TELEDYNE LECROY
Everywhere**you**look™

WaveRunner 6 Zi Oscilloscopes
400 MHz −4 GHz

Key Features

- **400 MHz - 4 GHz bandwidths**
- **Up to 40 GS/s sample rate**
- **12.1" touch screen display**
- **Advanced Tools**
  — Spectrum Analyzer Mode
  — WaveScan – Search and Find
  — LabNotebook Documentation and Report Generation
  — History Mode - Waveform Playback
- **Comprehensive set of serial data analysis, debug, validation and compliance tools**
- **Advanced Triggering with TriggerScan and Measurement Trigger**
- **WaveRunner 620MZi complete debug bundle available**
- **18 digital channels with 2 GS/s**
  — Analog and Digital Cross-Pattern Triggering
  — Digital Pattern Search and Find
  — Analog and Digital Timing Measurements
  — Logic Gate Emulation
  — Activity Indicators

The WaveRunner 6 Zi oscilloscope family features 400 MHz - 4 GHz of bandwidth, 40 GS/s sampling rate, exceptional signal fidelity, and fast operation, helping to get the job done quickly and accurately. The versatile toolset provides every necessity for an engineer to validate a design, debug errors at board bring up, and offer powerful analysis capabilities to characterize an embedded system. The WaveRunner 6 Zi is the ultimate debug machine.

Superior Validation, Debug, Analysis

The WaveRunner 6 Zi defines superiority in a test instrument with a powerful feature set including a wide range of application packages, advanced triggering to isolate events, a user interface developed for quick and easy navigation, a wide range of probing options, and lightning-fast performance.

Excellent Signal Fidelity

The WaveRunner 6 Zi features a pristine signal path that offers unmatched signal fidelity with low noise, providing accuracy which can be counted on. This performance is augmented by a huge offset and timebase delay adjustment to allow easy signal and amplifier performance assessment and zooming on vertical and horizontal signal characteristics.

Most Comprehensive Serial Data Analysis

WaveRunner 6 Zi offers the most tools for serial data analysis. With over 30 trigger, decode, and compliance solutions, WaveRunner 6 Zi can address problems with unique, powerful views and automated tools. The SDAII serial data analysis package performs eye diagram and jitter testing which is ideal for characterization and debug.

WaveRunner 620MZi

The WaveRunner 620MZi model includes some of the most commonly used options as part of the standard configuration, reducing confusion when choosing a powerful toolset for debugging. In addition to the versatile software options, it is equipped with 40 GS/s and 128 Mpts of memory to ensure common debug needs are covered.

WaveRunner 6 Zi combines the power of a fully featured multi-purpose oscilloscope, a dedicated logic analyzer for mixed signal design, and a protocol analyzer for serial data debug.

1. Industry leading performance— 400 MHz—4 GHz, 40 GS/s, 128 Mpts of analysis memory

2. 12.1" Widescreen (16 x 9) high resolution WXGA color touch screen display

3. 90º rotating and tilting display for optimal viewing of signals

4. Small footprint, only 8.1" deep

5. Easy connectivity with two convenient USB ports on the front, two on the side

6. USBTMC (Test and Measurement Class) port simplifies programming

7. Deepest toolbox with more measurement, more math, more power

Accessory pouch option available.

8. Largest selection of serial triggers and decoders—more than 20—available to provide a total system view

9. Serial trigger captures signals up to 3 Gb/s

10. WavePilot consolidates important oscilloscope debug features in one place. LEDs illuminate to indicate navigation options and active oscilloscope features

11. The SuperKnob provides joystick control to easily navigation to key debug and documentation features

12. LBUS provides easy connection to the optional mixed signal feature, providing up to 36 digital channels

13. Wide array of probes and accessories to accommodate any probing challenge

Advanced Trigger Capabilities

A powerful combination of high bandwidth edge and 10 different SMART triggers, four stage cascade triggering, measurement trigger, and triggerscan are all standard. These features allow you to isolate the problem quickly and begin focusing on the cause. The measurement trigger offers a powerful option to qualify a trigger event based on a qualified measurement with great resolution. A high-speed serial trigger enables triggering on up to 3 Gb/s serial patterns of up to 80-bits in length. A full range of serial triggers (I^2C, SPI, UART, RS-232, Audio (I^2S, LJ, RJ, TDM), CAN, LIN, FlexRay, MIL-STD-1553, SATA, 8b/10b, USB and many others) are also available.

Sequence Mode Acquisition

Sequence mode enables capture of fine details of complex event sequences occurring over long time intervals, while ignoring the intervals between events, allowing for the most efficient use of the oscilloscope's memory. Timestamps are provided for each acquisition and dead-time between triggers is minimized to less than 1 µs. Combine Sequence mode with advanced triggers to isolate rare events over time and analyze afterwards.

TriggerScan™

TriggerScan uses high-speed hardware triggering capability with persistence displays to capture only the signals of interest and provide answers up to 100 times faster than other methods. Traditional fast display update modes work best on frequent events occurring on slow edge rates while TriggerScan excels in finding infrequent events on fast edge rates.
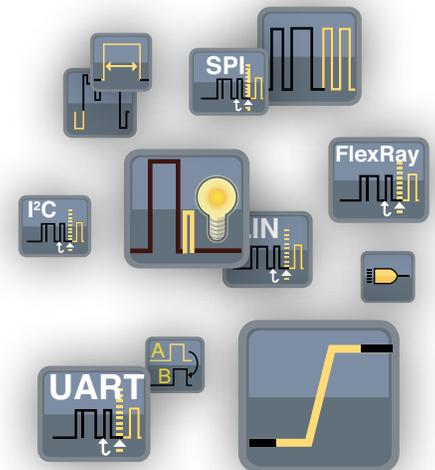
WaveScan Advanced Search

WaveScan provides powerful isolation capabilities that hardware triggers can't provide in order to locate runts, glitches, and other waveform anomalies. WaveScan allows searching analog, digital or parallel bus signals 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.

History Mode

History mode lets you scroll back in time to isolate those anomalies, measure them with parameters or cursors, and quickly find the source of the problem. History mode is always buffering waveforms, so no user action is required to save traces, only to invoke the viewer.

Graphical Track, Trend, and Histogram Views

The track math function plots measurement values on the Y-axis and time on the X-axis to display a measurement change time-correlated to the original channel acquisition; perfect for intuitive understanding of behaviors in frequency modulated (FM) or pulse width modulated (PWM) circuits and jitter measurements, including modulation or spikes. Histograms provide a visual distribution representation of a large sample of measurements, allowing faster insight. The trend math function is ideal for plotting slow changes in measurement values.

Rotating Display

The 12.1" high resolution WXGA wide screen is designed to provide the best view of any signal type on the display.

The widescreen is ideal for a variety of signals where long records are required and zooming or scrolling results in a large block of data.

Rotate the screen 90° degrees to optimize the display for viewing digital signals, jitter tracks, eye diagrams, and frequency plots. The screen image will adjust automatically when rotated.

Tilt the display up or down in either orientation to minimize reflections or glare.

The WaveRunner 6 Zi features the most complete serial data solutions. Solving serial data problems requires intimate knowledge of the protocol to get started. With the WaveRunner 6 Zi, the oscilloscope is the expert. Simply connect your probes or cables and the scope can provide the correct level of detail needed to view, debug, and analyze the serial data signals.

Solutions address the Embedded, Military and Avionics, Handset/Mobile/Cellular, and Storage/Peripherals/Interconnects, with a combination of decode, trigger, measure/graph, ProtoSync, and compliance tools.

Whether the protocol under test is a new emerging standard requiring jitter and eye diagram testing, a mature standard requiring compliance testing, or an embedded standard requiring protocol measurement and timing analysis, WaveRunner 6 Zi has it all.
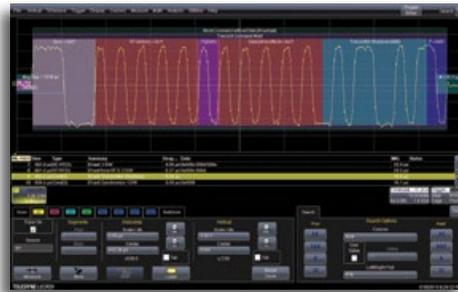
View

Decode
Viewing the protocol layer has never been easier with the intuitive color overlay. Advanced software algorithms understand the selected protocol and deconstruct the waveform into protocol information, then overlay the decoded data on the waveform.

Table
The table feature turns your oscilloscope into a protocol analyzer. Custom configure the table to display only the information you want, and export table data to an excel file. Touch a message in the table and automatically zoom for detail. This feature is standard with decode options.

Search
Serial data messages can be quickly located by searching on Address, Data, and other attributes specific to a particular protocol. This feature is standard with decode options.

Debug

Measure
Timing and bus measurements allow quick and easy characterization of a serial data system. The PROTObus MAG toolkit is the basic building block upon which many other serial trigger and decoder options can be added.

