

# GDS-1000A-U Series

150MHz/100MHz/70MHz Digital Storage Oscilloscope

## FEATURES

- 150/100/70 MHz Bandwidth, 2 Input Channels
- 1GSa/s Real-Time and 25GSa/s Equivalent-Time Sampling Rate
- 2Mega Points Record Length
- 2mV ~ 10V Vertical Scale
- 1ns ~ 50s Horizontal Range
- Up to 27 Auto Measurements
- Versatile Math Function +, -, x, FFT, FFTrms, Zoom FFT
- 5.7" Color TFT LCD Display
- USB Host & Device Ports
- Go/NoGo Function
- Data Logger
- Limited Lifetime Warranty

**GW INSTEK**  
Simply Reliable



# Discover Deep Memory Performance with the GDS-1000A-U Series

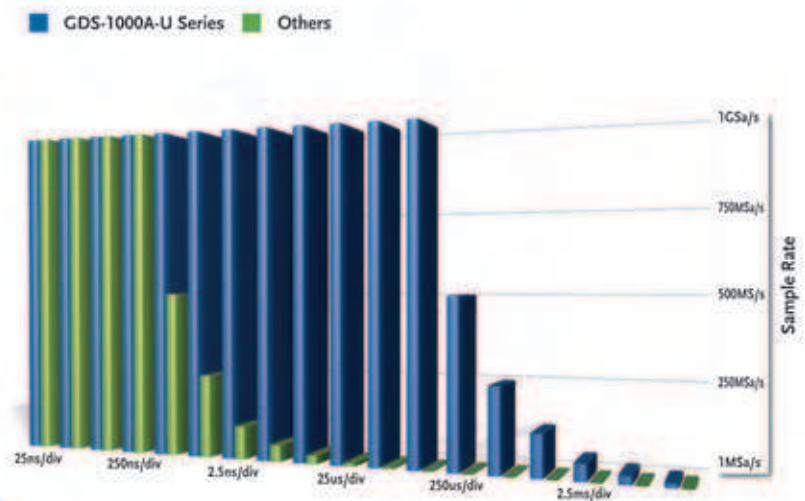
The GDS-1000A-U 150/100/70MHz dual-channel digital storage oscilloscope series inherits the passionate design and strong value to traditional GW Instek DSOs. The series features 1GS/s real-time sampling rate, 2M memory length, USB remote interface, high resolution color TFT display, and GW Instek's user-friendly interface. Quality design and powerful features combine to create a powerful tool for waveform capture and analysis.

## It's all about the memory

**MemoryPrime** 2MEGA MEMORY BUILT-IN With the increasing complexity of signals, traditional digital storage oscilloscopes don't have the capability of displaying an input signal completely or comparing the relative relationship between signals accurately due to memory constraints. After all, the waveform record length and the sample rate of a DSO are tied to memory depth, and only the combination of a high sample rate and a long record length can make detailed waveform analysis possible. Assuming a constant sample rate, the more memory a DSO has, the longer the signal can be displayed. Conversely, assuming a limited memory depth, a signal will be observed for a shorter time with a faster sample rate. In order to fully utilize the advantage of 2M points of memory without sacrificing the waveform update rate, the GDS-1000A-U adopts Memory Prime technology. Memory Prime uses a high speed signal processor in parallel with a CPU to increase the waveform reconstruction speed. Using a high Speed signal processor and 2M points of memory, the GDS-1000A-U is able to run at the maximum sampling speed of 1GSa/s under a wide range of time base selections (100us/div – 25ns/div). This unparalleled performance creates a significant differentiation compared to all other economic DSO products available in the market today.

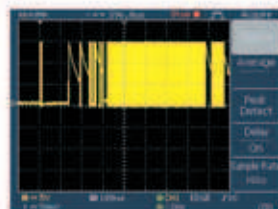
The sample rate of a DSO is closely related to memory size. Shallow memory digital storage oscilloscopes compromise the sample rate over a larger time base range as there is not enough memory to display the signal on the screen at the maximum sample rate. For example, a digital storage oscilloscope with a sample rate of 1GSa and a 2.5k point memory length can operate with a horizontal sweep speed below 20ns/div, but only by reducing the sampling rate accordingly. When the sample rate is reduced, there is a greater possibility that critical details get omitted. However, with a larger memory depth, a high sampling rate can be maintained over a wider horizontal range.

