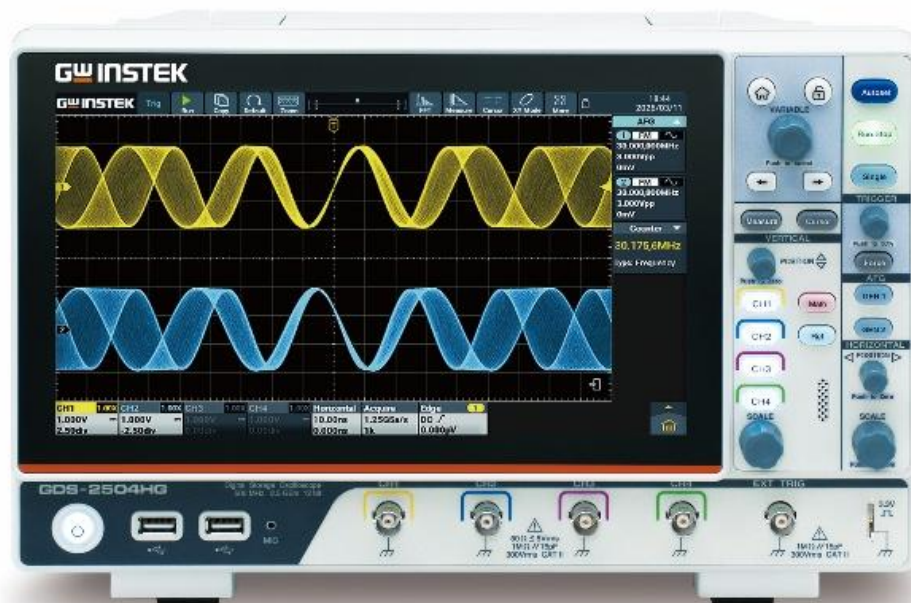


GW Instek GDS-2000HD/HG

12-Bit Digital Storage Oscilloscope



Precise, compact, and intelligent — meeting the
needs of every application scenario

New Product Announcement

GW Instek was founded in 1975 and has accumulated more than 50 years of rich experience in R&D, manufacturing and marketing, providing a comprehensive range of instrument products and superb services. GW Instek subsidiaries include Taiwan, China, the United States, Europe, Japan, South Korea, India and Southeast Asia to serve customers in more than 80 countries around the world.

GW INSTEK
Simply Reliable

Precise, compact, and intelligent — meeting the needs of every application scenario

Different application scenarios often define distinct market segments. Laboratories demand high precision—often at the expense of size and cost. Field applications require lightweight portability—typically sacrificing accuracy. Educational environments, tasked with delivering correct measurement concepts, must often compromise on features due to limited budgets. In other words, it's difficult to have it all. The GDS-2000HD/HG, with its 12-bit hardware high resolution and compact form factor, satisfies the needs of all application scenarios while delivering excellent cost-performance value, along with an innovative Android-based smart user experience. Whether for demanding power design, complex in-vehicle communication validation, seamless transitions between laboratory and field testing environments, or digitalized teaching scenarios, it accompanies you every step of the way. With unparalleled precision and intuitive operation, it becomes your most reliable measurement hub on the path to achieving excellence.

The GDS-2000HD/HG series is designed to meet and exceed industry standards, offering vertical accuracy comparable to the Tektronix MDO3000/4000C and horizontal accuracy that surpasses competing models in the same bandwidth class.

Core Advantages That Break the Limits

 **12-bit Hardware High Resolution:** Details make all the difference—say goodbye to coarse waveforms filled with quantization noise. The GDS-2000HD/HG features a newly designed 12-bit analog-to-digital converter (ADC), delivering 4096 levels of vertical quantization to enhance dynamic range and waveform clarity.

 **1.5% Vertical Accuracy:** Faithful Reproduction, No Compromise. We've pushed DC gain accuracy to a stringent 1.5%. This ensures that what you see on your screen is exactly what's happening on the board when performing rigorous power loss calculations or amplifying weak medical electronic signals.

 **1 ppm Horizontal Accuracy:** Time base accuracy is the foundation of frequency and phase analysis. Most competitors offer 5 ppm or 10 ppm accuracy, but the GDS-2000HD/HG, with its 1 ppm internal clock accuracy, is your most reliable timing verification solution.

All-in-One Analysis: Simplifying Complexity for Powerful Debugging

No more paying extra for essential features. The most commonly used debugging tools come standard, delivering a true all-in-one measurement experience:

- **Standard 5 Serial Logic Decoding:** Built-in RS232/UART, I²C, SPI, and commonly used automotive and industrial CAN and LIN triggering and decoding functions, making communication protocol debugging clear at a glance.
- **1M-point Million-Level FFT Analysis:** Provides unprecedented vertical and horizontal resolution for frequency domain analysis, easily identifying EMI interference sources and hidden noise.
- **Comprehensive Parameter Statistics:** Built-in 14 trigger types and 43 automatic measurement parameters (including statistical functions), and integrates a digital voltmeter (DVM), a six-digit frequency counter, and digital filters to meet all system verification needs.

