



Breakthrough
WaveShape
Analysis without
breaking
the bank.



WAVEPRO OSCILLOSCOPES

1 GHz — 3 GHz Bandwidth
Up to 48 Mpts Memory *and*
20 GS/s Sample Rate





Measure Complex Signals with **X-STREAM** Confidence

LeCroy has now integrated its industry leading SiGe ADC/amplifiers and groundbreaking X-Stream® Technology into the WavePro DSO line. The WavePro 7000 Series brings fast and accurate measurement capability to 1 GHz and 3 GHz bandwidth applications. And it does it at an extremely attractive price.

Viewing a signal on a high-resolution screen is a good start, but today's engineering requires the ability to go inside the signal and conduct next-generation waveform measurement and analysis to get to the source of a problem. Such ability gives you far greater confidence in your measurements.

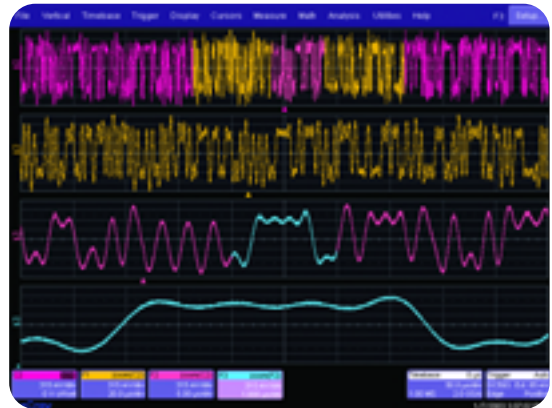
You can make faster more accurate more confident measurements with the WavePro 7000 Series through:

- Excellent signal integrity from SiGe amplifiers and ADCs
- 10 GS/s single-shot sample rate on all channels (20 GS/s maximum) to capture signal details
- Acquisition of up to 48 million data points to maintain high sampling rates and complex signals
- Built-in 1 M Ω and 50 Ω selectable inputs
- 2 ps jitter noise floor
- Unique processing chain that gives you the ability to add customized measurements inside
- Fast WaveShape Analysis

LeCroy's proprietary **X-Stream Technology** is an extremely fast streaming architecture that eliminates the trade-offs between long record lengths and quick processing. The WavePro DSO, incorporating X-Stream Technology, can conduct WaveShape Analysis 10–100 times faster than any other oscilloscope in the 1 GHz–3 GHz bandwidth class. That makes them excellent tools for next-generation designs, such as:

- Datacom/telecom standards development
- Gigabit Ethernet
- USB 2.0
- Advanced Military Designs
- Much, much, more

The WavePro oscilloscopes have a host of other features that simplify operation, such as a new processing web that makes it easy for you to set up measurements, a large color touch screen, and fast access to powerful capabilities. With our WavePro 7000 Series oscilloscopes, you'll never look at signal analysis the same way again.





Unleashing the Power of



Deep Memory—1 Mpt per channel standard memory. Options extend all the way to an industry-best 24 Mpts per channel.

