WavePro 7000 Series

7300
7200
7100
7000

LEADING FEATURES

- *Up to 24 Mpts/Ch (48 Mpts for 2 Ch)*
- *Up to 10 GS/s on 4 Channels (20 GS/s for 2 Ch)*
- *1, 2, and 3 GHz Bandwidths*
- *1 MΩ and 50 Ω Input Paths*
- *X- Stream Powered Technology*
- *Touch Screen and Front Panel User Interface*
- *10.4 " SVGA Display*
- *Zoom and Multi-Zoom Display*
- *Automated Measurements with Histicons*
- *Connectivity to USB, GPIB and 802.3xx*
- *Customizable with XDEV Developer's Kit Option*
- *Expandable WaveShape Analysis with XMAP Option*
- *Jitter Analysis*

LeCroy's WavePro 7000 Series brings the ability to conduct next-generation wave-form measurements and analysis — not just "viewing" of signals — to 1 GHz, 2 GHz, and 3 GHz bandwidth applications. The WavePro 7300 oscilloscope is the first to offer high-speed integrated 1 MΩ and 50 Ω inputs. Connect any passive or active probe, and the WavePro DSO is ready to measure — conveniently and accurately.

LeCroy has integrated its groundbreaking X-Stream™ Technology into the WavePro family and combined it with the most intuitive User Interface (UI) available. Such ability gives you greater confidence in the measurements you make. Confidence you can only achieve through fast oversampling of 10 GS/s on all channels, acquisition memory of up to 48 million points to maintain fast sampling—even for long complex signals—and excellent jitter noise floor performance.

The WavePro 7000 series can conduct WaveShape Analysis 10–100 times faster than any other oscilloscope in its class. That makes them excellent tools for next-generation designs, such as datacom/telecom standards development, Gigabit Ethernet, USB 2.0, digital design and debugging, and advanced military designs.

Greater Signal Understanding

The WavePro 7000 series provides multiple options so you can better understand the signals in design. Just press *Zoom* to see expanded detail of the waveform. See graphical views like *Histicons*, *Tracks,* and *Trends* of how a measurement changes throughout the signal. Use 3-D Analog Persistence to get better views of jitter and then measure directly from the trace.

The WavePro 7100, 7200, and 7300 units come with 1 M/channel memory, standard at 1 GHz, the entry-level WavePro 7000 unit provides accessibility to LeCroy's X-Stream Technology at an exceptional price.

Optional application packages focus the ability of the WavePro DSO to specific measurements in optical and electrical mask testing, magnetic and optical disk drive measurements, and clock and timing applications. Whether you're viewing signals or measuring timing and amplitude across multiple channels, the WavePro 7000 series has it all for less.

