GDS-2000E Series

VPO
Visual Persistence Oscilloscope

200/100MHz Digital Storage Oscilloscope

FEATURES

- 200/100MHz Bandwidth
- Sampling Rate : Max. 1GSa/s (4ch Model);Per Channel 1GSa/s (2ch Model)
- 10M Maximum Memory Depth and VPO Waveform Display Technology
- Waveform Update Rate of 120,000 wfm/s
- 8 ” 800 x 480 TFT LCD Display
- Max. 1M pts of FFT to Get Higher Resolution in Frequency Domain
- Digital Filter Function
- Segmented Memory and Waveform Search Functions
- I^2C/SPI/UART/CAN/LIN Serial Bus Trigger and Decoding Function
- Data Log Function for Waveform Observation in Long Periods of Time
- Network Storage Function

GW INSTEK
Simply Reliable

Fast Retrieval, Precision Measurement

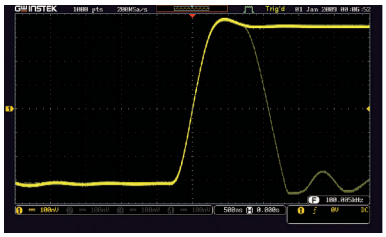
1GSa/s Maximum Real-Time Sampling Rate and 10M Maximum Memory Depth

The GDS-2000E digital oscilloscope features bandwidth selections of 200MHz, 100MH, and 70MHz. Two-channel model provides 1GSa/s real-time sampling rate for each channel; four-channel model provides 1GSa/s maximum real-time sampling rate. The 8-inch 800 x 480 TFT LCD display and the minimu 1mV/div vertical range allow the GDS-2000E Series to measure complex feeble signals and clearly display measurement results.

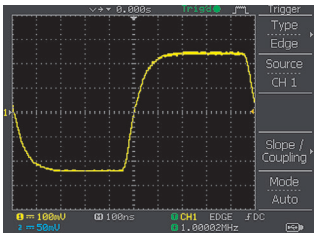
With respect to the memory depth, the GDS-2000E Series digital oscilloscope provides 10M long memory for users to completely retrieve and analyze waveforms. Users, based upon the application requirements, can select 1K, 10K, 100K, 1M or 10M memory depth. Short memory depth collocating with the high sampling rate allows users to observe fast-changing waveforms and, on the other hand, long memory depth aims for continuously changing waveforms. The GDS-2000E Series is equipped with waveform search and segmented memory functions to expand the flexible applications of 10M long memory. The segmented memory can be divided the maximum into 29,000 sections for users to bypass any unimportant waveforms so as to swiftly search all required waveforms. With the function, more meaningful waveforms can be saved and target waveforms can be displayed rapidly. With the waveform search function, users can rapidly search desired waveforms according to the required trigger conditions.

Waveform Update Rate of 120,000 wfm/s and VPO Waveform Display Technology

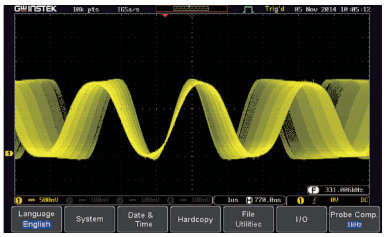
The GDS-200E digital oscilloscope allows users to easily and completely observe inrush signals and rare transient waveforms to increase waveform debugging efficiency by using features, including advanced VPO (Visual Persistence Oscilloscope) signal processing technology, waveform update rate as high as 120,000 wfm/s, and multi-layered afterglow display to enhance waveform display efficiency. Oscilloscope with VPO technology displays signals with three dimensional waveforms constructing by amplitude, time and signal strength to show each waveform point. 256 color gradients yield clear waveform changes. Comparing with the conventional digital storage oscilloscope, the GDS-2000E Series provides more natural and more genuine signal display effect which is very close to the original analog signal.



120,000wfms/s

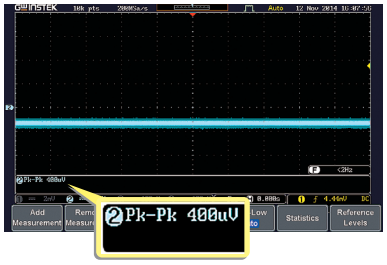


500wfms/s



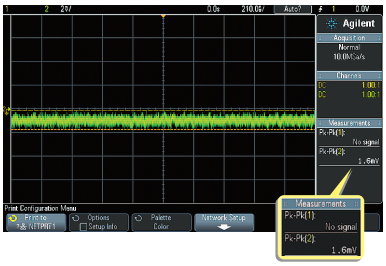
Rich Color Gradient Performance

A. Low Background Noise(Beneficial to Small Signal Measurement)



GW Instek

RIGOL



KEYSIGHT

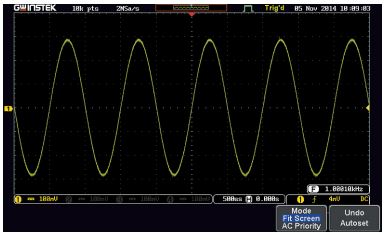
BACKGROUND NOISE COMPARISON			
Model	GW Instek GDS-2000E	Rigol DS2000A	Keysight DSOX2000A
Vp-p(*)	400μV	560μV	1.6mV

