

LECROY (TELEDYNE LECROY)

WaveMaster 816Zi

The Teledyne LeCroy WaveMaster 816Zi is a high-performance 16 GHz digital oscilloscope designed for demanding high-speed signal capture and analysis. Built on the advanced X-Stream II architecture, it leverages 5th-generation Digital Bandwidth Interleave (DBI) technology to achieve 16 GHz bandwidth and an 80 GS/s real-time sample rate, combined with deep memory capability of up to 512 Mpts. Featuring standard 50 Ω and 1 M Ω inputs, a 15.3-inch touchscreen display, and the optional high-speed LSIB data transfer bus, the 816Zi excels in signal integrity, serial data compliance, and complex multi-channel system debugging.

SPECIFICATIONS

General

Interfaces	6 x USB 2.0 (4 front, 2 rear), 1 x USB 2.0 Device Port, 2 x Gigabit Ethernet, LSIB PCIe x4 Bus Option, GPIB (optional), DVI-D, VGA
Display	15.3-inch WXGA (1280 x 768) color TFT-LCD resistive touchscreen
Calibration Interval	1 year

Physical

Power Supply	100–240 VAC ($\pm 10\%$) at 50/60 Hz, or 100–120 VAC ($\pm 10\%$) at 400 Hz; 975 W (975 VA) maximum power consumption
Operating Temperature	5 °C to 40 °C °C
Dimensions (W×H×D)	462 mm × 355 mm × 312 mm mm
Weight	20.4 kg kg

Vertical System

Analog Bandwidth (DBI Mode)	16 GHz (on 2 channels)
Analog Bandwidth (Standard Mode)	8 GHz (on 4 channels)
Calculated Rise Time (10% to 90%)	28 ps (typical)
Calculated Rise Time (20% to 80%)	21 ps (typical)
Number of Input Channels	4
Input Impedance (50 Ω)	50 Ω $\pm$ 1.5%
Input Impedance (1 M Ω)	1 M Ω $\pm$ 1% 16 pF
Input Coupling	DC, AC (1 M Ω only), GND
Vertical Resolution (ADC)	8-bit (up to 11-bit with Enhanced Resolution)
Input Sensitivity (50 Ω)	2 mV/div to 1 V/div
Input Sensitivity (1 M Ω)	2 mV/div to 10 V/div
DC Gain Accuracy	$\pm$ 1.5% of full scale
Maximum Input Voltage (50 Ω)	5 Vrms
Maximum Input Voltage (1 M Ω)	250 V max (peak AC < 10 kHz + DC)
Hardware Bandwidth Limits	20 MHz, 200 MHz, 1 GHz, 3 GHz, 4 GHz, 6 GHz, 8 GHz, 13 GHz
Enhanced Resolution (ERES)	Up to 11 bits (8.5 to 11 bits in 0.5-bit steps)
Input Sensitivity Range (50 Ω)	2 mV/div - 1 V/div (fully variable)
Input Sensitivity Range (1 M Ω)	2 mV/div - 10 V/div (fully variable, with optional AP-1M adapter)

Horizontal System

Maximum Real-Time Sampling Rate (DBI Mode)	80 GS/s (on 2 channels)
Maximum Real-Time Sampling Rate (Standard Mode)	40 GS/s (on 4 channels)
Standard Record Length (DBI Mode)	40 Mpts/Ch
Standard Record Length (Standard Mode)	20 Mpts/Ch
Maximum Record Length Option (DBI Mode)	512 Mpts/Ch
Maximum Record Length Option (Standard Mode)	256 Mpts/Ch
Time Base Range	20 ps/div to 128 s/div (real-time)
Time Base Accuracy	$\pm$ 1 ppm + aging ($\pm$ 0.1 ppm/year)
Channel-to-Channel Deskew Range	$\pm$ 9 s
Trigger Jitter	<100 fs rms (typical)

