

LECROY (TELEDYNE LECROY)

WaveSurfer 44MXs-A

The Teledyne LeCroy WaveSurfer 44MXs-A is a high-performance 400 MHz, 4-channel digital storage oscilloscope featuring a large 10.4-inch touch screen, a deep 10 Mpts/Ch acquisition memory, and a fast real-time sample rate of up to 5 GS/s. Built with a space-saving design only 15 cm deep, it provides advanced analysis capabilities such as WaveStream fast viewing mode, WaveScan Search and Find, and LabNotebook documentation, making it an exceptional tool for everyday design and debug.

SPECIFICATIONS

General

Interfaces	4 × USB 2.0 Host (2 front, 2 rear), 1 × USB 2.0 Device, 10/100Base-T LAN, SVGA Video Out, External Trigger Input, Auxiliary Output, GPIB (optional)
Display	10.4-inch Color TFT-LCD touch screen, 800 × 600 SVGA resolution
Standard Warranty	3 years

Physical

Power Supply	90 - 264 VAC, 47 - 63 Hz / 380 - 420 Hz, max 200 VA
Operating Temperature	5 to 40 °C °C
Dimensions (W×H×D)	340 mm × 260 mm × 152 mm mm
Weight	7.26 kg kg

Vertical System

Analog Bandwidth	400 MHz
Rise Time (10% to 90%)	875 ps
Input Channels	4
Vertical Resolution	8-bit (up to 11-bit with ERES)
Sensitivity Range (50 Ω)	2 mV/div - 1 V/div
Sensitivity Range (1 M Ω)	2 mV/div - 10 V/div
DC Vertical Gain Accuracy	$\pm 1.5\%$ of full scale
Max Input Voltage (50 Ω)	5 Vrms
Max Input Voltage (1 M Ω)	400 V max (DC + Peak AC $\leq$ 10 kHz)
Input Coupling	AC, DC, GND
Input Impedance	1 M $\Omega \pm 1\%$ 16 pF, or 50 $\Omega \pm 1\%$
Bandwidth Limiters	20 MHz, 200 MHz
Channel-to-Channel Isolation	≥ 40 dB (up to rated bandwidth)
Offset Range (50 Ω)	2 mV - 4.9 mV/div: ± 400 mV; 5 mV - 9.9 mV/div: ± 1 V; 10 mV - 19.8 mV/div: ± 2 V; 20 mV - 99 mV/div: ± 5 V; 100 mV - 1 V/div: ± 10 V
Offset Range (1 M Ω)	2 mV - 4.9 mV/div: ± 400 mV; 5 mV - 9.9 mV/div: ± 1 V; 10 mV - 19.8 mV/div: ± 2 V; 20 mV - 99 mV/div: ± 5 V; 100 mV - 198 mV/div: ± 20 V; 200 mV - 990 mV/div: ± 50 V; 1 V - 10 V/div: ± 100 V

Horizontal System & Acquisition

Max Real-Time Sample Rate (Single Channel)	5 GS/s (interleaved)
Max Real-Time Sample Rate (All Channels)	2.5 GS/s
Max Memory Depth (Single Channel)	10 Mpts
Max Memory Depth (All Channels)	10 Mpts/Ch
Timebase Range	200 ps/div - 1000 s/div
Timebase Accuracy	± 10 ppm

Trigger System

Trigger Modes	Auto, Normal, Single, Stop
Trigger Coupling	AC, DC, HFRej, LFRej
Trigger Source	CH1, CH2, CH3, CH4, EXT, EXT/10, Line
Trigger Holdoff Range	2 ns to 20 s, or 1 to 99,999,999 events
Trigger Level Range	±4.1 divisions (Internal), ±0.5 V (External), ±5 V (External/10)
External Trigger Input Impedance	1 MΩ ± 1% 16 pF
External Trigger Max Input Voltage	400 V max (DC + Peak AC ≤ 10 kHz)
Edge Triggering	Rising, Falling
SMART Triggers	Glitch, Width, Logic, Interval (State/Edge), Dropout, Runt, Slew Rate
TV / Video Triggering	Standard NTSC, PAL, SECAM, HDTV
Edge Trigger Sensitivity (Internal)	0.6 div (DC to 10 MHz), 0.9 div (DC to 400 MHz)
External Trigger Sensitivity	0.9 div equivalent or 90 mV (DC to 400 MHz)
Trigger Displacement Range	Pre-trigger: 0 to 100% of full scale; Post-trigger: 0 to 10,000 divisions or 86,400 seconds
Trigger Holdoff Types	By time (100 ns to 20 s) or by events (1 to 99,999,999 events)

