

## 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 5GSa/s and an equivalent-time sampling rate of 100GSa/s. The large 8-inch SVGA TFT 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.

### Rich Features

With widespread applications of embedded system using serial bus communications, 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 the most popular serial interface projects including I<sup>2</sup>C, SPI and UART.

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

### Hi-tech Platform

With 5GSa/s sampling and Visual Persistence Oscilloscope (VPO) technology, GDS-3000 displays waveforms truthfully and captures less-frequently-occurred signals, like glitches or runts, simultaneously without missing any spot of waveform information. A unique Split-screen feature allows each input channel to be operated independently with respective setting and waveform display. This gives users flexibility to use GDS-3000 Series as a multi-scope-in-one DSO.

To alleviate the burden of manual operation and to reduce human error, additional features such as auto range are used to automatically adjust the horizontal and vertical scale of a displayed signal so that waveforms are displayed with the best possible viewing ratio.

The I/O Interfaces give you a good range of choices and convenience. In the front panel, a USB host port is used for easy data access. And in the rear panel, another USB port can be used for remote control or for screen printout directly from PictBridge compatible printers. In addition, RS-232 and LAN interfaces provide the flexibility supporting broad range of applications. The SVGA video output port allows you to display the screen on an external projector or monitor for information sharing and discussion.

### Unique Signal Processing -VPO

The GDS-3000 VPO (Visual Persistence Oscilloscope) technology adopts a very unique signal-processing design. To significantly increase the data processing speed and the waveform capture rate, GDS-3000 uses FPGA platform to replace conventional serial microprocessor architecture. This unique technology allows the GDS-3000 Series to show waveforms in a fashion like that of an analog oscilloscope. The VPO three dimension waveform display, containing the information of amplitude, time and intensity, provides more useful signal contents for the analysis of rapid-changed events, such as video, jitter and infrequent signals.

### FEATURES

- 500/350/250/150MHz Bandwidth
- Dual Sampling Modes: 5GSa/s Real-Time Sampling Rate and 100GSa/s Equivalent Time Sampling Rate
- 25k 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 for Each Input Channel
- Three Input Impedance Selections: 50Ω /75Ω /1MΩ
- Optional Power Measurement Software for Power Supply Measurement and Analysis
- Optional Serial BUS Triggering and Decoding Software Supporting I<sup>2</sup>C, SPI and UART
- Support GW APP Software-Easy Upgrade of Feature New Function



Front



Rear Panel

### APPLICATIONS

- Industrial and Educational R&D Labs
- Product Testing and Quality Assurance
- Power Supply and Serial BUS Design
- System Integration & Debugging
- Maintenance & Repair Service