Trigger System

Trigger Sources	Ch 1, Ch 2, Ch 3, Ch 4, External, Line
Trigger Modes	Auto, Normal, Single, Stop
Trigger Coupling	DC, AC, HFRej, LFRej
Trigger Holdoff Range	100 ps to 20 s (or 1 to 99,999,999 events)
Edge Triggering	Positive or negative
Pulse Width Triggering	200 ps to 20 s
Runt Triggering	Positive, negative, or bi-directional
Window Triggering	Yes
Timeout Triggering	1 ns to 20 s
Setup/Hold Triggering	Yes
Pattern/State Triggering	Yes (up to 5 inputs)
External Trigger Input Impedance	50 Ω or 1 M Ω
Edge Trigger Sensitivity	0.5 div @ < 3 GHz, 1 div @ < 10 GHz, 2 div @ < 13 GHz
External Trigger Input Bandwidth	2 GHz
Trigger Level Range (Internal)	± 4.1 divisions from center
Trigger Level Range (External)	± 400 mV

Acquisition System

Acquisition Modes	Real-time, Roll, Random Interleaved Sampling (RIS), Sequence (Segmented Memory)
Maximum Waveform Capture Rate	>300,000 waveforms/second
Sequence Mode Segments (Standard)	Up to 10,000 segments
Sequence Mode Segments (Optional)	Up to 1,000,000 segments

Waveform Measurements and Analysis

Automatic Voltage Measurements	Amplitude, Base, Area, Cycle Area, Maximum, Minimum, Mean, Cycle Mean, Overshoot+, Overshoot-, Peak-to-Peak, RMS, Cycle RMS, Top
Automatic Time Measurements	Rise Time, Fall Time, Period, Frequency, Width+, Width-, Duty Cycle, Delay, Phase, Skew, Setup, Hold
Math Functions	Add, Subtract, Multiply, Divide, FFT, Absolute Value, Average, Derivative, Integral, Envelope, Rescale, Square, Square Root, Trend, Histogram
FFT Window Types	Von Hann (Hanning), Hamming, Flat Top, Blackman-Harris, Rectangular
Jitter & Signal Integrity Analysis	Eye Doctor II, SDA II (optional)

Connectivity and Ports

External Video Output	DVI-D and VGA
LSIB Option	LeCroy Serial Interface Bus (PCIe x4, up to 325 MB/s data rate)
Reference Clock Input	10 MHz (BNC, 50 Ω)
Reference Clock Output	10 MHz (BNC, 50 Ω)
Auxiliary Output (Trigger Out)	BNC connector, TTL compatible

Processor and Storage

Internal Operating System	Windows 7 Professional (64-bit)
Processor Type	Intel Core 2 Quad (2.5 GHz or faster)
System Memory (RAM)	4 GB standard (upgradable to 8 GB)
Internal Storage	160 GB or larger removable Hard Disk Drive (SATA)

Environmental Specifications

Storage Temperature Range	-20 °C to 60 °C
Operating Humidity Range	5% to 80% RH (non-condensing) up to 30 °C
Operating Altitude	Up to 3,048 m (10,000 ft) at 25 °C

Physical Characteristics

Form Factor	Benchtop
Height	355 mm
Width	462 mm
Depth	312 mm

Inputs & Outputs

Probe Interface	Teledyne LeCroy ProLink interface
Input Connectors	ProLink (SMA/BNC)

Timebase System

Sample Clock Jitter	< 125 fs RMS
Trigger Delay Range (Pre-trigger)	0 to 100% of full scale
Trigger Delay Range (Post-trigger)	0 to 10,000 divisions
Timebase Aging Rate	< 1 ppm per year

Connectivity

LXI Compliance	Class C
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Power

Power Consumption (Typical)	975 W (975 VA)
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Environmental

Vibration Compliance	MIL-PRF-28800F Class 3
Operating Shock	20 g peak, half-sine, 11 ms pulse, 3 shocks in each direction along 3 orthogonal axes

Power Requirements

AC Input Voltage	100 - 240 V AC (±10%) at 50/60 Hz; 115 V AC (±10%) at 400 Hz (automatic selection)
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TECHNOLOGY

Digital Bandwidth Interleave (DBI)

APPLICATIONS

High-Speed Serial Data Analysis, Signal Integrity Testing, and RF/Microwave System Debugging

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