LeCroy

Specifications

Vertical System	WavePro 7000	WavePro 7100	WavePro 7200	WavePro 7300
Analog Bandwidth @ 50 Ω (-3 dB)	1 GHz	1 GHz	2 GHz	3 GHz
Rise Time (Typical)	400 ps	400 ps	225 ps	150 ps
Input Channels	4			
Bandwidth Limiters	25 MHz; 200 MHz			
Input Impedance	50 Ω; 1 MΩ//11pF typical (using PP005A probe)			
Input Coupling	1 MΩ: AC, DC, GND; 50 Ω: DC			
Maximum Input Voltage	50 Ω: 5 Vrms, 1 MΩ: 100 Vmax (peak AC: ≤5 KHz + DC)			
Channel-Channel Isolation	250:1 at same V/div setting, 40:1 at 3 GHz			
Vertical Resolution	8 bits; up to 11 bits with enhanced resolution (ERES)			
Sensitivity	50 Ω: 2 mV – 1 V/div fully variable; 1 MΩ: 2 mV – 2 V/div fully variable			
DC Gain Accuracy	±1.5% of full scale; ±1% (typical)			
Offset Range	50 Ω: ±700 mV @ 2-4.99 mV/div ±1.5 V @ 5-100 mV/div ±10 V @ .102-1 V/div			
	1 MΩ: ±700 mV @ 2-4.99 mV/div ±1.5 V @ 5-100 mV/div ±20 V @ 0.102-2 V/div			
Offset Accuracy	±(1.5% of full scale + 0.5% of offset value + 2 mV)			
Horizontal System				
Timebases	Internal timebase common to 4 input channels; an external clock may be applied at the auxiliary input			
Time/Division Range	20 ps/div – 10 s/div			
Math & Zoom Traces	4 independent zoom and 4 math/zoom traces standard; 8 math/zoom traces available with XMAP (Master Analysis package) or XMATH (Advanced Math package)			
Clock Accuracy	≤ 10 ppm @ 0–40 °C			
Time Internal Accuracy	≤ 0.06 / SR + (10 ppm * Reading) (rms)			
Sample Rate & Delay Time Accuracy	± 10 ppm ≤ 10 s interval			
Jitter Noise Floor	2 ps rms @ 100 mV/div (typical)			
Trigger & Interpolator Jitter	≤ 2.5 ps (typical)			
Channel-Channel Deskew Range	±4.5 ns			
External Clock	30 MHz – 1 GHz; 50 Ω impedance; applied at the auxiliary input			
Acquisition System				
Single-Shot Sample Rate/Ch	5 GS/s	10 GS/s	10 GS/s	10 GS/s
2 Channel Max	10 GS/s	20 GS/s	20 GS/s	20 GS/s
Random Interleaved Sampling (RIS)	200 GS/s for repetitive signals: 20 ps/div – 1 µs/div			
Maximum Trigger Rate	150,000 waveforms/second (in Sequence Mode, up to 4 channels)			
Intersegment Time	≤ 6 µs			
Maximum Acquisition Points/Ch	4 Ch / (2 Ch)	4 Ch / (2 Ch)		Sequence Mode
Standard	500k / 1M	1M / 2M		500 segments
M – Memory Option	4M / 8M	4M / 8M		1,000 segments
L – Memory Option	—	8M / 16M		5,000 segments
VL – Memory Option	—	16M / 32M		10,000 segments
XL – Memory Option	—	24M / 48M		20,000 segments
Acquisition Processing				
Averaging	Summed averaging to 1 million sweeps; continuous averaging to 1 million sweeps			
Enhanced Resolution (ERES)	From 8.5 to 11 bits vertical resolution			
Envelope (Extrema)	Envelope, floor, roof for up to 1 million sweeps			
Interpolation	Linear, Sin x/x			
Triggering System				
Modes	Normal, Auto, Single, and Stop			
Sources	Any input channel, External, Ext X10, Ext/10, or line; slope and level unique to each source (except line trigger)			
Coupling mode	DC50 Ω, GND, DC1MΩ, AC1MΩ			
Pre-trigger delay	0–100% of horizontal time scale			
Post-trigger delay	0–10,000 divisions			
Hold-off by time or events	Up to 20 s or from 1 to 99,999,999 events			
Internal trigger range	±5 div from center			
Max trigger frequency	1 GHz w/Edge Trigger; 750 MHz w/SMART Trigger	1 GHz w/Edge Trigger; 750 MHz w/SMART Trigger	2 GHz w/Edge Trigger; 750 MHz w/SMART Trigger	3 GHz w/Edge Trigger; 750 MHz w/SMART Trigger
Basic Triggers				
Edge/Slope/Line	Triggers when signal meets slope and level condition			
SMART Triggers®				
State or Edge Qualified	Triggers on any input source only if a defined state or edge occurred on another input source. Delay between sources is selectable by time or events.			
Dropout	Triggers if signal drops out for longer than selected time between 2 ns and 20 s.			
Pattern	Logic combination (AND, NAND, OR, NOR) of 5 inputs (4 channels and external trigger input). Each source can be high, low, or don't care. The high and low level can be selected independently. Triggers at start or end of the pattern.			
SMART Triggers with Exclusion Technology				
Glitch	Triggers on positive or negative glitches with widths selectable from 600 ps to 20 s or on intermittent faults.			
Signal or Pattern Width	Triggers on positive or negative pulse widths selectable from 600 ps to 20 s or on intermittent faults.			
Signal or Pattern Interval	Triggers on intervals selectable between 2 ns and 20 s.			

