - if VDSL2 option enabled.



The **VA2XAB** unit does Annex A and Annex B. Annex A is on pair 2 and Annex B is on pair 1.

- The **Test Interface** setup options for the **VA2XAB** module are the following:
 - **ADSL2+ (xB/P1)** - if VDSL2 option disabled, Annex B mode.
 - **ADSL2+ (xA/P2)** - if VDSL2 option disabled, Annex A mode.
 - **VDSL2/ADSL2+ (xB/P1)** - if VDSL2 option enabled, Annex B mode.
 - **VDSL2/ADSL2+ (xA/P2)** - if VDSL2 option enabled, Annex A mode.
 - **ADSLMulti (xB/P1)** - supports G.DMT only.

- **ADSL2Multi (xA/P2)** - support G.dmt and T1.413 only.
- **VDSL Bonding** - if VDSL2 and Bonding options are enabled.
- **VDSL2-30a (P1)** - if VDSL2 option is enabled.
- **Annex M** allows you to **Enable/Disable** this option when **Test Interface** is ADSL2+ (xA/P2) or VDSL2/ADSL2+ (xA/P2).
- **Annex J** allows you to **Enable/Disable** this option when **Test Interface** is ADSL2+ (xB/P1) or VDSL2/ADSL2+ (xB/P1).
- **ADSL Transport** displays the transport type options: **PTM** (packet transfer mode), **ATM** (asynchronous transfer mode), or **ATM and PTM**.
- **Access Mode** options are dependent on the **Test Interface** selection.
 - For Auto and Manual tests, available options are: Sync Only, Bridged (not in Auto Test), DHCP, Static, PPPoE, PPPoA, IPoA, and IPv6 (DHCP).
 - For Ethernet tests, available options are Bridged, DHCP, Static, PPPoE, and IPv6 (DHCP).

Note: *IPv6 requires an option key to be enabled.*

- **Auto Resync** allows you to **Enable** the SyncLossCounter as the Pass/Fail criteria. When SyncLossCounter+1 is reached, the test will have fail status.

If **Auto Resync** is disabled, any time the test loses sync, the result status will be fail and the test will stop automatically.

- **Sync Timeout Period** enables you to enter the duration, between 2 and 30 minutes, to run a DSL test from activation to reaching **Show Time**.

Setting Up DSL/IP Tests

Test Configuration

- **Keep Sync Time** is either:
 - **Continuous** where the test runs until you manually stop it, or
 - **User Defined** where you can set a **Keep Sync Time Period**. Default is 5 minutes.
- **VPI (ATM mode only)** is the virtual path identifier (VPI) ranging from 0 through 255 for the downstream channel.
- **VCI (ATM mode only)** is the virtual circuit identifier (VCI) ranging from 32 through 65535 for the downstream channel.
- **Encapsulation Type** depends on the network configuration and sets the ATM to either **LLC** also known as LLC-SNAP (logical link control-sub network address protocol) or **VC_MUX** (virtual channel multiplex).
- **VLAN Support** enables the unit to tag/untag ethernet frames.
- **VLAN ID** is a virtual local area network (VLAN) tag ranging from 0 through 4094. The entry is available only when **VLAN Support** is **Enable**.
- **Vendor ID** is the name of the unit. This entry is available only when **Access Mode** is **DHCP**.
- **Local Mac Address** is the *internal* MAC address of the unit: either **MaxTester** or **User Defined**.
- **Mac Address** is a specific MAC address, in a hexadecimal format, if **User Defined** was selected for the previous parameter. This entry is available only when **Access Mode** is **DHCP** or **Static**.
- **WAN Login Timeout** is a numeric setup entry.
- **G.INP** allows you to **Enable/Disable** the standards based Physical Layer Retransmission scheme for impulse noise protection. This entry applies only to Auto and Manual tests.

- **Login to WAN (Data Test)** (in **Manual Test Setup** only) can be set to one of the following, when running a **Manual Test**:
 - **Auto** will start the WAN login automatically right after **Show Time**.
 - **Manual** enables a **Login** button on the **WAN Status** page, once **Show Time** is reached. You must press the button to start the WAN login.

This parameter can *not* be selected for the following **Access Modes**: **Sync Only**, **Bridged**, and **IPv6 (DHCP)**, and will be set to **Auto**.

The following parameters are available only when **Access Mode** is **PPPoE** or **PPPoA**.

- **Login Name/Password** is your user ID and password.
- **Obtain IP** is either **Dynamic** where the access concentrator or broadband remote access server assigns a temporary IP address to the unit, or **Static** where you enter the IP address of the unit.
- **Static IP** is the address of the current location assigned by the service provider. This entry is available only if **Obtain IP** is set to **Static**.

The following parameters are available only when **Access Mode** is **IPoA** or **Static**.

- **IP Address** is the address for the unit that is actively connected to your network or the internet at the time of login.
- **Gateway** is the IP address of the default gateway.
- **Verify Gateway** can be set to **Enable** or **Disable**.
- **Subnet Mask** is the network address used to identify if the IP address is within the same wide area network.
- **DNS1** is the address of the primary domain name server to be used by the unit. If DNS is unavailable, enter 0.0.0.0.
- **DNS2** is the address of the secondary domain name server to be used by the unit. If DNS is unavailable, enter 0.0.0.0.

Setting Up DSL/IP Tests

Test Configuration

The following parameters are available only when **Test Interface** is **Ethernet**.

- **WAN/LAN Link Speed** is a choice between **Auto** (negotiated during the link establishment), **100** or **10 Mbit/s**.
- **WAN/LAN Connect Mode** is **Full-** or **Half-Duplex**, when **Link Speed** is set to either **100** or **10 Mbit/s**.

To configure the setup options:

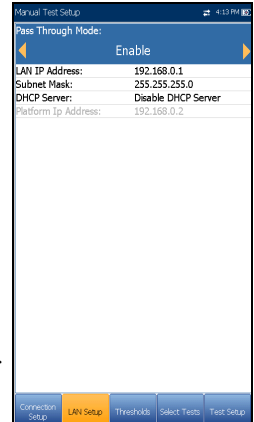
1. Press the up/down arrows to select the desired parameter.
2. Press the left/right arrow keys to view and select the options.
OR
3. Press ✓ on a value to open a list box of options or the alphanumeric editor screen and use the navigation keys to scroll through.
4. Press ✓ to confirm the value.
5. If you make any changes to the parameter values, press the on-screen function keys to save or cancel your input.

LAN Setup

The **LAN Setup** tab is available only in **Manual Test Setup** and when the **Access Mode** set in **Connection Setup** is *not* **Sync Only**. **LAN Setup** allows you to configure the parameters required when working in **Pass Through Mode**, and the LAN (local area network) is connected to the external device which supports 10/100 Ethernet.

This tab is not available in **Auto Test Setup**.

- **Pass Through Mode - Enable or Disable.**
- **LAN IP Address** is the local network IP address of the unit.



Note: *If the DSL WAN has an IP address on a specific subnet (for example 192.168.x.y) and the Ethernet LAN port is enabled, configure the default LAN IP address to a different subnet (for example 10.0.x.y) to avoid IP communication problems.*

- **Subnet Mask** is the network address mask used to identify if the IP address is within the same local area network.
- **DHCP Server** enables the dynamic host configuration protocol (DHCP) mode for the LAN side of the connection.
- **Platform Ip Address** displays the IP address of the unit's platform when the **DHCP Server** is disabled.

To configure LAN setup values:

1. Press the up/down arrows to select the desired parameter.
2. Press the left/right arrow keys to view and select the options.
OR
3. Press ✓ on a value to open a list box of options or the alphanumeric editor screen and use the navigation keys to scroll through.

Setting Up DSL/IP Tests

Test Configuration

4. Press ✓ to confirm the value.
5. If you make any changes to the parameter values, press the on-screen function keys to save or cancel your input.

IPv6 LAN Setup

The IPv6 LAN Setup tab is available only in **Manual Test Setup** and when the **Access Mode** set in **Connection Setup** is set to **IPv6 (DHCP)**. This page allows you to Enable/Disable Pass Through Mode when the LAN (local area network) is connected to the external device which supports 10/100 Ethernet. Pass Through Mode is renamed **LAN Port**.

To set the parameter:

1. Press the left/right arrow keys to toggle between **Enable/Disable**.

OR

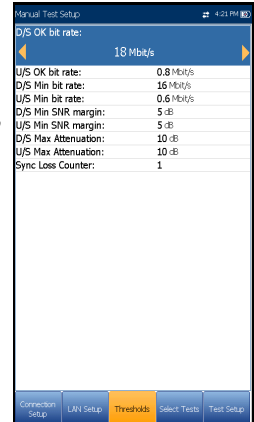
2. Press ✓ on any value to open the list box to toggle between **Enable/Disable** by pressing the up/down arrow keys.
3. Press ✓ to confirm your selection.



Thresholds

The **Thresholds** tab allows you to define DSL parameter criteria. For **D/S** (downstream) and **U/S** (upstream) data rates, there are **OK** and **Min** (minimum) bit rates defined to indicate unacceptable, marginal, and acceptable rates.

- **D/S and U/S OK bit rate:**
 - for ADSL - value limited to D/S 30 Mbit/s, U/S 2 Mbit/s.
 - for VDSL - D/S to 100 Mbit/s, U/S to 50 Mbit/s.
- **D/S and U/S Min SNR margin** - values range from 0 to 63.5 dB. Default is 5 dB.
- **D/S and U/S Max Attenuation** - values range from 0 to 96 dB. Default is 10 dB.
- **Sync Loss Counter** is the number of times the unit lost synchronization.



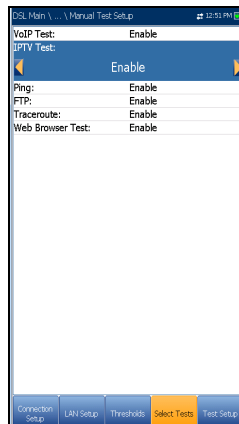
To set threshold values:

1. Press the up/down arrows to select the desired parameter.
2. Press the left/right arrow keys to view and select the options.
OR
3. Press ✓ on a value to open the alphanumeric editor screen and use the navigation keys to scroll through.
4. Press ✓ to confirm the value.
5. If you make any changes to the parameter values, press the on-screen function keys to save or cancel your input.

Select Tests

The **Select Tests** page allows you to **Enable/Disable** the following optional sub-tests, within the 3 types of test applications.

- **VoIP Test** determines DSL and IP packet rates, and calculates jitter, packet loss, and packet delay. When enabled, all other sub-tests are automatically disabled, in **Auto Test** and **Ethernet Test Setup**. In **Manual Test Setup**, you can enable all sub-tests independent of each other.
- **IPTV Test** supports STB (set-top box) emulation mode over DSL and Ethernet interfaces enabling the MaxTester to join and leave multicast IPTV streams. When enabled, all other sub-tests are automatically disabled, in **Auto Test** and **Ethernet Test Setup**. In **Manual Test Setup**, you can enable all sub-tests independent of each other.
- **Ping** is also known as ICMP echo request and determines network connectivity and accessibility. When **Access Mode** is set to **IPv6 (DHCP)**, this is the only test available.
- **FTP** test verifies the file transfer speed of the file download and upload.
- **Traceroute** is a complement tool of the Ping test to determine why a destination cannot be reached, or where the internet is broken.
- **Web Browser Test** can only be started when a WAN connection (either through xDSL or Ethernet) has been established.



When enabled, the sub-tests' test pages are available in the results pages.

When highlighted, the sub-tests' setup contents are shown on the **Test Setup** tab.

Note: *Select Tests and Test Setup tabs are not available in Sync Only and Bridged Access Modes.*

To select sub-tests:

1. Press the up/down arrows to highlight the desired test. Except in **Manual Test**, **VoIP/IPTV Test** must be disabled to view all other sub-tests.
2. Press the left/right arrow keys to toggle between **Enable/Disable**.
OR
3. Press **✓** on any value to open the list box to toggle between **Enable/Disable**.

IPv6 Select Tests

When **IPv6 (DHCP)** is set as the **Access Mode**, the **Select Tests** tab allows you to **Enable/Disable** only the **Ping** parameter.

To set the parameter:

1. Press the left/right arrow keys to toggle between **Enable/Disable**.
OR
2. Press **✓** on any value to open the list box to toggle between **Enable/Disable** by pressing the up/down arrow keys.
3. Press **✓** to confirm your selection.



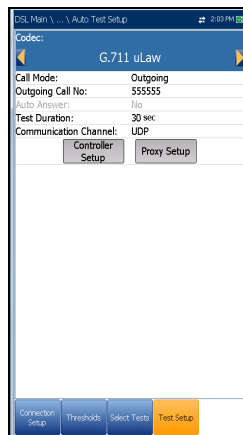
Test Setup

The **Test Setup** tab allows you to configure profile values for the optional sub-tests within the 3 types of test applications. You must highlight the sub-test on the **Select Tests** page in order to display the sub-test's parameters on the **Test Setup** page.

VoIP Test Setup

The **VoIP** test function allows you to configure the unit for VoIP testing. During the analysis, the unit determines the DSL and IP packet rate, and calculates jitter, packet loss, and latency.

- **Codec** is the VoIP coder/decoder value to be used by the unit.
- **Call Mode** (enabled for **Auto Test** only) is either **Incoming** or **Outgoing**. The VoIP test is not only used to initiate a VoIP call, but responds to incoming VoIP calls.

