**TELEDYNE LECROY**
Everywhere**you**look™

# WaveSurfer 3000 Oscilloscopes
## 200 MHz – 750 MHz

## Key Features

- **200 MHz, 350 MHz, 500 MHz and 750 MHz bandwidths**

- **Up to 4 GS/s sample rate**

- **Long Memory – up to 10 Mpts/Ch**

- **10.1" touch screen display**

- **MAUI - Advanced User Interface**
  - Designed for Touch
  - Built for Simplicity
  - Made to Solve

- **Advanced Anomaly Detection**
  - Fast Waveform Update
  - History Mode
  - WaveScan

- **Capture, Debug, Analyze, Document**
  - LabNotebook
  - Sequence Mode
  - Advanced Active Probe Interface
  - Math and Measure

- **Multi-Instrument Capabilities**
  - Protocol Analysis - Serial Trigger and Decode
  - Waveform Generation - Built-in Function Generator
  - Logic Analysis - 16 Channel MSO
  - Digital Voltmeter

- **Future Proof**
  - Upgradeable Bandwidth
  - Field Upgradable Software and Hardware Options

**WaveSurfer 3000 oscilloscopes feature the MAUI advanced user interface with touch screen simplicity to shorten debug time. Quickly identify and isolate anomalies with WaveScan, Fast Display, and History mode for faster troubleshooting; LabNotebook enables easy documentation and convenient collaboration. The advanced probe interface, upgradable bandwidth and multi-instrument capabilities provide maximum versatility and investment protection.**

## MAUI - A New Wave of Thinking

MAUI is the most advanced oscilloscope user interface. MAUI is designed for touch; all important oscilloscope controls are accessed through the intuitive touch screen. MAUI is built for simplicity; time saving shortcuts and intuitive dialogs simplify setup. MAUI is made to solve; deep set of debug and analysis tools help identify problems and find solutions quickly.

## Advanced Anomaly Detection

Combining a fast waveform update rate of 130,000 waveforms/second with History mode waveform playback and WaveScan search and find, the WaveSurfer 3000 is an outstanding tool for waveform anomaly detection.

## Capture, Debug, Analyze, Document

The advanced active probe interface gives tremendous flexibility for capturing all types of signals. Debug, analyze and document problems through the use of powerful math and measurement capabilities, sequence mode segmented memory, and LabNotebook.

## Multi-Instrument Capabilities

Beyond traditional oscilloscope functionality the WaveSurfer 3000 has a variety of multi-instrument capabilities including, waveform generation with a built-in function generator, protocol analysis with serial data trigger and decode, logic analysis with an available 16 channel mixed signal option and digital voltmeter measurements.

**MAUI is the most advanced oscilloscope user interface developed to put all the power and capabilities of the modern oscilloscope right at your fingertips. Designed for touch; all important oscilloscope controls are accessed through the intuitive touch screen. Built for simplicity; time saving shortcuts and intuitive dialogs simplify setup. Made to solve; a deep set of debug and analysis tools helps identify problems and find solutions quickly.**

Oscilloscopes are constantly evolving to meet the rapidly changing test and measurement needs of today's cutting edge designs. Additional complexity and capabilities are introduced with each new feature, and in some cases when capabilities of other instruments like a protocol analyzer, function generator or logic analyzer are added. With all this added capability the oscilloscope becomes complex and cumbersome to use. The traditional user interface consisting of knobs, buttons, soft keys and nested menus is unmanageable and more buttons are typically added to access the new functionality.

MAUI solves the complexity problem. MAUI eliminates the overwhelming number of buttons and knobs providing an intuitive user interface that is designed for touch, built for simplicity and made to solve without sacrificing any features or cutting edge test capabilities.