Specifications

Automatic Setup	
Auto Setup	Automatically sets timebase, trigger, and sensitivity to display a wide range of repetitive signals.
Vertical Find Scale	Automatically sets the vertical sensitivity and offset for the selected channels to display a waveform with maximum dynamic range.
Probes	
Probes	(2) PP005A standard; Optional passive and active probes available.
Probe System: Probus	Automatically detects and supports a variety of compatible probes.
Scale Factors	Automatically or manually selected depending on probe used.
Color Waveform Display	
Type	Color 10.4" flat-panel TFT-LCD with high resolution touch screen
Resolution	SVGA; 800 x 600 pixels
Real time Clock	Dates, hours, minutes, seconds displayed with waveform. SNTP support to synchronize to precision internet clocks.
Number of Traces	Display a maximum of 8 traces. Simultaneously display channel, zoom, memory, and math traces.
Grid Styles	Auto, Single, Dual, Quad, Octal, XY, Single + XY, Dual + XY
Waveform Styles	Sample dots joined or dots only
Analog Persistence Display	
Analog & Color-Graded Persistence	Variable saturation levels; stores each trace's persistence data in memory.
Persistence Selections	Select analog, color, or three-dimensional.
Trace Selection	Activate persistence on all or any combination of traces.
Persistence Aging Time	Select from 500 ms to infinity.
Sweeps Displayed	All accumulated, or all accumulated with last trace highlighted
Zoom Expansion Traces	
	Display up to 4 Zoom and 4 Math/Zoom traces; 8 Math/Zoom traces available with XMAP (Master Analysis package) or XMATH (Advanced Math package).
CPU	
Processor	Intel 1.7 GHz or better with MS Windows 2000 Platform
Processing Memory	Up to 1 Gbyte
Internal Waveform Memory	
	M1, M2, M3, M4 Internal Waveform Memory (store full-length waveforms with 16 bits/data point) or store to any number of files limited only by data storage media
Setup Storage	
Front Panel and Instrument Status	Store to the internal hard drive, floppy drive or to a USB-connected peripheral device.
Interface	
Remote Control	Via Windows Automation, or via LeCroy Remote Command Set
GPIB Port (Optional)	Supports IEEE – 488.2
Ethernet Port	10/100Base-T Ethernet interface
Floppy Drive	Internal, DOS-format, 3.5" high-density
USB Ports	4 USB ports support Windows compatible devices
External Monitor Port Standard	15-pin D-Type SVGA-compatible
Parallel Port	1 standard
Auxiliary Output	
Signal Types	Select from calibrator or control signals output on front panel
Calibrator Signal	5 Hz – 5 MHz square wave or DC level; 0.0 to 5.0 V into 50 Ω (0-1 V into 1 MΩ) or TTL volts (selectable)
Control Signals	Trigger enabled, trigger out, pass/fail status
Auxiliary Input	
Signal Types	Selected from External Trigger or External Clock input on front panel
General	
Auto Calibration	Ensures specified DC and timing accuracy is maintained for 1 year minimum
Power Requirements	100–120 VAC at 50/60/400 Hz; 200–240 VAC at 50/60 Hz; Automatic AC Voltage selection Power consumption: < 800 VA
Environmental	
Temperature (Operating)	+5 ℃ to +40 ℃ including floppy disk and CD-ROM drives
Temperature (Non-Operating)	-20 ℃ to +60 ℃
Humidity (Operating)	5% to 80% relative humidity (non-condensing) up to +30 ℃. Upper limit derates to 25% relative humidity (non-condensing) at +40 ℃
Humidity (Non-Operating)	5% to 95% relative humidity (non-condensing) as tested per MIL-PRF-28800F
Altitude (Operating)	up to 10,000 ft (3048 m) at or below +25 ℃
Altitude (Non-Operating)	up to 40,000 ft (12,192 m)
Random Vibration (Operating)	0.31 g rms 5 Hz to 500 Hz, 15 minutes in each of three orthogonal axes
Random Vibration (Non-Operating)	2.4 g rms 5 Hz to 500 Hz, 15 minutes in each of three orthogonal axes
Functional Shock	20 g peak, half sine, 11 ms pulse, 3 shocks (positive and negative) in each of three orthogonal axes, 18 shocks total
Physical Dimensions	
Dimensions (HWD)	264 mm x 397 mm x 491 mm; 10.4" x 15.6" x 19.3" (height excludes feet)
Weight	18 kg; 39 lbs.
Shipping Weight	24 kg; 53 lbs.
Certifications	
	CE Approved, UL and cUL listed; conforms to EN 61326-1, EN 61010-1, UL 3111-1, and CSA C22.2 No. 1010.1
Warranty and Service	
	2-year warranty; calibration recommended annually. Optional service programs include extended warranty, upgrades, and calibration services

