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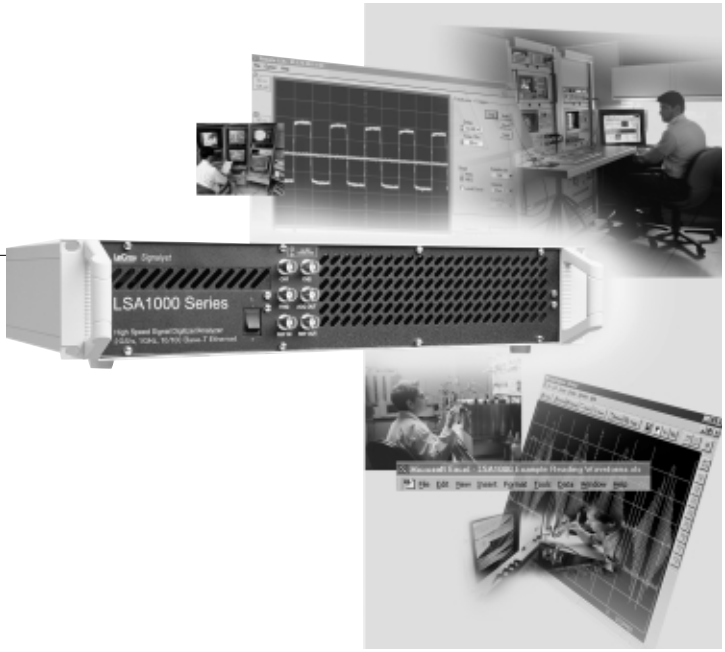
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High Throughput Digitizers LSA1000 Series



Main Features

- 1 GHz bandwidth
- 2 GS/s on one channel
- 1 GS/s on two channels
- 10/100 Base-T Ethernet interface for high throughput rate
- Acquisition memory to 8 Mpoints
- Easy-to-use software tools: ActiveX, LabVIEW, CVI drivers
- Optimized for OEM and system integration

LeCroy has a long tradition of technical leadership in high-speed, complex electronic signal acquisition and analysis. The company has made many breakthroughs over the years, including the industry's fastest digitizers and longest acquisition memories. LSA1000 has been designed to provide LeCroy's expertise to system designers and OEM customers.

Designers of integrated test systems or other instrument systems frequently require a good front-end stage with amplifier/attenuator, fast analog-to-digital conversion, high-speed memory, and a processor to compute answers or handle data transfer. By tapping into LeCroy's technologies, system designers can substantially reduce time, cost, and risk of developing new systems for fast data acquisition and analysis.

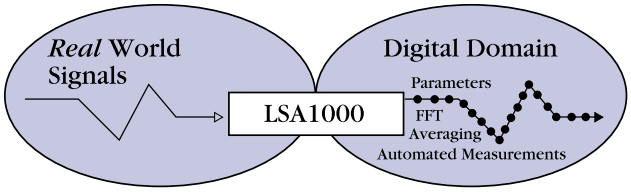
LeCroy's LSA1000 is a 2 GS/s waveform digitizer that brings the fidelity of LeCroy's digital scopes to embedded applications. Its onboard PowerPC processor maximizes measurement throughput and accelerates waveform analysis and computation. Acquired waveforms are transferred to the computer via 10/100 Base-T Fast Ethernet. LSA1000 maintains the integrity of your analog signals while digitizing and analyzing them in the shortest possible time.

LSA1000 provides:

- High Throughput
- Ease of Use
- Powerful Analysis

Solutions to Challenging Problems

Today's system designers and test engineers face major challenges in high-speed signal acquisition and analysis. While real-world signals remain predominantly analog, signal acquisition and analysis must be performed in the digital domain. The process must be fast, accurate, and cost-effective. This challenge requires fast digitizing of complex waveforms, followed by intensive calculations. Results must be communicated to the computer rapidly and must be correlated with design validation or even field-service tests. Meanwhile, test budgets are under constant pressure.