Breaking Spatial Limitations: Born for Field Testing and Modern Teaching

 **A Portable Lab (Supports Type-C Power)** : Weighing only approximately 3.2 kg, this lightweight design breaks the traditional limitation of oscilloscopes confined to a lab bench. Supporting Type-C power allows you to easily perform mobile measurements in automotive road tests, outdoor electromechanical equipment maintenance, or industrial settings simply by carrying a power bank.

 **Smart Android System, Reshaping Digital Teaching Scenarios** : Equipped with a smooth Android system, this oscilloscope is not just a measurement tool, but also a powerful teaching and presentation center:

- **Word 、 Excel 、 PPT ◦ Built-in WPS Office:** Open Word, Excel, and PowerPoint directly on the oscilloscope
- **Multimedia Support:** Smoothly play audio, video, and PDF files, making limited lab sessions and teaching presentations more interactive and efficient.
- **Ultimate Ease of Use:** Supports 11 languages, multi-touch gestures, and customizable shortcut menus, with the ability to record screen videos directly. External mouse and keyboard support further streamline operation, while Web Control and SCPI command interface tools enable effortless remote control.

☀ **Flagship Upgrade: HG Models (Built-in Arbitrary Waveform Generator) :**

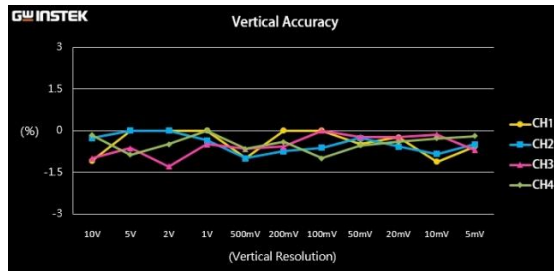
For advanced applications requiring complete stimulus and response testing, the HG models offer a more comprehensive solution:

- 50 MHz Arbitrary Waveform Output: Built-in 28 commonly used waveforms including engineering, mathematical, medical, and trigonometric functions.
- One-Click Waveform Copying: Directly and perfectly recreate real-world abnormal waveforms captured by the oscilloscope using the generator for extreme stress testing.
- Frequency Response Analysis (Bode Plot): An essential tool for power supply design engineers, providing intuitive analysis of the system stability and phase margins of switching power supplies and filter circuits.

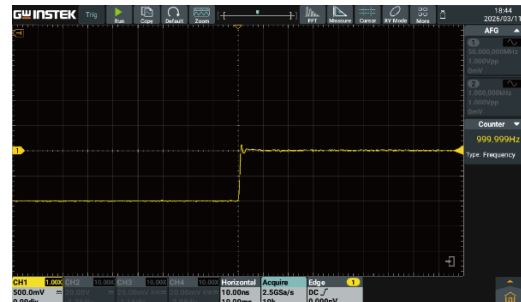
FEATURES

- Bandwidth : 250 MHz 、 350 MHz 、 500 MHz
- Vertical accuracy : $\geq 5 \text{ mV} \pm 1.5 \%$
- Horizontal accuracy : $\pm 1 \text{ ppm}$
- Maximum Real-time sampling rate : 2.5 GS/s
- Maximum Memory depth: 500 Mpts (350/500 MHz) ; 100 Mpts(250 MHz)
- 1 Mpt FFT analysis
- Built-in digital voltmeter (DVM), 6-digit frequency counter, and digital filters.
- Thoughtful Design to Prevent Human Error
- 14 trigger types + 43 automatic measurement parameters (with statistics)
- Standard 5 serial bus trigger & decode functions: RS232/UART, I²C, SPI, CAN, or LIN
- Easy to Learn and Use : Built-in 11 languages

A. Accuracy is the foundation of measurement

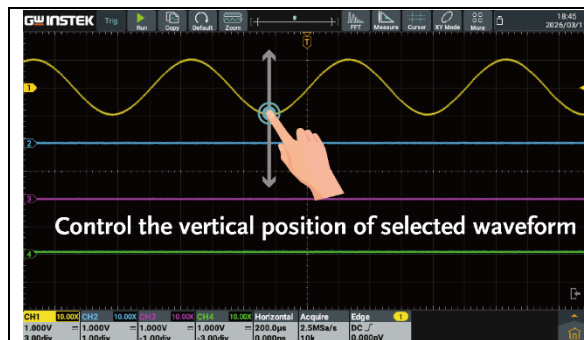


Vertical Accuracy : $\geq 5 \text{ mV} \pm 1.5 \%$

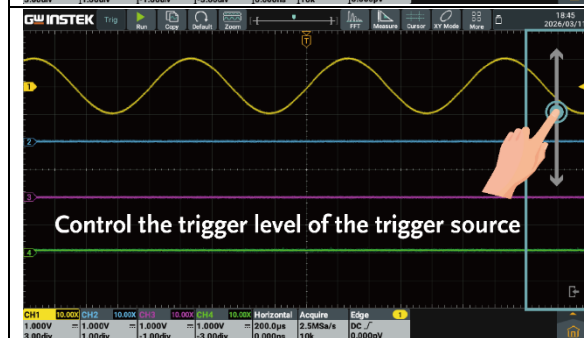


Horizontal accuracy : $\pm 1 \text{ ppm}$, about $\pm 1 \text{ ppm}$ increase in error per year.

