



**VPO**  
Visual Persistence Oscilloscope

## 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

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.

### 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									
VERTICAL SENSITIVITY	Channels	GDS-2072A	GDS-2074A	GDS-2102A	GDS-2104A	GDS-2202A	GDS-2204A	GDS-2302A	GDS-2304A
		2Ch+EXT	4Ch+EXT	2Ch+EXT	4Ch+EXT	2Ch+EXT	4Ch+EXT	2Ch+EXT	4Ch+EXT
	Bandwidth	DC~70MHz(-3dB)		DC~100MHz(-3dB)		DC~200MHz(-3dB)		DC~300MHz(-3dB)	
	Rise Time	5ns		3.5ns		1.75ns		1.17ns	
	Bandwidth Limit	20MHz		20MHz		20M/100MHz		20M/100M/200MHz	
	Vertical Resolution	8 bits@1M : 1mV*~10V ( * : When the vertical scale is set to 1mV/div, the bandwidth limit will be set to 20MHz automatically)							
	Input Coupling	AC, DC, GND							
	Input Impedance	1MΩ// 16pF approx.							
	DC Gain Accuracy(**)	±(3% X  Readout  + 0.1div + 1mV) when 2mV/div or greater is selected ; ±(5% X  Readout  + 0.1div + 1mV) when 1mV/div is selected ( ** : The measurement type is average of 216 waveforms with vertical position at zero)							
	Polarity	Normal , Invert							
	Maximum Input Voltage	300Vrms , CAT I (300Vrms CAT II with GTP-150A-2/250A-2/350A-2 10:1 probe)							
	Offset Position Range	1mV/div ~ 20mV/div : ±0.5V ; 50mV/div ~ 200mV/div : ±5V ; 500mV/div ~ 2V/div : ±25V ; 5V/div~10V/div : ±250V							
	Waveform Signal Process	+ , - , × , ÷ , FFT , FFTrms , d/dt(Differentiation*) , ∫ dt (Integration*) , $\sqrt{\quad}$ 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	Ch1 , CH2, CH3* , CH4* , Line, EXT, D0-D7 or D0-D15** ; *four channel models only. **Logic analyzer option only.							
	Trigger Mode	Auto (Supports Roll Mode for 100 ms/div and slower), Normal, Single Sequence							
	Trigger Type	Edge, Pulse Width(Glitch), Video, Pulse Runt, Rise & Fall(Slope), Alternate, Time out, Event-Delay(1~65,535 events), Time-Delay(Duration;10ns~10s), Logic* , Bus* , *with DS2-08LA or DS2-16LA option							
	Trigger Holdoff Range	10ns ~ 10s							
	Coupling	AC, DC, LF rej. , Hf rej. , Noise rej.							
	Sensitivity	DC ~ 100MHz Approx. 1div or 1.0mV ; 100MHz ~ 200MHz Approx. 1.5div or 15mV ; 200MHz ~ 300MHz Approx. 2div or 20mV							
EXT TRIGGER	Range	±15V							
	Sensitivity	DC ~ 100MHz Approx. 100mV							
	Input Impedance	100MHz ~ 200MHz Approx. 150mV ; 200MHz ~ 300MHz Approx. 150mV							
		1MΩ±3% , ~16pF							
HORIZONTAL	Time Base Range	1ns/div ~ 100s/div (1-2-5 increments); ROLL : 100ms/div ~ 100s/div							
	Pre-trigger	10 div maximum							
	Post-trigger	1,000 div max ( depend on time base )							
	Time Base Accuracy	±20 ppm over any ≥ 1 ms time interval							
	Real Time Sample Rate	Max. : 2GSa/s							
	ET Sample Rate	100GSa/s maximum for all models							
	Record Length	Max. : 2Mpts							
	Acquisition Mode	Normal, Average, Peak Detect, Single Sequence							
	Peak Detection	2ns (typical)							
	Average	Selectable from 2 to 256							
X-Y MODE	X-Axis Input	Channel 1 ; Channel 3* ( * : four channel models only )							
	Y-Axis Input	Channel 2 ; Channel 4* ( * : four channel models only )							
	Phase Shift	±3° at 100kHz							
CURSORS AND MEASUREMENT	Cursors	Amplitude, Time, Gating Available; Unit : Seconds(S), Hz(1/S), Phase (Degrees), Ratio(%)							
	Automatic Measurement	36 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, FRR, FRF, FFR, FFF, LRR, LRF, LFR, LFF, Phase							
	Control Panel Function	Cursors measurement							
	Auto Counter	6 digits, range from 2Hz minimum to the rated bandwidth							
	Autoset	Single-button, automatic setup of all channels for vertical, horizontal and trigger systems, with undo Autoset							
	Save Setup	20set							
	Save Waveform	24set							
DISPLAY SYSTEM	TFT LCD Type	8" TFT LCD SVGA color display(LED Back-light)							
	Display Resolution	800 horizontal x 600 vertical pixels (SVGA)							
	Interpolation	Sin(x)/x & Equivalent time sampling							
	Waveform Display	Dots, Vectors, Variable persistence(16ms~10s), Infinite persistence							
	Waveform Update Rate	80,000 waveforms per second, maximum							
	Display	Display mode : YT ; XY							
	Display Graticule	8 x 10 divisions							
INTERFACE	RS-232C	DB-9 male connector							
	USB Port	USB 2.0 Full-speed host port, USB 2.0 Full-speed device port							
	Ethernet Port (LAN)	RJ-45 connector, 10/100Mbps with HP Auto-MDIX (option)							
	SVGA Video Port	SVGA output (option)							
	GPIO	GPIO module (option)							
	Go/NoGo BNC	5V Max/10mA TTL open collector output							
	Kensington Style Lock	Rear-panel security slot connects to standard Kensington-style lock							
LOGIC ANALYZER (OPTION)	Sample Rate	500MSa/s							
	Bandwidth	200MHz							
	Record Length	2M max							
	Input Channels	16 Digital (D15 - D0) or 8 Digital (D7~D0)							
	Trigger Type	Edge, Pattern, Pulse Width, Serial bus (I <sup>2</sup> C, SPI, UART), Parallel							
	Thresholds	Quad-D0 ~ D3, D4 ~ D7. . . . Thresholds D8~D11* , D12~D15* (*: DS2-16LA only)							
	Threshold Selections	TTL, CMOS, ECL, PECL, User Defined							
	Threshold Accuracy	±100mV							
	User-defined Threshold Range	±10V							
	Maximum Input Voltage	±40V							
	Minimum Voltage Swing	±500mV							
	Input Impedance	101KΩ probe loading 8 pF							
	Vertical Resolution	1 bit							
POWER SOURCE MISCELLANEOUS	Line Voltage Range	AC 100V ~ 240V, 48Hz ~ 63Hz, auto selection							
	Multi-Language Menu	Available							
	On-Line Help	Available							
	Time clock	Time and date, provide the date/time for saved data							
	Operation Environment	Temperature: 0°C to 50°C. Relative Humidity: ≤80%, 40°C or below; ≤45%, 41°C ~ 50°C							
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-2000AGD2D	

