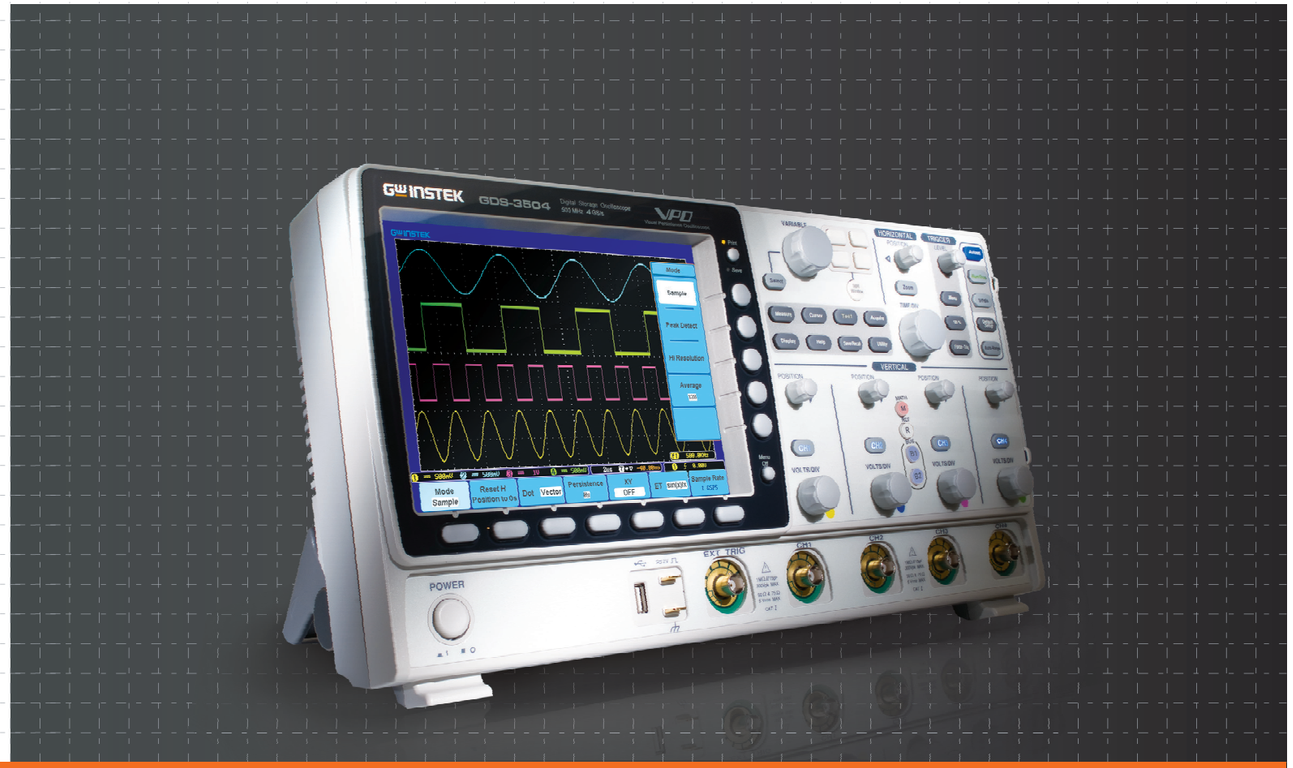

GDS-3000 Series

VPO
Visual Persistence Oscilloscope

500 MHz Digital Storage Oscilloscope

3 Year WARRANTY

FEATURES

- 500 MHz Bandwidth, 2/4 Input Channels
- 4 GSa/s Real-time Sampling Rate and 100 GSa/s Equivalent Time Sampling Rate
- 25 k Points Memory for Each Input Channel
- VPO (Visual Persistence Oscilloscope) Technology to Display Less-Frequently-Occurred Signals
- 8" 800 x 600 High Resolution TFT LCD Display
- Unique Split Screen System with Independent Setting and Display for Each Input Channel
- Three Built-in Input Impedance Selections : 50 Ω/75 Ω/1 MΩ
- Optional Power Analysis Software for Power Source Measurement and Analysis
- Optional Serial bus Analysis Software for Trigger & Decode of I^2C, SPI and UART Interfaces

GW INSTEK
Simply Reliable

DISTRIBUTOR :

DS-3000GD6BH

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VPO technology easily captures episodic events and reveals the complexity of the original signals.

4GSa/s real-time sampling rate accurately depict waveforms to satisfy a broad range of test applications.

The 8" TFT LCD display makes it easy to observe a signal.

50Ω , 75Ω and 1MΩ input impedances are built in to meet various test application needs.

The split-screen function enables each channel to be triggered and displayed independently.

CE | RS-232 | GPIB | Ethernet | Labview Driver | PictBridge Compatible | VGA Output | PC Software | USB High Speed

GDS-3000 Series

VPO Visual Persistence Oscilloscope

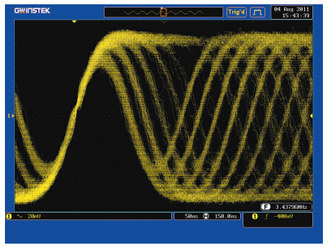
The GDS-3000 Series digital storage oscilloscope is a full-featured and powerful tool that allows you to tackle complex measurement issues with ease.
The GDS-3000 Series, carrying a maximum bandwidth of 500MHz, is equipped with a real-time sampling rate up to 4GSa/s and an equivalent-time sampling rate of 100GSa/s. The large 8-inch SVGA LCD screen, combined with the advanced digital signal processing technology VPO, provides meticulous detail and clarity for the displayed waveforms. The GDS-3000 Series gives you confidence not to miss any part of the test signal in the product verification and debugging stages and allows you to speed up your task without hesitation.

