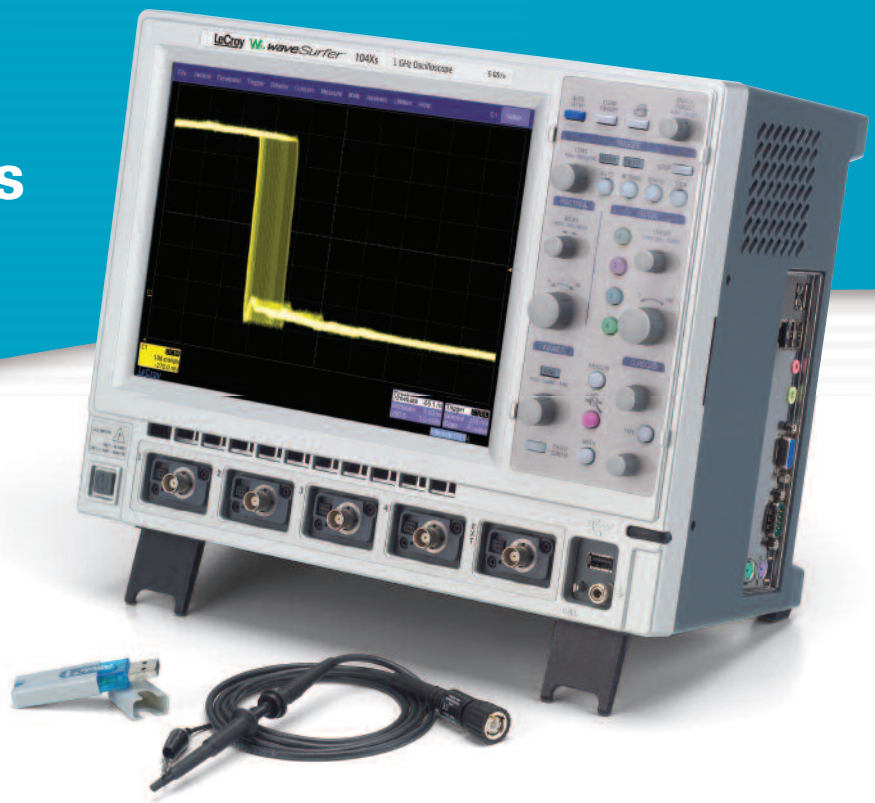
LeCroy

WaveSurfer® 104Xs



Leading Features

- **1 GHz Bandwidth**
- **2.5 GS/s Sample Rate (5 GS/s interleaved)**
- **2.5 Mpts/Ch standard**
- **Large Display and Small (6" deep) footprint**
- **I²C and SPI Trigger/Decode options enhance productivity in debugging embedded systems**
- **WaveScan™ locates unusual events in a single capture, or scans for events in many acquisitions over long periods of time.**
- **LeCroy WaveStream™ Fast Viewing Mode provides a lively analog-like display with 256 intensity levels**
- **Use with new ZS Series of high impedance, single-ended active FET probes with low circuit loading**
- **Mixed Signal Oscilloscope option (MS-32)**

The WaveSurfer 104Xs provides users with a great combination of performance, features, and value. Its incredibly small footprint (6" deep) and large 10.4" display make it a perfect fit for users who prefer a basic everyday oscilloscope, have limited work space, or both.

A Great Combination

Basic signal integrity checks and circuit validations require tools to quickly and effectively reach conclusions about circuit performance. WaveSurfer Xs provides the right combination of performance and features to help technicians and engineers quickly determine circuit quality and to perform basic debug. The new 1 GHz WaveSurfer 104Xs is ideal for those users who need higher bandwidth performance, but may have limited interest or need to use a more fully-featured instrument.