## Designed for Touch

MAUI is designed for touch. All important controls for vertical, horizontal and trigger are always one touch away. Touch the waveform to position and drag a box around it to zoom in for more details. Position cursors, configure measurements and interact with tables all through simple touch operation.
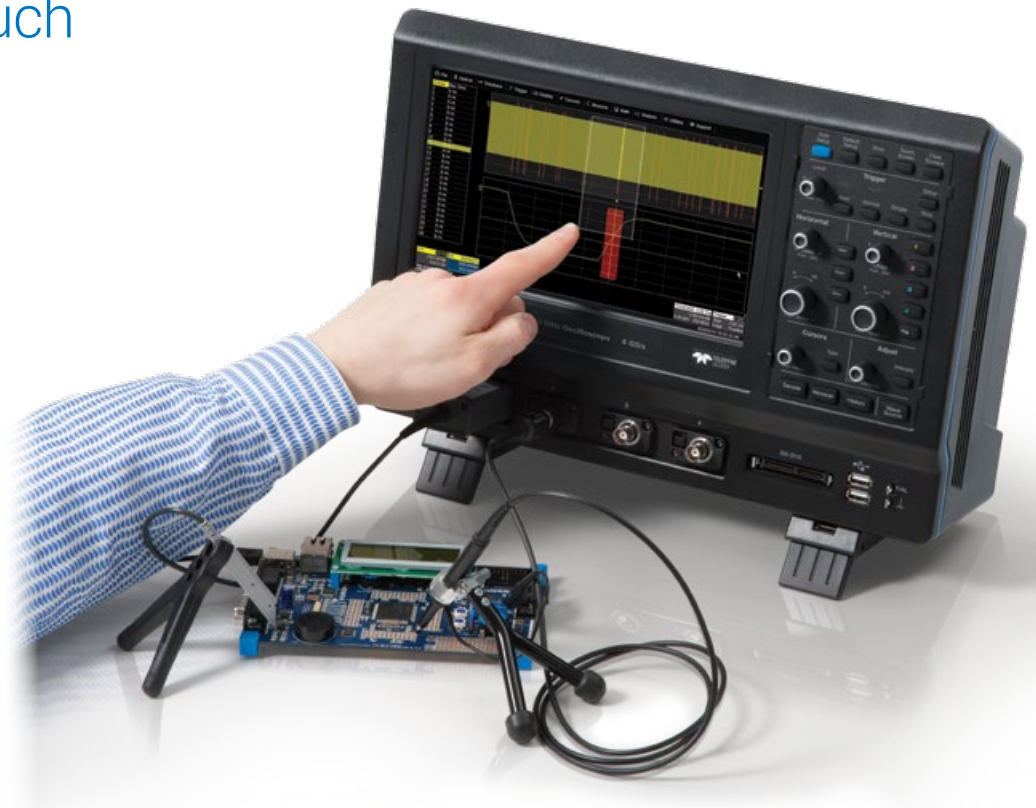
# Built for Simplicity

MAUI is built for simplicity. Basic waveform viewing and measurement tools as well as advanced math and analysis capabilities are seamlessly integrated in a single user interface. Time saving shortcuts and intuitive dialogs simplify setup and shorten debug time.



**A** Access shortcuts to analysis tools by touching the waveform.

**B** Configure parameters by touching measurement results.

**C** Channel, timebase and trigger descriptors provide easy access to controls without navigating menus.

**D** Shortcuts to commonly used functions are displayed at the bottom of the channel, math and memory menus.

# Made to Solve

MAUI is made to solve. Measure all aspects of a waveform to identify problems. Debug with a large set of time saving tools to find the cause of problems. Solve problems fast with powerful analysis tools.
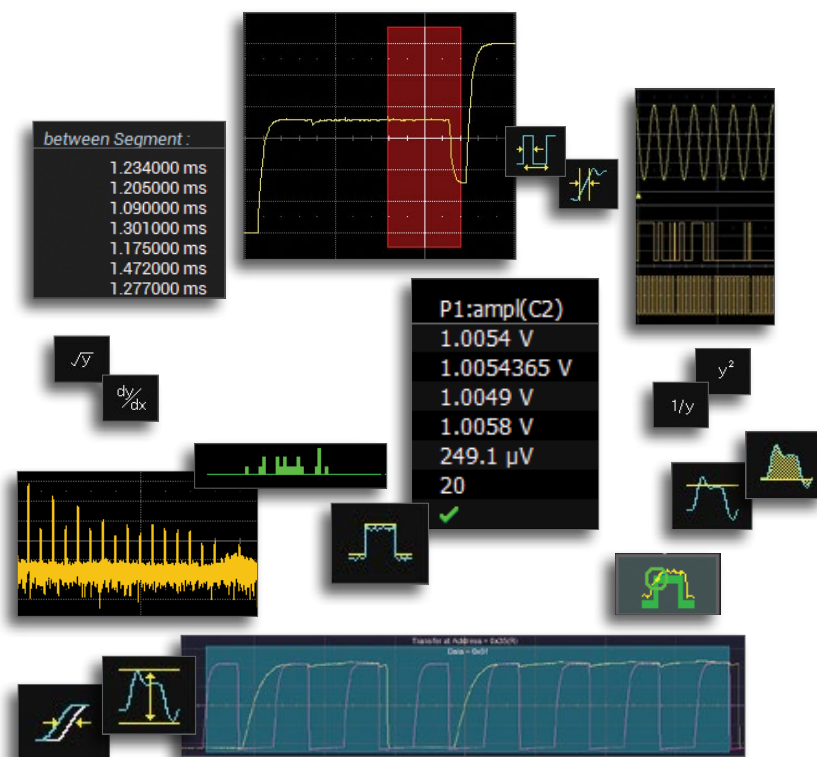
**Combining a fast waveform update rate of 130,000 waveforms/second with History mode waveform playback, Pass/Fail Mask Testing and WaveScan search and find, the WaveSurfer 3000 is an outstanding tool for waveform anomaly detection. A powerful set of triggering capabilities ensures that once a problem is detected it can be isolated and analyzed.**
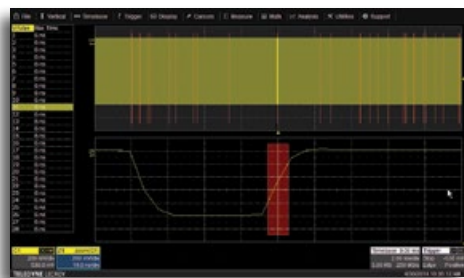


## WaveScan Advanced Search

Locate unusual events in a single capture or scan for an anomaly across many acquisitions over a long period of time. WaveScan provides powerful isolation capabilities that hardware triggers cannot provide.

