



TELEDYNE LECROY
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Quick Reference Guide

WaveSurfer® MXs-B Oscilloscopes



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.

User Interface

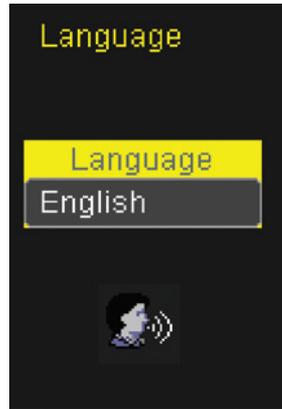
Local Language

Local Language User Interface

WaveSurfer can be set to display software menus in many different languages. You can select your language preference at startup by touching the icon in the upper right corner of the screen. This will take you to the language preferences selection.

Language Preference

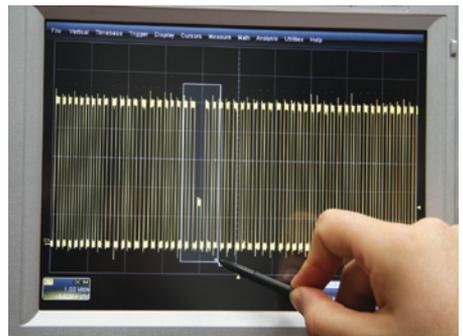
Select a language from the pop-up menu. Once selected, you do not need to reboot your oscilloscope, but you may have to wait a short time for all translated items to load from the database.



Touch Screen with Stylus

Touch Screen with Built-in Stylus Holder

Just pull the stylus out of the built-in holder and use it with the touch screen graphical user interface.



Understanding Display Information



Top Menu Bar
One way of accessing the setup menus.

Trigger Level Indicator
Color coded to the triggered signal.

Grid Area
Similar to many other oscilloscopes.

Descriptor Labels
Touch sensitive. One is provided for each channel, zoom, math, or memory that is on. Touch for quick access to the setup menu.

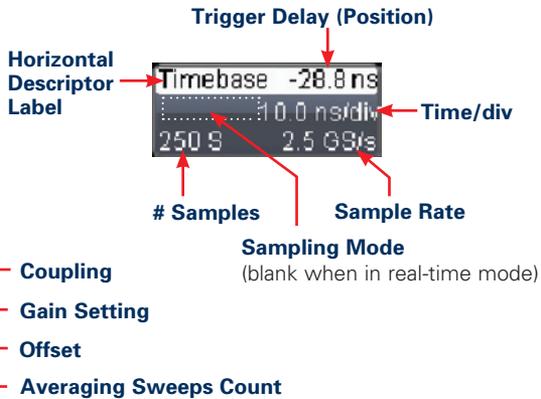
Trigger Position Indicator
Color coded to the triggered signal. Zero is center of display.

Timebase and Trigger Descriptor Labels
Touch sensitive. These are always displayed, and provide information on status. Touch for quick access to the setup menu.

Pre-Processing Summary Listing
(summarizes changes from default states)



Channel Abbreviation



Shortcuts

Shortcuts to Channel, Math, and Memory Menus

are provided to make it easy to access common functions.

Touch the descriptor box to display the menu.



Channel
Descriptor Box



Zoom
Descriptor Box



Math
Descriptor Box



Memory
Descriptor Box

Toolbar Shortcuts to Channel, Math, and Memory Menus

These shortcuts are available from the channel, zoom, math, and memory menus. They can save you valuable setup time by predefining sources; and they provide additional features (such as labeling of traces).



Opens a Measurement selection pop-up menu. You can then select up to 6 parameters (measurements) for the active channel from this menu without leaving the Channel Setup menu.



Creates a zoom trace of the channel signal. The zoom trace becomes active, and you can use the Math and Zoom controls to modify its scale and position.



Opens a Math selection pop-up menu. You can then select a math function for the active channel from this menu without leaving the Channel Setup menu.



Copies the channel trace into its corresponding Memory (Reference Waveform) location. For instance, C1 is loaded into M1, C2 is loaded into M2, etc.



Automatically performs a vertical scaling that fits the waveform into the grid.



Opens a Labeling pop-up menu that allows user-defined labels tied to the waveform.

WaveStream™ Fast Viewing Mode

Overview

WaveSurfer contains WaveStream technology that closely simulates the look and feel of a lively, analog display by providing a fast display update rate. You may adjust the intensity of the trace(s), and sample at the full scope sampling rate while in WaveStream mode, which significantly enhances glitch finding capability.



WaveStream Indicator Light is lighted when WaveStream fast viewing mode is ON.

Turn Knob to adjust intensity in either WaveStream fast viewing mode or real-time sampling mode.

Press Knob to toggle at any time between real-time sampling and WaveStream fast viewing mode.

Math and Measure in WaveStream Mode

WaveStream traces comprise many overlaid traces. While in WaveStream mode, math and measurements are applied only to the last trace in the WaveStream acquisition. A math trace will not have the same appearance as a channel does in WaveStream mode, and measurements will accumulate more slowly compared to real-time sampling mode.