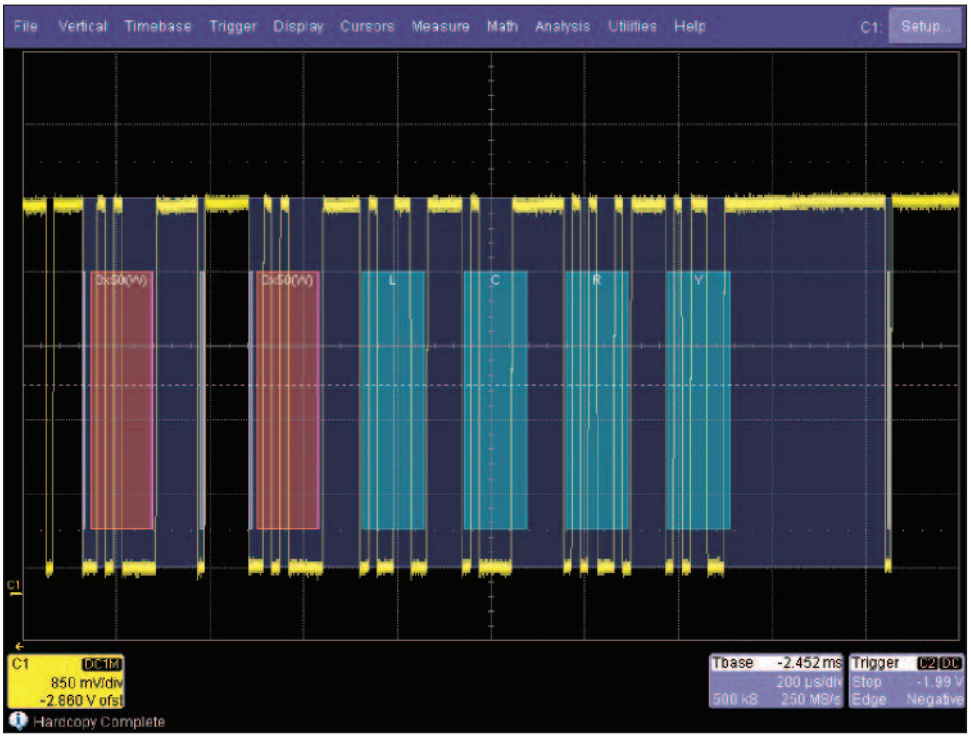
WaveScan™ Locates Problems Faster

The best trigger won't find all unusual events—a more powerful capability is needed. WaveScan provides the ability to locate unusual events in a single capture, or scan for an event in many acquisitions over a long period of time. Select from nearly 20 search modes (pulse width, runt, duty cycle, etc.), apply a search condition, and begin scanning. Zoom to view a specific location as needed.

I²C and SPI Trigger/Decode Options Enhance the Solution

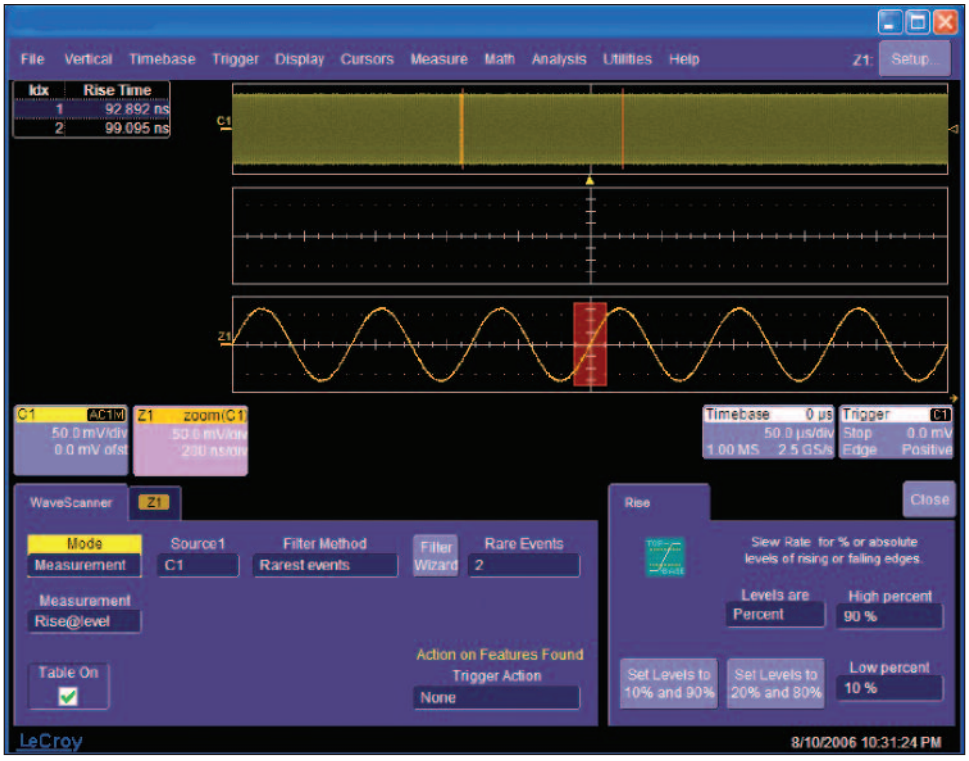
All WaveSurfer Xs oscilloscopes are now available with a powerful and flexible I²C or SPI trigger/decode option. The decode is color-coded and overlayed on the waveform, which makes it easy for novices or experts to understand embedded system behavior. The triggers are built in to the oscilloscope. I²C triggers offer unique conditional data triggering capability—in addition to "DATA=", a user can specify DATA >, ≥, <, ≤, <>, in range, or out of range. This makes it especially useful for triggering on specific I²C EEPROM memory locations, or verifying safe operating range by monitoring I²C ADC/sensor values.

