

LeCroy



Operator's Manual

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Introduction

WaveStudio is used to provide remote access to your oscilloscopes from a PC. It provides a graphical user interface with several powerful functions used to view and utilize waveforms.

System Requirements

- Your oscilloscope firmware must be at least **version 6.0.1.x or higher**.
- Your PC must be running **Windows XP SP2 (or newer)** with **256 MB of RAM (or more)** and **2 GB (or more)** of free HDD space.

Getting Started with WaveStudio

This section is meant to quickly get you up and running with your remote oscilloscope connection using WaveStudio. Use these steps to perform the following tasks.

Connecting to an Oscilloscope, Viewing, and Saving a Waveform, and Taking a Screen-Shot

1. **Make the hardware connection to your oscilloscope.**

For GPIB and USB/VirtualCOM connections, making the hardware connection includes plugging the cable between the oscilloscope and the PC. For network connections, connect the oscilloscope to your network or to your PC. (Use a crossover cable for direct connections.)

2. **Configure the remote control settings on the oscilloscope to enable remote control.**

Your oscilloscope may have multiple selections for remote control interface types available. Go to your oscilloscope's remote control dialog (**Utilities → Utilities Setup...**, and then click the **Remote** tab) to configure the remote control settings.

Note: The Utilities Setup dialog is present on LeCroy oscilloscopes running XStream software. While the WaveJet oscilloscope models (which do not run XStream) do not have this specific dialog, they are still supported. Refer to the WaveJet manual at www.lecroy.com for details.

3. **Configure the remote control interface on the PC.**

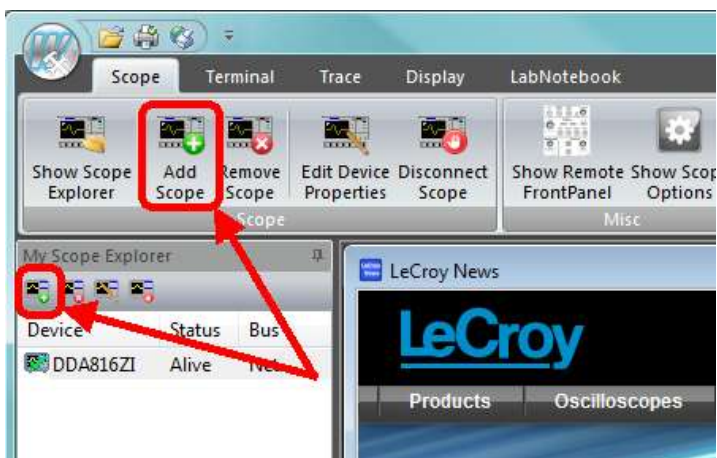
This step might already be complete, especially when connecting via a network; however, when making a direct network connection to the oscilloscope, you need to setup **specific IP addresses** and **subnet masks** on the **PC** and **oscilloscope**.

GPIB users may need to know the **primary GPIB address** of your card (if it isn't set to the default 0 value).

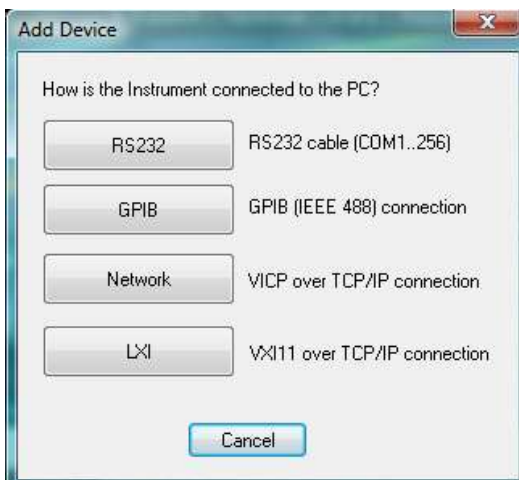
USB users (WaveJet and WaveAce oscilloscopes), should identify the **COM port** configured for the oscilloscope using **Device Manager**. (The USB interface is via **Virtual COM**).

4. Connect to the oscilloscope from Wave Studio.

Your first step in WaveStudio is to **Add a Scope**. This is done by clicking the button for this action, which can be found in the Scope dialog on the ribbon, or via the smaller button that is at the top the **My Scope Explorer** frame.



This opens the **Add Device** window.



Configurations are then made based on how your oscilloscope is connected to your PC (using **RS232**, **GPIB**, **Network**, or **LXI**). Click the appropriate selection to open a window for entering the oscilloscope's address.

When completed, WaveStudio establishes a connection to the oscilloscope and your added device configuration is shown on The Scope (Device) Explorer frame.

With an established connection, the bottom half of the My Scope Explorer frame shows a tree including items like **Terminal**, **Front Panel**, and **Traces** and is where most WaveStudio features are utilized.

5. View and Save a Waveform.

In the **My Scope Explorer** tree, click **Channels** to view the list of all input channels for the connected oscilloscope. Click on **C2** and instruct WaveStudio to fetch the waveform data for channel 2, opening the trace as a file inside the Document Display area.

Now, go up to the ribbon and click **Traces** for additional options for **zooming**, **measurements**, and **cursors**.

Save the waveform data by clicking either **Save to Binary File** or **Save to Text file**.

WaveStudio

6. Saving a Screen-Shot.

With the desired trace as the active file inside the Document Display area, click **Display Capture** at the bottom of the **My Scope Explorer** tree. A screen-shot is then downloaded and displayed as its own file inside the Document Display area.

Save the screen-shot by clicking **Copy to Clipboard** or **Save to bmp file** from the **Display** dialog on the ribbon.

TIP: Right-click on the screen-shot file inside the Document Display area for a contextual right-click menu which includes **Copy to Clipboard** and an **Annotate** option.

Application Layout

After launching WaveStudio, take a moment to familiarize yourself with the following interface sections.



1. **The WaveStudio File Button** (on page 7) - This button provides access to basic Open, Print, and Close, functions.
2. **The Quick Access Toolbar** (on page 7) - A customizable storage location for functions you like to keep handy.
3. **The Ribbon** (on page 8) - Labeled with categorical tabs, these dialogs provide collections of functions based on particular tasks.
4. **The Scope (Device) Explorer** (on page 20) - A listing of connection settings already configured and stored for reuse.
5. **The Document Display** (on page 21) - This is the main display area showing what you've opened to view or configure.

