

GDS-2000E Series DSO New Product Announcement

GW Instek debuts the brand new GDS-2000E series to offer users a more affordable and excellent 8" TFT LCD oscilloscope.

The GDS-2000E Series Digital Storage Oscilloscope offers 2 and 4-channel configurations and the bandwidth selections, including 200MHz, 100MHz and 70MHz. 4 channel models of the series provide 1GSa/s max.real-time sampling rate; 2 channel models of the series provide 1GSa/s per channel real-time sampling rate .The series is equipped with waveform update rate of 120,000 wfm/s. The 8-inch 800*480 16:9 WVGA display and the minimum 1mV/div vertical range allow the GDS-2000E series to clearly display complex and random waveforms.

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The GDS-2000E series provides 10 Mega point record length in each channel with Waveform Search and Segmented Memory functions, which greatly enhance the value of long memory utilization of a DSO. The GDS-2000E series also provides 1M max. FFT display. High resolution FFT display, high waveform update rate, Window Zoom and Peak Search allow users to obtain more accurate and efficient test and measurement results while conducting tests in the frequency domain.



GDS-2000E Series product description

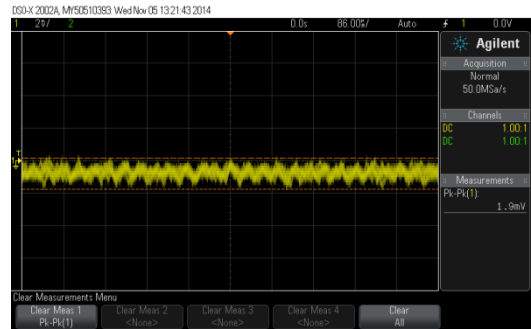
	<p>GDS-2204E 200MHz, 4-channel, Digital Storage Oscilloscope</p> <p>GDS-2104E 100MHz, 4-channel, Digital Storage Oscilloscope</p> <p>GDS-2074E 70MHz, 4-channel, Digital Storage Oscilloscope</p>
<p>GDS-2000E Series 4ch models</p>	

	<p>GDS-2202E 200MHz, 2-channel, Digital Storage Oscilloscope</p> <p>GDS-2102E 100MHz, 2-channel, Digital Storage Oscilloscope</p> <p>GDS-2072E 70MHz, 2-channel, Digital Storage Oscilloscope</p>
<p>GDS-2000E Series 2ch models</p>	

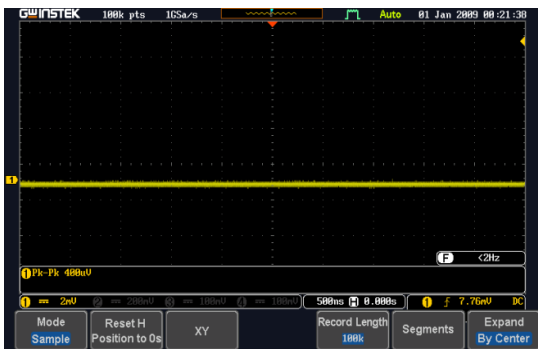
Low Background Noise

For small signal measurement, oscilloscope's background noise will affect the measurement results.

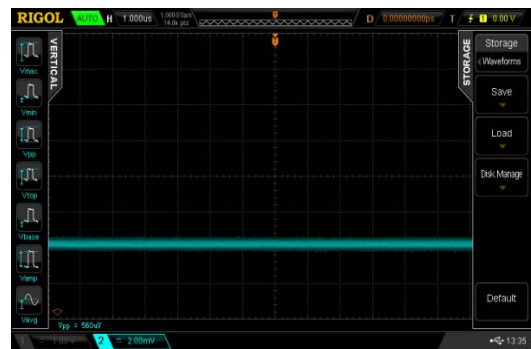
The brand new GDS-2000E low noise amplifying circuit can tremendously improve overall noise interference to produce the genuine signal demonstration. As shown in the below diagram, the GDS-2000E series has merely the background noise of 400uV under 2mV/div that is superior to the same category oscilloscopes developed by competitors.



