

BIGGEST TOUCH. BEST VALUE.



WaveSurfer 3000z

100 MHz – 1 GHz Oscilloscopes



10.1" Capacitive Touch Screen

20 Mpts Memory

Powerful, Deep Toolbox

The WaveSurfer 3000z has a 10.1" capacitive touch display, the longest memory, and the deepest toolbox – all at an affordable price.



BIGGEST TOUCH. BEST VALUE.

WaveSurfer 3000z

Biggest Touch



Best Value 30% Larger



Digital Voltmeter Logic Analysis with 16 Mixed Signal Capabilities

20 Mpts Powerful Triggering Superior Measurement Tools

History Mode Anomaly Detection

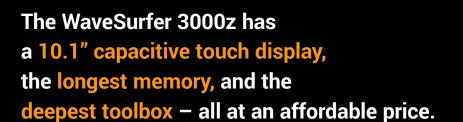
WaveScan LabNotebook Waveform Generator

Multi-Instrument Capabilities (AFG)

Powerful, Protocol Analysis with Serial Trigger and Decode

Pass/Fail Deep Toolbox

Testing Advanced Math Fast Waveform Update



- 10.1" Capacitive Touch Screen
- 20 Mpts Memory
- 3 Powerful, Deep Toolbox



Faster Time to Insight

Insight alone is not enough.

Markets and technologies change too rapidly.

The **timing** of **critical design** decisions is significant.

Faster Time to Insight is what matters.



THE WAVESURFER 3000Z ATTRIBUTES

The WaveSurfer 3000z provides the Most Advanced User Interface (MAUI) through a 10.1" capacitive touch screen. It promotes true versatility with 20 Mpts of memory, multi-instrument capabilities, a powerful, deep toolbox, and 100 MHz - 1 GHz of bandwidth.

Key Attributes

- 1. 10.1" widescreen capacitive touch screen display
- 2. MAUI Most Advanced User Interface
- **3.** Waveform Control Knobs for channel, zoom, math and memory traces
- **4.** "Push" Knobs push functionality provides shortcuts to common actions
- **5.** Dedicated buttons to quickly access popular debug tools.
- **6.** Mixed Signal Capability 16 channel mixed signal capability
- **7.** Easy connectivity with an ethernet and four USB 2.0 Ports
- **8.** Rotating and tilting feet for four different viewing positions







- WaveSource Ouput for Built-in Function Generator
- **10.** Micro SD Port 16 GB (or larger) micro SD card installed standard
- **11.** External Monitor DB-15 connector (Support resolution of 1024 x 600)
- **12.** USBTMC (Test and Measurement Class) over USB 2.0 for remote connectivity
- 13. Small Footprint



WAVESURFER 3000z AT A GLANCE

Key Features

100 MHz, 200 MHz, 350 MHz, 500 MHz and 1 GHz bandwidths

Up to 4 GS/s sample rate

Long Memory - up to 20 Mpts

10.1" capacitive touch screen display

16 Digital Channel MSO option

MAUI - Most Advanced User Interface

- Designed for Touch
- Built for Simplicity
- Made to Solve

Advanced Anomaly Detection

- Fast Waveform Update
- History Mode Waveform Playback
- WaveScan Search and Find

Multi-Instrument Capabilities

- Protocol Analysis -Serial Trigger and Decode
- Waveform Generation Built-in Function Generator
- Digital Voltmeter and Frequency Counter

Future Proof

- Upgradeable Bandwidth
- Field Upgradable Software and Hardware Options



Superior User Experience

MAUI is the most advanced oscilloscope user interface. It is designed for touch, built for simplicity, and made to solve.