Select from more than 20 search modes to find events on any analog or digital channel. Since the scanning modes are not simply copies of the hardware triggers, the utility and capability is much higher. There is no frequency trigger in any oscilloscope, yet WaveScan allows for frequency to be quickly scanned, notifying the user upon a shift in frequency. Searching can be done based on measured waveform parameters, runts, and non-monotonic edges as well as digital patterns.

WaveScan quickly and efficiently scans millions of events looking for unusual occurrences. Search and scan results can be seen with annotations directly on the waveform or in the interactive table. Quickly zoom to an event to see more details by simply touching it in the table.

## Pass/Fail Mask Testing

Built-in pass/fail mask testing quickly identifies problems and marks the location. A history of the pass/fail results can be displayed on the screen.

There are four different conditions that can be selected to specify a passing condition: All In, All Out, Any In, and Any Out. When a failure is found, one or more of the following actions can be selected to be performed to record the results: save a waveform, stop the acquisition, output and audible alarm, pulse the aux output port, save a hardcopy or even save a LabNotebook entry.

When the acquisition is running, failures are displayed as a red trace, however when the acquisition is stopped, a failure indicator is displayed to clearly show all failing points. Masks can either be created using the offline mask maker utility or created based on a reference waveform and specifying horizontal and vertical deltas.
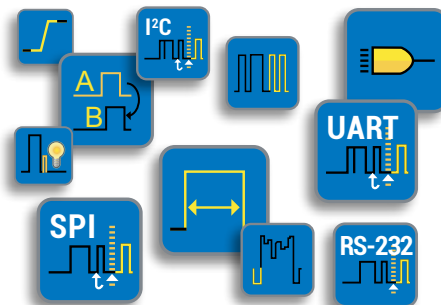
## Powerful Triggering

Good triggering is essential for effective debug and with a powerful combination basic and advanced triggers the WaveSurfer 3000 ensures that even the most challenging problems can be isolated. Basic triggering like edge and width are great for every day operation. Advanced triggers like runt or interval help isolate anomalies quickly. Qualified triggering allows for configuring a trigger across multiple channels.

With the MSO leadset connected, powerful logic triggering can be set up to catch a parallel pattern of up to 16 digital channels. Analog channels can be added to the pattern trigger to configure an analog-digital cross pattern, mixed signal trigger.

Beyond the standard oscilloscope triggering, unique serial data triggering capabilities for I2C, SPI, UART/RS-232, CAN, CAN FD, LIN and FlexRay add protocol specific triggering to isolate activity on a variety of serial busses.

## Fast Waveform Update

A fast update rate ensures that no waveform variations or details are missed. With an update rate of up to 130,000 waveforms per second the WaveSurfer 3000 is able to easily display random or infrequent events simplifying anomaly detection, identification and debug. Rapidly changing waveforms are easy to see and visually inspect. Changes over time can be seen with the intensity graded persistence display.

*Rotating and tilting feet provide four different viewing positions.*

## 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.

### Go Back in Time to Identify the Source of a Problem

**The advanced active probe interface gives tremendous flexibility for capturing all types of signals. Debug, analyze and document problems through the use of powerful math and measurement capabilities, sequence mode segmented memory, and LabNotebook.**







## Advanced Waveform Capture with Sequence Mode

Use Sequence mode to save waveforms into segmented memory. This is ideal for capturing fast pulses in quick succession or when capturing events separated by long time intervals. Combine Sequence mode with advanced triggers to isolate rare events over time. Trigger times and time between segments are provided for additional insight.
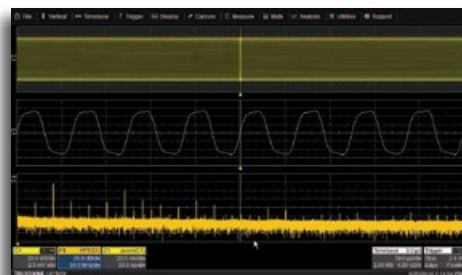
## Advanced Math Capabilities

A deep set of 20 math functions adds to the problem solving capability of WaveSurfer 3000. Math functions provide quick insight into waveforms and help point to the cause of the most challenging problems. Functions like the powerful FFT provide details of the frequency domain while averaging effectively filters noise out of the signal.

## Superior Measurement Tools

With 24 measurement parameters, the WaveSurfer 3000 can measure and analyze every aspect of analog and digital waveforms. Statistics and histicons go beyond traditional measurement tools providing insight to how a waveform changes over time. Measurement data can be trended to create a visual representation of changing measurements.