LeCroy's LSA1000 provides a high performance packaged solution at an unmatched price. The PowerPC processor maximizes throughput, while minimizing loading of your system's computer and busses. LSA1000's 19" rackmount form factor integrates easily into most environments and provides a cost-effective solution, even for low channel-count applications.

Applications

- Automatic Test Equipment: As mixed-signal testing becomes a key challenge, the LSA1000 provides fast and accurate digitization of your complex waveforms.
- Analytical Instruments: Whether you're in mass spectometry, ultra-sonic testing, medical imaging, or other analytical instrument applications, the LSA1000 is easy to use and integrate into your system. The Ethernet interface facilitates integration with your system control computer.
- Disk Drive Testing: The LSA1000 is an ideal test instrument for disk drive manufacturing testing. Combined with LeCroy's powerful disk drive-specific software packages such as PRML and Disk Drive Measurement, the LSA1000 delivers unmatched performance in the shortest possible time.
- Communication Test Systems: Timing is everything. The Jitter and Timing Analysis (JTA) software package delivers high accuracy and full jitter analysis capability. Use JTA in the LSA1000 to make precise timing and jitter measurements.
- Automotive: The LSA1000 is ideal for high-speed transient measurements. You will appreciate the LSA1000's speed in testing ignition air bag, engine control, collision avoidance systems and powertrains.









- Aerospace/Defense: Mission-critical data cannot be missed. If you work with radar, lidar, or other high-speed data acquisition applications, the LSA1000's large memory of up to 8 Mbytes and its high sample rate guarantee that you capture the complete picture.

Optimized for High Throughput

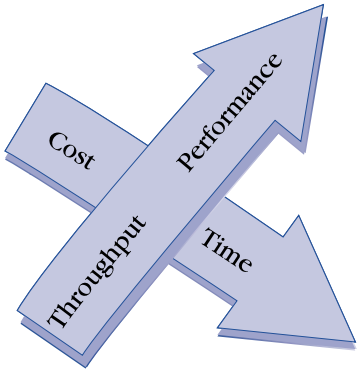
LSA1000 is optimized for high throughput in all phases of signal acquisition and analysis.

- Fast Data Acquisition: With up to 8 Mbytes on one channel, 1 GS/s sampling can be maintained for up to 8 ms of data. This maximizes waveform capture without costly interruptions.
- Onboard Data Analysis: A PowerPC processor performs advanced waveform analysis that otherwise has to be processed by the host computer. This local analysis means faster system throughput as LSA1000 gives you "answers," not just raw digitized data.
- Data Transfer over Ethernet: 10/100 Base-T Fast Ethernet interface ensures easy, standard connectivity to the computer with a faster data transfer rate than traditional GPIB.

Ease of Integration

The LSA1000 comes with several software tools to help you get started and to develop your own application-specific software quickly. All control commands are the same as LeCroy benchtop digital oscilloscopes to help preserve your software investment in other LeCroy products.

- Remote LSA provides a scope-like, live waveform display on your PC without any programming on your part. You can easily control LSA1000 settings through the soft panel. This means you can get visual feedback as you develop your own programs with the LSA1000.



- ActiveDSO™ is an ActiveX control for the LSA1000. ActiveDSO streamlines your programming in the Microsoft environment by taking care of the complicated PC-to-LSA1000 interfacing for you. Through ActiveDSO, a variety of Windows applications can control and exchange data with the LSA1000. Microsoft Office programs, Visual Basic, Visual C++, and MATLAB are a few of the many applications that support ActiveX controls.
- ScopeExplorer™ is another PC connectivity tool with a remote control terminal and virtual front panel for LSA1000. It also captures waveform images and converts and transfers waveform data.
- LabVIEW and LabWindows/CVI drivers are available for LSA1000.