Advanced Anomaly Detection

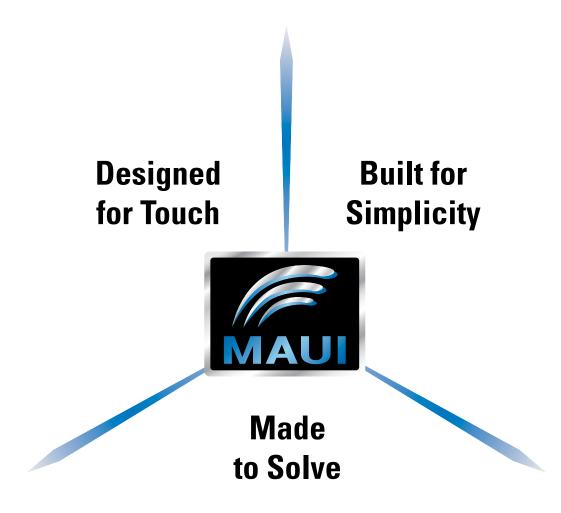
A fast waveform update rate, used in conjunction with history mode, WaveScan, sequence mode, and mask testing facilitates outstanding waveform anomaly detection.

Biggest Touch Display

A large capacitive touch screen enables accessible and responsive touch operation. The 10.1" display is 30% larger than competitive offerings, providing more waveform viewing area.

Powerful, Deep Toolbox

The standard collection of math, measurement, debug, and documentation tools provides unsurpassed analysis capabilities.



Designed for Touch

MAUI is designed for touch. Operate the oscilloscope just like a phone or tablet with the most unique touch screen features on any oscilloscope. All important controls are always one touch away. Touch the waveform to position or zoom in for more details using intuitive actions.

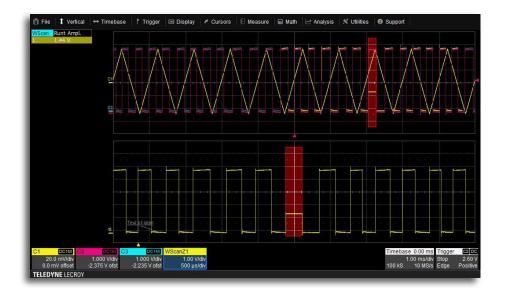
Built for Simplicity

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.

Made to Solve

MAUI is made to solve. A deep set of integrated debug and analysis tools help identify problems and find solutions quickly. Unsurpassed integration provides critical flexibility when debugging. Solve problems fast with powerful analysis tools.

ADVANCED ANOMALY DETECTION



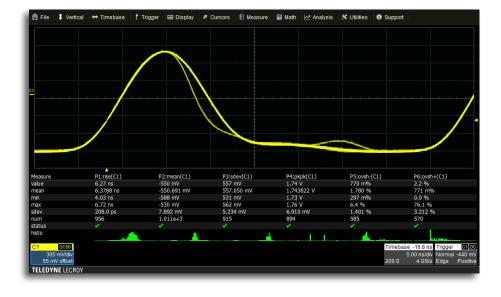
WaveScan Advanced Search

- Locate unusual events in a single capture or scan for an anomalies across many acquisitions
- More than 20 modes can be applied to analog or digital channels



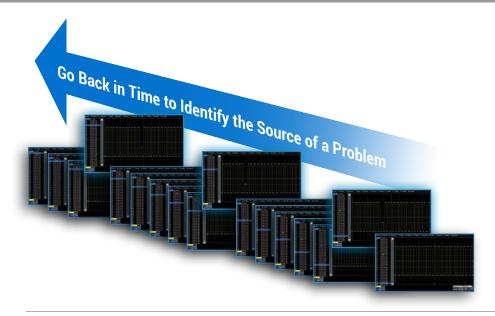
Pass/Fail Mask Testing

- Mask testing to quickly identify anomalies and mark their location.
- A history of these pass/fail results can be displayed



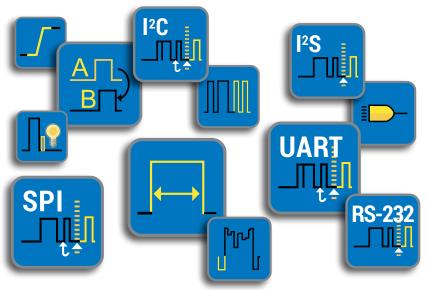
Fast Waveform Update

- An update rate of over 130,000 waveforms per second will easily display random or infrequent events
- Changes over time can be seen with the intensity graded persistence display