As illustrated, the GDS-1000A-U Series are able to maintain a sampling rate of 1Ga/S over 12 horizontal ranges, superior to that of other oscilloscopes with a 2.5k memory depth. Utilizing a greater memory depth, the GDS-1000A-U Series allows you to design and debug your projects more effectively.

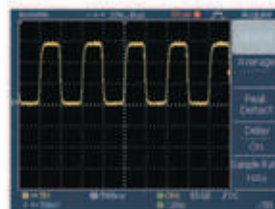


## About MemoryPrime Technology

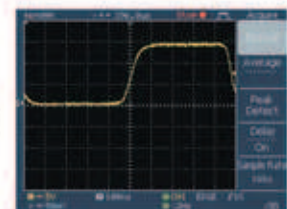
**GDS-1000A-U**  
2Mega Memory  
Waveform Display



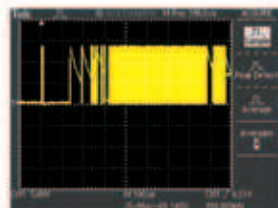
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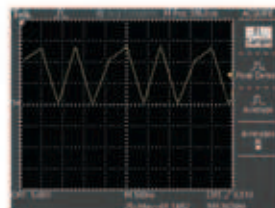
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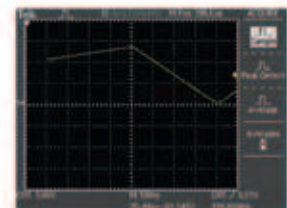
**Traditional DSO**  
2.5k Memory  
Waveform Display



Expand



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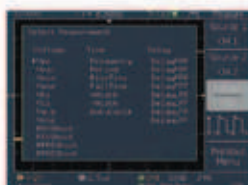
## Single-Shot Waveform Capture

What is the single feature lacking from most digital storage oscilloscopes? Adequate memory depth. Is the memory depth of your DSO large enough? With 2M points of memory, the GDS-1000A-U has the capability to acquire far more waveform data compared to other DSOs in the same performance range. The 1GSa/s sampling rate and 2M point memory plays an extremely powerful role for single-shot waveform capture. When the single-shot waveform is triggered and captured, you are able to check and see the single-shot event without losing any detailed information. A DSO, with a high sampling rate but short memory, **can't capture a single shot waveform as well as the GDS-1000A-U.**

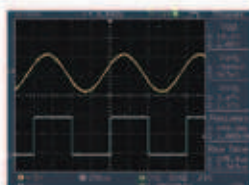




## EASY TO USE



27 Automatic Measurement Functions



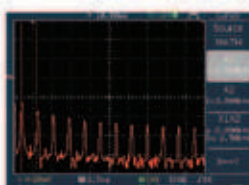
MATH Functions

The full-featured Acquisition mode and 27 auto measurement functions help users to measure captured waveform parameters accurately. The advanced Auto-Set function enables the GDS-1000A-U Series to capture waveforms automatically and display them quickly.

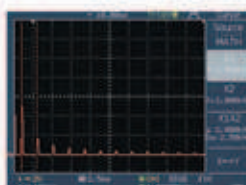
With addition, subtraction, multiplication and FFT math functions, the GDS-1000A-U Series keeps users aware of measurement results by constantly updating data. With minimal calculation, the GDS-1000A-U Series can provide sufficient testing information.