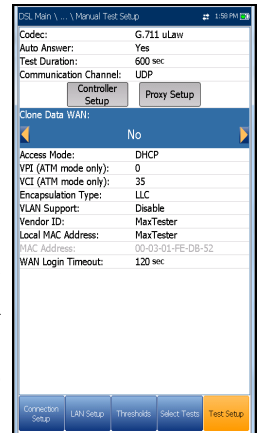


Note: When **Incoming** mode is selected, **Auto Answer** is set to **Yes**, and is read only. When **Outgoing** mode is selected, **Auto Answer** is set to **No**, and is read only; that is, incoming calls are rejected.

- **Auto Answer** (disabled for **Auto Test**) is either **Yes** or **No**. When an incoming call is detected, a popup message will indicate that this state is detected with the message **Incoming call**.
 - If **Auto Answer** is **No**, then the popup presents you with the choices: **Answer** or **Decline**.
 - If **Auto Answer** is **Yes**, then the popup message presented is **Incoming call**, and persists for 5 seconds.
- **Test Duration** allows you to set the duration of the VoIP test, in seconds.

- **Communication Channel** is the parameter based on either **UDP** or **TCP**.
- **Controller Setup** button opens a new page that allows you to set the required VoIP parameters for the unit.
- **Proxy Setup** button opens a new page that allows you to set parameters for the Proxy.
- **Clone Data WAN** (only available in **Manual Test Setup**) allows you to add the WAN configuration from the **Connection Setup** tab to this test, by selecting **Yes**. If you select **No**, all the parameters from the **Connection Setup** page, beginning with **Access Mode**, are listed and can be modified.

One additional **Access Mode**, **Bridged (DHCP)** can be configured here in the VoIP WAN setup, to support the modem in bridge mode and WinCE in DHCP. This allows WinCE to get the WAN IP address via DSL connection through the modem's bridge. **Bridged (DHCP)** uses same parameters as **DHCP** mode.



To configure test setup values:

1. Press the up/down arrow keys to select the desired parameter.
2. Press the left/right arrow keys to view and select the options.
OR
3. Press ✓ on a value to open a list box of options or the alphanumeric editor screen and use the navigation keys to scroll through.
4. Press ✓ to confirm the value.
5. If you make any changes to the parameter values, you will be prompted to save changes done in Profile. Press the on-screen function keys to save or cancel your input.

Controller Setup

The Controller is the local VoIP connection for your MaxTester. The **Controller Setup Info** page allows you to set the following VoIP parameters for your unit:

- **User Name** allows you to enter alphanumeric characters in this field using the editor screen to create a name.
- **Signalling Port** (read only) displays a fixed numeric value of the signalling port used to establish an IP network session.
- **Address Format** (read only) displays **DNS Name**.
- **Domain** (read only) displays the domain name `www.exfo.com`.



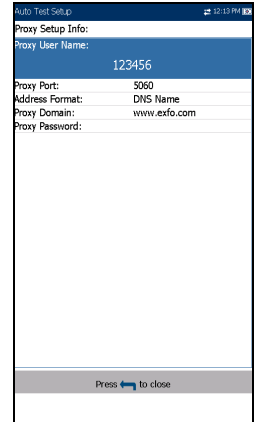
To enter a user name:

1. Press ✓ to open the alphanumeric editor screen and use the navigation keys to scroll through.
2. Press ✓ to confirm the value.

Proxy Setup

Proxy is the registered /proxy sip server. The **Proxy Setup Info** page allows you to set the following required server's VoIP parameters:

- **Proxy User Name** allows you to enter alphanumeric characters in this field using the editor screen to create a name.
- **Proxy Port** is a numeric value of the proxy port used to establish an IP network session.
- **Address Format** is either **IP Address** or **DNS Name**.
- **Proxy Domain** allows you to enter either the address of the IP or name of the domain server.
- **Proxy Password** allows you to set a password for the proxy domain.



The screenshot shows a mobile interface titled "Auto Test Setup" with a "Proxy Setup Info" section. The fields are as follows:

Proxy User Name:	123456
Proxy Port:	5060
Address Format:	DNS Name
Proxy Domain:	www.exfo.com
Proxy Password:	

At the bottom, there is a button labeled "Press [back] to close".

To setup the proxy info:

1. Press the up/down arrow keys to select the desired parameter.
 2. Press the left/right arrow keys to view and select the options.
- OR
3. Press ✓ on a value to open a list box of options or the alphanumeric editor screen and use the navigation keys to scroll through.
 4. Press ✓ to confirm the value.

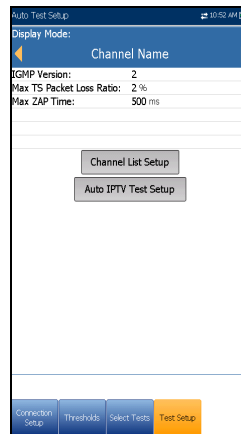
IPTV Test Setup

IPTV test supports STB (set-top box) emulation mode over xDSL and Ethernet interfaces enabling the MaxTester to join and leave multicast IPTV streams. The following parameters can be configured from the **Test Setup** tab:

- **Display Mode** is either the **Channel Name** or **#** used for displaying channel information in the result pages.
- **IGMP Version** is a value of either **2** or **3** used to send IGMP join/leave messages.

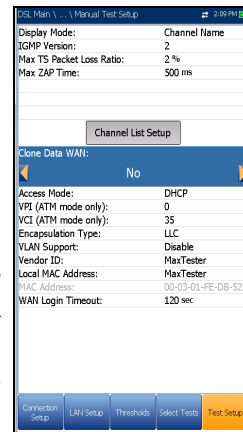
Note: *If you change the **IGMP Version** from the default of **2** to **3**, you must reboot your unit.*

- **Max TS Packet Loss Ratio** is an editable percentage, ranging from 1 to 50, used to qualify if the IPTV stream is stable.
- **Max ZAP Time** is an editable value ranging from 0 to 10,000 that measures the channel switch time in ms.
- **Channel List Setup** button accesses the page to configure parameters for channel analysis.
- **Auto IPTV Test Setup** button (only available In Auto Test Setup) accesses the setup page to automatically run an IPTV test.



- **Clone Data WAN** (only available in **Manual Test Setup**) allows you to add the WAN configuration from the **Connection Setup** tab to this test, by selecting **Yes**. If you select **No**, all the parameters from the **Connection Setup** page, beginning with **Access Mode**, are listed and can be modified.

One additional **Access Mode**, **Bridged (DHCP)** can be configured here in the IPTV WAN setup, to support the modem in bridge mode and WinCE in DHCP. This allows WinCE to get the WAN IP address via DSL connection through the modem's bridge. **Bridged (DHCP)** uses same parameters as **DHCP** mode.



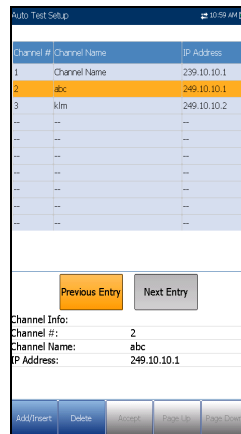
To configure test setup values:

1. Press the up/down arrow keys to select the desired parameter.
2. Press the left/right arrow keys to view and select the options.
OR
3. Press ✓ on a value to open a list box of options or the alphanumeric editor screen and use the navigation keys to scroll through.
4. Press ✓ to confirm the value.
5. If you make any changes to the parameter values, you will be prompted to save changes done in Profile. Press the on-screen function keys to save or cancel your input.

Channel List Setup

The **Channel List Setup** page in the IPTV test setup provides a tool for you to create an alias table. It allows you to join/leave an IPTV stream using a symbolic name or TV channel number instead of the IP address. Maximum entries in the table are 100, divided into pages.

- **Channel Info** lists 3 editable parameters:
 - **Channel #** is a numeric value from 1 to 9999.
 - **Channel Name** is a 24-character alphanumeric entry.
 - **IP Address** is a multicast address from 224.1.1.1 to 239.255.255.254.
- **Previous/Next Entry** buttons highlight the previous/next entry in the table (up/down direction). When the highlight reaches the first/last entry of the alias table page, the button(s) is disabled.
- On-screen function buttons:
 - **Add/Insert** adds currently edited channel info into the alias table below the highlighted entry and moves the highlight to the newly added entry. If the page is full, the bottom entry moves to the next page. Selecting the highlight placement allows you add and group entries with similar parameters.
 - **Delete** removes the highlighted entry in the alias table. If the deleted entry was also present in the **IPTV Channel Analysis** list or **Join/leave Test** list in **Auto IPTV Test Setup** page, it will also be removed from those lists.
 - **Accept** replaces the edited value for the current highlighted entry. Use this function for modification purposes.
 - **Page Up/Down** display the previous/next page(s) of the alias table. If current page is the first/last page, the button(s) are disabled.



To setup the channel list:

- 1.** Press the up/down, right/left keys to select the desired channel parameter.
- 2.** Use the on-screen function buttons to create or edit the channel list.
OR
- 3.** Use the navigation keys to select the **Previous/Next Entry** button(s) and press ✓ to select the entry to be highlighted and edited.

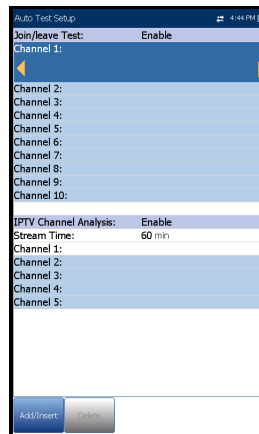
Auto IPTV Test Setup

The **Auto IPTV Test Setup** page in the IPTV test setup allows you to define 2 types of IPTV tests to run automatically:

- **Join/leave Test - Enable** to define a list of channels to sequentially join and leave. If disabled, no test is performed.

Channel 1-10 allows you to define a list of up to 10 channels.

- **IPTV Channel Analysis - Enable** to add channels for analysis. If disabled, channel analysis in auto test is not performed.
 - **Stream Time** defines the length of time, from 1 to 60 s, to keep the channel stream(s) for analysis.
 - **Channel 1-5** allows you to define up to 5 IPTV channels for concurrent analysis.
- On-screen function buttons:
 - **Add/Insert** is available only when a blank entry is highlighted. When the button is pressed, the first available channel from the alias **Channel List** is automatically added to this list of channels. Upon highlighting another blank entry, the next channel from the alias table is added, and so on.
 - **Delete** removes the selected channel from the list.



You can **Enable** either one or both, but you cannot **Disable** both of them at same time. If both tests are enabled, **Join/leave Test** runs first.

To configure test setup values:

- 1.** Press the up/down arrow keys to select the desired parameter.
- 2.** Press the left/right arrow keys to view and select the options.

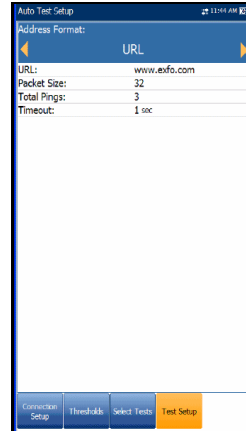
OR

- 3.** Press ✓ on a value to open a list box of options or the alphanumeric editor screen and use the navigation keys to scroll through.
- 4.** Press ✓ to confirm the value.

Ping Test Setup

The **Test Setup** tab is available only if **Access Mode** is *not Sync Only*.

- **Address Format** is **URL**, **IP Address**, or **Gateway**. When **IPv6 (DHCP)** is set as the **Access Mode** in **Connection Setup**, **IP Address** is changed to **IPv6 Address**.
- **URL/IP Address** lists either the URL or IP Address where the unit pings.
- **IPv6 Address** parameter replaces the **URL/IP Address** when **IPv6 (DHCP)** is set as the **Access Mode**.
- **Packet Size** is a value from 32 through 1200 of the number of bytes sent in one packet. The default value is 32.
- **Total Pings** is the total number of Ping packets to send out from 1 through 99. The default value is 3.
- **Timeout** is the time in seconds from 1 through 10, that the unit will wait for a response back from the destination device.




To configure test setup values:

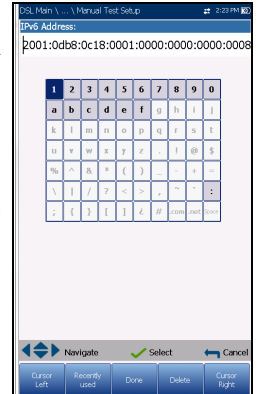
1. Press the up/down arrow keys to select the desired parameter.
2. Press the left/right arrow keys to view and select the options.
OR
3. Press ✓ on a value to open a list box of options or the alphanumeric editor screen and use the navigation keys to scroll through.
4. Press ✓ to confirm the value.
5. If you make any changes to the parameter values, press the on-screen function keys to save or cancel your input.

Enter IPv6 Address

The alphanumeric editor screen allows you to add and change parameter values, and save changes to an **IPv6 Address**. You must enter a value for each of the 8 IPv6 octets for example, 2001:db8:0:0:0:0:2:1.

To use the editor screen:

1. Press the up/down left/right arrows to navigate the highlighted keys in the on-screen keyboard.
2. Press  to confirm each selection.
3. Use the on-screen function buttons to create or edit the address.



