

Quick Reference Guide

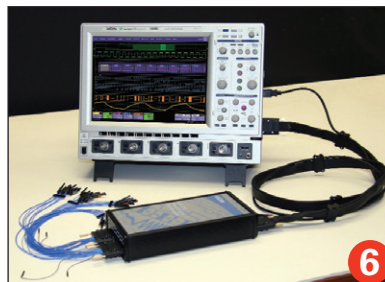
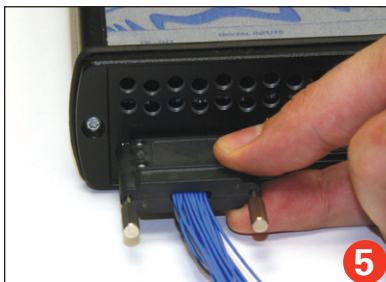
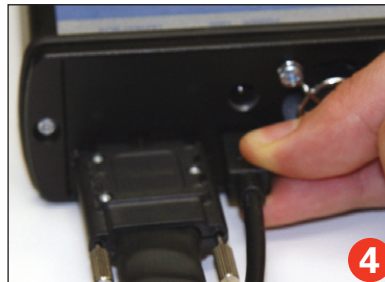
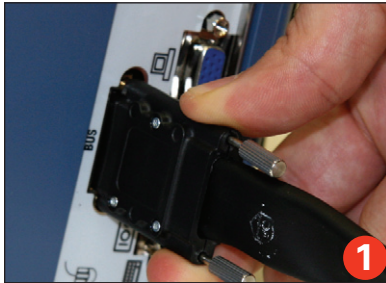


MS Series – Mixed Signal Oscilloscope Option

To get started quickly, take a few moments to read through this guide.

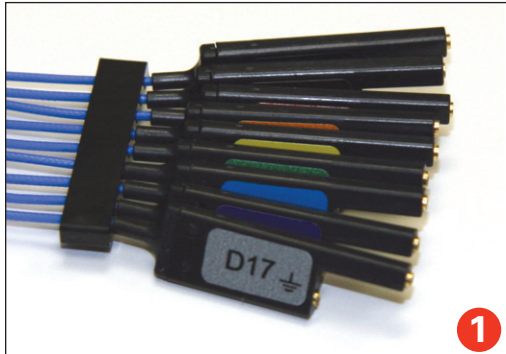
Additional information can be found in the Getting Started Manual.
On-line help also contains more information on using the instrument.

Connecting to the Oscilloscope

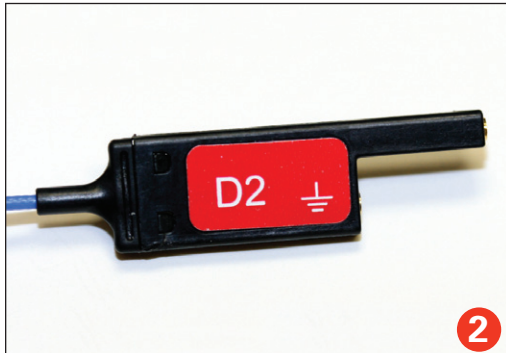


- 1** Connect the LeCroy Bus cable to the LeCroy Bus connector on the side of the oscilloscope and fasten the thumb screws.
- 2** Connect the USB 2.0 cable (attached to the LeCroy Bus cable) to any of the side mounted USB ports on the oscilloscope
- 3** Connect the other end of the LeCroy Bus cable to the MS-250/MS-500 and fasten the thumb screws.
- 4** Connect the other end of the USB 2.0 cable to the MS-250/MS-500.
- 5** Connect the Digital Lead Set to the other end of the MS-250/MS-500 where it is labeled Digital Inputs, D0–D17 and fasten the thumb screws. For MS-500 with 36 channels repeat this step with second lead set, D18–D35.
- 6** The complete system should look like this, shown here is the MS-500 using 36 channels.

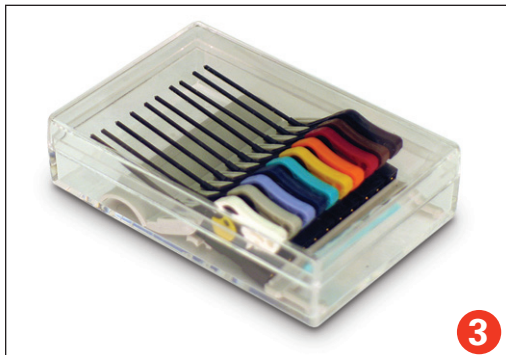
Connecting to the Device Under Test



1



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Standard Output Connection

The standard terminations on the digital lead sets can be pushed directly onto 25-mil pins. MicroGrippers or NanoGrippers may also be used to probe the test circuit's pins. LeCroy provides a selection of small, medium, and large grippers for various pitch sizes.

