TELEDYNE LECROY
Everywhereyoulook™

HDO4000 High Definition Oscilloscopes

200 MHz – 1 GHz



Key Features

- 12-bit ADC resolution, up to 15-bit with enhanced resolution
- 200 MHz, 350 MHz, 500 MHz, 1 GHz bandwidths
- Long Memory – up to 50 Mpts
- 12.1" touch screen display
- Multi-language User Interface
- WaveScan – Search and Find
- LabNotebook Documentation and Report Generation
- History Mode
- Spectrum Analyzer Mode
- Power Analysis Software
- Serial Data Trigger and Decode
- 16 Digital Channels with 1.25 GS/s
  - Analog and Digital Cross-Pattern Triggering
  - Digital Pattern Search and Find
  - Analog and Digital Timing Measurements
  - Activity Indicators

Combining Teledyne LeCroy's HD4096 high definition technology, with long memory, a compact form factor, 12.1" wide touch screen display, powerful debug tools, and mixed signal capability, the HDO4000 is the ideal oscilloscope for precise measurements and quick debug. Tools such as WaveScan Search and Find, LabNotebook Report Generator, and History Mode help identify and isolate problems for faster troubleshooting.

HD4096 Technology

HD4096 high definition technology consists of high sample rate 12-bit ADCs, high signal-to-noise input amplifiers and a low-noise system architecture. This technology enables high definition oscilloscopes to capture and display signals of up to 1 GHz with high sample rate and 16 times more resolution than other oscilloscopes.

Large 12.1" Touch Screen

Navigating complicated user interfaces is a thing of the past thanks to the large touch screen display of the HDO4000. The user interface was designed for touch screens which makes navigating the HDO4000 extremely intuitive. Every aspect of the interface is touchable making channel, timebase and trigger settings only one touch away.

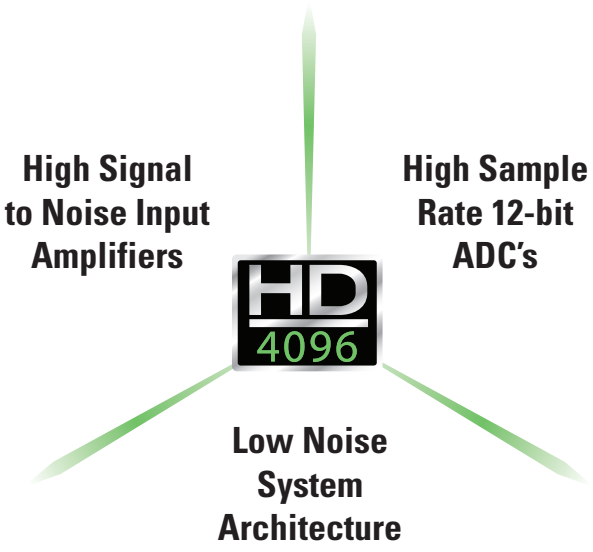
Long Memory

With up to 50 Mpts of memory the HDO4000 High Definition Oscilloscopes can capture large amounts of data with more precision than other oscilloscopes. The 2.5 GS/s, 50 Mpts architecture provides the ability to capture a fast transient or a long acquisition.

Compact Form Factor

The HDO4000 builds upon Teledyne LeCroy's history of "Large Screen, Small Footprint" with its 12.1" wide touch screen display and 5" depth. Additionally, the innovative rotating, tilting feet enable the HDO4000 to be placed in 4 different viewing positions ensuring optimal viewing no matter where it is being positioned in the lab.

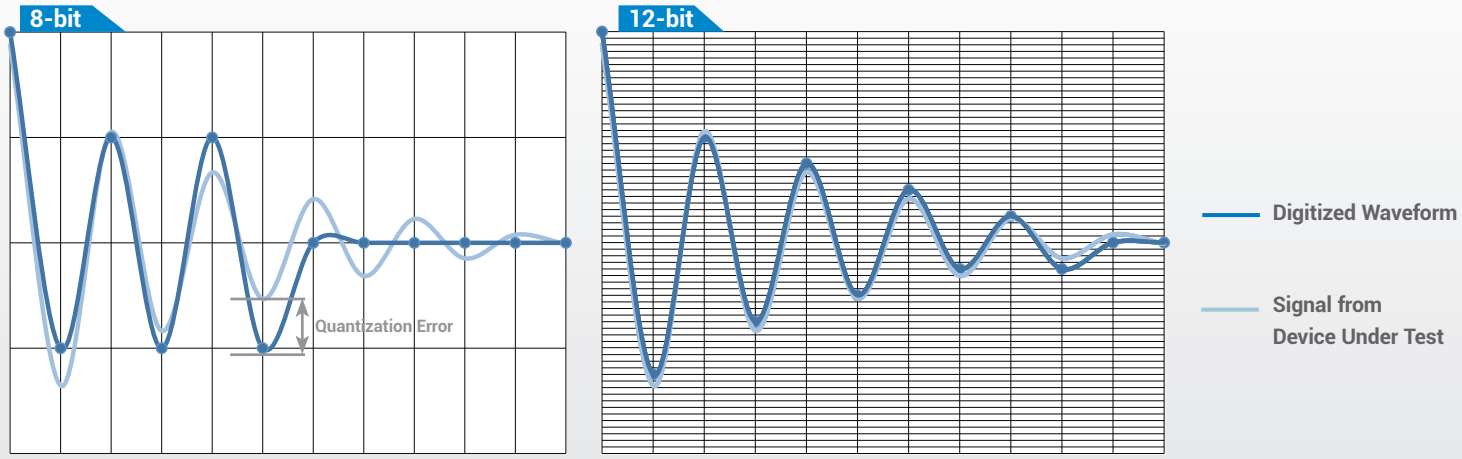
HD4096 HIGH DEFINITION TECHNOLOGY



HD4096 high definition technology consists of high sample rate 12-bit ADCs, high signal-to-noise ratio amplifiers and a low-noise system architecture. This technology enables high definition oscilloscopes to capture and display signals of up to 1 GHz with high sample rate and 16 times more resolution than other oscilloscopes.

Oscilloscopes with HD4096 technology have higher resolution and measurement precision than 8-bit alternatives. The high sample rate 12-bit ADCs provide high resolution sampling at up to 2.5 GS/s. The high performance input amplifiers deliver phenomenal signal fidelity with a 55 dB signal-to-noise ratio and provide a pristine signal to the ADC to be digitized. The low-noise signal architecture ensures that nothing interferes with the captured signal and the oscilloscope displays a waveform that accurately represents the signals from the device under test.

16x Closer to Perfect



16x More Resolution

12-bits of vertical resolution provides sixteen times more resolution than 8-bits. The 4096 discrete levels reduce the quantization error. Signals captured with lower resolution oscilloscopes have a higher level of quantization error resulting in less accurate waveforms on the display. Signals captured on an oscilloscope with 12-bit HD4096 technology are accurately displayed with minimal quantization error.

DEBUG IN HIGH DEFINITION WITH HD4096

Oscilloscopes with HD4096 have a variety of benefits that allow the user to debug in high definition. Waveforms displayed by high definition oscilloscopes are cleaner and crisper. More signal details can be seen and measured; these measurements are made with unmatched precision resulting in better test results and shorter debug time.

