Test & Measurement

> sales
> rentals
> calibration
> repair
> disposal

Complimentary Reference Material

This PDF has been made available as a complimentary service for you to assist in evaluating this model for your testing requirements.

TMG offers a wide range of test equipment solutions, from renting short to long term, buying refurbished and purchasing new. Financing options, such as Financial Rental, and Leasing are also available on application.

TMG will assist if you are unsure whether this model will suit your requirements.

Call TMG if you need to organise repair and/or calibrate your unit.

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Calibration

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Acquisition

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Solution Centre

Product Lifecycle Management System

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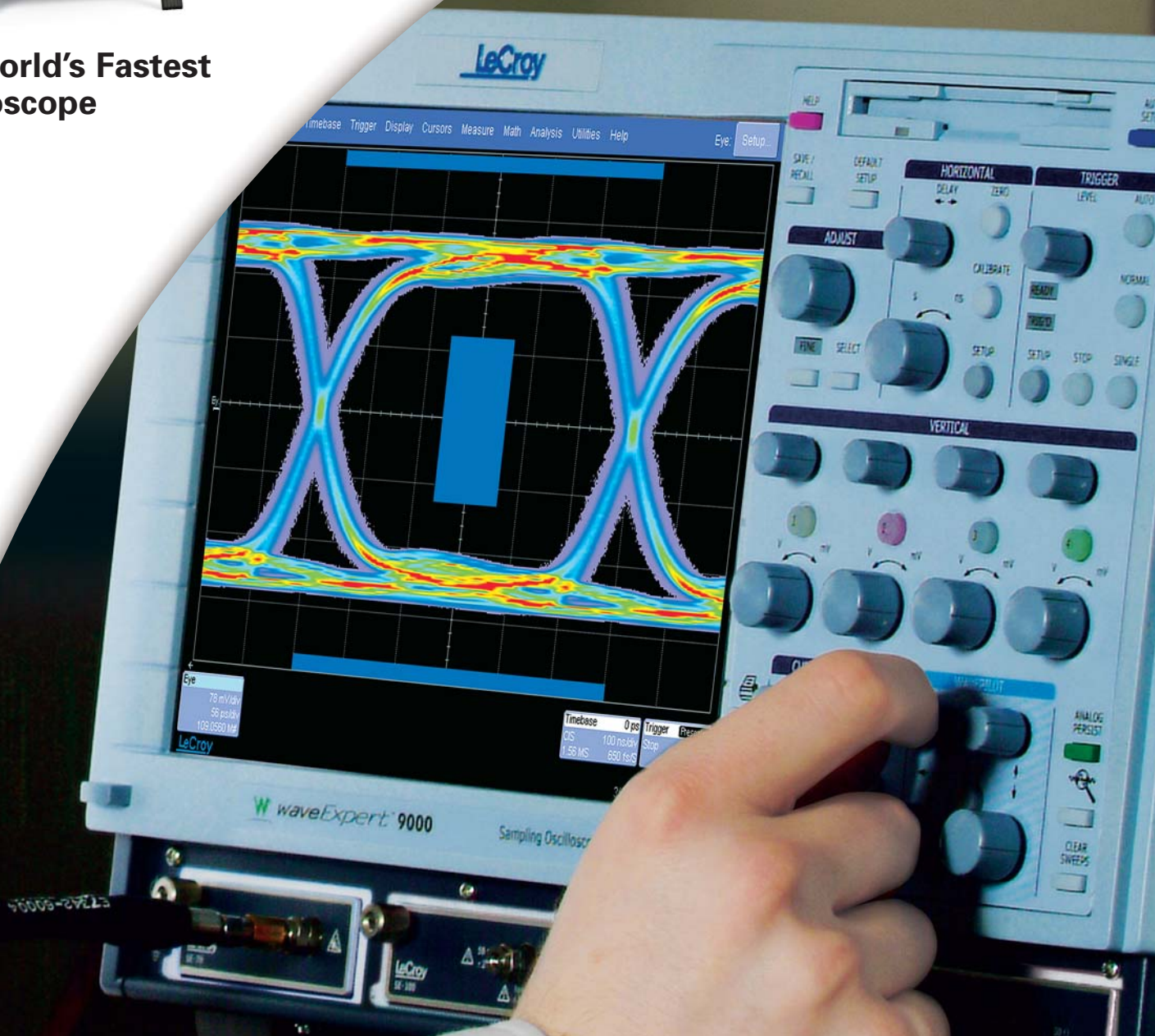
Form 080/01

NATA

LeCroy

WaveExpert™ Series Oscilloscopes
WE 9000
NRO 9000
SDA 100G

The World's Fastest Oscilloscope

The Fastest Oscilloscope in the Marketplace

The WaveExpert NRO 9000 and SDA 100G are the first instruments to combine the high bandwidth and accuracy of a sampling oscilloscope with the speed and flexibility of a real-time instrument. These are the first products in the new instrument class called Near Real Time Oscilloscopes (NRO), which eliminate most of the constraints of traditional sampling oscilloscopes.

The WaveExpert family features high acquisition speed, a responsive GUI and a powerful suite of analysis tools. Enabled by another new LeCroy technology—Accelerated Throughput Architecture (ATA)—WaveExpert comes to market with up to 100 GHz bandwidth, signal acquisition speeds 100 times faster, and memory depths 125,000 times deeper than conventional sampling oscilloscopes. In addition to much higher throughput, LeCroy ATA allows for signal analysis algorithms that rival capabilities found in only real-time oscilloscopes.

Underlying the ATA technology is the LeCroy exclusive: Coherent Interleaved Sampling mode. The CIS timebase (patent pending) permits the capture and display of very long serial data waveforms without the need for an external pattern trigger. The WaveExpert and SDA 100G have an acquisition rate of up to 10 MS/s, which is a 100 times improvement over existing instruments in this class.