1 Channel Groupings

The 18 channels in the lead set are divided into two physical groups of 9 and each group is bundled with a plastic separator. When using 36 channels there are 4 groups of 9 leads.

2 Connector Colors

The wires in each group use 9 repeating colors.

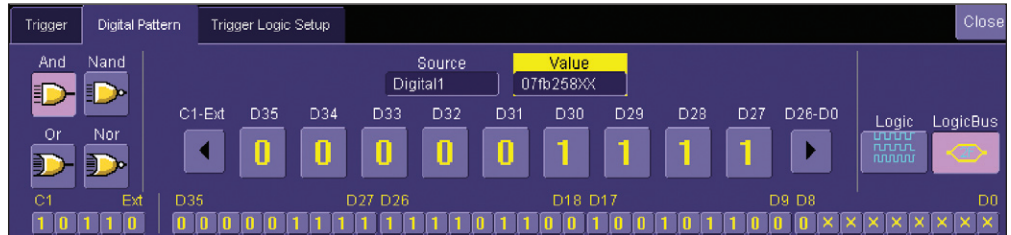
The color sequence corresponds to the resistor color code to make it easy to know the digital line number without having to look at the label.

3 MicroGrippers

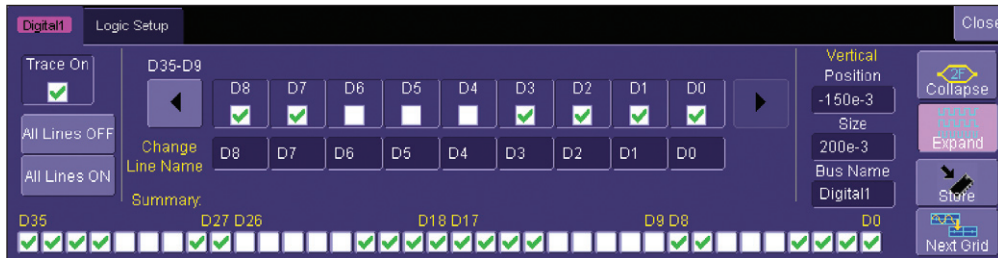
LeCroy offers three different sizes of grippers to probe the device under test. These grippers are designed for 0.1" (2.54 mm), 0.04" (1.0 mm), and 0.008" (0.2 mm) pitch ICs.

Using the MS Series

Digital Group Setup



Pattern Trigger Setup



Overview

The digital trace and pattern trigger settings are easily accessible in a number of ways. The MS Series adds additional dialogs and enhanced trigger capabilities to the WaveRunner Xi and WaveSurfer Xs. When the LeCroyBus cable and USB 2.0 cable are connected these new menus and capabilities are enabled.

Digital Group Setup

Digital groups are very similar to analog channels—they can be turned ON or OFF, they can be increased in size and they can be positioned on the grid. You can also store them as waveform files. In software they are accessed through the same vertical menu as analog channels. Cursors and timing measurements also work with digital traces.

However, digital groups have capability beyond that of analog channels. Each digital group can consist of up to 36 (18 with MS-250) digital lines. You can create up to 4 digital groups and each digital line can be used in as many or as few groups as desired. You can choose to display the group as individual lines or as a collapsed bus view with bus data values calculated on screen within the bus trace.

Pattern Trigger

The MS Series adds a powerful, flexible trigger to the oscilloscope but it is also very easy to set up for basic triggers. Select from any combination of analog and digital channels to set a simple or complex analog/digital cross-pattern trigger. On top of pattern triggering a logic bus value can be entered. Also, any digital channel can be selected as the source for the standard oscilloscope triggers such as Edge, Width, Interval, etc.

Useful Features

Digital Size and Position



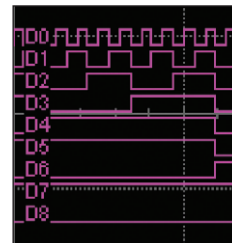
There are no dedicated front panel controls for digital line position and size. However, you can touch the controls (shown at left) twice and enter in a unitless value for position and size using the pop up keypad or you can touch them once and use the front panel adjustment knob to adjust the value.

Another way to make the digital group “active” is to touch the descriptor box (shown at right) and then use the front panel V/div and Offset knobs.



Displaying Digital Information in a Bus View

You can view digital traces as individual lines (Expanded View) like this:



Or collapsed into a bus (Collapsed View) like this:



Just select the appropriate button in the digital menu to get the view that you want.

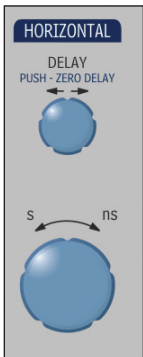


Helpful Hints

Setting Memory

The MS Series is available in two models with different memory lengths. The MS-500 provides 50 Mpts/Ch on 18 channels or 25 Mpts/Ch on 36 channels. The MS-250 provides 10 Mpts/Ch max. If you wish the memory can be used 100% pre-trigger, 100% post-trigger, or something in between.