Zooming in WaveStream Mode

WaveStream data is pixilated data with 256 different intensity levels. If you zoom a WaveStream trace, you will zoom pixilated data. Therefore, it is recommended that you toggle to real-time sampling mode for most zooming.

Horizontal and Vertical Controls

Light OFF
Channel may or may not be displayed. Vertical controls will not adjust that channel (channel is "inactive").

Light ON
Indicates that the vertical controls will adjust that channel (channel is "active").

Press Knob
to toggle between zero trigger delay and new setting.

Press Knob
to toggle between zero offset and new setting.

If all Channel Lights are Off

Then the Horizontal and Vertical Controls are "Active" for either a Math, Zoom, or Memory trace, and function as a scale control for the active trace. The solid coloring on the descriptor labels indicates "Active." Note that only one trace can be "Active" at a time.

| | | | |
|---|---|---|---|
| <p>Inactive Vertical controls will not work for this trace</p> | <div style="border: 1px solid gray; padding: 5px; margin-bottom: 5px;"> C1 DC50 200 mV/div -246.0 mV </div> <div style="border: 1px solid gray; padding: 5px; margin-bottom: 5px;"> Math FFT(C1) 20.0 dB/div 125 MHz/div </div> <div style="border: 1px solid gray; padding: 5px; margin-bottom: 5px;"> Z1 zoom(C1) 200 mV/div 1.00 ns/div </div> <div style="border: 1px solid gray; padding: 5px;"> M3 200 mV/div 10.0 ns/div </div> | <div style="border: 1px solid gray; padding: 5px; margin-bottom: 5px;"> C1 DC50 200 mV/div -246.0 mV </div> <div style="border: 1px solid gray; padding: 5px; margin-bottom: 5px;"> Math FFT(C1) 20.0 dB/div 125 MHz/div </div> <div style="border: 1px solid gray; padding: 5px; margin-bottom: 5px;"> Z1 zoom(C1) 200 mV/div 1.00 ns/div </div> <div style="border: 1px solid gray; padding: 5px;"> M3 200 mV/div 10.0 ns/div </div> | <p>Active Vertical controls will work for this trace</p> |
|---|---|---|---|

Trigger Control

Sets the trigger level — push to set to 50%. Is lighted when the trigger is armed. Is lighted and stays lit after a trigger. Press to open the trigger setup menu.

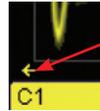
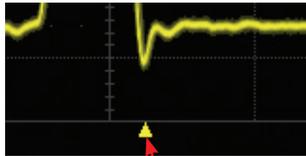
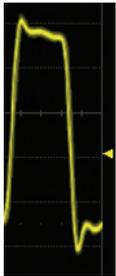


Triggers even if the trigger conditions are not met.

Triggers whenever the trigger conditions are met.

Triggers once (single-shot acquisition) when the trigger conditions are met.

Cancels the acquisition in Auto, Normal, or Single trigger mode.



Post Trigger Indicator

Trigger Position Indicator

Trigger Level Indicator

Touch to access the trigger setup menu.

The image shows a digital display for the "Trigger" setup menu. The text on the screen is as follows:

| | |
|---------|----------|
| Trigger | C1 DC |
| Stop | 510 mV |
| Edge | Positive |

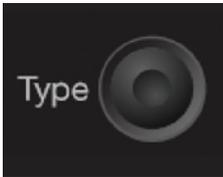
Labels with arrows point to various elements: "Trigger Source" points to "C1 DC"; "Trigger Coupling" points to "DC"; "Trigger Level" points to "510 mV"; "Trigger Mode" points to "Edge"; "Trigger Slope" points to "Positive". A label "Trigger Status" points to the "Stop" option.

Using Cursors

Dedicated cursor knobs on WaveSurfer make using cursors easy. All common cursor features can be accessed from the front panel controls. There is no need to open menus to use cursors on WaveSurfer.

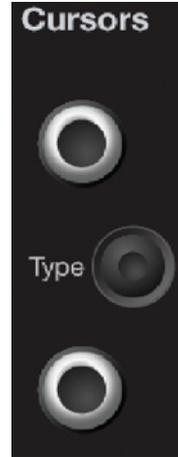
Cursor Type Button

Press to turn cursors ON, toggle through types, and then turn cursors OFF



Cursor Knobs

Rate sensitive knobs combine fine and coarse adjustment. One knob is provided for each cursor. Push to set cursor to default position.



Cursor Readout

Vertical (Y) information is located in the descriptor labels.

| | |
|----|------------|
| C1 | DC50 |
| | 200 mV/div |
| | -246.0 mV |
| ↓ | 841.2 mV |
| ↑ | 805.1 mV |
| Δy | -36.1 mV |

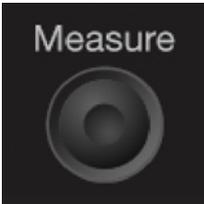
| | |
|-------------------|-----------------|
| Timebase -52.8 ns | Trigger C1 DC |
| 10.0 ns/div | Stop 510 mV |
| 250 S | 2.5 GS/s |
| Edge | Positive |
| X1= 10.4 ns | ΔX= 43.3 ns |
| X2= 53.7 ns | 1/ΔX= 23.09 MHz |

Horizontal (X) information is located underneath the Timebase and Trigger Descriptor Labels

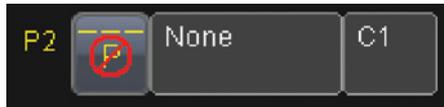
Setting Up Measurements

Measure Button

Press the front panel Measure button to access the Measure setup menu.