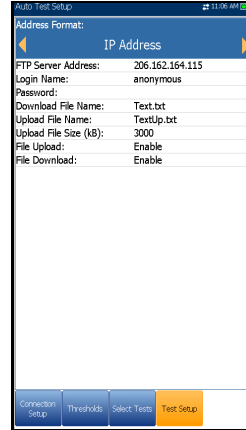
Setting Up DSL/IP Tests

Test Setup

FTP Test Setup

The FTP test verifies the file transfer speed of the file download and upload. The **FTP Test Setup** tab allows you to configure the following parameters:

- **Address Format** is **URL** or **IP Address**.
- **FTP Server Address** lists either the URL or IP Address.
- **Login Name/Password** is your user ID and password.
- **Download File Name** is the filename requested for downloading, maximum 128 characters.
- **Upload File Name** is the filename used for uploading, maximum 128 characters.
- **Upload File Size (kB)** is the number of bytes or size of the file to be uploaded to the server.
- **File Upload/Download - Enable/Disable** options available only in **Auto Test Setup**. **Enable** to perform the upload/download operation automatically.



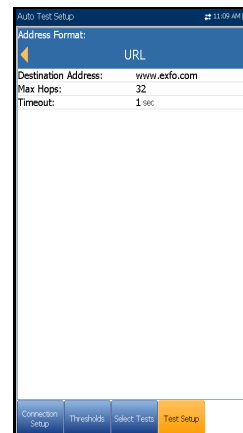
To configure test setup values:

1. Press the up/down arrow keys to select the desired parameter.
2. Press the left/right arrow keys to view and select the options.
OR
3. Press **✓** on a value to open a list box of options or the alphanumeric editor screen and use the navigation keys to scroll through.
4. Press **✓** to confirm the value.
5. If you make any changes to the parameter values, press the on-screen function keys to save or cancel your input.

Traceroute Test Setup

The Traceroute **Test Setup** tab allows you the configure the following parameters:

- **Address Format** is **URL** or **IP Address**.
- **Destination Address** is the destination IP or URL address.
- **Max Hops** specifies the maximum number of hops (1 to 32) used in attempting to reach the destination address.
- **Timeout** is the time in seconds from 1 to 10, that the unit will wait for a response back from the destination device.



To configure test setup values:

1. Press the up/down arrow keys to select the desired parameter.
2. Press the left/right arrow keys to view and select the options.
OR
3. Press ✓ on a value to open a list box of options or the alphanumeric editor screen and use the navigation keys to scroll through.
4. Press ✓ to confirm the value.
5. If you make any changes to the parameter values, press the on-screen function keys to save or cancel your input.

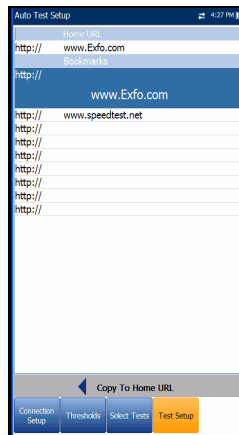
Web Browser Test Setup

The **Test Setup** page for the web browser content is displayed when the **Web Browser Test** is highlighted on the previous **Select Tests** tab. Here you can edit the **Bookmarks** and **Home URL**.

- **Bookmarks** lists 9 entries. The default is **http://**.

The **Bookmarks** list is shared by all 3 tests (Auto Test, Manual, and Ethernet tests). If the list is changed in one test, the changes are reflected in the other two.

- **Home URL** acts as the Home URL for the web browser test page when started. It is independent among the 3 types of test applications.
- **Copy to Home URL** allows you to set a highlighted URL as the **Home URL**.



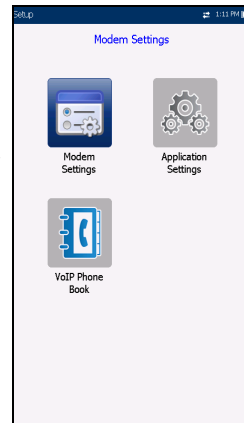
To configure the web browser setup:

1. Press the up/down arrows to highlight the desired entry in the list.
2. Press ✓ to access the edit screen.
3. If you make any changes to the test values, press the on-screen function keys to save or cancel your input.

Setup

The **Setup** function displays the following sub-menu:

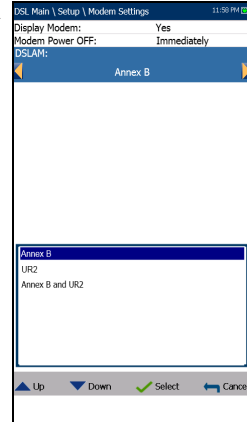
- **Modem Settings** allows you to set the display and power parameters of the modem.
- **Application Settings** allows you to preset the unit with specific DSL measurement values.
- **VoIP Phone Book** includes pages to setup and save phone numbers for the VoIP test.






Modem Settings

Modem Settings provide the means to configure the unit power scheme.

- **Display Modem** allows you to display the modem state in the title bar of the unit. Default value is **Yes**.
- **Modem Power OFF:**
 - **Immediately** for when a DSL/IP test is completed or stopped. In this mode, the modem is powered on when DSL/IP test starts.
 - **Idle** values power off the modem within a defined period after an DSL/IP test is completed or stopped.
- If your modem is V2XAB, then **DSLAM** entry is visible and allows you to choose the following:
 - **Annex B**
 - **UR2**
 - **Annex B and UR2**



To access the modem settings:

1. From , select **DSL/IP Tests, Setup**, and then **Modem Settings**.
2. Use the up/down arrow keys to select the setting to change.
3. Press  to view the list of available choices or use the left/right arrow keys.
4. Press  to confirm.

Application Settings

Before executing the DSL/IP tests, the **Application Settings** function allows you to set general settings and identification fields.

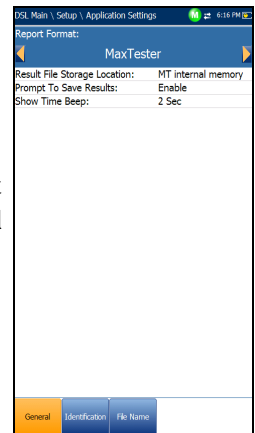
To access *Application Settings*:

From the **Home** pane, select **DSL/IP Tests, Setup**, and then **Application Settings**. The following parameters are available to configure:

General

The **General** tab allows you to configure the unit with specific measurement values.

- **Report Format** is **MaxTester**, **HTML**, **MHTML**, or **XML** as the generated report format.
- **Result File Storage Location** allows you to select where to save your results: to a **USB** or the internal memory of the MaxTester
- **Prompt To Save Results** allows you to **Enable/Disable** popup confirmation messages before leaving a test and not saving results.
- **Show Time Beep** allows you to select the time span for a beep from 0 to 3 seconds.



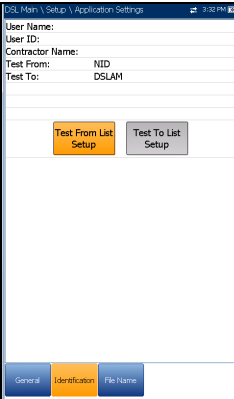
To access the parameter values:

1. Press the up/down arrow keys to highlight the desired parameter.
 2. Press the left/right arrow keys to view and select the options.
- OR
3. Press ✓ on a value to open a list box of options.
 4. Press ✓ to confirm the value.

Identification

The **Identification** tab allows you to preset values to identify each single and auto test result file when saving them. The parameters are as follows:

- **User Name/User ID** allow you to enter up to 25 alphanumeric characters, in each field.
- **Contractor Name** allows you to enter the name of a contractor used to perform the tests.
- **Test From/To** list the following values: **DSLAM**, **NID**, **CPE**, **CROSSBOX**, **FRAME** - up to 20 entries each, including user defined values.
- **Test From/To List Setup** buttons open separate list management pages.



The screenshot shows a window titled "DSL Main \ Setup \ Application Settings" with a timestamp of 11:02 PM. The window contains the following fields: "User Name:" (empty), "User ID:" (empty), "Contractor Name:" (empty), "Test From:" (NID), and "Test To:" (DSLAM). Below these fields are two buttons: "Test From List Setup" (orange) and "Test To List Setup" (grey). At the bottom of the window, there are three tabs: "General", "Identification" (selected), and "File Name".

To select the parameter values:

1. Press the up/down arrow keys to highlight the desired parameter.
2. Press the left/right arrow keys to view and select the options.
OR
3. Press **✓** on a value to open a list box of options or the alphanumeric editor screen and use the navigation keys to scroll through.
4. Press **✓** to confirm the value.

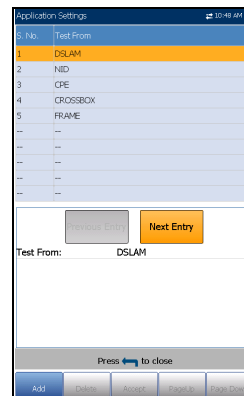
Test List Setup

The **Test From List Setup** and **Test To List Setup** pages allow you to manage the entries of the list. However, there are 5 entries by default which cannot be edited or deleted. These are **DSLAM**, **NID**, **CPE**, **CROSSBOX**, and **FRAME**. When any of these are selected, the **Delete** and **Accept** buttons are disabled.

A maximum of 20 different entries can be added.

To manage the list:

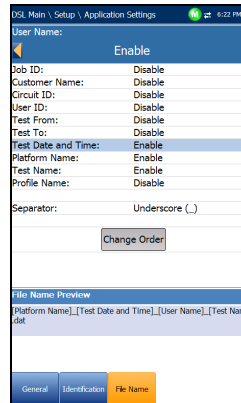
1. Press the left/right arrow keys to select the **Previous/Next Entry** buttons and press **✓** to select the previous/next entry.
2. Press **Page Up/Down** function keys to see entries on the previous or next pages. These keys are disabled if no other pages exist.
3. Press **Add** function key to add an entry just below the selected entry in the list.
4. To edit an entry, press the up/down arrow keys to highlight the selected test. Press **Accept** function key to confirm the changes. If you press **Previous/Next Entry** buttons before the **Accept** function key, the edited value will be lost.
5. Press **Delete** function key to delete any entry you have added.



File Name

The **File Name** tab sets up the standard configuration for automatically naming a result file. You can only **Enable/Disable** the entries. All enabled entries are considered for file name generation.

- **File Name Preview** displays a preview of the file name. The actual values of the enabled entries are not shown.
- **Date and Time** value format depends on the format selected in **System Settings**. This entry cannot be disabled.
- **Separator** allows you to choose a value to separate the enabled entries in the file name, e.g.: **Space ()**, **Dash (-)**, **Underscore (_)**.



To select an entry and choose a value:

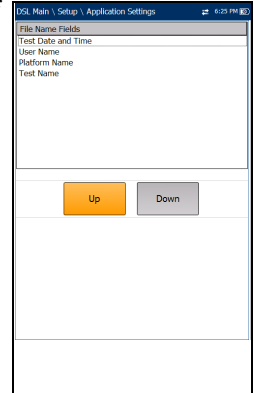
1. Press the up/down arrow keys to highlight the desired entry.
 2. Press the left/right arrow keys to view and select the options.
- OR
3. Press **✓** on a value to open a list box of options.
 4. Press the up/down arrow keys to select the option and press **✓** to confirm your selection.

Change Order

Change Order page allows you to change the order of the entries in the file name.

To change the order:

1. Press **✓** to get into the list.
2. Use the up/down arrow keys to select the desired entry.
3. Press **↶** to come out of the list.
4. Press the up or down arrow key to activate the **Up/Down** buttons.
5. Using the left/right arrow keys, select **Up/Down** and press **✓** to move the entry up/down the list.
6. Press **↶** to go back to the **File Name** tab. The **File Name Preview** will be updated with your changes.

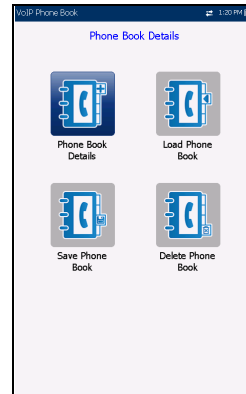


VoIP Phone Book

The **Phone Book** menu presents a selection of functions which allow you to manage phone numbers relevant to performing VoIP tests.

The functions are as follows:

- **Phone Book Details** displays an editable list of phone book entries.
- **Load Phone Book** allows you to import a phone book from either the internal memory of a USB.
- **Save Phone Book** allows you to save or export a phone book.
- **Delete Phone Book** allows you to delete an entry.



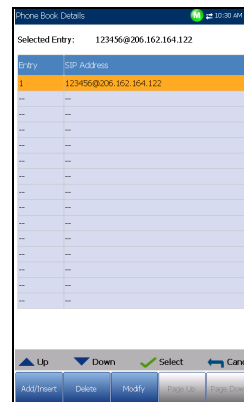
To navigate between the phone book functions:

1. Press the up/down left/right arrow keys on the keypad to select an icon.
2. Press ✓ to confirm your selection.

Phone Book Details

The **Phone Book Details** page allows you to view, add, and edit **VoIP Phone Book** entries.

- **Selected Entry** is the current **SIP Address** entry that you selected.
- **Entry** displays the entry number and cannot be edited.
- **SIP Address** has the form *username@host*, where *username* is the SIP user name (or number) and *host* is the SIP server IP address or domain name. Examples of **SIP Address** are:
 - john@206.162.164.122
 - 3145551212@domain.com
 - john@206.162.164.122:5060



On-screen function buttons:

- **Add/Insert** adds a new entry into the **Phone Book** below the highlighted entry and moves the highlight to the newly added one. If the page is full, the bottom entry moves to the next page.
- **Delete** removes the highlighted entry in the Phone Book.
- **Modify** replaces the edited value of the current highlighted entry.
- **Page Up/Down** display the previous/next page(s) of the Phone Book. If current page is the first/last page, the button(s) are disabled.