4GSa/s Sampling & VPO Technology

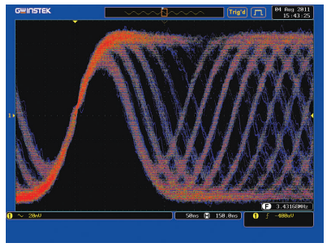
The GDS-3000 Series adopts VPO (Visual Persistence Oscilloscope) signal processing technology to enhance the performance of multi-gray-scale waveform display. The FPGA parallel processing, instead of conventional microprocessor architecture, is applied in GDS-3000 Series design to significantly increase the data processing speed and therefore increase the waveform update rate. This technology allows the GDS-3000 Series to display waveforms with various gray scales based on the occurrence frequencies, a fashion analogous to the analog oscilloscope display. As the visual persistence oscilloscope contains 3-dimension waveform data, including amplitude, time and intensity, for each waveform spot, it provides more useful signal information than a normal digital storage oscilloscope can do. The high-speed data processing of VPO technology enables the signal analysis of rapid events such as video, jitter, glitch and runt.

The GDS-3000 Series features a maximum real-time sampling rate of 4GSa/s, which is superior to most of the equivalent oscilloscopes available in the market today. The series is also equipped with an equivalent- time sampling rate of 100 GSa/s, providing an economic solution for the waveform acquisition and reconstruction of very high-speed repetitive signals. The fast-acquisition capability along with VPO signal processing technology, make GDS-3000 a very handy tool for observing occasionally-occurred signals such as transient and inrush events. With powerful technology, GDS-3000 Series gives you full confidence in every acquisition of complex waveform that adheres to high-speed circuit design of modern products.

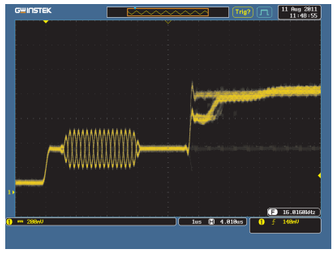
VPO Visual Persistence Oscilloscope Signal Processing Technology

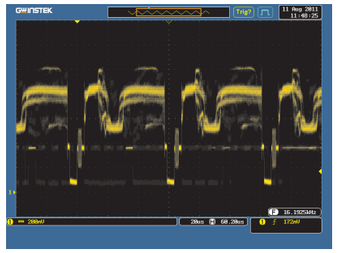


Gray Mode



Color Mode





The GDS-3000 Series equipped with VPO signal processing technology and 5GSa/s high-speed real-time sampling rate, allows you to view the video signal clearly.

A Hi-tech DSO Platform

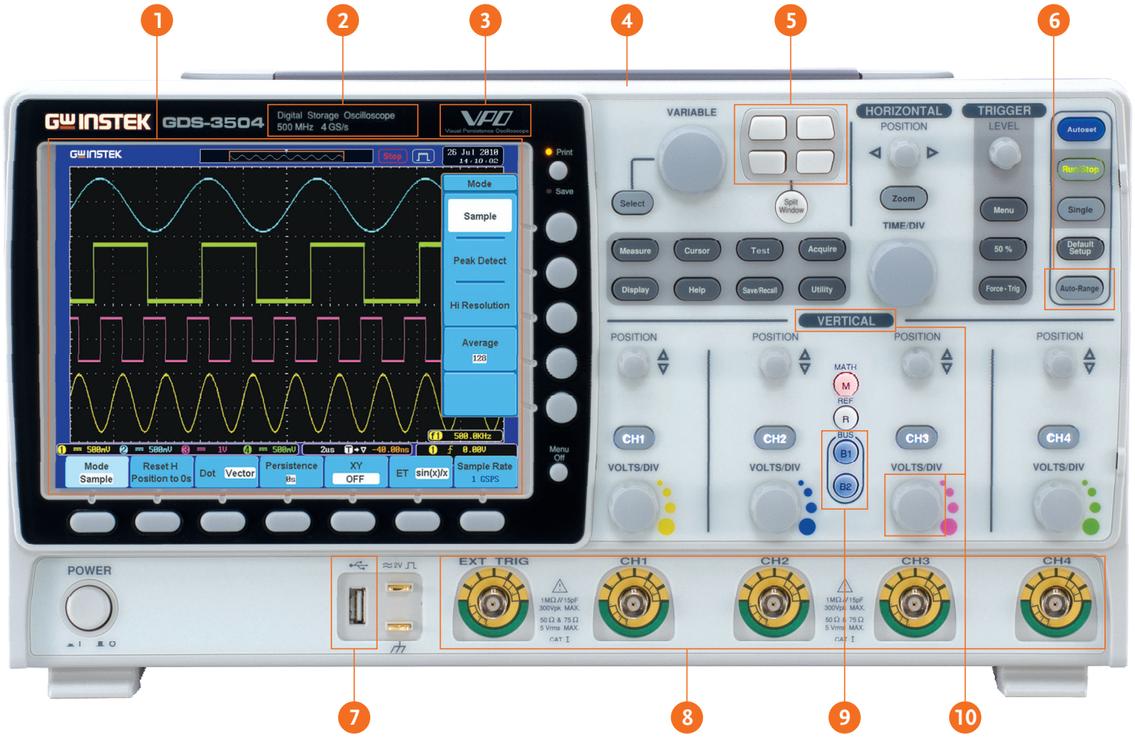
The GDS-3000 Series is a new platform of 4-input channels, 500MHz bandwidth, 5GSa/s sampling rate, and VPO waveform display. The split screen feature has been designed to meet the requirements of multi-window & multi-signal tests in the research and the manufacturing fields. The optional power analysis software and the optional serial bus analysis software are available to facilitate the engineer's tasks in testing and manufacturing of the associated products. Three new differential probes, GDP-025, GDP-050 & GDP-100, and five new current probes, GCP-300, GCP-500, GCP-1000, GCP-530 & GCP-1030, are coming along with the GDS-3000 Series to provide total solutions for a wide variety of applications in the industry, service and education market sectors. The GDS-3000 Series, a high-tech platform carrying thoughtful features, brings very high customer value to both general purpose market and professional market.