Leverages Familiar Industry Standards

LSA1000 utilizes familiar industry standards, reducing its integration time into your system. Supported standards include:

- Ethernet Interface
- Windows NT/95 support

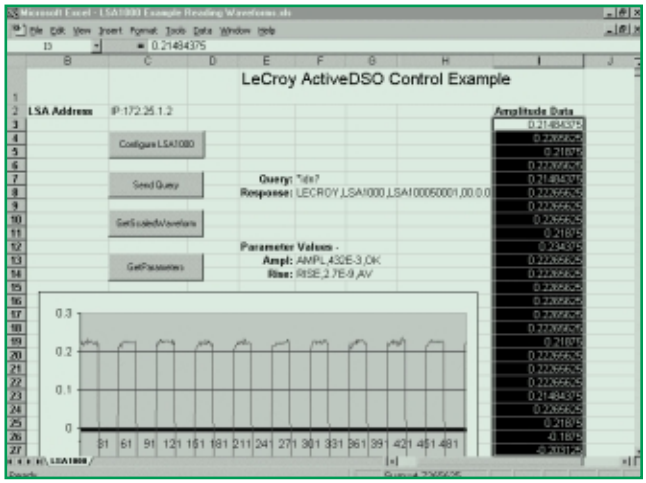
Powerful Analysis Tool

LSA1000 provides the same powerful waveform analysis capability as LeCroy digital oscilloscopes. Its onboard processor handles advanced waveform processing locally, using the same high-level commands as LeCroy DSOs. In addition to standard waveform analysis, advanced packages for FFT, histograms, and jitter measurement and disk-drive analysis are also available.

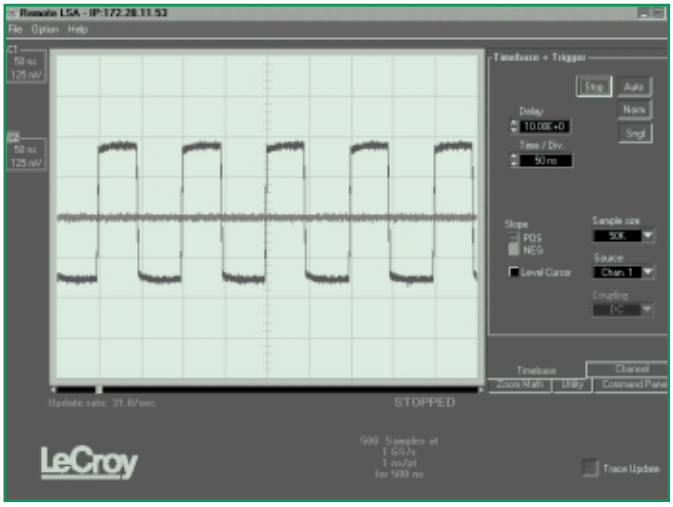
Customer Approval

LSA1000 has received many accolades from customers for its innovative design and superior performance. It has also received industry awards.