## LabNotebook Documentation Tool

LabNotebook is a one-button tool to save and restore waveforms, measurements and settings without navigating multiple menus. Saved waveforms can be measured and analyzed later both on the oscilloscope or offline using the WaveStudio PC Utility.
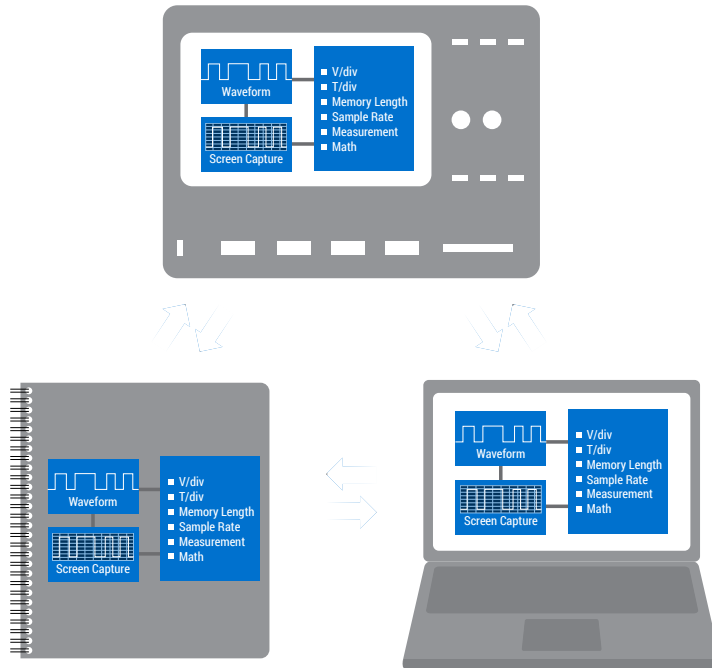


## WaveStudio Offline Analysis Tool

WaveStudio is a fast and easy way to analyze acquired waveforms offline. Offline tools include x and y axis cursors for quick measurements and 21 built-in automatic measurements for more precise and accurate results. WaveStudio can also connect to the oscilloscope for direct data transfer to the PC. Data saved with LabNotebook can be shared with others using WaveStudio for easy collaboration.
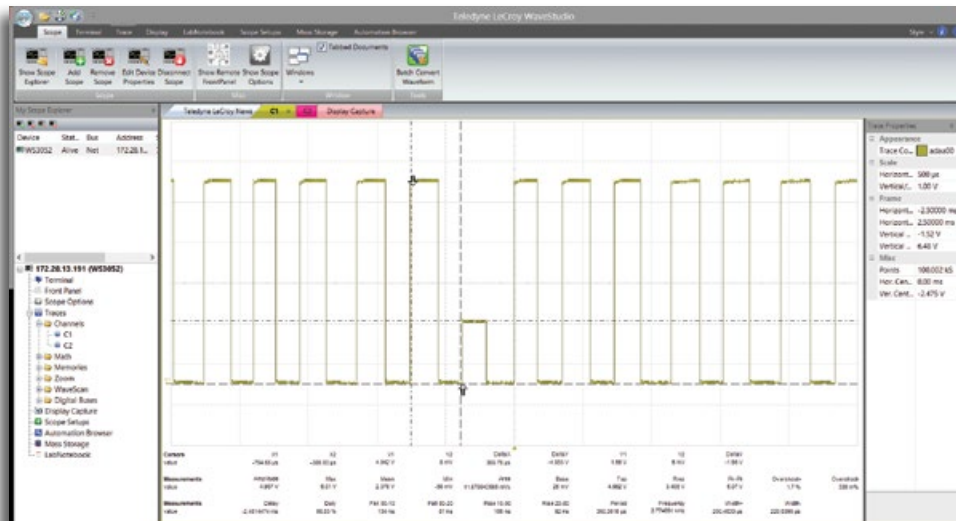


## Advanced Probe Interface

**The advanced active probe interface gives tremendous flexibility for measuring high voltages, high frequencies, currents, or differential signals.**

### High Impedance Active Probes



### High Bandwidth Differential Probes



### High Voltage Differential Probes



### High Voltage Passive Probes



### Current Probes

**Beyond traditional oscilloscope functionality the WaveSurfer 3000 has a variety of multi-instrument capabilities including waveform generation with a built-in function generator, protocol analysis with serial data trigger and decode, and logic analysis with an available 16 channel mixed signal option.**

## Protocol Analysis with Serial Trigger and Decode

Debugging serial data busses can be confusing and time consuming. Time saving protocol analysis capabilities are provided by the serial trigger and decode tools.

## Intuitive, Color-Coded Protocol Decode Overlay

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

## Powerful Serial Data Triggers

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



## Table Summary 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 will display just that event. Additionally, built-in search functionality will find specific decoded values.