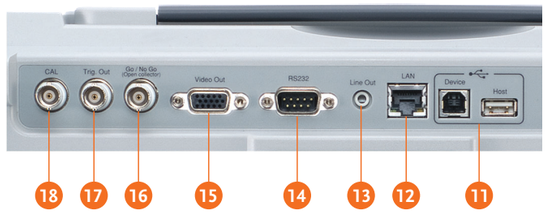
Serial Bus Analysis Software and Power Quality Analysis Software

With widespread applications of embedded system adopting serial bus communication standards, resolving unexpected issues, such as propagation delay and bus contention, is often a challenge to design and testing engineers. The GDS-3000 Series provides (optional) design and testing engineers with powerful tools for the communication analysis and debugging of most the popular serial interface projects including I^2C ,SPI and UART.

To fulfill the increasing power measurement demands, as a green energy trend, GDS-3000 provides an embedded power analysis software (optional), which includes measurements of Power Quality, Harmonics, Ripple and Inrush Current, meeting requirements of most power measurement standards.

A High-tech Platform Carrying Advanced Technologies





1. 8"TFT LCD Panel

The bright 8" TFT LCD display makes multiple signal observation easy.

2. 4GSa/s Real-time Sampling Rate for Fast Waveform Capture

The high speed sampling technology used for data acquisition truthfully reconstructs complex signals.

3. VPO Signal Processing Technology

VPO signal processing technology displays waveforms in 3 dimensions - amplitude, time and intensity.

4. Compact Design

With a depth of only 5 inches, the compact size of the product doesn't occupy valuable work space.

5. Split Window Function (Split Screen)

The GDS-3000 Series supports up to four independently operated and triggered windows at a time so that you can simultaneously monitor up to 4 signals carrying different characteristics.

6. Auto-Range Function

The Auto Range function automatically adjusts the time base and/or the vertical scale of displayed waveform when the frequency and/or the amplitude of input signal changed.

7. High Speed USB 2.0 Port

USB Host port for easy access of stored data.

8. Three Input Impedance Selections

The three built-in input impedances (75Ω, 50Ω ,1MΩ) can be selected to meet the requirements of various applications.

9. Serial Bus Triggering and Decode (Optional)

2 dedicated keys used for setting recall in the serial bus analysis applications supporting UART, I^2C and SPI serial bus.

10. Independent Channel Design

The independent zone of vertical operations for each channel substantially increases the measurement efficiency.

4 Channel Model

2 Channel Model

SELECTION GUIDE

Model	GDS-3504	GDS-3502
Bandwidth	500MHz	500MHz
Channels	4	2
Record Length	25k/Channel	25k/Channel
Real-Time Sampling	4 GSa/s	4 GSa/s
Equivalent-Time Sampling	100GSa/s	100GSa/s

☆ 2 Channels on Max Sampling Rate : 2GSa/s (GDS-3504/3502);
☆ 3, 4 Channels on Max Sampling Rate : 2GSa/s (GDS-3504)

11. USB Ports as Standard

USB Host/Device interfaces for easy access of stored data and direct print-out through a PictBridge compatible printer.

12. LAN Port as Standard

LAN interfaces for remote control and monitoring.

13. Line Output

3.5mm stereo sound output for Go/NoGo buzzer.

14. RS-232 Interface

15. SVGA Video Output

SVGA video output port allows the transfer of DSO screen image to an external projector or monitor for remote monitoring or big screen observation.

16. Go/NoGo BNC

The open collector output signal allows external instrument to be controlled by the test result.

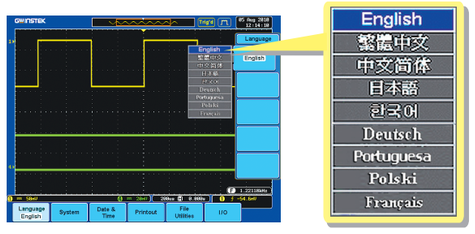
17. Trigger Output Port

A 5V TTL Level trigger signal is available for the synchronization with other devices.

18. Self-Calibration Signal Output

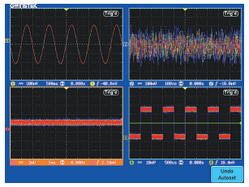
Self-Calibration signal output for input channel vertical gain calibration.