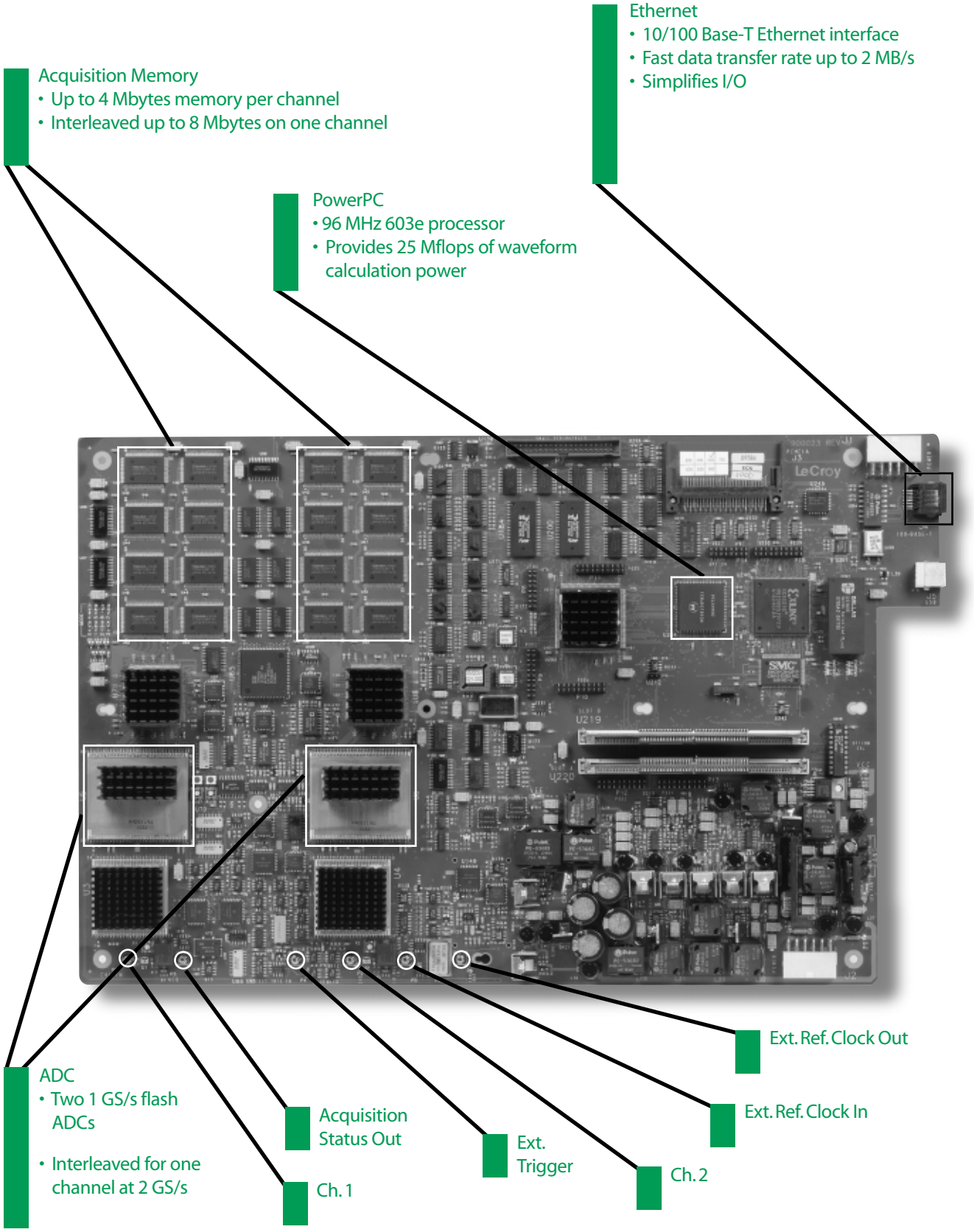




ActiveDSO gives you the power to build software applications quickly.



LSA1000 includes several software tools such as Remote LSA to help you get started quickly.


Ethernet
• 10/100 Base-T Ethernet interface
• Fast data transfer rate up to 2 MB/s
• Simplifies I/O
Acquisition Memory
• Up to 4 Mbytes memory per channel
• Interleaved up to 8 Mbytes on one channel
PowerPC
• 96 MHz 603e processor
• Provides 25 Mflops of waveform calculation power
Ext. Ref. Clock Out
Ext. Ref. Clock In
Ch. 2
Ext. Trigger
Acquisition Status Out
Ch. 1
ADC
• Two 1 GS/s flash ADCs
• Interleaved for one channel at 2 GS/s

Acquisition System

Bandwidth (-3dB): 1 GHz @ 50 Ω

No. of Channels: 2

No. of Digitizers: 2

Sampling Rate: Two channels in use: 1 MS/s to 1 GS/s; One channel in use: 2 MS/s to 2 GS/s

Sensitivity: 250 mV - 2.5 V or 100 mV - 1 V Full Scale Range (FSR), depending on model. Higher sensitivity achievable with lower bandwidth.