The WaveStudio File Button

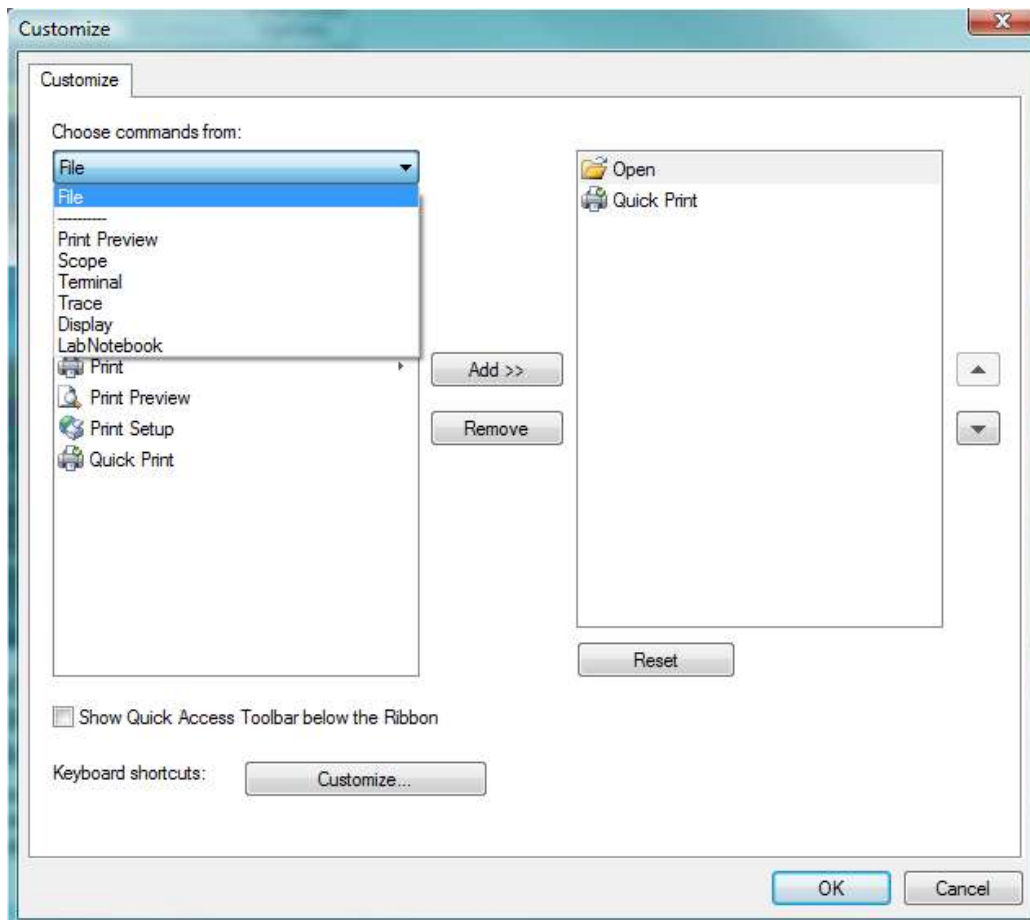
Besides providing access to **Open**, **Print**, and **Close** functions, this button also keeps a running log of recently opened items on the right.

You can also use the **File** button directly open **Report Trace** files which are then shown in the Document Display along with a its Trace Properties window on the far right of the screen. See the **The Ribbon** () topic for details.

The Quick Access Toolbar

This toolbar provides a customizable storage location for your preferred functions. By default, the Open and Quick Print functions are shown on the toolbar.

Customize the toolbar by selecting **More Commands**. The **Customize** pop-up is shown.



Categories of functions are shown on the left. Use the **Choose commands from** drop-down to browse through various functions. Add a function to your toolbar by clicking and selecting the function on the left pane, and then clicking the **Add** button to include it on the right pane. Reverse the process (from right to left) and use the **Remove** button to take a function off your toolbar. Highlight functions on the left pane and use the up and down arrow buttons to rearrange the order of functions on your toolbar.

From this Customize pop-up, you can also do the following:

- Move the toolbar below or above the Ribbon.
- Set Keyboard shortcuts for functions.
- Reset your Customizations to the default state.

The Ribbon

Overview

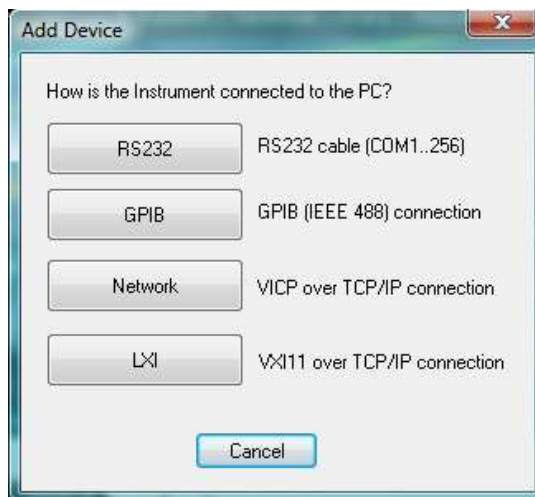
Categorical tabs for these dialogs providing collections of functions based on particular tasks include **Scope**, **Terminal**, **Trace**, **Display**, and **LabNotebook**. Each of these tabs can also be accessed using the **The Scope (Device) Explorer** (on page 20).

Tip: Double-click the tab portion of any dialog to quickly minimize the ribbon. Double-click again to restore the dialog.

The Scope Dialog

This dialog shows three collections **Scope**, **Window**, and **Misc**.

- **Scope** - When not connected to any instrument, the **Show Scope Explorer** button launches the Scope Explorer application. **Add Scope** opens the **Add Device** pop-up.

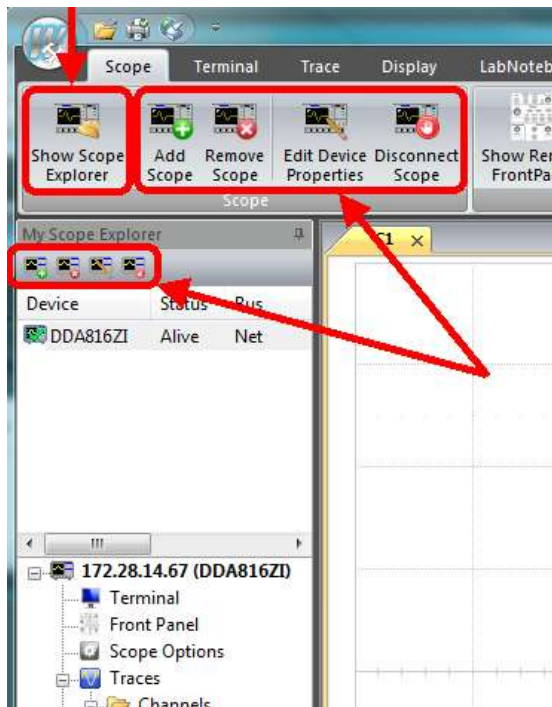


Configurations are then made based on how your oscilloscope is connected to your PC (using **RS232**, **GPIB**, **Network**, or **LXI**).

When completed, your added device configuration is shown on The Scope (Device) Explorer for reuse.