Keysight DSOX2000A



GW Instek GDS-2000E



Rigol DS2000A

Background noise comparison			
Model	GW GDS2000E	Rigol DS2000A	Keysight DSOX2000A
Vp-p ^(*)	400uV	560uV	1.6mV

(*): The measurement data were retrieved from actual tests, under same test conditions. (Voltage range: 2mV/div, without any input; test result from Vp-p)

120,000wfm/s waveform update rate

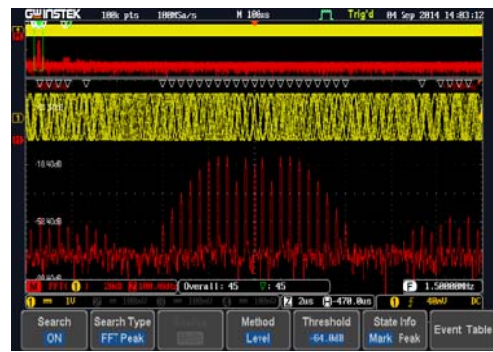
The GDS-2000E digital oscilloscope allows users to easily observe rare transient waveforms and jitters with the high waveform update rate of 120,000 wfm/s. The advanced VPO (Visual Persistence Oscilloscope) signal processing technology combines the multi-layered gray display to enhance waveform display efficiency that allows users to easily and completely observe inrush signals and rare transient waveforms to increase waveform debugging efficiency. As shown on the right diagram, GDS-2000E can easily retrieve and differentiate rare transient signals. Oscilloscope with VPO technology displays signals with three dimensional waveform data constructing by amplitude, time and signal strength to show each waveform point. Comparing with the conventional digital storage oscilloscope, the GDS-2000E series provides more useful information on the screen.



1M FFT Display

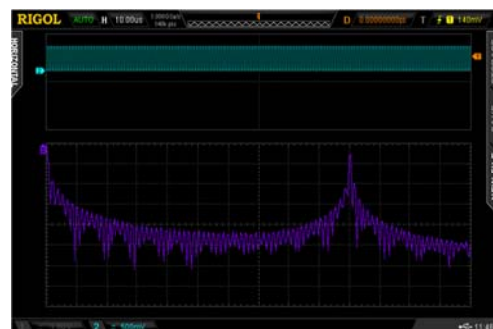
The FFT (Fast Fourier Transform) function of the GDS-2000E Series provides the maximum 1M points display. The function supports four window displays, including Rectangular, Hamming, Hanning, and Black-harris. Users select window display for frequency domain analysis according to their test requirements. After selecting the FFT function, dB marker will be shown on the screen for users to easily identify frequency domain signals. The GDS-2000E series not only provides the FFT function but also FFTrms, vertical adjustment, and local zoom-in functions. Via rapid waveform update rate and waveform search functions, users can precisely observe the test results of frequency domain.

Right diagram 1 shows GDS-2000E FFT display. We can clearly see that each spectrum component is shown in the frequency domain.



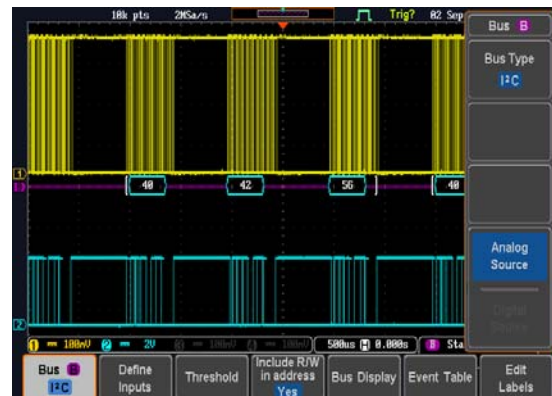
Right diagram 2 and 3 are the frequency domain display for Keysight DSOX2000A and Rigol DS2000A. For Keysight DSOX2000A, the waveform envelop can be seen and vector component of each frequency domain cannot be seen.

