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SAFETY INSTRUCTION

This chapter contains important safety instructions that you must follow when operating GDS-1000 and when keeping it in storage. Read the following before any operation to insure your safety and to keep the best condition for GDS-1000.

Safety Symbols
These safety symbols may appear in this manual or on GDS-1000.

⚠️ WARNING
Warning: Identifies conditions or practices that could result in injury or loss of life.

⚠️ CAUTION
Caution: Identifies conditions or practices that could result in damage to GDS-1000 or to other properties.

⚠️ DANGER High Voltage

⚠️ Attention Refer to the Manual

⚠️ Protective Conductor Terminal

⚠️ Earth (ground) Terminal

Safety Guidelines

General
Guideline

• Make sure the BNC input voltage does not exceed 300V peak.

⚠️ CAUTION

• Never connect a hazardous live voltage to the ground side of the BNC connectors. It might lead to fire and electric shock.

• Do not place any heavy object on GDS-1000.

• Avoid severe impacts or rough handling that leads to damaging GDS-1000.

• Do not discharge static electricity to GDS-1000.

• Use only mating connectors, not bare wires, for the terminals.

• Do not block the cooling fan opening.

• Do not perform measurement at power source and building installation site (Note below).

• Do not disassemble GDS-1000 unless you are qualified as service personnel.

(Measurement categories) EN 61010-1:2001 specifies the measurement categories and their requirements as follows. GDS-1000 falls under category II.

• Measurement category IV is for measurement performed at the source of low-voltage installation.

• Measurement category III is for measurement performed in the building installation.

• Measurement category II is for measurement performed on the circuits directly connected to the low voltage installation.

• Measurement category I is for measurements performed on circuits not directly connected to Mains.

Power Supply

• AC Input voltage: 100 ~ 240V AC, 47 ~ 63Hz

⚠️ WARNING

• The power supply voltage should not fluctuate more than 10%.

• Connect the protective grounding conductor of the AC power cord to an earth ground, to avoid electrical shock.
SAFETY INSTRUCTION

Fuse

- Fuse type: T1A/250V
- Make sure the correct type of fuse is installed before power up.
- To ensure fire protection, replace the fuse only with the specified type and rating.
- Disconnect the power cord before fuse replacement.
- Make sure the cause of fuse blowout is fixed before fuse replacement.

Cleaning GDS-1000

- Disconnect the power cord before cleaning.
- Use a soft cloth dampened in a solution of mild detergent and water. Do not spray any liquid.
- Do not use chemical containing harsh material such as benzene, toluene, xylene, and acetone.

Operation Environment

- Location: Indoor, no direct sunlight, dust free, almost non-conductive pollution (Note below)
- Relative Humidity: < 80%
- Altitude: < 2000m
- Temperature: 0°C to 50°C

(Pollution Degree) EN 61010-1:2001 specifies the pollution degrees and their requirements as follows. GDS-1000 falls under degree 2.

Pollution refers to “addition of foreign matter, solid, liquid, or gaseous (ionized gases), that may produce a reduction of dielectric strength or surface resistivity”.

- Pollution degree 1: No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.
- Pollution degree 2: Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected.
- Pollution degree 3: Conductive pollution occurs, or dry, non-conductive pollution occurs which becomes conductive due to condensation which is expected. In such conditions, equipment is normally protected against exposure to direct sunlight, precipitation, and full wind pressure, but neither temperature nor humidity is controlled.

Storage environment

- Location: Indoor
- Relative Humidity: < 85%
- Temperature: 0°C to 50°C

Power cord for the United Kingdom

When using GDS-1000 in the United Kingdom, make sure the power cord meets the following safety instructions.

NOTE: This lead/appliance must only be wired by competent persons

WARNING: THIS APPLIANCE MUST BE EARTHED

IMPORTANT: The wires in this lead are coloured in accordance with the following code:

Green/ Yellow: Earth
Blue: Neutral
Brown: Live (Phase)

As the colours of the wires in main leads may not correspond with the colours marking identified in your plug/appliance, proceed as follows:

The wire which is coloured Green & Yellow must be connected to the Earth terminal marked with the letter E or by the earth symbol or coloured Green or Green & Yellow.
The wire which is coloured Blue must be connected to the terminal which is marked with the letter N or coloured Blue or Black.
The wire which is coloured Brown must be connected to the terminal marked with the letter L or P or coloured Brown or Red.