The WaveExpert and SDA 100G are modular instruments that can accommodate up to (4) acquisition modules. Additionally, the oscilloscopes have an optional source module, which generates PRBS sequences in commonly used pattern lengths and bit rates that can be used for component testing. An additional acquisition module can output a TDR pulse with < 20 ps rise time, which is 30% faster than existing instruments, making them the tools of choice for time-domain-reflectometry (TDR) measurements.
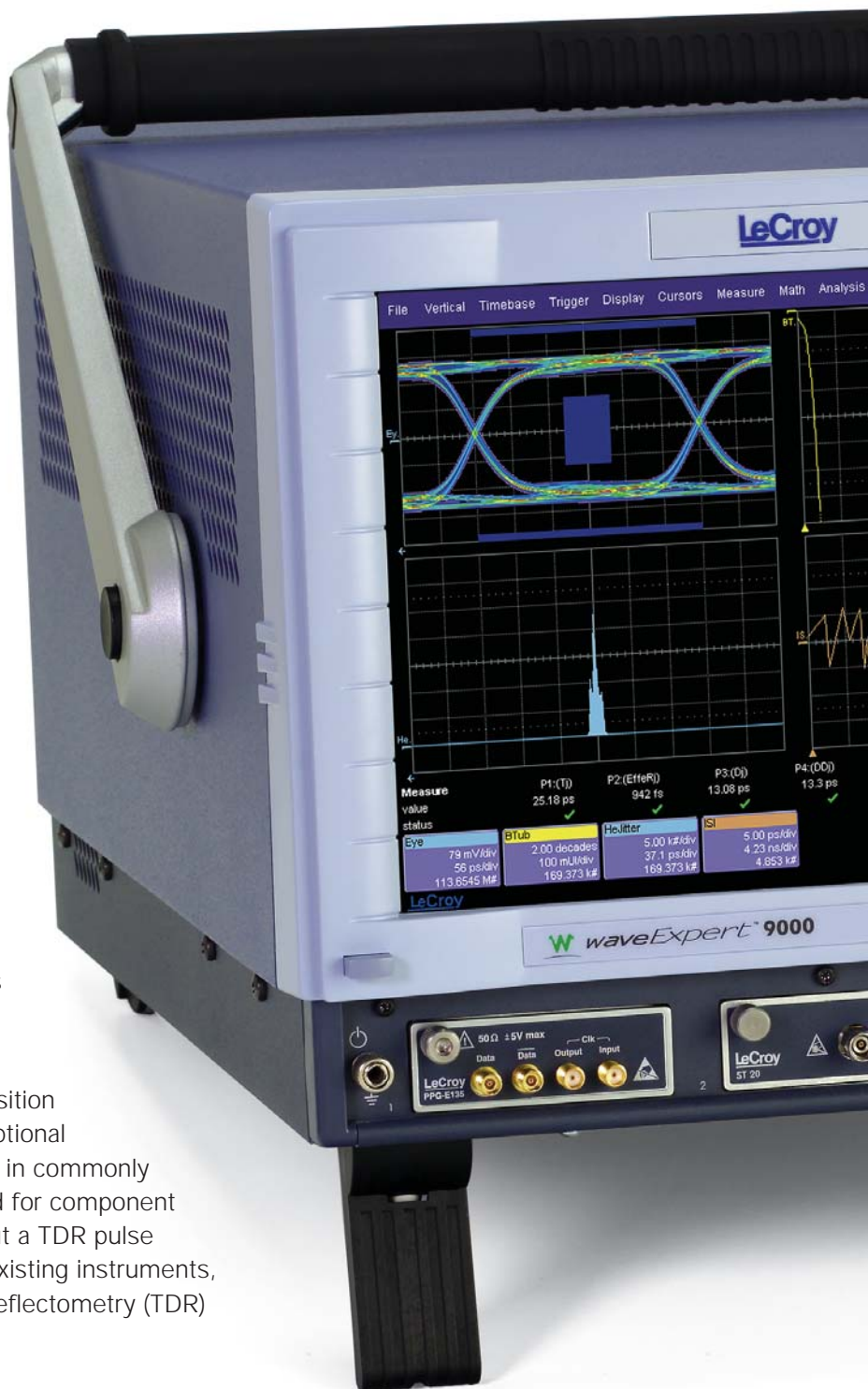
100 GHz Bandwidth is Here!
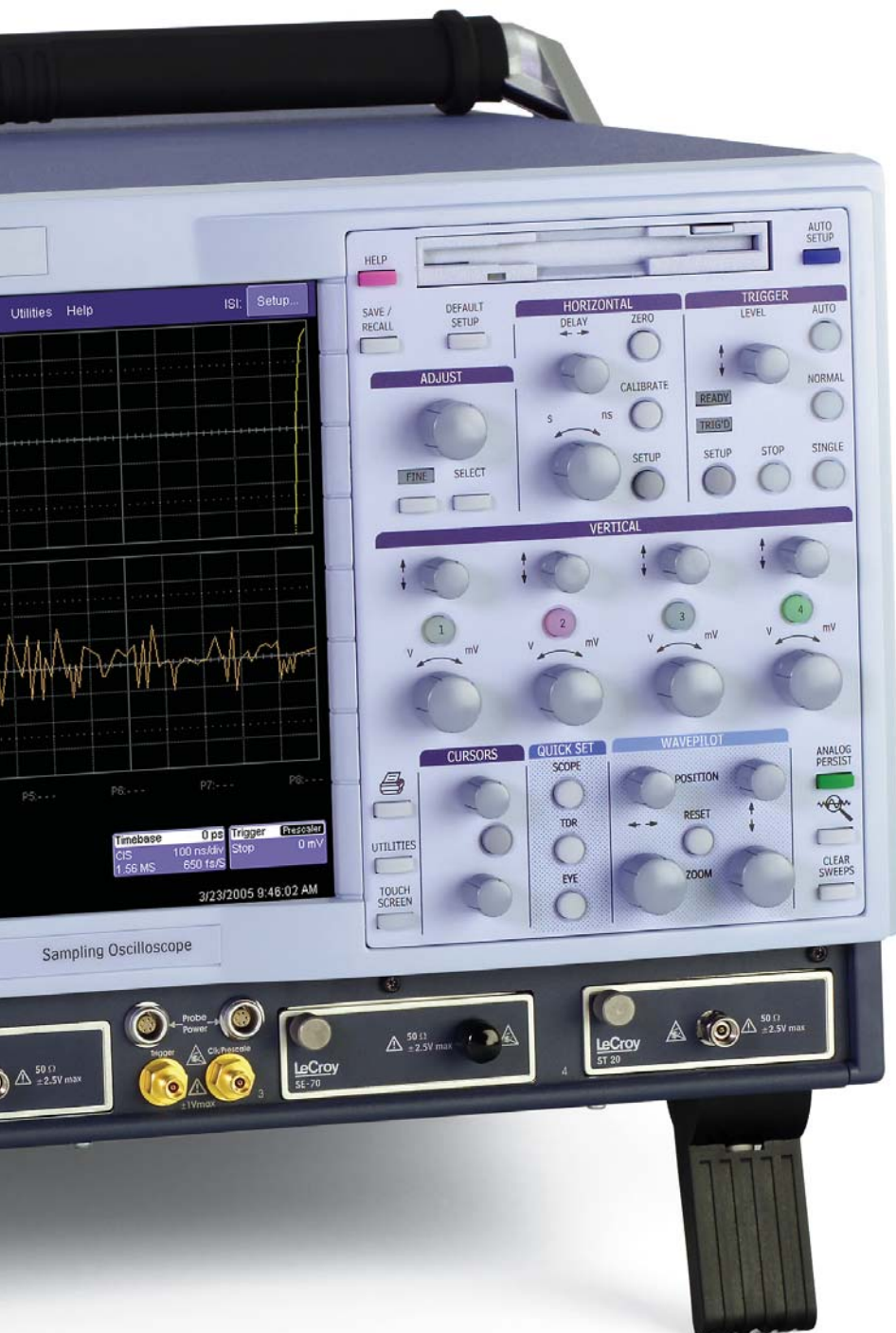
Leading Features