Scale Factors: Attenuator selected for proper FSR, adjustable over 10:1 range

Offset Range: ≥FSR

DC Accuracy: Typically 1%

Vertical Resolution: 8 bits (up to 11 bits with Enhanced Resolution [ERES] with optional WP01 Advanced Waveform Math Package)

Bandwidth Limiters: 25 MHz, 200 MHz

Input Coupling: DC

Input Impedance: 50 Ω ±2%

Max Input Voltage: 2.5 V rms and ±5 V peak

Acquisition Modes

Single Shot: For transient and repetitive signals

Timebase System

Acquisition Memory Size:
100 kpts/ch on two active channels. 200 kpts on one active channel. Larger memory options available (L models: 4 Mpts/ch).

Capture Time Window:

Memory	@1 GS/s	@1 MS/s
100 k	0.1 ms	100 ms
500 k	0.5 ms	500 ms
2 M	2 ms	2 s
4 M	4 ms	4 s

Clock Accuracy: ≤10 ppm

Interpolator Resolution: 500 ps or sample size, whichever is larger.

External Reference:
Type: 10 MHz Square Wave
Coupling: AC
Impedance: 50 Ω
Level: 250 mV pk-pk min, 2V pk-pk max

Triggering System

Modes: Normal, Auto, Single, Stop

Sources: CH1, CH2, Ext

Slopes: Ch1, CH2: Positive, Negative Window; Ext: Positive, Negative

Coupling: DC

Pre-Trigger Recording: 0-100% of record size (adjustable in 1% increments)

Post-Trigger Delay: 0-1,000 times record size (adjustable in 1% increments)

Internal Trigger Range: ±FSR setting

Ext Trigger: ECL, TTL optional

Ext Trigger Max Input: ECL: 0.0 V to -4.0 V. TTL: 7.5 V to -11.5 V

Ext Trigger Range: ECL or TTL signal swing

Waveform Processing

Processing Functions: Add, Subtract, Multiply, Divide, Negate, Identity, Summation Averaging, and Sine x/x; four functions performable at one time.

Average: Summed averaging of up to 1000 waveforms in the basic instrument; up to 10^6 averages possible with optional WP01.

Extrema: Roof, Floor or Envelope values from 1 to 10^6 waveforms with WP01 Option.

ERES: Low-Pass digital filter provides up to 11 bits vertical resolution; sampled data always available even when trace turned off; any of above modes usable without destroying data with WP01 Option.

FFT: Spectral analysis with five windowing functions and FFT averaging, with optional WP02 Spectrum Analysis Package.

Histogramming and Trending: With optional WP03 Parameter Analysis Package, in-depth diagnostics on waveform parameters.

Internal Memory

Waveform Memory: Up to four 16-bit memories

Processing Memory: Up to four 16-bit waveform processing memories

System Memory: 16 Mbytes RAM; L models: 64 Mbytes RAM

Cursor Measurements

Relative Time: Provides time and voltage differences relative to each other

Relative Voltage: Measures voltage differences up to ±0.2% of full scale

Absolute Time: Measures time relative to the trigger and voltage with respect to ground

Absolute Voltage: Measures voltage with respect to ground

Interfacing

Remote Control: By Ethernet for all instrument controls, internal functions

Ethernet Port: 10/100 Base-T Ethernet

Ethernet Protocol: TCP/IP

Versatile Instrument Control Protocol (VICP): Allows Ethernet medium to emulate much of the GPIB behavior; remote command set conforms to the IEEE 488.2 standard to ensure compatibility with existing software.