Graph
Extract data from the serial protocol message stream and use the track functions to graphically plot that data on the display. The digital data is used to create an analog waveform that can then be compared to other electrical signals.

Learn More
http://lcry.us/oHoltC

True Hardware Protocol Trigger
An 80-bit serial trigger for serial data signals up to 3 Gb/s (including SATA, 8b/10b and USB) and a conditional trigger (I^2C, SPI, UART, CAN, LIN, FlexRay,™ I^2S, Mil-STD-1553) can completely isolate specific message events.
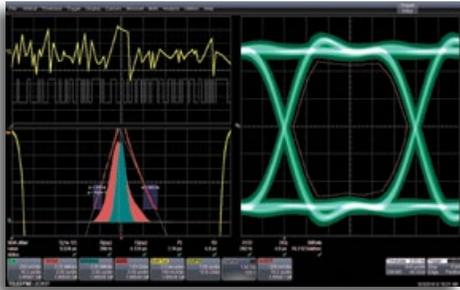
Analyze

Eye Diagrams

Create eye diagrams utilizing the full memory for maximum statistical significance. Unique eye diagram features such as IsoBER and eye violation locator provide powerful insight into physical layer analysis.

Jitter

The integrated clock and jitter analysis tools use advanced jitter decomposition methodologies and tools to provide more information about root cause. TJ analysis, RjBUj analysis and DDj analysis are made simple with the deepest toolset dedicated to providing the highest level of insight into your serial data signals.

Learn More
http://lcry.us/n1OmTV

Compliance

Automated compliance and testing is simplified with the QPHY software option. QPHY features automated scripts, connection diagrams, and test reports to greatly simplify the compliance process.

Learn More
teledynelecroy.com/serialdata

ProtoSync

ProtoSync combines the oscilloscope view with a simultaneous view of data link layer decodes on the same instrument. This combination makes ProtoSync very effective in debugging PCI Express negotiation rates.

Compatible with PCI Express, USB 2, SAS, SATA, and Fibre Channel.

|		Decode	Trigger	Measure/Graph	ProtoSync	QualiPHY
Embedded	I²C	•	•	•		
	SPI	•	•	•		
	I²S	•	•	•		
	UART, RS-232	•	•	•		
Automotive	CAN	•	•	•		
	CAN FD	•	•			
	LIN	•	•	•		
	SENT	•		•		
	FlexRay	•	•	•		
	MOST50/150					•
Military & Avionics	ARINC 429	•		•		
	MIL-STD-1553	•	•	•		
Handset Cellular Mobile	DigRF 3G	•		•		
	MIPI D-PHY /CSI-2/DSI	•				•
	MIPI M-PHY	•		•		
	DigRF v4	•		•		
Storage / Peripherals Interconnects	8b/10b	•	•			
	BroadR-Reach					•
	Fibre Channel	•			•	
	SATA (1.5 & 3 Gb/s)	•	•		•	•
	SAS (1.5 & 3 Gb/s)	•			•	
	PCI Express (Gen1)	•			•	•
	USB 2.0	•	•		•	•
	USB2-HSIC	•				
	LPDDR2					•
	DDR2					•
	DDR3					•
	Ethernet	•				•
Serial Data Composition	Manchester	•				
	NRZ	•				

QualiPHY

QualiPHY is designed to reduce the time, effort, and specialized knowledge needed to perform compliance testing on high-speed serial buses.

- Guides the user through each test setup

- Performs each measurement in accordance with the relevant test procedure

- Compares each measured value with the applicable specification limits

- Fully documents all results

- QualiPHY helps the user perform testing the right way — every time

Supported Standards:
- ENET
- USB
- DDR2, DDR3, LPDDR2
- MIPI-DPHY
- BroadR-Reach
- MOST50, MOST150
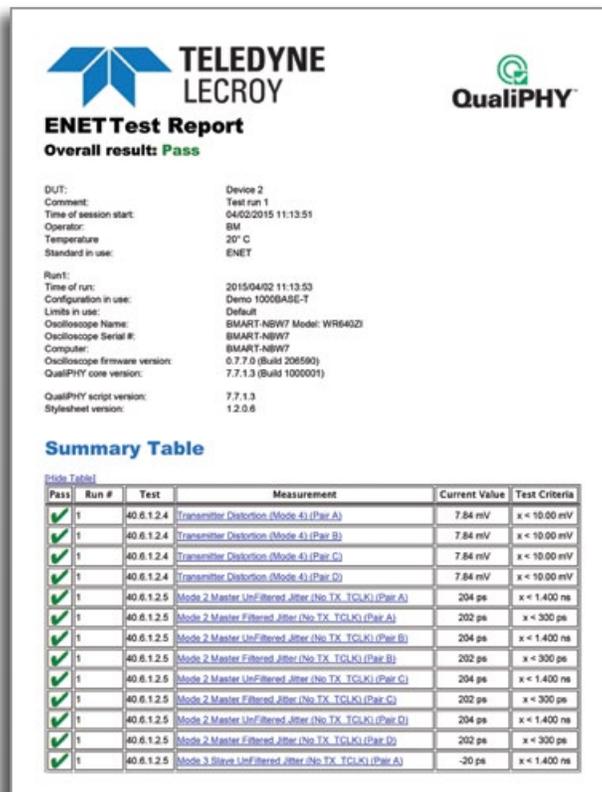
Compliance Reports contain all of the tested values, the specific test limits and screen captures. Compliance Reports can be created as HTML, PDF or XML.

## SDA II – Advanced Tools to Isolate and Analyze (WR6Zi-SDAII)

Unleash the power of serial data analysis for understanding and characterizing a design, proving compliance, and understanding why a device or host fails compliance. The SDAII architecture provides fast updates and eye diagram creation. Combined with up to 128 Mpts record lengths and more complete jitter decomposition tools, SDA II provides a fast and complete understanding of why serial data fails a compliance test. Whether debugging eye pattern or other compliance test failures, the WaveRunner 6 Zi Series rapidly isolates the source of the problem.
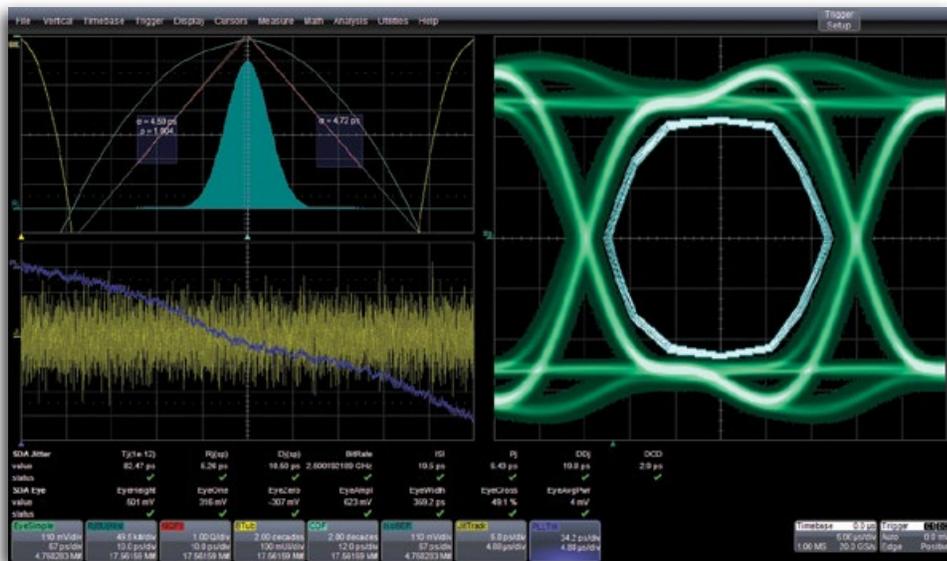
Advanced jitter decomposition methodologies and tools provide more information about root cause. Tj Analysis, RjBUj Analysis and DDj

Analysis are made simple with the deepest toolset dedicated to providing the highest level of insight into your serial data signals.
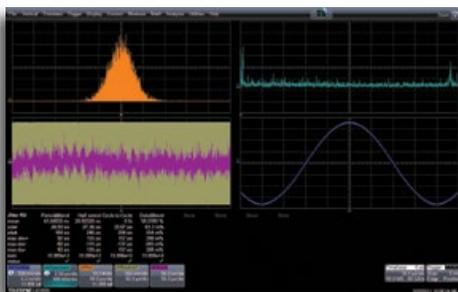
Before
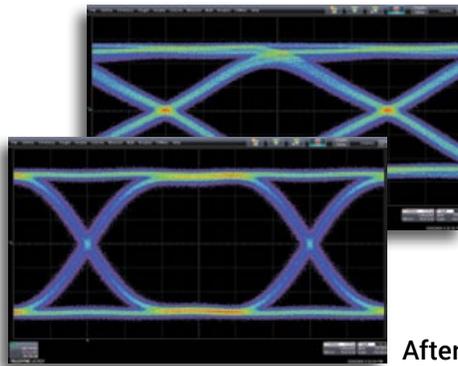
After

DDR Debug Toolkit (WR6Zi-DDR3-Toolkit)

The DDR Debug Toolkit provides test, debug and analysis tools for the entire DDR design cycle. The unique DDR analysis capabilities provide automatic Read and Write burst separation, bursted data jitter analysis and DDR-specific measurement parameters. The WaveRunner 6 Zi supports both standard and custom speed grades of DDR2 and DDR3.