- **100 GHz bandwidth**
- **10 MS/s acquisition rate**
- **512 Mpts waveform memory**
- **< 600 fs rms timebase jitter**
- **Jitter and eye pattern measurement software**
- **Real-time oscilloscope interface including a full set of math functions and parameters**
- **< 20 ps TDR rise time**
- **Integrated 12.5 Gb/s serial pattern generator**

Jitter Analysis Software

The Jitter Analysis software, available on the WaveExpert NRO 9000 and SDA 100G, measures the total jitter as well as the breakdown of random and deterministic sources. A summary display is provided that shows the eye pattern along with several views of jitter.

# The First Sampling Oscilloscope with a Real-time Interface

The Most Convenient Sampling Oscilloscope

The WaveExpert uses LeCroy's award-winning user interface pioneered in the WaveMaster® Series of real-time oscilloscopes. This interface provides access to dozens of measurements and math functions that can be combined to give an unparalleled level of analysis. More in-depth analysis is possible using custom functions that can be created using MATLAB, Mathcad, Excel, or any other Windows®-compatible programming language.

The automatic pattern-lock capability in the coherent interleaved timebase makes it possible to capture voltage vs. time waveforms without a pattern trigger. With the optional clock recovery module, an external clock is not required, making the WaveExpert ideal for analyzing high-speed serial data signals.

Coherent Interleaved Sampling

The unique and powerful analysis capabilities of the WaveExpert are due to the development of an entirely new method of sampling known as Coherent Interleaved Sampling (CIS). This sampling method employs a phase-locked sampling strobe that is referenced to a user-supplied or recovered clock. The sampling clock is locked to the bit clock of the signal under test, so trigger jitter is eliminated.
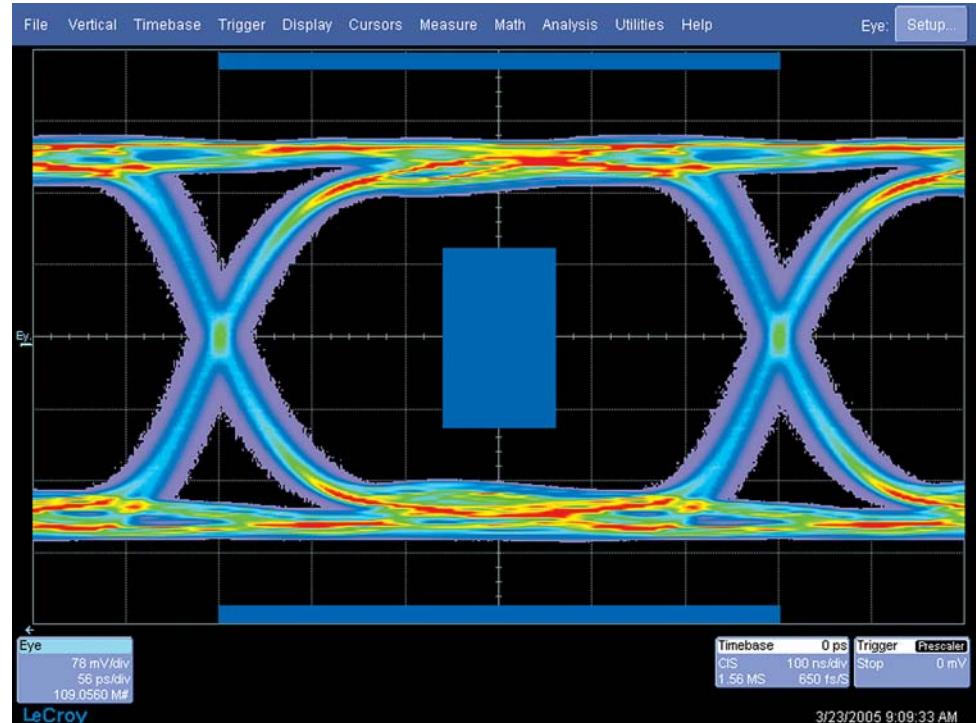
Eye patterns measured using the optional CIS timebase and Jitter Analysis software accumulate up to 3.3 MS/s.
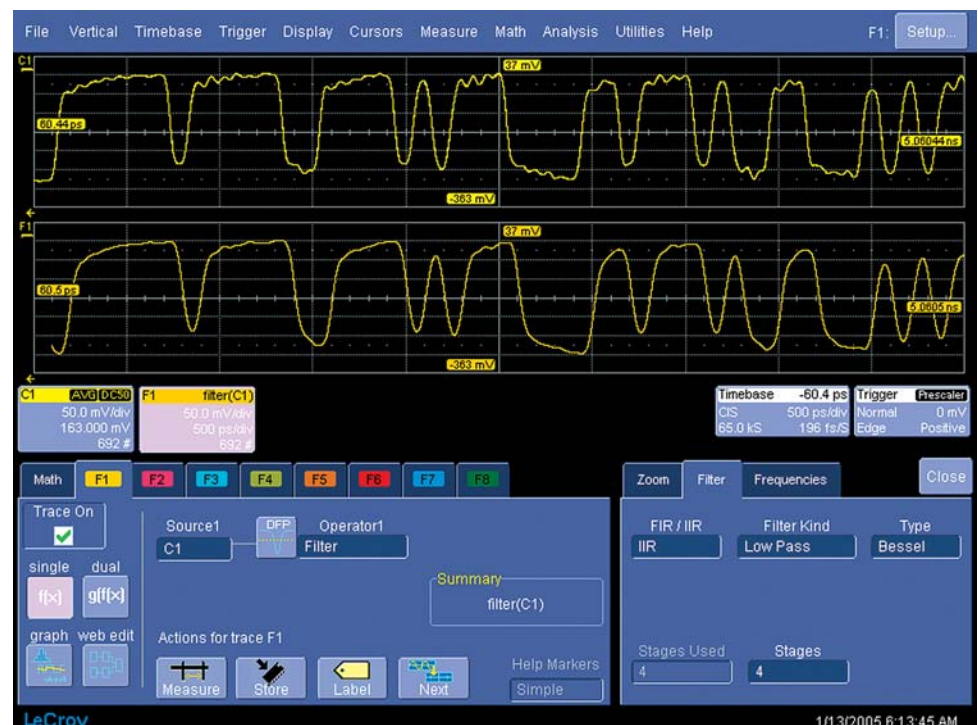
Filtering functions are available that offer custom FIR and IIR filters, as well as built-in LPF, BPF, HPF, and Notch types.