For right diagram 3 Rigol DS2000A, its frequency domain display has a great difference comparing with the real frequency domain signals.



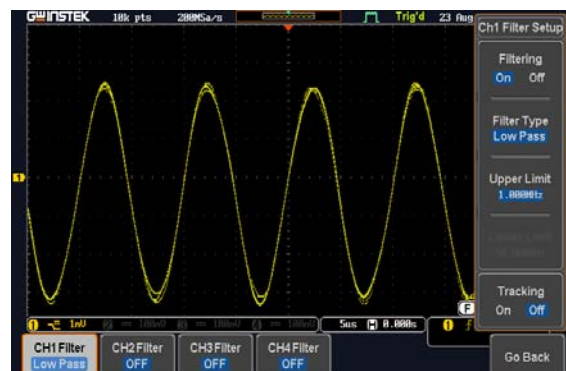
Support I2C/SPI/UART/CAN/LIN Decoding and Analysis

The serial bus technology has been widely applied in the present embedded application design. 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, in a long period, frequently used I²C, SPI and UART serial bus and CAN/LIN bus, which is often used by automotive communications. Without the extra software cost, school courses and embedded system design can easily conduct excellent serial bus decoding and analysis by using the GDS-2000E series oscilloscopes.



Digital Filter Function

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 parameters for each channel. The tracking on function rapidly sets all channels to the same filter frequency. The GDS-2000E series provides users with the digital filter function to rapidly remove high or low frequency noise interference in the electric circuit so as to correctly obtain measurement parameters.



GDS-2000E Features and Functions

- 200/100/70MHz Bandwidth Selection; 2 or 4 Channels
- 1GSa/s Real-Time Sampling Rate for Each Channel (2ch model) ; 1GSa/s Maximum Real-Time Sampling Rate (4ch model)
- Standard 10M Maximum Memory Depth and VPO Waveform Display Technology
- Max. Waveform Update Rate of 120,000 wfm/s
- 8 " WVGA TFT LCD Display
- FFT with Maximum 1M points to Provide Higher Frequency Domain Resolution Measurement
- High and Low Pass Digital Filter Functions
- 29,000 Sections of Segmented Memory and Waveform Search Functions
- I2C/SPI/UART/CAN/LIN Serial Bus Trigger and Decoding Function
- Data Log Function Tracks Signal Changes Up To 100 hours
- Network Storage Function

The GDS-2000E series provides rich functionalities which are identical to that of the GDS-2000A series including Zoom Window, Play/Pause, 36 automatic measurements with statistics mode, and remote software and digital voltage meter. The complete functionalities can meet the requirement of various signal retrievals and measurements.

Key Dates for Product Announcement

1. Order Queue Open (Jan 12th 2015)
2. Global Market Announcement (Jan 12th 2015)
3. Demo Units Delivery to Distributors (Jan 30th 2015)
4. Mass-Quantity Order Fulfillment (Feb 6th 2015)

GDS-2000E Product Position

The GDS-2000E series is developed by GW Instek to offer users a more affordable and excellent mid-level oscilloscope.

1. The position of the GDS-2000e series is between GDS-1000A-U and GDS-2000A.
2. The series can satisfy the requirement of preliminary industrial measurement and mid-level school courses.

Target Markets and Associated Features

1. Preliminary industrial test oscilloscope (10M memory depth ;Waveform update rate of 120,000wfm/s;1M FFT; Digital Filter and Serial bus trigger and decode)
2. Medium-level educational oscilloscope (8" WVGA display ; 10M memory depth; Waveform update rate of 120,000wfm/s and Serial bus trigger and decode)
3. Serial bus design (8" WVGA display; standard provide I2C ,SPI ,UART ,CAN ,LIN bus trigger and decode)