New Capabilities Enhance WaveSurfer Xs



Use conditional I²C DATA triggering to isolate specific messages.

WaveScan in WaveSurfer Xs provides capability beyond triggering—locate unusual events in a single capture, or scan for events in multiple captures. Set the oscilloscope to perform a variety of actions when an event condition is satisfied.



Specifications

	WaveSurfer 44Xs	WaveSurfer 42Xs	WaveSurfer 64Xs	WaveSurfer 62Xs	WaveSurfer 104Xs
Analog Bandwidth @ 50 Ω 10 mV–1 V/div	400 MHz	400 MHz	600 MHz	600 MHz	1 GHz
Rise Time	875 ps	875 ps	625 ps	625 ps	400 ps
Input Channels	4	2	4	2	4
Display	10.4" Color flat-panel TFT-LCD, 800 x 600 SVGA, touch screen				
Sample Rate (single-shot)	2.5 GS/s (all channels)				
Sample Rate (RIS mode)	50 GS/s				
Standard Record Length	2.5 Mpts (all channels)				2.5 GS/s (5 GS/s interleaved)
Standard Capture Time	up to 1 ms at full sample rate				
Vertical Resolution	8 bits				
Vertical Sensitivity	2 mV/div–10 V/div (1 MΩ); 2 mV/div–1 V/div (50 Ω)				
Vertical (DC Gain) Accuracy	±1.0% of full scale (typical); ±1.5% of full scale, ≥ 10 mV/div (warranted)				
Bandwidth Limit	20 MHz, 200 MHz				
Maximum Input Voltage	CAT I: 400 V max. (DC + Peak AC ≤ 5 kHz) with 1 MΩ input. 5 V_{rms} with 50 Ω input				50 Ω: 5 V_{rms} 1 MΩ: 250 V max (Peak AC: ≤ 10 KHz + DC)
Input Coupling	AC, DC, GND (DC and GND for 50 Ω)				
Input Impedance	1 MΩ || 16 pF, or 50 Ω				1 MΩ || 20 pF, or 50 Ω
Probing System	BNC or ProBus				
Probes	One PP009 (5 mm) per channel (standard)				One PP007 (2.5 mm) per channel (standard)
Timebase Range	200 ps/div–1000 s/div (roll mode from 500 ms/div–1000 s/div)				
Timebase Accuracy	10 ppm				

Triggering

Standard	Edge, Glitch, Width, Logic (Pattern), TV-Composite Video
Advanced (WS Xs-ADVTRIG)	Runt, Slew Rate, Interval, Dropout, Qualified (State or Edge)