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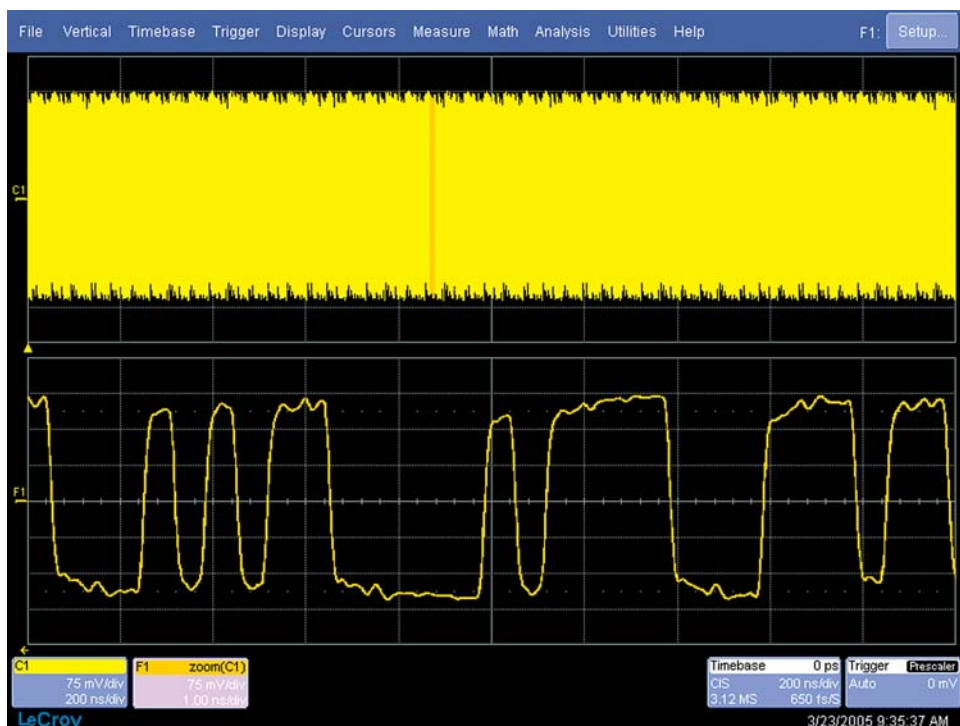
The WaveExpert can capture over 125,000 times more waveform samples than any other sampling oscilloscope, opening up a vast array of measurement and analysis capabilities.
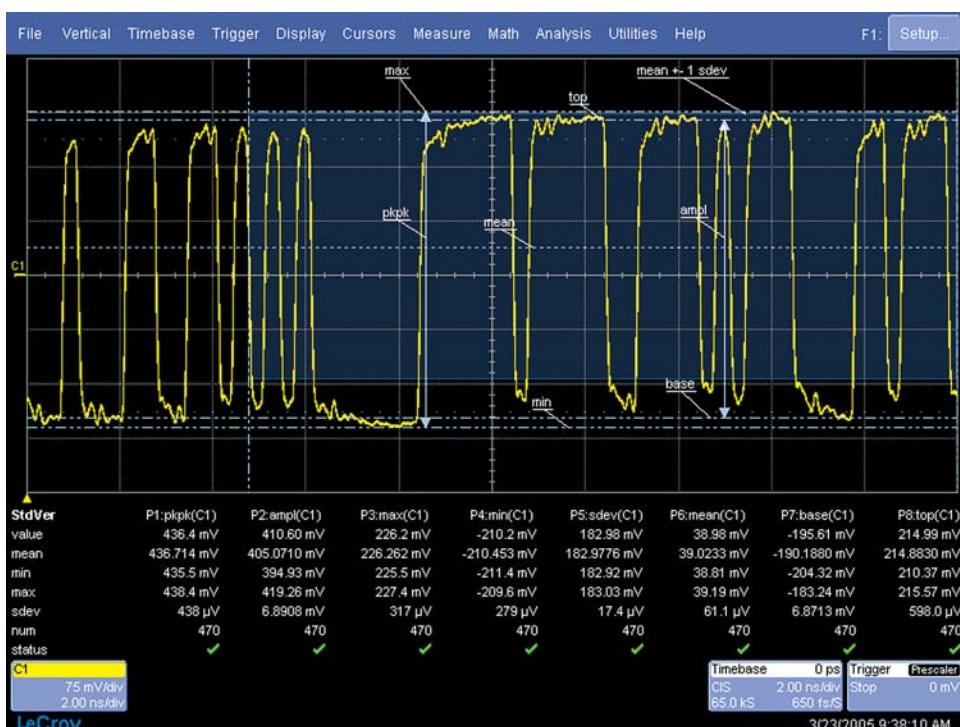

The user interface includes a full complement of math and measurement functions. The operation of the instrument is essentially the same as LeCroy's real-time oscilloscopes, making it easy to quickly move among different oscilloscopes.