If in doubt, consult the instructions provided with the equipment or contact the supplier.

This cable/appliance should be protected by a suitably rated and approved HBC mains fuse: refer to the rating information on the equipment and/or user instructions for details. As a guide, cable of 0.75mm² should be protected by a 3A or 5A fuse. Larger conductors would normally require 13A types, depending on the connection method used.

Any moulded mains connector that requires removal /replacement must be destroyed by removal of any fuse & fuse carrier and disposed of immediately, as a plug with bared wires is hazardous if engaged in live socket. Any re-wiring must be carried out in accordance with the information detailed on this label.
GETTING STARTED

This chapter describes GDS-1000 in a nutshell, including its main features and front / rear panel introduction. After going through the overview, follow the Set Up section to properly set up operation environment.

GDS-1000 Series Overview

<table>
<thead>
<tr>
<th>Model name</th>
<th>Frequency bandwidth</th>
<th>Input channels</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDS-1022</td>
<td>DC – 25MHz (-3dB)</td>
<td>2</td>
</tr>
<tr>
<td>GDS-1042</td>
<td>DC – 40MHz (-3dB)</td>
<td>2</td>
</tr>
<tr>
<td>GDS-1062</td>
<td>DC – 60MHz (-3dB)</td>
<td>2</td>
</tr>
<tr>
<td>GDS-1102</td>
<td>DC – 100MHz (-3dB)</td>
<td>2</td>
</tr>
</tbody>
</table>

Main Features

- **Performance**
  - 250MSa/S real-time sampling rate
  - 25GS/s equivalent-time sampling rate
  - 4k points record length per channel
  - Up to 10ns peak detection

- **Feature**
  - 5.6 inch color TFT display
  - Saving and recalling setups and waveforms
  - 18 types automatic measurements
  - 6-digit real-time frequency counter
  - Multi-language menu
  - Math operation: Add, Subtract, FFT
  - Edge, TV-line, Pulse Width trigger
  - Built-in Help

- **Interface**
  - SD card port for data saving/recalling
  - Calibration output
  - External trigger input

Compact size: (W) 310 x (D) 140 x (H) 142 mm
Panel Overview

Front Panel

- **LCD display**: TFT color, 320 x 234 resolution, wide angle view LCD display.
- **Function keys**: Activates the functions which appear on the left side of the LCD display.
- **Variable knob**: Increases/decreases value or move to the next/previous parameter.
- **Acquire key**: Configures acquisition mode (page 51).
- **Display key**: Configures display settings (page 54).
- **Power switch**
- **SD Card port**
- **Probe compensation output**
- **CH1 terminal**
- **CH1/CH2/MATH keys**
- **CH2 terminal**
- **Ground Terminal**
- **Menu keys**
- **Trigger keys**
- **Horizontal POSITION knob**
- **Vertical POSITION knob**
- **VOLTS/DIV knob**
- **Horizontal POSITION knob**
- **Trigger LEVEL knob**
- **EXT TRIG terminal**
- **Trigger menu key**
- **Horizontal menu key**
- **Trigger force key**
- **Horizontal position knob**
- **Run/Stop key**
- **Trigger level knob**
- **Save/Recall key**
- **Save/Recall**
- **Utility key**
- **Utility**
- **Help key**
- **Help**
- **Autoset key**
- **Autoset**
- **Cursor key**
- **Cursor**
- **Measure key**
- **Measure**
- **Hardcopy key**
- **Hardcopy**
- **Run/Stop key**
- **Freezes the signal view (page 39).**
- **Sets the trigger level (page 64).**
- **Configures trigger settings (page 64).**
- **Selects the single trigger mode (page 70).**
- **Forces the trigger level to 50% of the signal amplitude (page 70).**
- **Configures horizontal view (page 56).**
- **Sets the horizontal position of waveforms (page 56).**

**Utility key**
- **Utility**
- Configures Hardcopy (page 77), system info (page 70), menu language (page 71), calibration (page 92), and probe compensation (page 93).

**Help key**
- **Help**
- Shows Help contents on the LCD display (page 36).

**Autoset key**
- **Autoset**
- Finds signals and sets the appropriate horizontal / vertical / trigger settings (page 38).