Comparison table

	GW Instek GDS-2000E Series	Rigol DS2000A	Tektronix DPO2000B Series	Keysight DSO2000A
Bandwidth	70/100/200MHz	70/100/200/300MHz	70/100/ 200MHz	70/ 100/ 200MHz
Channels	2 / 4	2	2 / 4	2 / 4
Record Length	10M	14M (option to 56M)	1M	100k ,option to 1M
Waveform capture rate (WFM/sec)	120,000	50,000	5,000	50,000
Real Time Sampling rate	1.Per channel 1 GSa/s (2CH Model) 2. Max. 1 GSa/s (4CH Model)	2Gsa/s	1GS/s	2Gsa/s
Display	8" WVGA 800*480	8" SVGA 800*480	7" WQVGA 480*234	8.5" WVGA 800*480
Horizontal range	1ns~100s/div	70M/100M: 5ns~1000s/div 200M:2ns~1000s/div 300M:1ns~1000s/div	DPO2012/ 2014: 4ns~100s/div DPO2024: 2ns~100s/div	70MHz: 5ns~50s /div 100MHz: 5ns~50s/div 200MHz: 2ns~50s/div
Vertical range	1mV~10V/div	500uV~10V/div	2mV~5V/div	2mV~5V/div
FFT Display	1M pts	100k pts	100K pts	100k pts

Market Strategy

1. Main features: waveform update rate of 120,000wfms/s; FFT display of 1M pts; low background noise.
2. Offer more affordable and excellent 8" display digital oscilloscope.
3. Suggested list price will be 20% lower than the same category GDS-2000A. It will be the most affordable and excellent 2000 series digital oscilloscope.
4. The GDS-2000E series does not have option. If logic analyzer, function generator or GPIB, RS-232 interface are required, please choose the GDS-2000A series.
5. Hopefully, by rolling out the GDS-2000E series, our market share of the mid-level DSO can be expanded.

The following chart shows the major differences between GDS-2000E and GDS-2000A:

	GDS-2000E	GDS-2000A
Bandwidth	70/100/200MHz	70/100/200/300MHz
Sampling Rate	Max. 1GSa/s (4 channel model) Per channel 1GSa/s (2 Channel model)	Max. 2GSa/s
Memory depth	10M	2M
Display	8" TFT LCD WVGA (16:9 ,800*480)	8" TFT LCD SVGA (4:3 ,800*600)
Waveform update rate	120,000WFMs/sec	80,000WFMs/sec
Optional	NA	1) 8 or 16ch Logic Analyzer 2) 2.5M or 25M Function generator 3) GPIB 4) LAN/VGA output
Waveform Signal Process	+ , — ,X , ÷ ,FFT ,FFTrms , , User define math	+ , — ,X , ÷ ,FFT ,FFTrms , ∫dt ,d/dt ,√
Interface	USB(1 device ,2 host), Go/NoGo ,Kensington lock ,LAN	USB (device *1, host *2), RS232, Go/NoGo, Kensington lock , GPIB (optional), LAN/VGA output (optional)

Existing GW Product Replacement

No replacement

At the early stage of entering the market, the GDS-2000E series will coexist with the GDS-2000A series. No oscilloscope will be replaced by this new product.

Service Policy

1. **3 year warranty.** The GDS-2000E Series Oscilloscope carries a standard 3-year warranty. The LCD display panel warranty is 1 year and probe is expendable.

- Service Support.** The service instructions in the Service Manual will help distributors repair defective units promptly. Should the board replacement is necessary to fix the defective unit, the board swapping service support is provided by Good Will Instrument to facilitate the repair jobs done at the distributor's site.
- Firmware upgrade through Website.** Good Will Instrument continues to provide the after sales support through its website. The most updated version of firmware and PC software of GDS-2000E series will be posted on Good Will Instrument Website at <http://www.gwinstek.com> for free download via USB Flash Drive.