Clean, Crisp Waveforms

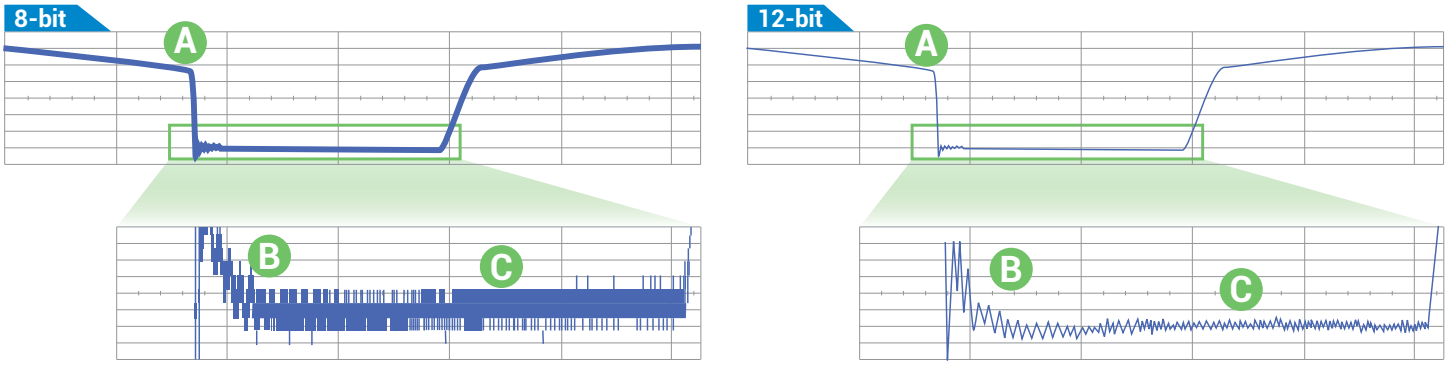
When compared to waveforms captured and displayed by 8-bit oscilloscopes, waveforms captured with HD4096 technology are dramatically crisper and cleaner. Oscilloscopes with HD4096 acquire waveforms at high resolution, high sample rate and low noise to display the most accurate waveforms.

More Signal Details

Signal details often lost in the noise are clearly visible and easy to distinguish when captured on oscilloscopes with HD4096. Details which were previously difficult to even see can now be easily seen and measured. Using the oscilloscope zoom capabilities gives an even closer look at the details for unparalleled insight to the signals on screen.

Unmatched Measurement Precision

Precise measurements are critical for effective debug and analysis. HD4096 enables oscilloscopes to deliver unmatched measurement precision to improve testing capabilities and provide better results.



A Clean, Crisp Waveforms | *Thin traces show the actual waveform with minimal noise interference*

B More Signal Details | *Waveform details lost on an 8-bit oscilloscope can now be clearly seen*

C Unmatched Measurement Precision | *Measurements are more precise and not affected by quantization noise*

HDO4000 - HIGH DEFINITION OSCILLOSCOPE

HDO4000 High Definition Oscilloscopes combine Teledyne LeCroy's HD4096 high definition technology with long memory, powerful debug tools and mixed signal capability in a compact form factor with a 12.1" touch screen display.

1. Only 13 cm (5") Deep – The most space-efficient oscilloscope for your bench from 200 MHz to 1 GHz
2. 12.1" Widescreen (16 x 9) high resolution WXGA color touch screen display. The most time-efficient user interface is even easier to use with a built-in stylus
3. Local language user interface – Select from 10 language preferences. Add a front panel overlay with your local language
4. "Push" Knobs – All knobs have push functionality that provides shortcuts to common actions such as Set to Variable, Find Trigger Level, Zero Offset, and Zero Delay
5. Waveform Control Knobs – Control channel, zoom, math and memory traces with the multiplexed vertical and horizontal knobs







6. Dedicated Cursor Knob – Select type of cursor, position them on your signal, and read values without ever opening a menu
7. Dedicated buttons to quickly access popular debug tools.
8. Easy connectivity with two convenient USB ports on the front, two on the side
9. Mixed Signal Capability - Debug complex embedded designs with integrated 16 channel mixed signal capability
10. Rotating and Tilting Feet provide 4 different viewing positions
11. Auxiliary Output and Reference Clock Input/Output connectors for connecting to other equipment
12. USBTMC (Test and Measurement Class) port simplifies programming



Document and Share:

- Quickly save all files with LabNotebook
- Create custom reports with LabNotebook
- Save to internal hard disk or network drive
- Print to a USB printer
- Save to USB memory stick
- Connect with LAN or GPIB
- View data on a PC with free WaveStudio utility

POWERFUL MIXED SIGNAL CAPABILITIES

Teledyne LeCroy's HDO4000-MS High Definition mixed signal oscilloscope combines the high definition analog channels of the HDO4000 with the flexibility of 16 digital inputs. In addition, the many triggering and decoding options turn the HDO4000-MS into an all-in-one analog, digital, serial debug machine.

High-performance 16 Channel Mixed Signal Capability

With embedded systems growing more complex, powerful mixed signal debug capabilities are an essential part of modern oscilloscopes. The 16 integrated digital channels and set of tools designed to view, measure and analyze analog and digital signals enable fast debugging of mixed signal designs.

Extensive Triggering

Flexible analog and digital cross-pattern triggering across all 20 channels provides the ability to quickly identify and isolate problems in an embedded system. Event triggering can be configured to arm on an analog signal and trigger on a digital pattern.