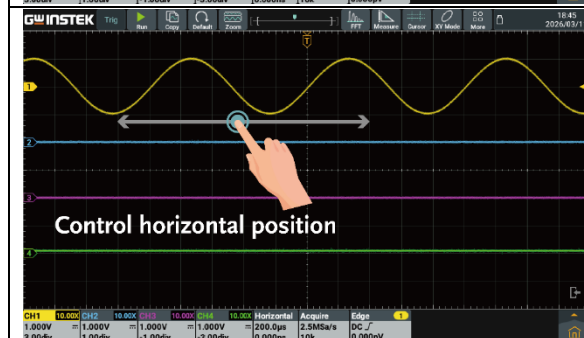
B. Touch Gestures



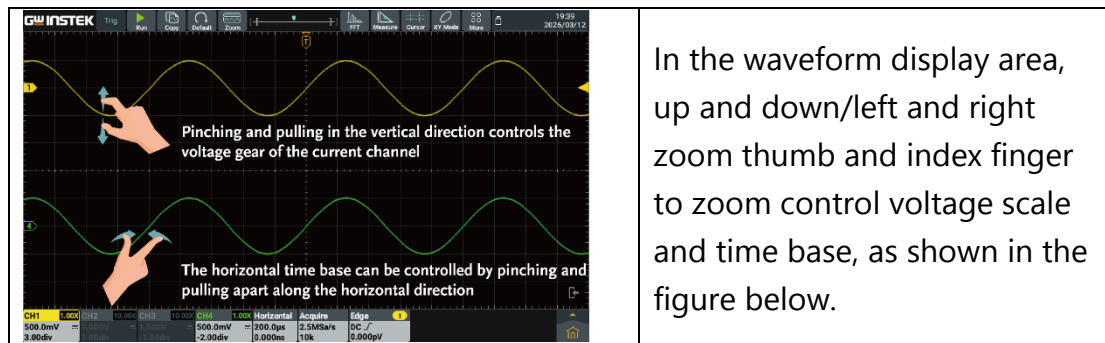
The vertical position of the waveform can be changed by swiping your finger up and down in the blank position of the waveform display area, as shown in the figure below.



The two grids on the right of the waveform area are the trigger level touch moving area, and the trigger level can be changed by sliding up and down in this area, as shown in the figure below.

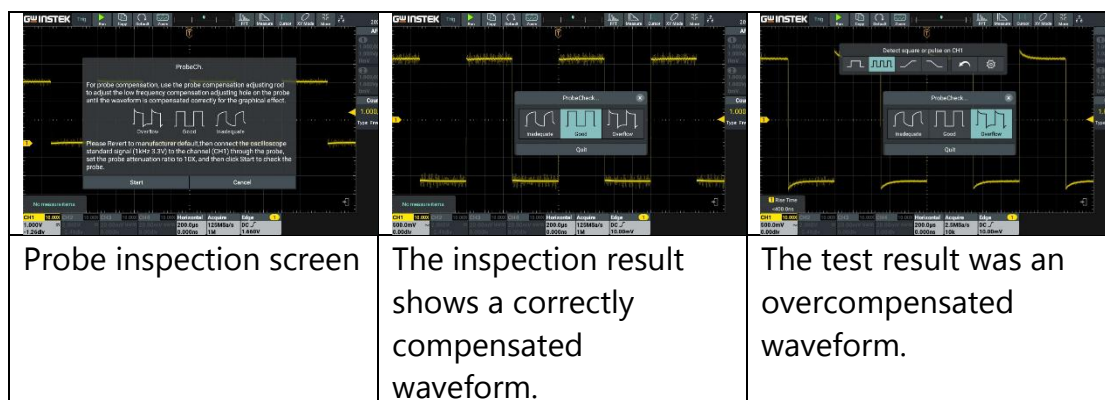


The horizontal position of the waveform can be changed by swiping your finger around the waveform display area, as shown in the figure below.