**Cursor key**
- **Cursor**
- Runs cursor measurements (page 46).

**Measure key**
- **Measure**
- Configures and runs automatic measurements (page 43).

**Save/Recall key**
- **Save/Recall**
- Saves and recalls image, waveform, panel setup (page 72).

**Hardcopy key**
- **Hardcopy**
- Transfers data to SD card (page 77).

**Run/Stop key**
- **Run/Stop**
- Freezes the signal view (page 39).
GETTING STARTED

- **TIME/DIV knob**: Selects the horizontal scale (page 56); Fine (clockwise) or coarse (counterclockwise).

- **Vertical position knob**: Sets the vertical position of waveforms (page 60).

- **CH1/CH2 key**: Configures the vertical scale and coupling mode for each channel (page 60).

- **VOLTS/DIV knob**: Selects the vertical scale (page 60); Fine (clockwise) or coarse (counterclockwise).

- **Input terminal**: Accepts input signals: 1MΩ±2% input impedance, BNC terminal.

- **Ground terminal**: Accepts the DUT ground lead for common ground.

- **MATH key**: Performs math operation (page 48).

- **SD card port**: Facilitates transferring waveform data and display image (page 72).

- **Probe compensation output**: Outputs 2Vp-p, square signal for probe compensation (page 93) or demonstration.

- **External trigger input**: Accepts external trigger signal (page 64).

- **Power switch**: Powers on or off the oscilloscope.

---

Rear Panel

- **Fuse socket**: Fuse socket holds AC main fuse, T1A/250V.
  For fuse replacement procedure, see page 97.

- **Power cord socket**: Power cord socket accepts AC mains, 100 ~ 240V, 50/60Hz.

- **USB slave port**: Accepts typeB male connector for PC software connection (reserved for future use).

- **CAL output**: Outputs the signal for vertical scale accuracy calibration (page 92).
Display

Waveform marker
Waveform position
Run/Stop
Trigger status

Vertical status
Horizontal status
Frequency
Trigger condition

Menu

Set Up

Background
This section describes how to connect a signal, adjust the scale, and compensate the probe. Before operating GDS-1000 in a new environment, run these steps to make sure the oscilloscope is functionally stable and to help becoming familiar with it.

Steps
1. Connect the power cord to the rear panel socket.

2. Press the power switch. The display becomes active.

3. Reset the system by recalling the factory setting. Press the Save/Recall key, then Default Setup. For factory setting details, see page 35.

4. Connect the probe to Channel 1 input terminal and to the probe compensation signal output (2Vp-p, 1kHz square wave).

5. Set the probe attenuation to x10.

Waveforms
Shows input signal waveforms.
Channel 1: Yellow
Channel 2: Blue

Trigger status
Trig’d
Triggered.
Trig?
Not triggered, display not updated.
Auto
Not triggered, display updated.
STOP
Trigger stopped. Also appears in Run/Stop (page 39).

For trigger details, see page 64.

Input signal frequency
Shows the input signal frequency.
“< 20Hz” Indicates that the frequency is less than 20Hz (lower frequency limit).

Trigger configuration
Shows the trigger source, type, and slope. In case of Video trigger, shows trigger source and polarity.

Channel status
Shows the channel, coupling mode, vertical scale, and horizontal scale.
For channel details, see page 60.
6. Press the Autoset key. A square waveform appears on the center of the waveform. For Autoset details, see page 38.

7. Press the Display key, then Type to select vector waveform.

8. Turn the adjustment point on the probe to make the square waveform edge flat.

9. Continue with other operations. Measurements: page 37 Configurations: page 51

QUICK REFERENCE

This chapter describes GDS-1000 menu tree, shortcuts to major operations, built-in Help access, and default factory settings. Use them as a handy reference to get a quick access to the functionality.