### Supported Protocols
- I²C
- SPI
- UART / RS-232
- CAN
- LIN

| I2C | Time | Addr Length | Address | R/W | Length | Data |
|---|---|---|---|---|---|---|
| 1 | -8.09085 µs | 10 | 0x032 | W | 17 | 0x00 00 4c 65 43 72 6f 79 20 49 32 43 00 00 32 31 33 |
| 2 | 4.31869 ms | 10 | 0x032 | W | 0 | |
| 3 | 4.52191 ms | 10 | 0x032 | R | 17 | 0x00 00 4c 65 43 72 6f 79 20 49 32 43 00 00 32 31 33 |
| 4 | 43.6751 ms | 7 | 0x34 | W | 17 | 0x00 00 4c 65 43 72 6f 79 20 49 32 43 00 00 32 31 34 |
| 5 | 47.9074 ms | 7 | 0x34 | W | 1 | 0x00 |
| 6 | 48.1106 ms | 7 | 0x35 | R | 17 | 0x00 00 4c 65 43 72 6f 79 20 49 32 43 00 00 32 31 34 |
| 7 | 87.3585 ms | 7 | 0x36 | W | 17 | 0x00 00 4c 65 43 72 6f 79 20 49 32 43 00 00 32 31 35 |
| 8 | 91.5907 ms | 7 | 0x36 | W | 1 | 0x00 |
| 9 | 91.7939 ms | 7 | 0x37 | R | 17 | 0x00 00 4c 65 43 72 6f 79 20 49 32 43 00 00 32 31 35 |

## Digital Voltmeter

The Digital Voltmeter option activates an integrated 4-digit digital voltmeter and 5-digit frequency counter that operates through the same probes already attached to the oscilloscope channels. Real-time measurements can be viewed on the screen at all times or view more details through a dedicated user interface display. Measurements continue to be updated even when the triggering system is stopped. **The DVM license key can be downloaded at no charge from** *teledynelecroy.com/redeem/dvm.*

## Logic Analysis with 16 Channel Mixed Signal Capability

The 16 integrated digital channels and tools designed to simultaneously view, measure, and analyze both 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 a mixed signal environment. Event triggering can be configured to arm on an analog signal and trigger on a digital pattern or both analog and digital channels can be incorporated in to a single pattern trigger.

## 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 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 in digital waveforms.

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

## Waveform Generation with Built-in Function Generator

The built-in WaveSource function generator provides up to 25 MHz and 125 MS/s waveform generation capabilities. The function generator controls are integrated directly into the oscilloscope with a dedicated user interface. The integrated function generator is a convenient time saving tool allowing for quick and easy generation of sine, square, pulse, ramp, triangle, noise and DC waveforms. Additionally, CSV files saved from an oscilloscope
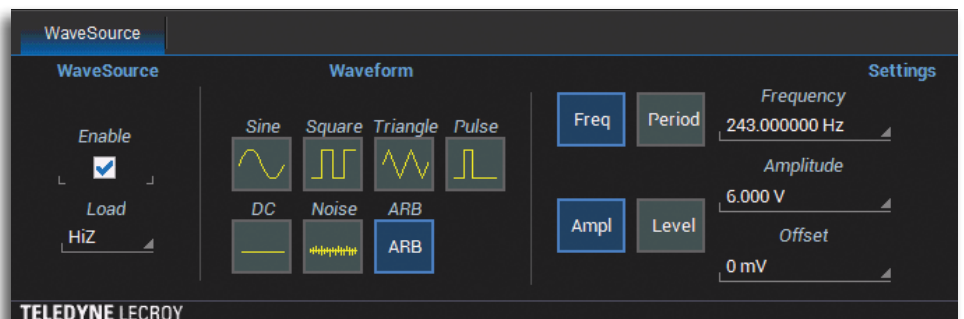


can be uploaded into the WaveSource to generate arbitrary waveforms. Familiar function generator controls are seamlessly integrated in to the WaveSurfer 3000 user interface

simplifying the process of generating waveform stimulus and measuring the response with the oscilloscope. A rear panel BNC connector provides easy access to the generator output.