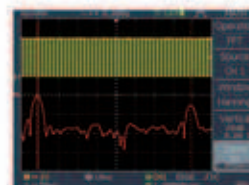
## FFT / FFTrms / ZOOM FFT MEASUREMENT



FFT Measurement



FFTrms Measurement



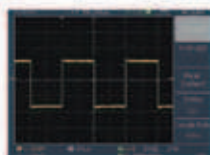
Zoom FFT Measurement

To observe the fundamental and harmonic components of a signal, the FFT math function on a digital storage oscilloscope is often used. Typically, the traditional unit of the FFT is the decibel (dB). However, when using dB it is sometimes difficult to identify the fundamental frequency of a signal from a noisy

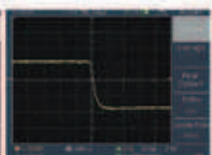
spectrum. With the FFTrms function, The he GDS-1000A-U Series can clearly display the fundamental frequency of an acquired waveform. Zoom FFT provides users with observation flexibility that they can move FFT waveform horizontally and zoom in it up to 20X to investigate details of FFT signal.



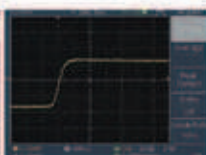
## OBSERVATION-DELAY ON/OFF



Original Signal



Delay On



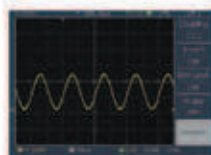
Delay Off

For convenient waveform observation and analysis, the GDS-1000A-U Series includes Delay On/Off functions; usually seen only in higher end products. With Delay On, a signal can be observed from an offset of the trigger point. With this feature, the horizontal scale and thus waveform scale can be expanded and centered on the delay point, but not at the trigger point. This allows a signal to be observed in detail where needed.

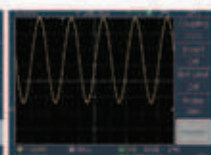
\* With Delay On, the waveform scale is expanded from the center of the screen. With Delay Off, the waveform scale is expanded from the trigger point.



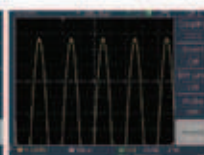
## OBSERVATION-EXPAND BY GROUND/CENTER



Original Signal



Expand by Ground

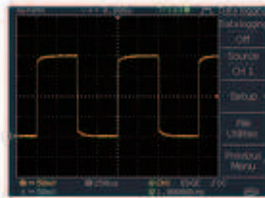


Expand by Center

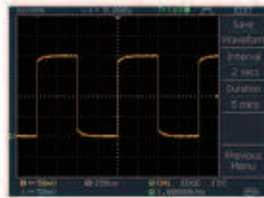
In a DSO, "AC Coupling" is normally used to isolate the AC components of a signal by blocking the DC components. This is useful to see a signal with a small AC component that is offset with a large DC voltage. With AC coupling to block the DC voltage, small AC waveforms can be observed from the center of the screen for measurement or examination. However, capacitive loading under AC coupling mode may cause waveform distortion as low frequency components may become degraded, frequency critical applications. The Expand by Ground and Center functions are convenient tools to expand a waveform vertically. With this feature, the vertical scale of a waveform can be expanded either from the ground reference or from the center of the screen without causing capacitive loading.



## USB HOST & DATA LOGGER



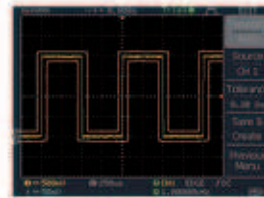
Data Logger turn ON



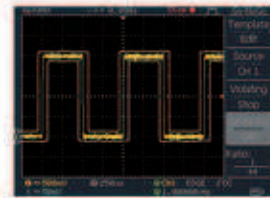
Data Logger Setup

USB host function enables user to easily store waveform setting, data, or image on USB flash disk. Furthermore, data logger can continue monitoring input signals and storing their waveform data in USB flash disk when trigger conditions are met, saving users' efforts to tracking signals manually and allowing them to analyze and observe waveform data afterwards.

## GO/NOGO FUNCTION



Template Editing



Go/NoGo Test

Go/NoGo testing function check whether the incoming signal violates the user-defined template. Users can easily define this template by setting the tolerance ratio to determine violation conditions. Go/NoGo testing can either keep counting violation number or stop testing when violation conditions are met.