Multi-Language Support



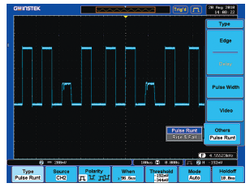
The GDS-3000 Series interface supports multiple languages to provide the upmost convenience for cross-country team cooperation and multinational engineering efforts.

A. UNIQUE SPLIT SCREEN FUNCTION



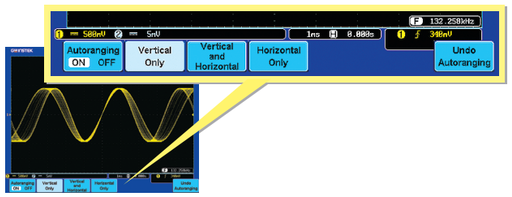
The unique split screen feature of GDS-3000 Series allows each input channel to be operated independently with respective setting and waveform display. The time base, the vertical sensitivity, and the trigger selections can be done by each channel separately, and the waveform of each input signal can be shown on the individual part of the screen. This nearly four-DSO-in-one feature* is very useful for the applications that need to simultaneously see the details of multiple waveforms with very different characteristics. The 8-inch high resolution 800x600 LCD display makes the split screen a pleasant observation environment to view the details of complex signals.

B. COMPLETE SET of TRIGGER FUNCTIONS



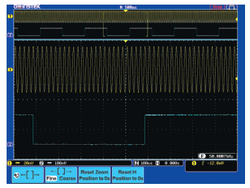
Besides Edge trigger, the GDS-3000 Series also offers various trigger functions, including Video, Pulse Width, Runt, Rise Time & Fall Time (specific time length), Alternate, Delay by Time, Delay by Event, and Hold-Off. The high sampling rate, the VPO signal processing & display, and the flexible trigger function all together make the GDS-3000 Series a powerful tool for waveform capture and display of various types of signals.

C. AUTO RANGE for both TIME BASE and VERTICAL SCALE



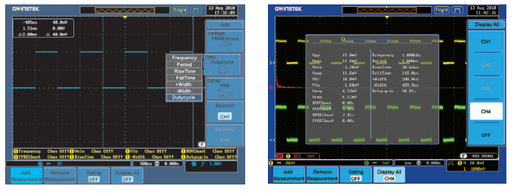
The Auto Range function automatically adjusts the time base and/or the vertical scale of displayed waveform when the frequency and/or the amplitude of input signal changed. This function gives user the convenience to have DSO always display waveform in a proper fashion on the screen tracking the frequency and amplitude changes of the input signal. It is especially useful when the user needs to alternately probe and test multiple circuit points containing signals with different frequencies and amplitudes.

D. DUAL DISPLAY WINDOW ZOOM



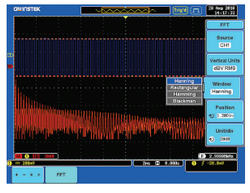
The GDS-3000 Series Window Zoom function provides dual display mode to show the main waveform and the magnified section of zoomed-in waveform at the same time. Under "Zoom" mode, the width and the position of zoom-in window over the main waveform can be selected to get the magnified waveform as needed for detailed observation. To quickly and accurately move the zoom-in window to the expected position, the "Coarse" mode helps move the window to the needed position immediately and the "Fine" mode provides fine adjustment to precisely place the window in the exact position.

E. 28 AUTOMATIC MEASUREMENTS



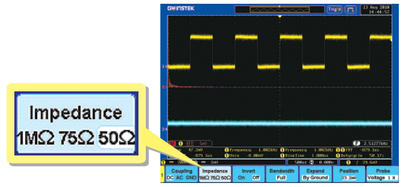
The GDS-3000 Series supports simultaneous measurement of up to 28 waveform measurement items grouped into three main waveform parameters: amplitude, time and delay measurements. The display modes include an individual mode and a Display All mode. The former can display any 8 of the automatic measurements while the later can display all the automatic measurements for a channel.

F. FFT TEST FUNCTION



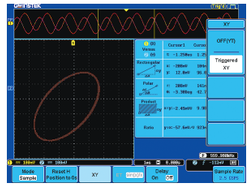
To observe fundamental and harmonic frequency components of a signal, the FFT function on a digital storage oscilloscope is often used. Typically the traditional unit of the FFT is decibel (dB). However, when using dB it is sometimes difficult to identify the fundamental frequency of a signal from a noisy spectrum. With FFTrms function, the GDS-3000 Series can clearly display the fundamental frequency of an acquired waveform.
The FFT function of GDS-3000 supports Rectangular, Hamming, Hanning, and Black-harris windows.

G. THREE INPUT IMPEDANCE SELECTIONS



Three input impedance, 1MΩ, 75Ω, and 50Ω are available for user's selection. The flexibility of impedance selections, including 1MΩ to get minimum loading effect, 75Ω to accommodate Video transmission applications and 50Ω to fit RF communication applications, extends the GDS-3000 Series utilization range.

H. X-Y MODE

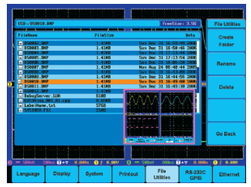


The X-Y mode of GDS-3000 defines CH1 and CH3 as the horizontal axis and CH2 and CH4 as the vertical axis, allowing the display of 2 sets of X-Y pattern simultaneously. The measurement items include Rectangular, Polar, Product and Ratio that fits most of the popular X-Y applications. The X-Y pattern and the time domain waveforms can be shown on the screen simultaneously. Two cursors on the time domain waveforms allow the identification of cursor-associated locations on the X-Y pattern display.