To setup the Phone Book details:

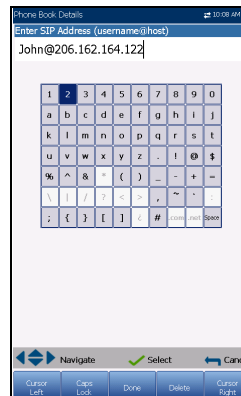
1. Press the up/down arrow keys to select the desired entry.
2. Use the on-screen function buttons to create or edit the details.

Enter SIP Address

The alphanumeric editor screen allows you to add and change parameter values, and save changes to the **Phone Book**.

To use the editor screen:

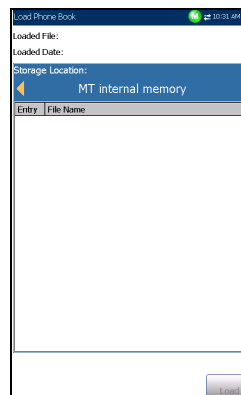
1. Press the up/down left/right arrows to navigate the on-screen keyboard.
2. Press ✓ to confirm each selection.
3. Use the on-screen function buttons to create or edit the address.



Load Phone Book

The **Load Phone Book** page allows you to import a phone book. The page lists phone book files stored at a particular location and displays the **Loaded File** name and date of the last phone book loaded. Only .csv files are supported.

- The **Storage Location** lists the load destinations:
 - **MT internal memory**
 - **USB**
- **Entry** displays the entry number of the phone book(s).
- **File Name** lists the phone book file name(s) to load.
- **Load** button imports the selected phone book. You will be prompted for confirmation since this action will overwrite the current phone book.



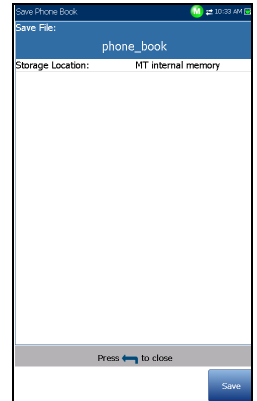
To load a phone book:

1. Select the **Storage Location** using the left/right arrow keys.
OR
2. Press ✓ to display the list of options.
3. Using the up/down arrow keys, select a file name to load.
4. Press **Load** button and confirm. The unit will remove the existing phone book and replace it by the loaded one.

Save Phone Book

The **Save Phone Book** page allows you to save or export a phone book.

- **Save File** allows you to enter a file name of the current phone book to save. By default, the name is phone_book.csv.
- The **Storage Location** lists the save destinations:
 - **MT internal memory**
 - **USB**
- **Save** button saves the selected file.



Note: The unit will overwrite any document with the same file name found on the disk, without warning.

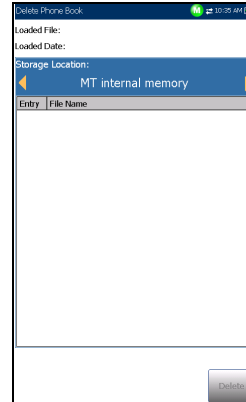
To save a phone book:

1. Accept the default file name or press ✓ to create a new name using the edit screen.
2. Select a **Storage Location**.
3. Press **Save** button.

Delete Phone Book

The **Delete Phone Book** page allows you to delete a phone book. The page lists phone book files stored at a particular location and displays the **Loaded File** name and date of the last phone book loaded.

- The **Storage Location** lists the location where the phone book file is stored:
 - **MT internal memory**
 - **USB**
- **Entry** displays the number of the phone book(s).
- **File Name** lists the phone book file name(s).
- **Delete** button deletes the selected phone book.



To delete a phone book:

1. Select the **Storage Location** using the left/right arrow keys.
OR
2. Press **✓** to display the list of options.
3. Press the up/down arrow keys to select the entry to be removed.
4. Press the **Delete** button to remove the selected entry from the list.

6 Running DSL/IP Tests and Viewing Results

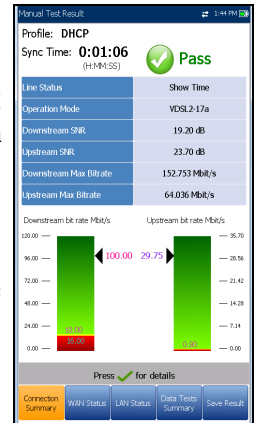
The MaxTester is designed to make DSL/IP turn-up easy. The unit will emulate an customer CPE modem to the point that it can handshake and connect with an DSLAM and report the upstream and downstream parameters. Simply connect to the line, turn on the MAX-630, and select a test to run. Results obtained include upstream and downstream throughput and noise margin.

DSL/IP Connection Summary

The **Connection Summary** tab allows you to view the pass/fail status and details of the test results.

When the **Test Interface** for **Auto Test** or **Manual Test** is set to ADSL2+ or VDSL2 bonding mode, there will be 2 columns of results. While the test is running, 2 soft LEDs will appear above these columns displaying the 2-DSL line condition. The pass/fail status is based on the 2-DSL line connection state and combined data rate. Once the test is completed, these 2 soft LEDs disappear and the pass/fail icon is displayed at the top of the screen.

- **Profile** displays the name of the current profile that results were saved to.
- **Sync Time** is a count-up timer that starts counting only when the **Line Status** reaches **Show Time**. In the case of bonding, both lines must reach **Show Time** before the counter starts.
- **Line Status** displays the status of the line under test during negotiation with the DSLAM. The value changes from **Idle /Activate /Handshake /Training /Show Time** for ADSL2+ or VDSL2 mode.



Note: When loading firmware into the Broadcom chipset, the **Line Status** value displays **Loading M:SS**, where **M:SS** is a count down timer.

Running DSL/IP Tests and Viewing Results

DSL/IP Connection Summary

- **Operation Mode** is the xDSL mode of operation, bonded or non-bonded, as negotiated between the unit and the DSLAM.
- **Downstream/Upstream SNR** is a value ranging from 0 through 63.5 for the existing SNR (signal-to-noise ratio) margin.
- **Downstream/Upstream Max Bitrate** displays the D/S (downstream) and U/S (upstream) maximum attainable bit rates that the circuit can handle as determined by the remote terminal and CO during the training phase. Values can be greater than the actual bit rate.

If the **Operation Mode** is bonded, the 2-DSL line **Max Bitrate** is combined.

- Downstream/Upstream actual bit rates are displayed by graphic bars and the current actual values appear as numbers.
 - Downstream/Upstream bit rate values are shown in yellow region if they are greater than Min threshold and less than OK threshold.
 - Downstream/Upstream bit rate values are shown in red region if they are less than Min threshold.

If the **Operation Mode** is bonded, the actual bit rate is a summary of both DSL lines.

Ethernet Connection Summary

When set up over Ethernet, the available test results are the following:

- **WAN/LAN Port Line Status** displays either **Connected** or **Disconnected** for the particular line connection under test.
- **WAN/LAN Port Link Speed** is **Auto** (negotiated during the link establishment), **100** or **10 Mbit/s**.
- **WAN/LAN Port Connect Mode** is **Full-** or **Half-Duplex**, when **Link Speed** is either **100** or **10 Mbps**.
- The **Total** number of **Received** and **Transmitted Bytes, Packets, and Ethernet Errors** are also displayed during the test.

The screenshot shows the 'Ethernet Test' results for profile 'mmb'. The test status is 'Pass', indicated by a green checkmark. The connection parameters are as follows:

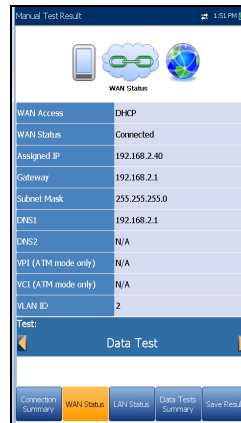
WAN Parameter	Received	Transmitted
WAN Port Line Status	Connected	
WAN Port Link Speed	100 Mbit/s	
WAN Port Connect Mode	Full-Duplex	
Total Bytes	3413	2975
Total Packets	14	13
Total Ethernet Errors	0	0

At the bottom of the interface, there is a button labeled 'Press to reset counters' and a navigation bar with buttons for 'Connection Summary', 'WAN Status', 'VoIP Call Summary', and 'Save Result'.

WAN Status

The **WAN Status** tab allows you to view the status information of the connection between the WAN port of the unit and the ISP (internet service provider). For **Manual Test**, you can also select which triple-play test you want to run or view.

- **WAN Access** specifies the encapsulation method used by the network and consists of the following types:
 - **PPPoE** is point-to-point protocol over Ethernet.
 - **PPPoA** is point-to-point protocol over ATM.
 - **DHCP** is Dynamic Host Control Protocol which is used to dynamically assign an IP address for the client node on the network.
 - **IPv6 (DHCP)** is equivalent to the above but for Internet Protocol version 6 vs IPv4.
 - **Static IP** is the current location assigned by the service provider or user.
 - **IPoA** stands for classical Internet Protocol over ATM.
- **WAN Status** value changes as per the WAN state of the current test. For **Manual Test**, the following states may be displayed:
 - **Idle** - if WAN setup for the selected **Test** is different from the one running and **Login** button is not activated
 - **Disconnected** - if WAN setup for the selected **Test** is different from the one running and this test had WAN connected before and stopped.
 - **Connecting** or **Connected** - if current selected test is running.
 - **Assigned IP** displays IPv4 address information assigned to the unit that is connected to the network.



- **WAN IPv6** parameter replaces the IPv4 **Assigned IP**, when **IPv6 (DHCP)** is set as the **Access Mode in Connection Setup**, because there are 2 assigned IPv6 addresses: the global one (WAN) and the local one (Link-Local).
- **Link-Local IPv6** is only displayed when **IPv6 (DHCP)** is set as the **Access Mode**, and is the assigned local IPv6 address.
- **Gateway** is the IP address of the default gateway.
- **Subnet Mask** is the network address used to identify if the IP address is within the same WAN.
- **DNS1** is the address of the primary domain name server to be used by the unit.
- **DNS2** is the address of the secondary domain name server to be used by the unit.
- **VPI (ATM mode only)** is the virtual path identifier value, not available in PTM mode.
- **VCI (ATM mode only)** is the virtual circuit identifier value, not available in PTM mode.
- **VLAN ID** is a virtual local area network (VLAN) tag ranging from 0 through 4094. The entry is available only when **VLAN Support is Enable**.
- **Test** (for **Manual Test** only) allows you to select which triple play test you want to run or results to view, along with their respective tabs:
 - **Data Test - LAN Status** and **Data Tests Summary**.
 - **IPTV Test - Join Leave** and **IPTV Summary**.
 - **VoIP Test - VoIP Call** and **VoIP Summary**.

The WAN info reflects the state of currently selected test.

Running DSL/IP Tests and Viewing Results

LAN Status

- **Login** (for **Manual Test** only) button allows you to start the test application, which also stops the previous test. For example, if the current test is IPTV, and you select **Data Test** and press the **Login** button, the **IPTV Test** stops and the unit will reconnect WAN for Data Test if the WAN setup is different between these 2 tests.

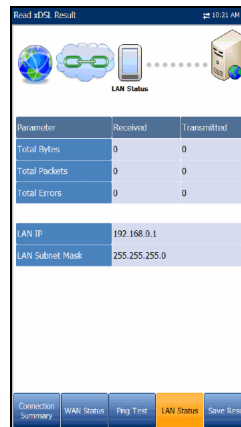
LAN Status

The **LAN Status** tab allows you to view the information related to the LAN (local area network).

- **LAN IP** is the local network IP address of the unit.
- **LAN Subnet Mask** is the network address mask used to identify if the IP address is within the same local area network.

Note: *The previous 2 parameters are not displayed if IPv6 (DHCP) is set as the Access Mode in Connection Setup.*

- The **Total** number of **Received** and **Transmitted Bytes, Packets, and Errors** counted on the unit's LAN interface are also displayed during the test.



Parameter	Received	Transmitted
Total Bytes	0	0
Total Packets	0	0
Total Errors	0	0

LAN IP	192.168.0.1
LAN Subnet Mask	255.255.255.0

VoIP Call

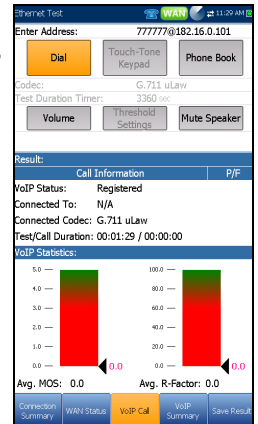
The **VoIP Call** feature allows you to place and receive VoIP calls while displaying phone numbers, call status, and statistics.

- **Enter Address** displays the dialed number entered from the editor screen or selected from the **Recent Dialed Numbers** list or **Phone Book**.

When **Enter Address** is selected, it opens the alphanumeric keypad to enter a **SIP Address**.

If the call is already connected after **Enter Address** is selected, it opens the **DTMF/Touch-Tone Keypad**.