Menu Tree / Operation Shortcuts

Convention

Normal = Select Normal
Average = Select Average repeatedly
Normal ~ Average = Select one from Normal to Average and press it
Normal → VAR = Press Normal, then use the Variable knob

Acquire key

Select acquisition mode
Normal ~ Peak-Detect
Select average number
Average =
Turn peak detect on/off
Peak-Detect =
Autoset key

- Automatically find signal and set scale
- Autoset

CH1/2 key

- Turn on/off channel
- CH 1/2

| Coupling | Select coupling mode
|----------|---------------------|
| ~ / mm / | Coupling
| Off      | Invert

- Turn waveform invert On/Off
- Invert

- Turn bandwidth limit On/Off
- BW Limit

- Select probe attenuation factor
- Probe x1 / x10 / x100

Cursor key

- Turn on/off cursor
- Cursor

- Select X or Y cursor
- X ↔ Y

Display key

- Select waveform display type
- Type

- Waveform accumulate On/Off
- Accumulate

- Refresh (refresh display when On)
- Refresh

- Set display contrast
- Contrast → VAR

- Select display grid
- 

GDS-1000 Series User Manual
Hardcopy key

Hardcopy → See Utility key (page 32)

Help key

Help → Turn help mode On/Off

Help

Horizontal menu key

<table>
<thead>
<tr>
<th>MENU</th>
<th>Select main (default) display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main</td>
<td>Main</td>
</tr>
<tr>
<td>Window</td>
<td>Select Window mode and zoom</td>
</tr>
<tr>
<td>Window Zoom</td>
<td>Window → TIME/DIV, Window Zoom</td>
</tr>
<tr>
<td>Roll</td>
<td>Select windows roll mode</td>
</tr>
<tr>
<td>XY</td>
<td>Select XY mode</td>
</tr>
</tbody>
</table>

Math key

MATH

Operation

Select math operation type (+/−)

CH1+/−CH2

Set result position

Position → VAR

Math result Volt/Div

Unit/Div → VAR

Math key (cont.)

MATH

Operation FFT

Select math operation type (FFT)

Source

Select FFT source channel

CH1/2

Select FFT window

Window

Select FFT result position

Position → VAR

Select vertical scale

Unit/Div
### Measure key

<table>
<thead>
<tr>
<th>Measure key</th>
<th>Measure key</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vpp 1.204mV</td>
<td>Source CH1/2</td>
</tr>
<tr>
<td>Vavg 2.993mV</td>
<td>Indication On/Off</td>
</tr>
<tr>
<td>Frequency 1:1.000kHz</td>
<td>Voltage/Vpp</td>
</tr>
<tr>
<td>Select ?</td>
<td>Previous Menu</td>
</tr>
</tbody>
</table>

- **Turn on/off measurement**: Measure
- **Select source channel**: Source
- **Display measurement result**: Indication
- **Select measurement type**: Voltage/Time
- **Select measurement item**: VAR or Icon
- **Go back to previous menu**: Previous Menu

### Run/Stop key

<table>
<thead>
<tr>
<th>Run/Stop key</th>
<th>Run/Stop key</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freeze/unfreeze waveform or trigger</td>
<td>Run/Stop</td>
</tr>
</tbody>
</table>

### Save/Recall key

#### Save/Recall

<table>
<thead>
<tr>
<th>Save/Recall</th>
<th>Save/Recall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default Setup</td>
<td>To Save Setup</td>
</tr>
<tr>
<td>Recall Setup</td>
<td>Save Waveform</td>
</tr>
<tr>
<td>Recall Waveform</td>
<td>To Save Waveform</td>
</tr>
<tr>
<td>Display Refs.</td>
<td>To Save Image</td>
</tr>
<tr>
<td>Recall Setup (cont.)</td>
<td>To Save All</td>
</tr>
</tbody>
</table>

- **Select Save or Recall menu**: Save/Recall
- **Recall default setup**: Default Setup
- **Save/Recall key (cont.)**

#### Recall Setup

<table>
<thead>
<tr>
<th>Recall Setup</th>
<th>Recall Setup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recall Setup</td>
<td>Source Memory</td>
</tr>
<tr>
<td>Source VAR</td>
<td>Memory/SD Card</td>
</tr>
</tbody>
</table>

- **Select other menu**: Recall Setup
- **Select setup source**: Source
- **Recall setup**: Recall
- **Go to SD card file utility**: File Utility

### Additional notes:

- **Recall Setup (cont.)**: Recall
- **File Utility**: Go to SD card file utility
- **File Utility**: (SD Card only)

---

**Page 26**
Save/Recall key (cont.)

Recall Waveform
- Select other menu
- Recall Waveform
- Select waveform source
  - Source → VAR
- Select waveform destination
  - Destination → VAR
- Recall waveform
- Recall
- Go to SD card file utility
- File Utility

Display Refs.
- Select other menu
- Display Refs.
- Turn ref. waveform A On/Off
  - Ref A
- Turn ref. waveform B On/Off
  - Ref B

Save/Recall key (cont.)