Eye Doctor II (WR6Zi-EYEDRII)

The Eye Doctor II advanced signal integrity toolkit enables a complete set of channel emulation, de-embedding, and receiver equalization simulation tools. It provides capability to emulate a serial data link, de-embed or embed a fixture, cable or serial data channel, add or remove emphasis, and perform CTLE, FFE, or DFE equalization.
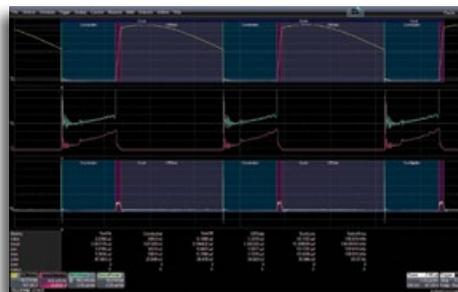

Jitter and Timing Analysis Option (WR6Zi-JITKIT)

JITKIT makes it simple and easy to understand the basic system jitter performance of clock signals and clock-data activities, including period, half period, cycle-cycle, skew, amplitude, differential voltage crossing, slew rate, and a wide variety of other common jitter measurements.

Power Analyzer Software Option (WR6ZI-PWR)

Quickly measure and analyze operating characteristics of power conversion circuits. Make automatic switching device measurements and identify areas of loss and conduction with color-coded overlay. Control loop modulation analysis and line power harmonic testing are all simplified with a dedicated user interface.

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

Having the most commonly used debug tools as part of the standard configuration, the WaveRunner 620MZi model provides a powerful set of analysis tools for effective debugging. By combining 40 GS/s sample rate and 128 Mpts of memory with a powerful set of triggers, signals of interest can be isolated with ease. The inclusion of the Spectrum Analyzer and Serial Trigger and Decode options creates a powerful multi-instrument tool for looking at a system under test from multiple perspectives. The XDEV customization option and digital filtering package allow the debug setup to emulate custom applications.

What's included with the WaveRunner 620MZi?

- **128 Mpts of Memory**
- **40 GS/s Sample Rate**
- **Spectrum Analyzer Software**
- **Digital Filter Software**
- **XDEV Customization Package**
- **I²C Trigger and Decode**
- **SPI Trigger and Decode**
- **UART Trigger and Decode**
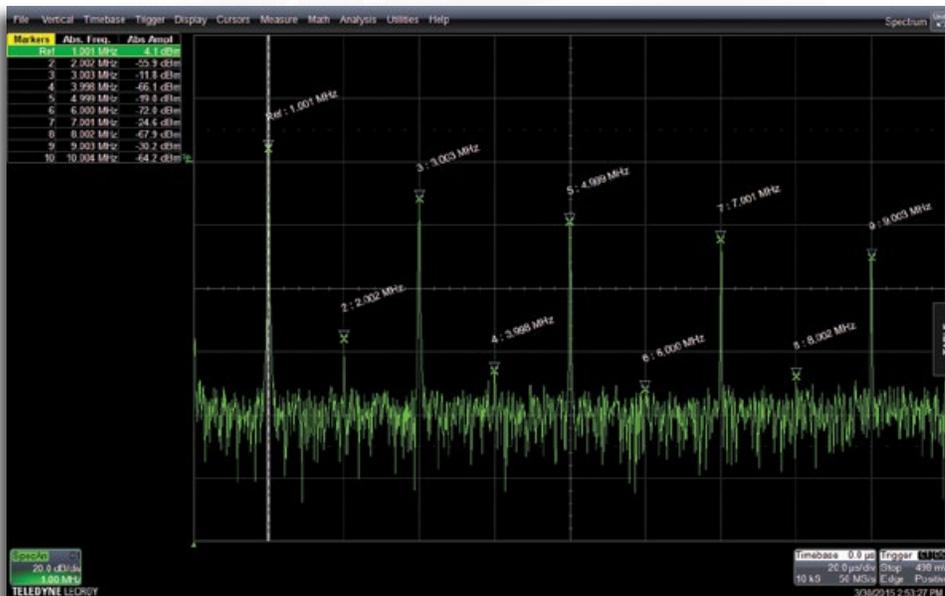
Spectrum Analyzer Option (WR6Zi-SPECTRUM)

The Spectrum Analyzer 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 in the desired units and the unique peak search automatically labels spectral components and presents frequency and level in an interactive table. To monitor how the spectrum changes over time, view the spectrogram which can display a 2D or 3D history of the frequency content.

40 GS/s Sample Rate and 128 Mpts of Long Memory

A 40 GS/s sample rate allows for a detailed edge reconstruction even for signals with the fastest rise times. This is critical for detecting signal integrity issues such as reflections.

Deep memory of 128 Mpts is ideal for debugging long term behavior on high speed serial data buses. For example, slowly varying physical-layer characteristics such as Spread Spectrum Clocking (SSC) must be analyzed over periods of milliseconds.
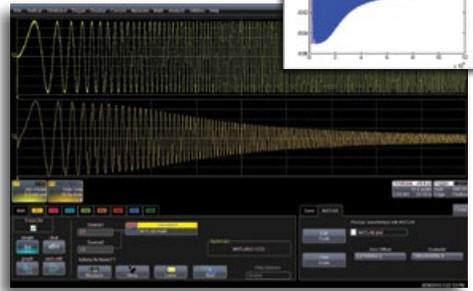
XDEV Customization Option (WR6Zi-XDEV)

With the XDEV option, third party programs can be completely integrated into the oscilloscope's processing stream. Create customized math functions and parameters using C/C++, MATLAB, Excel, JScript or Visual Basic without ever leaving the oscilloscope application - and view the results directly on the oscilloscope, in real-time.

Digital Filter Software Option (WR6Zi-DFP2)

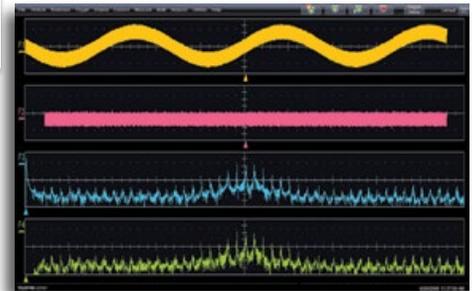DFP2 lets you implement Finite Impulse Response (FIR) or Infinite Impulse Response (IIR) filters to eliminate undesired spectral components, such as noise, and enhances your ability to examine important signal components. You can choose from a standard set of FIR or IIR filters or you can also design your own custom filters. Create and apply a variety of FIR and IIR digital filters to your capture waveforms or processed traces.
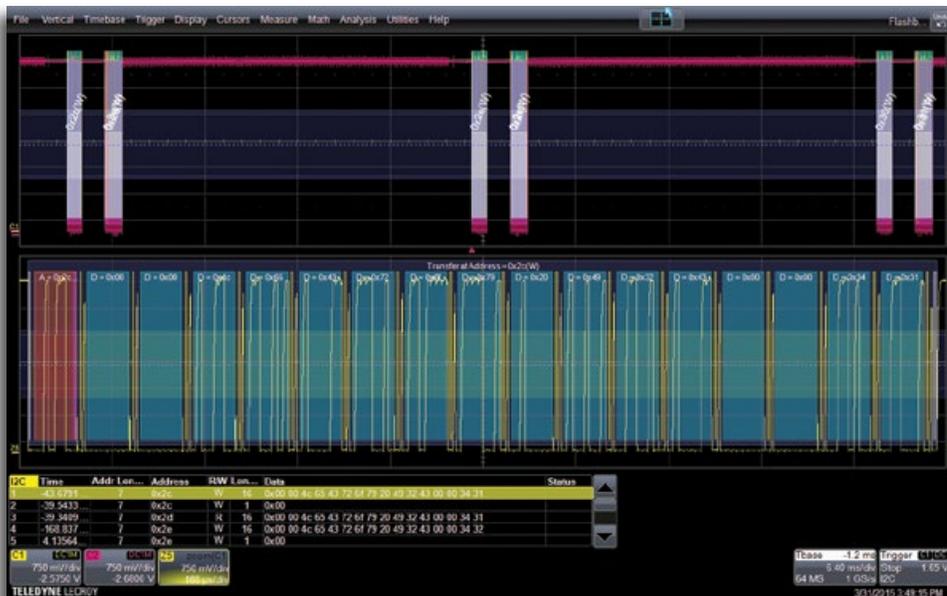
I²C, SPI, and UART Trigger and Decode (WR6Zi-EMB)

A 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 is fast even with long memory, and zooming in to the waveform shows precise byte by byte decoding.