- **Dial/Hang Up** button allows you to dial the selected or entered number, or disconnect the dialed call.
- **Touch-Tone Keypad** button opens the DTMF keypad. If the call is not in progress or connected, this button is disabled.
- **Phone Book** button opens a page where you can enter a new address, access **Recently Dialed** numbers, or **Select From Phone Book**.
- **Volume** button adjusts the speaker volume.
- **Threshold Settings** button opens a new page that allows you to set the VoIP Call threshold parameters.
- **Mute/Unmute Speaker** button changes the speaker status.
- **Result** displays **Call Information** such as the **VoIP Status**, number and Codec the call is connected to, duration, and the pass/fail status of the test/call.



Running DSL/IP Tests and Viewing Results

VoIP Call

- **VoIP Statistics** display histograms showing the current values of each of the following:
 - **Avg. MOS** - average Mean Opinion Score, which provides a relative measurement of VoIP call quality.
 - **Avg. R-Factor** - average R-Factor score, which is a VoIP transmission quality rating derived from multiple VoIP metrics, including latency, jitter, and loss.

To select the parameter values:

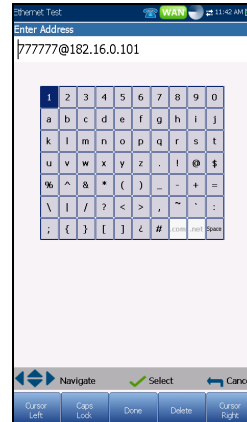
1. Press the up/down arrow keys to highlight the desired parameter.
 2. Press the left/right arrow keys to view and select the options.
- OR
3. Press ✓ on a value to open a list box of options or the alphanumeric editor screen and use the navigation keys to scroll through.
 4. Press ✓ to confirm the value.

Enter Address

The alphanumeric editor screen allows you to change parameter values and save changes to a new profile.

To use the editor screen:

1. Press the up/down left/right arrows to navigate the on-screen keyboard.
2. Press to confirm each selection.
3. Use the on-screen function buttons to create or edit the address.

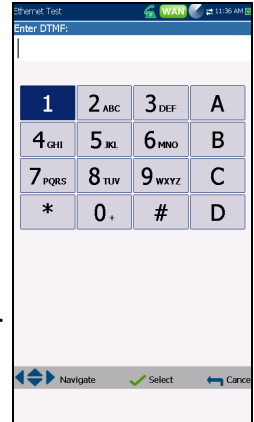


Touch-Tone Keypad

The **Touch-Tone Keypad** allows you to enter a DTMF number to dial a **VoIP Call**. The page contains alphanumeric keys to send a DTMF tone, and special-use alpha keys: A, B, C, D. For example, some systems require these keys for entering admin mode.

To enter a phone number:

- Press any of the buttons on the key pad by using the navigation keys on the unit and pressing ✓.
- The selected numbers are entered in the text box.



Phone Book

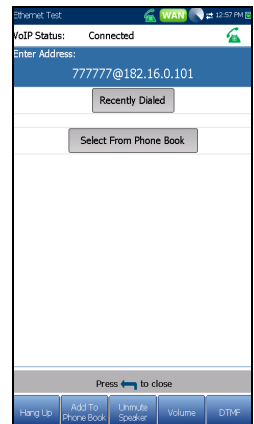
The **Phone Book** page allows you to enter a new address, access **Recently Dialed** numbers, or **Select From Phone Book**.

- **VoIP Status** shows the current status of the dialed number.
- **Enter Address** displays the dialed number entered or selected from the **Recent Dialed Numbers** list or **Phone Book**.

When **Enter Address** is selected, it opens the alphanumeric keypad to enter a **SIP Address**.

If the call is already connected after **Enter Address** is selected, it opens the **DTMF/Touch-Tone Keypad**.

- **Recent Dialed** button opens a list of recently dialed numbers for selection.
- **Select From Phone Book** button allows you to select a number from the **Phone Book**.



Running DSL/IP Tests and Viewing Results

VoIP Call

- Function Keys:
 - **Dial/Hang Up** button allows you to dial the selected or entered number, or disconnect the dialed call.
 - **Add To PhoneBook** saves the entered number to the **Phone Book**.
 - **Mute/Unmute Speaker** changes the speaker status.
 - **Volume** adjusts the volume level.
 - **DTMF** opens the DTMF keypad. If the call is not in progress or connected, this button is disabled.

To dial a number:

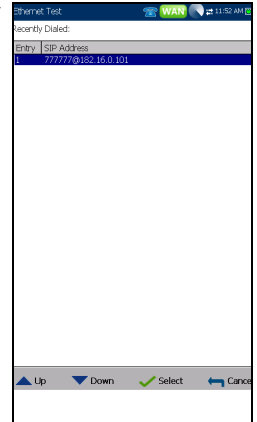
1. Use the up/down arrow keys to highlight an entry or button and press ✓.
2. Enter a new number using the on-screen keypad or select an existing one from the lists.
3. Press the **Dial** function key to start the call.

Recently Dialed

The **Recently Dialed** page contains a list of previously dialed SIP entries which you can select to make your call.

To select an entry:

1. Use the up/down arrow keys to select an entry.
2. Press **✓** to confirm your choice. The number is automatically entered in the **Enter Address** field of the **VoIP Call** page.

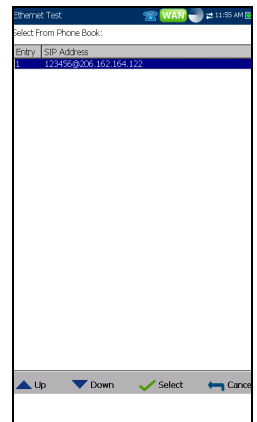


Select From Phone Book

The **Select From Phone Book** page contains a selection of entries from the **Phone Book**, to make a **VoIP Call**.

To select an entry:

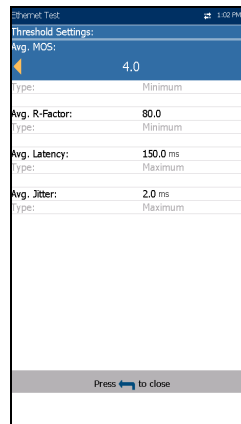
1. Use the up/down arrow keys to select an entry.
2. Press **✓** to confirm your choice. The number is automatically entered in the **Enter Address** field of the **VoIP Call** page.



Threshold Settings

The **Threshold Settings** page allows you to set the VoIP test threshold parameters.

- **Avg. MOS** is the average Mean Opinion Score, which provides a relative measurement of VoIP call quality.
- **Avg. R-Factor** or average R-Factor score is a VoIP transmission quality rating derived from multiple VoIP metrics, including latency, jitter, and loss.
- **Avg. Latency** is the maximum average threshold time delay (in ms) allowed to deliver the data.
- **Avg. Jitter** the average variation (in ms) in the packet transit delay of received packets.
- **Type** is a read-only field displaying the threshold limit: either **Minimum** or **Maximum**.



To set threshold values:

1. Press the up/down arrow keys to highlight the desired parameter.
2. Press ✓ on a value to open the alphanumeric editor screen and use the navigation keys to scroll through.
3. Press ✓ to select each value and use the function keys to complete your selection.
4. Press ↵ to confirm and close your selections.

VoIP Summary

The **VoIP Summary** tab allows you to view the pass/fail status and measurement details of the different parameters. If a measured value is out the thresholds configured in the **VoIP Call** setup, or if the WAN connection was not completed successfully, the **VoIP Summary** page will display a fail status.

- **MOS** displays values for both the average and current Mean Opinion Score, which provides a relative measurement of VoIP call quality.
- **R-Factor** displays values for both the average and current R-Factor score which is a VoIP transmission quality rating derived from multiple VoIP metrics, including latency, jitter, and loss.
- **Latency** displays the average, current, and maximum time delay experienced (in ms) to deliver VoIP packets.
- **Jitter** displays the average, current, and maximum variation (in ms) in the packet transit delay of received VoIP packets.
- **Packets** displays the number of lost and received VoIP packets, and the total number of received bytes or active (non-idle) frames received on a channel.

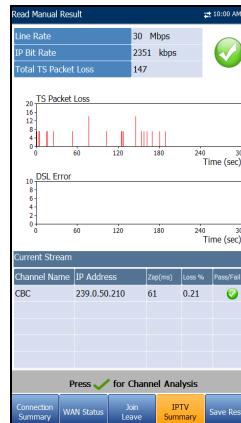
MOS:		
Avg. MOS	4.4	✓
Current MOS	4.4	✓
R-Factor:		
Avg. R-Factor	93.2	✓
Current R-Factor	93.2	✓
Latency:		
Avg. Latency	0.0 ms	✓
Current Latency	0.0 ms	✓
Max. Latency	0.0 ms	✓
Jitter:		
Avg. Jitter	0.0 ms	✓
Current Jitter	0.0 ms	✓
Max. Jitter	0.0 ms	✓
Packets:		
Lost Packets	0	
Rx Packets	0	
Rx Bytes	0	

IPTV Summary

The **IPTV Summary** tab allows you to view the pass/fail status and test results of the IPTV stream live time analysis and statistic counters and actions (Join/Leave).

- **Line Rate** is the actual rate achieved by the physical interface media, in Mbps.
- **IP Bit Rate** is the IP data rate for the IPTV service, including all channels detected.
- **Total IP Packet Loss** is the total number of packets lost, with errors, or out of sequence, during the test period.
- **Current Stream** lists a maximum of 5 live channel streams by name and **IP Address**.
 - **Zap** is the time between sending a request to join the stream and the start of receiving the video stream. It is one of the key factors to be considered when evaluating the IPTV quality of service (QoS).
 - **Loss** is the percentage of IP packet loss during the last ten thousand packets received.

To view the **Channel Analysis**, press ✓ from the **IPTV Summary** tab.



Channel Analysis

The Channel Analysis function provides a separate tab for every live stream channel. Each channel displays the following information:

➤ Stream Rate Info

➤ Transport Rate (kbit/s)

➤ IP Packet Rate (kbit/s)

➤ Stream Content lists the information about the **Video**, **Audio**, and **Program Association/Map Table(s)** content for each MPEG video analyzed stream.

➤ PID is a unique packet identifier that is

assigned to the packet payload of the video stream.

➤ Rate (kbit/s) is the rate calculated of a given stream content.

➤ Stream Error Indicator

➤ TS Packet Loss Counter is the number of packets lost, with errors, or out of sequence, during the test period in the transport stream.

➤ TS Packet Loss Ratio (%) is the percentage of IP packet loss per last ten thousand packets received in the transport stream.

The screenshot displays the 'Read Ethernet Result' window at 5:36 PM. It is divided into two main sections: 'Stream Rate Info' and 'Stream Error Indicator'. The 'Stream Rate Info' section shows 'Transport Rate (kbit/s)' at 8146 and 'IP Packet Rate (kbit/s)' at 8361. Below this is a table for 'Stream Content' with columns for 'Stream Content', 'PID', and 'Rate (kbit/s)'. The table lists 'Video' (PID 68, Rate 8199), 'Audio' (PID 69, Rate 231), 'Program Association Table' (PID 0, Rate 7), and 'Program Map Table' (PID 66, Rate 7). The 'Stream Error Indicator' section shows 'TS Packet Loss Counter' at 7 and 'TS Packet Loss Ratio (%)' at 0.00. At the bottom, there is a navigation bar with a 'Back' button and a 'Go back to IPTV Result' button, along with several status buttons labeled 'CBC', 'CBC', '11CBC', '111CBC', and '1111CBC'.

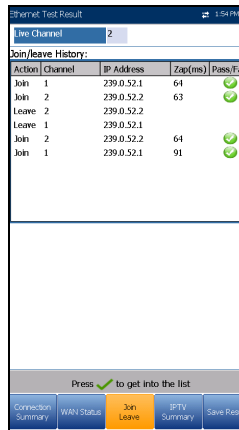
Stream Content	PID	Rate (kbit/s)
Video	68	8199
Audio	69	231
Program Association Table	0	7
Program Map Table	66	7

Join Leave

The **Join Leave** tab displays a list of IPTV channels from the alias table, their activity (measured Zap time), and pass/fail status. Upon successful WAN connection, the **Join/Leave Channel** lists are shown.

To join/leave channels:

1. Press **Join** to send an IGMP report to join the specified multicast IP address.
2. Press **Leave** to inform the network to stop sending the specified multicast stream.



DSL Parameter Details

The **DSL Param Details** tab displays the **Downstream** and **Upstream** parameter results configured in the DSL/IP tests.

When the **Test Interface** for **Auto Test** or **Manual Test** is set to ADSL2+ or VDSL2 bonding mode, there will be 2 pages of results, one for each DSL line-pair.

To access the second-pair results, press the **Pair 1/2** function key at the bottom-right of the screen.

- **Line Status** displays the status of the line under test during negotiation with the DSLAM. The value changes from Idle /Activate /Handshake /Training /Show Time for ADSL2+ or VDSL2 mode.

Note: When loading firmware into the Broadcom chipset, the **Line Status** value displays **Loading M:SS**, where **M:SS** is a count down timer.

- **Operation Mode** is the DSL mode of operation as negotiated between the unit and the DSLAM.
- **CO Vendor ID** is a unique 4-digit alphanumeric identifier of the DSL chipset manufacturer used on the CO (central office) side.
- **CO Version** is the version number of the unique alphanumeric identifier of the DSL chipset used on the CO side.
- **Sync loss count** is the number of times the unit lost synchronization.