Measure, Zoom, and Math Tools

Standard Parameter Measurement	Up to 6 of the following parameters can be calculated at one time on any waveform: Amplitude, Area, Base (Low), Cyclic Area, Cyclic Mean, Cyclic RMS, Cyclic Std. Deviation, Delay, Duty, Fall Time (90%-10%), Fall Time (80%-20%), Frequency, Maximum, Mean, Minimum, Overshoot+, Overshoot-, Period, Peak-Peak, Phase, Rise Time (10%-90%), Rise Time (20%-80%), RMS, Skew, Standard Deviation, Top (High), Width+, Width-. Measurements can be gated.
Zooming	Use front panel QuickZoom button, or use touch screen or mouse to draw a box around the zoom area.
Standard Math	Operators include Sum, Difference, Product, Ratio, and FFT (up to 25 kpts with power spectrum output and rectangular, VonHann, and FlatTop windows). 1 math function may be defined at a time.
Extended Math (WS Xs-MathSurf)	Adds the following additional math functions: Absolute Value, Averaging (summed and continuous), Derivative, Envelope, Enhanced Resolution (to 11 bits), Floor, Integral, Invert, Reciprocal, Roof, Square, and Square Root. Also adds chaining of two math functions, rescaling to different units, and 1 Mpts FFTs.

Ordering Information

Product Description	Product Code
WaveSurfer Xs Digital Oscilloscopes	
1 GHz, 2.5 GS/s, 4 Ch, 2.5 Mpts/Ch (5 GS/s interleaved) with 10.4" Color Touch Screen Display	WaveSurfer 104Xs
Included with Standard Configuration	
÷10 HiZ 500 MHz Passive Probe (Total of 1 Per Channel)	
Getting Started Manual and Quick Reference Guide	
CD-ROMs containing Utility Software	
Standard Ports: 10/100Base-T Ethernet, USB 2.0 (5), SVGA Video out, Audio in/out, RS-232	
Protective Front Cover	
Standard Commercial Calibration and Performance Certificate	
3-year Warranty	
Memory Option	
10 Mpts/Ch Memory Option	WSXs-VL
General Accessories	
Keyboard Accessory	WSXs-KYBD
Optical Mouse Accessory	WSXs-MOUSE
External GPIB Accessory	WS-GPIB
Hard Carrying Case	WSXs-HARDCASE
Soft Carrying Case	WSXs-SOFTCASE
Rack Mount Accessory	WSXs-RACK
Accessory Pouch	WSXs-POUCH
Mounting Accessory	
Clamp Mounting Stand	WSXs-MS-CLAMP
Local Language Overlays	
German Front Panel Overlay	WSXs-FP-GERMAN
French Front Panel Overlay	WSXs-FP-FRENCH
Italian Front Panel Overlay	WSXs-FP-ITALIAN
Spanish Front Panel Overlay	WSXs-FP-SPANISH
Japanese Front Panel Overlay	WSXs-FP-JAPANESE
Korean Front Panel Overlay	WSXs-FP-KOREAN
Chinese (Tr) Front Panel Overlay	WSXs-FP-CHNES-TR
Chinese (Simp) Front Panel Overlay	WSXs-FP-CHNES-SI
Russian Front Panel Overlay	WSXs-FP-RUSSIAN

Product Description	Product Code
Software Options	
Advanced Trigger Software Package	WSXs-ADVTRIG
Extended Math Software Package	WSXs-MATHSURF
Electrical Telecom Mask Test Software Package	WSXs-ET-PMT
Windows Lockout Software Option	WSXs-LOCKOUT
Hardware and Software Application Options	
32 Digital Channel Oscilloscope Mixed Signal Option	MS-32
I²C Trigger and Decode Option	I2Cbus TD
SPI Trigger and Decode Option	SPIbus TD
Probes and Amplifiers*	
1.5 GHz, 1 MΩ, 0.9 pF Active Probe	ZS1500
1 GHz, 1 MΩ, 0.9 pF Active Probe	ZS1000
2500 V, 50 MHz, High CMRR Differential Amplifier	PWR2500-DA
500 V, 100 MHz, High CMRR Differential Amplifier	PWR500-DA
100 V, 100 MHz, High CMRR Differential Amplifier	PWR100-DA

*A wide variety of other passive, active, and differential probes are also available. Consult LeCroy for more information

Customer Service

LeCroy oscilloscopes and probes are designed, built, and tested to ensure high reliability. In the unlikely event you experience difficulties, our digital oscilloscopes are fully warranted for three years, and our probes are warranted for one year.

This warranty includes:

- No charge for return shipping
- Long-term 7-year support
- Upgrade to latest software at no charge

LeCroy

1-800-5-LeCroy
www.lecroy.com

Local sales offices are located throughout the world.
To find the most convenient one visit www.lecroy.com

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