Show Scope Explorer Button

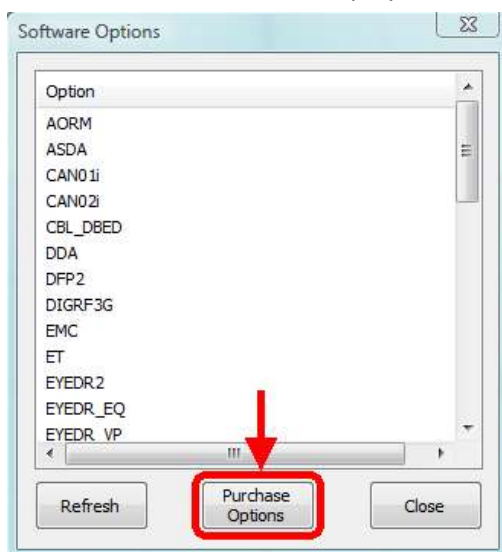
Once connected to an instrument, if you happen to close the My Scope Explorer screen area, it can be reopened using the **Show Scope Explorer** button as follows.



Add, Remove, Edit, and Disconnect Buttons

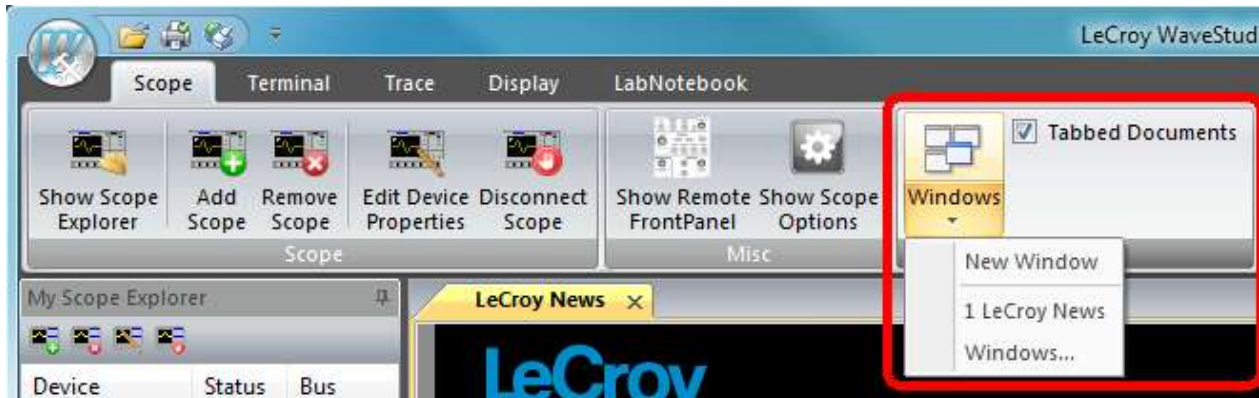
Additional buttons on the Scope Dialog coincide with buttons shown on the My Scope Explorer to **Add** or **Remove**, **Edit**, and **Disconnect** oscilloscope connections, shown previously.

- **Misc** - Your oscilloscope's front panel buttons are easily accessed by clicking the **Show Remote FrontPanel** button. Click the **Show Scope Options** to review software loaded on your instrument. Clicking the **Purchase Options** button shows the Hardware & Software Options page on the LeCroy website in the Document Display for convenience.



Window Functions

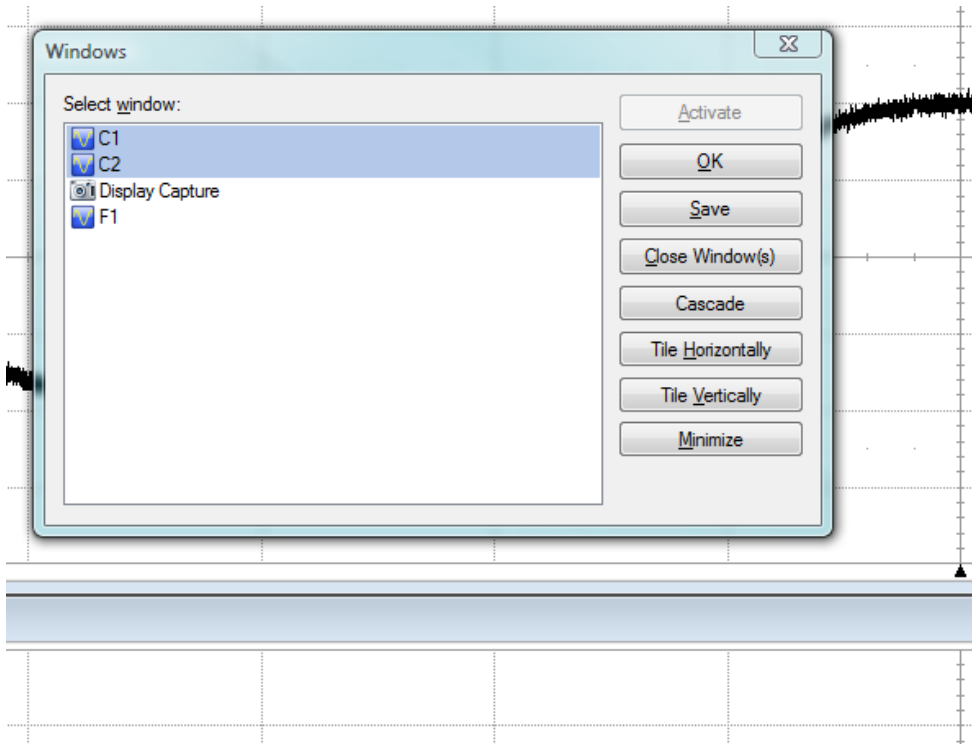
- **Window** - Quickly bring open items to the foreground on The Document Display by selecting from the **Windows** drop-down.



Items in the Document Display are shown in a standard **Tabbed Document** layout by default. Un-check the **Tabbed Documents** check-box for a **floating windows** display of your open items. Or, use the **Windows** button (or select **Windows** from the drop-down menu) for even more display control of your open items showing in the Document Display.

Horizontal, Vertical, or Quad Window Display

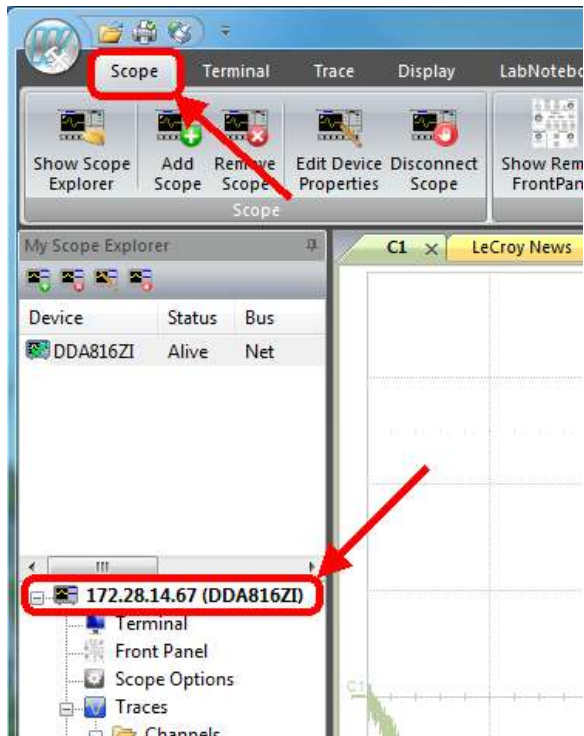
Control the display of multiple windows in the Document Display by un-checking the Tabbed Document check-box, and then use the **Windows** button (or select **Windows** from the drop-down menu) to show the **Windows** pop-up.