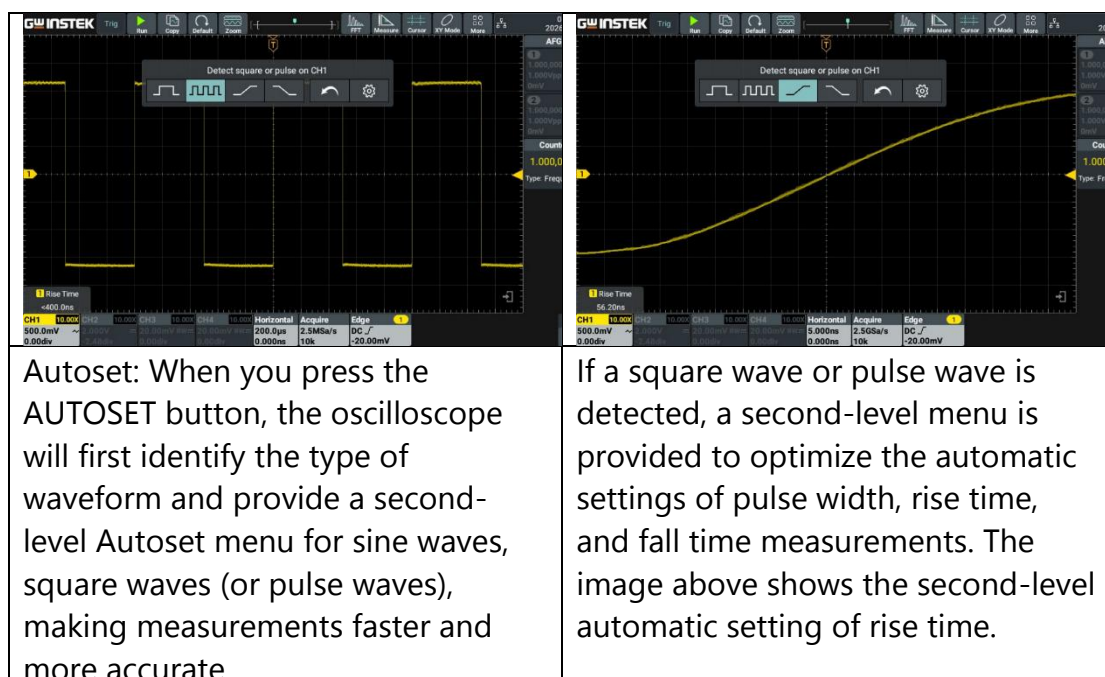


In the waveform display area, up and down/left and right zoom thumb and index finger to zoom control voltage scale and time base, as shown in the figure below.

C. Thoughtful Design to Prevent Human Error



To prevent measurement errors, a passive probe compensation test is included. If the test result indicates under- or over-compensation, users can adjust the variable capacitor on the passive probe and re-test after proper compensation is achieved.

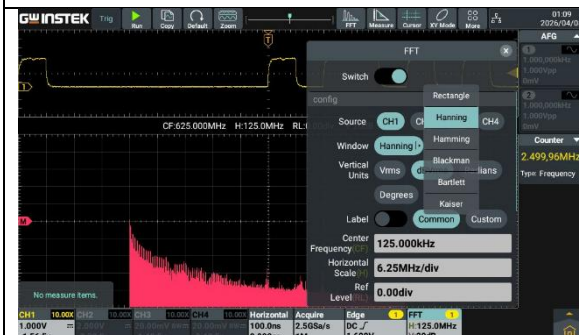


D. Memory depth and FFT analysis



Memory depth: 500 Mpts (single channel), 250 Mpts (dual channel), 100 Mpts (four channels) This greatly enhances transient capture capability and maintains high sampling rates at medium/low time-base settings for serial bus decoding. Segmented memory saves memory by only storing signal changes (no waste on flat sections).

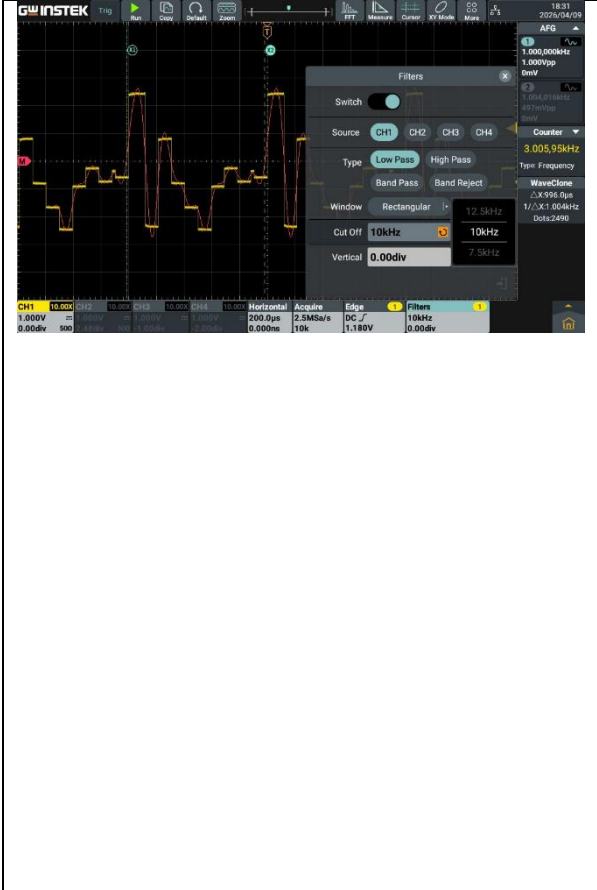
Note: Only the 500 MHz and 350 MHz models support 500 Mpts in single-channel mode.