SPECIFICATIONS

	WaveRunner 604Zi	WaveRunner 606Zi	WaveRunner 610Zi
Vertical System			
Analog Bandwidth @ 50 Ω (-3 dB)	400 MHz (≥ 2 mV/div)	600 MHz (≥ 2 mV/div)	1 GHz (≥ 2 mV/div)
Analog Bandwidth @ 1 MΩ (-3 dB)	400 MHz (typical)	500 MHz (typical)	500 MHz (typical)
Rise Time (10−90%, 50 Ω)	875 ps (typical)	580 ps (typical)	375 ps (typical)
Rise Time (20−80%, 50 Ω)	650 ps (typical)	435 ps (typical)	280 ps (typical)
Input Channels	4		
Bandwidth Limiters	20 MHz, 200 MHz	20 MHz, 200 MHz	20 MHz, 200 MHz
Input Impedance	50 Ω ±2% or 1 MΩ || 17pF, 10 MΩ || 9.5 pF with supplied Probe		
Input Coupling	1 MΩ: AC, DC, GND; 50 Ω: DC, GND		
Maximum Input Voltage	50 Ω: 5 V_{rms} ±10 V peak 1 MΩ: 400 V max. (DC + peak AC < 10 kHz)		
Channel-Channel Isolation	> 100:1 up to rated BW		
Vertical Resolution	8-bits; up to 11-bits with enhanced resolution (ERES)		
Sensitivity	50 Ω: 1 mV/div−1 V/div, fully variable 1 MΩ: 1 mV/div−10 V/div, fully variable		
DC Vertical Gain Accuracy (Gain Component of DC Accuracy)	±1% F.S. (typical), offset at 0 V		
Offset Range	**50 Ω:** ±1.6 V @ 1 mV− 4.95 mV/div ±4 V @ 5 mV−9.9 mV/div ±8 V @ 10 mV−19.8 mV/div ±10 V @ 20 mV−1 V/div **1 MΩ:** ±1.6 V @ 1 mV−4.95 mV/div ±4 V @ 5 mV−9.9 mV/div ±8 V @ 10 mV−19.8 mV/div ±16 V @ 20 mV−140 mV/div ±80 V @ 142 mV−1.4 V/div ±160 V @ 1.42 V−10 V/div		
DC Vertical Offset Accuracy	±(1.5% of offset setting +1% of full scale + 1 mV) (test limit)		
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 - 1.6 ks/div with standard memory (up to 3.2 ks/div with -S memory, 6.4 ks/div with -M memory) RIS available at ≤ 10 ns/div; Roll Mode available at ≥ 100 ms/div and ≤ 5 MS/s		
Clock Accuracy	≤ 1.5 ppm +(aging of 0.5 ppm/yr from last calibration)		
Trigger and Interpolator Jitter	≤ 4.5 ps_{rms} (typical) < 0.1 ps_{rms} (typical, software assisted)	≤ 4 ps_{rms} (typical) < 0.1 ps_{rms} (typical, software assisted)	≤ 3.5 ps_{rms} (typical) < 0.1 ps_{rms} (typical, software assisted)
Channel-Channel Deskew Range	±9 x time/div. setting, 100 ms max., each channel		
External Timebase Reference (Input)	10 MHz ±25 ppm via optional LBUS BNC adapter		
External Timebase Reference (Output)	10 MHz 3.5 dBm ±1 dBm, synchronized to reference being used by user (internal or external reference) via optional LBUS BNC adaptor		
External Clock	DC to 100 MHz; (50 Ω/1 MΩ), Ext. BNC input, Minimum rise time and amplitude requirements apply at low frequencies		

Vertical System

	WaveRunner 620Zi	WaveRunner 620MZi	WaveRunner 625Zi	WaveRunner 640Zi
Analog Bandwidth @ 50 Ω (-3 dB)	2 GHz (≥ 5 mV/div)		2.5 GHz (≥ 5 mV/div)	4 GHz (≥ 5 mV/div)
Analog Bandwidth @ 1 MΩ (-3 dB)	500 MHz (typical)		500 MHz (typical)	500 MHz (typical)
Rise Time (10−90%, 50 Ω)	175 ps (typical)		160 ps (typical)	100 ps (typical)
Rise Time (20−80%, 50 Ω)	130 ps (typical)		120 ps (typical)	75 ps (typical)
Input Channels	4			
Bandwidth Limiters	20 MHz, 200 MHz, 1 GHz		20 MHz, 200 MHz, 1 GHz	20 MHz, 200 MHz, 1 GHz
Input Impedance	50 Ω ±2% or 1 MΩ ‖ 17pF, 10 MΩ ‖ 9.5 pF with supplied Probe			
Input Coupling	1 MΩ: AC, DC, GND; 50 Ω: DC, GND			
Maximum Input Voltage	50 Ω: 5 V$_{rms}$ ±10 V peak 1 MΩ: 400 V max. (DC + peak AC < 10 kHz)			
Channel-Channel Isolation	> 100:1 up to rated BW			> 100:1 up to 2.5 GHz > 30:1 from 2.5 GHz to rated BW
Vertical Resolution	8-bits; up to 11-bits with enhanced resolution (ERES)			
Sensitivity	50 Ω: 1 mV/div−1 V/div, fully variable 1 MΩ: 1 mV/div−10 V/div, fully variable			
DC Vertical Gain Accuracy (Gain Component of DC Accuracy)	±1% F.S. (typical), offset at 0 V			
Offset Range	**50 Ω:** ±1.6 V @ 1 mV−4.95 mV/div ±4 V @ 5 mV−9.9 mV/div ±8 V @ 10 mV−19.8 mV/div ±10 V @ 20 mV−1 V/div **1 MΩ:** ±1.6 V @ 1 mV−4.95 mV/div ±4 V @ 5 mV−9.9 mV/div ±8 V @ 10 mV−19.8 mV/div ±16 V @ 20 mV−140 mV/div ±80 V @ 142 mV−1.4 V/div ±160 V @ 1.42 V−10 V/div		**50 Ω:** **BWL ≤ 1 GHz** ±1.6 V @ 1 mV−4.95 mV/div ±4 V @ 5 mV−9.9 mV/div ±8 V @ 10 mV−19.8 mV/div ±10 V @ 20 mV−1 V/div **BWL > 1 GHz** ±1.4 V @ 5 mV−122 mV/div ±10 V @ 124 mV−1 V/div **1 MΩ:** ±1.6 V @ 1 mV−4.95 mV/div ±4 V @ 5 mV−9.9 mV/div ±8 V @ 10 mV−19.8 mV/div ±16 V @ 20 mV−140 mV/div ±80 V @ 142 mV−1.4 V/div ±160 V @ 1.42 V−10 V/div	
DC Vertical Offset Accuracy	±(1.5% of offset setting +1% of full scale + 1 mV) (test limit)			

Horizontal System

	WaveRunner 620Zi	WaveRunner 620MZi	WaveRunner 625Zi	WaveRunner 640Zi
Timebases	Internal timebase common to 4 input channels; an external clock may be applied at the auxiliary input			
Time/Division Range	20 ps/div - 1.6 ks/div with standard memory (up to 3.2 ks/div with -S memory, 6.4 ks/div with -M memory) RIS available at ≤ 10 ns/div; Roll Mode available at ≥ 100 ms/div and ≤ 5 MS/s	20 ps/div - 6.4 ks/div with standard memory RIS available at ≤ 10 ns/div; Roll Mode available at ≥ 100 ms/div and ≤ 5 MS/s	20 ps/div - 1.6 ks/div with standard memory (up to 3.2 ks/div with -S memory, 6.4 ks/div with -M memory) RIS available at ≤ 10 ns/div; Roll Mode available at ≥ 100 ms/div and ≤ 5 MS/s	
Clock Accuracy	≤ 1.5 ppm +(aging of 0.5 ppm/yr from last calibration)			
Trigger and Interpolator Jitter	≤ 3 ps$_{rms}$ (typical) < 0.1 ps$_{rms}$ (typical, software assisted)		≤ 2.5 ps$_{rms}$ (typical) < 0.1 ps$_{rms}$ (typical, software assisted)	≤ 2 ps$_{rms}$ (typical) < 0.1 ps$_{rms}$ (typical, software assisted)
Channel-Channel Deskew Range	±9 x time/div. setting, 100 ms max., each channel			
External Timebase Reference (Input)	10 MHz ±25 ppm via optional LBUS BNC adapter			
External Timebase Reference (Output)	10 MHz 3.5 dBm ±1 dBm, synchronized to reference being used by user (internal or external reference) via optional LBUS BNC adaptor			
External Clock	DC to 100 MHz; (50 Ω/1 MΩ), Ext. BNC input, Minimum rise time and amplitude requirements apply at low frequencies			