Save Setup
- Select other menu
- Save Setup
- Select destination
- Destination → VAR
- Save setup
- Save
- Go to file utility
- File Utility

Save Waveform
- Select other menu
- Save Waveform
- Select source
  - Source → VAR
- Select destination
  - Destination → VAR
- Save waveform
- Save
- Go to file utility
- File Utility
**Save/Recall key (cont.)**

**Save Image**
- Select other menu
- Save Image
- Turn on/off ink saver
- Ink Saver
- Destination
  - SD Card
- Save
- File Utility
  - (SD Card only)
  - To File Utility

**Save All**
- Select other menu
- Save All
- Turn on/off ink saver
- Ink Saver
- Destination
  - SD Card
- Save
- File Utility
  - (SD Card only)
  - To File Utility

**File Utilities (cont.)**
- Select file/folder
- Create or rename folder/file
- New Folder
- Rename
- VAR → Enter character / Backspace / Save / Previous menu
- Delete
- Go to previous menu

**Trigger key**
- Select video trigger type
  - Type
- Select trigger source
  - Source
- Select video standard
  - Standard
- Select video polarity
  - Polarity
- Select video line
  - Line
  - Field 1 / Field 2 / Line
**Trigger key (cont.)**

<table>
<thead>
<tr>
<th>MENU</th>
<th>CH1/2/Ext/Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Edge</td>
</tr>
<tr>
<td>Source</td>
<td>CH1</td>
</tr>
</tbody>
</table>

Select edge trigger type

Select trigger source

Go to slope/coupling menu

Select trigger mode

---

**Utility key**

<table>
<thead>
<tr>
<th>Utility</th>
<th>CH1/2/Ext/Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Edge</td>
</tr>
<tr>
<td>Source</td>
<td>CH1</td>
</tr>
</tbody>
</table>

Select pulse trigger type

Select trigger source

Select pulse trigger condition and pulse width

When VAR

Go to slope/coupling menu

Select trigger mode

---

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<table>
<thead>
<tr>
<th>MENU</th>
<th>CH1/2/Ext/Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Pulse</td>
</tr>
<tr>
<td>Source</td>
<td>CH1</td>
</tr>
</tbody>
</table>

Select pulse trigger type

Select trigger source

Select pulse trigger condition and pulse width

When VAR

Go to slope/coupling menu

Select trigger mode
Utility key (cont.)

Calibration / System information

<table>
<thead>
<tr>
<th>Self CAL Menu</th>
<th>Vertical</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Info.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Enter self calibration
Self CAL
Show system information
System Info
Go to previous menu
Previous Menu

Utility key (cont.)

Hardcopy

<table>
<thead>
<tr>
<th>Function</th>
<th>SaveImage/SaveAll</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inksaver</td>
<td>On/Off</td>
</tr>
</tbody>
</table>

Select Hardcopy function
Turn on/off inksaver
Go to previous menu
Previous Menu

Utility key (cont.)

Probe compensation

Select probe compensation signal
Wave Type

<table>
<thead>
<tr>
<th>Wave Type</th>
<th>(only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>m/r</td>
<td>1k ~ 100k</td>
</tr>
<tr>
<td>f/r</td>
<td>5% ~ 95%</td>
</tr>
</tbody>
</table>