1 Mpt FFT analysis – dramatically improves both vertical and horizontal resolution in frequency-domain analysis.

The built-in FFT function offers six window types: Hamming, Rectangular, Blackman, Hanning, Kaiser, and Bartlett. It supports simultaneous display of time and frequency domains, helping users understand the signal's frequency content.

E. Built-in digital voltmeter (DVM), 6-digit frequency counter, and digital filters.

	Built-in digital voltmeter (DVM), digital filters, and six-digit frequency counter
	Six-digit frequency counter: Provides high-resolution, high-accuracy measurement results. 14.318 MHz is the system clock of many electronic products. The accuracy of the clock affects the operation of the entire system. The frequency parameters in the automatic parameter measurement of digital oscilloscopes are calculated by software after sampling, which cannot provide sufficient resolution and accuracy. Therefore, a hardware frequency counter is needed to measure the system clock. The GDS-2000HD/HG series provides a six-digit hardware frequency counter, which can accurately verify the clock frequency.

F. 14 trigger types + 43 automatic measurement parameters



fully meet debugging and system verification requirements.

With 43 automatic measurement parameters, the oscilloscope allows users to quickly and easily analyze various signal conditions. The Area parameter supports waveform integration—an example application being the integration calculation of energy (in joules) from a power waveform (watts * seconds). The +PulseCount feature enables fast data acquisition in applications such as stepper motor control (number of pulses per unit time) or industrial sewing machines (number of stitches per unit time). Other counting parameters include –PulseCount, RiseEdgeCnt, and FallEdgeCnt. The Cursor RMS function allows users to measure the RMS value within a specified interval using cursors—ideal for measuring the transient RMS of inrush currents.

G. Standard 5 serial bus trigger & decode functions



Standard 5 serial bus trigger & decode functions: RS232/UART, I²C, SPI, CAN, or LIN.

Event Tabe

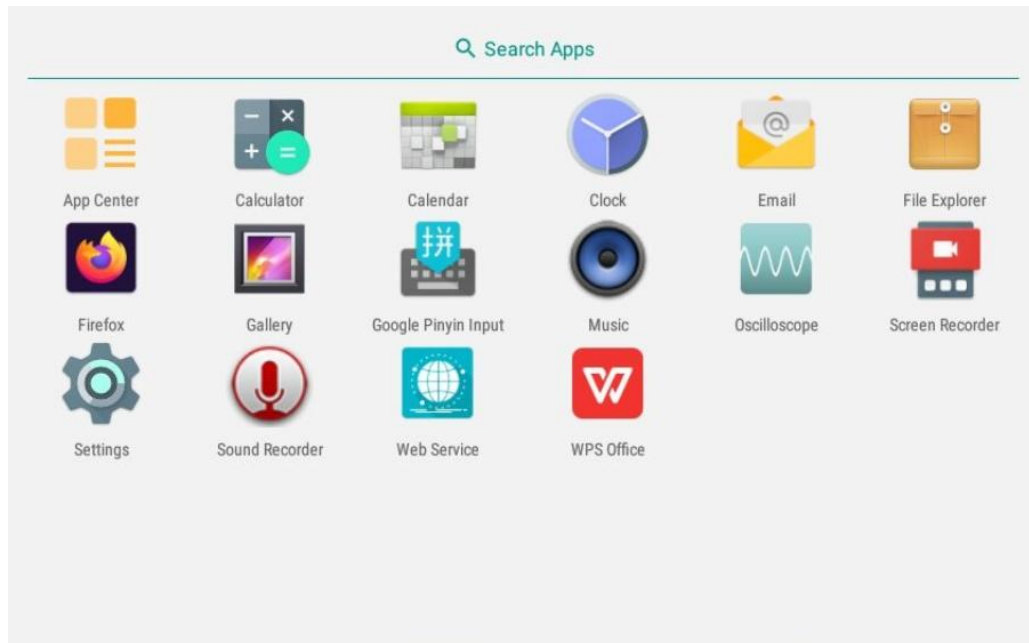
H. Easy to Learn and Use



Built-in 11 languages ; Multi-touch gestures, custom shortcut menus, screen video recording. ; External mouse & keyboard supported for faster editing of measurement results. ; Remote control made simple via Web Control and SCPI command tool.

I. Android OS

Built-in WPS Office (Word, Excel, PPT) + smooth playback of audio, video, and PDF teaching files. Perfect for digital teaching environments and makes limited lab time far more efficient. ◦



J. Portable

Weight $\approx$ 3.2 kg , Powered via USB Type-C – ideal for outdoor field measurements and automotive road testing.