The Windows are listed on the left side of the Windows pop-up. Select one or more windows listed and choose from a variety buttons on the right of the Windows pop-up to **Activate**, **Save**, **Close**, **Cascade**, **Tile Vertically**, **Tile Horizontally**, and **Minimize** them.

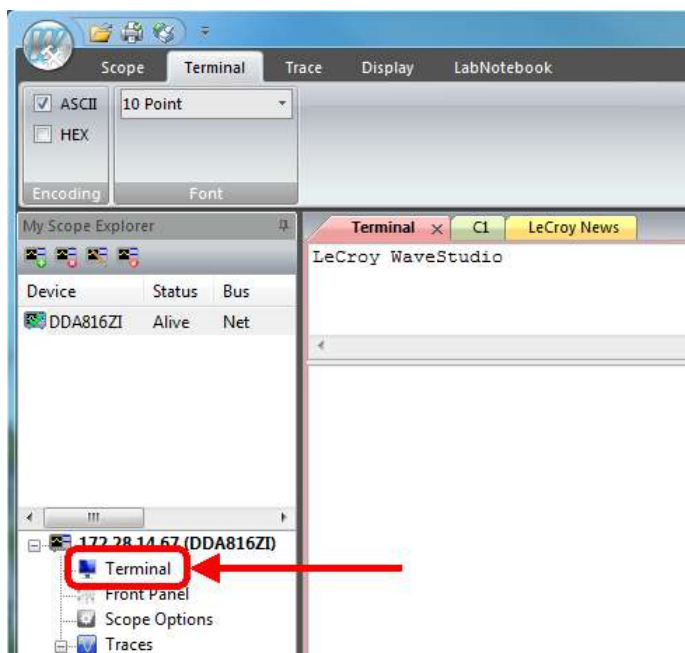
PLEASE NOTE THE FOLLOWING:

- The **Scope Dialog** is also shown when you touch the main node of the connected instrument showing on My Scope (Device) Explorer.
- As a general rule, touch **My Scope (Device) Explorer items** (Terminal, Front Panel, Traces, Display Capture, and LabNotebook) first, and then use corresponding enabled fields on the Ribbon dialogs.



The Terminal Dialog

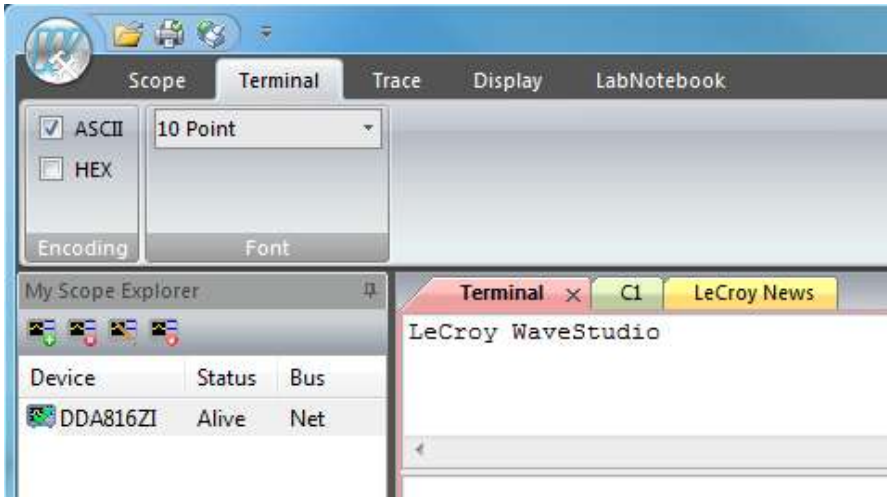
The **Terminal** dialog fields are enabled and a **connection window** is also shown when you touch **Terminal** on the My Scope (Device) Explorer.



WaveStudio

The **Terminal** dialog provides settings for your connection window (shown in the document display area when connected to a device).

You can configure the **Encoding** and **Font** settings for the terminal connection.



How to Use the Terminal Window

Use the Terminal window to interactively test out remote control and queries prior to integration within your own custom application. To open the terminal window, click the option for Terminal in My Scope Explorer. The terminal window opens, and is ready to accept commands and queries. See the Remote Control Manual for your oscilloscope for a complete list of commands and queries.