For small signal measurement, oscilloscope's background noise will affect the measurement results. The brand new GDS-2000E low noise amplifying circuit can tremendously improve overall noise interference to produce the genuine signal demonstration.

As shown in the above diagram, the GDS-2000E series has merely the background noise of 400μV under 2mV/div that is superior to the same category oscilloscopes from competitors.

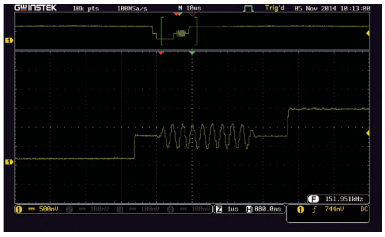
* The measurement data were retrieved from actual tests, under same test conditions.

B. Small Signal Autoset Retrieving Capability



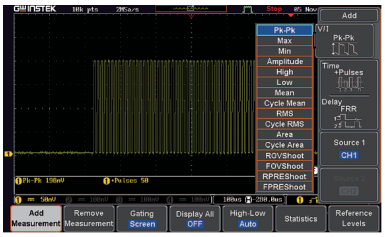
The Autoset function of the GDS-2000E series can retrieve waveform as fast as 0.7 seconds. The GDS-2000E series assists users to rapidly retrieve wavefors of small signals equivalent to 8mV/30Hz.

C. Dual Display Screen Zoom-In and Play/Pause Functions

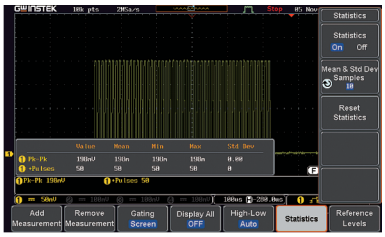


The GDS-2000E series provides the dual display screen zoom-in function to simultaneously display waveforms and major target areas. Users can zoom in display area by adjusting time/div. Under zoom-in mode, waveform can be played or paused so as to automatically view all input waveforms on the moving zoom-in screen. Users can swiftly identify each desired event. Manual control play speed and direction can be adjusted according to users' requirements. Press “Pause” to stop the play function. With “waveform search”, all desired events from different stages can be rapidly identified and examined back and forth. The GDS-2000E series is capable of swiftly searching signals and observing signals' details. 10M long memory depth provides the function of complete waveform retrieval and analysis.

D. 36 Items of Auto Measurement Selection and the Statistics Function

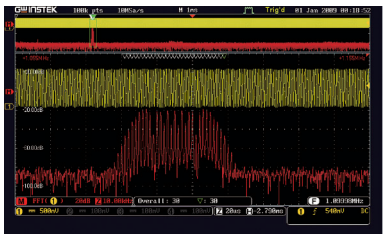


The GDS-2000E series soundly provides 36 measurement items. Based upon the paramters such as voltage, current, time, frequency, and delay measurement, users can decide which measurement items to choose. On the single display screen, the GDS-2000E series provides 8 measurement selections.

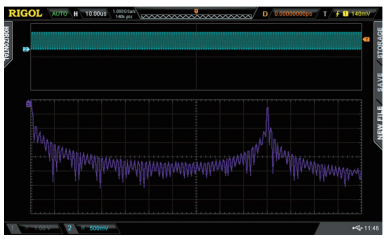


The statistics mode can also be selected for users to analyze the mean value, the maximum, the minimum, and standard deviation of the retrieved waveforms to ensure signal's integrity and identify abnormal waveforms.