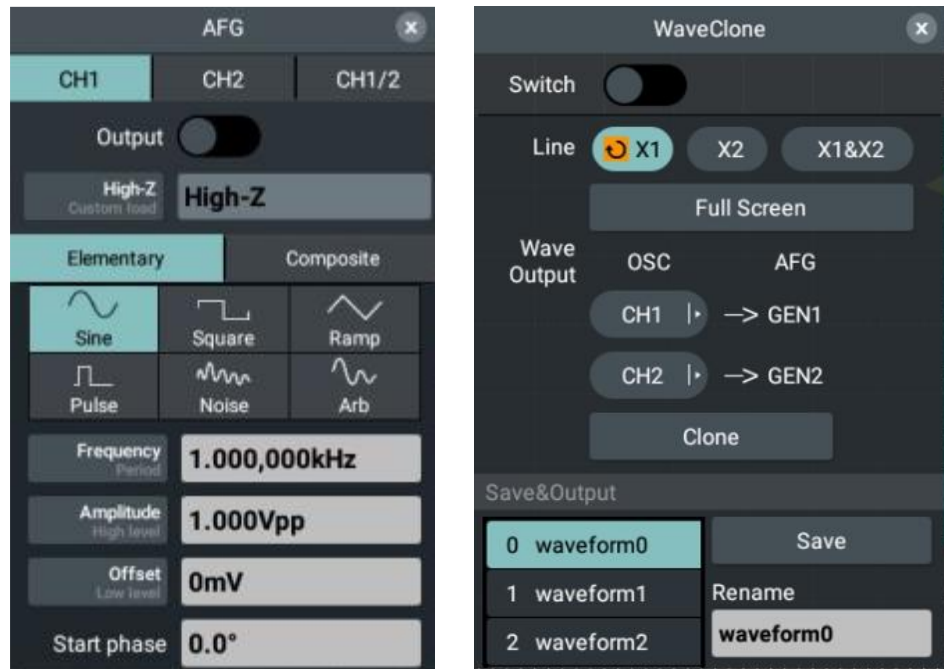


K. ARB. Function Generator (HG Only)

Maximum output frequency: 50 MHz , 28 built-in arbitrary waveforms (engineering, mathematics, medical, trigonometric functions, etc.)

Waveform clone – instantly reproduce any captured oscilloscope waveform using the built-in AFG

FRA (Frequency Response Analysis) – Bode plot function.



Target Markets

- Users seeking a replacement for the Tektronix MDO3000/4000C
- Educational institutions
- Electronics repair and maintenance
- Personal studios and hobbyist workshops

Ordering information

Model name	Part No.	Description	EAN-13 Code
GDS-2254HD	03LLDS2254DR/S	250MHz/4 CH GDS-2254HD (CE)	4711458123703
GDS-2254HG	03LLDS2254GR/S	250MHz/4 CH/AFG GDS-2254HG (AFG) (CE)	4711458123710
GDS-2354HD	03LLDS2354DR/S	350MHz/4 CH GDS-2354HD (CE)	4711458123727
GDS-2354HG	03LLDS2354GR/S	350MHz/4 CH/AFG GDS-2354HG (AFG) (CE)	4711458123734
GDS-2504HD	03LLDS2504DR/S	500MHz/4 CH GDS-2504HD (CE)	4711458123741
GDS-2504HG	03LLDS2504GR/S	500MHz/4 CH/AFGGDS-2504HG (AFG) (CE)	4711458123758

Standard Accessories

Power Cord, Certificate of Calibration,
Passive probe (one probe per channel)
BNC-BNC cable*1 (GDS-2000HG only)

Key Dates for Product Announcement

Date of launch:

- Distributor Announcement Order Queue Open (May 22, 2026)
- Global Market Announcement (May 29, 2026)

Service Policy

- GDS-2000HD/HG series carries a global **three-year warranty**.
- If you have any questions about the GDS-2000HD/HG series maintenance policy, please contact wendy.su@gw-instek.eu

Related document updates

- Datasheet
- User Manual

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Appendix A: Specifications

SPECIFICATIONS			
MODEL	GDS-2254HD/HG	GDS-2354HD/HG	GDS-2504HD/HG
Bandwidth	250 MHz	350 MHz	500 MHz ^[1]
Channels	4 Ch + EXT	4 Ch + EXT	4 Ch + EXT