Trace Folders and The Trace Dialog

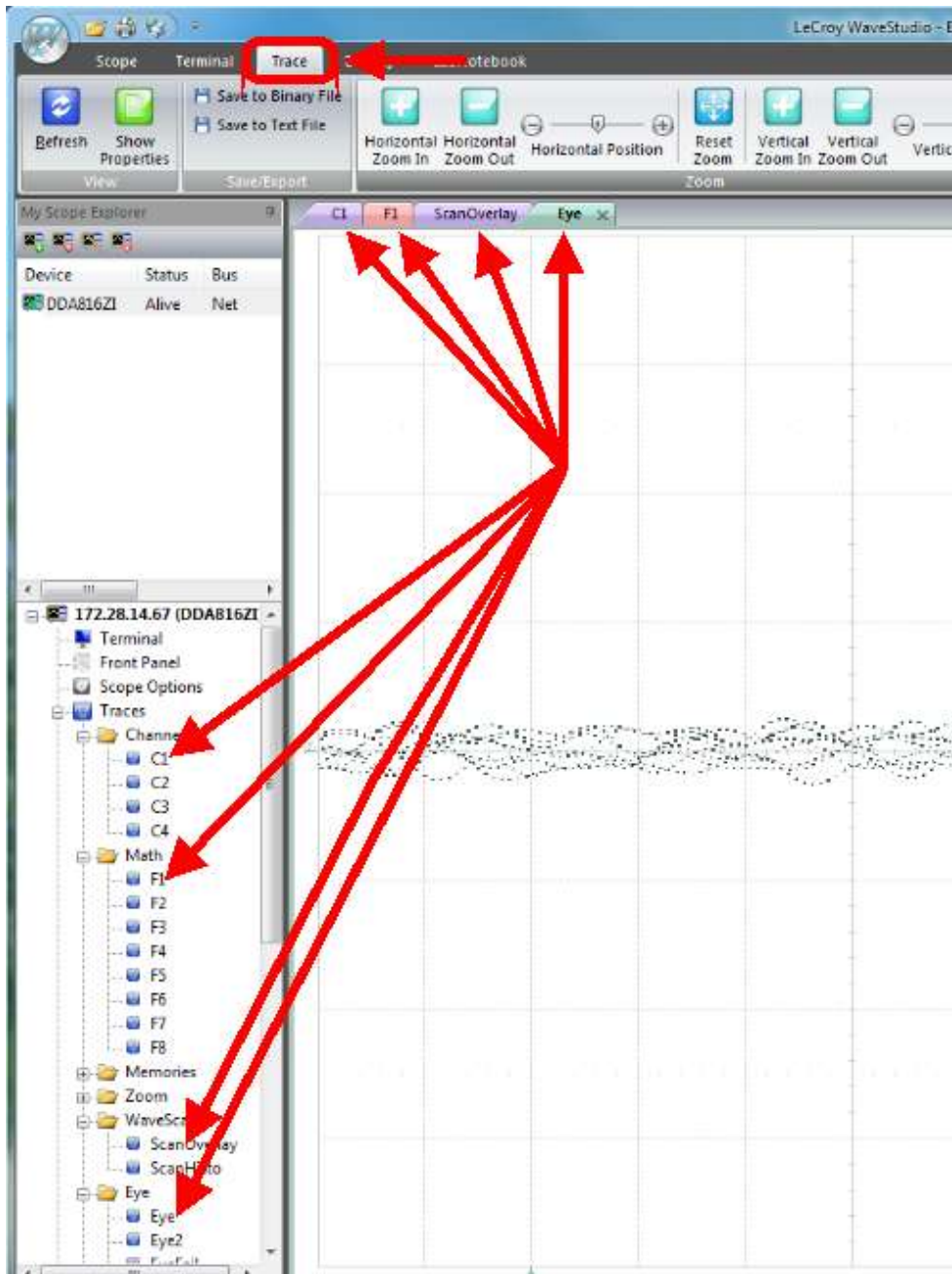
Trace Folders

Since it's necessary to touch **My Scope (Device) Explorer items** (in this case, Traces) first, and then use corresponding enabled fields on the Trace dialog on the Ribbon, lets first clarify the Traces folder on the My Scope (Device) Explorer, and then address the Trace dialog.

The **Trace** folder organizes various trace types into corresponding subfolders as follows:

- **Channels, Math, Memories, and Zoom** subfolders retrieve basic trace information.
- **WaveScan, Eye, EyeDoctor, SDA, and Other** subfolders retrieve trace information based on the features installed on the oscilloscope to which you're connected and correspond with features accessed from the Analysis menu.

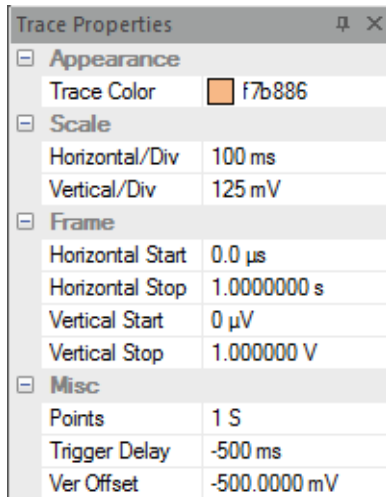
Note: Each click opens a new respective trace window in the document display area.



WaveStudio

The Trace Dialog

When you touch traces from the My Scope (Device) Explorer, fields on the **Trace** dialog are enabled and the trace signal is also loaded in the Document Display area along with a corresponding **Trace Properties** window on the far right of the screen.



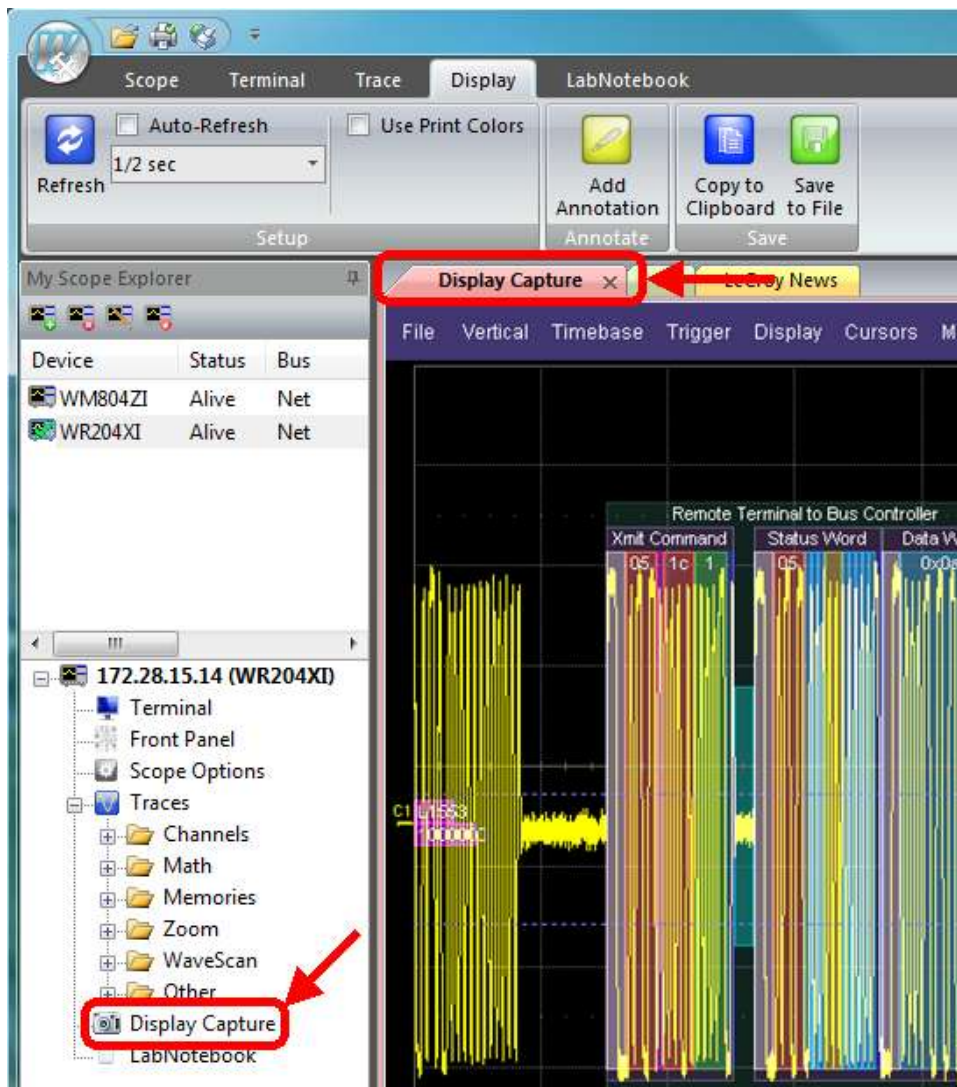
The **Trace** dialog is divided into **View**, **Save/Export**, **Zoom**, **Cursors**, and **Measure** collections.