SPECIFICATIONS

	WaveRunner 604Zi	WaveRunner 606Zi	WaveRunner 610Zi

Acquisition System

Single-Shot Sample Rate/Ch	10 GS/s on 4 Ch 20 GS/s on 2 Ch		
Random Interleaved Sampling (RIS)	200 GS/s for repetitive signals (20 ps/div to 10 ns/div)		
Maximum Trigger Rate	1,000,000 waveforms/second (in Sequence Mode, up to 4 channels)		
Intersegment Time	1 µs		
Standard Memory (4 Ch / 2 Ch / 1 Ch) (Number of Segments)	16M / 32M / 32M (5,000)		
Memory Options (4 Ch / 2 Ch / 1 Ch) (Number of Segments)	S-32 Option: 32M / 64M / 64M (15,000) M-64 Option: 64M / 128M / 128M (15,000)		

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, or roof for up to 1 million sweeps
Interpolation	Linear or Sin x/x

Triggering System

Modes	Normal, Auto, Single, and Stop		
Sources	Any input channel, Ext, Ext/10, or line; slope and level unique to each source (except line trigger)		
Coupling Mode	DC, AC, HFRej, LFRej		
Pre-trigger Delay	0 - 100% of memory size (adjustable in 1% increments or 100 ns)		
Post-trigger Delay	0 - 10,000 divisions in real time mode, limited at slower time/div settings or in roll mode		
Hold-off by Time or Events	From 2 ns up to 20 s or from 1 to 99,999,999 events		
Internal Trigger Range	±4.1 div from center (typical)		
Trigger Sensitivity with Edge Trigger (Ch 1–4)	2 div @ < 400 MHz 1.5 div @ < 200 MHz 0.9 div @ < 10 MHz (DC, AC, and LFRej coupling)	2 div @ < 600 MHz 1.5 div @ < 300 MHz 1 div @ < 200 MHz 0.9 div @ < 10 MHz (DC, AC, and LFRej coupling)	2 div @ < 1 GHz 1.5 div @ < 500 MHz 1 div @ < 200 MHz 0.9 div @ < 10 MHz (DC, AC, and LFRej coupling)
External Trigger Sensitivity, (Edge Trigger)	2 div @ 1 GHz 1.5 div @ < 500 MHz 1 div @ < 200 MHz 0.9 div @ < 10 MHz (DC, AC, and LFRej coupling)		
Max. Trigger Frequency, SMART Trigger	400 MHz @ ≥ 10 mV/div 1.9 ns (minimum triggerable width 1.9 ns)	600 MHz @ ≥ 10 mV/div 1.2 ns (minimum triggerable width 1.2 ns)	1.0 GHz @ ≥ 10 mV/div (minimum triggerable width 750 ps)
External Trigger Input Range	Ext (±0.4 V); Ext/10 (±4 V)		

Basic Triggers

Edge	Triggers when signal meets slope (positive, negative, or either) and level condition
Window	Triggers when signal exits a window defined by adjustable thresholds
TV-Composite Video	Triggers NTSC or PAL with selectable line and field; HDTV (720p, 1080i, 1080p) with selectable frame rate (50 or 60 Hz) and Line; or CUSTOM with selectable Fields (1–8), Lines (up to 2000), Frame Rates (25, 30, 50, or 60 Hz), Interlacing (1:1, 2:1, 4:1, 8:1), or Synch Pulse Slope (Positive or Negative)

SPECIFICATIONS

	WaveRunner 620Zi	WaveRunner 620MZi	WaveRunner 625Zi	WaveRunner 640Zi
Acquisition System				
Single-Shot Sample Rate/Ch	10 GS/s on 4 Ch 20 GS/s on 2 Ch	20 GS/s on 4 Ch 40 GS/s on 2 Ch		
Random Interleaved Sampling (RIS)	200 GS/s for repetitive signals (20 ps/div to 10 ns/div)			
Maximum Trigger Rate	1,000,000 waveforms/second (in Sequence Mode, up to 4 channels)			
Intersegment Time	1 µs			
Standard Memory (4 Ch / 2 Ch / 1 Ch) (Number of Segments)	16M / 32M / 32M (5,000)	64M / 128M / 128M (15,000)	16M / 32M / 32M (5,000)	
Memory Options (4 Ch / 2 Ch / 1 Ch) (Number of Segments)	S-32 Option: 32M / 64M / 64M (15,000) M-64 Option: 64M / 128M / 128M (15,000)	NA	S-32 Option: 32M / 64M / 64M (15,000) M-64 Option: 64M / 128M / 128M (15,000)	
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, or roof for up to 1 million sweeps			
Interpolation	Linear or Sin x/x or cubic (using math tool)			
Triggering System				
Modes	Normal, Auto, Single, and Stop			
Sources	Any input channel, Ext, Ext/10, or line; slope and level unique to each source (except line trigger)			
Coupling Mode	DC, AC, HFRej, LFRej			
Pre-trigger Delay	0 - 100% of memory size (adjustable in 1% increments or 100 ns)			
Post-trigger Delay	0 - 10,000 divisions in real time mode, limited at slower time/div settings or in roll mode			
Hold-off by Time or Events	From 2 ns up to 20 s or from 1 to 99,999,999 events			
Internal Trigger Range	±4.1 div from center (typical)			
Trigger Sensitivity with Edge Trigger (Ch 1–4) ProBus Inputs	2 div @ < 2 GHz 1.5 div @ < 1 GHz 1 div @ < 200 MHz 0.9 div @ < 10 MHz (DC, AC, and LFRej coupling)		2 div @ < 2.5 GHz 1.5 div @ < 1.25 GHz 1 div @ < 200 MHz 0.9 div @ < 10 MHz (DC, AC, and LFRej coupling)	2 div @ < 4 GHz 1.5 div @ < 2 GHz 1 div @ < 200 MHz 0.9 div @ < 10 MHz (DC, AC, and LFRej coupling)
External Trigger Sensitivity, (Edge Trigger)	2 div @ 1 GHz 1.5 div @ < 500 MHz 1 div @ < 200 MHz 0.9 div @ < 10 MHz (DC, AC, and LFRej coupling)			
Max. Trigger Frequency, SMART Trigger	2.0 GHz @ ≥ 10 mV/div (minimum triggerable width 400 ps)		2.0 GHz @ ≥ 10 mV/div (minimum triggerable width 300 ps)	2.0 GHz @ ≥ 10 mV/div (minimum triggerable width 200 ps)
External Trigger Input Range	Ext (±0.4 V); Ext/10 (±4 V)			
Basic Triggers				
Edge	Triggers when signal meets slope (positive, negative, or either) and level condition			
Window	Triggers when signal exits a window defined by adjustable thresholds			
TV-Composite Video	Triggers NTSC or PAL with selectable line and field; HDTV (720p, 1080i, 1080p) with selectable frame rate (50 or 60 Hz) and Line; or CUSTOM with selectable Fields (1–8), Lines (up to 2000), Frame Rates (25, 30, 50, or 60 Hz), Interlacing (1:1, 2:1, 4:1, 8:1), or Synch Pulse Slope (Positive or Negative)			

	WaveRunner 604Zi 606Zi	WaveRunner 610Zi 620Zi 620 MZi	WaveRunner 625Zi 640Zi

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
Qualified First	In Sequence acquisition mode, triggers repeatably on event B only if a defined pattern, state, or edge (event A) is satisfied in the first segment of the acquisition. Holdoff between sources is selectable by time or events
Dropout	Triggers if signal drops out for longer than selected time between 1 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 as low as 200 ps (depending on oscilloscope bandwidth) to 20 s, or on intermittent faults
Width (Signal or Pattern)	Triggers on positive or negative glitches with widths selectable as low as 200 ps (depending on oscilloscope bandwidth) to 20 s, or on intermittent faults
Interval (Signal or Pattern)	Triggers on intervals selectable between 1 ns and 20 s
Timeout (State/Edge Qualified)	Triggers on any source if a given state (or transition edge) has occurred on another source. Delay between sources is 1 ns to 20 s, or 1 to 99,999,999 events
Runt	Trigger on positive or negative runts defined by two voltage limits and two time limits. Select between 1 ns and 20 ns
Slew Rate	Trigger on edge rates. Select limits for dV, dt, and slope. Select edge limits between 1 ns and 20 ns
Exclusion Triggering	Trigger on intermittent faults by specifying the expected behavior and triggering when that condition is not met

Measurement Trigger

	Trigger on measurement values, Edge, Serial Pattern, Bus Pattern, Non-monotonic

Cascade (Sequence) Triggering

Capability	Arm on "A" event, then Trigger on "B" event. Or Arm on "A" event, then Qualify on "B" event, and Trigger on "C" event. Or Arm on "A" event, then Qualify on "B" then "C" event, and Trigger on "D" event
Types	Cascade A then B: Edge, Window, Pattern (Logic) Width, Glitch, Interval, Dropout, or Measurement. Measurement can be on Stage B only. Cascade A then B then C (Measurement): Edge, Window, Pattern (Logic), Width, Glitch, Interval, Dropout, or Measurement. Measurement can be on Stage C only. Cascade A then B then C: Edge, Window, Pattern (Logic). Cascade A then B then C then D: Edge, Window, Pattern (Logic), or Measurement. Measurement can be on Stage D only
Holdoff	Holdoff between A and B, B and C, C and D is selectable by time (1ns to 20s) or number of events. Measurement trigger selection as the last stage in a Cascade precludes a holdoff setting between the prior stage and the last stage.