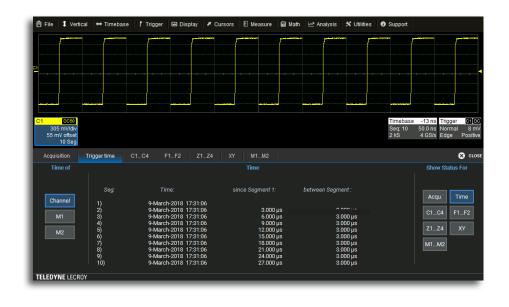
History Mode Waveform Playback

- View previous waveforms to discover past anomalies
- Use cursors and measurement parameters to quickly identify the source of problems
- History mode is always enabled and accessible through the click of a button



Powerful Triggering

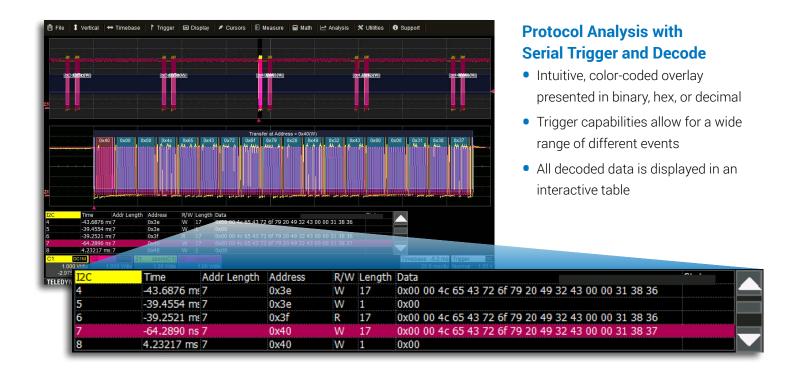
- Basic triggering such as edge or width can be used for everyday solutions
- Qualified triggering enables the ability to trigger across multiple channels
- Powerful logic triggering can be setup to catch a parallel pattern
- Smart triggers such as runt, dropout, or interval help isolate anomalies quickly
- Serial data triggering adds protocol specific triggers



Advanced Waveform Capture with Segmented Memory

- Save waveforms into segmented memory
- Capture fast pulses in quick succession or events separated by long time intervals
- Combine Sequence mode with advanced triggers to isolate rare events

MULTI-INSTRUMENT CAPABILITIES





The DVM license key can be downloaded at no charge from *teledynelecroy.com/redeem/dvm*.

Precise Measurements with Digital Voltmeter

- 4-digit digital voltmeter
- 5-digit frequency counter
- Any channel can be selected as a source
- Voltage readings can be set to DC, DC RMS, or AC RMS
- Measurements will continue to be updated even when triggering is stopped

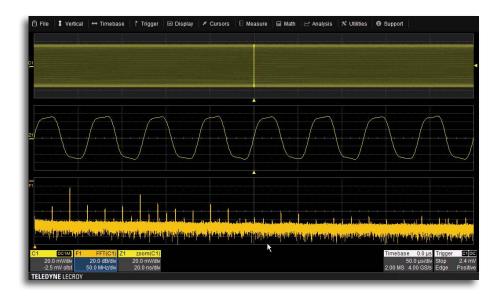




Waveform Generation with Built-in Function Generator

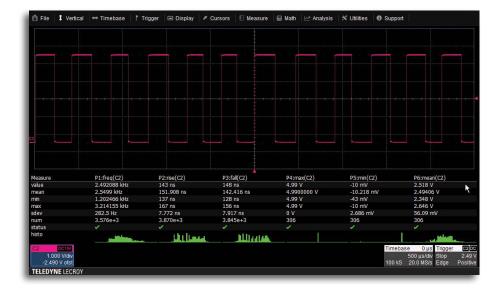
- Frequencies of up to 25 MHz
- Waveform Options: sine, square, pulse, ramp, triangle, noise and DC waveforms
- Rear panel BNC output
- Saved waveforms can be uploaded into the WaveSource to generate arbitrary waveforms

POWERFUL, DEEP TOOLBOX



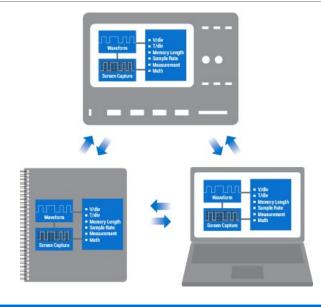
Advanced Math Capabilities

- A deep set of 20 math functions provide quick insight into waveforms
- Dedicated Grid for Math Traces
- Any Channel, Measurement, or Analysis Package can have a math function applied