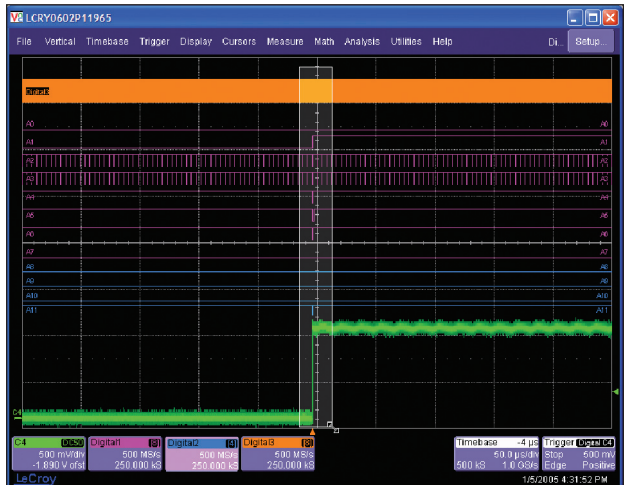
Optimize your memory by accessing the Timebase Dialog and selecting the desired memory length. Make sure enough memory to maintain the desired sample rate or your analog and digital signals may not be acquired accurately.



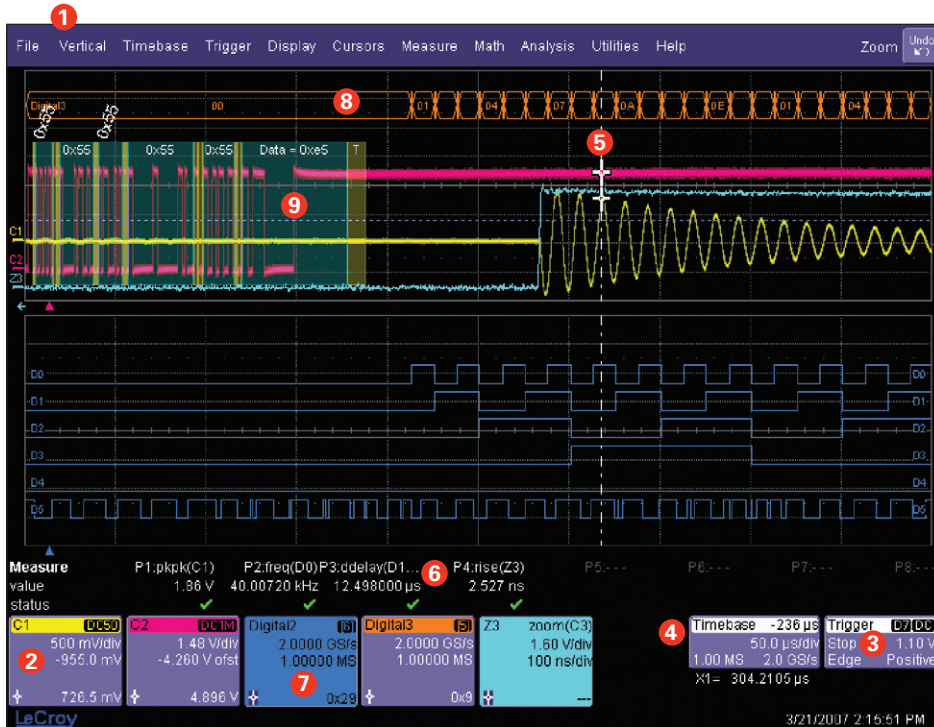
Zooming Analog and Digital Data

There are a number of ways to zoom a mix of analog and digital signals. The easiest method is to zoom everything is to stop the acquisition and simply adjust the T/div and Delay settings. Use the T/div knob to adjust the zoom ration and delay to change the position.

You can also zoom by drawing a box with a mouse or the touch screen around the area you wish to zoom.



Mixed Signal Overview



- 1 Turn on and define a digital group from the vertical menu.
- 2 Descriptor boxes allow quick access to channel dialogs.
- 3 Access the trigger controls by touching the trigger descriptor box.
- 4 Open the Timebase dialog by touch the descriptor. From here increase the memory and/or sample rate.
- 5 Use cursors to measure both analog and digital traces. Turn them on from the front panel button or Cursors menu from the top.
- 6 Add measurement parameters to measure both digital and analog channels from the Measure menu.
- 7 Solid color descriptor boxes indicate active channels. If a digital group or analog channel is active use the front panel V/div and Offset knobs to control them.
- 8 Define the digital group as a bus to read hexadecimal bus data.
- 9 Decode serial bus data (optional) using any of the digital inputs. Access the serial data decode from the Analysis pull down menu.

Thank You for Purchasing a Mixed Signal Oscilloscope

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