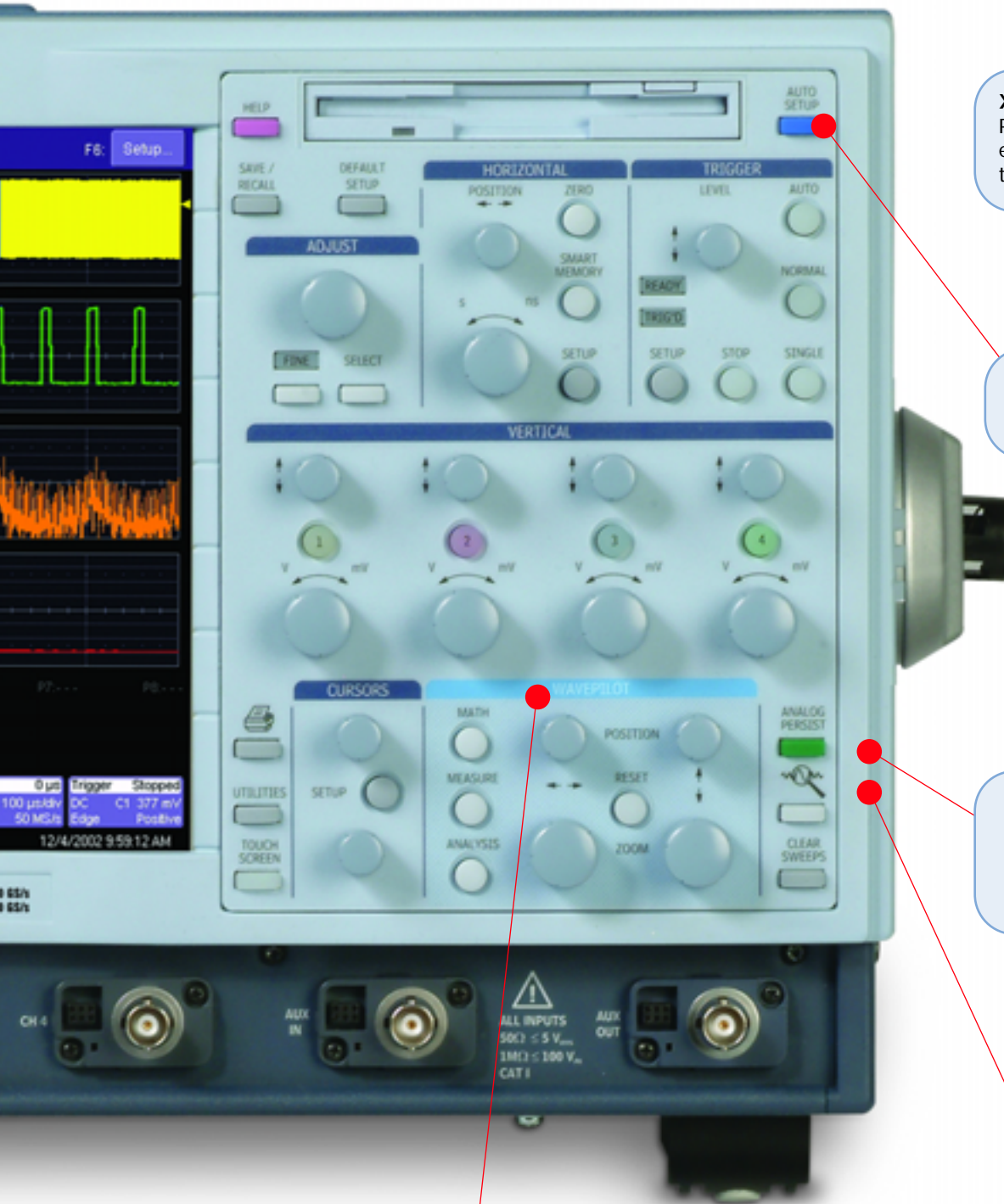
Advanced Windows®—based operating system offers robust system performance, with an intuitive and informative user interface.

Display—Large 10.4" SVGA touch screen has 20% larger waveform display area than comparable oscilloscopes.

Accessories—Passive, active, and differential probes, as well as an O/E converter can be connected to a WavePro DSO.

High Impedance Input—All WavePro DSO channels can be used at either 50 Ω or 1 M Ω , both selectable on the screen.

X-STREAM Technology



X-Stream Technology— Proprietary technology that enables data processing that is 10–100 times faster.

Auto SetUp—One button automatically calls up a signal on the display.