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Bandwidth Limit	20 MHz	20 MHz	20 MHz
Calculated Rise Time	1.75 ns	1 ns	0.7 ns
VERTICAL SENSITIVITY			
Resolution	12 bits ; 500 μ V/div to 10 V/div ^[2]		
Input Coupling	AC, DC, GND		
Input Impedance	1 M Ω $\pm$ 2 % ; in parallel with 15 pF $\pm$ 5 pF ; 50 Ω $\pm$ 2 %		
DC Gain Accuracy	$\leq$ 1 mV $\pm$ 3 % ; 2 mV $\pm$ 2 % ; $\geq$ 5 mV $\pm$ 1.5 %		
Polarity	Normal & Invert		
Maximum Input Voltage	1 M Ω $\leq$ 300 Vrms, CAT II ; 50 Ω $\leq$ 5 Vrms		
Offset Position Range	For 1 M Ω input impedance : 500 μ V/div to 50 mV/div : $\pm$ 2 V ; 100 mV/div to 500 mV/div : $\pm$ 20 V ; 1 V/div to 10 V/div : $\pm$ 200 V For 50 Ω input impedance : 500 μ V/div to 50 mV/div : $\pm$ 2 V ; 100 mV/div to 1 V/div : $\pm$ 5 V		
Waveform Signal Process	+, -, $\times$, $\div$, FFT, User Defined Expression, FFT : 1 Mpts ; FFT : Spectral magnitude, Set FFT Vertical Scale to Vrms, dBVrms, Radians or Degrees, FFT Window Displays : Rectangle, Hamming, Hanning, Blackman, Bartlett or Kaiser		
TRIGGER			
Source	CH1, CH2, CH3, CH4, EXT TRIG, AC Lines		
Trigger Mode	Auto 、 Normal 、 Single		
Trigger Type	Edge, Pulse Width(Glitch), Video, Pulse Runt, Rise & Fall(Slope), Windows, Nth Edge, Logic, Time out, Bus(I ² C, SPI, RS232/UART, CAN, LIN)		
Holdoff Range	100 ns to 10 s		
Coupling	AC, DC, HF		
Sensitivity	0.3 div to 10 div		
EXT TRIGGER			
Range	EXT $\pm$ 2 V ; EXT/5 $\pm$ 10 V		
Sensitivity	DC to 5 MHz EXT : 150 mV ; DC to 5 MHz EXT/5 : 750 mV		
Input Impedance	1 M Ω $\pm$ 2 % ; in parallel with 15 pF $\pm$ 5 pF		
HORIZONTAL			
Time Base Range	500 ps/div to 1000 s/div (1-2-5 increments)		

Pre-trigger	10 div maximum
Post-trigger	80,000,000 div maximum
Time Base Accuracy	± 1 ppm , about ± 1 ppm increase in error per year
Peak Detection	0.8 ns (typical)
SIGNAL ACQUISITION	
Real Time Sample Rate	2.5 GSa/s (half channels) ^[3] ; 1.25 GSa/s (all channels)
Record Length	Max. 500 Mpts / CH ^[4]
Acquisition Mode	Sample, Peak, High Res, Average, Segmentation
Average	4, 16, 64, 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768, 65536 selectable
X-Y MODE	
X-Axis Input	User defined
Y-Axis Input	User defined
Phase Shift	± 3 degrees at 100 kHz
CURSORS AND MEASUREMENT	
Cursors	Amplitude, Time, Gating available ; FFT ^[5] ; Unit : Seconds(s), Hz (1/s), Phase(degree), Ratio(%), FFT Vrms(V), FFTdBVrms(dB), FFT Radians(RAD), FFT Degrees($^{\circ}$)
Automatic Measurement	43 sets : Period, Frequency, +Width, -Width, Rise Time, Fall Time, Scr Duty, +Duty, -Duty, Vavg, Vpp, VRMS, Overshoot, Vmax, Vmin, Vtop, CycRms, Vbase, Vamp, Preshoot, Std Dev, +Pulse Cnt, -Pulse Cnt, Rise Cnt, Fall Cnt, Area, Cyc Area, Delay(A $\uparrow$ -B $\uparrow$), Delay(A $\uparrow$ -B $\downarrow$), Delay(A $\downarrow$ -B $\uparrow$), Delay(A $\downarrow$ -B $\downarrow$), Phase(A $\uparrow$ -B $\uparrow$), Phase(A $\uparrow$ -B $\downarrow$), Phase(A $\downarrow$ -B $\uparrow$), Phase(A $\downarrow$ -B $\downarrow$), FRR(A $\uparrow$ -B $\uparrow$), FRR(A $\uparrow$ -B $\downarrow$), FRR(A $\downarrow$ -B $\uparrow$), FRR(A $\downarrow$ -B $\downarrow$), LRR(A $\uparrow$ -B $\uparrow$), LRR(A $\uparrow$ -B $\downarrow$), LRR(A $\downarrow$ -B $\uparrow$), LRR(A $\downarrow$ -B $\downarrow$)
Cursors Measurement	Manual mode : Voltage difference between cursors(ΔV) Time difference between cursors(ΔT) Tracing mode : The voltage value and time value of the X waveform point are tracked by fixing the Y-axis The fixed X-axis tracks the voltage value and time value of the Y waveform point
Auto Counter	6 digits, range from 2 Hz minimum to the rated bandwidth