Optional High-speed Serial Protocol Triggering (WR6Zi-80B-8B10B TD)

Data Rates	150 Mb/s–3 Gb/s
Pattern Length	80-bits, NRZ or 8b/10b
Clock Recovery Jitter	1 ps$_{rms}$ + 0.3% Unit Interval RMS for PRBS data patterns with 50% transition density
Hardware Clock Recovery Loop BW	PLL Loop BW = Fbaud/5500, 100 Mb/s to 2.488 Gb/s (typical)

Color Waveform Display

Type	Color 12.1" widescreen flat panel TFT-Active Matrix with high resolution touch screen
Resolution	WXGA; 1280 x 800 pixels
Number of Traces	Display a maximum of 16 traces. Simultaneously display channel, zoom, memory and math traces
Grid Styles	Auto, Single, Dual, Quad, Octal, X-Y, Single+X-Y, Dual+X-Y
Waveform Representation	Sample dots joined, or sample dots only

SPECIFICATIONS

	WaveRunner 604Zi 606Zi	WaveRunner 610Zi 620Zi 620 MZi	WaveRunner 625Zi 640Zi

Processor/CPU

Type	Intel® E5300 Pentium Dual Core 2.6 GHz or greater
Processor Memory	2 GB standard, up to 4 GB optional
Operating System	Microsoft Windows® 7 Professional for Embedded Systems, 64-bit
Real Time Clock	Date and time displayed with waveform in hardcopy files. SNTP support to synchronize to precision internal clocks

Interface

Remote Control	Via Windows Automation, or via Teledyne LeCroy Remote Command Set
Network Communication Standard	VXI-11 or VICP, LXI Class C (v1.2) Compliant
GPIB Port (Optional)	Supports IEEE—488.2 (External)
Ethernet Port	Supports 10/100/1000Base-T Ethernet interface (RJ45 port)
USB	Minimum 4 total (Including 2 front panel) USB 2.0 ports support Windows compatible devices
USB Device Port	1 USBTMC Port
External Monitor Port	15-pin D-Type SVGA compatible DB-15 to support customer-supplied external monitor. Includes support for extended desktop operation with WXGA resolution on second monitor
Peripheral Bus	Teledyne LeCroy LBUS standard

Power Requirements

Voltage	100—240 VAC ±10% at 45—66 Hz; 100—120 VAC ±10% at 380—420 Hz; Automatic AC Voltage Selection; Installation Category: 300 V CAT II
Power Consumption (Nominal)	400 W / 400 VA
Max Power Consumption	500 W / 500 VA (with all PC peripherals, active probes connected to 4 channels, and MSO active)

Environmental

Temperature (Operating)	+5 °C to +40 °C
Temperature (Non-Operating)	−20 °C to +60 °C
Humidity (Operating)	5% to 80% relative humidity (non-condensing) up to +31 °C Upper limit derates to 50% 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. (3,048 m) at or below +25 °C
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	30 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)	11.6929" H x 16.4567" W x 8.937" D (297 x 418 x 227 mm)
Weight	25.4 lbs. (11.52 kg)
Shipping Weight	39 lbs. (17.69 kg)

Certifications

CE Compliant, UL and cUL listed; Conforms to EN 61326-1, EN 61010-1, UL 61010-1 2nd edition, and
CSA C22.2 No. 61010-1-04

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 8 math function traces (F1–F8). 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	exp (base 10)	product (x)
average (summed)	fft (power spectrum, power average, magnitude, phase, up to 128 Mpts)	reciprocal
average (continuous)		rescale (with units)
correlation (two waveforms)		roof
	floor	(sinx)/x
derivative	integral	sparse
deskew (resample)	interpolate (cubic, quadratic, sinx/x)	square
difference (−)		square root
enhanced resolution (to 11 bits vertical)	invert (negate)	sum (+)
	log (base e)	zoom (identity)
envelope	log (base 10)	
exp (base e)		

Measure Tools

Display 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. Parameter Math allows addition, subtraction, multiplication, or division of two different parameters.

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

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, e-mail the image of the failure, save waveforms, send a pulse out at the front panel auxiliary BNC output, or (with the GPIB option) send a GPIB SRQ.

Standard (cont'd)

Basic Jitter and Timing Analysis

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

- "Track" graphs of all parameters, no limitation of number

– Cycle-Cycle Jitter	– Period @ level	– Setup
– N-Cycle	– Half Period	– Hold
– N-Cycle with start selection	– Width @ level	– Skew
– Frequency @ level	– Time Interval Error @ level	– Duty Cycle @ level
		– 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)

Advanced Customization

Provides capability to create a math function or measurement parameter in MATLAB, Excel, C++, JavaScript, or Visual Basic Script (VBS) format and insert it into the oscilloscope's processing stream. All results are processed and displayed on the oscilloscope grid, and are available for further processing. Also permits the creation of customized plug-ins that can be inserted into the scope user interface, control of the scope via Visual Basic scripts embedded in customized functions, and use of Teledyne LeCroy's Custom DSO capabilities.

Software Options

SDA II Serial Data Analysis Option (WR6Zi-SDAII)

Total Jitter

A complete toolset is provided to measure total jitter. Eye Diagrams with millions of UI are quickly calculated from up to 128 Mpts records, and advanced tools may be used on the Eye Diagram to aid analysis. Complete TIE and Total Jitter (Tj) parameters and analysis functions are provided.

- Time Interval Error (TIE) Measurement Parameter, Histogram, Spectrum and Jitter Track
- Total Jitter (Tj) Measurement Parameter, Histogram, Spectrum
- Eye Diagram Display (sliced)
- Eye Diagram IsoBER (lines of constant Bit Error Rate)
- Eye Diagram Mask Violation Locator
- Eye Diagram Measurement Parameters

– Eye Height	– Eye Width	– Mask hits
– One Level	– Eye Crossing	– Mask out
– Zero Level	– Avg. Power	– Bit Error Rate
– Eye Amplitude	– Extinction Ratio	– Slice Width (setting)

- Q-Fit Tail Representation
- Bathtub Curve
- Cumulative Density Function (CDF)
- PLL Track

Software Options (cont'd)

SDA II Serial Data Analysis Option (WR6Zi-SDAII) - *continued*

Jitter Decomposition Models
Two jitter decomposition methods are provided and simultaneously calculated to provide maximum measurement confidence. Q-Scale, CDF, Bathtub Curve, and all jitter decomposition measurement parameters can be displayed using either method.

- Spectral Method
- NQ-Scale Method

Random Jitter (Rj) and Non-Data Dependent Jitter (Rj+BUj)
- Random Jitter (Rj) Measurement Parameter
- Rj+BUj Histogram
- Rj+BUj Spectrum
- Rj+BUj Track

Deterministic Jitter (Dj)
- Deterministic Jitter (Dj) Measurement Parameter

Data Dependent Jitter (DDj)
- Data Dependent Jitter (DDj) Measurement Parameter
- DDj Histogram
- DDj Plot (by Pattern or N-bit Sequence)

Eye Doctor II Advanced Signal Integrity Tools (WM8Zi-EYEDRII)

Complete set of channel emulation, de-embedding and receiver equalization simulation tools. Provides capability to emulate a serial data link, de-embed or embed a fixture, cable or serial data channel, add or remove emphasis, and perform CTLE, FFE, or DFE equalization. If purchased with SDAIII, then capabilities are accessed from within the SDAIII-Complete-LinQ user interface framework.

Power Analyzer Option (WR6Zi-PWR)

Power switching device measurements, control loop modulation analysis, and line power harmonic testing are all simplified with a dedicated user interface and automatic measurements.

Device Analysis
- Losses – Automatic measurement of turn-on, turn-off, and conduction loses as well as off-state power, total losses and switching frequency
- Safe Operating Area
- B-H-Hysteresis Curve
- Dynamic On-Resistance
- Dv/dt and di/vt

Control Loop Analysis
- Closed loop time-domain – Duty cycle, width, period or frequency

Line Power Analysis
- Power – Vrms, Irms, real-power, apparent power, power factor, crest factor
- Harmonics – EN61000-3-2 pre-compliance, Total Harmonic Distortion

Measurement Setup
- Controls for Deskew, DC fine adjust, probe integration, device zone identification

Cable De-embedding Option (WR6Zi-CBL-DE-EMBED)

Removes cable effects from your measurements. Simply enter the S-parameters or attenuation data of the cable(s) then all of the functionality of the WR6Zi can be utilized with cable effects de-embedded.

