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TECHNOLOGY GROUP

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WaveSurfer Specifications

Main Specifications

	WaveSurfer 424	WaveSurfer 422	WaveSurfer 434	WaveSurfer 432	WaveSurfer 454	WaveSurfer 452
Bandwidth (@ 50 Ω)	200 MHz		350 MHz		500 MHz	
Rise Time (Typical)	1.75 ns		1 ns		750 ps	
Input Channels	4	2	4	2	4	2
Display	10.4" color flat-panel TFT-LCD, 800 x 600 SVGA, touch screen					
Sample Rate (single-shot)	1 GS/s (all channels), 2 GS/s max. (interleaved mode).					
Sample Rate (RIS mode)	50 GS/s					
Standard Record Length	1 Mpts/Ch (all channels), 2 Mpts/Ch (interleaved mode).					
Standard Capture Time	up to 1 ms at full sample rate					
Vertical Resolution	8 bits					
Vertical Sensitivity (V/div)	1 mV/div–10 V/div (1 MΩ); 1 mV/div–2 V/div (50 Ω)					
Vertical (DC Gain) Accuracy	±(1.5% + 0.5% of full scale)					
Vertical Offest Range	±1 V (1–20 mV/div), ±10 V (50–200 mV/div), ±100 V (500 mV–10 V/div)					
Bandwidth Limit	20 MHz		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					
Input Coupling	AC, DC, GND (DC and GND for 50 Ω)					
Input Impedance	1 MΩ || 16 pF, or 50 Ω ±1%					
Probing System	BNC or ProBus					
Probes	One PP007 (2.5 mm) per channel standard					
Timebase Range	1 ns/div–1000 s/div		500 ps/div–1000 s/div		200 ps/div–1000 s/div	
Timebase Accuracy	10 ppm					

Triggering

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

Measure, Zoom, and Math Tools

Standard Parameter Measurements	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 may 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-MATHSURF Option)	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.

Product Code / Ordering Information

Product Code	Ordering Information
WaveSurfer Four Channel Digital Oscilloscopes	
WaveSurfer 454	500 MHz, 2 GS/s, 2 Mpts/Ch (Interleaved), with 10.4" Color Display (1 GS/s, 1 Mpts/Ch)
WaveSurfer 434	350 MHz, 2 GS/s, 2 Mpts/Ch (Interleaved), with 10.4" Color Display (1 GS/s, 1 Mpts/Ch)
WaveSurfer 424	200 MHz, 2 GS/s, 2 Mpts/Ch (Interleaved), with 10.4" Color Display (1 GS/s, 1 Mpts/Ch)
WaveSurfer Two Channel Digital Oscilloscopes	
WaveSurfer 452	500 MHz, 2 GS/s, 2 Mpts/Ch (Interleaved), with 10.4" Color Display (1 GS/s, 1 Mpts/Ch)
WaveSurfer 432	350 MHz, 2 GS/s, 2 Mpts/Ch (Interleaved), with 10.4" Color Display (1 GS/s, 1 Mpts/Ch)
WaveSurfer 422	200 MHz, 2 GS/s, 2 Mpts/Ch (Interleaved), with 10.4" Color Display (1 GS/s, 1 Mpts/Ch)
Included with Standard Configuration	
10.4" 800x600 resolution TFT display	
PP007-WS-1, ÷10 HiZ 500 MHz Passive Probe	
Operator's Printed Getting Started Manual and Quick Reference Guide	
CD-ROM with Operator's On-Line Help, Getting Started Manual (multi-language), Quick Reference Guide, and Remote Control Manual	
CD-ROM with Application Software	
10/100Base-T Ethernet Port, 3 USB 2.0 Ports, SVGA Video Output, RS232-C Serial Port, Centronics Parallel Port	
Protective Front Cover	
Standard Commercial Calibration and Performance Certificate	
3-Year Warranty	
Hardware and Software Options and Accessories	
WS-ADVTRIG	Advanced Trigger Software Package
WS-ET-PMT	Electrical Telecom Mask Test Software Package
WS-MATHSURF	Extended Math Software Package
WS-LOCKOUT-BUS	Operating System Lockout Option for Businesses
WS-LOCKOUT-NFP	Operating System Lockout Option for Not-for-Profit Organizations
MS-32*	32 Digital Channel Oscilloscope Mixed Signal Option
WS-GPIB	USB 2.0 to GPIB IEEE-488.2 Adapter
WS-BATT-SYS	Complete Battery System (one (1) battery pack and one (1) charger)
WS-DCADAP	12-28 Vdc Input DC-DC Converter
*MS-32 is compatible with only WaveSurfer 434 and 454 oscilloscopes.	
Mounting/Ergonomic Accessories	
WS-MS-CLAMP	Mounting Stand – Desktop Clamp Style (includes WS-MB mounting bracket)
WS-MB	Mounting Bracket Only – 100 mm Square
WS-RMA-25	Rackmount Ears Kit

