



MDO-2000A Series

VPO
Visual Persistence Oscilloscope

300/200/100MHz Mixed-Domain Oscilloscope

FEATURES

- 300/200/100MHz Bandwidth Selections: 2 Channels
- Maximum Real Time Sampling Rate: 2 GSa/s
- MDO-2000A Equips with a Spectrum Analyzer
- MDO-2000AG Equips with a Spectrum Analyzer ; a Dual Channel 25MHz AWG
- Per Channel 20M Memory Depth and VPO Waveform Display Technology
- Waveform Update Rate up to 120,000 wfm/s
- 8" WVGA TFT LCD
- MDO-2000AG Provides Frequency Response Analysis Function
- Maximum 1M FFT Provides Higher Frequency Domain Resolution Measurements
- High Pass, Low Pass and Band Pass Filter Functions
- 29,000 Segmented Memory Sections and Waveform Search Function
- I²C/UART/CAN/LIN Serial Bus Trigger and Decoding Functions
- Data Log Function is able to Track Signal Changes up to 1000 Hours
- Mask Test Function
- Network Storage Function

GW INSTEK
Simply Reliable

SPECIFICATIONS		MDO-2102A/G	MDO-2202A/G	MDO-2302A/G
VERTICAL SENSITIVITY	Channels	2Ch+EXT	2Ch+EXT	2Ch+EXT
	Bandwidth Calculated Rise Time Bandwidth Limit	DC~100MHz(-3dB) 3.5ns 20MHz	DC~200MHz(-3dB) 1.75ns 20M/100MHz	DC~300MHz(-3dB) 1.17ns 20M/100M200MHz
TRIGGER	Vertical Resolution Input Coupling Input Impedance DC Gain Accuracy Polarity Maximum Input Voltage Offset Position Range Waveform Signal Process	8 bits : 1mV ~ 10V/div AC, DC, GND 1MΩ // 16pF approx. ±(3% when 2mV/div or greater is selected ; ±(5%) when 1mV/div is selected Normal & Invert 300Vrms , CAT I 1mV/div ~ 20mV/div : ±0.5V ; 50mV/div ~ 200mV/div : ±5V ; 500mV/div ~ 2V/div : ±25V ; 5V/div~10V/div : ±250V +, -, ×, ÷, FFT, User Defined Expression FFT : 1Mpts ; FFT : Spectral magnitude. Set FFT Vertical Scale to Linear RMS or dBV RMS and FFT Window to Rectangular, Hamming , Hanning, or Blackman		
	Source Trigger Mode Trigger Type Trigger Holdoff Range Coupling Sensitivity	Ch1 ,CH2, Line, EXT Auto (Supports Roll Mode for 100 ms/div and slower), Normal, Single Sequence Edge, Pulse Width(Glitch), Video, Pulse Runt, Rise & Fall(Slope), Alternate, Time out, Event-Delay(1~65,535 events),Time-Delay(Duration;4ns~10s), Bus 4ns ~ 10s AC, DC, LF rej. , Hf rej. , Noise rej. 1div		
EXT TRIGGER	Range Sensitivity Input Impedance	±15V DC ~ 100MHz Approx. 100mV; 100MHz ~ 200MHz Approx. 150mV; 200MHz ~ 300MHz Approx. 150mV 1MΩ±3%, ~16pF		
HORIZONTAL	Time Base Range Pre-trigger Post-trigger Time Base Accuracy Real Time Sample Rate Record Length Acquisition Mode Peak Detection Average	1ns/div ~ 100s/div (1-2-5 increments); ROLL : 100ms/div ~ 100s/div 10 div maximum 2,000,000 div maximum ±50 ppm over any ≥ 1 ms time interval Max. : 2GSa/s (shared) Per Channel 20Mpts Normal, Average, Peak Detect, Single 2ns (typical) Selectable from 2 to 256		
X-Y MODE	X-Axis Input Y-Axis Input Phase Shift	Channel 1 Channel 2 ±3° at 100kHz		
CURSORS AND MEASUREMENT	Cursors Automatic Measurement	Amplitude, Time, Gating Available; Unit : Seconds(S), Hz(1/S), Phase (Degrees), Ratio(%) 38 sets : Pk-Pk, Max, Min, Amplitude, High, Low, Mean, Cycle Mean, RMS, Cycle RMS, Area, Cycle Area, ROVShoot, FOVShoot, RPREShoot, FPREShoot, Frequency, Period, RiseTime, FallTime, +Width, -Width, Duty Cycle, +Pulses, -Pulses, +Edges, -Edges, %Flicker, Flicker Idx., FRR, FRF, FFR, FFF, LRR, LRF, LFR, LFF, Phase		