Advanced Digital Debug Tools

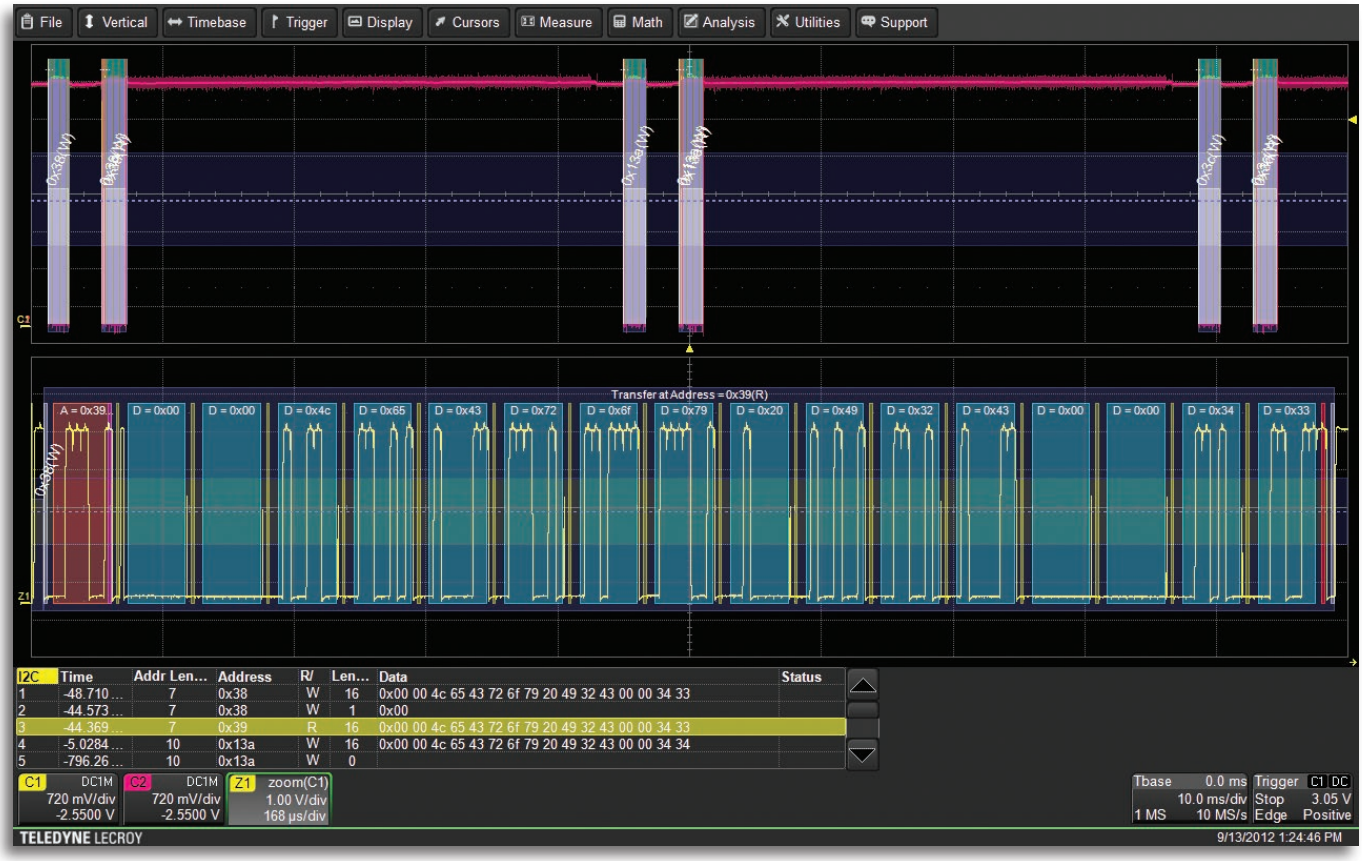
Using the powerful parallel pattern search capability of WaveScan, patterns across many digital lines can be isolated and analyzed. Identified patterns are presented in a table with timestamp information and enables quick searching for each pattern occurrence.

Use a variety of many timing parameters to measure and analyze the characteristics of digital busses. Powerful tools like trends, statistics and histicons provide additional insight and help find anomalies.

Quickly see the state of all the digital lines at the same time using convenient activity indicators.



SERIAL TRIGGER AND DECODE OPTIONS



View decoded protocol information on top of physical layer waveforms and trigger on protocol specific messages.

Trigger and Decode

The serial data trigger will quickly isolate events on a bus eliminating the need to set manual triggers and hoping to catch the right information. Trigger conditions can be entered in binary or hexadecimal formats and conditional trigger capabilities even allow triggering on a range of different events.

Protocol decoding is shown directly on the waveform with an intuitive, color-coded overlay and presented in binary, hex or ASCII. Decoding on the HDO4000 is fast even with long memory and zooming in to the waveform shows precise byte by byte decoding.

Table and Search

To further simplify the debug process all decoded data can be displayed in a table below the waveform grid. Selecting an entry in the table with the touch screen will display just that event. Additionally, built-in search functionality will find specific decoded values.

Serial data messages can be quickly located by searching on address, data and other attributes specific to a particular protocol. Once found, the specific location containing the specified search criteria can be automatically zoomed to.

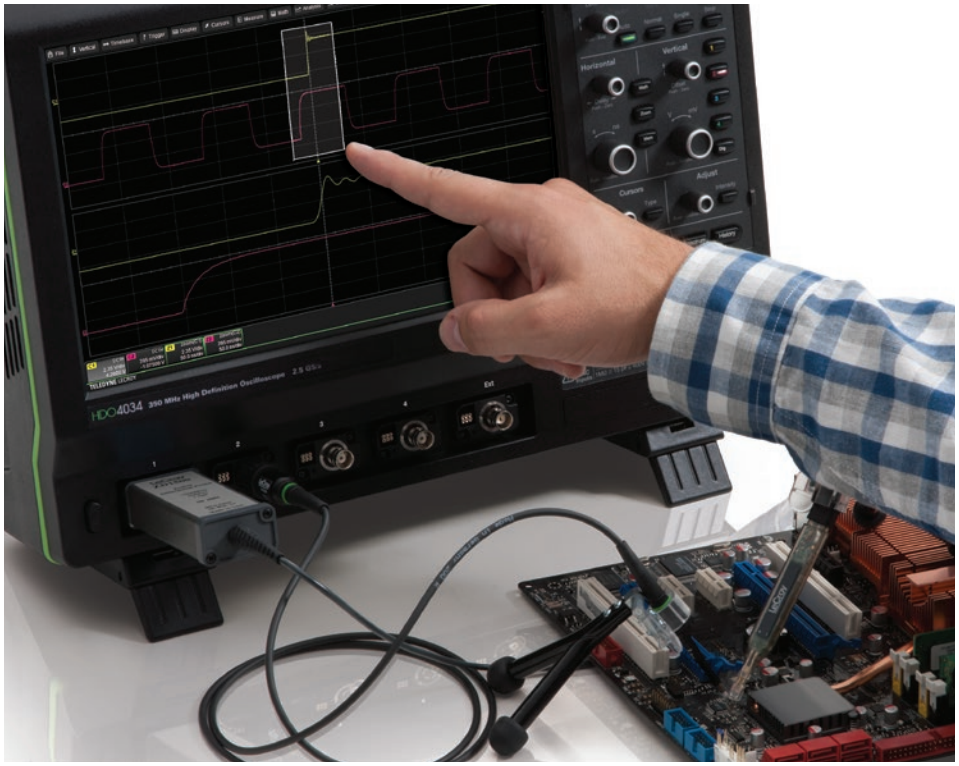
Supported Serial Data Protocols

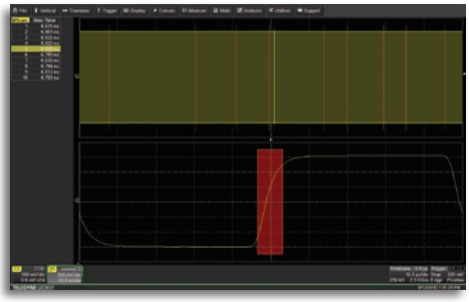
- I²C, SPI, UART
- CAN, LIN, FlexRay™, SENT
- Ethernet 10/100BaseT, USB 1.0/1.1/2.0, USB 2.0-HSIC
- Audio (I²S, LJ, RJ, TDM)
- MIL-STD-1553, ARINC 429
- MIPI D-PHY, DigRF 3G, DigRF v4
- Manchester, NRZ

IDENTIFY AND ISOLATE PROBLEMS FASTER

Touch Screen Simplicity

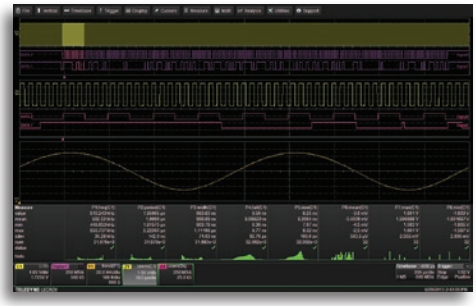
Configuring the HDO4000 is simple thanks to the intuitive touch screen user interface. Everything on the screen is interactive. To adjust channel, timebase, or trigger settings, simply touch the associated descriptor box and the appropriate menu is opened. Measurements can be touched to adjust their settings and cursors can be positioned precisely by touching and dragging them to the proper location. A box can be drawn around a portion of a waveform to create a zoom. Even waveform offset and delay can be adjusted by touching and dragging the waveform.