| | WaveSurfer 3022 | WaveSurfer 3024 | WaveSurfer 3034 | WaveSurfer 3054 | WaveSurfer 3074 |
|---|---|---|---|---|---|
| **Analog - Vertical** | | | | | |
| Bandwidth (@ 50Ω) | 200 MHz | | 350 MHz | 500 MHz | 750 MHz |
| Rise time | 1.75 ns typical | | 1 ns typical | 800 ps typical | 550 ps typical |
| Input Channels | 2 | | 4 | | |
| Vertical Resolution | 8-bits; up to 11-bits with enhanced resolution (ERES) | | | | |
| Sensitivity | 50 Ω: 1mV/div - 1 V/div; 1 MΩ: 1 mV/div - 10 V/div | | | | |
| DC Gain Accuracy | ±(1.5%) Full Scale, Offset at 0V, > 5mV/div; ±(2.5%) < 5 mV/div | | | | |
| BW Limit | 20 MHz | | | 20 MHz, 200 MHz | |
| Maximum Input Voltage | 50 Ω: 5 Vrms, ±10 V Peak; 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% ‖ 16 pF | | | | |
| Offset Range | 50 Ω:  1 mV - 19.8 mV: ±2 V, 20 mV - 100 mV: ±5 V, 102 mV - 198 mV: ±20 V, 200 mV - 1 V: ±50 V<br>1 MΩ: 1 mV - 19.8 mV: ±2 V, 20 mV - 100 mV: ±5 V, 102 mV - 198 mV: ±20 V, 200 mV - 1 V: ±50 V,<br>    1.02 V - 1.98 V: ±200 V, 2 V - 10 V: ±400 V | | | | |
| Offset Accuracy | ±(1.0% of offset value + 1.5%FS + 1 mV) | | | | |
| **Analog - Acquisition** | | | | | |
| Sample Rate (Single-shot) | 2 GS/s (4 GS/s interleaved) | | | | |
| Sample Rate (Repetitive) | 50 GS/s | | | | |
| Record Length | 10 Mpts/ch (all channels) | | | | |
| Acquisition Modes | Real Time, Roll, RIS (Random Interleaved Sampling),<br>Sequence (Segmented Memory up to 1,000 segments with 1µs minimum intersegment time) | | | | |
| Real Time Timebase Range | 2 ns/div - 50 s/div | | | 1 ns/div - 50 s/div | |
| RIS Mode Timebase Range | 2 ns/div - 10 ns/div | | | 1 ns/div - 10 ns/div | |
| Roll Mode Timebase Range | Up to 50 s/div (roll mode is user selectable at ≥ 50 ms/div) | | | | |
| Timebase Accuracy | ±10 ppm measured over > 1ms interval | | | | |
| **Digital - Vertical and Acquisition (WS3K-MSO Option Only)** | | | | | |
| Input Channels | 16 Digital Channels | | | | |
| Threshold Groupings | Pod 2: D15 - D8, Pod 1: D7 - D0 | | | | |
| Threshold Selections | TTL(+1.4V), 5V CMOS (+2.5V), ECL (-1.3V) or User Defined | | | | |
| Maximum Input Voltage | ±30V Peak | | | | |
| Threshold Accuracy | ±(3% of threshold setting + 100mV) | | | | |
| Input Dynamic Range | ±20V | | | | |
| Minimum Input Voltage Swing | 500mVpp | | | | |
| Input Impedance (Flying Leads) | 100 kΩ ‖ 5 pF | | | | |
| Maximum Input Frequency | 125 MHz | | | | |
| Sample Rate | 500 MS/s | | | | |
| Record Length | 10MS - 16 Channels | | | | |
| Minimum Detectable Pulse Width | 4 ns | | | | |
| Channel-to-Channel Skew | ± (1 digital sample interval) | | | | |
| User defined threshold range | ±10V in 20mV steps | | | | |
| **Trigger System** | | | | | |
| Modes | Auto, Normal, Single, Stop | | | | |
| Sources | Any input channel, External, Ext/5, 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 | 10ns up to 20s or 1 to 100,000,000 events | | | | |
| Internal Trigger Level Range | ±4.1 Divisions | | | | |
| External Trigger Level Range | Ext: ±610mV, Ext/5: ±3.05V | | | | |
| Trigger Types | Edge, Width, Logic (Pattern), TV (NTSC, PAL, SECAM, HDTV - 720p, 1080i, 1080p), Runt, Slew Rate,<br>Interval (Signal or Pattern), Dropout, Qualified (State or Edge); External and Ext/5 support edge trigger only. | | | | |
| **Measure, Zoom and Math Tools** | | | | | |
| Measurement Parameters | Up to 6 of the following parameters can be calculated at one time on any waveform: Amplitude, Area, Base, Delay, Duty Cycle, Fall Time (90%−10%), Fall Time (80%−20%), Frequency, Maximum, Mean, Minimum, Overshoot+, Overshoot-, Peak-Peak, Period, Phase, Rise Time (10%−90%), Rise Time (20%−80%), RMS, Skew, Standard Deviation, Top, Width+, Width-. Statistics and histicons can be added to measurements. 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 | Up to 2 of the following functions can be calculated at one time: Sum, Difference, Product, Ratio, Absolute Value, Average, Derivative, Enhanced Resolution, Envelope, Floor, Integral, Invert, Reciprocal, Rescale, Roof, SinX/x, Square, Square Root, Trend, Zoom and FFT (up to 1 Mpts with power spectrum output and rectangular, VonHann, and FlatTop windows). | | | | |
| **Probes** | | | | | |
| Standard Probes | One PP019 (5mm) per channel | | | One PP020 (5mm) per channel | |
| Probing System | BNC and Teledyne LeCroy ProBus for Active voltage, current and differential probes | | | | |

| | WaveSurfer 3022 | WaveSurfer 3024 | WaveSurfer 3034 | WaveSurfer 3054 | WaveSurfer 3074 |
|---|---|---|---|---|---|

## Display System

| | |
|---|---|
| Display Size | 10.1" Wide TFT-LCD Touch-Screen |
| Display Resolution | 1024 x 600 |

## Connectivity

| | |
|---|---|
| Ethernet Port | 10/100Base-T Ethernet interface (RJ-45 connector) |
| Removable Storage | (1) MicroSD Port - 8 GB micro SD card installed standard |
| USB Host Ports | (4) USB Ports Total – (2) Front USB Ports |
| USB Device Port | (1) USBTMC |
| GPIB Port (Optional) | Supports IEEE – 488.2 |
| External Monitor Port | Standard DB-15 connector (support resolution of 1024x600) |
| Remote Control | Via Windows Automation, or via Teledyne LeCroy Remote Command Set |
| Network Communication Standard | GPIB IEEE-488.2 and VICP, USBTMC/USB488 |