Acquisition Modes

Real-Time Mode	Standard real-time acquisition
Sequence Mode	Segmented memory up to 1,000 segments
Roll Mode	Supported for slow timebases
Average Mode	Summed average up to 1 million sweeps

Mathematical & Analysis Capabilities

Standard Math Operators	Sum, Difference, Product, Ratio, FFT, Absolute Value, Average, Derivative, Envelope, Enhanced Resolution (ERES), Integral, Reciprocal, Rescale, Square, Square Root, Zoom
FFT Window Functions	Von Hann (Hanning), Hamming, Flat Top, Rectangular, Blackman-Harris
Automatic Measurements	Up to 6 measurements displayed simultaneously with statistics
WaveScan Search and Find	More than 20 search and scan modes
Pass/Fail Mask Testing	Supported with multi-segment masks
LabNotebook	Standard documentation and report generation tool

Display & User Interface

Grid Styles	Single, Dual, Quad, Octal, XY, Single+XY, Dual+XY
Waveform Display Styles	Normal (vectors), Dots
WaveStream Fast Viewing Mode	Intensity-graded (256 levels) analog-like display

Storage & Processor

Operating System	Windows XP Embedded
Internal Storage	Internal hard drive

Environmental & Compliance

Storage Temperature	-20 to 60 °C
Operating Humidity	5% to 80% RH (non-condensing) up to 30 °C, de-rating to 45% RH at 40 °C
Operating Altitude	Up to 3,000 m (9,843 ft)
LXI Compliance	LXI Class C compliant
Calibration Interval	1 year
Safety Compliance	UL 61010-1, CAN/CSA-C22.2 No. 61010-1-04, EN 61010-1
EMC Compliance	EN 61326-1

Ordering Information & Options

Standard Included Probes	One PP009 (500 MHz, 10:1, 10 MΩ) passive probe per channel
Mixed Signal Option	MS-250 (250 MHz, 18 Ch, 1 GS/s) or MS-500 (500 MHz, 18 or 36 Ch, 2 GS/s)
Serial Decode Options	I2C, SPI, UART, RS-232, LIN, CAN

Acquisition System

Random Interleaved Sampling (RIS) Rate	50 GS/s
Enhanced Resolution (ERES)	0.5 to 3 bits in 0.5-bit steps
Interpolation	Linear, Sin(x)/x
Maximum Segmented Memory Segments	1,000

Triggering

Trigger Jitter	≤ 9 ps rms (typical)
External Trigger Input Range	EXT: ±0.4 V, EXT/10: ±4.0 V

Hardware & Operating System

Processor	Intel Celeron M 1.5 GHz
System Memory	1 GB RAM

Connectivity

USB Host Ports	4 x USB 2.0 (2 front, 2 side)
USB Device Ports	1 x USB 2.0 (Type B) for remote control
LAN Port	10/100/1000Base-T Ethernet (RJ-45)
External Monitor Port	15-pin D-Sub (SVGA)
Auxiliary Output	Rear panel BNC (Trigger Out, Pass/Fail, or Calibrator)
Probe Interface	LeCroy ProBus
GPIO Port Option	Supported via optional external USB-to-GPIO adapter

Power Requirements

AC Input Voltage	90 - 264 VAC (at 47 - 63 Hz), 90 - 132 VAC (at 380 - 420 Hz)
Max Power Consumption	340 VA

Inputs & Outputs

Probe Calibration Output	1 kHz, 1 V p-p square wave into $\geq 10\text{ k}\Omega$
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Horizontal System

Channel-to-Channel Deskew Range	$\pm 9\text{ ns}$
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Data Storage & Transfer

Waveform Storage Formats	Teledyne LeCroy Binary (.trc), ASCII, CSV, Mathcad, MATLAB, Excel
Image Storage Formats	BMP, JPEG, PNG, TIFF

Software & Options

Available Software Options	WSXs-MATHSURF (Advanced Math), WSXs-PWR (Power Analysis), WSXs-SPECTRUM (Spectrum Analysis)
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Environmental

Vibration (Operating)	0.31 g rms (5 Hz to 500 Hz, 15 min in each of 3 axes)
Vibration (Non-Operating)	2.4 g rms (5 Hz to 500 Hz, 15 min in each of 3 axes)
Shock (Functional)	30 g peak, half-sine, 11 ms pulse, 3 shocks in each of 3 axes
Storage Altitude	Up to 12,192 m (40,000 ft)

TECHNOLOGY

Digital Storage Oscilloscope

APPLICATIONS

Embedded systems design, serial data debug, general-purpose electronic test and measurement

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