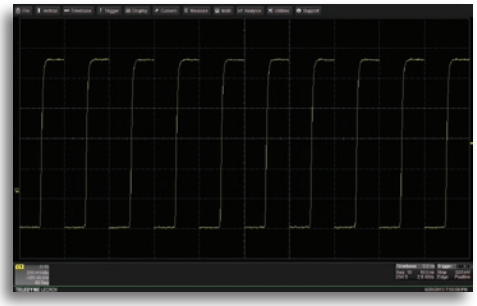
WaveScan Advanced Search

WaveScan provides powerful isolation capabilities that hardware triggers can't provide. WaveScan allows searching analog, digital or parallel bus signal in a single acquisition using more than 20 different criteria. Or, set up a scan condition and scan for an event over hours or even days.



Advanced Math and Measure

With many math functions and measurement parameters available, the HDO4000 can measure and analyze every aspect of analog and digital waveforms. By utilizing HD4096 technology, the HDO4000 measures 16 times more precisely than traditional 8-bit architectures. Additionally, the HDO4000 provides statistics, histicons and trends to show how waveforms change over time.

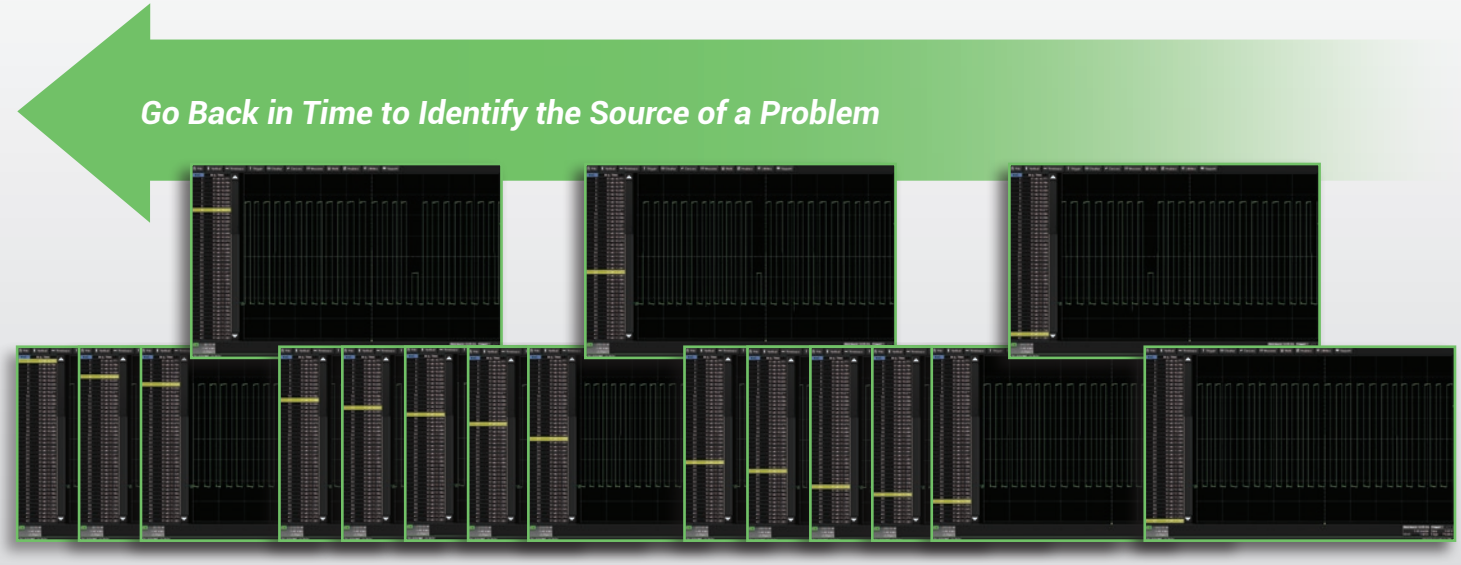


Advanced Waveform Capture with Sequence Mode

Use Sequence mode to store up to 10,000 triggered events as segments. This is ideal when capturing fast pulses in quick succession or when capturing events separated by long time periods. Each segment has a timestamp and dead-time between triggers is less than 1 µs. Isolate rate events over time by combining with advanced triggers.

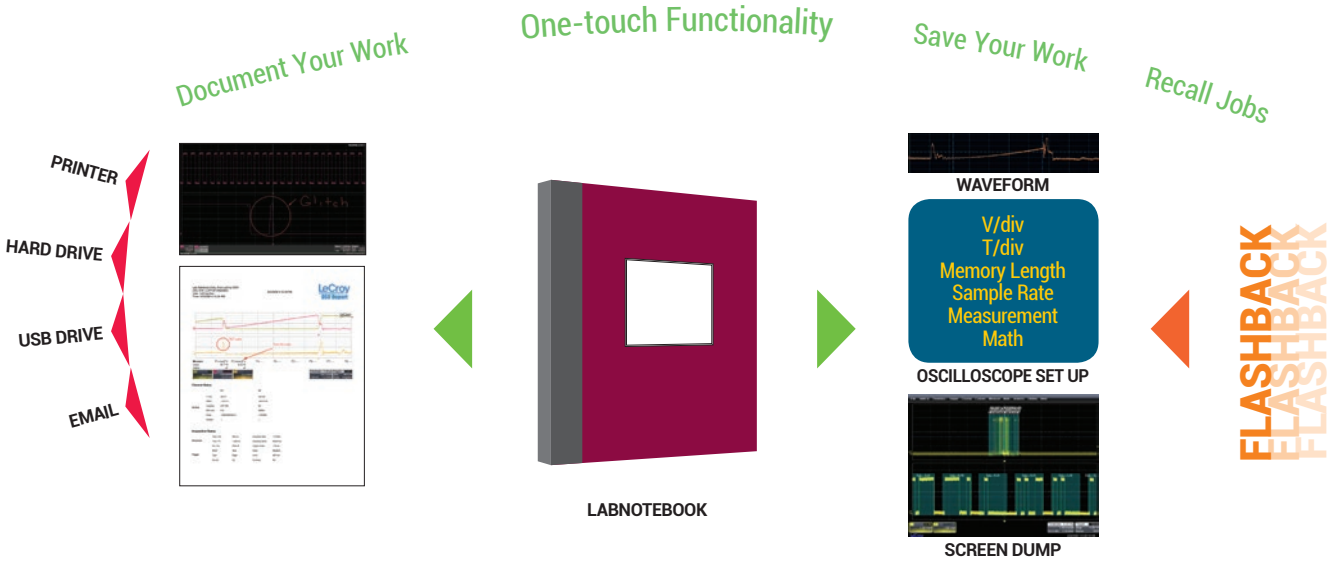
History Mode Waveform Playback

Scroll back in time using History Mode to view previous waveforms and isolate anomalies. Use cursors and measurement parameters to quickly find the source of problems. History mode is always available with a single button press, no need to enable this mode and never miss a waveform.



LabNotebook

The LabNotebook feature of HDO4000 provides a report generation tool to save and document all your work. Saving all displayed waveforms, relevant settings, and screen images is all done through LabNotebook, eliminating the need to navigate multiple menus to save all these files independently.