When the signal under test consists of a repeating data pattern, the CIS timebase can be set to pattern lock on the signal, resulting in a voltage-vs.-time waveform. The waveform can be processed in many ways, similar to a waveform from a real-time oscilloscope. Processing includes convolution, FFT, and filtering.

Jitter-free Clock Recovery

A common limitation of electrical clock recovery circuits used to supply trigger signals to sampling oscilloscopes is that they add to the trigger jitter, thus increasing the overall measurement inaccuracy. The CIS timebase, with its phase-locked loop, maintains the same jitter performance whether clock recovery is used or not.

Integrated Data Source

The analysis capability of the WaveExpert is further enhanced by the first-ever internal data generator. This serial data generator operates at bit rates up to 12.5 Gb/s and features a < 30 ps rise time and support for 2^7, 2^{10}, 2^{15}, 2^{23}, and 2^{31} PRBS patterns. The unit plugs into any available module slot in the main frame and includes differential data outputs, a clock output, and clock input. The generator's internal clock provides bit rates of 2.45 to 2.87, 4.9 to 5.75, and 9.8 to 11.5 Gb/s. An external clock input is available to allow other data rates.

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The data generator is ideal for testing backplanes, circuit boards, amplifiers, and other modules that require a PRBS signal input.

Clock Recovery

Both optical and electrical clock recovery modules are available when a symbol clock is not. The electrical clock recovery module plugs into any available main frame slot and supports both differential and single-ended signal types. An internal passive power divider allows the signal under test to be looped through the clock recovery module so that external power dividers are unnecessary. The module recovers clock signals of data streams from 622 MHz through 13.5 GHz.

Optical clock recovery is available using an external module for data rates from 12.5 MHz to 2.7 GHz and 9.95 through 12.5 Gb/s. The optical signal loops through the clock recovery, and the recovered clock is electrically coupled to the instrument's trigger input. The form factor of this clock recovery module allows for an overall smaller system height, minimizing space requirements in rack mount configurations.
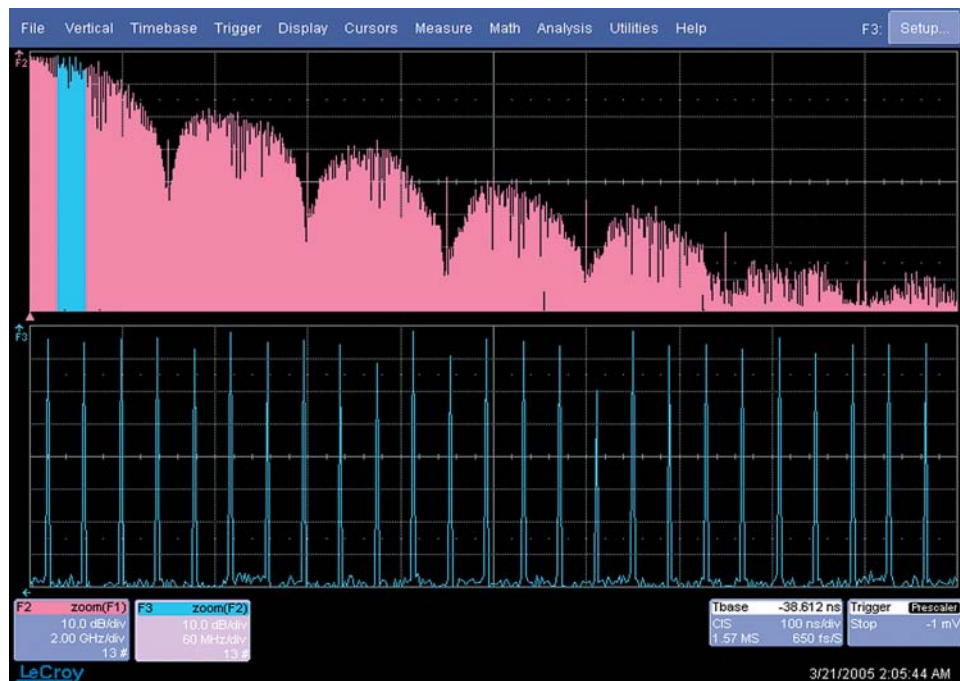
Detailed frequency domain analysis is provided by the standard Fourier transform function. This functionality is unavailable in other sampling oscilloscopes.

Eye Pattern Analysis—
Fast and Accurate

The traditional eye pattern view of serial data signals continues to be the most widely used measurement of signal integrity. The WaveExpert eye pattern mode uses a standard persistence display with the acquisition triggered by an external or recovered clock. The optional coherent timebase and Jitter Analysis software (standard in the SDA 100G) measures a complete voltage-vs.-time waveform, which is then "folded" to create the eye pattern. This dramatically improves measurement throughput and enables the display of specific symbols within the data pattern that cause mask violations. Compliance masks are included for most common standards, and additional masks can be easily created for new and emerging standards.

LeCroy's Optical and Electrical Sampling Modules

Complete Jitter Analysis

Jitter measurement has become a critical component of serial data analysis for systems and components. Traditionally, sampling oscilloscopes have measured jitter by determining the peak-to-peak and rms values of histograms on eye diagrams. Previously, this method was simple and reliable. However, current serial data standards require more detailed jitter analysis including the total jitter at a specific bit error rate, as well as the random and deterministic components.

Fastest TDR Step

The WaveExpert contains the fastest TDR step available in any instrument. The 20 ps rise time allows the measurement of even the smallest feature sizes. TDR traces can be scaled in volts, reflectance, or ohms. The capacitive or inductive reactance of specific portions of the trace can also be displayed by placing markers around the section of the trace of interest. The instrument supports both single-ended and differential TDR as well as TDT measurements.

