



**VPO**  
Visual Persistence Oscilloscope

The GDS-2000A Series DSO comes along with a high-value design framework, including 2G Sa/s sampling rate, 2M points record length, 2 or 4 input channels and a large screen color LCD display, to perform very fast waveform acquisition and procession at 80,000 wfms/s update rate utilizing VPO (Visual Persistence Oscilloscope) technology.

The GDS-2000A Series, carrying bandwidths of 300MHz, 200MHz, 100MHz and 70MHz and inputs of 2 and 4 channels, makes up a family of 8 in the whole series. The 2M points record length not only enables the long time waveform storage but also plays the role as a huge database of the input signals for the post-storage waveform analysis. Two powerful functions, Waveform Search and Segmented Memory are available of the GDS-2000A Series to facilitate the search the event of interest from the long record length. Waveform search defines the waveform types for the search whereas segmented memory divides the whole record length into a number of segments. Therefore, the process of searching particular waveforms can be easier and faster.

The ping-pong waveform acquisition design and the advanced VPO-technology-based waveform procession system, greatly enhance the speed and the quality of waveform display of GDS-2000A Series at a very fast update rate of 80,000 waveforms per second, GDS-2000A also provides I<sup>2</sup>C, UART, SPI serial bus trigger and decoding functionalities free of charge. Users via GDS-2000A not only to measure basic waveform but also available to analysis the low speed serial bus.

The optional logic analyzer function allows the signal acquisition through logic triggering and enables the logic waveforms and the analog waveforms to be shown on the same screen for comparison and time correlation analysis. This Mixed Signal Oscilloscope (MSO) function is field-installable with a plug-in module, containing either 8 or 16 input channels, at the rear panel. The MSO function supports the I<sup>2</sup>C / SPI / UART serial bus trigger and decoding.

The GDS-2000A Series is equipped with all the features that a high-tech DSO should have today. The RS-232C interface, USB ports, and Go-NoGo output are provided as standard, and the Ethernet port, SVGA Video output and GPIB port are available as options for user's free selection. At a moderate cost, GDS-2000A Series is a DSO to provide high customer-value with innovative design.

## GDS-2000A Series

### FEATURES

- 300/200/100/70MHz Bandwidth, 2 or 4 Input Channels
- 2GSa/s Maximum Real-Time Sampling Rate and 100GSa/s Equivalent Time Sampling Rate
- 2M points Maximum Record length
- VPO Technology to Display Less-Frequently-Occurred Signals
- Fast Update Rate of 80,000 Waveform Per Second
- Segmented Memory Acquisition and Waveform Search Function
- Standard Model Provides I<sup>2</sup>C, UART, SPI Serial Bus Trigger and Analysis Functionality
- Optional 8 or 16 Additional Digital Channels with Logic Analyzer(MSO)
- Upgradable CAN/LIN Bus, DVM, H-Expansion, Data Log and Advanced Logic Functionality
- Optional 5MHz & 25MHz Function Generator
- Flexible Remote Control Connectivity (Standard : USB ; Optional : LAN/GPIB)



Front



Rear Panel

### APPLICATIONS

- Industrial and Educational R&D Labs
- Product Testing and Quality Assurance
- Embedded System and Mix Signal Design
- System Integration & Debugging
- Maintenance & Repair Service