Specifications						
	GDS-2072E	GDS-2074E	GDS-2102E	GDS-2104E	GDS-2202E	GDS-2204E
Channels	2ch+Ext	4ch	2ch+Ext	4ch	2ch+Ext	4ch
Bandwidth	DC~70MHz (-3dB)	DC~70MHz (-3dB)	DC~100MHz (-3dB)	DC~100MHz (-3dB)	DC~200MHz (-3dB)	DC~200MHz (-3dB)
Rise time	5ns	5ns	3.5ns	3.5ns	1.75ns	1.75ns
Bandwidth Limit	20MHz	20MHz	20MHz	20MHz	20M/100MHz	20M/100MHz
Vertical Sensitivity						
Resolution	8 bit					
	:1mV~10V/div					
Input Coupling	AC, DC, GND					
Input Impedance	1MΩ// 16pF approx.					
DC Gain Accuracy	±(3%)when 2mV/div or greater is selected ±(5%)when 1mV/div is selected;					
Polarity	Normal & Invert					
Maximum Input Voltage	300Vrms, CAT I					
Offset Position Range	1mV/div ~ 20mV/div : ±0.5V					
	50mV/div ~ 200mV/div : ±5V					
	500mV/div ~ 2V/div : ±25V					
	5V~10V/div : ±250V					
Waveform Signal Process	+, -, ×, ÷, FFT, FFTrms ,User Defined Expression.					
	FFT:1Mpts FFT: Spectral magnitude. Set FFT Vertical Scale to Linear RMS or dBV RMS FFT Window : Rectangular, Hamming , Hanning, Blackman-Harris					
Trigger						
Source	CH1 ,CH2, CH3, CH4, Line, EXT*					
	*EXT only on dual channel models					
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 (~65535 events), Time-Delay (Duration,4nS~10S), Bus					
Hold-off range	4ns~10s					
Coupling	AC,DC,LF rej. ,HF rej. ,Noise rej.					
Sensitivity	1div					

External Trigger (2ch model only)	
Range	±15V
Sensitivity	DC ~ 100MHz Approx. 100mV
	100MHz ~ 200MHz Approx. 150mV
Input Impedance	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	2,000,000 div maximum.
Time base Accuracy	±50 ppm over any ≥ 1 ms time interval
Real Time Sample Rate	Max.:1GSa/s (4ch model) Per channel 1GSa/s (2ch model)
Record Length	Max:10Mpts
Acquisition Mode	Normal, Average, Peak Detect, Single
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(degree) ,Ration(%)
Automatic Measurement	36 sets: Pk-Pk, Max, Min, Amplitude, High, Low, Mean, Cycle Mean, RMS, Cycle RMS, Area, Cycle Area, ROV Shoot, FOV Shoot, RPRE Shoot, FPRE Shoot, Frequency, Period, Rise Time, Fall Time, +Width, -Width, Duty Cycle, +Pulses, -Pulses, +Edges, -Edges, FRR, FRF, FFR, FFF, LRR, LRF, LFR, LFF, Phase ,Cursor measurements
Control Panel Function	
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	
TFT LCD Type	8" TFT LCD WVGA color display
Display Resolution	800 horizontal × 480 vertical pixels (WVGA)
Interpolation	Sin(x)/x
Waveform Display	Dots, vectors, variable persistence (16ms~4s), infinite persistence
Waveform Update Rate	120,000 waveforms per second, maximum
Display Graticule	8 x 10 divisions
Display mode	YT ;XY

Interface	
USB Port	USB 2.0 High-speed host port X1, USB High-speed 2.0 device port X1
Ethernet(LAN) Port	RJ-45 connector, 10/100Mbps with HP Auto-MDIX
Go-NoGo BNC	5V Max/10mA TTL open collector output
Kensington Style Lock	Rear-panel security slot connects to standard Kensington-style lock.
Miscellaneous	
Multi-language menu	Available
operation environment	Temperature: 0°C to 50°C. Relative Humidity ≤ 80% at 40°C or below; ≤ 45% at 41°C ~ 50°C.
On-line help	Available
Time clock	Time and Date ,Provide the Date/Time for saved data
Dimensions	384mmX208mmX127.3mm
Weight	2.8kg

Should you have any questions on the GDS-2000E series announcement, please don't hesitate to contact us.

Sincerely yours,

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