The optional Jitter Analysis software (standard in the SDA 100G) measures total jitter at a selectable bit error rate, as well as the deterministic jitter and its components. Data dependent jitter, random + periodic jitter histograms for positive and negative-going edges, and the jitter bathtub curves are displayed.
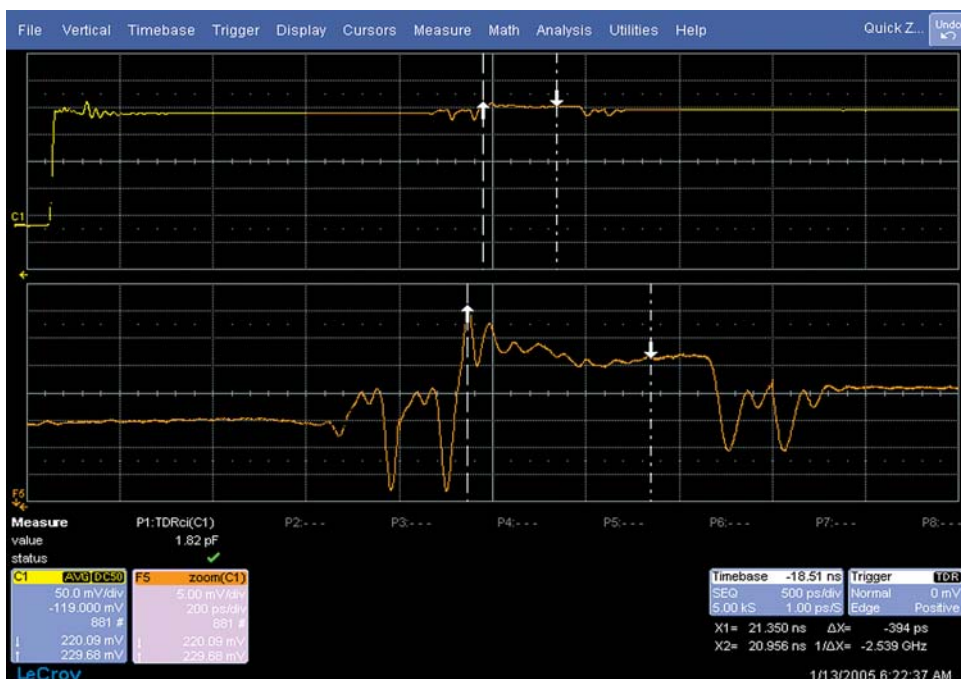
TDR measurements are enhanced by the fastest step in the industry. Traces can be scaled in impedance, reflectance, or volts. The capacitive or inductive reactance of specific features can also be displayed.

Specifications

Timebase

Trigger Input

Input Channels	1
Input Connector	2.92 mm
Frequency Range	DC to 5 GHz
Input Impedance	50 Ω nominal
Input Amplitude	±1 V
Max. Input Voltage	±2.5 V
Coupling	DC only
Threshold Range	±1 V
Threshold Resolution	2 mV
Trigger Sensitivity	-10 dBm at 100 MHz, -5 dBm at 5 GHz

Prescaler Input

Input Channels	1
Input Connector	2.92 mm
Frequency Range	125 MHz† to 14 GHz
Input Impedance	50 Ω nominal
Input Amplitude	0.0 dBm ±6 dBm
Max. Input Voltage	±2.5 V
Coupling	AC coupled
Prescaler Sensitivity	-5 dBm

Sequential Timebase

Minimum Time Per Division	1 ps
Time Resolution	100 fs
Timebase Delay Time Range	25 ns to 10 ms
Time Interval Accuracy	±1 ps ±0.1% of reading
Long Term Sample Rate and Delay Time Accuracy	±1 ppm
Maximum Record Length	16k samples – Std., 100k L option
Sample Rate	1 MS/s
Jitter	1.8 ps rms (typical) ±1 ppm * delay

CIS Timebase

Frequency Ranges	62.5 MHz to 100 GHz
Frequency Stability	Determined by the stability of the trigger prescaler signal
Jitter	600 fs rms (typical)
Timebase Range	1 ps/div to 500 ns/div (4M memory)
Timebase Delay Time Range	±1 pattern
Time Interval Accuracy	Determined by trigger/prescaler signal
Sample Rate	10 MS/s
Maximum Record Length	4M Std., 64M - L, 128M - VL, 256M - XL, 512M - XXL

Electrical Sampling Modules

ST-20 – 20 GHz/TDR

Connector Type	2.92 mm
Rise Time	18 ps
Bandwidth	20 GHz
Input Voltage Range	2 V_{pk-pk}
DC Vertical Voltage Accuracy (worst case)	±1% (800 mV$_{p-p}$ signal)
Aberrations	First 40 ps: ±10%, 40 ps to 200 ps: ±5%, 200 ps – 10 ns ±2%
RMS Noise	700 µV max. (500 µV typical)
TDR Step Voltage	250 mV
Incident Rise Time	20 ps (typical)
Offset Range	±1 V
TDR Pulse Rate	1 MHz
Offset Range	±1 V

Electrical Sampling Modules (continued)

SE-30 – 30 GHz

Connector Type	2.92 mm
Rise Time	12 ps
Bandwidth	30 GHz
Input Voltage Range	2 V_{pk-pk}
DC Vertical Voltage Accuracy	±1% (800 mV$_{p-p}$ signal)
Aberrations	First 40 ps: ±10%, 40 ps to 200 ps: ±5%, 200 ps – 10 ns ±2%
RMS Noise	1 mV (max.)
Offset Range	±1 V

SE-50 – 50 GHz

Connector Type	2.4 mm
Rise Time	8 ps
Bandwidth	50 GHz
Input Voltage Range	2 V_{pk-pk}
Aberrations	First 40 ps: ±10%, 40 ps to 200 ps: ±5%, 200 ps – 10 ns ±2%
RMS Noise	2 mV (max.)
Offset Range	±1 V

SE-70 – 70 GHz

Connector Type	1.85 mm
Rise Time	5 ps
Bandwidth	70 GHz
Input Voltage Range	2 V_{pk-pk}
Aberrations	First 40 ps: ±10%, 40 ps to 200 ps: ±5%, 200 ps – 10 ns ±2%
RMS Noise	3 mV (max.)
Offset Range	±1 V

SE-100 – 100 GHz

Connector Type	1 mm
Rise Time	4 ps
Bandwidth	100 GHz
Input Voltage Range	2 V_{pk-pk}
Aberrations	First 40 ps: ±10%, 40 ps to 200 ps: ±5%, 200 ps – 10 ns ±2%
RMS Noise	3 mV (max.)
Offset Range	±1 V