Set frequency for square wave
Frequency

Set duty cycle for square wave
Duty Cycle

Go to previous menu
Previous Menu
## Default Settings

Here is the factory installed panel settings which appear when pressing the Save/Recall key → Default Setup.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Setting</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acquisition</strong></td>
<td><strong>Mode:</strong> Normal</td>
<td></td>
</tr>
<tr>
<td><strong>Channel</strong></td>
<td>Scale: 2V/Div</td>
<td>CH1: On, CH2: Off</td>
</tr>
<tr>
<td></td>
<td>Coupling: DC</td>
<td>Invert: Off</td>
</tr>
<tr>
<td></td>
<td>BW limit: Off</td>
<td>Probe attenuation: x1</td>
</tr>
<tr>
<td><strong>Cursor</strong></td>
<td>Source: CH1</td>
<td>Cursor: Off</td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td>Type: Vectors</td>
<td>Accumulate: Off</td>
</tr>
<tr>
<td></td>
<td>Graticule:</td>
<td></td>
</tr>
<tr>
<td><strong>Horizontal</strong></td>
<td>Scale: 2.5us/Div</td>
<td>Mode: Main Timebase</td>
</tr>
<tr>
<td><strong>Math</strong></td>
<td>Type: + (Add)</td>
<td>Channel: CH1+CH2</td>
</tr>
<tr>
<td></td>
<td>Position: 0.00 Div</td>
<td>Unit/Div: 2V</td>
</tr>
<tr>
<td><strong>Measure</strong></td>
<td>Source: CH1</td>
<td>Measurement: Off</td>
</tr>
<tr>
<td><strong>Trigger</strong></td>
<td>Type: Edge</td>
<td>Source: Channel1</td>
</tr>
<tr>
<td></td>
<td>Mode: Auto</td>
<td>Slope: ___</td>
</tr>
<tr>
<td></td>
<td>Coupling: DC</td>
<td>Rejection: Off</td>
</tr>
<tr>
<td><strong>Utility</strong></td>
<td>SavelImage, InkSaver Off</td>
<td>Language: English</td>
</tr>
<tr>
<td></td>
<td>Square wave probe, 1k, 50% duty cycle</td>
<td>Hardcopy: save image</td>
</tr>
</tbody>
</table>

---

## Built-in Help

The Help key shows help contents. When each functional key is pressed, simple explanations of major functionalities appear on the display.

### Applicable keys

- Acquire
- Display
- Utility
- Help
- Autoset
- Cursor
- Measure
- Save/Recall
- Hardcopy
- Run/Stop

### Panel operation

1. Press the Help key. The display changes to the Help mode.
2. Press each key to access its help contents. (example: Acquire key)
3. Use the Variable knob to scroll the Help contents up and down.
4. Press the Help key again to exit the Help mode.
Basic Measurement

This section describes the basic operations required in capturing and viewing the input signal. For more detailed operations, see the following chapters.

- Measurements → from page37
- Configurations → from page51

Channel activation

Activate channel  
To activate an input channel, press the Channel key. The waveform appears on the display.

De-activate channel  
To disable the channel, press the Channel key again. If the display menu is other than the Channel menu, press twice (the first pressing just activates the Channel menu).

Default setup  
When the default setup is recalled (Save/Recall key → Default Setup), Channel 1 automatically turns On. Channel 2 becomes Off.

Autoset  
The Autoset (page38) does NOT automatically activate the channels to which input signals are connected.

Autoset function automatically configures the panel settings to position the input signal to the best viewing condition. GDS-1000 automatically configures the following parameters.
- Horizontal scale
- Vertical scale
- Trigger source channel

Panel operation

1. Connect the input signal to GDS-1000 and press the Autoset key.

2. The waveform appears in the center of the display.

3. To undo Autoset, press Undo. This feature is available for 5 seconds after Autoset is activated.

Limitation  
Autoset does not work in the following situation.
- Input signal frequency less than 20Hz
- Input signal amplitude less than 30mV
Run/Stop

Background
By default, the waveform on the display is constantly updated (Run mode). Freezing the waveform (Stop mode) allows flexible observation and analysis. To enter the Stop mode, two methods are available: pressing the Run/Stop key or using Single Trigger mode.

Stop mode icon
When in Stop mode, the Stop icon appears at the top of the display.

Freeze waveform by Run/Stop key
1. Press the Run/Stop key once. The waveform freezes. To unfreeze the waveform, press the Run/Stop key again.

Freeze waveform by Single Trigger mode
2. In the single trigger mode, the waveform always stays in the Stop mode, and is updated only when the Run/Stop key is pressed. For trigger details, see page 64. Note: pressing the Run/Stop key only updates the waveform once – it does not switch to Run mode (continuous update).

Waveform operation
The waveform can be moved or scaled in both Run and Stop mode, but in different manners. For details, see page 56 (Horizontal position/scale) and page 60 (Vertical position/scale).