## PRIME FEATURES



### PictBridge Printer Supported

The GDS-1000A-U is one of the few DSOs currently on the market that can provide complete remote control or data capture over a USB interface. The GDS-1000A-U Series also supports PictBridge, allowing you to print directly to your printer without complex configuration. After connecting to a PictBridge compatible printer with a USB cable, printing is as easy as pressing a button.



### Auto Measurement Gating

A built-in Autoset function on a digital oscilloscope gives engineers remarkable convenience. With the complexities of product features, traditional auto measurement information is inadequate for modern measurement needs. The new Cursor Gating feature allows you to mark an area with cursors for auto measurement.



### Fast Horizontal Position Mark and Search

MemoryPrime technology allows a maximum of 2M points of waveform data. For engineers, analyzing a considerable amount of data can be an extremely challenging task. To assist engineers in analyzing waveforms quicker, we provide Horizontal Page Skip and Set Time Mark functionalities. This lets engineers take full advantage of the 2M memory depth.

0.1x  
to  
2000x

### Flexible Probe Factor Setting

There is a diverse range of test probes currently on the market such as passive, differential, and electrical probes. The attenuation ratio of each probe type also differs greatly. To ensure compatibility, probe attenuation ratios of 0.1X to 2000X as well as voltage and current probes as supported with the GDS-1000A-U.

## PC REMOTE CONTROL SOFTWARE



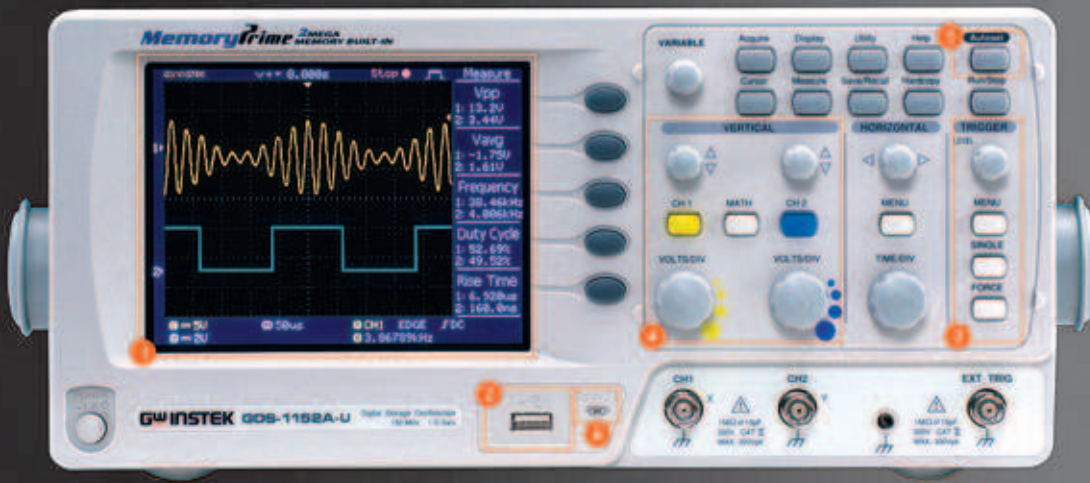
Using a USB port coupled with FreeWave remote monitoring software is the easiest and most convenient way to capture data from the GDS-1000A-U. With FreeWave, a screenshot can be saved as an image file (.bmp/.jpg), waveform data(.csv) can be logged and movie files(.wmv) can be recorded in real-time. Not only can FreeWave monitor and record waveforms over a long period of time, but previously recorded waveforms can also be observed. Instrument settings can even be configured without the need to learn incomprehensible command line syntax. With the simple user interface and robust features, FreeWave allows you to get the most out of the GDS-1000A-U with little effort.

## GUARANTEED PROTECTION



By providing the Global Lifetime Warranty Program for GDS-1000A-U digital storage oscilloscope series, we believe you can have high confidence in the quality of each GDS-1000A-U DSO. By purchasing a GDS-1000A-U you can be assured of a highly economical, low maintenance, quality DSO backed with the protection of the Lifetime Warranty program. The Lifetime Warranty Program guarantees customers will be supported regardless of their location. Customers will receive at least 5 years of full support even after production has ceased. For more details and applicable conditions regarding the Lifetime Service program, please visit the GW Instek website [www.gwinstek.com/llw](http://www.gwinstek.com/llw) or consult your nearest distributor.