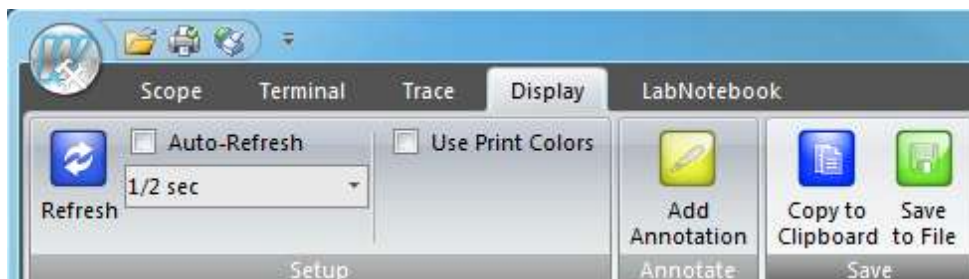
- **View** - Use **Refresh** to adjust the trace display. Click **Show Properties** to display the property dialog to the left of the document display.
- **Save/Export** - You can save your trace to **Binary** or **Text** formats.
- **Zoom** - Horizontally or vertically zoom **In**, **Out**, change **Position**, and **Reset** as desired.
- **Cursors** - Mark the **Show Cursors** checkbox and they are shown on remote or offline traces. Use the **Reset Cursor Pos.** button to reset the cursor locations.
- **Measure** - Mark the **Show Measure** checkbox. Measurements and data are shown for remote or offline traces.
- **Show Measure** checkbox. Measurements and data are shown for remote or offline traces.
- **Copy to Clipboard** - Use this button to add the contents of the trace you are viewing to the clipboard for use outside of WaveStudio.

The Display Dialog

Fields on the **Display** dialog are enabled when you touch **Display Capture** on the My Scope (Device) Explorer.



The **Display** dialog is divided into **Setup**, **Annotate**, and **Save** functions. You can use Display functions while showing a remotely-connected oscilloscope or on saved waveforms loaded into WaveStudio (during offline use).



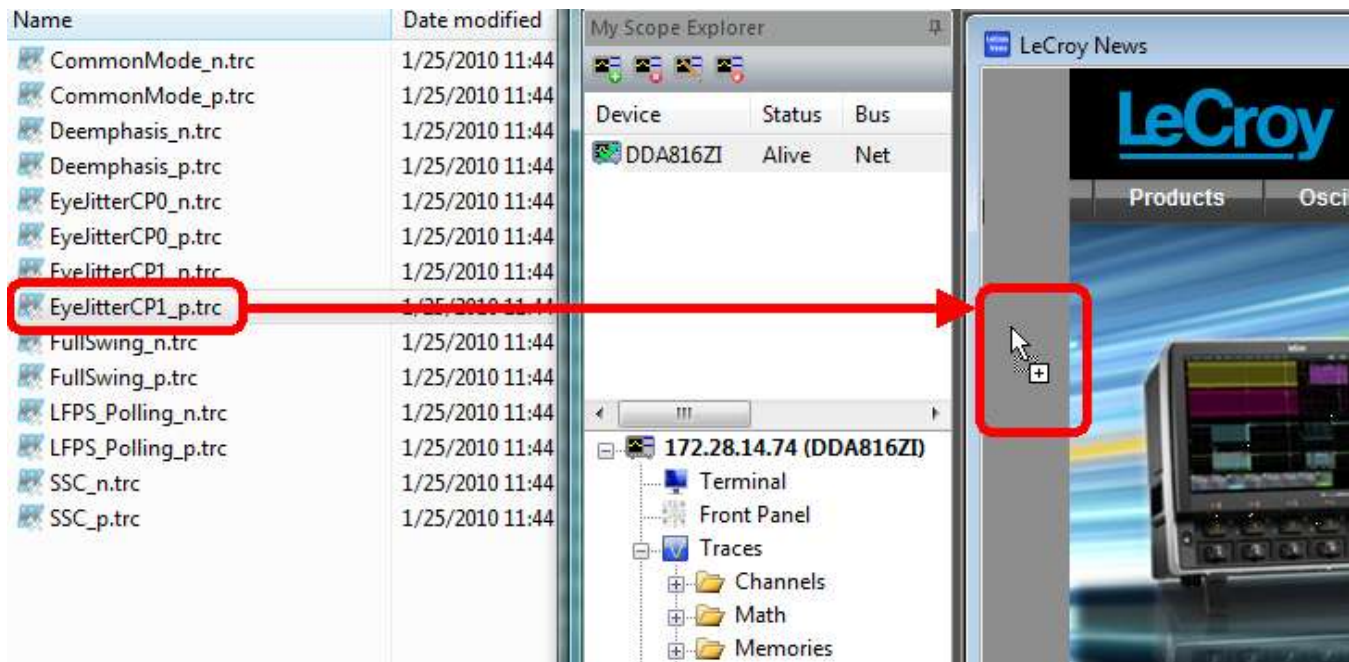
Taking a Remote Screen-Shot

With the desired trace as the active file inside the Document Display area, clicking **Display Capture** at the bottom of the **My Scope Explorer** tree takes a downloaded screen-shot and displays it as a file inside the Document Display area. A **Display Capture** is also shown as a file in the Document Display.

WaveStudio

Drag and Drop Support for .trc Files

Have some .trc files from another oscilloscope you'd like to view in WaveStudio? Just transfer the files to your PC running WaveStudio, and then drag and drop the file(s) anywhere into WaveStudio.



Files are then opened in the Document Display and ready for use.

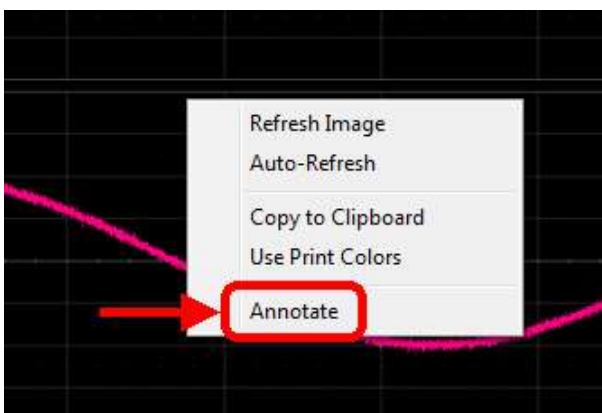
Sizing Traces and Display Captures

When viewing traces on or screen-shots from a remotely-connected oscilloscope, it's a good idea to click the **Refresh** button, or use the **Auto-Refresh** checkbox and drop-down to set forced intervals when WaveStudio reads the display on the connected instrument. This helps you make sure updated changes are being shown from your instrument's display with some relative frequency. It also ensures the image size is being rendered correctly.