Horizontal position/scale
For more detailed configuration, see page 56.

<table>
<thead>
<tr>
<th>Set horizontal position</th>
<th>The horizontal position knob moves the waveform left/right.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select horizontal scale</td>
<td>To select the timebase (scale), turn the TIME/DIV knob; left (slow) or right (fast).</td>
</tr>
<tr>
<td>Range</td>
<td>1ns/Div ~ 10s/Div, 1-2-5 increment</td>
</tr>
</tbody>
</table>

The corresponding sampling rate appears on the upper side of the display. The timebase indicator appears on the lower side.

Stop mode
In the Stop mode, the memory bar and waveform size changes according to the scale.

Vertical position/scale
For more detailed configuration, see page 60.

<table>
<thead>
<tr>
<th>Set vertical position</th>
<th>To move the waveform up or down, turn the vertical position knob for each channel.</th>
</tr>
</thead>
<tbody>
<tr>
<td>As the waveform moves, the vertical position of the cursor appears at the bottom left corner of the display.</td>
<td></td>
</tr>
<tr>
<td>Run/Stop mode</td>
<td>The waveform can be moved vertically in both Run and Stop mode.</td>
</tr>
<tr>
<td>Select vertical scale</td>
<td>To change the vertical scale, turn the VOLTS/DIV knob; left (down) or right (up).</td>
</tr>
<tr>
<td>Range</td>
<td>2mV/Div ~ 5V/Div, 1-2-5 increments</td>
</tr>
</tbody>
</table>
The vertical scale indicator for each channel on the bottom left of the display changes accordingly.

**Stop mode** In Stop mode, the vertical scale setting can be changed but the waveform shape stays the same.

## Probe compensation signal

### Background

This section introduces how to use the probe compensation signal for general usage, in case the DUT signal is not available or to get a second signal for comparison. For probe compensation details, see page 93.

Note that the frequency accuracy and duty factor are not guaranteed. Therefore the signal should not be used for reference purpose.

### Waveform type

<table>
<thead>
<tr>
<th>Waveform</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Waveform" /></td>
<td>Square waveform used for probe compensation. 1k ~ 100kHz, 5% ~ 95%.</td>
</tr>
<tr>
<td><img src="image" alt="Waveform" /></td>
<td>Demonstration signal for showing the effects of peak detection. See page 51 for peak detection mode details.</td>
</tr>
<tr>
<td><img src="image" alt="Waveform" /></td>
<td>Demonstration signal for showing the effects of long memory.</td>
</tr>
</tbody>
</table>

### View compensation

1. Connect the probe between the compensation signal output and Channel input.

2. Press the Utility key.

3. Press **ProbeComp**.

4. Press Wave type repeatedly to select the wave type.

5. (For ![Waveform](image) only) To change the frequency, press **Frequency** and use the Variable knob.

   - **Range**: 1kHz ~ 100kHz

6. (For ![Waveform](image) only) To change the duty cycle, press **Duty Cycle** and use the Variable knob.

   - **Range**: 5% ~ 95%

For probe compensation details, see page 93.
## Automatic Measurement

Automatic measurement function measures and updates major items for Voltage, Time, and Delay type.

### Measurement items

<table>
<thead>
<tr>
<th>Overview</th>
<th>Voltage type</th>
<th>Time type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overview</td>
<td>Voltage type</td>
<td>Time type</td>
</tr>
<tr>
<td>Vpp</td>
<td>Frequency</td>
<td>Freq</td>
</tr>
<tr>
<td>Vmax</td>
<td>Period</td>
<td>Period</td>
</tr>
<tr>
<td>Vmin</td>
<td>RiseTime</td>
<td>RiseTime</td>
</tr>
<tr>
<td>Vamp</td>
<td>FallTime</td>
<td>FallTime</td>
</tr>
<tr>
<td>Vhi</td>
<td>+Width</td>
<td>+Width</td>
</tr>
<tr>
<td>Vlo</td>
<td>-Width</td>
<td>-Width</td>
</tr>
<tr>
<td>Vavg</td>
<td>DutyCycle</td>
<td>DutyCycle</td>
</tr>
<tr>
<td>Vrms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROVShoot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FOVShoot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RPRESoot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FPRESoot</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Voltage measurement

- **Vpp**
  - Difference between positive and negative peak voltage ($= V_{max} - V_{min}$)
- **Vmax**
  - Positive peak voltage.
- **Vmin**
  - Negative peak voltage.
- **Vamp**
  - Difference between global high and global low voltage ($= V_{hi} - V_{lo}$)
- **Vhi**
  - Global high voltage.