Superior Measurement Tools

- 24 measurement parameters
- Additional statistics and histicons can be applied to each parameter
- Trends can be displayed for any measurement



LabNotebook Documentation Tool

- Save all displayed waveforms, oscilloscope setup file, and a screen image with a single button press
- Recall LabNotebook files onto the oscilloscope
- View the LabNotebook files on a PC using WaveStudio

Teledyne LeCroy offers an extensive range of probes to meet virtually every probing need.

ZS Series High Impedance Active Probes (1 GHz - 1.5 GHz)



The active voltage probe can become the everyday probe for all different types of signals and connection points.

Differential Probes (200 MHz - 1.5 GHz)



These active differential probes are ideal for applications such as automotive electronics and data communications.

Active Voltage/Power Rail Probe (4 GHz)



The Active Rail Probe is specifically designed to probe a low impedance power/voltage rail.

High Voltage Fiber Optically-isolated Probes



The HVFO108 is ideal for measurement of small signals floating on an HV bus in power electronics designs or for EMC, EFT, ESD, and RF immunity testing sensor monitoring.

High Voltage Differential Probes (120 MHz)



HVDs are rated for wide differential voltage swings - ideal for power electronics circuits.

High Voltage Passive Probes



High Voltage Single-ended passive probes that are ideal for lightning/surge or EFT testing, or for probing in-circuit beyond the range of a LV-rate passive probe.

Current Probes (100 MHz)



Current probes with peak currents of 700 A and sensitivities to 1 mA/div. Ideal for component or power conversion system input/output measurements.

Probe and Current Sensor Adapters



TPA10 adapts supported Tektronix TekProbe-compatible probes to Teledyne LeCroy ProBus interface.