## SPECIFICATIONS

|                             |   | GDS-3152   | GDS-3154 | GDS-3252                               | GDS-3254 | GDS-3352                                  | GDS-3354 | GDS-3502  | GDS-3504 |
|-----------------------------|---|--|----------|--|----------|---|----------|---|----------|
| VERTICAL                    | <b>Channels</b>   | 2Ch+EXT  | 4Ch+EXT  | 2Ch+EXT                                | 4Ch+EXT  | 2Ch+EXT                                   | 4Ch+EXT  | 2Ch+EXT   | 4Ch+EXT  |
|                             | <b>Bandwidth</b><br><b>Rise Time</b><br><b>Bandwidth Limit</b>  | DC~150MHz(-3dB)<br>2.3ns<br>20MHz  |          | DC~250MHz(-3dB)<br>1.4ns<br>20M/100MHz |          | DC~350MHz(-3dB)<br>1ns<br>20M/100M/200MHz |          | DC~500MHz(-3dB)<br>700ps<br>20M/100M/200/350MHz |          |
|                             | <b>Vertical Resolution</b><br><b>Vertical Resolution(1MΩ)</b><br><b>Vertical Resolution(50/75Ω)</b><br><b>Input Coupling</b><br><b>Input Impedance</b><br><b>DC Gain Accuracy</b><br><b>Polarity</b><br><b>Maximum Input Voltage(1MΩ)</b><br><b>Maximum Input Voltage(50/75Ω)</b><br><b>Offset Position Range</b><br><b>Waveform Signal Process</b> | The bandwidth of the 75Ω input impedance is limited to 150MHz only<br>8 bits<br>2mV~5V/div<br>2mV~1V/div<br>AC, DC, GND<br>1MΩ // 15pF approx.<br>(3% X  Readout  + 0.1div + 1mV)<br>Normal, Invert<br>300V (DC+AC Peak), CAT I<br>5 Vrms, CAT I<br>2mV/div ~ 100mV/div : 0.5V ; 200mV/div ~ 5V/div : 25V<br>Add, Subtract, Multiply, and Divide waveforms, 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                     | <b>Source</b><br><b>Trigger Mode</b><br><b>Trigger Type</b><br><b>Trigger Holdoff Range</b><br><b>Coupling</b><br><b>Sensitivity</b>  | 2CH model: CH1, CH2, Line, EXT ; 4CH model: CH1, CH2, CH3, CH4, Line, EXT<br>Auto (Supports Roll Mode for 100 ms/div and slower), Normal, Single<br>Edge, Pulse Width, Video, Runt, Rise & Fall, Alternate, Event-Delay(1~65,535 events), Time-Delay(10ns~10s), I <sup>2</sup> C, SPI, UART(optional)<br>10ns ~ 10s<br>AC, DC, LF rej., Hf rej., Noise rej.<br>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                 | <b>Range</b><br><b>Sensitivity</b><br><b>Input Impedance</b>  | 15V<br>DC ~ 150MHz Approx. 100mV<br>150MHz ~ 250MHz Approx. 150mV; 250MHz ~ 350MHz Approx. 150mV; 350MHz~500MHz Approx. 200mV<br>1MΩ 3%, ~16pF   |          |  |          |   |          |   |          |
| HORIZONTAL                  | <b>Range</b><br><b>Pre-trigger</b><br><b>Post-trigger</b><br><b>Accuracy</b>  | 1ns/div ~ 100s/div (1-2.5 increments; GDS-3502/3504 1-2.5-5 increments) ROLL : 100ms/div ~ 100s/div<br>10 div maximum<br>1,000 div max ( depend on time base )<br>20 ppm over any > 1 ms time interval   |          |  |          |   |          |   |          |
| X-Y MODE                    | <b>X-Axis Input/Y-Axis Input</b><br><b>Phase Shift</b>  | Channel 1; Channel 3/Channel 2; Channel 4<br>3° at 100kHz  |          |  |          |   |          |   |          |
| SIGNAL ACQUISITION          | <b>Real Time Sample Rate</b><br><b>ET Sample Rate</b><br><b>Record Length</b><br><b>Acquisition Mode</b>  | 2.5GSa/s   | 5GSa/s   | 2.5GSa/s                               | 5GSa/s   | 5GSa/s                                    | 5GSa/s   | 4GSa/s  | 4GSa/s   |
|                             |   | 100GSa/s maximum for all models<br>25k points<br>Normal, Average, Peak detect, High resolution, Single<br>Average: 2 ~ 256 waveforms ; Peak detect: 2ns  |          |  |          |   |          |   |          |
| CURSORS AND MEASUREMENT     | <b>Cursors</b><br><b>Automatic Measurement</b><br><b>Cursors measurement</b><br><b>Auto counter</b>   | Amplitude, Time, Gating available<br>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)<br>Voltage difference between cursors (ΔV) Time difference between cursors (ΔT)<br>6 digits, range from 2Hz minimum to the rated bandwidth  |          |  |          |   |          |   |          |
| POWER MEASUREMENTS (OPTION) | <b>Power Quality Measurements</b><br><b>Harmonics</b><br><b>Ripple Measurements</b><br><b>In-rush current</b>   | VRMS, VCrest factor, Frequency, IRMS, ICrest factor, True power, Apparent power, Reactive power, Power factor, Phase angle.<br>Freq, Mag, Mag rms, Phase, THD-F, THD-R, RMS<br>Vripple, Irripple<br>First peak, second peak  |          |  |          |   |          |   |          |
| CONTROL PANEL FUNCTION      | <b>Autoset</b><br><b>Auto-Range</b><br><b>Save Setup</b><br><b>Save Waveform</b>  | Single-button, automatic setup of all channels for vertical, horizontal and trigger systems, with undo autoset<br>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.<br>20set<br>24set   |          |  |          |   |          |   |          |
| DISPLAY SYSTEM              | <b>TFT LCD Type</b><br><b>Display Resolution</b><br><b>Interpolation</b><br><b>Waveform Display</b><br><b>Display Graticule</b><br><b>Display Brightness</b>  | 8" TFT LCD SVGA color display(LED Back-light)<br>800 horizontal x 600 vertical pixels (SVGA)<br>Sin(x)/x & Equivalent time sampling<br>Dots, Vectors, Variable persistence, Infinite persistence<br>8 x 10 divisions<br>Adjustable   |          |  |          |   |          |   |          |
| INTERFACE                   | <b>RS-232C</b><br><b>USB Port</b><br><b>Ethernet Port</b><br><b>SVGA Video Port</b><br><b>GPIO</b><br><b>Go/NoGo BNC</b><br><b>Internal Flash Disk</b><br><b>Kensington Style Lock</b><br><b>Line Output</b>  | DB-9 male connector<br>2 sets USB 2.0 high-speed host port ; 1 set USB high-speed 2.0 device port<br>RJ-45 connector, 10/100Mbps<br>DB-15 female connector, monitor output for display on SVGA monitors<br>GPIO-to-USB Adapter (Optional)<br>5V Max/10mA TTL open collector output<br>64MB<br>Rear-panel security slot connects to standard Kensington-style lock<br>3.5mm stereo jack for Go/NoGo audio alarm   |          |  |          |   |          |   |          |
| POWER SOURCE MISCELLANEOUS  | <b>Line Voltage Range</b><br><b>Multi-Language Menu</b><br><b>On-Line Help</b><br><b>Time clock</b>   | AC 100V ~ 240V, 48Hz ~ 63Hz, auto selection<br>Available<br>Available<br>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.