For more detailed information and a listing of LeCroy offices and distributors visit www.lecroy.com/goto/wavesurfer

Available from:

LeCroy

www.lecroy.com

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WS400DSrevA_17Apr06
LG 7.5K

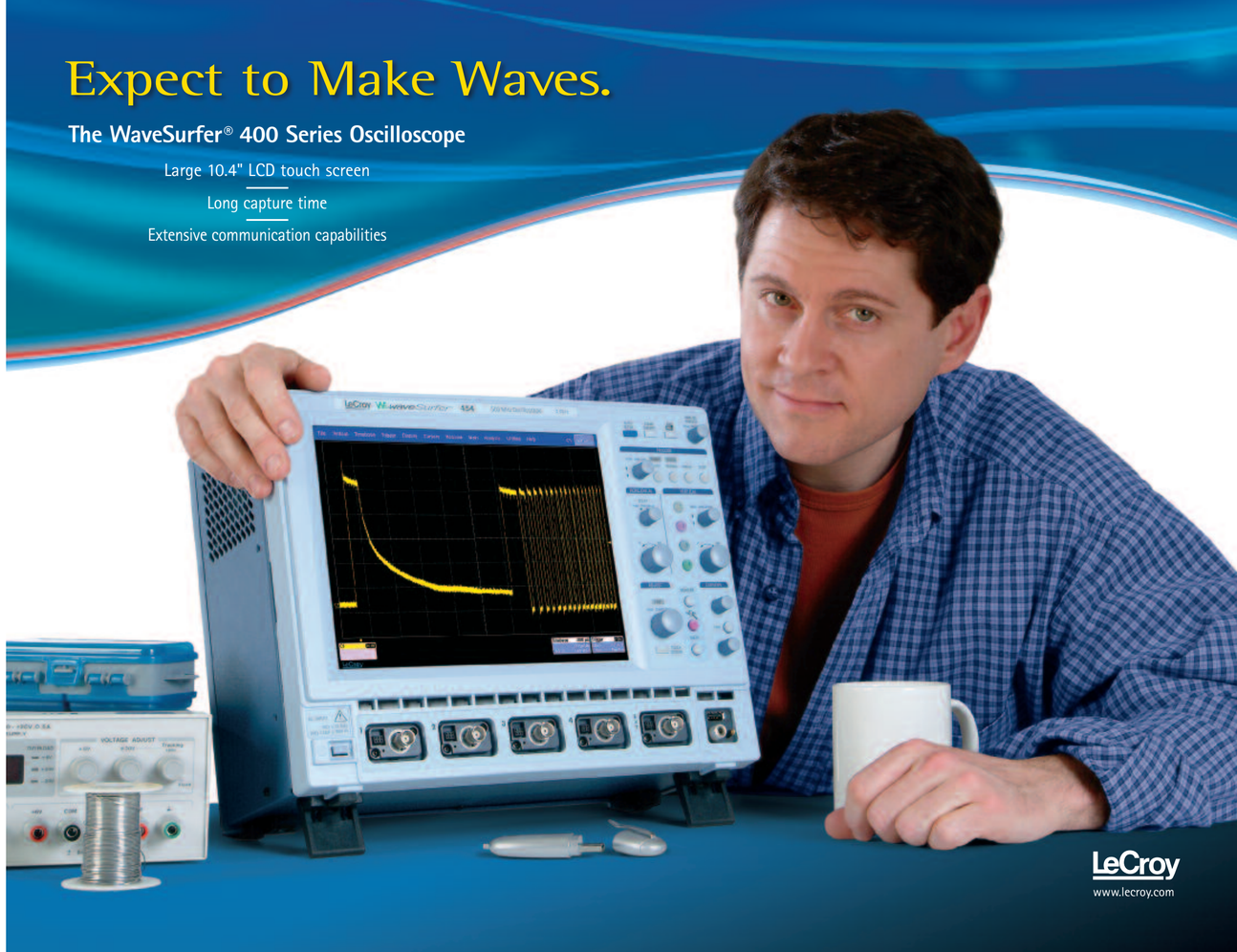
Expect to Make Waves.

