

TEKTRONIX

MDO3104

The Tektronix MDO3104 is a 1 GHz, 4-channel Mixed Domain Oscilloscope from the MDO3000 series. It combines a traditional analog oscilloscope with an integrated spectrum analyzer, digital channels, and optional arbitrary function generator capabilities, making it a highly versatile 6-in-1 tool for embedded design and debugging.

SPECIFICATIONS

General

Interfaces	USB 2.0 Host (x2 front, x2 rear), USB 2.0 Device (x1 rear), LAN (10/100 Base-T Ethernet, LXI compliant), Video Out (D-sub 15-pin VGA), GPIB (optional)
Display	9.0-inch (229 mm) WVGA widescreen color display, 800 × 480 resolution

Physical

Power Supply	100 to 240 V $\pm 10\%$ (50 to 60 Hz), 115 V $\pm 10\%$ (400 Hz), 120 W maximum power consumption
Operating Temperature	0 °C to +50 °C °C
Dimensions (W×H×D)	379 mm × 203 mm × 147 mm mm
Weight	4.2 kg kg
Cooling Clearance	50.8 mm (2 in) required on left side and rear of instrument

Analog Vertical System

Analog Input Channels	4
Analog Bandwidth (-3 dB)	1 GHz
Calculated Rise Time (10% to 90%)	350 ps (typical)
Input Coupling	AC, DC
Hardware Bandwidth Limits	20 MHz or 250 MHz
Vertical Resolution	8 bits (11 bits with Hi Res)

Digital Vertical System

Digital Channels	16 (with optional MDO3MSO)
Threshold Selections	TTL, CMOS, ECL, PECL, User-defined
User-defined Threshold Range	-15 V to +25 V
Maximum Input Voltage	± 15 V
Minimum Voltage Swing	500 mV
Input Resistance	101 k Ω
Probe Loading	8 pF
Vertical Resolution (Digital)	1 bit

Horizontal System

Time Base Range	400 ps/div to 1000 s/div
Maximum Duration at Highest Sample Rate (all/half channels)	4/2 ms
Channel-to-Channel Deskew Range	±125 ns
Time Base Accuracy	±10 ppm over any ≥1 ms interval
Time Base Delay Time Range	-10 divisions to 5000 s

Horizontal System (Digital)

Maximum Sample Rate (Main, Digital)	500 MS/s (2 ns resolution)
Maximum Record Length (Main, Digital)	10 M
Maximum Sample Rate (MagneVu, Digital)	8.25 GS/s (121.2 ps resolution)
Maximum Record Length (MagneVu, Digital)	10k centered on the trigger
Minimum Detectable Pulse Width (typical)	2 ns
Channel-to-Channel Skew (typical)	500 ps

Spectrum Analyzer

Spectrum Analyzer Channels	1
Standard RF Frequency Range	9 kHz - 1 GHz
Optional RF Frequency Range (MDO3SA)	9 kHz - 3 GHz
Resolution Bandwidth (RBW) Range	20 Hz to 150 MHz
Spectrum Analyzer DANL (5 MHz - 2 GHz)	<-138 dBm/Hz (<-142 dBm/Hz typical)
Spectrum Analyzer Span	9 kHz to 1 GHz (standard), or 9 kHz to 3 GHz (with option MDO3SA)
Spectrum Analyzer RF Input Maximum Operating Level	+20 dBm
Spectrum Analyzer RF Input Maximum DC Voltage	±40 VDC
Spectrum Analyzer RF Input Damage Level	+30 dBm (1 W) continuous, +45 dBm (30 W) peak pulses (<10 μs)
Spectrum Analyzer Window Types	Kaiser (default), Rectangular, Hamming, Hanning, Blackman-Harris, Flat-top

Arbitrary Function Generator

Arbitrary Function Generator Outputs	1 (with optional MDO3AFG)
AFG Sine Waveform Frequency Range	0.1 Hz to 50 MHz
AFG Square/Pulse Waveform Frequency Range	0.1 Hz to 25 MHz
AFG Arbitrary Waveform Length	1 to 128k points
AFG Sampling Rate	250 MS/s

Acquisition System

Analog Channels Sample Rate	5 GS/s (half channels), 2.5 GS/s (all channels)
Analog Record Length	10 M
Maximum Waveform Capture Rate	>280,000 wfm/s (FastAcq mode)

Vertical System

Input Impedance	1 M Ω $\pm$ 1% (8 pF $\pm$ 2 pF) and 50 Ω $\pm$ 1%
Input Sensitivity Range (1 M Ω)	1 mV/div to 10 V/div
Input Sensitivity Range (50 Ω)	1 mV/div to 1 V/div
DC Gain Accuracy	$\pm$ 1.5% for $\geq$ 5 mV/div, $\pm$ 2.0% for 2 mV/div, $\pm$ 2.5% for 1 mV/div
Channel-to-Channel Isolation	$\geq$ 100:1 at $\leq$ 100 MHz, and $\geq$ 30:1 at >100 MHz up to 1 GHz

Trigger System

Trigger Modes	Auto, Normal, Single
Trigger Holdoff Range	20 ns to 8 s
Trigger Types	Edge, Sequence, Pulse Width, Runt, Timeout, Slew Rate, Setup/ Hold, Logic, Video
Trigger Jitter (typical)	< 4 ps RMS
Trigger Source	Analog channels, Digital channels, Line, Aux
Trigger Sensitivity (Internal, DC Coupled)	0.4 div from DC to 50 MHz, increasing to 1 div at 1 GHz

Digital Voltmeter

Digital Voltmeter (DVM) Voltage Resolution	4 digits
Digital Voltmeter (DVM) Frequency Resolution	5 digits

Waveform Measurements

Waveform Math	Arithmetic, FFT, Advanced Math (including user-defined algebraic equations)
Automatic Measurements	30 measurements (including Period, Frequency, Rise/Fall Time, Amplitude, Max, Min, RMS)

Power

Power Consumption	120 W maximum
-------------------	---------------

Arbitrary Function Generator (Option MDO3AFG)

AFG Waveforms	Sine, Square, Pulse, Ramp, Triangle, Sin(x)/x, Exponential Rise, Exponential Decay, Gaussian, Lorentz, Haversine, Cardiac, Noise, Arbitrary
AFG Amplitude Range (50 Ω)	2 mVp-p to 2.5 Vp-p
AFG Amplitude Range (1 M Ω)	4 mVp-p to 5 Vp-p
AFG Frequency Resolution	0.1 Hz or 4 digits

Digital Voltmeter (DVM)

DVM Measurements	AC+DC RMS, AC RMS, DC
------------------	-----------------------

Environmental

Operating Altitude	Up to 3,000 m (9,843 ft)
Non-Operating Altitude	Up to 12,000 m (39,370 ft)
Acoustic Noise	30 dBA (typical)

TECHNOLOGY

Mixed Domain Oscilloscope

APPLICATIONS

Embedded design, mixed signal debugging, EMI troubleshooting, power analysis

Generated by SpecAtlasHub (specatlashub.com). Specifications are compiled from available sources and are subject to change — verify critical values against the manufacturer before purchase.