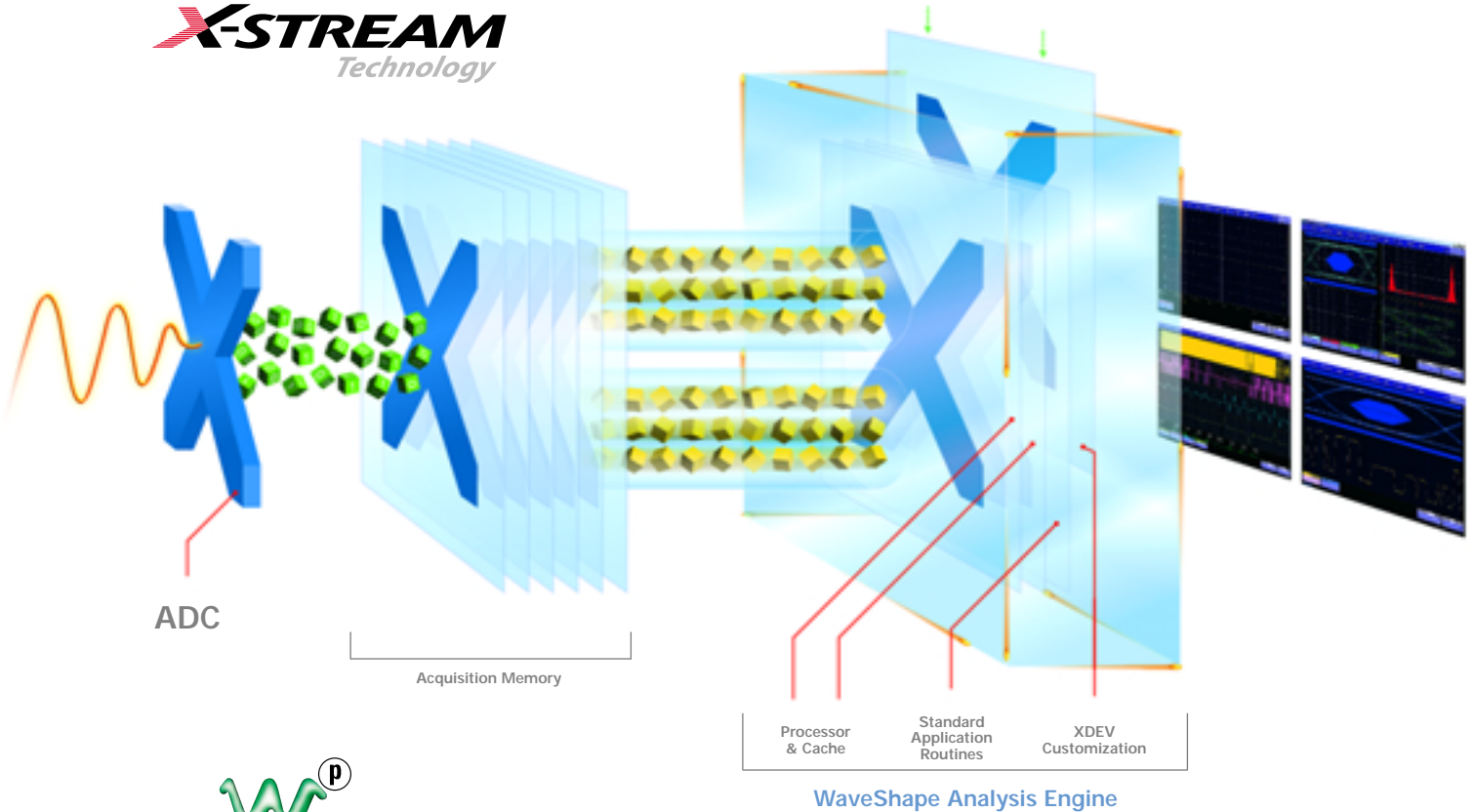
Analog Persistence— Switches between analog view and digital view so you can fully explore the signal's modulation.

QuickZoom— Automatically displays 10x magnified traces of all signals on multi-grids.

WavePilot—Controls give easy access to powerful signal analysis capabilities so you can gain insight and trace problems directly to their source.

LeCroy

X-STREAM
Technology



WavePro oscilloscopes are the only instruments in their bandwidth class that can accurately measure the long complex signals found in many of today's devices. That is because they fully incorporate LeCroy's proprietary X-Stream Technology. No other company can offer X-Stream Technology in any class. Only LeCroy can give you the measurement confidence you need to make sure your designs work.

What is X-Stream Technology? It's the foundation upon which LeCroy's WaveMaster and WavePro instruments rest. X-Stream Technology allows engineers to perform WaveShape Analysis at depths they could only dream about. X-Stream Technology makes those dreams come true by delivering extraordinary performance:

- Capture and analyze long records faster than ever before
- Utilize advanced tools for detailed analysis
- Customize your measurement capability
- Display your signal in 3D views and "Histicons" to see inside a signal

All of this is achieved because X-Stream Technology is an extremely fast streaming

architecture that enables high throughput of data — even when the WavePro oscilloscopes are conducting complex measurements.

LeCroy's proprietary CMOS memory accepts 10 Gbytes of data in real time from each SiGe ADC, packetizes it, and speeds the data through dual high-speed pipelines to the CPU. Once in the CPU, LeCroy's proprietary software algorithms "capture" each packet, and perform many of the required calculations in the CPU's L1 cache memory.

This process eliminates the "fetching" of data and math instructions from RAM to minimize calculation time. It also allows user-created functions and measurements to be inserted using our XDEV option.

World Class Signal Integrity and In-depth Analysis – without Digging Deep into Your Pocket

Integrating the industry's only SiGe ADCs, large high resolution screen, advanced Windows operating system, and X-Stream Technology into the WavePro 7000 Series gives the new DSOs in-depth analysis capability that is friendly to your bottom line. Now, you don't have to make a choice between total measurement confidence and budgetary constraints. With the WavePro oscilloscopes you can have both.

It starts with the oscilloscope's SiGe amplifiers with very flat bandwidth response followed by a 10 GS/s ADC on each channel (5 GS/s for the model 7000). The model 7100 is the first 1 GHz/oscilloscope in this class with 10 GS/s oversampling. Standard memory is 1 Mpts per channel (500 kpts for the model 7100), with options extending all the way to an industry-best 24 Mpts per channel (48 Mpts when in dual channel mode). Such capability assures signal integrity when you analyze, so you don't have to worry about under sampling the waveform.