Easy report generation helps you share your findings and communicate important results.

LabNotebook adds a simple way to report your work and save all essential waveforms, settings, and screen images.

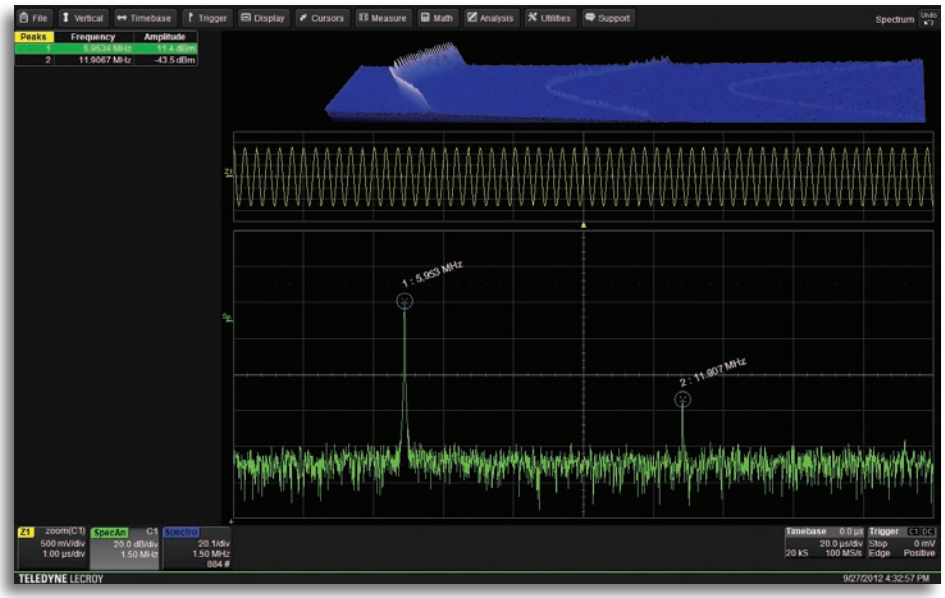
Quickly save all the necessary files with LabNotebook in a single button press.

Recall your settings from any report by using the Flashback capability.

SPECTRUM ANALYZER MODE

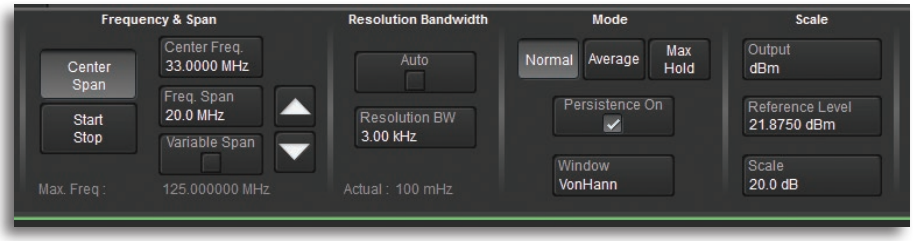
Key Features

- **Spectrum analyzer style controls for the oscilloscope**
- **Select from six vertical scales**
- **Automatically identify frequency peaks**
- **Display up to 20 markers, with interactive table readout of frequencies and levels**
- **Easily make measurements with reference and delta markers**
- **Automatically identify and mark fundamental frequency and harmonics**
- **Spectrogram shows how spectra changes over time in 2D or 3D views**



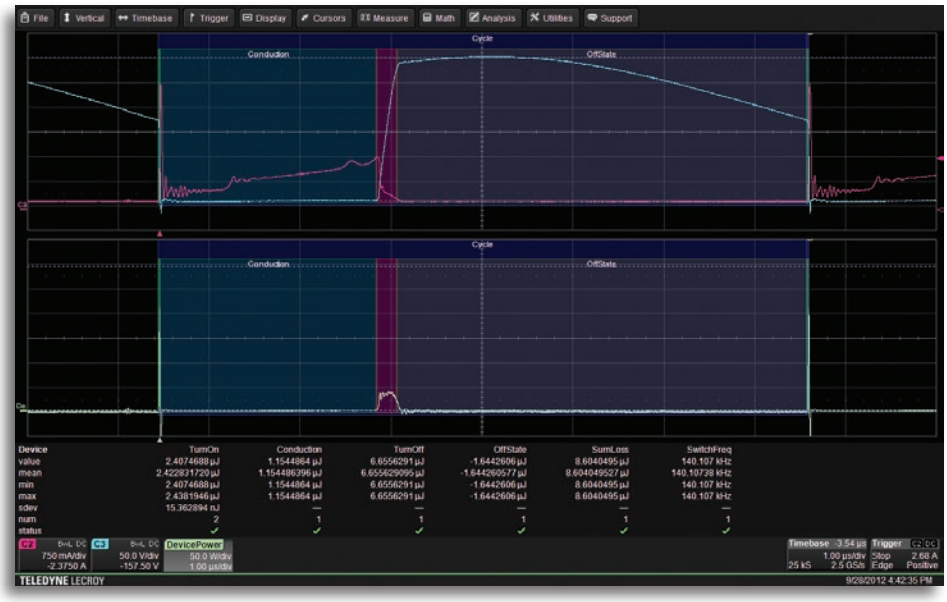
Simplify Analysis of FFT Power Spectrum

Get better insight to the frequency content of any signal with use of the Spectrum Analyzer mode on the HDO4000. This mode provides a spectrum analyzer style user interface with controls for start/stop frequency or center frequency and span. The resolution bandwidth is automatically set for best analysis or can be manually selected. Vertical Scale can be selected as dBm, dBV, dBmV, dBuV, Vrms or Arms for proper viewing and analysis while the unique peak search automatically labels spectral components and presents frequency and level in an interactive table. Utilize up to 20 markers to automatically identify harmonics and quickly analyze frequency content by making measurements between reference and delta markers. To monitor how the spectrum changes over time, view the spectrogram which can display a 2D or 3D history of the fequency content.



Spectrum analyzer style controls simplify waveform analysis in the frequency domain.

POWER ANALYZER OPTION



Key Features

- **Automatic switching device measurements**
- **Color coded overlay to identify power losses**
- **Control loop and time domain response analysis**
- **Line power and harmonics tests to IEC 61000-3-2**
- **Total harmonic distortion table shows frequency contribution**
- **B-H Curve shows magnetic device saturation**