# SPECIFICATIONS

		GDS-2072A	GDS-2074A	GDS-2102A	GDS-2104A	GDS-2202A	GDS-2204A	GDS-2302A	GDS-2304A
VERTICAL SENSITIVITY	Channels	2Ch+EXT	4Ch+EXT	2Ch+EXT	4Ch+EXT	2Ch+EXT	4Ch+EXT	2Ch+EXT	4Ch+EXT
	Bandwidth Calculated Rise Time Bandwidth Limit	DC~70MHz(-3dB) 5ns 20MHz		DC~100MHz(-3dB) 3.5ns 20MHz		DC~200MHz(-3dB) 1.75ns 20M/100MHz		DC~300MHz(-3dB) 1.17ns 20M/100M/200MHz	
	Vertical Resolution Input Coupling Input Impedance Offset Position Range DC Gain Accuracy (**)	8 bits@1M : 1mV*~10V (* : When the vertical scale is set to 1mV/div, the bandwidth limit will be set to 20MHz automatically) AC, DC, GND 1MΩ // 16pF approx. ±(3% X  Readout  + 0.1div + 1mV) when 2mV/div or greater is selected ; ±(5% X  Readout  + 0.1 div + 1mV) when 1mV/div is selected (** : The measurement type is average of ≥16 waveforms with vertical position at zero)							
	Polarity Maximum Input Voltage Offset Position Range Waveform Signal Process	Normal, Invert 300Vrms, CAT I (300Vrms CAT II with GTP-150A-2/250A-2/350A-2 10:1 probe) 1mV/div ~ 20mV/div : ±0.5V ; 50mV/div ~ 200mV/div : ±5V ; 500mV/div ~ 2V/div : ±25V ; 5V/div~10V/div : ±250V +, -, x, ÷, FFT, FFTms, d/dt(Differentiation*), ∫ dt(Integration*), √ FFT : Spectral magnitude. Set FFT Vertical Scale to Linear RMS or dBV RMS, and FFT Window to Rectangular, Hamming, Hanning, or Blackman-Harris.							
TRIGGER	Source Trigger Mode Trigger Type  Trigger Holdoff Range Coupling Sensitivity	Ch1, CH2, CH3*, CH4*, Line, EXT, D0-D7 or D0-D15** ; *four channel models only. **Logic analyzer option 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, Glitch Trigger, Duration Trigger, Slope Trigger, Time out, Event-Delay(1~65,535 events), Time-Delay(Duration;10ns~10s), Logic*, Bus* , *with DS2-08LA or DS2-16LA option 10ns ~ 10s AC, DC, LF rej., HF rej., Noise rej. DC ~ 100MHz Approx. 1div or 1.0mV ; 100MHz ~ 200MHz Approx. 1.5div or 15mV ; 200MHz ~ 300MHz Approx. 2div or 20mV							
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 ET 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 1,000 div max (depend on time base) ±20 ppm over any ≥ 1 ms time interval Max : 2GSa/s 100GSa/s maximum for all models Max : 2Mpts Normal, Average, Peak Detect, Single Sequence 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							
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(%) 36 sets: Pk-Pk, Max, Min, Amplitude, High, Low, Mean, Cycle Mean, RMS, Cycle RMS, Area, Cycle Area, ROVShoot, RPREShoot, FPREShoot, Frequency, Period, RiseTime, FallTime, +Width, -Width, Duty Cycle, +Pulses, -Pulses, +Edges, -Edges, FRR, FRF, FFR, LRR, LRF, LFR, LFF, Phase 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 Display Graticule	8" TFT LCD SVGA color display(LED Back-light) 800 horizontal x 600 vertical pixels (SVGA) Sin(x)/x & Equivalent time sampling Dots, Vectors, Variable persistence(16ms~10s), Infinite persistence 80,000 waveforms per second, maximum Display mode : YT ; XY 8 x 10 divisions							
INTERFACE	RS-232C USB Port Ethernet Port (LAN) SVGA Video Port GPIB Go/NoGo BNC Kensington Style Lock	DB-9 male connector USB 2.0 Full-speed host port, USB 2.0 Full-speed device port RJ-45 connector, 10/100Mbps with HP Auto-MDIX (option) SVGA output (option) GPIB module (option) 5V Max/10mA TTL open collector output Rear-panel security slot connects to standard Kensington-style lock							
LOGIC ANALYZER (OPTION)	Sample Rate Bandwidth Record Length Input Channels Trigger Type Thresholds Threshold Selections Threshold Accuracy User-defined Threshold Range Maximum Input Voltage Minimum Voltage Swing Input Impedance Vertical Resolution	500MSa/s 200MHz 2M max 16 Digital (D15 - D0) or 8 Digital (D7~D0) Edge, Pattern, Pulse Width, Serial bus (I <sup>2</sup> C, SPI, UART), Parallel Quad-D0 ~ D3, D4 ~ D7... Thresholds D8~D11*, D12~D15* (*: DS2-16LA only) TTL, CMOS, ECL, PECL, User Defined ±100mV ±10V ±40V ±500mV 101KΩ probe loading 8 pF 1 bit							
OPERATING ENVIRONMENT	Temperature	0°C ~ 50°C, Relative Humidity≤80% at 40°C or below ; ≤45% at 41°C~50°C							
POWER SOURCE	Line Voltage Range Multi-Language Menu On-Line Help Time clock	AC 100V ~ 240V, 48Hz ~ 63Hz, auto selection Available Available Time and date, provide the date/time for saved data							
MISCELLANEOUS									
DIMENSIONS & WEIGHT		380(W) X 220(H) X 145(D)mm, Approx. 4.2 kg							