Performance advantages continue with the oscilloscope's 2 ps jitter noise floor, which allows even small signal imperfections to be detected.

Plus, the WavePro 7300 is the first oscilloscope to offer both 1 M Ω and 50 Ω inputs in a 3 GHz instrument. This flexibility gives the WavePro 7300 the convenience of a high-impedance input for capturing lower bandwidth signals up to 500 MHz, combined with a very high performance SiGe 3 GHz, 50 Ω input.

Easy to Use, Simple to View Results

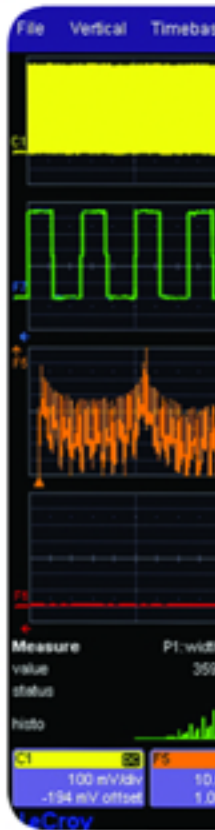
Operation of the WavePro DSO is easy and intuitive. Adjust the timebase, voltage and cursors from the front panel knobs or use the most advanced touch screen user interface in oscilloscopes today. Getting to parameter

measurements is fast and graphical. It's highly intuitive and adaptable to the way you like to work. An advanced Windows 2000-based operating system handles all the pull down menus and I/O to peripherals to add to the familiarity, and offers robust system performance.

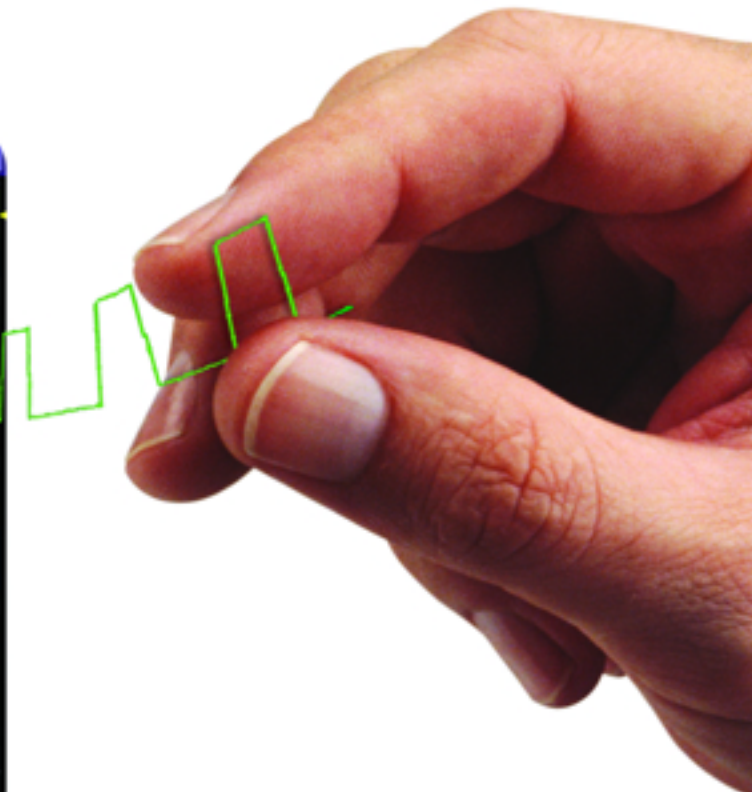
Viewing the results is as easy as acquiring them. All WavePro oscilloscope models are designed with a 10.4-inch SVGA touch screen display with a waveform viewing area 20% larger than comparable oscilloscopes. Plus, LeCroy has designed features into the WavePro oscilloscopes that allow you to view your signal in the time, frequency, or statistical domains.

For example, the WavePro oscilloscopes have the ability to create up to eight unique zoom or math traces, each analyzing a different segment of the waveform. Calculations can be performed on the zoomed areas. A Multi-Zoom feature allows you to view time-correlated events, and AutoScroll is available to roll through the waveform.

Another unique viewing capability is Histicons — small histogram views that provide a visual indication of parameter distributions. Up to eight Histicons and their accompanying statistics can be displayed simultaneously, without adversely affecting the processing time.



With the XMAP option, LeCroy's Processing Web lets you think about signal analysis graphically. Visualize an oscilloscope measurement as a chain of operations while seeing results at every step.



A Comprehensive Suite of Analysis Options

Now with the WavePro oscilloscopes there is a new level of WaveShape Analysis that allows engineers to troubleshoot 1—3 GHz circuits in ways that have never been possible. The XMAP suite of analysis options gives the oscilloscopes advanced capabilities that have previously been reserved for instruments operating at a higher bandwidth and price.