## Power Requirements

| | |
|---|---|
| Voltage | 100 - 240 VAC ± 10% at 50-60 Hz +/-5%; 100 - 120 VAC ± 10% at 400 Hz +/- 5%; Automatic AC Voltage Selection |
| Power Consumption (Nominal) | 100 W / 100 VA |
| Power Consumption (Max) | 150 W / 150 VA (with all PC peripherals, digital leadset and active probes connected to 4 channels) |

## Environmental

| | |
|---|---|
| Temperature | Operating: 0 °C to 50 °C; Non-Operating: -30 °C to 70 °C |
| Humidity | Operating: 5% to 90% relative humidity (non-condensing) up to ≤ 30 °C, Upper limit derates to 50% relative humidity (non-condensing) at +50 °C<br>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 ≤ 25C; Non-Operating: Up to 12,192 meters (40,000 ft) |

## Physical

| | |
|---|---|
| Dimensions (HWD) | 10.63"H x 14.96"W x 4.92"D (270 mm x 380 mm x 125 mm) |
| Weight | 4.81 kg (10.6 lbs) |

## Regulatory

| | |
|---|---|
| CE Certification | Low Voltage Directive 2006/95/EC; EN 61010-1:2010, EN 61010-2-030:2010<br>EMC Directive 2004/108/EC; EN 61326-1:2013, EN61326-2-1:2013; RoHS2 Directive 2011/65/EU |
| UL and cUL Listing | UL 61010-1, UL 61010-2-030:2010, 3rd Edition; CAN/CSA C22.2 No. 61010-1-12 |

## Digital Voltmeter (optional)

| | |
|---|---|
| Functions | $AC_{rms}$, DC, $DC_{rms}$, Frequency |
| Resolution | ACV/DCV: 4 digits, Frequency: 5 digits |
| Measurement Rate | 100 times/second, measurements update on the display 5 times/second |
| Vertical Settings Autorange | Automatic adjustment of vertical settings to maximize the dynamic range of measurements |

## WaveSource Function Generator (optional)

### General

| | |
|---|---|
| Max Frequency | 25 MHz |
| Channels | 1 |
| Sample Rate | 125 MS/s |
| Arbitrary Waveform Length | 16 kpts |
| Frequency Resolution | 1 µHz |
| Vertical Resolution | 14-bit |
| Vertical Range | ±3V (HiZ); ±1.5V (50 Ω) |
| Waveform Types | Sine, Square, Pulse, Ramp, Noise, DC |

### Frequency Specification

| | |
|---|---|
| Sine | 1 µHz - 25 MHz |
| Square/Pulse | 1 µHz - 10 MHz |
| Ramp/Triangular | 1 µHz - 300 KHz |
| Noise | 25 MHz (-3dB) |
| Resolution | 1 µHz |
| Accuracy | ±50 ppm, over temperature |
| Aging | ±3 ppm/year, first year |

### Output Specification

| | |
|---|---|
| Amplitude | 4 mVpp - 6 Vpp (HiZ); 2 mVpp - 3 Vpp(50 Ω) |
| Vertical Accuracy | ±(0.3dB + 1 mV) |
| Amplitude Flatness | ±0.5dB |

### DC Offset

| | |
|---|---|
| Range (DC) | ±3V (HiZ); ±1.5V (50 Ω) |
| Offset Accuracy | ±(1% of offset value + 3 mV) |

### Waveform Output

| | |
|---|---|
| Impedance | 50 Ω ± 2% |
| Protection | Short-circuit protection |

### Sine Spectrum Purity

| | |
|---|---|
| SFDR (Non Harmonic) @1.265Vpp | |
| DC-1 MHz | -60dBc |
| 1 MHz - 5 MHz | -55dBc |
| 5 MHz - 25 MHz | -50dBc |
| Harmonic Distortion @1.265Vpp | |
| DC - 5 MHz | -50dBc |
| 5 MHz - 25 MHz | -45dBc |

### Square/Pulse

| | |
|---|---|
| Rise/fall time | 24 ns (10% - 90%) |
| Overshoot | 3% (typical - 1 kHz, 1 Vpp) |
| Pulse Width | 50 ns min. |
| Jitter | 500ps + 10ppm of period (RMS cycle to cycle) |

### Ramp/Triangle

| | |
|---|---|
| Linearity | 0.1% of Peak value output (typical - 1 kHz, 1 Vpp, 100% symmetric) |
| Symmetry | 0% to 100% |

| Product Description | Product Code |
|---|---|
| **WaveSurfer 3000 Oscilloscopes** | |
| 200 MHz, 4 GS/s, 2 Ch, 10 Mpts/Ch with 10.1" Touch screen Display | WaveSurfer 3022 |
| 200 MHz, 4 GS/s, 4 Ch, 10 Mpts/Ch with 10.1" Touch screen Display | WaveSurfer 3024 |
| 350 MHz, 4 GS/s, 4 Ch, 10 Mpts/Ch with 10.1" Touch screen Display | WaveSurfer 3034 |
| 500 MHz, 4 GS/s, 4 Ch, 10 Mpts/Ch with 10.1" Touch screen Display | WaveSurfer 3054 |
| 750 MHz, 4 GS/s, 4 Ch, 10 Mpts/Ch with 10.1" Touch screen Display | WaveSurfer 3074 |

