



MSO-2000E Series

VPO
Visual Persistence Oscilloscope

200/100/70MHz Mixed-signal Oscilloscope

FEATURES

- 200/100/70MHz Bandwidth Selections : 2 or 4 Channels
- Real Time Sample Rate Per Channel : 1GSa/s (2 Channel Models);
Maximum Real Time Sample Rate : 1 GSa/s (4 Channel Models)
- MSO-2000E Equips with a 16 Channel Logic Analyzer
- MSO-2000EA Equips with a 16 Channel Logic Analyzer and a Dual Channel
25MHz Arbitrary Waveform Generator
- Free Frequency Response Analyzer Software for MSO-2000EA
- Per Channel 10M Memory Depth and VPO Waveform Display Technology
- Waveform Update Rate up to 120,000 wfm/s
- 8 " WVGA TFT LCD
- 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/SPI/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

PANEL INTRODUCTION



1. Hardcopy Key
2. Autoset, Run/Stop, Single & Default Keys
3. Search and Zooming Controls
4. Trigger Controls
5. Math, Reference & Bus Keys
6. Probe Calibration Output
7. USB Host Port
8. Option Key
9. Menu Off Key
10. Logic Analyzer Probe Connector
11. USB Device Port
12. LAN Port
13. Go-NoGo Output
14. Calibration Output
15. Dual Channel Arbitrary Waveform Generator (MSO-2000EA only)
16. GTL-16E : 16-Channel Logic Analyzer Probe
17. GCP-201 : Probe Clip , 20PCS



MSO-2000E Series SELECTION GUIDE

Model	MSO-2204E	MSO-2202E	MSO-2104E	MSO-2102E	MSO-2074E	MSO-2072E
Bandwidth	200MHz	200MHz	100MHz	100MHz	70MHz	70MHz
Channels	4	2	4	2	4	2
Record Length	10M / ch	10M / ch	10M / ch	10M / ch	10M / ch	10M / ch
Real-time Sampling Rate	Max. 1 GSa/s	Per channel 1 GSa/s	Max. 1 GSa/s	Per channel 1 GSa/s	Max. 1 GSa/s	Per channel 1 GSa/s
Built-in	16 Channel Logic Analyzer					

MSO-2000EA Series SELECTION GUIDE

Model	MSO-2204EA	MSO-2202EA	MSO-2104EA	MSO-2102EA	MSO-2074EA	MSO-2072EA
Bandwidth	200MHz	200MHz	100MHz	100MHz	70MHz	70MHz
Channels	4	2	4	2	4	2
Record Length	10M / ch	10M / ch	10M / ch	10M / ch	10M / ch	10M / ch
Real-time Sampling Rate	Max. 1 GSa/s	Per channel 1 GSa/s	Max. 1 GSa/s	Per channel 1 GSa/s	Max. 1 GSa/s	Per channel 1 GSa/s
Built-in	16 Channel Logic Analyzer and Dual Channel 25MHz Arbitrary Waveform Generator					

SPECIFICATIONS

		MSO-2072E(A)	MSO-2074E(A)	MSO-2102E(A)	MSO-2104E(A)	MSO-2202E(A)	MSO-2204E(A)
VERTICAL SENSITIVITY	Channels	2Ch+EXT	4Ch	2Ch+EXT	4Ch	2Ch+EXT	4Ch
	Bandwidth Calculated Rise Time Bandwidth Limit	DC~70MHz (-3dB) 5ns 20MHz		DC~100MHz (-3dB) 3.5ns 20MHz		DC~200MHz (-3dB) 1.75ns 20M/100MHz	
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 (300Vrms CAT II with GTP-070B-4/100B-4/200B-4, 10 : 1 probe) 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 ; FFT Window Displays : Rectangular, Hamming , Hanning, Blackman-Harris					
	Source Trigger Mode Trigger Type Trigger Holdoff Range Coupling Sensitivity	CH1 ,CH2, CH3, CH4, Line, EXT* ; *dual channel models only. 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 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. : 1GSa/s (4ch model); Per channel 1GSa/s (2ch model) 10Mpts/CH 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 3* (* : four channel models only) Channel 2 ; Channel 4* (* : four channel models only) ±3° at 100kHz					