Imagine capturing large amounts of data and graphing it in intuitive, easily understandable ways to allow deep insight. Histogram, Track, and Trend capabilities allow you to use the long memory of the WavePro DSO to its best advantage. Expanded FFT algorithms provide unique spectral insights.

Simplify your use of an oscilloscope when you want to perform customized analysis or math operations.

Your own user-defined math, parameter measurement, or control routines can be quickly and easily inserted into the DSO processing stream. You can go way beyond basic “connectivity” or data export and make the oscilloscope your own measurement tool.

Jitter and timing analysis functions allow period, width, cycle-to-cycle, and other timing parameters to be measured. Results can be presented as statistics, histograms, or time domain tracks. Users can also view a Jitter FFT, which provides a spectral fingerprint of a signal's jitter sources.

The XMAP option gives you all this utility and insight, and is just one of the full line of analysis packages available for the WavePro 7000 Series.

Customized Measurements Expand Analysis Capability

WavePro DSOs provide the most powerful set of analysis you can get in an oscilloscope. That means you have a whole new way to analyze the pulse shape or perform special types of waveform math.

X-Stream Technology lets you insert new analysis directly into the processing chain of the WavePro oscilloscope. You can write your own Visual Basic script, MATLAB, Mathcad, or Excel function, and seamlessly integrate it into your oscilloscope's processing chain without having to run a different program, establish remote communication between the oscilloscope and another program, create a new reference waveform, or transfer large data files between the DSO and another program.

The WavePro DSO's customization functions go beyond measurement techniques. LeCroy's CustomDSO package allows the User Interface (UI) to be modified to accommodate your test process, starting from the panel setups.

Control of the WavePro oscilloscopes can be customized as well. Using LeCroy's standard remote command language, IVI, or LabView drivers, the WavePro oscilloscopes can interface with third party software. Microsoft-compliant Automation language can also be used for integration into most Windows-based programs. Connections can be made with the standard 10/100 Base-T network connection or via optional GPIB.



With
WavePro
oscilloscopes powered by
X-Stream Technology,
the possibilities are only
limited by your requirements —
or your **imagination!**



- Port tools such as filters from your simulation environment into the scope to compare simulated signals with actual circuit performance. Validate if circuit performance matches the model and reduce characterization time.
- Build your own user interface. Add push buttons, frames, custom controls.

Insert proprietary calculations into the processing stream. See your parameter or math function updates live on every trigger. You can use all the oscilloscope tools on your custom measurement including cursors, parameters, persistence display, FFT, or any other oscilloscope capability.

First, source a customized algorithm.

Then load it.

Now display the calculated results.

Meet The **X-STREAM**




7300

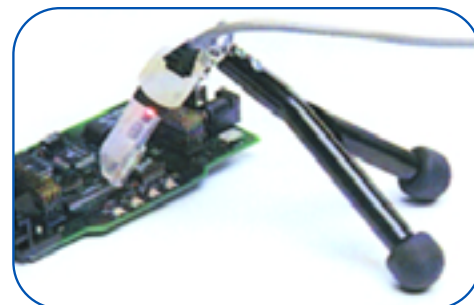
WavePro 7300

| | |
|----------------------------------------------------------------------------|------------------------------------------------|
| Bandwidth | 3 GHz |
| Sample Rate on 4 channels (Maximum 2 ch) | 10 GS/s (20 GS/s / 2 Ch) |
| Memory Standard | 1M/Ch (2M / 2 Ch) |
| Optional Memory Maximum | 24M/Ch (48M / 2 Ch) |
| 1 MΩ and 50 Ω Selectable Inputs | Yes |
| Triggering | SMART Trigger, glitch, edge, pattern, interval |

Probes and Accessories

LeCroy offers a variety of probe solutions to maximize the performance of your WavePro oscilloscope. A full line of passive, active, and differential probes, as well as Optical-to-Electrical (O/E) converters are available to give you the tools necessary to connect to the signal under analysis.

The **HFP** series active probes integrate advanced technologies and techniques to ensure the highest measurement accuracy.