I. EXTENDABLE APPLICATION SOFTWARE

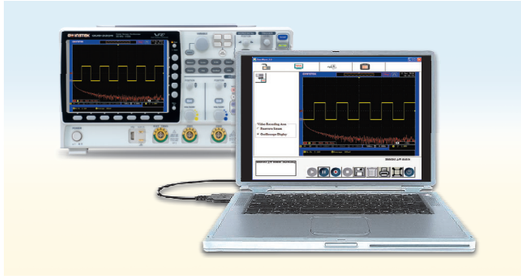
The GDS-3000 Series allows future installation of additional application software at the user site. This provides an open environment for optional software upgrade and additional feature built-in in whenever the GDS-3000 Series user has the need. The flexibility of software installation platform keeps the DSO being in use always up-to-date.

J. WAVEFORM FILE PREVIEW



The GDS-3000 provides an optimized operation interface for viewing screen captures. Generally, the oscilloscope may store large amounts of waveform data after a long period of time. To help prevent engineers from selecting the wrong file from a large number of stored waveform files, the screen capture preview function can be used to preview the waveform file without opening files so that operation of the oscilloscope is more efficient and convenient.

K. FREE 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-3000 Series. With FreeWave, a screenshot can be saved as an image file (.bmp/.jpg)and waveform data (.csv).
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-3000 with little effort.

L. SVGA OUTPUT

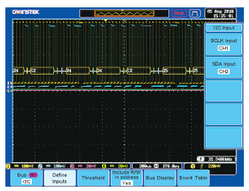
A SVGA video output port in the rear panel of GDS-3000 Series allows the screen-image transfer from DSO to an external projector or a monitor for remote monitoring or big screen observation. This direct image transfer feature greatly increase the efficiency of presentation in the meeting, teaching in the class, remote monitoring of hazardous events from a secured zone, and fast and easy monitoring in the production line.

M. VARIOUS INTERFACES SUPPORT

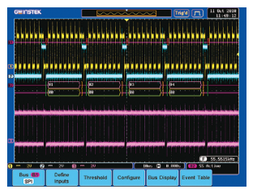
Two high-speed USB 2.0 Host ports located in both front panel and rear panel are used for easy access of stored data. In the rear panel, a USB Device port is available for remote control and hardcopy print-out through a PictBridge compatible printer. RS-232 and LAN interfaces are provided as standard for system communication & ATE applications.

A SVGA video output port allows the transfer of DSO screen image to an external projector or monitor for remote monitoring or big screen observation. A GPIB to USB adaptor is available as an option for interface conversion though the USB Device port in the front panel.

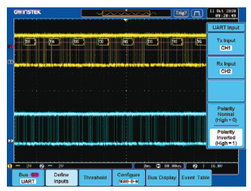
N. SERIAL BUS ANALYSIS SOFTWARE SUPPORTING I²C, SPI and UART (OPTIONAL)



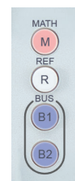
I²C Serial Bus Analysis Software



SPI Serial Bus Analysis Software



UART Serial Bus Analysis Software

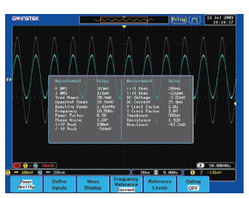


The GDS-3000 Series provides two dedicated keys in the front panel for tow sets of setting recall

With serial bus technology being widely used in embedded applications, the proper triggering and analysis of flowing data, control signal and associated pulse waveforms in serial bus communication has been a difficult job and challenge to design engineers. The Serial Bus Analysis software of GDS-3000 Series carries complete analysis tools for triggering and decoding of commonly used serial bus interfaces, including I²C, SPI and UART. Without spending time to study serial bus regulation details, the user only needs to set the trigger condition on GDS-3000 to get the data slots of interest.

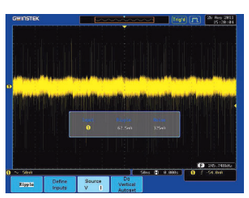
** Only four-channel models support SPI function.*

O. POWER ANALYSIS SOFTWARE FOR POWER SUPPLY MEASUREMENTS (OPTIONAL)

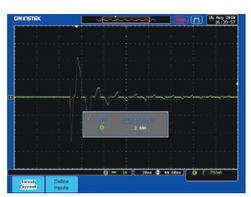


Power Quality

Harmonics



Ripple



In-rush Current

The Power Analysis software contains four measurement functions, including Power Quality, Harmonics, Ripple and Inrush Current. The Power Quality analysis function allows the measurements of Voltage, Current, Frequency, Power and other quality related parameters for power source efficiency improvement. The Harmonics analysis function performs evaluation of power waveform distortion and gives harmonic test data for power source design and quality check. This function is complied with IEC 61000-3-2 standard. The Ripple measurement function, acquiring the ripple and noise overriding the DC waveform, is used to evaluate the DC power source quality. The Inrush Current measurement function is used to measure the power-on surge current, which may cause the damage of the device circuit.