Pair 1		
Line Status	Show Time	
Operation Mode	VDSL2-8d	
CO Vendor ID	IFTN	
CO Version	E202	
sync loss count	0	
Parameter	Downstream	Upstream
Actual Data Rate	47.306 Mbit/s	6.909 Mbit/s
SNR	6.20 dB	6.00 dB
Attenuation	N/A	N/A
Capacity	97.9 %	100.0 %
Maximum Data Rate	48.328 Mbit/s	6.394 Mbit/s
Output Power	-27.8 dBm	14.4 dBm
Latency	Interleave	Interleave
Interleave Delay	8 ms	8 ms
INP	1	1
Interleave Depth	199	28
Bitswap	Active	Not Active
Frellis	On	On
s:INP	Not Active	Not Active

Press **↔** to go to Connection Summary

DSL Param Details | DSL Statistics | Band Information | Loop Diagnostics | Pair 2

Running DSL/IP Tests and Viewing Results

DSL Parameter Details

➤ **Parameter - Downstream/Upstream**

- **Actual Data Rate** displays the values at which the unit and CO are connected, as negotiated during the training phase. The values should represent what the CO was set to, unless the DSL link is being subjected to high levels of noise/crosstalk.
- **SNR** is the signal-to-noise ratio margin measured on the line.
- **Attenuation** is line attenuation measured during the training phase.

Note: *DSL Param Details* displays **Attenuation** for ADSL1/2/2+ only. See **Band Information** for VDSL2 attenuation.

- **Capacity** is the capacity of the line as a ratio of achieved bit rate over the maximum attainable bit rate presented as a percentage (%). A high value could mean that the link is nearing its maximum capabilities while a low value could mean the link is being under utilized (sometimes intentionally – verify your local DSLAM setup).
- **Maximum Data Rate** displays the maximum attainable bit rates that the circuit can handle as determined by the remote terminal and CO during the training phase. Values can be greater than the actual bit rate.
- **Output Power** is the current transmit power level that is a measure of the aggregated transmit power.
- **Latency** is the path type, **Fast** or **Interleave**, set by the service provider at the CO. The use of the interleaved path means greater delay in the delivery of data but it is less susceptible to noise or crosstalk due to increased Reed-Solomon coding and FEC (forward error checking). The use of the fast path means little or no delay in the delivery of data but it is more susceptible to noise and crosstalk.

- **Interleave Delay** defines the mapping (relative spacing) between subsequent input bytes at the interleave input and their placement in the bit stream at the interleave output.
- **INP** is the level of impulse noise protection.
- **Interleave Depth** defines the number of bits (or bytes) in each block of data.
- **Bitswap** specifies the status of the bit swapping mechanism - **Active** or **Not Active** - swapping bits from tone m to tone n to prevent modem retraining.
- **Trellis** or Trellis Coded Modulation (TCM) is a type of convolutional code which utilizes parity bits on each symbol within a continuous data stream. When the line is connected, Trellis displays either **On** or **Off**.
- **Phy-R** is Broadcom proprietary Physical Layer Retransmission technology which is used to overcome impulse noise.

G.INP is the standards based Physical Layer Retransmission scheme for impulse noise protection and will report **Active** or **Not Active**. **G.INP** state will be shown unless system is using **Phy-R**.

DSL Statistics

The **DSL Statistics** tab allows you to view transfer mode statistics and DSL counters.

When the **Test Interface** for **Auto Test** or **Manual Test** is set to ADSL2+ or VDSL2 bonding mode, there will be 2 pages of results, one for each DSL line-pair.

To access the second-pair results, press the **Pair 1/2** function key at the bottom-right of the screen.

- **DSL Counters** lists the **Local** and **Remote** results for the following counters:

- **CRC** is the cyclical redundancy check Interleaved/Fast counter.
- **FEC** is the Reed Solomon forward error correction.
- **Error Seconds** is the number of seconds when code violation is detected.
- **HEC** is the header error check (HEC) Interleaved/Fast counter. Available only in ATM connection mode.

Manual Test Result		
Pair 1		
DSL Counters	Local	Remote
CRC	0	32
FEC	24	53
Error Seconds	0	1
HEC	7	0
Parameter	Received	Transmitted
Bytes	4186	4786
Packets	17	19
DSL Transport	PTM	
Sync loss count	0	
Vector State	Not Active	
RLO	0 dB	
EWL	< 230 ft / 70 m	
Performance Counters	Local	Remote
G.INP.RTX_TX	0	0
G.INP.RTX_C	0	0
G.INP.RTX_LC	0	0
Vector Err_Samples Sent	0	
Vector Err_Samples Dis.	0	

- **Parameter - Received/Transmitted**
 - **Bytes** records the number of active (non-idle) PTM/ATM cells or frames on a channel.
 - **Packets** displays the number of packets.
- **DSL Transport** options include **PTM** (packet transfer mode), **ATM** (asynchronous transfer mode), and **ATM/PTM**.
- **Sync loss count** is the number of times the unit lost synchronization.

- **Vector State** (only displayed for single VDSL2 connection) is **Active/Not Active**. When **Active**, the VCE (vector control entity) + DSLAM asks the CPE for noise samples. The VCE uses the noise samples to calculate the level of FEXT (far end crosstalk) and to calculate the solution to mitigate the effects of FEXT.
- **KL0** displays the attenuation the system calculated during the determination of UPPBO requirements.
- **EWL** is the estimated wire length and is based on the **KL0**.
- **Performance Counters - Local/Remote**
 - **G.INP RTX_TX** is the number of frames retransmitted by the transmitter. The **Local** number is what is retransmitted from the CPE to the DSLAM. The **Remote** value is what is retransmitted from the DSLAM to the CPE.

Note: *The RTX_TX number may contain retransmits not requested by the receiver (that is, the retransmission request channel got corrupted and a retransmission was sent automatically) resulting in an incremental value even though the same frame ID was retransmitted multiple times.*

- **G.INP RTX_C** is a counter that is increased each time a frame is detected in error and has successfully been *corrected* by a retransmission. The **Local** number is received by the CPE, the **Remote** value received by the DSLAM.
- **G.INP RTX_UC** is a counter that is increased each time a frame is detected in error and has *not been corrected* by one or more retransmissions within the maximum delay period. The **Local** number is received by the CPE, the **Remote** value received by the DSLAM.

Note: *The RTX_TX may not equal RTX_C + RTX_UC because of the infrequent reboot nature of the DSLAM and the double-counting that the RTX_TX counter might do.*

Running DSL/IP Tests and Viewing Results

DSL Statistics

- **Vector Err. Samples Sent** is the total number of error samples the CPE has sent to the DSLAM during the test. A high number can indicate a network that is unstable (CPEs joining / leaving, causing the VCE to continuously recalculate the best solution).
- **Vector Err. Samples Dis.** is the total number of error samples discarded. A high number can indicate a network that is unstable (CPEs joining / leaving, causing the VCE to continuously recalculate the best solution).

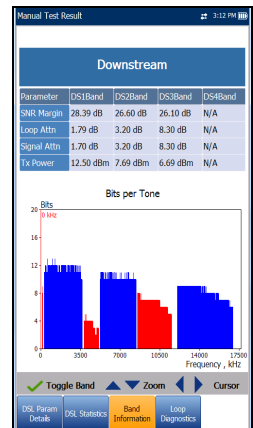
Band Information

The **Band Information** tab allows you to view a list of individual upstream or downstream band parameter details.

When the **Test Interface** for **Auto** or **Manual Test** is set to ADSL2+ or VDSL2 bonding mode, there will be 2 pages of results, one for each DSL line-pair.

To access the second-pair results, press the **Pair 1/2** function key at the bottom-right of the screen.

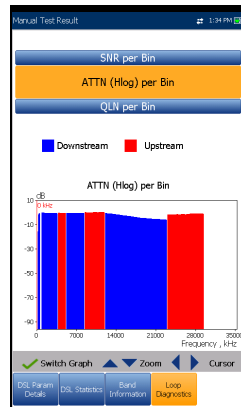
- The tab contains **Upstream** and **Downstream** parameters. Press ✓ to toggle between bands.
 - ADSL lists only 1 of each.
 - VDSL lists US0 to US3, and DS1 to DS4 possible bands, depending on the band plan.
- **Parameter - Downstream/Upstream**
 - **SNR Margin** is the measured current signal-to-noise ratio margin across all active sub-carriers, as an amount of increased noise relative to the measured noise power that the system would be able to tolerate. Only a value of 6 or above is able to support a bit error rate of 10^{-7} .
 - **Loop Attenuation** is the current quality of the line and is measured only once during testing.
 - **Signal Attenuation** is the current reduction of signal strength and is measured periodically when the line is connected.
 - **Tx Power** is the upstream/downstream transmitting power for the selected band.



Loop Diagnostics

The **Loop Diagnostics** tab displays the characteristics and potential problems on the line, in graphical format. Some DSLAMs provide upstream SNR and Hlog per bin info to the CPE during DSL connection phase. If the SNR/Hlog/QLN info is available, the upstream and downstream diagnostic data is displayed using 2 different colors which are identified in the graph. There are 3 separate graphs for each pair:

- **SNR per Bin** presents the signal-to-noise ratio per bin.
 - **ATTN (Hlog) per Bin** shows the attenuation from Hlog (Channel Response) per bin.
 - **QLN per Bin** shows the PSD noise from quiet line noise per bin.
- Press ✓ to switch between graphs.

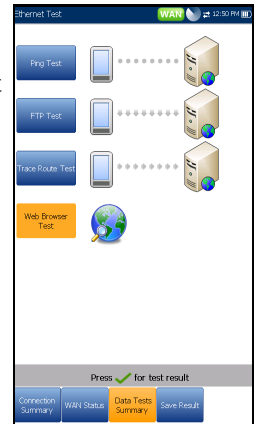


Data Tests Summary

The **Data Tests Summary** tab displays the pass/fail status of the selected data tests enabled in the connection setup. A successful WAN connection must be established in order to view the detailed results. When **IPv6 (DHCP)** is set as the **Access Mode** in **Connection Setup**, only **Ping Test** will be displayed.

To view individual data test results:

1. Press the up/down navigation keys to select the desired test.
2. Press **✓** to display the test result details.



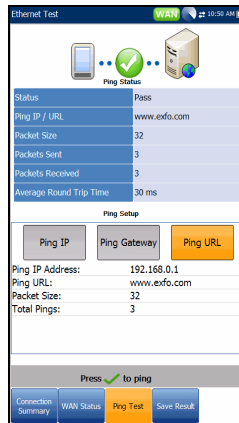
Running DSL/IP Tests and Viewing Results

Data Tests Summary

Ping Test

The **Ping Test** tab allows you to view the Pass/Fail summary status of either a Ping Address or Ping Gateway.

- **Status** is the status of the Ping test performed.
- **Ping IP/URL** is the IP Address or domain name of the destination being pinged.
- **Packet Size** is the number of bytes sent in one packet.
- **Packets Sent** is the number of packets sent.
- **Packets Received** is the number of packets received.
- **Average Round Trip Time** is the duration in milliseconds (ms) it took the data to reach the destination device and come back.



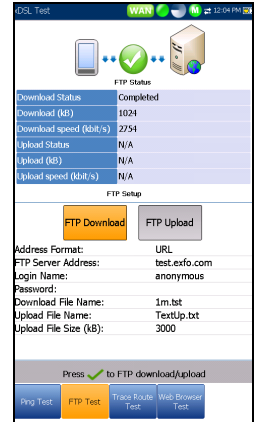
Note: The following are not shown if the **Access Mode** in **Connection Setup** is set to **IPv6 (DHCP)**.

- **Ping IP Address** is the destination IP address.
- **Ping URL** is the destination URL address.
- **Packet Size** is the number of bytes sent in one packet ranging from 32 through 1200 (default is 32 bytes).
- **Total Pings** is the total number of Ping requests to be sent.

FTP Test

The **FTP Test** tab displays the FTP download and upload results configured in the connection setup, and a pass/fail summary status of whether or not the file transfer protocol (FTP) was completed successfully or not.

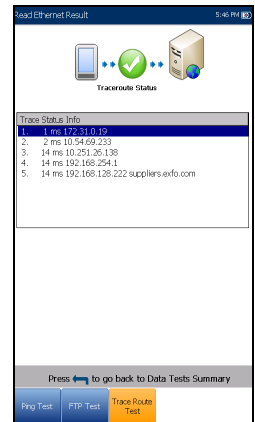
Except for Auto Test, FTP parameters can be reconfigured and have information updated from this tab by using the on-screen **FTP Download/Upload** buttons.



Trace Route Test

The **Trace Route Test** tab allows you to view the pass/fail status of the IP packet sent to a specified IP destination, and the path and time taken to do so.

Except for Auto Test, Traceroute parameters can be reconfigured and have information updated from this tab by using the on-screen **Trace URL** or **Trace IP** buttons.

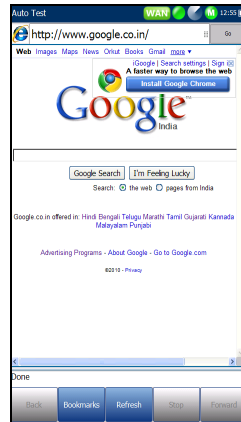


Web Browser



The MaxTester web browser is intended as a tool to view web pages and confirm internet connections. It is not designed for extensive browsing or to view complex web pages. Some pages containing images or animated graphics may not display fully. EXFO suggests that you use the supplied bookmarks or similar simple web pages for testing.