- Enabled WavePro Oscilloscopes




wavepro®
7100/7000

| | WavePro 7100 | WavePro 7000 |
|-------------------------------------------------|------------------------------------------------|-------------------------|
| Bandwidth | 1 GHz | 1 GHz |
| Sample Rate on 4 channels (Maximum 2 ch) | 10 GS/s (20 GS/s / 2 Ch) | 5 GS/s (10 GS/s / 2 Ch) |
| Memory Standard | 1M/Ch (2M / 2 Ch) | 500k/Ch (1M / 2 Ch) |
| Optional Memory Maximum | 24M/Ch (48M / 2 Ch) | 4M/Ch (8M / 2 Ch) |
| Hi Z and 50 Ohm selectable inputs | Yes | Yes |
| Triggering | SMART Trigger, glitch, edge, pattern, interval | |

Circuit design engineers who need to probe a wide variety of IC pins, circuit vias, and surface mount components will discover that the HFP series is an ideal solution. Offering high impedance and low capacitance, the HFP series features a unique "FreeHand" probe holder and variety of probe tips.

If you need to capture and analyze optical signals, the **OE425 and OE455 O/E converters**

are available. Covering a wide range of wavelengths with up to 5 GHz optical bandwidth, the O/E converters feature a unique DSP-based reference receiver that eliminates the need for re-calibration when switching channels or instruments.



| Vertical System | WavePro 7000 | WavePro 7100 | WavePro 7300 |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------------|
| Analog Bandwidth @ 50 Ω (-3 dB) | 1 GHz | 1 GHz | 3 GHz |
| Rise Time (Typical) | 400 ps | 400 ps | 150 ps |
| Input Channels | 4 | | |
| Bandwidth Limiters | 25 MHz; 200 MHz | | |
| Input Impedance | 50 Ω ; 10 M Ω //11pF typical (using PP005A probe) | | |
| Input Coupling | 1 M Ω : AC, DC, GND; 50 Ω : DC | | |
| Maximum Input Voltage | 50 Ω : 5 Vrms, 1 M Ω : 100 Vmax (peak AC \leq : 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 M Ω : 2 mV – 2 V/div fully variable | | |
| DC Gain Accuracy | \pm 1.5% of full scale; \pm 1% (typical) | | |
| Offset Range | 50 Ω : \pm 700 mV @ 2–4.99 mV/div \pm 1.5 V @ 5–100 mV/div \pm 10 V @ 0.102-1 V/div 1 M Ω : \pm 700 mV @ 2-4.99 mV/div \pm 1.5 V @ 5–100 mV/div \pm 20 V @ 0.102-2 V/div | | |
| Offset Accuracy | \pm (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 (max.) | | |
| 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 | \leq 5 ppm @ 0–40 $^{\circ}$ C | | |
| Time Internal Accuracy | \leq 0.06 / SR + (5 ppm * Reading) (rms) | | |
| Sample Rate & Delay Time Accuracy | \pm 5 ppm \leq 10s interval | | |
| Jitter Noise Floor | 2 ps rms @ 100 mV/div (typical) | | |
| Trigger & Interpolator Jitter | \leq 2.5 ps (typical) | | |
| Channel-Channel Deskew Range | \pm 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 |
| 2 Channel Max | 10 GS/s | 20 GS/s | 20 GS/s |
| Random Interleaved Sampling (RIS) | 200 GS/s for repetitive signals; 20 ps/div – 1 μ s/div | | |
| Maximum Trigger Rate | 150,000 waveforms/second (in Sequence Mode, up to 4 channels) | | |
| Intersegment Time | \leq 6 μ s | | |
| 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, sinx/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, DC1M Ω , AC1M Ω | | |
| 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 | \pm 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 | 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. |
| 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 |
| Realtime 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 M Ω) 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°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 |
| 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°C |
| 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 | |
| | 3-year warranty; calibration recommended annually Optional service programs include extended warranty, upgrades, and calibration services |

STANDARD

Math Tools

Display up to four math function traces (F1 – F4). The easy to use graphical interface simplifies setup of up to two operations on each function trace, and function traces can be chained together to perform math-on-math.

| | |
|-------------------------------------------------------|--------------------------------|
| absolute value | invert (negate) |
| average (summed) | log (base e) |
| average (continuous) | log (base 10) |
| derivative | product (x) |
| deskew (resample) | ratio (f) |
| difference (-) | reciprocal |
| enhanced resolution (to 11 bits vertical) | rescale (with units) |
| envelope | roof |
| exp (base e) | (sinx)/x |
| exp (base 10) | square |
| fft (power spectrum, magnitude, phase, up to 25 kpts) | square root |
| floor | sum (+) |
| histogram of 1000 events | trend (datalog) of 1000 events |
| integral | zoom (identity) |

Pass/Fail Testing

Simultaneously test multiple parameters against selectable parameter limits or pre-defined masks. Pass or fail conditions can initiate actions including document to local or networked files, email the image of the failure, save waveforms, send a pulse out at the front panel auxiliary NC output, or (with the GPIB option) send a GPIB SRQ.