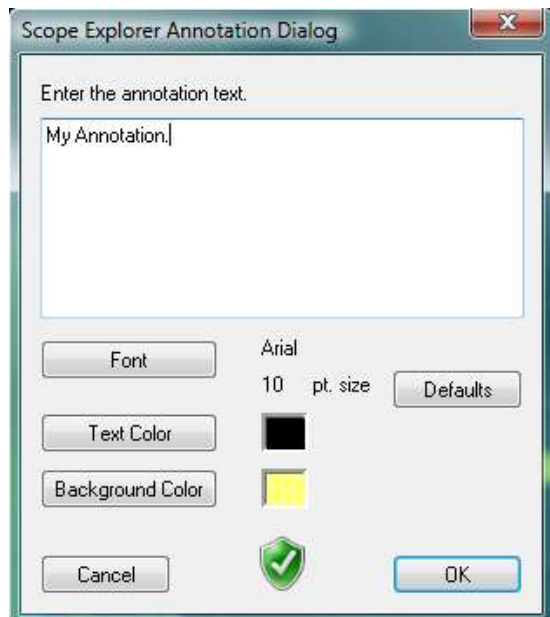
You can also use the **Use Print Colors** checkbox to force the use of a more printer-friendly color palette.

Adding Annotations to Screen-Shots in WaveStudio

Touch the **Add Annotation** button and the **Annotation** dialog is shown. Alternatively, you can **Right-click on the screen-shot** (to which you wish to add an annotation) from inside the Document Display area. A right-click menu is shown. Select the **Annotate** option and the **Annotation** dialog is shown.



On the **Annotation** dialog add text as desired, click the **OK** button, and save your screen-shot again (as follows).



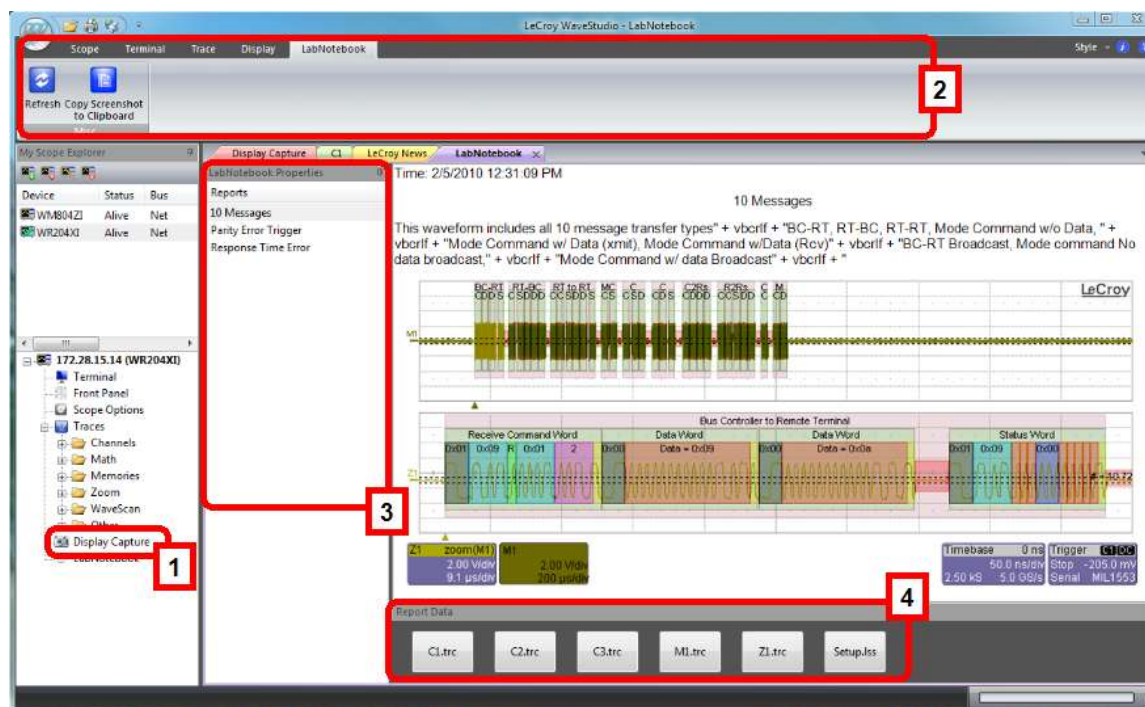
Carefully following these steps stores your annotations inside your saved screen-shot

Saving Screen-Shots in WaveStudio

Saving screen-shots from WaveStudio's Display dialog can be done by touching the **Copy to Clipboard** or **Save to File** buttons.

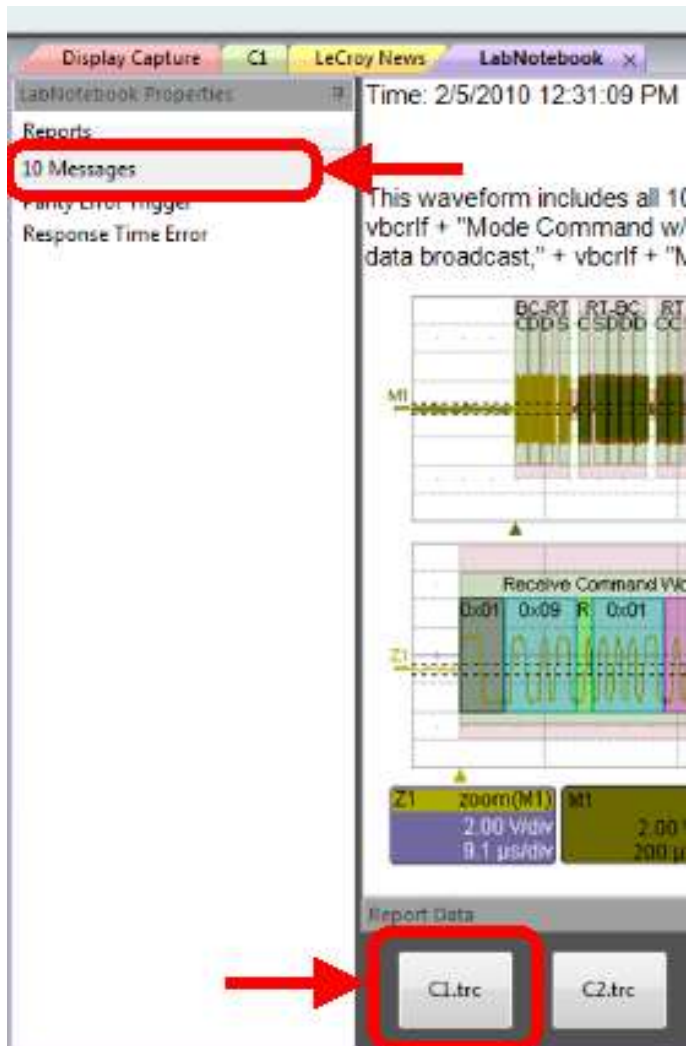
The LabNotebook Dialog

When you touch **LabNotebook** on the My Scope (Device) Explorer (1, as follows), the top **LabNotebook** Ribbon dialog contains **Refresh** and **Copy Screenshot to Clipboard** buttons (2). Also, a list of all LabNotebook **Reports** (3) and saved **Report Traces** (4) on the remotely-connected oscilloscope are shown in the Document Display.