Optical Sampling Modules

SO-50 – 50 GHz

Optical Bandwidth	50 GHz
FWHM (50%)	8.5 ps (typical), 8.8 ps (max.)
Wavelength Range	1280 to 1620 nm
Responsivity	17 V/W (typical) 15 V/W (min.) @ 1564 nm, 11 V/W (typical) 9 V/W (min.) @ 1310 nm
Maximum Peak Optical Input	50 mW (+17 dBm)
Maximum Average Optical Input	20 mW (+13 dBm)
Noise Equivalent Power	83 µW (-11 dBm) @ 50 GHz bandwidth with 150 MHz IF bandwidth
Optical Power Monitor	-30 dBm to +10 dBm ±5%
Optical Return Loss	> 25 dB @ 1550 nm

SO-25 – 28 GHz

Optical Bandwidth	28 GHz
FWHM (50%)	15 ps
Wavelength Range	1280 to 1620 nm
Responsivity	17 V/W (typical) 15 V/W (min.) @ 1564 nm, 11 V/W (typical) 9 V/W (min.) @ 1310 nm

† 1 ns maximum rise time

Specifications

SO-25 – 28 GHz (continued)

Maximum Peak Optical Input	50 mW (+17 dBm)
Maximum Average Optical Input	20 mW (+13 dBm)
Noise Equivalent Power	47 µW (-13.2 dBm) @ 28 GHz bandwidth with 150 MHz IF bandwidth
Optical Power Monitor	-30 dBm to +10 dBm ±5%
Optical Return Loss	> 25 dB @ 1550 nm

SO-10 – 10 GHz

Optical Bandwidth	9 GHz (min.) 10 GHz (typical)
FWHM (50%)	40 ps (max.) 35 ps (typical)
Wavelength Range	750 to 1650 nm
Responsivity	450 V/W (typical) 425 V/W (min.) @ 1310 nm, 425 V/W (typical) 400 V/W (min.) @ 1565 nm, 225 V/W (typical) 200 V/W (min.) @ 850 nm
Maximum Peak Optical Input	5 mW
Optical Return Loss	-22 dB (SM), -14 dB (MM)
Noise Equivalent Power	3 µW (max.) 2 µW (typical) @ 10 GHz optical bandwidth into 150 MHz IF bandwidth
Sensitivity	-15 dBm 10.7 Gb/s 1550 SM, -14 dBm 12.5 Gb/s 1550 SM

Optical Reference Receiver Filters for SO-10 Module

Individual Filters

155 Mb/s	REF-00155	3.320 Gb/s	REF-03320
622 Mb/s	REF-00622	4.250 Gb/s	REF-04250
1.063 Gb/s	REF-01063	9.953 Gb/s	REF-09950
1.250 Gb/s	REF-01250	10.31 Gb/s	REF-10310
2.125 Gb/s	REF-02125	10.52 Gb/s	REF-10520
2.48832 Gb/s	REF-02488	10.66 Gb/s	REF-10660
2.5 Gb/s	REF-02500	10.71 Gb/s	REF-10710
3.125 Gb/s	REF-03125	11.1 Gb/s	REF-11100
3.188 Gb/s	REF-03188		

Filter Kits

REFKIT-TELCO – SONET/SDH Kit. Includes: REF-00155, REF-00622, REF-2488, REF-09950, REF-10660, REF-10710, REF-03320

REFKIT-SBUS – Serial Bus Kit. Includes: REF-01063, REF-01250, REF-02125, REF-02500, REF-03125, REF-03188, REF-04250, REF-09950, REF-10310, REF-11100

Clock Recovery and Source Optical/Electrical Modules

Clock Recovery Modules

CDR-E135

Configuration	Electrical differential data input/output (passive loop-through) with single-ended clock output
Frequency Range	622 Mb/s to 8 Gb/s (13.5 Gb/s with option 001)
Input Sensitivity	100 mV to 2 V_{p-p}
Input Return Loss	> -10 dB
Max. Input Level	2 V_{p-p}
Clock Out Level	> .5 V_{p-p}
Output Clock Rise/Fall Time	30 ps
Output Clock Jitter	< 800 fs rms
PLL Loop Bandwidth	6 MHz

CDR-O125

Configuration	External optical clock recovery with multi mode optical input/output and single-ended electrical clock output

CDR-O125 (continued)

Frequency Range	155 Mb/s to 2.7 Gb/s, 9.95 Gb/s to 12.5 Gb/s
Wavelength Range	750 nm to 1650 nm
Phase-Locked Loop Bandwidth	300 kHz and 4 MHz, user selectable
Clock Outputs	350 mV_{p-p} (9.95 to 12.5 Gb/s), 500 mV_{p-p} (155 Mb/s to 2.7 Gb/s)
Recovered Clock Jitter	.007 UI rms max.
Optical Signal Level Range	-10 dBm to +5 dBm
Optical Connector	Diamond MAS series 62.5 µm fiber with FC-PC
Input Return Loss	-15 dB
Input Insertion Loss	-3 dB

Pulse Pattern Generator

PPG-E135

Configuration	Differential data output, single-ended clock output with external clock input
Frequency Range	2.45 to 2.875 Gb/s, 4.9 to 5.75 Gb/s, 9.8 to 11.5 Gb/s
Data Patterns	PRBS 7, 10, 15, 23, 31
Mark Density	0.5, 0.25, 0.125
Data Output Voltage	500 mV_{p-p}
Data Output Jitter	< 1 ps rms
Data Output Rise/Fall Time (20–80%)	30 ps
Clock Out Level	> 0 dBm
Clock Input Level	> 0 dBm
Frequency Accuracy	±3 ppm

Power Requirements

100-200 V_{rms} (±10%) at 50/60 Hz; 115 V_{rms} (±10%) at 400 Hz, Automatic AC Voltage Selection Installation Category: 300V CAT II; Max Power Consumption: 400 VA (400 W)

Environmental

Temperature (Operating)	+5 ˚C to +40 ˚C including floppy disk and CD-ROM drives
Temperature (Non-Operating)	-20 ˚C to +60 ˚C
Humidity (Operating)	5% to 80% relative humidity (non-condensing) up to +30 ˚C. Upper limit derates to 25% relative humidity (non-condensing) at +40 ˚C
Altitude (Operating)	Up to 10,000 ft. (3048 m) at or below +25 ˚C
Altitude (Non-Operating)	Up to 40,000 ft. (12,192 m)
Random Vibration (Operating)	.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) (height excludes feet)	264 mm x 397 mm x 491 mm; 10.4" x 15.6" x 19.3"
Weight	36 lbs; 16 kg
Shipping Weight	48 lbs; 22 kg