The web browser results screen is available only if the software option is enabled. The results screen contains the following functions:




- URL Box displays the current web address to be connected.
- The **Go** button starts the specified URL or reloads the previous web page.
- On-screen function keys:
 - **Back** retrieves the previous web page (if available). If no web page was previously browsed, this key is disabled.
 - **Enter Text** opens the editor screen allowing you to type an entry.
 - **Bookmarks** opens the **Bookmarks** page allowing you to select a URL from the list or save the current URL to **Bookmarks**. You must press **↵** to enable the **Bookmarks** key.
 - **Refresh** reloads the current web page.
 - **STOP** halts loading the web page. If the web page has already loaded, the key is disabled.
 - **Forward** takes you to the next web page (if available). If no web page was browsed after the current page, this key will be disabled.



To edit the web address:

1. Press  to highlight the URL box.
2. Press  to bring up the edit screen and modify the web address. The edited URL can be used to browse the web page temporarily but it will not be saved as the **Home URL**.

To navigate the web browser page:

1. Use the keypad arrow keys to move the on-screen cursor. When the cursor reaches the edge of the viewing area, the web browser page scrolls up/down/left/right. The cursor turns into a text edit tool when scrolling over an editable box or a hand tool when hovering near a hyperlink.
2. Press  to start the desired outcomes.
3. Press  to load the **Home URL** page.
4. Press  to exit from the web browser test.

Bookmarks

The **Bookmarks** page allows you to select from a list of URLs or save the current one.

- **URL** box shows the current URL in the web browser page.
- On-screen function keys:
 - **Add to Bookmarks** copies the current URL to the **Bookmarks** list above the highlight. When the list reaches the maximum 9 URLs, the key is disabled.
 - **Set as URL** copies the highlighted URL to the **URL** box.
 - **GO** saves the bookmarks and starts the web connection using the address in **URL** box.



Press **←** to exit from the **Bookmarks** page avoiding all actions and return to the web browser page.

7 Saving, Reading, and Managing DSL/IP Test Results

Saving Results

You can save a snapshot of test results into a result file during or after performing a DSL/IP test, with the MaxTester. Each Auto Test, Manual, and Ethernet test includes an **Upload/Save Result** tab to do so. The tab allows you to **Upload & Save** your test results using the following:

- out-band upload method if not disabled and the test is stopped
- existing in-band method if enabled, using the DSL or Ethernet connection made during the test, and the test is running.

Or you can **Save** your results to an internal memory file; or **Export** results to an HTML, MHTML, or XML report using a USB key.

Alternately, when a test is completed or stopped and you press ↩, **Confirm Save Results** dialogue box pops up. Selecting **Yes** displays the **Upload/Save Result** screen where the following information can be entered:

➤ Identification Fields

- **User Name/User ID** display the values set up in the **Setup/Application Settings/Identification** tab. You can edit this field using the editor screen.
- **Contractor Name** allows you to enter the name of a contractor used to perform the tests.
- **Test From/To** display the values set up in the **Setup/Application Settings/Identification** tab. You can edit this field using the choices from the list box.
- **Job ID** allows you to create/edit a unique identifier for the task.
- **Customer Name** is the name of the customer for which the test was run.

The screenshot shows a software interface for saving test results. It includes fields for user identification, test parameters, and options for saving to internal memory or exporting to a report. The interface is clean and functional, with clear labels and buttons.

Saving, Reading, and Managing DSL/IP Test Results

Saving Results

- **Circuit ID** allows you to create/edit a unique identifier for the circuit under test.
- **Comments** allows you to add any relevant information.
- **Save Result**
 - **Select Result File** button displays a list of existing file names where you can save your results.
 - **Result File Storage Location** gives you the option of storing results either in the **MT internal memory** or **USB** device. The default selection comes from **Setup/Application Settings/General** tab.
 - **Result File Name** allows you to preview and edit the result file name. The proposed file name is based on current auto-naming parameters configured in **Setup/Application Settings/File Name**.
 - **Out-Band Upload & Save** button is enabled when test is stopped and out-band upload method is not disabled.
 - **Save** button confirms if the **Result File Name** is saved successfully.
- **Export Report**
 - **Report Format** is **MaxTester**, **HTML**, **MHTML**, or **XML**.

You can generate and export HTML, MHTML, or XML reports from any saved test result. Reports include:

 - Product/General Information** including **Pass/Fail** status.
 - Identification**
 - Profile/Results Summary**

Blank entries for your **Signature** and the **Date**.
 - **Report File Name** allows you to preview and edit the result file name. The proposed file name is based on current auto-naming parameters configured in **Setup/Application Settings/File Name**.

- **Export** button confirms if the **Report File Name** is saved successfully. If a USB device is not inserted, the following warning dialogue box appears: **USB device not present**.

Note: *The **Save Result** tab found in the **Read/Export Result** application allows you to do all of the above except upload results.*

To set parameter values and save results:

1. Press the left/right and up/down arrow keys to highlight the desired parameter.
2. Press ✓ to display the list or select the value.
3. Press the up/down arrow key to highlight the desired value.

OR

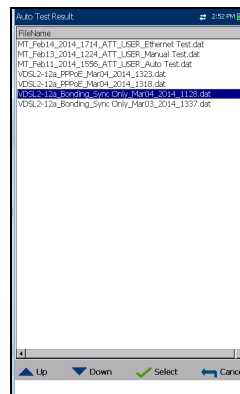
4. Press the left arrow key to erase the existing value, and then use the alphanumeric keypad to enter a value. To cancel the entry, press ↵.
5. Press ✓ to accept the value.

Select Result File

Select Result File page displays a list of existing file names where you can save your results.

To save your results to an existing file name:

1. Use the up/down navigation keys to highlight the desired **FileName**.
2. Press ✓ to confirm your selection.



Saving, Reading, and Managing DSL/IP Test Results

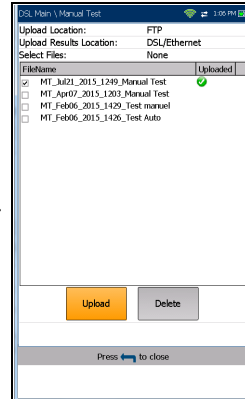
Saving Results

Upload





The **Upload** page allows you to upload the saved results to an FTP site or a USB memory stick. Select a **FileName** or **All** files previously saved. Files are uploaded via the existing in-band DSL or Ethernet connection made during the test, or an out-band upload connection (Wi-Fi or Ethernet) as shown by the corresponding icon in the top right-hand corner of the navigation bar.

- **Upload Location** is either **FTP** or **USB**.
- **Upload Results Location** allows you to upload saved **DSL/Ethernet** or **Copper** result files. DSL and Ethernet result files are at the same location.
- **Select Files** is either **None** which removes all check marks allowing you to select one or more files, or **All**.
- **Uploaded** status column displays a successful, failed, or no upload for each file.
- **Upload** button transfers the selected files to the designated location.
- **Delete** button removes selected XML files from the internal memory.

Note: For *Auto Test*, if you have enabled the **Web Browser**, wait for the browser test to start, and then exit the browser to upload files. Alternately, wait for files to complete uploading before pressing any keys.

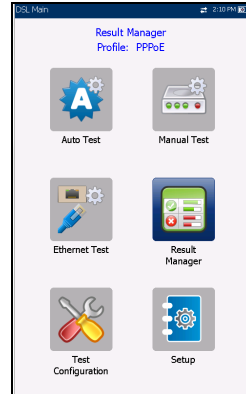


To upload previously saved results:

- 1.** Press the left/right arrow keys to highlight the desired **Upload Location**.
- OR
- 2.** Press  to display the list and select the value.
- 3.** Press the down arrow key and select either **None** or **All** files.
- 4.** If **None**, press the down arrow key to highlight the list box and press  to open the list.
- 5.** In the list, press the up/down arrows to select the desired files.
- 6.** Press  to come out of the list.
- 7.** Press the down arrow key to highlight either **Upload** or **Delete** and press .

Managing Results

You can view, upload, export, and delete any of your saved results with the MAX-630 by highlighting the **Result Manager** icon from the **DSL Main** pane and pressing **✓**.

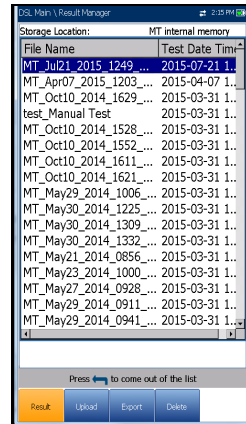


Read Results

The **Result** page allows you to select a **File Name** and view the results of files previously saved. The page lists all saved result files by test date and time. The format of **Test Date Time** is per the selection in **System Settings**. Result files can be loaded from either the **MT internal memory** or a **USB**.

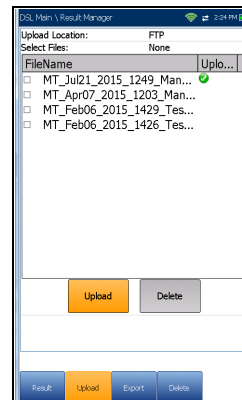
To open previously saved test results:

1. Press the left/right arrow keys to highlight the desired parameter.
- OR
2. Press **✓** to display the list or select the value.
3. Press the down arrow key to highlight the list box and press **✓** to open the list.
4. In the list, press the up/down arrows to select the test results file.
5. Press **✓** to open the result file.



Upload

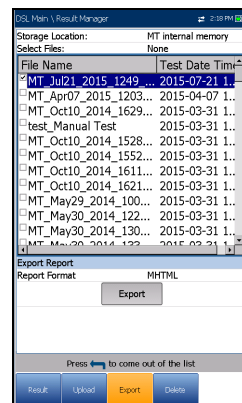
The **Upload** page in the Result Details is the same as previously described. Please see *Upload* on page 112 for more information.



Export

The **Export** page allows you to select a **File Name** or **All** files previously saved and export the results in a selected **Report Format**.

- **Storage Location** gives you the option of exporting your results to either the **MT internal memory** or USB device.
- **Select Files** is either **None** or **All**. **None** removes all check marks allowing you to select one or more files, or **All**.
- **Report Format** is **HTML**, **MHTML**, or **XML**.
- **Export** button transfers the selected file(s) to the internal memory or USB device in the selected report format.



To export previously saved test results:

1. Press the left/right arrow keys to highlight the desired **Storage Location**.

OR

2. Press **✓** to display the list and select the value.

Saving, Reading, and Managing DSL/IP Test Results

Managing Results

3. Press the down arrow key and select either **None** or **All** files.
4. If **None**, press the down arrow key to highlight the list box and press **✓** to open the list.
5. In the list, press the up/down arrows to select the desired files.
6. Press **←** to come out of the list.
7. Press the down arrow key to highlight the **Report Format**.
8. Press the left/right arrow keys to select the desired format
OR
9. Press **✓** to display the list and select the value.
10. Press the down arrow key to press the **Export** button.

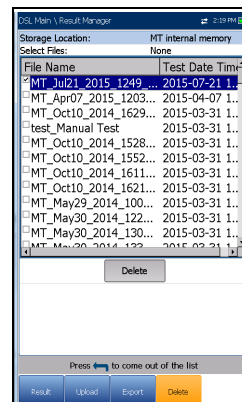
Delete

The **Delete** page allows you to delete a selected **File Name** or **All** selected result files previously saved in the **MT internal memory** only.

- **Storage Location** is the **MT internal memory**.
- **Select Files** is either **None** or **All**. **None** removes all check marks allowing you to select one or more files, or **All**.
- **Delete** button removes the selected files.

To delete previously saved test results:

1. Press the left/right arrow keys ✓ to select either **None** or **All** files.
2. If **None**, press the down arrow key to highlight the list box and press ✓ to open the list.
3. In the list, press the up/down arrows to select the desired files.
4. Press ← to come out of the list.
5. Press the down arrow key to press the **Delete** button.
6. Press **Delete** to confirm your selection or **Cancel** to abort the operation.



8 **Maintenance**

General Maintenance

The MaxTester has been designed to be a rugged and lightweight piece of test equipment. The MaxTester LCD display should only be cleaned using a soft, lint-free cloth and an anti-static cleaning solution. Ordinary detergents and other cleaning solutions may cloud or scratch the surface and should be avoided.

To help ensure long, trouble-free operation:

- 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 and let the unit dry completely.



WARNING

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

Recalibrating the Unit

EXFO manufacturing and service center calibrations are based on the ISO/IEC 17025 standard (*General Requirements for the Competence of Testing and Calibration Laboratories*). This standard states that calibration documents must not contain a calibration interval and that the user is responsible for determining the re-calibration date according to the actual use of the instrument.

The 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, as well as the specific requirements for your application. All of these elements must be taken into consideration when determining the appropriate calibration interval of this particular EXFO unit.

Under normal use, the recommended interval for your MaxTester 630 is: 2 years.

For newly delivered units, EXFO has determined that the storage of this product for up to six months between calibration and shipment does not affect its performance (EXFO Policy PL-03).

To help you with calibration follow-up, EXFO provides a special calibration label that complies with the ISO/IEC 17025 standard and indicates the unit calibration date and provides space to indicate the due date. Unless you have already established a specific calibration interval based on your own empirical data and requirements, EXFO would recommend that the next calibration date be established according to the following equation:

Next calibration date = Date of first usage (if less than six months after the calibration date) + Recommended calibration period (2 years)

To ensure that your unit conforms to the published specifications, calibration may be carried out at an EXFO service center or, depending on the product, at one of EXFO's certified service centers. Calibrations at EXFO are performed using standards traceable to national metrology institutes.