The WaveSurfer® 400 Series Oscilloscope

Large 10.4" LCD touch screen

Long capture time

Extensive communication capabilities



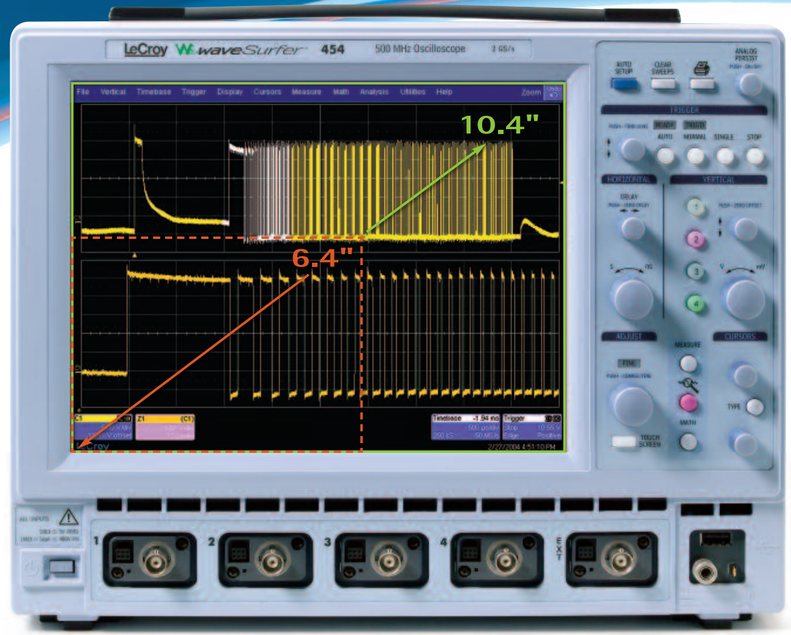
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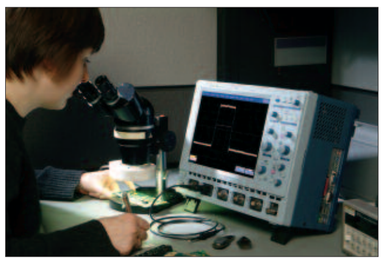
The WaveSurfer Oscilloscope — It's an Original

From its large 10.4" LCD touch screen to its space-saving small footprint, the WaveSurfer oscilloscope is a radical rethinking of the basic bench scope. It breaks the rules of conventional scope design to deliver dramatically improved signal viewing, 100x the capture time, and up-to-the-minute connectivity capabilities. But more importantly, it's designed for the way you like to work — big, sharp images of your signal, a simple, easy-to-use interface and a strong tool set for testing and debugging. Bottom line? It's not only a great fit for your bench, it's a perfect match for your budget.

So Much to See



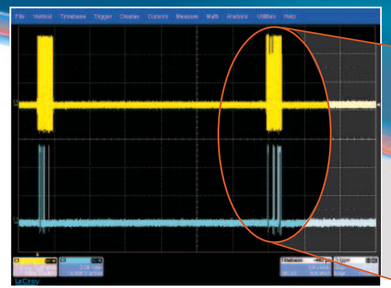
The WaveSurfer 400 Series' 10.4" display is 2-1/2 times the size of the 6.4" screens found on competitive oscilloscopes. And its 6" deep footprint eliminates the space penalty that comes with conventional oscilloscopes. Just looking at the screen you can see the improvement — the 800 x 600 SVGA display boasts exceptional brightness and a wide viewing angle. Signal details are clearer than ever. And you know that when you can see the signal, you can come up with the solution. That's what the WaveSurfer 400 Series oscilloscope is all about.



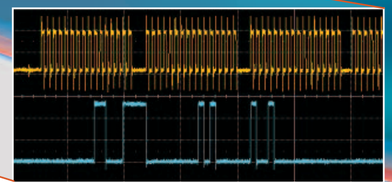
The space savings on your bench are dramatic.