Current Probe and Differential Probe Selections

GCP-300/500/1000

GCP-530/1030,GCP-206P/425P

GDP-025

GDP-050/100

In addition to the standard passive probes, the optional current or differential probes can be used to perform additional tests or power analysis.
The differential probes come in three bandwidths: 25 MHz, 50 MHz and 100 MHz. The current probes come in a broad variety of bandwidth and current ranges (ranging from 50 MHz/30 A, 100 MHz/30 A, 300 kHz/200 A, 500 kHz/150 A, 1 MHz/70 A), to cover any number of power supply testing applications.

**** The GCP-530/1030 must be used in conjunction with the GCP-206P/425P current probe power supply.***

**** The GCP-206P is capable of powering 2 units of GCP-530 or GCP-1030 and the GCP-425P is capable of powering 4 units.***

CURRENT PROBE

	GCP-300	GCP-500	GCP-530	GCP-1000	GCP-1030
Probe Bandwidth	DC to 300 kHz	DC to 500 kHz	DC to 50 MHz	DC to 1 MHz	DC to 100 MHz
Rise Time	1.17 µs (Typ.)	0.7 µs (Typ.)	7 ns or less	0.35 µs (Typ.)	3.5 ns or less
Maximum Continuous Input Range	200 A (10 mV/A) 20 A (100 mV/A)	150 A (20 mV/A) 15 A (200 mV/A)	50 Apeak	70 A (50 mV/A) 7 A (500 mV/A)	50 Apeak
Maximum Peak Current Value	DC : 200 A AC : 140 Arms	DC : 150 A AC : 100 Arms	DC : 50 A AC : 30 Arms	DC : 70 A AC : 50 Arms	DC : 50 A AC : 30 Arms
Output Voltage Rate	100 mV/A ; 10 mV/A	200 mV/A ; 20 mV/A	0.1 V/A	500 mV/A ; 50 mV/A	0.1 V/A
DC Amplitude Accuracy	±3% ±50 mA at 100 mV/A (50 mA to 20 A peak range) ±4% ±50 mA at 10 mV/A (500 mA to 70 A peak range) ±15% max at 10 mV/A (70 A peak to 150 A peak range) ±25% max at 10 mV/A (150 A peak to 200 A peak range)	±3 % ±30 mA at 200 mV/A (30 mA to 15 A peak range) ±4 % ±300 mA at 20 mV/A (300 mA to 80 A peak range) ±15 % max at 20 mV/A (80 A peak to 150 A peak range)	±1.0 % rdg ±1 mV (0 to 30 Arms/DC, 45 to 66 Hz) ±2.0 % rdg (30 Arms to 50 A peak/ DC, 45 to 66 Hz)	±3 % ±20 mA at 500 mV/A (20 mA to 7 A peak range) ±4 % ±200 mA at 50 mV/A (200 mA to 50 A peak range) ±15 % max at 50 mV/A (50 A peak to 70 A peak range)	±1.0 % rdg ±1 mV (0 to 30 Arms/DC, 45 to 66 Hz) ± 2.0 % rdg (30 Arms to 50 A peak/ DC, 45 to 66 Hz)
Noise	–	–	2.5 mArms or less	–	2.5 mArms or less
Rate Supply Voltage	–	–	±12 V ± 0.5 V	–	±12 V ± 0.5 V
Maximum Rated Power	–	–	5.6 VA	–	5.3 VA
Maximum Rated Voltage	300 V CAT III / 600 V CAT II	600 V CAT III	300 V CAT I	600 V CAT III	300 V CAT I

CURRENT PROBE POWER SUPPLY

	GCP-206P	GCP-425P
Compatible Current Probe	GCP-530/GCP-1030	GCP-530/GCP-1030
Number of Power Supply Connectors	2	4
Output Voltage	±12 V± 0.5 V	±12 V ± 0.5 V
Rated Output Current	±600 mA	±2.5 A
Rated Supply Voltage(50/60 Hz)	110 V/120 V, 220 V/240 V AC ± 10 %	100 V to 240 V AC ±10 %
Maximum Rated Power	20 VA	170 VA
Dimensions & Weight	73(W) x 110(H) x 186(D) mm ; Approx.1.1 kg	80(W) x 119(H) x 200(D) mm ; Approx.1.1 kg
Accessories	Power cord, fuse	Power cord, fuse