Note: *You may have purchased a FlexCare plan that covers calibrations. See the Service and Repairs section of this user documentation for more information on how to contact the service centers and to see if your plan qualifies.*

Battery

The MAX-630 is equipped with a Lithium-ion battery.





WARNING

- Recharge the battery using only the MaxTester and with the battery properly installed in the unit.
- Never open the battery back panel of the MaxTester without reading the *Replacing the Battery* section in this chapter.

When fully charged, the battery should provide between 3 and 10 hours of power depending on different factors such as: type of tests performed, display backlight level, and connected accessories.

Note: *When the battery level is very low, tests cannot be performed. Plug into AC Mains supply for continued operation and to recharge the battery.*

To maximize battery power of the MAX-630:

1. Lower the display backlight level using the application found in **Display and Language** in the **System Settings**, when the MAX-630 is used under low to medium light conditions.
2. Disconnect any unused USB or SD accessories.
3. Quit any running tests when the MaxTester is not in use.
4. Whenever possible, put the MAX-630 in suspend mode by pressing  until the suspend notification sound plays, about 2 seconds.
5. When not in use, turn the unit off by pressing  for at least 4 seconds.

If the battery capacity remains low or outside the previously stated values, it should be replaced. This could occur after 3 years depending on the usage. If your current battery capacity is lower than 8000 mAh, replace the battery.

Unit Temperature Handling

When the battery temperature reaches $\geq 55\text{ }^{\circ}\text{C}$, the unit temperature is displayed in the bar at the top of the unit and a warning message will appear. Tests stop automatically when the battery temperature reaches $60\text{ }^{\circ}\text{C}$.

Replacing the Battery



WARNING

Only use an EXFO battery. Batteries from other suppliers could result in serious damage to the MaxTester or personal injuries. See *Contacting the Technical Support Group* on page 128 for information on contacting EXFO.

Battery replacement should only be done by a qualified technician with the appropriate tools on an electronic bench or similar environment.

To replace the battery:

1. Remove all 4 screws of the battery back panel using a 1.5 mm Allen key. Put aside the screws and the panel keeping the inside foam seal clean. See *LED Statuses* on page 127.
2. Pull out the old battery using your fingers. Flipping the unit, battery-side down, will ease removal. Do not use tools in order to prevent damage to the battery envelope. Pull out the electrical connector. Put aside the old battery.
3. Remove the new battery from its package. Keep the package for future use. Plug in the electrical connector ensuring the pins are correctly aligned. Place the new battery in the MaxTester.
4. Inspect the inside rib around the MaxTester battery compartment to make sure it is free from any debris. Remove any debris using a dry cloth. Replace the battery back panel. Replace the 4 screws with a moderate torque so the foam seal is evenly compressed without damaging the screws.

Maintenance

Recycling and Disposal (Applies to European Union Only)

Battery Charging and Replacing

Charging the MaxTester battery can take up to 5 hours. This battery was custom made for your unit; replacement batteries must be ordered from EXFO.




Recycling and Disposal (Applies to European Union Only)

For complete recycling/disposal information as per European Directive WEEE 2002/96/EC, visit the EXFO Web site at www.exfo.com/recycle.

9 Troubleshooting

Solving Common Problems

The table below presents common problems and their solution.

Problem	Possible Cause	Solution
Impossible to turn on unit.	<ul style="list-style-type: none"> ➤ You did not press  long enough. ➤ Battery discharged. ➤ Battery is missing. ➤ Unit temperature is too cold or too hot. 	<ul style="list-style-type: none"> ➤ Press  for a few seconds. ➤ Charge battery by connecting the AC adapter/charger. ➤ Insert a battery and replace battery back panel. ➤ Make sure that the unit is within the operation temperature range. You might have to wait for the unit to warm up/cool down.
Battery does not charge as expected.	<ul style="list-style-type: none"> ➤ Temperature is too high. ➤ Battery is incorrectly connected. 	<ul style="list-style-type: none"> ➤ Ensure temperature is within specifications. ➤ Ensure battery is connected properly.
A battery status LED is red.	<ul style="list-style-type: none"> ➤ Battery temperature is too high. ➤ Battery is defective. 	<ul style="list-style-type: none"> ➤ Shut down the unit by pressing  and holding it down for more than 10 seconds and/or until the power LED goes off. ➤ Wait for the unit to cool down, and then reboot it. ➤ Contact EXFO or replace the battery.

Troubleshooting

Solving Common Problems

Problem	Possible Cause	Solution
The unit is not responding.		<ul style="list-style-type: none"><li data-bbox="787 263 1139 324">▶ Shut down the unit, as above.<li data-bbox="787 331 1139 406">▶ Turn the unit on again to reset it.

LED Statuses

The power and battery LEDs are used to indicate specific statuses of your unit. If you notice that one of the LEDs displays a particular status, please see the table below to determine what could be causing it.

LED Legend

Power State	Power Source	Power LED	Charger State	Battery Level	Battery LED
ON	DC	Solid green	Error	N/A	Red
			Charging	N/A	Green blinking
			Charged	Full	Solid green
	Battery	Solid yellow	N/A	< 10 %	Red blinking
				≥ 10 % - < 25 %	Yellow blinking
				≥ 25 % - < 75 %	Yellow
				> 75 %	Solid Green
Fake suspend ^a	DC	Solid green	Error	N/A	Red
			Charging	N/A	Green blinking
			Charged	Full	Solid green
Suspend	Battery	Yellow blinking	N/A	N/A	Black
OFF	Battery	Black	N/A	N/A	Black

- a. Fake Suspend -- When AC/DC is plugged in, MaxTester will simulate the suspend mode by turning off the display in order to facilitate the charger.

Troubleshooting

Contacting the 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).

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

For detailed information about technical support, and for a list of other worldwide locations, visit the EXFO Web site at www.exfo.com.

If you have comments or suggestions about this user documentation, you can send them to customer.feedback.manual@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.

10 Warranty

General Information

EXFO 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.

Warranty

Liability

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

In the case of products equipped with optical connectors, EXFO will charge a fee for replacing 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 135). 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 135).

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
support@exfo.com

EXFO Europe Service Center

Winchester House, School Lane
Chandlers Ford, Hampshire S053 4DG
ENGLAND

Tel.: +44 2380 246800
Fax: +44 2380 246801
support.europe@exfo.com

EXFO Telecom Equipment (Shenzhen) Ltd.

3rd Floor, Building C,
FuNing Hi-Tech Industrial Park, No. 71-3,
Xintian Avenue,
Fuyong, Bao'An District,
Shenzhen, China, 518103

Tel: +86 (755) 2955 3100
Fax: +86 (755) 2955 3101
support.asia@exfo.com

To view EXFO's network of partner-operated Certified Service Centers nearest you, please consult EXFO's corporate website for the complete list of service partners:

<http://www.exfo.com/support/services/instrument-services/exfo-service-centers>.

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.

DSL SPECIFICATIONS		
DSL chipset	Broadcom	
Standards compliance	ADSL1/2/2+	ITU-T G.992.5 (ADSL2+ including Annex A, B, J, M) ITU-T G.992.3 (ADSL2 including Annex A, B, J, L) ITU-T G.992.1 (G.DMT including Annex A, B) ITU-T G.994.1 ATIS/ANSI T1.413 Issue 2 IEEE 802.3ah (PTM) ITU-T G.998.1, 2 (ATM, Ethernet bonding) ITU-T G.998.4 (G.INP) DT 1 TR 112 U-R2
	VDSL2	ITU-T G.993.2 Annex A, B, Y Profiles: 8a/b/c/d, 12a/b, 17a, 30a Band Plan: 997, 998, US0 IEEE 802.3ah (PTM) ITU-T G.998.2 (Ethernet bonding) ITU-T G.998.4 (G.INP) ITU-T G.993.5 (G.Vector) DT 1 TR 112 U-R2 (U-RV2)
DSL parameters	Maximum attainable bit rates Actual achieved bit rates Actual bonded achieved rates Latency modes: fast, interleaved Data modes: ATM, PTM Capacity (%) Signal-to-noise ratio (SNR) margin Output power Attenuation Bits/bin Attenuation/bin (Hlog/bin) QLN/bin SNR/bin Vendor code, revision	Interleave depth Interleave delay Trellis coding Bit swapping INP Nitro PhyR, G.INP state, performance counters Vectoring state, performance counters Modes: PTM, ATM, Nitro LOS, FEC, CRC, HEC LATN per band SATN per band EWL KLO

Technical Specifications

MULTIPLAY TESTING SPECIFICATIONS		
Test interfaces	<ul style="list-style-type: none"> › VDSL2 › ADSL1/2/2+ › Ethernet 10/100 BT 	
Encapsulation methods	<ul style="list-style-type: none"> › RFC 2684/Bridged Ethernet/IPoE (IPv4 and IPv6) › IPoA (RFC 1577) 	<ul style="list-style-type: none"> › PPPoE (RFC 2516) › PPPoA/LLC and PPPoA/VC-MUX (RFC 2364)
Operating modes	<ul style="list-style-type: none"> › DSL Terminate › Modem Replacement (DSL to Ethernet) Pass Through 	<ul style="list-style-type: none"> › Ethernet Terminate
Login format	<ul style="list-style-type: none"> › User name and password using PAP/CHAP 	
Connectivity support	<ul style="list-style-type: none"> › IPv4 and IPv6 LAN/WAN status › IPv4 and IPv6 DNS, gateway › IPv4 DHCP client/server, DHCP vendor class › IPv6 DHCP client › NAT 	<ul style="list-style-type: none"> › VLAN ID, VLAN tagging › VPI/VCI › IP release › Multi-VLAN support
Ping test	<ul style="list-style-type: none"> › Ping destination › Number of pings › Packet size › Timeout › Results 	<ul style="list-style-type: none"> › Gateway, IPv4 or IPv6 address or URL › 1 to 99 › 32 to 1200 bytes (32 is default) › 1 to 10 seconds › Packets sent/received, average round-trip delay (ms)
Traceroute test	<ul style="list-style-type: none"> › Traceroute destination › Timeout › Packet size › Number of hops › Results 	<ul style="list-style-type: none"> › Gateway, IPv4 address or URL › In seconds, default is 1 s, maximum is 10 s › 32 bytes › 1 to 32 (default is 30) › Indicates IPv4 address of hop and round-trip time in milliseconds (ms)
FTP test	<ul style="list-style-type: none"> › Address › Direction › Results 	<ul style="list-style-type: none"> › IPv4 address or URL › Upload and/or download › Time, kB transferred, bit rate in kbit/s
Web browser (software option)	<ul style="list-style-type: none"> › Address › Bookmarks 	<ul style="list-style-type: none"> › IPv4 address or URL › User-definable
VoIP testing (software option)	<ul style="list-style-type: none"> › Protocol support › Codecs › Interface support › Parameter/functionality 	<ul style="list-style-type: none"> › SIP (IPv4) › G.711 μ-Law, G.711 A-Law › ADSL1/2/2+, VDSL2, Ethernet › Test duration timer › MOS (current, average) › R-Factor (current, average) › Latency (current, average, maximum) › Jitter (current, average, maximum) › Packets (lost, total)
IPTV testing (software option)	<ul style="list-style-type: none"> › Supported video standards › Operating modes › IPTV parameters/functionality 	<ul style="list-style-type: none"> › MPEG2, MPEG4 part 2 and 10 (H.264/AVC), Microsoft Mediaroom/WM9/VC1 › DSL Terminate › Ethernet Terminate › IGMP (IPv4) join/leave requests with STB emulation › Automatic tests to join/leave and analyze up to five simultaneous streams › Programmable channel list for storage of commonly used channels › Bandwidth usage per channel › IGMP (IPv4) packet and rate information per line and channel › Multicast/unicast RTP/UDP IP stream support › Key IP video QoS parameters, packet loss, zap time, PID statistics › Graphical results › Transport

GENERAL SPECIFICATIONS	
Display	Touchscreen TFT LCD with backlight 152 mm (6 in) diagonal 800 x 480 resolution, WVGA
Test connections	RJ11 for ADSL2+/VDSL2 RJ45 for Ethernet 10/100 WAN RJ45 for Ethernet 10/100 LAN
Results storage	1.2 GB internal memory
Temperature operating storage	0 °C to 40 °C (32 °F to 104 °F) -20 °C to 60 °C (-4 °F to 140 °F)
Relative humidity	5 % to 95 %, non-condensing
Shock	1 m (39 in) drop per GR-196-CORE
Altitude	3000 m (9842 ft)
Input power	9-24 VDC, 2 A, 15 W via 90-220 VAC adapter or 12 V vehicle adapter
Battery	Internal rechargeable lithium polymer, with battery-state and level indications, adjustable auto-power down
Safety	CE and CSA marked
Size (H x W x D)	254 mm x 124 mm x 62 mm (10 in x 4 ⁷ / ₈ in x 2 ⁷ / ₁₆ in)
Weight (with battery)	1.5 kg (3.3 lb)
Water/dust ingress	IP54 compliant
Self-test	Routine on power-up
Connectivity	Two USB 2.0 client ports One USB Type B host port
Languages	English, French, Spanish, Polish and Italian

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NOTICE
通告

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



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 镉 (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.
如果适用。

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.
如果适用。

P/N: 1068550

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