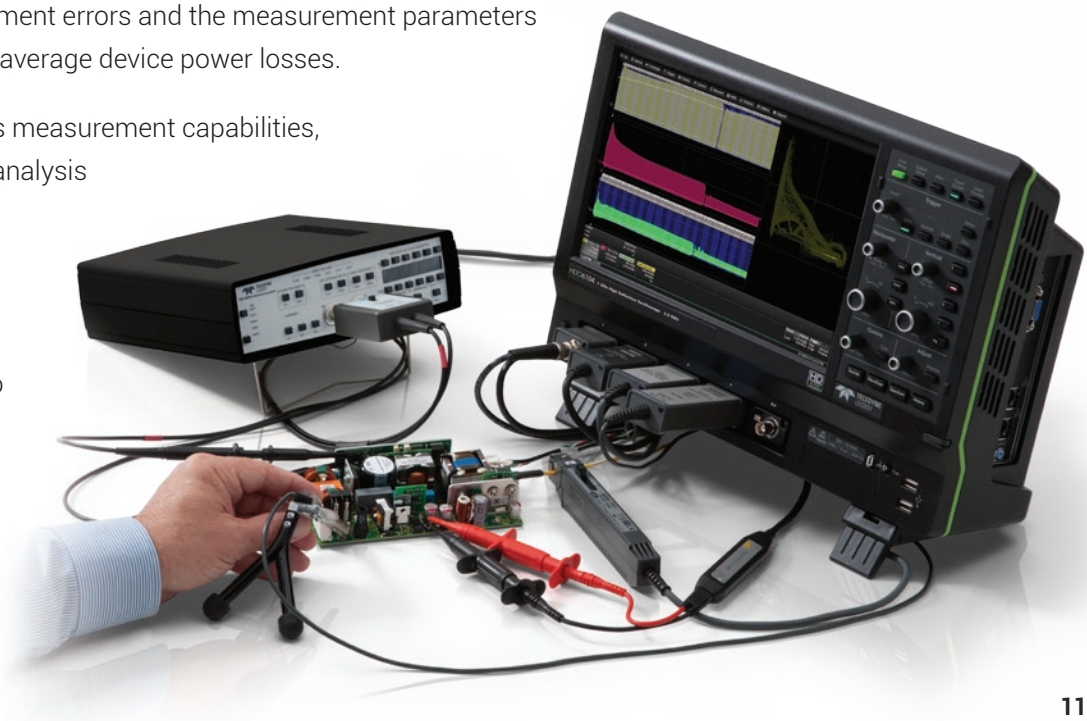
Power Analyzer Automates Switching Device Loss Measurements

Quickly measure and analyze the operating characteristics of power conversion devices and circuits with the Power Analyzer option. Critical power switching device measurements, control loop modulation analysis, and line power harmonic testing are all simplified with a dedicated user interface and automatic measurements. Areas of turn-on, turn-off, and conduction loss are all identified with color-coded waveform overlays for faster analysis.

Power Analyzer provides quick and easy setup of voltage and current inputs and makes measurements as simple as the push of a button. Tools are provided to help reduce sources of measurement errors and the measurement parameters provide details of single cycle or average device power losses.

Beyond the advanced power loss measurement capabilities, the Power Analyzer modulation analysis capabilities provide insight to understand control loop response to critical events such as a power supply's soft start performance or step response to line and load changes. The Line Power Analysis tool allows simple and quick pre-compliance testing to EN 61000-3-2.

Teledyne LeCroy has a variety of probes and probing accessories such as high common mode rejection ratio (CMRR) differential amplifiers, differential probes, current probes, and deskew fixtures.



PROBES

The right probe is an essential tool for accurate signal capture and Teledyne LeCroy offers an extensive range of probes to meet virtually every probing need.

ZS Series High Impedance Active Probes
ZS2500, ZS1500, ZS1000,
ZS2500-QUADPAK,
ZS1500-QUADPAK,
ZS1000-QUADPAK



The ZS Series probes provide high impedance and an extensive set of probe tips and ground accessories to handle a wide range of probing scenarios. The high 1 MΩ input resistance and low 0.9 pF input capacitance mean this probe is ideal for all frequencies. The ZS Series probes provide full system bandwidth for all Teledyne LeCroy oscilloscopes having bandwidths of 1 GHz and lower.

Differential Probes (200 MHz – 1.5 GHz)
ZD1500, ZD1000,
ZD500, ZD200



High bandwidth, excellent common-mode rejection ratio (CMRR) and low noise make these active differential probes ideal for applications such as automotive development (e.g. FlexRay) and failure analysis, as well as wireless and data communication design. The ProBus interface allows sensitivity, offset and common-mode range to be displayed on the oscilloscope screen.

High Voltage Differential Probes
ADP305, ADP300, AP031



Low cost active differential probes are intended for measuring higher voltages. The differential techniques employed permit measurements to be taken at two points in a circuit without reference to the ground, allowing the oscilloscope to be safely grounded without the use of opto-isolators or isolating transformers.

High Voltage Passive Probes
PPE1.2KV, PPE2KV,
PPE4KV, PPE5KV, PPE6KV



The PPE Series includes five fixed-attenuation probes covering a range from 2 kV to 20 kV, and one switchable probe providing ÷10/÷100 attenuation for voltage inputs up to 1.2 kV. All fixed-attenuation, standard probes automatically rescale compatible Teledyne LeCroy oscilloscopes for the appropriate attenuation of the probe.

Current Probes
CP031, CP030, AP015,
CP150, CP500, DCS015



Available current probes reach bandwidths of 100 MHz, peak currents of 700 A and sensitivities of 10 mA/div. Use multiple current probes to make measurements on three-phase systems or a single current probe with a voltage probe to make instantaneous power measurements. Teledyne LeCroy current probes enable the design and testing of switching power supplies, motor drives, electric vehicles, and uninterruptible power supplies.

SPECIFICATIONS

	HDO4022 HDO4022-MS	HDO4024 HDO4024-MS	HDO4032 HDO4032-MS	HDO4034 HDO4034-MS	HDO4054 HDO4054-MS	HDO4104 HDO4104-MS
Analog - Vertical						
Bandwidth (@ 50Ω)	200 MHz		350 MHz		500 MHz	1 GHz
Rise time	1.75 ns typical		1 ns typical		700 ps typical	450 ps typical
Input Channels	2	4	2	4	4	4
Vertical Resolution	12-bits; up to 15-bits with enhanced resolution (ERES)					
Sensitivity	50 Ω: 1mV/div - 1 V/div; 1 MΩ: 1 mV/div - 10 V/div					
DC Gain Accuracy	±(0.5%) Full Scale, offset at 0 V					
BW Limit	20 MHz, 200 MHz					
Maximum Input Voltage	50 Ω: 5 Vrms; 1 MΩ: 400 V max (DC + Peak AC ≤ 10 kHz)					
Input Coupling	50 Ω: DC, GND; 1 MΩ: AC, DC, GND					
Input Impedance	50 Ω ±2.0%, 1 MΩ ±2.0% || 15 pF					
Offset Range	50 Ω: 1 mV - 4.95 mV: ±1.6 V, 5 mV - 9.9 mV: ±4 V, 10 mV - 19.8 mV: ±8 V, 20 mV - 1 V: ±10 V 1 MΩ: 1 mV - 4.95 mV: ±1.6 V, 5 mV - 9.9 mV: ±4 V, 10 mV - 19.8 mV: ±8 V, 20 mV - 100 mV: ±16 V, 102 mV - 198 mV: ±80V, 200 mV - 1 V: ±160 V, 1.02 V -10 V: ±400 V					
Offset Accuracy	±(1.0% of offset value + 0.5%FS + 0.02% of max offset + 1 mV)					
Analog - Acquisition						
Sample Rate (Single-shot)	2.5 GS/s					
Sample Rate (Repetitive)	125 GS/s					
Record Length	Standard -STD: 12.5 Mpts/ch (all channels) 25 Mpts (interleaved) Optional -L: 25 Mpts/ch (all channels), 50 Mpts (interleaved)					
Acquisition Modes	Real Time, Roll, RIS (Random Interleaved Sampling), Sequence (Segmented Memory up to 10,000 segments with 1µs intersegment time)					
Timebase Range	200 ps/div - 1.25 ks/div with standard memory (up to 2.5 ks/div with -L memory); RIS available at ≤ 10 ns/div; Roll Mode available at ≥ 100 ms/div and ≤ 5 MS/s					
Timebase Accuracy	±2.5 ppm for 5 to 40C + 1.0 ppm/year from calibration					
Digital - Vertical and Acquisition (-MS Models Only)						
Input Channels	16 Digital Channels					
Threshold Groupings	Pod 2: D15 - D8, Pod 1: D7 - D0					
Threshold Selections	TTL, ECL, CMOS (2.5 V, 3.3 V, 5 V), PECL, LVDS or User Defined					
Maximum Input Voltage	±30V Peak					
Threshold Accuracy	±(3% of threshold setting + 100mV)					
Input Dynamic Range	±20V					
Minimum Input Voltage Swing	400mV					
Input Impedance (Flying Leads)	100 kΩ || 5 pF					
Maximum Input Frequency	250 MHz					
Sample Rate	1.25 GS/s					
Record Length	Standard STD: 25MS - 16 Channels Optional -L: 50MS - 16 Channels					
Minimum Detectable Pulse Width	2 ns					
Channel-to-Channel Skew	350ps					
User defined threshold range	±10V in 20mV steps					
User defined hysteresis range	100 mV to 1.4 V in 100 mV steps					
Trigger System						
Modes	Auto, Normal, Single, Stop					
Sources	Any input channel, External, Ext/10, or line; slope and level unique to each source (except for line trigger)					
Coupling	DC, AC, HFREJ, LFREJ					
Pre-trigger Delay	0-100% of full scale					
Post-trigger Delay	0-10,000 Divisions					
Hold-off	2ns up to 20s or 1 to 1,000,000,000 events					
Internal Trigger Level Range	±4.1 Divisions					
External Trigger Level Range	Ext: ±400mV, Ext/10: ±4V					
Trigger Types	Edge, Glitch, Width, Logic (Pattern), TV (NTSC, PAL, SECAM, HDTV–720p, 1080i, 1080p), Runt, Slew Rate, Interval (signal or Pattern), Dropout, Qualified (State or Edge)					