OPTIONAL

Master Analysis Package (XMAP)

This package provides maximum capability and flexibility, and includes all the functionality present in XMATH, XDEV, and JTA2

Advanced Math Package (XMATH)

This package provides a comprehensive set of signal WaveShape Analysis Tools providing insight into the waveshape of complex signals. Additional capability provided by XMATH includes:

- Intuitive, Graphical Math Setup (Processing Web) with unlimited chaining of functions
- 8 math traces total (4 additional)
- Parameter math – add, subtract, multiply, or divide two different parameters
- Histograms expanded with 19 histogram parameters and up to 2 billion events
- Trend (datalog) of up to 1 million events
- Track graphs of any measurement parameter
- FFT capability added to include: power averaging, power density, real and imaginary components, frequency domain parameters, and FFT on up to 25 Mpts.
- Narrow band power measurements
- Auto-correlation function
- Sparse function
- Cubic and Quadratic Interpolation function

Advanced Customization Package (XDEV)

This package provides a set of tools to modify the scope and customize it to meet your unique needs. Additional capability provided by XDEV includes:

- Creation of your own measurement parameter or math function, using third party software packages, and display the result in the scope. Supported third party software packages include:
 - VBScript
 - MATLAB
 - Excel
 - Mathcad
- CustomDSO – create your own user interface in a scope dialog box.
- Addition of macro keys to run VBScript files
- Support for plug-ins

Measure Tools

Displays any 8 parameters together with statistics, including their average, high, low, and standard deviations. Histicons provide a fast, dynamic view of parameters and wave shape characteristics.

| | | |
|------------------------------------|-------------------------------------|-----------------------------|
| amplitude | maximum | width |
| area | mean | median |
| base | median | phase |
| cycles | minimum | time @ minimum (min.) |
| data | number of points | time @ maximum (max.) |
| delay | +overshoot | Δ time @ level |
| Δ delay | -overshoot | Δ time @ level from trigger |
| duty cycle | peak-to-peak | x @ max |
| duration | period | x @ min |
| falltime (90–10%, 80–20%, @ level) | phase | |
| frequency | rissetime (10–90%, 20–80%, @ level) | |
| first | rms | |
| last | std. deviation | |
| level @ x | top | |

Timing Tools

LeCroy M1 Timing Tools software runs inside your WavePro oscilloscope, acquires data, and calculates, displays, and analyzes jitter in clock and serial data. A wide variety of measurement tools are available including differential crossing point measurements. Jitter viewing tools include line graph, histogram, jitter, spectrum text, and eye diagram. Available in an advanced or basic version.

| | |
|--------------------------------------------|-------------------|
| LeCroy M1 Timing Tool (Advanced, 1 scope) | LeCROY M1 / ADV-1 |
| LeCroy M1 Timing Tool (Advanced, 4 scopes) | LeCROY M1 / ADV-4 |
| LeCroy M1 Timing Tool (Basic) | LeCROY M1 / BASIC |

Jitter and Timing Analysis Package (JTA2)

This package provides jitter timing and analysis using time, frequency, and statistical views for common timing parameters, and also includes other useful tools. JTA2 includes:

- Jitter and timing parameters, with "Track" graphs of
 - Cycle-Cycle Jitter
 - N-Cycle
 - N-Cycle with start selection
 - Frequency
 - Period
 - Half Period
 - Width
 - Time Interval Error
 - Setup
 - Hold
 - Skew
 - Duty Cycle
 - Duty Cycle Error
- Edge@lv parameter (counts edges)
- Histograms expanded with 19 histogram parameters and up to 2 billion events
- Trend (datalog) of up to 1 million events
- Track graphs of all parameters
- Persistence histogram, persistence trace (mean, range, sigma)

Disk Drive Measurements Package (DDM2)

This package provides disk drive parameter measurements and related mathematical functions for performing disk drive WaveShape Analysis.

- Disk Drive Parameters are as follows:

| | | |
|---------------------------|----------------------------|-----------------------------|
| amplitude assymetry | local time between troughs | overwrite |
| local base | local time at minimum | pulse width 50 |
| local baseline separation | local time at maximum | pulse width 50– |
| local maximum | local time peak-trough | pulse width 50+ |
| local minimum | local time over threshold | resolution |
| local number | local time trough-peak | track average amplitude |
| local peak-peak | local time under threshold | track average amplitude– |
| local time between events | narrow band phase | track average amplitude+ |
| local time between peaks | narrow band power | auto-correlation s/n |
| | | non-linear transition shift |
- Correlation function
- Trend (datalog) of up to 1 million events
- Histograms expanded with 18 histogram parameters and up to 2 billion events