### 1. Stunning Display

The 5.7" TFT color LCD greatly enhances the GDS-1000A-U display performance letting you see the waveform details clearly from a broad range of view-angle.

### 2. Memory and Interface



Up to 17 waveforms can be saved into the internal memory to be recalled later and compared. USB Host port provides a safe environment for data storage and transfer of measurement results, and the USB device port interface allows remote control for direct printing to PictBridge compatible printers.

### 3. Advanced Triggers

Quick setting to capture any signal of interest with Normal, Single, Force, Pulse Width and Video line selectable triggers.

### 4. Vertical Controls

Separate vertical controls for each channel allows for simple and fast operation. There is no longer any need to share one set of vertical controls for both channels.

### 5. Autoset Enable/ Disable

To help students learn how to use an oscilloscope manually, the Autoset function can be disabled on the GDS-1000A-U Series.

### 6. Enhanced CAL signal output

GDS-1000A-U Series has an enhanced 1kHz calibration signal. Its output frequency is adjustable from 1 kHz to 100 kHz as well as the duty cycle adjustable by 5% ~ 95%.

### SELECTION GUIDE

MODEL	GDS-1152A-U	GDS-1102A-U	GDS-1072A-U
BANDWIDTH	150MHz	100MHz	70MHz
CHANNELS	2		
SAMPLE RATE	1GSa/s(Real-time) 25GSa/s(Equivalent-time)		
RECORD LENGTH	2 Mega Points		
DISPLAY DEVICE	5.7" TFT Color LCD		
USB HOST	Standard		
USB DEVICE			
CALIBRATION OUTPUT			

