

KEYSIGHT TECHNOLOGIES (AGILENT HP)

DSOX4104A

The Keysight DSOX4104A is a high-performance 1 GHz, 4-channel digital storage oscilloscope belonging to the InfiniiVision 4000 X-Series. Designed to speed up debugging with its industry-leading 1,000,000 waveforms per second update rate, a massive 12.1-inch capacitive touch screen, and patented Zone touch triggering, it offers unparalleled usability and performance for demanding engineering tasks.

SPECIFICATIONS

General

Interfaces	USB 2.0 High-Speed Host (2 front, 1 rear), USB 2.0 High-Speed Device (1 rear), LAN (10/100Base-T), VGA video out, GPIB (optional)
Display	12.1-inch capacitive touch screen TFT LCD, 800 x 600 resolution (SVGA)

Physical

Power Supply	100 to 120 V AC (50/60/400 Hz), 100 to 240 V AC (50/60 Hz), Max 120 W
Operating Temperature	0 to +50 °C °C
Dimensions (W×H×D)	454 mm × 275 mm × 156 mm mm
Weight	6.3 kg

Vertical System - Analog Channels

Analog Bandwidth (-3 dB)	1 GHz
Calculated Rise Time (10% to 90%)	350 ps
Number of Input Channels	4 analog channels
Input Coupling	AC, DC
Input Impedance	1 MΩ ± 1% (16 pF), 50 Ω ± 1.5%
Vertical Resolution	8 bits (up to 12 bits with High Resolution mode)
Input Sensitivity Range (1 MΩ)	1 mV/div to 5 V/div
Input Sensitivity Range (50 Ω)	1 mV/div to 1 V/div
Maximum Input Voltage (1 MΩ)	300 Vrms, 400 Vpk
Maximum Input Voltage (50 Ω)	5 Vrms
DC Gain Accuracy	±2.0% of full scale
Hardware Bandwidth Limits	20 MHz

Horizontal System

Timebase Range	200 ps/div to 50 s/div
Timebase Accuracy	±1.6 ppm + aging
Channel-to-Channel Deskew Range	±100 ns

Acquisition System

Maximum Real-Time Sample Rate (Interleaved)	5 GSa/s
Maximum Real-Time Sample Rate (All Channels)	2.5 GSa/s
Maximum Memory Depth (Interleaved)	4 Mpts
Maximum Memory Depth (All Channels)	2 Mpts
Segmented Memory	Standard, up to 1000 segments
Waveform Capture Rate	> 1,000,000 wfms/s
Acquisition Modes	Normal, Peak Detect, Averaging, High Resolution, Segmented

Trigger System

Trigger Sources	Analog channels, Line, External, WaveGen (optional)
Trigger Modes	Normal, Auto, Single, Force
Trigger Coupling	AC, DC, LF Reject, HF Reject, Noise Reject
Trigger Holdoff Range	40 ns to 10 s
Standard Trigger Types	Edge, Edge Transition, Pattern, Pulse Width, Runt, Setup/Hold, Rise/Fall Time, Nth Edge Burst, Video
Advanced / Protocol Trigger Options	InfiniiScan Zone Touch Trigger, I2C, SPI, UART/RS-232, CAN, CAN-FD, LIN, FlexRay, SENT, I2S, MIL-STD 1553, ARINC 429, USB 2.0
Trigger Sensitivity	Internal: < 10 mV/div: greater of 0.6 div or 4.3 mV, ≥ 10 mV/div: 0.5 div; External: 200 mVpp (DC to 100 MHz), 350 mVpp (100 MHz to 1 GHz)
Trigger Jitter	< 1.6 ps RMS
Zone Trigger	Standard, touch-based zone trigger (up to 2 zones)

Waveform Measurements and Analysis

Automatic Measurements	Up to 10 measurements displayed simultaneously, 30+ types available
Waveform Math Operators	Add, Subtract, Multiply, Divide, FFT, d/dt, Integrate, Square Root
FFT Window Types	Hanning, Flat Top, Rectangular, Blackman-Harris
Limit / Mask Testing	Standard (hardware-based)

Integrated Instruments

Integrated Digital Voltmeter (DVM)	3-digit (standard)
Integrated Frequency Counter	5-digit (standard)

Display and User Interface

Waveform Display Formats	YT, XY
Display Size	12.1 inches (307 mm) diagonal
Touchscreen Technology	Capacitive multi-touch

Environmental and Compliance

Storage Temperature Range	-40 °C to +70 °C
Operating Altitude	Up to 3,000 m (9,842 ft)
Non-operating Altitude	Up to 15,300 m (50,229 ft)

Physical Characteristics

Form Factor	Benchtop
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Accessories

Standard Passive Probe	N2894A (one per channel, 700 MHz, 10:1)
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Display Specifications

Display Resolution	800 × 600 pixels (SVGA)
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Digital Channels (MSO)

Digital Channels	16 channels (with optional DSOX4MSO upgrade)
Digital Channel Sample Rate	2.5 GSa/s (interleaved), 1.25 GSa/s (all channels)
Digital Channel Memory Depth	4 Mpts (interleaved), 2 Mpts (all channels)
Minimum Detectable Pulse Width	2 ns (digital channels)
Maximum Digital Toggle Rate	250 MHz

Arbitrary Waveform Generator

WaveGen Output Channels	2 channels (with optional DSOX4WAVEGEN2)
WaveGen Maximum Frequency	20 MHz
WaveGen Resolution	14-bit

Environmental

Operating Humidity	Up to 95% RH at +40 °C (non-condensing)
Non-Operating Humidity	Up to 90% RH at +65 °C (non-condensing)
Operating Vibration	0.31 g rms, 5 Hz to 500 Hz, 10 min/axis, 3 axes

Compliance

EMC Compliance	IEC 61326-1:2005 / EN 61326-1:2006, ICES-001:2004
Safety Standards	UL61010-1, CAN/CSA-C22.2 No. 61010-1, EN61010-1

Maintenance

Calibration Interval	2 years
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Vertical System

Channel-to-Channel Isolation	≥ 40 dB from DC to 1 GHz
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Connectivity

USB Host Ports	3 ports (1 front, 2 rear, USB 2.0 Hi-Speed)
USB Device Port	1 port (rear, USB 2.0 Hi-Speed, supports USBTMC)
Video Output	SVGA out (15-pin D-sub, rear panel)

Acquisition

Maximum Segments	1000 segments
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Waveform Analysis

Search and Navigate Types	Edge, pulse width, rise/fall time, runt, setup and hold, serial bus
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WaveGen (Optional)

Dual-Channel WaveGen Waveforms	Sine, Square, Ramp, Pulse, DC, Noise, Sinc, Exponential Rise, Exponential Fall, Cardiac, Gaussian, Arbitrary
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Power

Max Power Consumption	120 W
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TECHNOLOGY

Digital Storage Oscilloscope

APPLICATIONS

Electronic design, debugging, power analysis, and serial protocol validation

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