Ordering Information

WavePro 4-Channel Digital Oscilloscopes

Product Code

| | |
|------------------------------------------------------------------------------------------------------------|--------------|
| 3 GHz 20 GS/s (2 Ch); 10 GS/s 4 Ch 1 M Ω & 50 Ω Color DSO 2 Mpts/2 Ch; 1 Mpts/Ch Standard | WavePro 7300 |
| 1 GHz 20 GS/s (2 Ch); 10 GS/s 4 Ch 1 M Ω & 50 Ω Color DSO 2 Mpts 2 Ch; 1 Mpts/Ch Standard | WavePro 7100 |
| 1 GHz 10 GS/s (2 Ch); 5 GS/s 4 Ch 1 M Ω & 50 Ω Color DSO 1 Mpts 2 Ch; 500kpts/Ch Standard | WavePro 7000 |

Included with Standard Configuration

| | |
|--------------------------------------------------------------------------------------------------------|--------|
| 10:1 10 M Ω 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 | |
| 3 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: 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 |

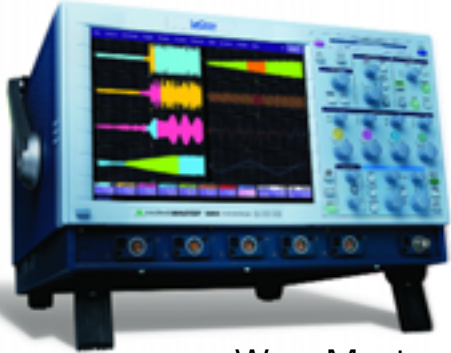
Selected Accessories

| | |
|----------------------------------------------------|------------------|
| 10:1 10 M Ω Passive Probes | PP005A |
| 3.5 GHz Active Voltage Probe | HFP3500 |
| 2.5 GHz Active Voltage Probe | HFP2500 |
| 1.5 GHz Active Voltage Probe | HFP1500 |
| 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 |



Breakthrough WaveShape Analysis from LeCroy's Family of X-Stream-based Instruments

The WavePro 7000 Series of digital oscilloscopes is part of a growing family of instruments that has LeCroy's proprietary X-Stream Technology as its genetic thread, creating a unique DSO "DNA" that delivers breakthrough WaveShape Analysis.

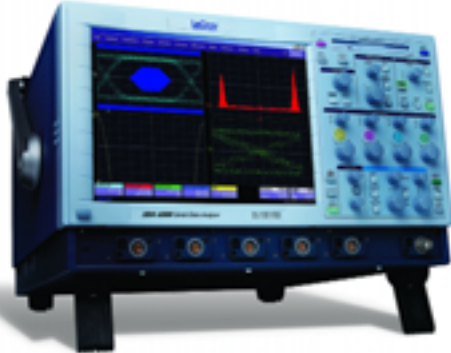


WaveMaster

In addition to the WavePro 7000 Series, LeCroy's family of X-Stream-based instruments include:

WaveMaster

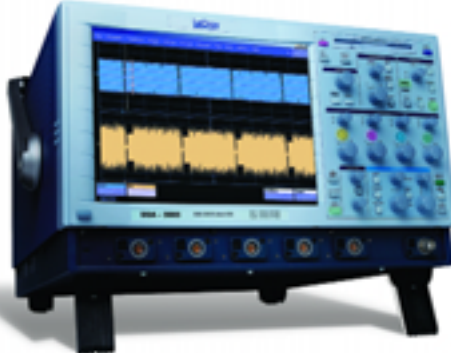
The "big brother" to the WavePro 7000 Series, the WaveMaster series is for engineers who need bandwidth between 3 GHz – 6 GHz. The WaveMaster 8600A, 8500A, and 8300A offer the longest memory in the industry – 50 Mpoints per channel (100 Mpoints when using one or two channels). The DSOs can perform real time sampling at 20GS/s when using one or two channels, 1 ppm clock accuracy, and a jitter noise floor of 1 ps.



SDA

Serial Data Analyzer (SDA)

The SDA is the first fully integrated test system designed specifically for evaluating the physical layer characteristics of both optical and electrical serial data signals, including jitter, eye pattern, and bit error rate. With unrivaled performance, the SDA brings unprecedented analysis capabilities for verifying and testing serial data according to a wide range of formats and standards, such as serial ATA, PCI-Express, Fibre Channel, Gigabit Ethernet, and IEEE 1394b.



DDA

Disk Drive Analyzer (DDA)

A unique combination of sophisticated measurement capability and informative UI makes the DDA-5005A the solution for disk drive analysis. View SAM histograms of head signal quality, rapidly locate PRML signal problems, create head signal quality line graphs, characterize media noise, and measure drive performance parameters.



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