HIGH-VOLTAGE DIFFERENTIAL PROBE

	GDP-025	GDP-050	GDP-100
Probe Bandwidth	DC to 25 MHz(-3dB)	DC to 50 MHz(-3dB)	DC to 100 MHz(-3dB)
Attenuation	x20 , x50 , x200	x100 , x200 , x500 , x1000	x100 , x200 , x500 , x1000
Accuracy	±2 %	±2 %	±2 %
Voltage Input Range (DC+AC peak to peak)	≤140 Vp-p for x 20 (≅ 48 Vrms or DC) ≤350 Vp-p for x 50 (≅ 120 Vrms or DC) ≤1400 Vp-p for x 200 (≅ 480 Vrms or DC)	≤700 Vp-p for x 100 (≅ 230 Vrms or DC) ≤1400 Vp-p for x 200 (≅ 460 Vrms or DC) ≤ 3500 Vp-p for x 500 (≅ 1140 Vrms or DC) ≤7000 Vp-p for x 1000 (≅ 2300 Vrms or DC)	≤700 Vp-p for x 100 (≅ 230 Vrms or DC) ≤1400 Vp-p for x 200 (≅ 460 Vrms or DC) ≤ 3500 Vp-p for x 500 (≅ 1140 Vrms or DC) ≤7000 Vp-p for x 1000 (≅ 2300 Vrms or DC)
Permitted Max Input Voltage	Maximum differential voltage: 400 V (DC+AC peak to peak) or 480 Vrms; Max voltage between input terminal and ground: 240 Vrms	Maximum differential voltage: 7000 V (DC+AC peak to peak); Max voltage between input terminal and ground: 1200 Vrms	Maximum differential voltage: 7000 V (DC+AC peak to peak); Max voltage between input terminal and ground: 1200 Vrms
Input Impedance	Differential: 4 MΩ/1.2 pF ; Between terminals and ground: 2 MΩ/2.3 pF	Differential: 16 MΩ/1.2 pF ; Between terminals and ground: 8 MΩ/2.3 pF	Differential: 16 MΩ/1.2 pF ; Between terminals and ground: 8 MΩ/2.3 pF
Output	≤ ±7.0 V	≤ ±7.0 V	≤ ±7.0 V
Output Impedance	50 Ω	50 Ω	50 Ω
Rise Time	14 ns	7 ns	3.5 ns
Rejection Rate on Common Mode(CMRR)	60 Hz > 80 dB , 100 Hz > 60 dB, 1 MHz > 50 dB	60 Hz > 80 dB , 100 Hz > 60 dB, 1 MHz > 50 dB	60 Hz > 80 dB , 100 Hz > 60 dB, 1 MHz > 50 dB
Power Supply	External DC adapter	External DC adapter	External DC adapter
Consumption	< 300 mA maximum	< 300 mA maximum	< 300 mA maximum

SPECIFICATIONS

	GDS-3502	GDS-3504
VERTICAL		
Channels	2Ch+EXT	4Ch+EXT
Bandwidth	DC~500MHz(-3dB)	DC~500MHz(-3dB)
Calculated Rise Time	700ps	700ps
Bandwidth Limit	20M/100M/200/350MHz	20M/100M/200/350MHz
	The bandwidth of the 75Ω input impedance is limited to 150MHz only	
Vertical Resolution	8 bits	
Vertical Resolution (1MΩ)	2mV~5V/div	
Vertical Resolution (50/75Ω)	2mV~1V/div	
Input Coupling	AC, DC, GND	
Input Impedance	1MΩ// 15pF approx.	
DC Gain Accuracy	±3% full scale	
Polarity	Normal , Invert	
Maximum Input Voltage(1MΩ)	300Vrms, CAT I	
Maximum Input Voltage(50/75Ω)	5 Vrms , CAT I	
Offset Position Range	2mV/div ~ 100mV/div : ±0.5V ; 200mV/div ~ 5V/div : ±25V	
Waveform Signal Process	Add, Subtract, Multiply, and Divide waveforms, Differentiation, Integration (App installation required)FFT, FFTrms ; 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	2CH model: CH1, CH2, Line , EXT ; 4CH model: CH1 , CH2 , CH3 , CH4 , Line , EXT	
Trigger Mode	Auto (Supports Roll Mode for 100 ms/div and slower), Normal, Single	
Trigger Type	Edge, Pulse Width, Video, Runt, Rise & Fall, Alternate, Glitch Trigger, Duration Trigger, Slope Trigger Event-Delay(1~65,535 events),Time-Delay(10ns~10s),I C,SPI,UART(optional)	
Trigger Holdoff Range	10ns ~ 10s	
Coupling	AC, DC, LF rej. , HF rej. , Noise rej.	
Sensitivity	DC~30MHz Approx. 1div or 10mV; 50MHz~150MHz Approx. 1.5div or 15mV; 150MHz~350MHz Approx. 2div or 20mV; 350MHz~500MHz Approx. 2.5div or 25mV	
EXT TRIGGER		
Range	±15V	
Sensitivity	DC ~ 150MHz Approx. 100mV 150MHz ~ 250MHz Approx. 150mV;250MHz ~ 350MHz Approx. 150mV;350MHz~500MHz Approx. 200mV	
Input Impedance	1MΩ ±3%, ~16pF	
HORIZONTAL		
Range	1ns/div ~ 100s/div (1-2.5-5 increments) ROLL : 100ms/div ~ 100s/div	
Pre-trigger	10 div maximum	
Post-trigger	1,000 div max (depend on time base)	
Accuracy	±20 ppm over any ≥ 1 ms time interval	
X-Y MODE		
X-Axis Input/Y-Axis Input	Channel 1; Channel 3/Channel 2; Channel 4	
Phase Shift	±3°at 100kHz	
SIGNAL ACQUISITION		
Real Time Sample Rate	4GSa/s	4GSa/s
ET Sample Rate	100GSa/s maximum for all models	
Memory Depth	25k points	
Acquisition Mode	Normal, Average, Peak detect, High resolution, Single Average: 2 ~ 256 waveforms ; Peak detect: 2ns	
CURSORS AND MEASUREMENT		
Cursors	Amplitude, Time, Gating available	
Automatic Measurement	28 sets: Vpp , Vamp , Vavg , Vrms , Vhi , Vlo , Vmax , Vmin , Rise Preshoot/ Overshoot , Fall Preshoot/Overshoot, Freq , Period , Rise time , Fall time , Positive width , Negative width , Duty cycle, Phase, and eight different delay measurements (FRR, FRF, FFR, FFF, LRR, LRF, LFR, LFF)	
Cursors Measurement	Voltage difference between cursors (△V) Time difference between cursors (△T)	
Auto Counter	6 digits, range from 2Hz minimum to the rated bandwidth	
POWER MEASUREMENTS(OPTION)		
Power Quality Measurements	V RMS, I RMS, True Power, Apparent Power, Reactive Power, Frequency, Power Factor, Phase Angle, V Crest Factor, I Crest Factor, (+)V Peak,(-)V Peak,(+)I Peak, (-)I Peak, DC Voltage, DC Current, Impedance, Resistance, Reactance	
Harmonics	Frequency(Hz), Magnitude(%), Mag. RMS(A), Phase(o), Limit(A), Limit(%), Pass / Fail, Max all, Windows(A),200% Limit, POHC Limit, THD-F, THD-R,RMS, Overall, POHL, Input Power, Power Factor, Fundamental Current, Harmonic 3, Harmonic 5	
Ripple Measurements	Ripple, Nose	
In-rush current	First peak, second peak	
CONTROL PANEL FUNCTION		
Autoset	Single-button, automatic setup of all channels for vertical, horizontal and trigger systems, with undo autoset	
Auto-range	Allow automatically adjusts the time base and/or the vertical scale of displayed waveform when the frequency and/or the amplitude of input signal changed.	
Save Setup	20 sets	
Save Waveform	24 sets	