	WaveSurfer 30147	WaveSurfer 30247	WaveSurfer 3034z	WaveSurfer 30547	WaveSurfer 31047
Analog - Vertical	Waveourier 00142	Waveourier 00242	Waveourier 00042	Waveourier 50042	Waveourier 510-12
Analog Bandwidth @ 50Ω (-3dB)	100 MHz	200 MHz	350 MHz	500 MHz	1 GHz
Rise time	3.5 ns (typical)	1.75 ns (typical)	1 ns (typical)	800 ps (typical)	430 ps (typical)
Input Channels	4				
Vertical Resolution	8-bits; up to 11-bits wit	h enhanced resolution (I	ERES)		
Sensitivity	50 Ω: 1mV/div - 1 V/div	r; 1 MΩ: 1 mV/div - 10 V	/div		
DC Gain Accuracy	±(1.5%) Full Scale, Offse	et at 0V, > 5mV/div; ±(2.	5%) < 5 mV/div		
BW Limit		MHz		20 MHz, 200 MHz	
Maximum Input Voltage		ak; 1 MΩ: 400 V max (D	C + Peak AC ≤ 10 kHz)		
Input Coupling	50 Ω: DC, GND; 1 MΩ: A				-
Input Impedance	50 Ω ±2.0%, 1 MΩ ±2.0				
Offset Range	1 MΩ: 1 mV - 19.8 mV:		5 V, 102 mV - 198 mV: ±2 5 V, 102 mV - 198 mV: ±2 /		
Offset Accuracy	±(1.0% of offset value +		<u>. </u>		
Analog - Acquisition					
Sample Rate (Single-shot)	1 GS/s		2 G	S/s	
	(2 GS/s interleaved)			terleaved)	
Sample Rate (Repetitive)	50 GS/s				
Standard Memory (4 Ch / 2 Ch)	10 Mpts / 20 Mpts				
Acquisition Modes		andom Interleaved Samp	olina).		
7 toquisition Wodes			gments with 1µs minimu	ım interseament time)	
Real Time Timebase Range	5 ns/div - 100 s/div		100 s/div	1 ns/div - 100 s/div	500 ps/div - 100 s/div
RIS Mode Timebase Range	5 ns/div - 10 ns/div	2 ns/div -		1 ns/div - 10 ns/div	500 ps/div - 10 ns/div
Roll Mode Timebase Range		ode is user selectable at		1110/ 017 10 110/ 017	000 00, 011
Timebase Accuracy	±10 ppm measured over				
ŕ	• •				
<u>Digital - Vertical and Acquisiti</u>		<u>on Only)</u>			
Input Channels	16 Digital Channels	7 00			
Threshold Groupings	Pod 2: D15 - D8, Pod 1: D		D - 6 1		
Threshold Selections		2.5V), ECL (-1.3V) or User	Defined		
Maximum Input Voltage Threshold Accuracy	±30V Peak ±(3% of threshold setting	z ι 100m/Λ			
Input Dynamic Range	±20V	j + 100mv)			
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 inter	rval)			
User defined threshold range	±10V in 20mV steps	vaij			
_	=101 m120m1 otopo				
Trigger System Modes	Auto, Normal, Single, St	ton			
Sources			and level unique to eac	h source (except for line	tringer)
Coupling	DC. AC. HFREJ. LFREJ	ai, Exc, 0, 01 iiiic, 310pe	sand level unique to each	Journe (exocpt for lift	<u>,ggc1)</u>
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 (Pat	tern), TV (NTSC, PAL, SE	CAM, HDTV - 720p, 108		
	, ,	em), propout, Qualified (State or Edge); External a	anu Ext/o support edge	ungger omy.
Measure, Zoom and Math Too			and a second		- A D
Measurement Parameters			culated at one time on a		
			0%-20%), Frequency, Ma		
			ne (10%–90%), Rise Time		
			isticons can be added to		
	LICE TROUT DANGE ()LICK /	NOW DUITTON OF LICO TOLIO	n screen or mouse to dr	aw a box around the zo	om area.
Zooming					
Zooming Math Functions	Up to 2 of the following	functions can be calcu	lated at one time: Sum, [Difference, Product, Rat	io, Absolute Value,
	Up to 2 of the following Average, Derivative, Enl	functions can be calculation, Enve		Difference, Product, Rat ert, Reciprocal, Rescale,	io, Absolute Value, Roof, SinX/x, Square,

One PP019 (5mm) per channel

One PP020 (5mm)

BNC and Teledyne LeCroy ProBus for Active voltage, current and differential probes