**Included with Standard Configurations**

÷10 Passive Probe (Total of 1 Per Channel), 1 Micro SD card (Installed), Micro SD card adapter, Protective Front Cover, Getting Started Guide, Commercial NIST Traceable Calibration with Certificate, Power Cable for the Destination Country, 3-year Warranty

| Product Description | Product Code |
|---|---|
| **General Accessories** | |
| External GPIB Accessory | USB2-GPIB |
| Soft Carrying Case | WS3K-SOFTCASE |
| Rack Mount Accessory | WS3K-RACK |

| Product Description | Product Code |
|---|---|
| **Local Language Overlays** | |
| German Front Panel Overlay | WS3K-FP-GERMAN |
| French Front Panel Overlay | WS3K-FP-FRENCH |
| Italian Front Panel Overlay | WS3K-FP-ITALIAN |
| Spanish Front Panel Overlay | WS3K-FP-SPANISH |
| Japanese Front Panel Overlay | WS3K-FP-JAPANESE |
| Korean Front Panel Overlay | WS3K-FP-KOREAN |
| Chinese (Tr) Front Panel Overlay | WS3K-FP-CHNES-TR |
| Chinese (Simp) Front Panel Overlay | WS3K-FP-CHNES-SI |
| Russian Front Panel Overlay | WS3K-FP-RUSSIAN |

| Product Description | Product Code |
|---|---|
| **Multi-Instrument Options** | |
| MSO software option and 16 Channel Digital probe leadset | WS3K-MSO |
| MSO License (MS Probe Not Included) | WS3K-MSO-LICENSE |
| Function Generator Option | WS3K-FG |
| CAN and LIN Trigger and Decode Option | WS3K-AUTO |
| CAN FD Trigger and Decode Option | WS3K-CAN FDbus TD |
| I$^2$C, SPI, UART and RS-232 Trigger and Decode Option | WS3K-EMB |
| FlexRay Trigger and Decode Option | WS3K-FlexRaybus TD |

| Product Description | Product Code |
|---|---|
| **Probes** | |
| 250 MHz Passive Probe 10:1, 10 MΩ | PP019 |
| 500 MHz Passive Probe 10:1, 10 MΩ | PP020 |
| 700 V, 15 MHz High-Voltage Differential Probe | AP031 |
| 200 MHz, 3.5 pF, 1 MΩ Active Differential Probe | ZD200 |
| 500 MHz, 1.0 pF Active Differential Probe, ±8 V | ZD500 |
| 1 GHz, 1.0 pF Active Differential Probe, ±8 V | ZD1000 |
| Deskew Calibration Source for CP031 and CP030 | DCS015 |
| 30 A; 50 MHz Current Probe – AC/DC; 30 A$_{rms}$; 50 A$_{peak}$ Pulse | CP030 |
| 30 A; 50 MHz High Sensitivity Current Probe – AC/DC; 30 A$_{rms}$; 50 A$_{peak}$ Pulse | CP030A |
| 30 A; 100 MHz Current Probe – AC/DC; 30 A$_{rms}$; 50 A$_{peak}$ Pulse | CP031 |
| 30 A; 100 MHz High Sensitivity Current Probe – AC/DC; 30 A$_{rms}$; 50 A$_{peak}$ Pulse | CP031A |
| 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 |
| 100:1 400 MHz 50 MΩ 1 kV High-voltage Probe | HVP120 |
| 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 |
| 1 GHz, 0.9 pF, 1 MΩ High Impedance Active Probe | ZS1000 |
| Set of 4 ZS1000, 1 GHz, 0.9 pF, 1 MΩ High Impedance Active Probe | ZS1000-QUADPAK |
| 1 kV, 25 MHz High Voltage Differential Probe with 2 m cable | HVD3102 |
| 1 kV, 120 MHz High Voltage Differential Probe with 2 m cable | HVD3106 |
| 1 kV, 80 MHz High Voltage Differential Probe with 6m cable | HVD3106-6M |
| 1 kV, 25 MHz High Voltage Differential Probe with 2 m cable without tip Accessories | HVD3102-NOACC |
| 1 kV, 120 MHz High Voltage Differential Probe with 2 m cable without tip Accessories | HVD3106-NOACC |
| 2 kV, 120 MHz High Voltage Differential Probe with 2 m cable | HVD3206-NOACC |
| 6 kV, 100 MHz High Voltage Differential Probe with 6 m cable | HVD3605 |

| Product Description | Product Code |
|---|---|
| **Probe Adapters** | |
| TekProbe to ProBus Probe Adapter | TPA10 |
| Set of 4 TPA10 TekProbe to ProBus Probe Adapters. Includes soft carrying case. | TPA10-Quadpak |

## 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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# OCEAN CHIPS
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### Поставка электронных компонентов

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics  и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».

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Разъемы специального, военного и аэрокосмического назначения:

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ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).

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