SPECIFICATIONS

	GDS-3502	GDS-3504
DISPLAY SYSTEM		
TFT LCD Type	8" TFT LCD SVGA color display(LED Back-light)	
Waveform Update Rate	3500 wfm/sec	
Display Resolution	800 horizontal x 600 vertical pixels (SVGA)	
Interpolation	Sin(x)/x & Equivalent time sampling	
Waveform Display	Dots, Vectors, Variable persistence, Infinite persistence	
Display Graticule	8 x 10 divisions	
Display Brightness	Adjustable	
INTERFACE		
RS-232C	DB-9 male connector	
USB Port	2 sets USB 2.0 high-speed host port ;1 set USB high-speed 2.0 device port	
Ethernet Port	RJ-45 connector, 10/100Mbps	
SVGA Video Port	DB-15 female connector, monitor output for display on SVGA monitors	
GPIB	GPIB-to-USB Adapter (Optional)	
Go/NoGo BNC	5V Max/10mA TTL open collector output	
Internal Flash Disk	64MB	
Kensington Style Lock	Rear-panel security slot connects to standard Kensington-style lock	
Line Output	3.5mm stereo jack for Go/NoGo audio alarm	
OPERATING ENVIRONMENT		
Temperature	0°C ~ 50°C, Relative Humidity≤80% at 40°C or below ; ≤ 45% at 41°C~50°C	
POWER SOURCE		
Line Voltage Range	AC 100V ~ 240V, 50Hz ~ 60Hz, auto selection	
MISCELLANEOUS		
Multi-Language Menu	Available	
On-Line Help	Available	
Time Clock	Time and date, provide the date/time for saved data	
DIMENSIONS & WEIGHT		
	400(W) X 200(H) X 130(D)mm, Approx. 4 kg	

* Three-year warranty, excluding probes & LCD display panel.

Specifications subject to change without notice.

ORDERING INFORMATION

GDS-3502 500MHz, 2-Channel, Visual Persistence DSO
GDS-3504 500MHz, 4-Channel, Visual Persistence DSO

ACCESSORIES
Power cord x 1
GTP-501R : 500 MHz 10:1 passive probe for GDS-3502/3504 (one per channel)

OPTION

DS3-PWR Power analysis software: Power quality/Harmonic/Ripple/In-rush current measurements
DS3-SBD Serial Bus analysis software: I €/SPI/UART(only 4 channel models support SPI function)

OPTIONAL ACCESSORIES

GUG-001	GPIB to USB Adapter	**GTL-248**	GPIB Cable, Double Shielded, 2000 mm
GTP-033A	35 MHz 1:1 Passive probe	**GTL-110**	Test lead, BNC to BNC connector
GTP-352R	350 MHz 20:1 Passive probe	**GTL-232**	RS-232C cable, 9-pin female to 9-pin female
GDP-025	25 MHz High voltage differential probe	**GTL-246**	USB 2.0 cable, A-B type,1800 mm
GDP-050	50 MHz High voltage differential probe	**GRA-441**	Rack Adapter Panel
GDP-100	100 MHz High voltage differential probe	**GTP-1501R**	1.5 GHz 10:1 Passive probe
GCP-300	300 kHz/200 A Current probe	**GCP-0275**	2 MHz/750 A Current probe
GCP-500	500 kHz/150 A Current probe	**GCP-0550**	5 MHz/500 A Current probe
GCP-530	50 MHz/30 A Current probe	**GCP-2525**	25 MHz/250 A Current probe
GCP-1000	1 MHz/70 A Current probe	**GCP-425P**	Power supply for current probe(4 input channel)
GCP-1030	100 MHz/30 A Current probe	**GDP-1020P**	1 GHz/20 V High Frequency Differential Probe
GKT-100	Deskew Fixture	**GDP-2035H**	200 MHz/3500 Vpk High Voltage Differential Probe

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PC Software OpenWave software **Driver** LabView driver