One PP020 (5mm) per channel

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Probes

Standard Probes

Probing System

SPECIFICATIONS

Display System	WaveSurfer 3014z Wa	veSurfer 3024z	WaveSurfer 30	34z WaveSurfer 3054z WaveSurfer 3104z
Display Size	10.1" widescreen capacitive	touch screen		
Display Resolution	1024 x 600			
Connectivity				
Ethernet Port	10/100Base-T Ethernet inter	rface (RJ-45 connect	or)	
Removable Storage	(1) MicroSD Port - 16 GB mid			
USB Host Ports	(4) USB 2.0 Ports Total – (2)	Front USB 2.0 Ports		
USB Device Port	(1) USBTMC			
GPIB Port (Optional)	Supports IEEE - 488.2			
External Monitor Port	Standard DB-15 connector (s			10
Remote Control	Via Windows Automation, or	r via Teledyne LeCroy	Remote Comma	and Set
Network Communication Standard	on VICP and LXI compatible			
Power Requirement				
Voltage		50 Hz +/-5%; 100 - 12	<u> 10 VAC ± 10% at 4</u>	100 Hz +/- 5%; Automatic AC Voltage Selection
Power Consumption (N		and the second of the second of	and a second and a second	and a second to the distance of the
Power Consumption (N	nax) 150 W / 150 VA (With all PC	peripherais, digital le	adset and active	probes connected to 4 channels)
Environmental				
Temperature	Operating: 0 °C to 50 °C; Nor			
Humidity	Operating: 5% to 90% relative			0 °C, Upper limit derates to 50% relative humidity
	(non-condensing) at +50 °C			
A february	Non-Operating: 5% to 95% re			
Altitude	Operating: 3,048 m (10,000	ft) max at ≤ 25C; Nor	n-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 2014/	/35/FU: FN 61010-1:	2010 FN 61010-2	2-030:2010
				RoHS2 Directive 2011/65/EU
UL and cUL Listing	UL 61010-1, UL 61010-2-030	0:2010, 3rd Edition; C	AN/CSA C22.2 N	o. 61010-1-12
Digital Voltmeter (or	ntional)			
Functions	AC _{rms} , DC, DC _{rms} , Frequen	CV		
Resolution	ACV/DCV: 4 digits, Frequence			
Measurement Rate	100 times/second, measure		display 5 times/	second
Vertical Settings Autora				
-			•	
WaveSource Function	on Generator (optional)			
General			Offset	
Max Frequency	25 MHz		ge (DC)	±3V (HiZ); ±1.5V (50 Ω)
Channels	1	Offs	et Accuracy	±(1% of offset value + 3 mV)
Sample Rate	125 MS/s			
Arbitrary Waveform Length	16 kpts		reform Output edance	50 Ω ± 2%
Frequency Resolution	1 µHz		ection	Short-circuit protection
Vertical Resolution	14-bit			•
Vertical Range	±3V (HiZ); ±1.5V (50 Ω)		Spectrum Purity	
Waveform Types	Sine, Square, Pulse, Ramp, Noise, DC		R (Non Harmonic	
			1 MHz	-60dBc
Frequency Specification			Hz - 5 MHz	-55dBc
Sine Square/Pulse	1 µHz - 25 MHz		Hz - 25 MHz	-50dBc
Ramp/Triangular	1 μHz - 10 MHz 1 μHz - 300 KHz		<u>monic Distortion (</u> - 5 MHz	-50dBc
Noise	25 MHz (-3dB)		Hz - 25 MHz	-45dBc
Resolution	1 μHz			.0000
Accuracy	±50 ppm, over temperature		are/Pulse	0.4 (100, 000)
Aging	±3 ppm/year, first year		e/fall time	24 ns (10% - 90%)
			rshoot	3% (typical - 1 kHz, 1 Vpp)
Output Specification	4 m\/nn 6 \/nn (11i7): 2 m\/nn 2 \/n= /F		se Width	50 ns min. 500ps + 10ppm of period (RMS cycle to cycle)
Amplitude Vertical Accuracy	4 mVpp - 6 Vpp (HiZ); 2 mVpp - 3 Vpp(5 ±(0.3dB + 1 mV)	<u>(Ο Ω)</u> Jitte	51	Soops + Toppin of period (Rivis cycle to cycle)
Amplitude Flatness	±0.5dB		np/Triangle	
, ampireduc i idelicos	_0.000	Line	arity	0.1% of Peak value output (typical - 1 kHz, 1 Vpp,
				100% symmetric)
		Sym	nmetry	0% to 100%

ORDERING INFORMATION

Product Description	Product Code
WaveSurfer 3000z Oscilloscopes	
100 MHz, 2 GS/s, 4 Ch, 10 Mpts/Ch with	WaveSurfer 3014z
10.1" Capacitive Touch Screen Display	
20 Mpts /Ch in interleaved mode	
200 MHz, 4 GS/s, 4 Ch, 10 Mpts/Ch with	WaveSurfer 3024z
10.1" Capacitive Touch Screen Display	
20 Mpts /Ch in interleaved mode	
350 MHz, 4 GS/s, 4 Ch, 10 Mpts/Ch with	WaveSurfer 3034z
10.1" Capacitive Touch Screen Display	
20 Mpts /Ch in interleaved mode	
500 MHz, 4 GS/s, 4 Ch, 10 Mpts/Ch with	WaveSurfer 3054z
10.1" Capacitive Touch Screen Display	
20 Mpts /Ch in interleaved mode	
1 GHz, 4 GS/s, 4 Ch, 10 Mpts/Ch with	WaveSurfer 3104z
10.1" Capacitive Touch Screen Display	
20 Mpts /Ch in interleaved mode	
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, $\begin{tabular}{ll} \hline \textbf{Commercial NIST Traceable Calibration with Certificate, Power Cable for } \\ \hline \end{tabular}$ the Destination Country, 3-year Warranty