Choose your Measurement and Source in the measure setup menu—touch on the icon or Source name to choose.



Measurement Display

Value

Last value measured in the acquisition.

Status Indicator

Good measurement. (Refer to the manual for a complete listing of indicator icons).



Source

Measurement (Parameter) Number **Measurement Name**



Turn statistics on to see complete information

| Measure | P1:ovsh+(C1) |
|---------|-------------------------------------|
| value | 2.1 % |
| mean | 1.623 % |
| min | 454 m% |
| max | 3.0 % |
| sdev | 422 m% |
| num | 371 |
| status | <input checked="" type="checkbox"/> |



View Statistics as Histicons

Simply check the box in the measure menu and a histicon will show you statistical distribution.

Zoom your Signals

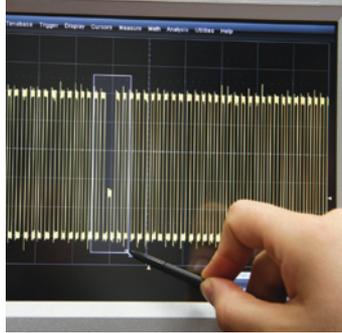
There are three ways to zoom with the WaveSurfer.
Use whichever method feels best.



1 QuickZoom Button

Press the button and all

channels displayed will be zoomed in separate grids. Will also UNDO any zooms.



2 Draw a Zoom Box

Using the stylus, outline the area you wish to zoom.



3 Horizontal Adjust

Stop your acquisition, and use the delay and horizontal adjust knobs to position a subset of your acquisition.

Zoomed Area is shown



Zoom Descriptor Label

shows zoom scaling.



Use Horizontal and Vertical controls to adjust memory scale and position (if desired).

Setting Up Math

Math Button

Press the front panel Math button to turn on the Math trace and access the Math setup menu



Choose your Math Operator and Source(s) in the Math setup menu—touch on the Operator name or Source name to choose



Math trace appears on a separate grid



Math Descriptor Label shows math scaling.

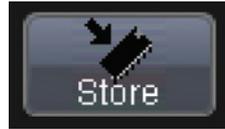


Use Horizontal and Vertical controls to adjust math scale and position (if desired).

Setting Up Memories (Reference Waveforms)



- 1 **Touch the descriptor label** of the trace that you want to create a memory of (if it's not active, you'll have to touch it twice).



- 2 **Touch the Store Button** in the toolbar area of the channel setup menu.

Memory trace automatically appears on the grid.



Memory Descriptor Label

shows memory scaling.



Use Horizontal and Vertical controls to adjust memory scale and position (if desired).

Communicate and Document

WaveSurfer makes it easy to store, transfer and print your files and images. Refer to the Getting Started Manual for complete details.



Saving Screen Images

You can save a screen image as a file, send it as an email, print it, or store it on the clipboard. Define in Utilities, Utilities Setup, Hardcopy Menu.

Print Button

Can be defined to perform with one button push any of the functions at left.



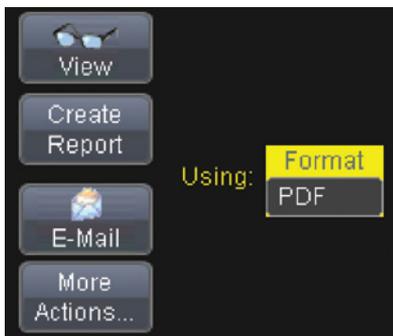
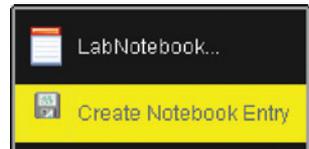
LabNotebook™

Saving Work and Documenting Results

The WaveRunner LabNotebook feature simplifies the way important waveforms, screen captures, and oscilloscope setup files are saved and documented. LabNotebook also provides an easy way to recall your settings with the Flashback feature. And it lets you create reports, showing your screen images, in pdf, html, or rtf output formats.

Creating a LabNotebook Entry

LabNotebook entries are easily created by selecting LabNotebook from the File menu, then clicking the Create button. Several annotation tools and colors then are put at your disposal to mark up your waveform. When you click Done, your mark-ups and scope settings are saved together in a database resident on the scope.



Click the Create Report button to generate a hardcopy format that you can save to a network drive or external media. Or click the E-mail button to send the report to another location. Use the Flashback feature at any time to recall a Notebook entry, including scope setup, for further study.

Communicate and Document



Front Mounted USB Port

makes it easy to transfer files quickly to your PC. Or, store files to your hard drive.



Connect Your WaveSurfer to the Network

and easily email files to people anywhere, or let others view your oscilloscope display from their PC. Plug in printers to USB ports.

**Thank You for Purchasing
a WaveSurfer Oscilloscope.**



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