150/100/70 MHz Digital Storage Oscilloscope



GDS-1000A-U Series



# SPECIFICATIONS

		GDS-1072A-U	GDS-1102A-U	GDS-1152A-U
<b>VERTICAL</b>	Channels Bandwidth Rise Time Sensitivity Accuracy Input Coupling Input Impedance Polarity Maximum Input Waveform Signal Process Offset Range Bandwidth Limit	2 DC-70MHz(-3dB) <5ns Approx. 2mV/div - 10V/div (1-2.5 increments) $\pm (3\% \times \text{Readout}) + 0.1 \text{ div} + 1 \text{ mV}$ AC, DC & Ground 1M $\Omega$ $\pm$ 2%, -15pF Normal & Invert 300V (DC+AC peak), CATII +, -, x, FFT, FFTrms, Zoom FFT 2mV/div - 50mV/div : $\pm 0.4\text{V}$ ; 100mV/div - 500mV/div : $\pm 4\text{V}$ ; 1V/div - 5V/div : $\pm 40\text{V}$ ; 10V/div : $\pm 300\text{V}$ 20MHz (-3dB)	2 DC-100MHz(-3dB) <3.5ns Approx.	2 DC-150MHz(-3dB) <2.3ns Approx.
<b>TRIGGER</b>	Source Mode Coupling Sensitivity	CH1, CH2, Line, EXT AUTO, NORMAL, SINGLE, TV, Edge, Pulse width AC, DC, LF rej., HF rej., Noise rej. DC - 25MHz: Approx. 0.5div or 5mV; 25MHz - 70/100/150MHz: Approx. 1.5div or 15mV		
<b>EXT TRIGGER</b>	Range Sensitivity Input Impedance Maximum Input	$\pm 15\text{V}$ DC - 25MHz : - 50mV; 25MHz - 70/100/150MHz : -15mV 1M $\Omega$ $\pm$ 2%, - 15pF 300V (DC + AC peak), CATII		
<b>HORIZONTAL</b>	Range Modes Accuracy Pre-Trigger Post-Trigger	1ns/div - 50s/div (1-2.5-5 increments); ROLL : 50ms/div - 50s/div MAIN, WINDOW, WINDOW ZOOM, ROLL, X-Y $\pm 0.01\%$ 10 div maximum 1000 div		
<b>X-Y MODE</b>	X-Axis Input Y-Axis Input Phase Shift	Channel 1 Channel 2 $\pm 3^\circ$ at 100kHz		
<b>SIGNAL ACQUISITION</b>	Real-Time Sample Rate Equivalent Sample Rate Vertical Resolution Record Length Acquisition Mode Peak Detection Average	1GSa/s maximum 25GSa/s maximum 8 Bits 2Mega Points maximum Normal, Peak Detect, Average 10ns(500ns/div - 50s/div) 2, 4, 8, 16, 32, 64, 128, 256		
<b>CURSORS AND MEASUREMENT</b>	Voltage Measurement Time Measurement Delay Measurement Cursors Measurement Auto Counter	$V_{pp}, V_{amp}, V_{avg}, V_{rms}, V_{hi}, V_{lo}, V_{max}, V_{min}$ , Rise Preshoot/Overshoot, Fall Preshoot/Overshoot Freq., Period, Rise Time, Fall Time, Positive Width, Negative Width, Duty Cycle Eight different delay measurement Voltage difference between cursors ( $\Delta V$ ) Time difference between cursors ( $\Delta T$ ), frequency measurement ( $1/\Delta T$ ) Resolution : 6 digits Accuracy : $\pm 2\%$ Signal Source: All available trigger source except the Video trigger mode		
<b>ADJUSTABLE PROBE COMPENSATION SIGNAL</b>	Frequency Range Duty Cycle Range	1kHz - 100kHz, 1kHz/STEP 5% - 95%, 5%/STEP		
<b>CONTROL PANEL FUNCTION</b>	Autoset Save Setup Save Waveform	Adjust Vertical VOLT/DIV, Horizontal TIME/DIV, and Trigger level automatically Up to 15 sets of measurement conditions 15 sets of waveform		
<b>DISPLAY</b>	TFT LCD Type Display Resolution Display Graticule Display Brightness	5.7 inch 234(Vertically)x 320 (Horizontally) Dots 8 x 10 divisions Adjustable		
<b>INTERFACE</b>	USB Device USB Host	USB1.1 & 2.0 full speed compatible (PictBridge Compatibility Printers Supported) Image (BMP) waveform data (CSV) and setup (SET)		
<b>POWER SOURCE</b>	Line Voltage Range	AC 100V - 240V, 48Hz - 63Hz, Auto selection		
<b>MISCELLANEOUS</b>	Go/NoGo Function Data Logger Multi-Language Menu Online Help	Available Available Available Available		
<b>DIMENSIONS &amp; WEIGHT</b>		310(W) x 142 (H) x 140(D)mm, Approx. 2.5kg		

The specifications apply when the oscilloscope is powered on for at least 30 minutes under +20°C→+30°C.

Specifications subject to change without notice. DS-1000A-UGD1BH

## ORDERING INFORMATION

<b>GDS-1072A-U</b>	70MHz, 2 channel, 1GSa/s & 2Mega Memory DSO
<b>GDS-1102A-U</b>	100MHz, 2 channel, 1GSa/s & 2Mega Memory DSO
<b>GDS-1152A-U</b>	150MHz, 2 channel, 1GSa/s & 2Mega Memory DSO

## ACCESSORIES

User manual x1, Power cord x1  
Probe GTP-070A-4 or equivalent:70MHz(10:1/1:1)Switchable passive probe for GDS-1072A-U(one per channel)  
Probe GTP-100A-4 or equivalent:100MHz(10:1/1:1)Switchable passive probe for GDS-1102A-U(one per channel)  
Probe GTP-150A-2 or equivalent:150MHz(10:1/1:1)Switchable passive probe for GDS-1152A-U(one per channel)

## OPTIONAL ACCESSORIES

<b>GTL-242</b>	USB Cable, USB 2.0 Type A - Type B, 4P	<b>GTL-110</b>	Test Lead, BNC-BNC Heads
<b>GSC-006</b>	Soft Carrying Case		

## FREE DOWNLOAD

<b>PC Software</b>	FreeWave software	<b>Driver</b>	USB driver; LabView Driver
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