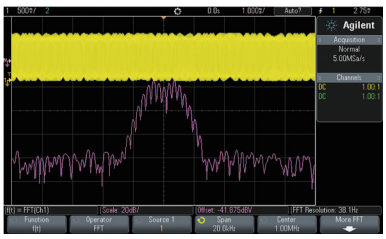
E. 1M FFT Frequency Domain Display Function



GW Instek GDS-2000E - FFT Display



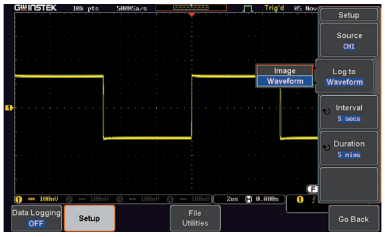
RIGOL DS2000A - FFT Display



KEYSIGHT DSOX2000A - FFT Display

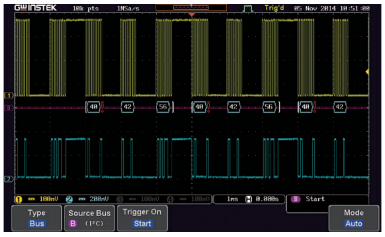
The FFT function of the GDS-2000E Series provides the maximum 1M display for more precision frequency domain display. The function supports four window displays, including Rectangular, Hamming, Hanning, and Black-harris. Users select window display for frequency domain analysis according to test requirements. The GDS-2000E Series not only provides the FFT function but also FFTrms, vertical adjustment, and local zoom-in functions for users to adjust waveforms of frequency domain by their requirements. Via rapid waveform update rate and waveform search functions, users can precisely observe the test results of frequency domain, Users can clearly differentiate the difference between 1M FFT and low-resolution FFT by viewing the above diagrams.

F. Data Log Function



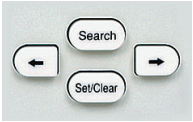
Users, via the data log function, can observe waveform changes in long periods of time to ensure prouct reliability or measure sporadically appeared signals. The data log function, based on the requirements, can set record time and interval. Record time can be selected from 5 minutes to 100 hours, and record interval is 5 seconds, the minimum. Waveform type for record data and CSV file format for each channel can also be selected. Data can be stored in USB drive, the GDS-2000E series or the remote computer via LAN.

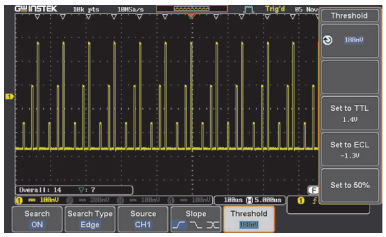
G. Support Serial Bus Trigger and Decoding Function



The serial bus technology has been widely applied in the present embedded application design. How to rapidly and correctly trigger and analyze serial bus data has posed a difficult challenge to engineers. The GDS-2000E series provides serial bus analysis function and 10M long memory depth to trigger, decode, and analyze frequently used I^2C, SPI ,UART serial bus and CAN/LIN bus, which is often used by automotive communications.

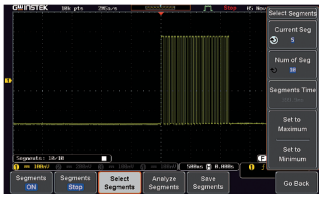
H. Waveform Search Function





Users can rapidly search desired waveforms according to the trigger condition. After activating the search function, hollow inverted triangles will show the location met the trigger condition. The upper left hand corner Overall will show the total number of waveforms met the trigger condition. Users can set waveform search by the trigger condition such as Edge, pulse width, Runt, Rise/Fall, and Bus. When the trigger condition is met, hollow inverted triangles will appear. Users can save all marks to compare with the next input signal. The front panel of the GDS-2000E series controls waveform zoom-out and play/pause function to swiftly identify each desired event. The function allows users to conveniently complete waveform search and save marks for rapid comparison and analysis.

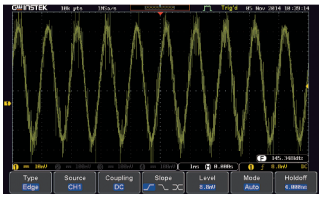
I. Segmented Memory Function



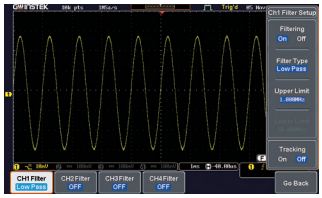
Users Can Also Select "Analyze Segments" To Conveniently Obtain The Analysis Results.

To achieve the most ideal application for memory depth, the GDS-2000E serieshas the built-in segmented memory function. The segmented memory function allows users to select the desired important signals for observation. Hence, insignificant signals can be neglected and serial bus decoding; pulse or inrush signals can be identified when retrieving signals. The segmented memory function of the GDS-2000E series allows users to select the number of sections. The maximum sections can be selected are 29,000. Afer activating the function, users can select and observe waveform for each segment by turning the Variable knob. The ultimate application of memory depth, therefore, is completely realized.