CONTROL PANEL FUNCTION	Auto Counter Autoset Save Setup Save Waveform	6 digits, range from 2Hz minimum to the rated bandwidth Single-button, automatic setup of all channels for vertical, horizontal and trigger systems, with undo Autoset 20 sets 24 sets		
DISPLAY SYSTEM	TFT LCD Type Display Resolution Interpolation Waveform Display Waveform Update Rate Display Mode Display Graticule	8" TFT LCD WVGA color display 800 horizontal x 480 vertical pixels (WVGA) Sin(x)/x Dots, Vectors, Variable persistence(16ms~4s), Infinite persistence 120,000 waveforms per second, maximum YT : XY 8 x 10 divisions		
INTERFACE	USB Port Ethernet Port (LAN) Go/NoGo BNC Kensington Style Lock	USB 2.0 High-speed host port x 1, USB 2.0 High-speed device port x 1 RJ-45 connector, 10/100Mbps with HP Auto-MDIX 5V Max/10mA TTL open collector output Rear-panel security slot connects to standard Kensington-style lock		
SPECTRUM ANALYZER SPECIFICATIONS	Frequency Range Span Resolution Bandwidth Reference Level Vertical Units Vertical Position Vertical Scale Display Average Noise Level Spurious Response Frequency Domain Trace Types Detection Methods FFT Windows	DC~1GHz(Max.) (Max. bandwidth ~1GHz uncalibrated) 1kHz ~ 1GHz(Max.) 1Hz ~ 1MHz(Max.) -50 dBm to +40dBm in steps of 5dBm dBV RMS; Linear RMS; dBm -12divs to +12divs 1dB/div to 20dB/div in a 1-2-5 Sequence 1V/div < -50dBm, Avg : 16 ; 100mV/div < -70dBm, Avg : 16 ; 10mV/div < -90dBm, Avg : 16 2nd harmonic distortion< 40dBc ; 3rd harmonic distortion< 45dBc Normal ; Max Hold ; Min Hold ; Average (2 ~ 256) Sample ; +Peak ; -Peak ; Average FFT Factor : Hanning 1.44 ; Rectangular 0.89 ; Hamming 1.30 ; Blackman 1.68		
AWG SPECIFICATIONS (MDO-2000AG only)	Channels Sample Rate Vertical Resolution Max. Frequency Waveforms Output Range Output Resolution Output Accuracy Offset Range Offset Resolution Sine Square/Pulse Ramp	2 200 Msa/s 14 bits 25 MHz Sine, Square, Pulse, Ramp, DC, Noise, Sinc, Gaston, Lorentz, Exponential Rise, Exponential Fall, Haversine, Cardiac 20 mVpp to 5 Vpp, High Z; 10 mVpp to 2.5 Vpp, 50Ω 1mV 2% (1 kHz) ±2.5 V ac+dc, High Z; ±1.25 V ac+dc, 50Ω 1mV Frequency Range: 100mHz~25MHz ; Flatness(relative to 1kHz): ±0.5 dB<15MHz; ±1 dB 15MHz~25MHz; Harmonic Distortion: -40 dBc ; Stray(Non-harmonic): -40 dBc ; Total Harmonic Distortion:1% ; S/N Ratio: 40 dB Frequency Range : 100mHz~15MHz ; Rise/Fall time : <15ns ; Overshoot : <3% ; Duty cycle Square : 50% & Pulse : 0.4%~99.6% ; Min. Pulse Width : 30 ns ; Jitter : 500 ps Frequency Range :100mHz~1MHz ; Linearity : 1% ; Symmetry : 0~100%		
FREQUENCY RESPONSE ANALYSIS (MDO-2000AG only)	Dynamic Range Input and Output Sources Frequency Range Number of Test Points Test Amplitude Test Results Manual Measurements Plot Scaling	> 80 dB (typical) Channel 1 or 2 20 Hz to 25 MHz 10 to 90 points per decade 20 mVpp to 5 Vpp into High-Z : Fixed test amplitude or custom amplitude for each decade Logarithmic overlaid gain and phase plot Two pairs of tracking gain and phase markers Auto-scaled during test		
MISCELLANEOUS	Line Voltage Range Multi-Language Menu On-Line Help Time Clock Operation Environment Dimensions & Weight	AC 100V ~ 240V, 50Hz ~ 60Hz, auto selection Available Available Time and date, provide the date/time for saved data Temperature: 0°C to 50°C. Relative Humidity: ≤ 80% at 40°C or below; ≤ 45%, 41°C ~ 50°C 384(W) X 208(H) x 127.3(D) mm, Approx. 3kg		