Certifications

CE Compliant, UL and cUL listed; Conforms to EN 61326; EN 61010-1; UL 61010-1; and CSA C22.2 No. 61010-1

Ordering Information

Product Description	Product Code
WaveExpert 9000 Mainframe	
Standard 4-slot Mainframe	WE 9000
100k/Channel Memory	WE9K-L
Gated Trigger	WE9K-GT
WaveExpert NRO Mainframe	
NRO 4-slot Mainframe (includes CIS timebase)	NRO 9000
Serial Data Package (Jitter and Hi-Throughput Eye-Pattern Analysis)	NRO-SDA
64M (1 Ch), 32M (2 Ch), 16M (4 Ch) Waveform Memory	NRO-L
128M (1 Ch), 64M (2 Ch), 32M (4 Ch) Waveform Memory	NRO-VL
256M (1 Ch), 128M (2 Ch), 64M (4 Ch) Waveform Memory	NRO-XL
512M (1 Ch), 256M (2 Ch), 128M (4 Ch) Waveform Memory	NRO-XXL
Gated Trigger	NRO-GT
WaveExpert SDA Mainframe	
SDA 4-slot Mainframe (includes CIS timebase, Serial Data Analysis Package)	SDA 100G
High Stability CIS Timebase < 200 fs RMS Jitter	SDA 100G-HCIS
64M (1 Ch), 32M (2 Ch), 16 M (4 Ch) Waveform Memory	SDA 100G-L
128M (1 Ch), 64M (2 Ch), 32M (4 Ch) Waveform Memory	SDA 100G-VL
256 M (1 Ch), 128M (2 Ch), 64M (4 Ch) Waveform Memory	SDA 100G-XL
512M (1 Ch), 256M (2 Ch), 128M (4 Ch) Waveform Memory	SDA 100G-XXL
Gated Trigger	SDA 100G-GT
Software Options	
Digital Filter Software Package	WE9K-DFP2
Advanced Customization Software Package	WE9K-XDEV
Advanced Math Software Package	Included in standard configuration
Processing Web Editor Software Package for Functions and Parameters	WE9K-XWEB
Electrical Sampling Modules	
100 GHz Electrical Sampling Module	SE-100
70 GHz Electrical Sampling Module	SE-70
50 GHz Electrical Sampling Module	SE-50
30 GHz Electrical Sampling Module	SE-30
20 GHz Electrical Sampling Module with TDR	ST-20
Optical Sampling Modules	
High Sensitivity 10 GHz Optical Sampling Module with Plug-in Reference Receivers	SO-10
28 GHz Optical Sampling Module	SO-25
50 GHz Optical Sampling Module	SO-50

Product Description	Product Code
Optical Reference Receiver Filters for SO-10	
155 Mb/s Reference Receiver Filter for SO-10	REF-00155
622 Mb/s Reference Receiver Filter for SO-10	REF-00622
1.063 Gb/s Reference Receiver Filter for SO-10	REF-01063
1.250 Gb/s Reference Receiver Filter for SO-10	REF-01250
2.125 Gb/s Reference Receiver Filter for SO-10	REF-02125
2.488 Gb/s Reference Receiver Filter for SO-10	REF-02488
2.5 Gb/s Reference Receiver Filter for SO-10	REF-02500
3.125 Gb/s Reference Receiver Filter for SO-10	REF-03125
3.188 Gb/s Reference Receiver Filter for SO-10	REF-03188
3.32 Gb/s Reference Receiver Filter for SO-10	REF-03320
4.25 Gb/s Reference Receiver Filter for SO-10	REF-04250
9.950 Gb/s Reference Receiver Filter for SO-10	REF-09950
10.31 Gb/s Reference Receiver Filter for SO-10	REF-10310
10.52 Gb/s Reference Receiver Filter for SO-10	REF-10520
10.66 Gb/s Reference Receiver Filter for SO-10	REF-10660
10.71 Gb/s Reference Receiver Filter for SO-10	REF-10710
11.1 Gb/s Reference Receiver Filter for SO-10	REF-11100
Optical Reference Receiver Kit – Serial Bus	REFKIT-SBUS
Optical Reference Receiver Kit – SONET/SDH	REFKIT-TELCO
Hardware Options and Accessories	
1.5 Meter Module Extender Cable	ME-15
IEEE-488 GPIB Remote Control Interface	GPIB-1
Keyboard, USB	KYBD-1
Oscilloscope Cart with Extra Shelf and Drawer	OC1024
Oscilloscope Cart	OC1021
Rackmount Adapter with 25" (64 cm) Slides	RMA-25
Rackmount Adapter with 30" (76 cm) Slides	RMA-30
Removable Hard Drive Package	WE9K-RHD
Additional Removable Hard Drive (Includes USB, CD-ROM and Spare Hard Drive)	WE9K-RHD-02
2.92 mm F-F Adapter	ADAPT-292
2.92 – SMA F-F Adapter	ADAPT-292-SMA
1.85 mm F-F Adapter	ADAPT-185
1 mm F-F Adapter	ADAPT-100
1 mm – 1.85 mm F-F Adapter	ADAPT-100-185
4 in.-lb. Torque Wrench	TW-4
8 in.-lb. Torque Wrench	TW-8
Optical Clock Recovery Modules	
Optical Clock Recovery Module (12.5 MHz to 2.5 Gb/s, 9.95 Gb/s to 12.5 Gb/s)	CDR-O125
Electrical Clock Recovery Module (622 MHz to 8 GHz)	CDR-E135
Extend Frequency Range of CDR-E135 to 13.5 Gb/s	CDR-E135-001
Pulse Pattern Generator	
PRBS Source 10 Gb/s, 5 Gb/s, 2.5 Gb/s	PPG-E135

Customer Service

LeCroy oscilloscopes are designed, built, and tested to ensure high reliability. In the unlikely event you experience difficulties, the WaveExpert Series oscilloscopes and modules are warranted for a period of 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