J. Digital Filter Function



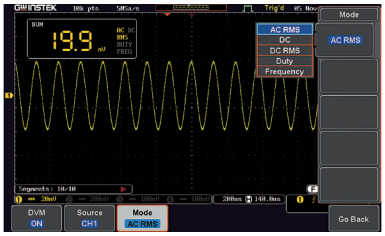
Unfiltered Waveform with Noise Interference



Filtered Waveform, Noise Removed

Engineers are often troubled by noise interference while measuring signals in the electric circuit tests. The GDS-2000E series features the digital filter function which can be set to high pass or low pass digital filter. Digital filter allows users to independently set filter frequency for each channel. The tracking on function rapidly sets same filter frequency for all channels.

K. Digital Voltage Meter



The integrated digital voltage meter provides three-digit voltage meter and five-digit frequency counter. Its function includes tests for AC rms, DC, DC rms, period and frequency. Under the limited resources, engineers can simultaneously monitor voltage and frequency as well as conduct complex measurement for signal trigger to elevate the R&D efficiency. This feature is very convenient for users to grasp the actual issue, diagnose and debug system circuit.

PANEL INTRODUCTION

CE | USB high Speed | PC Software | Labview Driver | Ethernet | PictBridge Compatible

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. USB Device Port
11. LAN Port
12. Go-NoGo Output
13. Calibration Output

4 Channel Model

2 Channel Model

SELECTION GUIDE

Model	GDS-2104E	GDS-2102E	GDS-2204E	GDS-2202E
Bandwidth	100MHz	100MHz	200MHz	200MHz
Channels	4	2	4	2
Record Length	10M / ch	10M / ch	10M / ch	10M / ch
Real-time Sampling Rate	Max. 1 GSa/s	1 GSa/s / ch	Max. 1 GSa/s	1 GSa/s / ch
Waveform Update Rate	120,000wfms/s	120,000wfms/s	120,000wfms/s	120,000wfms/s

SPECIFICATIONS

		GDS-2102E	GDS-2104E	GDS-2202E	GDS-2204E
VERTICALSENSITIVITY	Channels	2Ch+EXT	4Ch	2Ch+EXT	4Ch
	Bandwidth Calculated Rise Time Bandwidth Limit	DC~100MHz(-3dB) 3.5ns 20MHz		DC~200MHz(-3dB) 1.75ns 20M/100MHz	
	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 , FFTrms , 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			
TRIGGER	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. : 1Sa/s (4ch model); Per channel 1GSa/s (2ch model) Max. : 10Mpts 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			
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, FOVShoot, RPREShoot, FPREShoot, Frequency, Period, RiseTime, FallTime, +Width, -Width, Duty Cycle, +Pulses, -Pulses, +Edges, -Edges, FRR, FRF, FFR, FFF, 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 mode Display Graticule	8" TFT LCD WVGA color display 800 horizontal x 480 vertical pixels (WVGA) Sin(x)/x Dots, Vctors, V ariable 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 Full-speed host port x 1, USB High-speed 2.0 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			
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. DS-2000EGD2BH

ORDERING INFORMATION

GDS-2204E 200 MHz, 4-Channel, Digital Storage Oscilloscope
GDS-2202E 200 MHz, 2-Channel, Digital Storage Oscilloscope
GDS-2104E 100 MHz, 4-Channel, Digital Storage Oscilloscope
GDS-2102E 100 MHz, 2-Channel, Digital Storage Oscilloscope

ACCESSORIES

Power cord x 1

GTP-100B-4 100 MHz(10:1/1:1) Switchable passive probe for GDS-2102E/2104E(one per channel)

GTP-200B-4 200 MHz(10:1/1:1) Switchable passive probe for GDS-2202E/2204E(one per channel)

OPTIONAL ACCESSORIES

GRA-426 Rack Adapter Panel
GAK-003 50 Ω Impedance Adapter
GSC-008 Soft Carrying Case
GTL-246 USB Cable, USB 2.0, A-B Type, 1200 mm
GCP-300 300 kHz/200 A Current probe
GCP-530 50 MHz/30 A Current probe
GCP-500 500 kHz/150 A Current probe
GCP-1030 100 MHz/30 A Current probe
GCP-1000 1 MHz/70 A Current probe
GCP-0275 2 MHz/750 A Current probe
GCP-0550 5 MHz/500 A Current probe
GCP-2525 25 MHz/250 A Current probe
GCP-206P Power supply for current probe (2 input channel)
GCP-425P Power supply for current probe (4 input channel)
GTP-033A Oscilloscope Probe, 35 MHz 1:1 Passive Probe, BNC(P/M)
GDP-025 25 MHz High voltage differential probe
GDP-050 50 MHz High voltage differential probe
GDP-100 100 MHz High voltage differential probe
GDP-1020P 1 GHz/20 V High Frequency Differential Probe
GDP-2035H 200 MHz/3500 Vpk High Voltage Differential Probe

FREE DOWNLOAD

PC Software OpenWave software
Driver USB driver ; LabView driver

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GW INSTEK
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