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BH-2000AGD2DH

ORDERING INFORMATION		OPTION	
GDS-2304A	300MHz, 4-Channel, Digital Storage Oscilloscope	DS2-LAN	Ethernet & SVGA output
GDS-2302A	300MHz, 2-Channel, Digital Storage Oscilloscope	DS2-GPIB	GPIB Interface
GDS-2204A	200MHz, 4-Channel, Digital Storage Oscilloscope	DS2-FGB	DDS Function Generator
GDS-2202A	200MHz, 2-Channel, Digital Storage Oscilloscope	AFG-125	25MHz Single channel USB Modular Arbitrary Function Generator
GDS-2104A	100MHz, 4-Channel, Digital Storage Oscilloscope	AFG-225	25MHz Dual channel USB Modular Arbitrary Function Generator
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		OPTION ACCESSORIES	
Quick start guide , User manual CD x 1, Power cord x 1		GTL-08LA	8-Channel Logic Analyzer Probe
GTP-070A-4 :70MHz (10:1/1:1) Switchable passive probe for GDS-2072A/2074A(one per channel)		GTL-16LA	16-Channel Logic Analyzer Probe
GTP-150A-2 :150MHz (10:1/1:1) Switchable passive probe for GDS-2102A/2104A(one per channel)		GRA-420	Rack Adapter Panel
GTP-250A-2 :250MHz (10:1/1:1) Switchable passive probe for GDS-2202A/2204A(one per channel)		GAK-003	50 $\Omega$ Impedance Adapter
GTP-350A-2 :350MHz (10:1/1:1) Switchable passive probe for GDS-2302A/2304A(one per channel)		GLA-08	8-Channel Logic Analyzer Card
		GLA-16	16-Channel Logic Analyzer Card
		DS2-FH1	Module extension bay & USB Type A to Type A/B cable
FREE DOWNLOAD			
PC Software	FreeWave software	Driver	USB driver ; LabView driver

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