8b/10b Decode and 80-bit High Speed Serial Trigger Option (WR6Zi-80B-8B10B TD)

Intuitive, color-coded serial trigger decode with powerful search capability enables captured waveforms to be searched for user-defined sequences of symbols. Multi-lane analysis decodes up to four simultaneously captured lanes. Includes 150 Mb/s to 3.125 Gb/s High-speed 80-bit Serial Pattern Trigger Option

Software Options (cont'd)

Serial Data Mask Option (WR6Zi-SDM)

Create eye diagrams using a comprehensive list of standard eye pattern masks, or create a user-defined mask. Mask violations are clearly marked on the display for easy analysis.

Electrical Telecom Pulse Mask Test Option (WR6Zi-ET-PMT)

Performs automated compliance mask tests on a wide range of electrical telecom standards.

Spectrum Analyzer Option (WR6Zi-SPECTRUM)

Spectrum analyzer style user interface and advanced FFT capabilities.
- Automatic oscilloscope setup when selecting start/stop frequency or center frequency and span
- Resolution bandwidth automatically or manually controlled
- FFT Reference and vertical scale in dBm, dBV, dBmV, dBuV, Vrms or Arms
- Spectrogram provides 2D or 3D spectral history display
- Up to 100 automatic peak markers
- Up to 20 markers, either manually controlled or automatic which mark fundamental frequency and harmonics
- Math waveform analysis, additional output types:
  – Power density
  – Real
  – Imaginary
  – Magnitude squared

Disk Drive Measurements Option (WR6Zi-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 asymetry	– local time at minimum	– overwrite
– local base	– local time at maximum	– pulse width 50
– local baseline separation		– pulse width 50 –
– local maximum	– local time peak-trough	– pulse width 50 +
– local minimum	– local time over threshold	– resolution
– local number		– track average amplitude
– local peak-peak	– local time trough-peak	– track average amplitude –
– local time between events	– local time under threshold	– track average amplitude +
– local time between peaks	– narrow band phase	– auto-correlation s/n
– local time between troughs	– narrow band power	– non-linear transition shift

Product Description	Product Code

WaveRunner 6 Zi Series Oscilloscopes

400 MHz, 10 GS/s, 4 Ch, 16 Mpts/Ch DSO with 12.1" WXGA Color Display. 50 Ω and 1 MΩ Input 20 GS/s and 32 Mpts/Ch in Interleaved Mode	WaveRunner 604Zi
600 MHz, 10 GS/s, 4 Ch, 16 Mpts/Ch DSO with 12.1" WXGA Color Display. 50 Ω and 1 MΩ Input 20 GS/s and 32 Mpts/Ch in Interleaved Mode	WaveRunner 606Zi
1 GHz, 10 GS/s, 4 Ch, 16 Mpts/Ch DSO with 12.1" WXGA Color Display. 50 Ω and 1 MΩ Input 20 GS/s and 32 Mpts/Ch in Interleaved Mode	WaveRunner 610Zi
2 GHz, 10 GS/s, 4 Ch, 16 Mpts/Ch DSO with 12.1" WXGA Color Display. 50 Ω and 1 MΩ Input 20 GS/s and 32 Mpts/Ch in Interleaved Mode	WaveRunner 620Zi
2 GHz, 20 GS/s, 4 Ch, 64 Mpts/Ch DSO with 12.1" WXGA Color Display. 50 Ω and 1 MΩ Input 20 GS/s and 128 Mpts/Ch in Interleaved Mode	WaveRunner 620MZi
2.5 GHz, 20 GS/s, 4 Ch, 16 Mpts/Ch DSO with 12.1" WXGA Color Display. 50 Ω and 1 MΩ Input 40 GS/s and 32 Mpts/Ch in Interleaved Mode	WaveRunner 625Zi
4 GHz, 20 GS/s, 4 Ch, 16 Mpts/Ch DSO with 12.1" WXGA Color Display. 50 Ω and 1 MΩ Input 40 GS/s and 32 Mpts/Ch in Interleaved Mode	WaveRunner 640Zi

Included with Standard Configuration

÷10, 500 MHz Passive Probe (Qty. 4)
Optical 3-button Wheel Mouse, USB 2.0
Printed Quick Reference Guide
Printed Getting Started Manual
Product Manual in PDF Format on Oscilloscope Desktop
Anti-virus Software (Trial Version)
Microsoft Windows® 7 for Embedded Systems 64-bit License
Commercial NIST Traceable Calibration with Certificate
Power Cable for the Destination Country
3-year Warranty

Oscilloscope Synchronization

8 Channel Simultaneous Acquisition- Capture and Transfer Waveforms Between Two WR 6Zi Oscilloscopes	WR6ZI-8CH-SYNCH

Product Description	Product Code

Memory Options

32 Mpts/Ch (64 Mpts/Ch Interleaved) Standard Memory. Includes 4 GB of RAM	WR604Zi-S-32
32 Mpts/Ch (64 Mpts/Ch Interleaved) Standard Memory. Includes 4 GB of RAM	WR606Zi-S-32
32 Mpts/Ch (64 Mpts/Ch Interleaved) Standard Memory. Includes 4 GB of RAM	WR610Zi-S-32
32 Mpts/Ch (64 Mpts/Ch Interleaved) Standard Memory. Includes 4 GB of RAM	WR620Zi-S-32
32 Mpts/Ch (64 Mpts/Ch Interleaved) Standard Memory. Includes 4 GB of RAM	WR625Zi-S-32
32 Mpts/Ch (64 Mpts/Ch Interleaved) Standard Memory. Includes 4 GB of RAM	WR640Zi-S-32
64 Mpts/Ch (128 Mpts/Ch Interleaved) Standard Memory. Includes 4 GB of RAM	WR604Zi-M-64
64 Mpts/Ch (128 Mpts/Ch Interleaved) Standard Memory. Includes 4 GB of RAM	WR606Zi-M-64
64 Mpts/Ch (128 Mpts/Ch Interleaved) Standard Memory. Includes 4 GB of RAM	WR610Zi-M-64
64 Mpts/Ch (128 Mpts/Ch Interleaved) Standard Memory. Includes 4 GB of RAM	WR620Zi-M-64
64 Mpts/Ch (128 Mpts/Ch Interleaved) Standard Memory. Includes 4 GB of RAM	WR625Zi-M-64
64 Mpts/Ch (128 Mpts/Ch Interleaved) Standard Memory. Includes 4 GB of RAM	WR640Zi-M-64

Product Description	Product Code

Memory and Sample Rate Options

Product Description	Product Code
20 GS/s (40 GS/s Interleaved) Sampling Rate Option	WR610Zi-STD-4x20GS
32 Mpts/Ch (64 Mpts/Ch Interleaved) Standard Memory. Includes 4 GB of RAM. 20 GS/s (40 GS/s Interleaved) Sampling Rate Option	WR610Zi-S-32-4x20GS
64 Mpts/Ch (128 Mpts/Ch Interleaved) Standard Memory. Includes 4 GB of RAM. 20 GS/s (40 GS/s Interleaved) Sampling Rate Option	WR610Zi-M-64-4x20GS
20 GS/s (40 GS/s Interleaved) Sampling Rate Option	WR620Zi-STD-4x20GS
32 Mpts/Ch (64 Mpts/Ch Interleaved) Standard Memory. Includes 4 GB of RAM. 20 GS/s (40 GS/s Interleaved) Sampling Rate Option	WR620Zi-S-32-4x20GS
64 Mpts/Ch (128 Mpts/Ch Interleaved) Standard Memory. Includes 4 GB of RAM. 20 GS/s (40 GS/s Interleaved) Sampling Rate Option	WR620Zi-M-64-4x20GS

Computer Upgrade

Product Description	Product Code
Upgrade From 2 GB RAM to 4 GB RAM	WR6Zi-UPG-4GBRAM
Removable Hard Drive Option	WR6Zi-500GB-RHD
Additional 500 GB Hard Drive for Use With RHD Option. Includes Windows 7 Pro for Embedded Systems OS, Teledyne LeCroy Oscilloscope Software and Critical Scope Operational File Duplicates	WR6Zi-500GB-RHD-02

Serial Trigger and Decode

Product Description	Product Code
8b/10b Trigger and Decode Option	WR6Zi-80B-8B10B TD
ARINC 429 Bus Symbolic Decode Option	WR6Zi-ARINCbus DSymbolic
Audiobus Trigger and Decode for I^2S, Option LJ, RJ, and TDM	WR6Zi-Audiobus TD
Audiobus Trigger, Decode, and Graph Option for I^2S, LJ, RJ, and TDM	WR6Zi-Audiobus TDG
CANbus FD Trigger and Decode Option	WR6Zi-CAN FDbus TD
CANbus TD Trigger and Decode Option	WR6Zi-CANbus TD
CANbus TDM Trigger, Decode and Measure/Graph Option	WR6Zi-CANbus TDM
Decode Annotation and Protocol Analyzer Synchronization Software Option	WR6Zi-ProtoSync
DigRF 3G Decode Option	WR6Zi-DigRF3Gbus D
DigRF v4 Decode Option	WR6Zi-DigRFv4bus D
ENET Decode Option	WR6ZI-ENETbus D
Fibre Channel Decode Annotation Option	WR6Zi-FCbus D
FlexRay Trigger and Decode Option	WR6Zi-FlexRaybus TD
FlexRay Trigger, Decode, and Physical Layer Test Option	WR6Zi-FlexRaybus TDP