General Accessories

External GPIB Accessory	USB2-GPIB
Soft Carrying Case	WS3K-SOFTCASE
Rack Mount Accessory	WS3K-RACK

Multi-Instrument Options

MSO software option and 16 Channel Digital probe lea	adset WS3K-MS0
MSO License (MS Probe Not Included)	WS3K-MSO-LICENSE
Function Generator Option	WS3K-FG
Spectrum Analyzer for WaveSurfer 3000z	WS3K-SPECTRUM-1
Audiobus Trigger and Decode Option for I ² S, LJ, RJ, and TDM	WS3K-Audiobus TD
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
Power Analysis Option	WS3K-PWR

Product Description F	Product Code
Probes	
250 MHz Passive Probe 10:1, 10 MΩ	PP019
500 MHz Passive Probe 10:1, 10 M Ω	PP020
700 V, 15 MHz High-Voltage Differential Probe	AP031
Power/Voltage Rail Probe. 4 GHz bandwidth, 1.2x attenuation, ±30V offset, ±800mV	RP4030
	0-BROWSER
1,500 V, 120 MHz High-Voltage Differential Probe	HVD3106A
1kV, 80 MHz High Voltage Differential Probe with 6m cable H'	VD3106A-6M
1kV, 120 MHz High Voltage Differential Probe HVD3 without tip Accessories	106A-NOACC
1,500 V, 25 MHz High-Voltage Differential Probe	HVD3102A
1kV, 25 MHz High Voltage Differential Probe without HVD3 tip Accessories	102A-NOACC
2kV, 120 MHz High Voltage Differential Probe	HVD3206A
	VD3206A-6M
2kV, 400 MHz High Voltage Differential Probe	HVD3220
6kV, 100 MHz High Voltage Differential Probe	HVD3605A
High Voltage Fiber Optic Probe, 150 MHz (requires accessory tip)	HVF0108
	0100-1X-TIP
	0100-5X-TIP
	100-20X-TIP
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
30 A; 50 MHz Current Probe – AC/DC; 30 A _{rms} ; 50 A _{peak} Pulse	CP030
30 A, 10 MHz Current Probe - AC/DC, 30 A rms, 50 A _{Peak} Pulse, 3 meter cable	CP030-3M
30 A; 50 MHz High Sensitivity Current Probe – AC/DC; 30 A _{rms;} 50 A _{peak} Pulse	CP030A
150 A; 10 MHz Current Probe – AC/DC; 150 A _{rms} ; 500 A _{peak} Pulse	e CP150
150 A, 5 MHz Current Probe - AC/DC, 150 A rms, 500 A _{Peak} Pulse, 6 meter cable	CP150-6M
500 A; 2 MHz Current Probe – AC/DC; 500 A _{rms} ; 700 A _{peak} Pulse	CP500
Deskew Calibration Source for CP031, CP030 and AP015	DCS025
500 MHz Differential Probe	AP033
200 MHz, 3.5 pF, 1 MΩ Active Differential Probe, ±20 V, 60V common-mode	ZD200
1 GHz, 1.0 pF, 1 M Ω Active Differential Probe, ± 8 V, 10V common-mode	ZD1000
$1.5~\text{GHz},1.0~\text{pF},1~\text{M}\Omega$ Active Differential Probe, $\pm 8~\text{V},10V$ common-mode	ZD1500
1 GHz, 0.9 pF, 1 MΩ High Impedance Active Probe	ZS1000
1.5 GHz, 0.9 pF, 1 MΩ High Impedance Active Probe	ZS1500
100:1 400 MHz 50 MΩ 1 kV High-voltage Probe	HVP120
2 kV HV Probe, 6 kV overvoltage capability	PPE6KV-A
500 MHz 60 V Common Mode Differential Probe. Includes standard set of leads and tips.	DL05-HCM
1 GHz 60 V Common Mode Differential Probe. Includes standard set of leads and tips.	DL10-HCM
Probe Adapters	
TekProbe to ProBus Probe Adapter	TPA10
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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



1-800-5-LeCroy teledynelecroy.com

Local sales offices are located throughout the world. Visit our website to find the most convenient location.