SPECIFICATIONS

	HDO4022 HDO4022-MS	HDO4024 HDO4024-MS	HDO4032 HDO4032-MS	HDO4034 HDO4034-MS	HDO4054 HDO4054-MS	HDO4104 HDO4104-MS
Measure, Zoom and Math Tools						
Measurement Parameters	Up to 8 of the following parameters can be calculated at one time on any waveform: Amplitude, Area, Base (Low), Delay, Delta Period @ Level, Delta Time @ Level, Duty, Duty @ Level, Edge @ Level, Fall Time (90%–10%), Fall Time (80%–20%), Frequency, Frequency @ level, Maximum, Mean, Minimum, Overshoot+, Overshoot-, Peak-Peak, Period, Period @ Level, Phase, Rise Time (10%–90%), Rise Time (20%–80%), RMS, Skew, Standard Deviation, Time @ Level, Top (High), Width+, Width-. Statistics and Histicons can be added to any measurement and all measurements can be gated.					
Zooming	Use front panel QuickZoom button, or use touch screen or mouse to draw a box around the zoom area.					
Math Functions	Functions include Sum, Difference, Product, Ratio, Absolute Value, Averaging (summed and continuous), Derivative, Envelope, Enhanced Resolution (to 15-bits), Floor, Integral, Invert, Reciprocal, Rescale (change scale and units), Roof, Square, Square Root, Trend, Zoom and FFT (up to 1 Mpts with power spectrum output and rectangular, VonHann, and FlatTop windows). 2 dual operator math functions may be defined at a time.					
Probes						
Standard Probes	One PP017 (5mm) per channel		One PP018(5mm) per channel			
Probing System	BNC and Teledyne LeCroy ProBus for Active voltage, current and differential probes					
Display System						
Display Size	12.1" Wide TFT-LCD Touch-Screen					
Display Resolution	1280 x 800					
Connectivity						
Ethernet Port	(2) 10/100/1000Base-T Ethernet interface (RJ-45 connector)					
USB Host Ports	(6) USB Ports Total – (2) Front USB Ports					
USB Device Port	(1) USBTMC					
GPIB Port (Optional)	Supports IEEE – 488.2					
External Monitor Port	Standard 15-pin D-Type SVGA-compatible DB-15 connector, DVI connector and HDMI connector					
Remote Control	Via Windows Automation, or via Teledyne LeCroy Remote Command Set					
Processor/CPU						
Type	Intel B810 Celeron processor 1.6 GHz or better					
Processor Memory	4 GB Standard					
Operating System	Windows Embedded Standard 7 64-Bit					
Power Requirements						
Voltage	100-240 VAC + 10% at 45-440 Hz; Automatic AC Voltage Selection					
Power Consumption (Nominal)	200 W / 200 VA					
Max Power Consumption	Max Power Consumption 320 W / 320 VA (with all PC peripherals and active probes connected to 4 channels)					
Environmental						
Temperature	Operating: 5 °C to 40 °C; Non-Operating: -20 °C to 60 °C					
Humidity	Operating: 5% to 90% relative humidity (non-condensing) up to +31 °C, Upper limit derates to 50% relative humidity (non-condensing) at +40 °C; Non-Operating: 5% to 95% relative humidity (non-condensing) as tested per MIL-PRF-28800F					
Altitude	Operating: 3,048 m (10,000 ft) max at ≤ 30C; Non-Operating: Up to 12,192 meters (40,000 ft)					
Physical						
Dimensions (HWD)	11.48"H x 15.72"W x 5.17"D (291.7 mm x 399.4 mm x 131.31 mm)					
Weight	5.86 kg (12.9 lbs)					
Regulatory						
CE Certification	Low Voltage Directive 2006/95/EC EN 61010-1:2010, EN 61010-2-030:2010 EMC Directive 2004/108/EC EN 61326-1:2006, EN61326-2-1:2006					
UL and cUL Listing	UL 61010-1 (3rd Edition), UL 61010-2-030 (1st Edition) CAN/CSA C22.2 No.61010-1-12					