SPECIFICATIONS

		MSO-2072E(A)	MSO-2074E(A)	MSO-2102E(A)	MSO-2104E(A)	MSO-2202E(A)	MSO-2204E(A)
CURSORS AND MEASUREMENT	Cursors Automatic Measurement Control Panel Function Auto Counter Autoset Save Setup Save Waveform	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, RPRESshoot, FPRESshoot, Frequency, Period, RiseTime, FallTime, +Width, -Width, Duty Cycle, +Pulses, -Pulses, +Edges, -Edges, %Flicker, Flicker Idx., FRR, FRF, FFR, FFF, LRR, LRF, LFR, LFF, Phase Cursors measurement Cursors measurement 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 20set 24set					
DISPLAY SYSTEM	TFT LCD Type Display Resolution Interpolation Waveform Display Waveform Update Rate Display mode Display Graticule	8" TFT LCD WGA color display 800 horizontal x 480 vertical pixels (WGA) Sin(x)/x Dots, Vectors, Variable persistence(16ms~10s), 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					
LOGIC ANALYSER SPECIFICATIONS	Sample Rate Bandwidth Record Length Input Channels Trigger Type Thresholds Quad Threshold Selections User-defined Threshold Range Maximum Input Voltage Minimum Voltage Swing Input Impedance Vertical Resolution	Per Channel 1GSa/s 200MHz Per Channel 10M pts (max) 16 Digital (D15 - D0) Edge, Pattern, Pulse Width, Serial bus (I ² C, SPI, UART(RS232/422/485), CAN, LIN), Parallel Bus D0~D3, D4~D7, D8~D11, D12~D15 Thresholds TTL, CMOS(5V, 3.3V, 2.5V), ECL, PECL, 0V, User Defined ±5V ±40 V ±250 mV 101KΩ probe loading 8pF 1 bit					
AWG SPECIFICATIONS (MSO-2000EA only)	Channels Sample Rate Vertical Resolution Max. Frequency Waveforms Output Range Output Resolution Output Accuracy Offset Range Offset Resolution	2 200 Msa/s 14 bits 25 MHz Sine, Square, Pulse, Ramp, DC, Noise, Sinc, Gaussian, 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 RESPONSE ANALYSIS	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 (3 or 4 for four channel model) 20 Hz to 25 MHz 10 to 90 points per decade 20 mVpp to 5 Vpp into High-Z Fixed amplitude across entire sweep Logarithmic overlaid gain and phase plot Two pairs of tracking gain and phase markers Auto-scaled during test					
POWER SOURCE MISCELLANEOUS	Line Voltage Range Multi-Language Menu On-Line Help Time clock Operation Environment	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%, 40°C or below; ≤ 45%, 41°C ~ 50°C					
DIMENSIONS & WEIGHT	384 (W) X 208 (H) X 127.3 (D)mm, Approx. 2.8 kg						

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

Specifications subject to change without notice. MSO2000EGD2DH

ORDERING INFORMATION

MSO-2204E(A)	200MHz, 4 + 16 Channel, Mixed-signal Oscilloscope
MSO-2202E(A)	200MHz, 2 + 16 Channel, Mixed-signal Oscilloscope
MSO-2104E(A)	100MHz, 4 + 16 Channel, Mixed-signal Oscilloscope
MSO-2102E(A)	100MHz, 2 + 16 Channel, Mixed-signal Oscilloscope
MSO-2074E(A)	70MHz, 4 + 16 Channel, Mixed-signal Oscilloscope
MSO-2072E(A)	70MHz, 2 + 16 Channel, Mixed-signal Oscilloscope

"(A)" have built-in a Dual Channel 25MHz Arbitrary Waveform Generator

ACCESSORIES

User manual CD x 1, Power cord x 1	
GCP-201 : Probe Clip, 20PCS	GTL-16E : 16-Channel Logic Analyzer Probe
GTP-070B-4 : 70MHz (10:1/1:1) Switchable passive probe for MSO-2072E(A)/2074E(A) (one per channel)	
GTP-100B-4 : 100MHz (10:1/1:1) Switchable passive probe for MSO-2102E(A)/2104E(A) (one per channel)	
GTP-200B-4 : 200MHz (10:1/1:1) Switchable passive probe for MSO-2202E(A)/2204E(A) (one per channel)	

OPTIONAL ACCESSORIES

GTL-16E	16-Channel Logic Analyzer Probe	GCP-530	50MHz/30A Current probe
GRA-426	Rack Mount Kit	GCP-500	500kHz/150A Current probe
GA-K-003	50Ω Impedance Adapter	GCP-1030	100MHz/30A Current probe
GSC-008	Soft Carrying Case	GCP-1000	1MHz/70A Current probe
GTL-246	USB Cable, USB 2.0, A-B Type, 1200mm	GCP-206P	Power supply for current probe (2 input channel)
GDB-03	Oscilloscope Education & Training Kit	GCP-425P	Current Probe - Power Supply, 4 Channel Power Supply for GCP-530/1030
GTP-033A	Oscilloscope Probe, 35MHz 1:1 Passive Probe, BNC(P/M)	GTP-033A	Oscilloscope Probe, 35MHz 1:1 Passive Probe, BNC(P/M)
GCP-300	300kHz/200A Current probe		

FREE DOWNLOAD

PC Software	OpenWave software	Driver	USB driver ; LabView driver
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