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

Specifications subject to change without notice. BH-2000AGD4BH

## ORDERING INFORMATION

GDS-2304A	300MHz, 4-Channel, Digital Storage Oscilloscope
GDS-2302A	300MHz, 2-Channel, Digital Storage Oscilloscope
GDS-2204A	200MHz, 4-Channel, Digital Storage Oscilloscope
GDS-2202A	200MHz, 2-Channel, Digital Storage Oscilloscope
GDS-2104A	100MHz, 4-Channel, Digital Storage Oscilloscope
GDS-2102A	100MHz, 2-Channel, Digital Storage Oscilloscope
GDS-2074A	70MHz, 4-Channel, Digital Storage Oscilloscope
GDS-2072A	70MHz, 2-Channel, Digital Storage Oscilloscope

## ACCESSORIES

Quick start guide , User manual CD x 1, Power cord x 1
GTP-070B-4 :70MHz (10:1/1:1) Switchable passive probe for GDS-2072A/2074A(one per channel)
GTP-150A-2 :150MHz (10:1/1:1) Switchable passive probe for GDS-2102A/2104A(one per channel)
GTP-250A-2 :250MHz (10:1/1:1) Switchable passive probe for GDS-2202A/2204A(one per channel)
GTP-350A-2 :350MHz (10:1/1:1) Switchable passive probe for GDS-2302A/2304A(one per channel)

## OPTION

DS2-LAN	Ethernet & SVGA output	DS2-16LA	16-Channel Logic Analyzer includes 16 Channel Logic Analyzer Card (GLA-16)
DS2-GPIB	GPIB Interface	DS2-08LA	8-Channel Logic Analyzer includes 8-Channel Logic Analyzer Card (GLA-08)
DS2-FGN	DDS Function Generator		
AFG-125	25MHz Single channel USB Modular Arbitrary Function Generator		
AFG-225	25MHz Dual channel USB Modular Arbitrary Function Generator		

## OPTION ACCESSORIES

CTL-08LA	8-Channel Logic Analyzer Probe	GDB-03	Oscilloscope Education & Training Kit
CTL-16LA	16-Channel Logic Analyzer Probe	GCP-005	Current Probe, 40Hz ~ 1kHz, 5A, Current Probe
CLA-08	8-Channel Logic Analyzer Card	GCP-020	Current Probe, DC ~ 100kHz, 10A, Current Probe
CLA-16	16-Channel Logic Analyzer Card	GCP-100	Current Probe, 40Hz ~ 10kHz, 20A, Current Probe
GRA-420	Rack Adapter Panel	GCP-1030	Current Probe, DC ~ 100MHz, 30Arms, Current Probe
GAK-003	50Ω Impedance Adapter	GCP-206P	Current Probe - Power Supply, 2 Channel Power Supply for GCP-530/1030
CSC-008	Soft Carrying Case	GCP-245P	Current Probe - Power Supply, 4 Channel Power Supply for GCP-530/1030
DS2-FH1	Module extension bay & USB Type A to Type A/B cable	GCP-530	Current Probe, DC ~ 50MHz, 30Arms, Current Probe
GTL-232	RS-232C Cable, 9-pin, F-F Type, null modem, 2000mm	GDP-025	Differential Probe, 25M High Voltage Differential Probe
GTL-246	USB Cable, USB 2.0, A-B Type, 1200mm	GDP-050	Differential Probe, 50M High Voltage Differential Probe
GTL-248	GPIB Cable, Double Shielded, 2000mm	GDP-100	Differential Probe, 100M High Voltage Differential Probe
GTL-251	USB-GPIB Adapter, GPIB-USB-HS, USB 2.0, Hi-Speed USB compliance, 2000mm	GTP-033A	Oscilloscope Probe, 35MHz 1:1 Passive Probe, BNC(P/M)

## FREE DOWNLOAD

PC Software	FreeWave software	Driver	USB driver ; LabView driver
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