ORDERING INFORMATION

Product Description	Product Code
HDO4000 Oscilloscopes	
200 MHz, 2.5 GS/s, 2 Ch, 12.5 Mpts/Ch 12-bit HD Oscilloscope with 12.1" WXGA Touch Display	HDO4022
200 MHz, 2.5 GS/s, 4 Ch, 12.5 Mpts/Ch 12-bit HD Oscilloscope with 12.1" WXGA Touch Display	HDO4024
350 MHz, 2.5 GS/s, 2 Ch, 12.5 Mpts/Ch 12-bit HD Oscilloscope with 12.1" WXGA Touch Display	HDO4032
350 MHz, 2.5 GS/s, 4 Ch, 12.5 Mpts/Ch 12-bit HD Oscilloscope with 12.1" WXGA Touch Display	HDO4034
500 MHz, 2.5 GS/s, 4 Ch, 12.5 Mpts/Ch 12-bit HD Oscilloscope with 12.1" WXGA Touch Display	HDO4054
1 GHz, 2.5 GS/s, 4 Ch, 12.5 Mpts/Ch 12-bit HD Oscilloscope with 12.1" WXGA Touch Display	HDO4104
HDO4000-MS Mixed Signal Oscilloscopes	
200 MHz, 2.5 GS/s, 2+16ch, 12.5 Mpts/Ch 12-bit HD Mixed Signal Oscilloscope w/ 12.1" WXGA Color Display	HDO4022-MS
200 MHz, 2.5 GS/s, 4+16ch, 12.5 Mpts/Ch 12-bit HD Mixed Signal Oscilloscope w/ 12.1" WXGA Color Display	HDO4024-MS
350 MHz, 2.5 GS/s, 2+16ch, 12.5 Mpts/Ch 12-bit HD Mixed Signal Oscilloscope w/ 12.1" WXGA Color Display	HDO4032-MS
350 MHz, 2.5 GS/s, 4+16ch, 12.5 Mpts/Ch 12-bit HD Mixed Signal Oscilloscope w/ 12.1" WXGA Color Display	HDO4034-MS
500 MHz, 2.5 GS/s, 4+16ch, 12.5 Mpts/Ch 12-bit HD Mixed Signal Oscilloscope w/ 12.1" WXGA Color Display	HDO4054-MS
1 GHz, 2.5 GS/s, 4+16ch, 12.5 Mpts/Ch 12-bit HD Mixed Signal Oscilloscope w/ 12.1" WXGA Color Display	HDO4104-MS
Included with Standard Configurations (HDO4000 and HDO4000-MS)	
÷10 Passive Probe (Total of 1 Per Channel), Getting Started Guide, Anti-virus Software (Trial Version), Microsoft Windows Embedded Standard 7 P 64-Bit License, Commercial NIST Traceable Calibration with Certificate, Power Cable for the Destination Country, 3-year Warranty	
Included with HDO4000-MS	
16 Channel Digital Leadset, Extra Large Gripper Probe Set (Qty. 22), Ground Extenders (Qty. 20), Flexible Ground Leads (Qty. 5)	
Memory Option	
25 Mpts/ch (50 Mpts interleaved) memory	HDO4K-L
Hardware Options	
Removable Hard Drive Package (includes removable hard drive kit and two hard drives)	HDO4K-RHD
Additional Removable Hard Drive	HDO4K-RHD-02
General Accessories	
External GPIB Accessory	USB2-GPIB
Soft Carrying Case	HDO4K-SOFTCASE
Rack Mount Accessory	HDO4K-RACK
Accessory Pouch	HDO4K-POUCH
Local Language Overlays	
German Front Panel Overlay	HDO4K-FP-GERMAN
French Front Panel Overlay	HDO4K-FP-FRENCH
Italian Front Panel Overlay	HDO4K-FP-ITALIAN
Spanish Front Panel Overlay	HDO4K-FP-SPANISH
Japanese Front Panel Overlay	HDO4K-FP-JAPANESE
Korean Front Panel Overlay	HDO4K-FP-KOREAN
Chinese (Tr) Front Panel Overlay	HDO4K-FP-CHNES-TR
Chinese (Simp) Front Panel Overlay	HDO4K-FP-CHNES-SI
Russian Front Panel Overlay	HDO4K-FP-RUSSIAN

Product Description	Product Code
Software Options	
Electrical Telecom Mask Test Package	HDO4K-ET-PMT
Spectrum Analysis Option	HDO4K-SPECTRUM
Power Analysis Option	HDO4K-PWR
Serial Data Options	
ARINC 429 Symbolic Decode Option	HDO4K-ARINC429bus DSymbolic
Audiobus Trigger and Decode Option for I²S, LJ, RJ, and TDM	HDO4K-Audiobus TD
CAN, LIN and FlexRay Trigger and Decode Option	HDO4K-AUTO
CAN TD Trigger and Decode Option	HDO4K-CANbus TD
D-PHY Decode Option	HDO4K-DPHYbus D
DigRF 3G Decode Option	HDO4K-DigRF3Gbus D
DigRF v4 Decode Option	HDO4K-DigRFv4bus D
ENET Decode Option	HDO4K-ENETbus D
FlexRay Trigger and Decode Option	HDO4K-FlexRaybus TD
I²C, SPI and UART Trigger and Decode Option	HDO4K-EMB
I²C Bus Trigger and Decode Option	HDO4K-I2Cbus TD
LIN Trigger and Decode Option	HDO4K-LINbus TD
Manchester Decode Option	HDO4K-Manchesterbus D
MIL-STD-1553 Trigger and Decode Option	HDO4K-1553 TD
NRZ Decode Option	HDO4K-NRZbus D
SENT Decode Option	HDO4K-SENTbus D
SPI Bus Trigger and Decode Option	HDO4K-SPIbus TD
UART and RS-232 Trigger and Decode Option	HDO4K-UART-RS232bus TD
USB 2.0 Trigger and Decode Option	HDO4K-USB2bus TD
USB2-HSIC Decode Option	HDO4K-USB2-HSICbus D
Probes and Amplifiers	
250 MHz Passive Probe 10:1, 10 MΩ	PP017
500 MHz Passive Probe 10:1, 10 MΩ	PP018
Set of 4 ZS1500, 1.5 GHz, 0.9 pF, 1 MΩ High Impedance Active Probe	ZS1500-QUADPAK
Set of 4 ZS1000, 1 GHz, 0.9 pF, 1 MΩ High Impedance Active Probe	ZS1000-QUADPAK
200 MHz, 3.5 pF, 1 MΩ Active Differential Probe	ZD200
500 MHz, 1.0 pF, 1 MΩ Active Differential Probe	ZD500
1 GHz, 1.0 pF, 1 MΩ Active Differential Probe	ZD1000
1.5 GHz, 1.0 pF, 1 MΩ Active Differential Probe	ZD1500
1,400 V, 100 MHz High-Voltage Differential Probe	ADP305
1,400 V, 20 MHz High-Voltage Differential Probe	ADP300
1 Ch, 100 MHz Differential Amplifier with Precision Voltage Source	DA1855A
30 A; 100 MHz Current Probe – AC/DC; 30 A_{rms}: 50 A_{peak} Pulse	CP031
30 A; 50 MHz Current Probe – AC/DC; 30 A_{rms}; 50 A_{peak} Pulse	CP030
30 A; 50 MHz Current Probe – AC/DC; 30 A_{rms}; 50 A_{peak} Pulse	AP015
150 A; 10 MHz Current Probe – AC/DC; 150 A_{rms}; 500 A_{peak} Pulse	CP150
500 A; 2 MHz Current Probe – AC/DC; 500 A_{rms}; 700 A_{peak} Pulse	CP500
Deskew Calibration Source for CP031, CP030 and AP015	DCS015
10:1/100:1 200/300 MHz, 50 MΩ High-voltage Probe 600 V/1,2 kV Max. Volt. DC	PPE1.2KV
100:1 400 MHz 50 MΩ 2 kV High-voltage Probe	PPE2KV
100:1 400 MHz 50 MΩ 4 kV High-voltage Probe	PPE4KV
1000:1 400 MHz 50 MΩ 5 kV High-voltage Probe	PPE5KV
1000:1 400 MHz 50 MΩ 6 kV High-voltage Probe	PPE6KV

Customer Service

Teledyne LeCroy oscilloscopes and probes are designed, built, and tested to ensure high reliability. In the unlikely event you experience difficulties, our digital oscilloscopes are fully warranted for three years and our probes are warranted for one year. This warranty includes:

- No charge for return shipping
- Long-term 7-year support
- Upgrade to latest software at no charge

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Local sales offices are located throughout the world.
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