DS-3000GD2DH

## ORDERING INFORMATION

|                 |   |
|-----------------|---|
| <b>GDS-3502</b> | 500MHz, 2-Channel, Visual Persistence DSO |
| <b>GDS-3504</b> | 500MHz, 4-Channel, Visual Persistence DSO |
| <b>GDS-3352</b> | 350MHz, 2-Channel, Visual Persistence DSO |
| <b>GDS-3354</b> | 350MHz, 4-Channel, Visual Persistence DSO |
| <b>GDS-3252</b> | 250MHz, 2-Channel, Visual Persistence DSO |
| <b>GDS-3254</b> | 250MHz, 4-Channel, Visual Persistence DSO |
| <b>GDS-3152</b> | 150MHz, 2-Channel, Visual Persistence DSO |
| <b>GDS-3154</b> | 150MHz, 4-Channel, Visual Persistence DSO |

## ACCESSORIES

|                                 |   |
|---------------------------------|---|
| User manual x 1, Power cord x 1 |   |
| GTP-151R : 150MHz 10:1          | passive probe for GDS-3152/3154 (one per channel) |
| GTP-251R : 250MHz 10:1          | passive probe for GDS-3252/3254 (one per channel) |
| GTP-351R : 350MHz 10:1          | passive probe for GDS-3352/3354 (one per channel) |
| GTP-501R : 500MHz 10:1          | passive probe for GDS-3502/3504 (one per channel) |

## OPTION

|                |  |
|----------------|--|
| <b>DS3-PWR</b> | Power analysis software: Power quality/Harmonic/Ripple/In-rush current measurements                  |
| <b>DS3-SBD</b> | Serial Bus analysis software: I <sup>2</sup> C/SPI/UART (only 4-channel models support SPI function) |
| <b>GUG-001</b> | GPIO to USB adapter  |

## OPTIONAL ACCESSORIES

|                 |   |                 |   |
|-----------------|---|-----------------|---|
| <b>GDP-025</b>  | 25MHz High voltage differential probe           | <b>GTP-033A</b> | 35MHz 1:1 Passive probe   |
| <b>GDP-050</b>  | 50MHz High voltage differential probe           | <b>GTP-352R</b> | 350MHz 20:1 Passive probe   |
| <b>GDP-100</b>  | 100MHz High voltage differential probe          | <b>GTC-001</b>  | Instrument cart 450(W)x430(D)mm(120V input socket)                      |
| <b>GCP-005</b>  | 1kHz/5A Current probe                           | <b>GTC-002</b>  | Instrument cart 330(W)x430(D)mm(120V input socket)                      |
| <b>GCP-020</b>  | 10kHz/200A Current probe                        | <b>GSC-008</b>  | Soft Carrying Case  |
| <b>GCP-100</b>  | 100kHz/100A Current probe                       | <b>GTL-110</b>  | Test lead, BNC to BNC connector   |
| <b>GCP-530</b>  | 50MHz/30A Current probe                         | <b>GTL-232</b>  | RS-232C cable, 9-pin female to 9-pin female,<br>Null Modem for computer |
| <b>GCP-1030</b> | 100MHz/30A Current probe                        | <b>GTL-246</b>  | USB 2.0 cable, A-B type cable 4P, 1800mm                                |
| <b>GCP-206P</b> | Power supply for current probe(2 input channel) | <b>GRA-411</b>  | Rack Adapter Panel  |
| <b>GCP-425P</b> | Power supply for current probe(4 input channel) | <b>GDB-03</b>   | Oscilloscope Education and Training Kit                                 |
|                 |   | <b>GKT-100</b>  | Deskew fixture  |

## FREE DOWNLOAD

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

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Simply Reliable

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