General

Humidity: <80% RH (non-condensing)

Auto-Calibration: Ensures specified DC and timing accuracy; temperature: 5° to 40° C (41° to 104° F) rated accuracy, 0° to 45° C (32° to 113° F) operating

Power: 90-132 VAC or 180-250 VAC; 45-66 Hz; 200 W max

Altitude: Up to 4600 m (15,090 feet) operating, 40° C max

Shock and Vibration: Conforms to selected sections of MIL-PRF-28800F, Class 3

Dimensions: (HWD) 88 mm x 483 mm x 500 mm (3.24" x 19.0" x 19.7")

Warranty: Three years

CE Conformity

EMC: Conforms to EN50081-1 (Emissions) and EN50082-1 (Immunity)

Safety: Conforms to EN61010-1: Protection Class 1, Installation (over-voltage) Category II, Pollution Degree 2

UL and cUL Listed: UL Standard: UL3111-1; cUL Canadian Standard: CSA-C22.2 No. 1010.1-9

Ordering Information

High-Speed Signal Analyzer	Product Code
1 GHz; 1 GS/s; 2 ch; 100 kpts/ch; Ethernet (250 mV - 2.5 V Full Scale Range, **Front** Panel BNCs)	LSA1000-01
1 GHz; 1 GS/s; 2 ch; 100 kpts/ch; Ethernet (250 mV - 2.5 V Full Scale Range, **Rear** Panel BNCs)	LSA1000-02
1 GHz; 1 GS/s; 2 ch; 100 kpts/ch; Ethernet (100 mV - 1 V Full Scale Range, **Rear** Panel BNCs)	LSA1000-09
1 GHz; 1 GS/s; 2 ch; 100 kpts/ch; Ethernet (100 mV - 1 V Full Scale Range, **Front** Panel BNCs)	LSA1000-12
1 GHz; 1 GS/s; 2 ch; 4 Mpts/ch; Ethernet (250 mV - 2.5 V Full Scale Range, **Front** Panel BNCs)	LSA1000-01L
1 GHz; 1 GS/s; 2 ch; 4 Mpts/ch; Ethernet (250 mV - 2.5 V Full Scale Range, **Rear** Panel BNCs)	LSA1000-02L
1 GHz; 1 GS/s; 2 ch; 4 Mpts/ch; Ethernet (100 mV - 1 V Full Scale Range, **Rear** Panel BNCs)	LSA1000-09L
1 GHz; 1 GS/s; 2 ch; 4 Mpts/ch; Ethernet (100 mV - 1 V Full Scale Range, **Front** Panel BNCs)	LSA1000-12L

Included with Standard Configuration	
Operator's Manual	LSA1000-OM
Remote Control Manual	LSA1000-RCM
Getting Started CD-ROM	LSA1000-GS
NIST Calibration Certificate	
Three-Year Warranty	

Hardware Options	
500 k memory/ch, 1 M memory/1 ch	LSA1000-M1*
1 M memory/ch, 2 M memory/1 ch	LSA1000-M2*
2 M memory/ch, 4 M memory/1 ch	LSA1000-M4*
TTL External Triggering	LSA1000-TTL
64 Mbyte System Memory (included in "L" models)	LSA1000-64MBSM

Software Options	
Advanced Waveform Math	WP01
FFT (Spectrum Analysis)	WP02
Parameter Analysis	WP03
PRML Analysis	PRML
Jitter and Timing Analysis	JTA
Basic Disk Drive Measurements (includes WP03)	DDM
Optical Recording Measurements	ORM
Disk Drive Failure Analysis	DDFA

Warranty & Calibration	
MIL STD Calibration	LSA1000-CCMIL
Five-Year Repair Warranty	LSA1000-W5
Five-Year Annual NIST Calibration Contract	LSA1000-C5
Five-Year Annual MILSTD Calibration Contract	LSA1000-CM5
Five-Year Warranty & NIST Calibration	LSA1000-T5

** These options are not applicable for "L" models, which have built-in 4 M memory/ch.*

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