Long capture time

Large screens show the detail — if you can capture it. The WaveSurfer oscilloscope provides all the detail you need by delivering more than 100x the capture time at full sample rate compared to other oscilloscopes in its class. It effectively eliminates the trade-off between high sample rate and long capture time. This high sample rate is especially important when capturing a mix of signals that are spaced widely apart in time, or when you require a long pre-trigger time. This means that the WaveSurfer 400 Series oscilloscope beats short-memory scopes when it comes to the debugging of common circuit problems like clock/data issues and timing errors.



1 ms long acquisition



Zoom for detail — sample rate remains high

See more at www.lecroy.com/goto/wavesurfer/capture

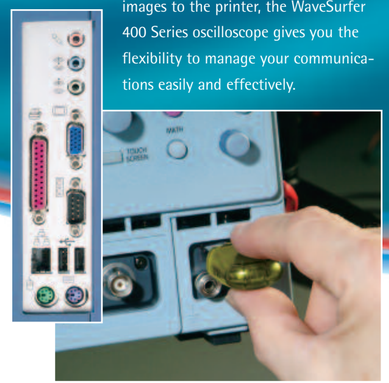
EXTEND WAVESURFER CAPABILITIES WITH OPTIONAL PACKAGES

- **Advanced Trigger Software Package**
  Includes Runt, Slew Rate, Qualified Edge, Qualified State, Interval (Signal or Pattern), and Dropout Triggers
- **MathSurfer**
  Additional math functions, chained math functions, rescaling of units, and enhanced FFT capability.
- **ET-PMT Electrical Testing**
  Transforms your oscilloscope into a dedicated mask testing device for manufacturing and field testing of electrical telecom signals.
- **MS-32 Mixed Signal Option***
  The ultimate solution for mixed signal oscilloscopes—enough channels. LeCroy's MS-32 and a WaveSufer oscilloscope provide 4 analog and 32 digital channels for powerful measurement capability. The perfect solution for 16-bit or 32-bit embedded controller testing.

  **MS-32 can be used with WaveSurfer 434 and 454 oscilloscopes.*

Communicate all the ways you want

Your list of connectivity options is extensive — from the front mounted USB port for your memory stick to the standard 10/100Base-T Ethernet port. You can document your work and communicate effectively with your group. Whether you want to save data to the oscilloscope's hard drive or a network drive, email other engineers, or send images to the printer, the WaveSurfer 400 Series oscilloscope gives you the flexibility to manage your communications easily and effectively.



www.lecroy.com/goto/wavesurfer/communication

One Touch Access to 23 Measurements

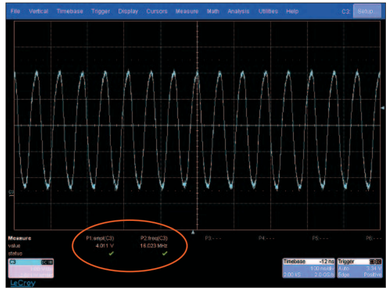
The WaveSurfer 400 Series oscilloscope fits your working style as comfortably as it fits your bench. Twenty-three basic measurements have been built in to give you quick answers.



1. *Access the measure menu from the front panel.*



2. *Select your measurement (and source, as necessary).*



3. *Measurements appear automatically below the grid and never obscure your signals.*

Smooth Cursor Control

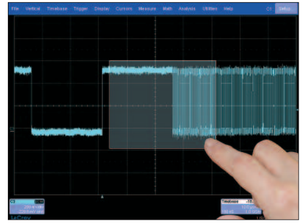
You can use dedicated front panel cursor knobs to position your cursors at any time without invoking special menus. You can quickly choose your cursor by using the "type" button. Then apply them to any signal, zoom, or math trace. You won't find an easier-to-use set of cursors on any other oscilloscope.



www.lecroy.com/goto/wavesurfer/tour

Simple Zooming and Math

Zooming is so easy with this scope — simply draw a box around the area to be zoomed (or use the front panel QuickZoom button). Waveform math is also built in and easily applied. In addition, a power spectrum FFT is standard. It can be quickly invoked and easily set up, even by someone not familiar with FFTs.



Try our Zero Footprint

The WaveSurfer 400 Series desktop clamp-style mounting system attaches to the edge of your bench and frees up valuable working space. Viewing positions can be changed easily up to a maximum range of 23" (58 cm). The scope can also be pivoted to achieve the optimal viewing angle. Or purchase just a mounting bracket and provide your own 75 x 75 mm mounting solution.



Desktop clamp-style mounting stand is available as an accessory.

www.lecroy.com/goto/wavesurfer/display



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