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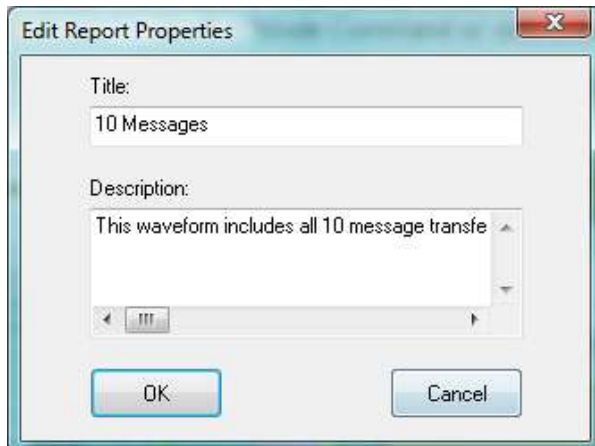
Select one of your Reports saved on the remotely-connected oscilloscope, and then choose one of the Report Traces.



WaveStudio then shows the **Trace dialog with enabled fields** on the top of the screen, **opens the actual Report Trace file (.trc) in the Document Display**, and shows its Trace Properties window on the far right of the screen.

Trace Properties	
Appearance	
Trace Color	f7b886
Scale	
Horizontal/Div	100 ms
Vertical/Div	125 mV
Frame	
Horizontal Start	0.0 μ s
Horizontal Stop	1.0000000 s
Vertical Start	0 μ V
Vertical Stop	1.000000 V
Misc	
Points	1 S
Trigger Delay	-500 ms
Ver Offset	-500.0000 mV

Touch one of your Reports twice and the **Edit Report Properties** dialog is shown where you can make changes to **Title** and **Description** information.



Visual Style, About, and Help

The far right of the ribbon contains a drop-down for selecting the Visual **Style** of the application. By default, the visual style is set to whatever one is already set for your Windows® interfaces. There's also links to the **About** window (showing the WaveStudio splash screen and software revision number) and the **Help** content.



Figure 3-1. The Visual Style Selector



Figure 3-2. The About Button and Splash Screen

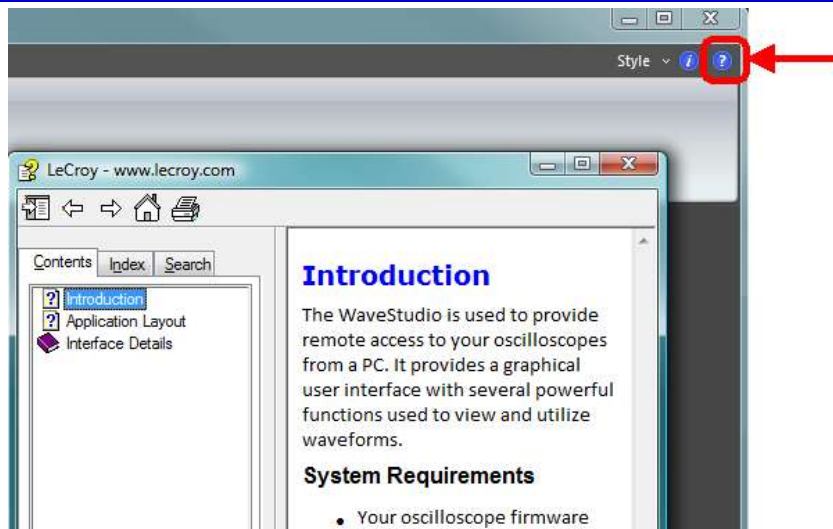


Figure 3-4. Help Button and the Help File

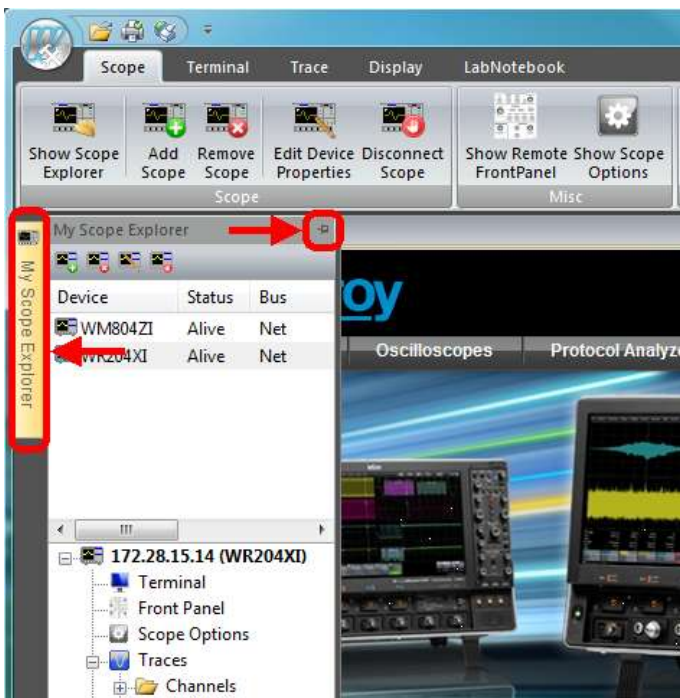
The Scope (Device) Explorer

This area stores a listing of your pre-configured connection settings for reuse.

Add Scope and **Remove Scope** buttons are provided for convenience.

Note: When a device is connected and its status is shown as **Alive**, the lower portion of the Explorer shows the **Instrument**, **Terminal**, **Front Panel**, **Traces** (Channels, Math, and Memory), **Display Capture**, and **LabNotebook**. As a general rule, touch **My Scope (Device) Explorer** items (Terminal, Front Panel, Traces, Display Capture, and LabNotebook) first, and then use corresponding enabled fields on **The Ribbon** (on page 8).

Click the **Auto Hide** pin to store the Explorer to the far left side of the screen; appearing only when you hover the mouse to the **My Scope Explorer** label.



The Document Display

This when you open something to view or configure, it's shown in this main display area.



- If you have the Tabbed Documents checkbox checked (from Scope Dialog on The Ribbon) and multiple documents are open in this area, the tab tops are automatically colorized for convenience.

Tip: Click and drag tabs to reorder them inside the document display.

- The Active Files drop-down on the far right is also provided for quick access to specific open documents.

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