Note : Three-year warranty, excluding probes & LCD display panel.

Specifications subject to change without notice.

MDO2000AGD1BH

ORDERING INFORMATION

MDO-2302AG 300MHz, 2-channel, Digital Storage Oscilloscope, Spectrum Analyzer, dual channel 25MHz AWG
MDO-2202AG 200MHz, 2-channel, Digital Storage Oscilloscope, Spectrum Analyzer, dual channel 25MHz AWG
MDO-2102AG 100MHz, 2-channel, Digital Storage Oscilloscope, Spectrum Analyzer, dual channel 25MHz AWG
MDO-2302A 300MHz, 2-channel, Digital Storage Oscilloscope, Spectrum Analyzer
MDO-2202A 200MHz, 2-channel, Digital Storage Oscilloscope, Spectrum Analyzer
MDO-2102A 100MHz, 2-channel, Digital Storage Oscilloscope, Spectrum Analyzer

ACCESSORIES

User manual CD x 1, Power cord x 1,
GTL-110 BNC-BNC cable x 2 (only on MDO-2000AG)
GTP-100B-4 : 100MHz (10:1/1:1) Switchable passive probe for MDO-2102A/2102AG (one per channel)
GTP-200B-4 : 200MHz (10:1/1:1) Switchable passive probe for MDO-2202A/2202AG (one per channel)
GTP-300B-4 : 300MHz (10:1/1:1) Switchable passive probe for MDO-2302A/2302AG (one per channel)

OPTIONAL ACCESSORIES

GRA-426 Rack Adapter Panel	GCP-300 300kHz/200A Current probe
GAK-003 50Ω Impedance Adapter	GCP-530 50MHz/30A Current probe
GSC-008 Soft Carrying Case	GCP-500 500kHz/150A Current probe
GTL-246 USB Cable, USB 2.0, A-B Type, 1200mm	GCP-1030 100MHz/30A Current probe
GCP-020 Current Probe, 40Hz~40kHz, 240A,	GCP-1000 1MHz/70A Current probe
Current Probe	GCP-206P Power supply for current probe (2 input channel)
GTP-033A Oscilloscope Probe, 35MHz 1:1	GCP-425P Current Probe - Power Supply, 4 Channel Power Supply for GCP-530/1030
Passive Probe	
GDP-025 Differential Probe, 25M High Voltage	
Differential Probe	
GDP-050 Differential Probe, 50M High Voltage	
Differential Probe	

FREE DOWNLOAD

PC Software OpenWave software	Driver USB driver ; LabView driver
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