Serial Trigger and Decode (cont'd)

Product Description	Product Code
I^2C Bus Trigger and Decode Option[†]	WR6Zi-I2Cbus TD
I^2C, SPI and UART Trigger and Decode Option[†]	WR6Zi-EMB
LIN Trigger and Decode Option	WR6Zi-LINbus TD
Manchester Decode Option	WR6ZI-Manchesterbus D
MIL-STD-1553 Trigger and Decode Option	WR6Zi-1553 TD
MIPI D-PHY Decode Option	WR6Zi-DPHYbus D
MIPI D-PHY Decode and Physical Layer Test Option	WR6Zi-DPHYbus DP
MIPI M-PHY Decode Option	WR6Zi-MPHYbus D
MIPI M-PHY Decode and Physical Layer Test Option	WR6Zi-MPHYbus DP
MS-500-36 with I^2C, SPI and UART Trigger and Decode Option	WR6Zi-MSO-EMB
NRZ Decode Option	WR6ZI-NRZbus D
PCI Express Gen1 Decode Option	WR6Zi-PCIebus D
PROTObus MAG Serial Debug Toolkit	WR6Zi-PROTObus MAG
SAS Decode Annotation Option	WR6Zi-SASbus D
SATA Trigger Decode Annotation Option Supports SATA Gen1 and 2	WR6Zi-SATAbus TD
SENT Bus Decode Option	WR6Zi-SENT D
SPI Bus Trigger and Decode Option[†]	WR6Zi-SPIbus TD
UART and RS-232 Trigger and Decode Option[†]	WR6Zi-UART-RS232bus TD
USB 1.x/2.0 Trigger/Decode Option	WR6Zi-USB2bus TD
USB2-HSIC Decode Option	WR6Zi-USB2-HSICbus D
Vehicle Bus Analyzer Package - Includes CANBus TDM, FlexRay TDP, LINBus TD, and ProtoBus MAG	WR6Zi-VBA

[†] Included with WaveRunner 620MZi

Serial Data Compliance

Product Description	Product Code
QualiPHY Enabled BroadR-Reach Software Option	QPHY-BroadR-Reach
QualiPHY Enabled Ethernet 10/100/1000BT Software Option	QPHY-ENET[*]
QualiPHY Enabled DDR2 Software Option	QPHY-DDR2
QualiPHY Enabled DDR3 Software Option	QPHY-DDR3
QualiPHY Enabled LPDDR2 Software Option	QPHY-LPDDR2
QualiPHY Enabled MIPI D-PHY Software Option	QPHY-MIPI-DPHY
QualiPHY Enabled MOST150 Software Option	QPHY-MOST150
QualiPHY Enabled MOST50 Software Option	QPHY-MOST50
QualiPHY Enabled USB 2.0 Software Option	QPHY-USB [‡]
10/100/1000Base-T Ethernet Test Fixture	TF-ENET-B[**]
USB 2.0 Compliance Test Fixture	TF-USB-B

[*] TF-ENET-B required.   [‡] TF-USB-B required.
[**] Includes ENET-2CAB-SMA018 and ENET-2ADA-BNCSMA.

ORDERING INFORMATION

Product Description	Product Code
Serial Data Analysis	
Cable De-Embedding Option	WR6Zi-CBL-DE-EMBED
Eye Doctor (Virtual Probe and Equalizer Emulation Bundle), Serial Data Analyzers, and Disk Drive Analyzers	WR6Zi-EYEDRII
Serial Data Mask Software Option	WR6Zi-SDM
SDA II Serial Data Analysis Option	WR6ZI-SDAII
Mixed Signal Solutions	
250 MHz, 1 GS/s, 18 Ch, 10 Mpts/Ch Mixed Signal Oscilloscope Option	MS-250
500 MHz, 2 GS/s, 18 Ch, 50 Mpts/Ch Mixed Signal Oscilloscope Option	MS-500
250 MHz, 1 GS/s, 36 Ch, 25 Mpts/Ch (500 MHz, 18 Ch, 2 GS/s, 50 Mpts/Ch Interleaved) Mixed Signal Oscilloscope Option	MS-500-36
Data Storage Software	
Advanced Optical Recording Measurement Option	WR6Zi-AORM
Disk Drive Measurements Software Option	WR6Zi-DDM2
Disk Drive Analyzer Software Option	WR6Zi-DDA
Power Analysis Software	
Power Analyzer Software Option	WR6Zi-PWR
Jitter Analysis Software	
Clock Jitter Analysis with Four Views Software Option	WR6Zi-JITKIT
Spectrum Analysis Software	
Spectrum Analyzer Option (Included with WaveRunner 620MZi)	WR6Zi-SPECTRUM

Product Description	Product Code
Other Software Options	
Advanced Customization Option (Included with WaveRunner 620MZi)	WR6Zi-XDEV
EMC Pulse Parameter Software Option	WR6Zi-EMC
Electrical Telecom Mask Test Software Option	WR6Zi-ET-PMT
Digital Filtering Software	
Digital Filter Software Option (Included with WaveRunner 620MZi)	WR6Zi-DFP2
Remote Control/Network Options	
External USB2 to GPIB Adaptor	USB2-GPIB
General Accessories	
Oscilloscope Cart with Additional Shelf and Drawer	OC1024
Oscilloscope Cart	OC1021
Accessory Pouch	WR6Zi-POUCH
Rackmount, 8U Adaptor Kit	WR6ZI-RACK
Keyboard, USB	KYBD-1
MIL Calibration Certification	WR6Zi-CCMIL
Soft Carrying Case	WR6Zi-SOFTCASE
Protective Hard Cover	WR6Zi-COVER
Hard Case	WR6Zi-HARDCASE
External Adaptor for Reference In and Out (To be applied at the Lbus Connector)	WR6Zi-ExtRef-IN/OUT

ORDERING INFORMATION

Product Description	Product Code
Probes	
÷10, 500 MHz 10 MΩ Passive Probe	PP009
÷10, 500 MHz 10 MΩ Passive Probe	PP008
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
1.5 GHz, 0.9 pF, 1 MΩ High Impedance Active Probe	ZS1500
Set of 4 ZS1500, 1.5 GHz, 0.9 pF, 1 MΩ High Impedance Active Probe	ZS1500-QUADPAK
2.5 GHz, 0.9 pF, 1 MΩ High Impedance Active Probe	ZS2500
Set of 4 ZS2500, 2.5 GHz, 0.9 pF, 1 MΩ High Impedance Active Probe	ZS2500-QUADPAK
4 GHz, 0.6 pF, 1 MΩ High Impedance Active Probe	ZS4000
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
WaveLink 4 GHz, 2.5 Vp-p Differential Probe System	D410-PS
WaveLink 4 GHz, 5 Vp-p Differential Probe System	D420-PS
WaveLink 4 GHz Differential Amplifier Module with Adjustable Tip	D400A-AT*
WaveLink ProBus Platform/Cable Assembly (4 GHz)	WL-PBus-CASE
25 MHz High Voltage Differential Probe	HVD3102
120 MHz High Voltage Differential Probe	HVD3106

* For a complete probe, order a WL-PBUS-CASE Platform/Cable Assembly with the Adjustable Tip Module

Product Description	Product Code
Probes (cont'd)	
1 Ch, 100 MHz Differential Amplifier with Precision Voltage Source	DA1855A
DA1855A with Rackmount	DA1855A-RM
2 Ch, 100 MHz Differential Amplifier with Precision Voltage Source	DA1855A-PR2
DA1855A with Rackmount (must be ordered at time of purchase, no retrofit)	DA1855A-PR2-RM
30 A; 50 MHz Current Probe – AC/DC; 30 Arms; 50 Apeak Pulse	AP015
30 A; 50 MHz Current Probe – AC/DC; 30 Arms; 50 Apeak Pulse	CP030
30 A; 100 MHz Current Probe – AC/DC; 30 Arms; 50 Apeak Pulse	CP031
150 A; 10 MHz Current Probe – AC/DC; 150 Arms; 500 Apeak Pulse	CP150
500 A; 2 MHz Current Probe – AC/DC; 500 Arms; 700 Apeak Pulse	CP500
700 V, 15 MHz High-Voltage Differential Probe (÷10, ÷100)	AP031
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 5 MΩ / 50 MΩ 6 kV High-Voltage Probe	PPE6KV
Optical-to-Electrical Converter, 500-870 nm ProBus BNC Connector	OE425
Optical-to-Electrical Converter, 950-1630 nm ProBus BNC Connector	OE455