CONTROL PANEL FUNCTION	
Autoset	Single button, automatic setup of all channels for vertical, horizontal and trigger systems, with "Undo Autoset"
Save Setup	10 sets
Save Waveform	Maximum 3 GB of available internal storage space ^[6]
Save Reference Waveform	100 sets
AFG SPECIFICATIONS (GDS-2000HG series)	
Channel	2
Sample Rate	160 MSa/s
Vertical Resolution	14 bits
Max. Frequency	50 MHz
Waveforms	Sine wave, square wave, ramp wave, pulse wave, Noise wave, Butterworth, X ² and EOG etc 28 built-in waveforms
Output Range	High Z : 2 mVpp to 10 Vpp (≤ 10 MHz) ; 2 mVpp to 5 Vpp (≤ 50 MHz) 50 Ω : 1 mVpp to 5 Vpp (≤ 10 MHz) ; 1 mVpp to 2.5 Vpp (≤ 50 MHz)
Output Resolution	1 mVpp or 5 bits
Output Accuracy	$\pm (1 \% \text{ of setting} + 1 \text{ mVpp})$ (typical 1 kHz sine, 0 V offset)
Offset Range	High Z : $\pm 5 \text{ Vpk} - \text{Amplitude Vpp}/2$ (≤ 10 MHz) ; $\pm 2.5 \text{ Vpk} - \text{Amplitude Vpp}/2$ (≤ 50 MHz) 50 Ω : $\pm 2.5 \text{ Vpk} - \text{Amplitude Vpp}/2$ (≤ 10 MHz) ; $\pm 1.25 \text{ Vpk} - \text{Amplitude Vpp}/2$ (≤ 50 MHz)
Offset Resolution	1 mVpp
SINE	
Frequency Range	1 μHz to 50 MHz
Flatness	≤ 10 MHz : $\pm 0.3 \text{ dB}$; ≤ 50 MHz : $\pm 0.5 \text{ dB}$
Harmonic Distortion	Typical value (0 dBm) ; DC to 1 MHz: $< -65 \text{ dBc}$; 1 MHz to 50 MHz: $< -50 \text{ dBc}$
Stray (Non-harmonic)	Typical value (0 dBm) ; ≤ 10 MHz : $< -70 \text{ dBc}$; > 10 MHz : $< -70 \text{ dBc} + 6 \text{ dBc/octave}$
Total Harmonic Distortion	$< 0.2 \%$, 10 Hz to 20 kHz, 1 Vpp
S/N Ratio	40 dB ^[7]

SQUARE/PULSE	
Frequency Range	Square : 1 μ Hz to 20 MHz ; Pulse : 1 μ Hz to 10 MHz
Rise/Fall Time	< 15 ns
Overshoot	< 5 %
Duty Cycle	Square : 50 % ; Pulse : 0.1 % to 99.9 %
Min. Pulse Width	$\geq$ 64 ns
Jitter	200 ps +25 ppm
RAMP	
Frequency Range	1 μ Hz to 1 MHz
Linearity	< the 1 % of maximum output (typical value 1 kHz, 1 Vpp, symmetry 50 %)
Symmetry	0 % to 100 %
DISPLAY	
TFT LCD Type	10.1 inch , LCD
Display Resolution	1024 horizontal $\times$ 600 vertical pixels
Interpolation	Auto, Sin(x)/x, x
Waveform Display	Dots, vectors, variable persistence (1 s 、 2 s 、 5 s), infinite persistence
Waveform Capture Rate	Real-time acquire : 50,000 wfms/s ; Segment acquire : 500,000 wfms/s ^[8]
Display Graticule	10 x 18 divisions
Display Mode	YT, XY
INTERFACE	
USB port	USB 2.0 High speed host port X3, USB 2.0 High speed device port X1
Ethernet Port (LAN)	RJ45 connector X1, 10/100 Mbps with HP Auto MDIX
Power Supply	Type-C power supply interface ^[9]
MISCELLANEOUS	
Multi-language Menu	Available
Operation Environment	Working Temperature : 0 $^{\circ}$ C to 40 $^{\circ}$ C ; Storage temperature: -20 $^{\circ}$ C to 60 $^{\circ}$ C ; Relative Humidity $\leq$ 90 %
Line Voltage Range	Power Supply : AC 100 V to 240 VACRMS, 50 Hz to 60 Hz ; Power Consumption : Without generator <35 W, With generator <50 W

Dimensions & Weight	325 mm(W) × 209.5 mm(H) × 111.5 mm(D) ; Approx. 3.2 kg
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NOTE :

- [1] 500 MHz bandwidth is available in the following cases: only one channel is enabled in each channel pair (CH1/CH2 and CH3/CH4).
- [2] 500 μ V/div is a digital magnification of 1 mV/div.
- [3] Limited to four-channel models, the maximum real-time sampling rate of two channels should meet one of the following conditions: only one channel of CH1 and CH2 can be turned on, and only one channel of CH3 and CH4 can be turned on.
- [4] Bandwidth 350 MHz and 500 MHz : up to 500 Mpts in single-channel mode, 250 Mpts in dual-channel mode ; Bandwidth 250 MHz: up to 100 Mpts.
- [5] The measurement function supports cursors, available in the measurement menu settings.
- [6] Waveform data up to 100 MB memory length can be stored in internal memory. Waveform data exceeding 100 MB memorylength must be saved to an external USB drive or external hard drive.
- [7] Tested under 10 MHz, 0 dBm conditions.
- [8] Test conditions: single channel, 1 k memory depth.
- [9] The adapter or battery should support the 12 V handshake protocol, with a power requirement of 48 W.