Ordering Information

WavePro 4-Channel Digital Oscilloscopes	Product Code
3 GHz 20 GS/s (2 Ch); 10 GS/s 4 Ch 1 MΩ & 50 Ω Color DSO 2 Mpts/2 Ch; 1 Mpts/Ch Standard	WavePro 7300
2 GHz 20 GS/s (2 Ch); 10 GS/s 4 Ch 1 MΩ & 50 Ω Color DSO 2 Mpts/2 Ch; 1 Mpts/Ch Standard	WavePro 7200
1 GHz 20 GS/s (2 Ch); 10 GS/s 4 Ch 1 MΩ & 50 Ω Color DSO 2 Mpts 2 Ch; 1Mpts/Ch Standard	WavePro 7100
1 GHz 10 GS/s (2 Ch); 5 GS/s 4 Ch 1 MΩ & 50 Ω Color DSO 1 Mpts 2 Ch; 500kpts/Ch Standard	WavePro 7000
Included with Standard Configuration	
10:1 10 MΩ Passive Probes (Qty 2)	PP005A
Operators Manual; Quick Reference Guide; CD-ROM with OM/RCM and Utility software and Recovery software	
Remote Control Manual	
Floppy Disk Drive	
CD-ROM Drive	
Optical 3 button Wheel Mouse- USB	
Standard Ports; 10/100Base-T Ethernet, Parallel, SVGA Video Output, USB	
Protective Front Cover	
Standard Commercial Calibration and Performance Certificate	
2 Year Warranty	
Memory Options	
8 Mpts/2 Ch, 4 Mpts/Ch	-M
16 Mpts/2 Ch, 8 Mpts/Ch	-L
32 Mpts/2 Ch, 16 Mpts/Ch	-VL
48 Mpts/2 Ch, 24 Mpts/Ch	-XL
Note: The WavePro 7000 unit's maximum memory is "M" option	
Hardware Options	
IEEE-488 Remote Control Interface	GPIB-1
Removable Hard Drive Option	RHD
WaveShape Analysis Packages	
X-Stream Math, Processing and Developer's Kit (includes XMATH, XDEV, JTA2)	XMAP
Advanced Math Analysis Package	XMATH
Developer's Customization Kit	XDEV
Jitter and Timing Analysis	JTA2
Digital Filter Package	DFP2
Serial Data Mask Testing Package	SDM
Disk Drive Measurement Package	DDM2
LeCroy M1 Timing Tool	M1/ADV-1
Selected Accessories	
10:1 10 MΩ Passive Probes	PP005A
3.5 GHz Active Voltage Probe	HFP3500
2.5 GHz Active Voltage Probe	HFP2500
1.5 GHz Active Voltage Probe	HFP1500
WaveLink 4 GHz Differential Probe	D300/D300AT
Differential Probe	AP034
Differential Probe	ADP300 series
Current Probe	CP and AP series
O/E Converters 500–1630 nm	OE 425/455
Keyboard	KYBD-1
Oscilloscope Cart	OC1021
Oscilloscope Cart with additional shelf and drawer	OC1024
Rackmount- 25" Slide	RMA-25
Rackmount- 30" Slide	RMA-30
AntiVirus Software	AV

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