### Time measurement

- **Freq**
  - Frequency of the waveform.
- **Period**
  - Waveform cycle time ($= 1 / \text{Freq}$).
- **Risetime**
  - Rising time of the pulse (~90%).
- **Falltime**
  - Falling time of the pulse (~10%).
- **+Width**
  - Positive pulse width.
- **-Width**
  - Negative pulse width.

### Duty Cycle

- **Duty Cycle**
  - Ratio of signal pulse compared with whole cycle $= 100 \times (\text{Pulse Width}/\text{Cycle})$
Measurement

1. Press the Measure key.

2. The Channel 1 and Channel 2 measurement results appear on the menu bar, constantly updated. Press the menu to change the measurement item for each location.

Select measurement item

1. The selection menu appears. Press Source repeatedly to select the first source channel.

2. Press the third menu repeatedly to select the measurement type: Voltage or Time.

3. Use the Variable knob or press the icon repeatedly to select the measurement item.

4. Press Previous Menu to confirm the item selection and to go back to the measurement results view.

Indication mode

Pressing Indication and turning on the indication mode allows the measurement result appear in the display regardless of the menu contents.

Cursor Measurement

Cursor line, horizontal or vertical, shows the position and value of the waveform and math operation result.

Use horizontal cursor

Panel operation/Range

1. Press the Cursor key to activate the cursors which appear in the display.

2. Press Source repeatedly to select the source channel.

3. Press X↔Y to select the horizontal (X1&X2) cursor.

4. The cursor position information appears in the menu.

Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1</td>
<td>Time position of the left cursor</td>
</tr>
<tr>
<td>X2</td>
<td>Time position of the right cursor</td>
</tr>
<tr>
<td>Δ</td>
<td>The time distance between the left and right cursor</td>
</tr>
<tr>
<td>f</td>
<td>The time distance (Δ) converted to frequency</td>
</tr>
</tbody>
</table>
5. Use the Variable knob to move the cursor left or right. The contents changes accordingly.

Use vertical cursor

Panel operation/Range

1. Press the Cursor key.

2. Press Source repeatedly to select the source channel.

   Range  CH1, 2, Math

3. Press X↔Y to select the vertical (Y1&Y2) cursor.

4. The cursor position information appears on the menu.

   Parameter
   Y1  Voltage level of the upper cursor
   Y2  Voltage level of the lower cursor
   ∆   The voltage difference between the upper and lower cursor

5. Use the Variable knob to move the cursor up or down.

Math Operation

Overview

Background  Math operation runs addition, subtraction, or FFT for the input signals and shows the result on the display. The resulted waveform characteristics can be measured using the cursors.

Addition (+)  Adds amplitude of CH1 & CH2 signals.

Subtraction (−)  Extracts the amplitude difference between CH1 & CH2.

FFT  Runs FFT calculation on a signal. Four types of FFT windows are available: Hanning, Flattop, Rectangular, and Blackman.

Hanning FFT window  Frequency resolution  Good
                     Amplitude resolution  Not good
                     Suitable for....  Frequency measurement on periodic waveform

Flattop FFT window  Frequency resolution  Not good
                     Amplitude resolution  Good
                     Suitable for....  Amplitude measurement on periodic waveform

Rectangular FFT window  Frequency resolution  Very good
                        Amplitude resolution  Bad
                        Suitable for....  Single-shot phenomenon (this mode is the same as having no window at all)
Blackman FFT window
Frequency resolution: Bad
Amplitude resolution: Very good
Suitable for: Amplitude measurement on periodic waveform

Addition/Subtraction

Panel operation
1. Activate both CH1 and CH2.
2. Press the Math key.
3. Press Operation repeatedly to select addition (+) or subtraction (–).
4. The math measurement result appears in the display. Press the vertical scale of math waveform (Unit/div) and use the Variable knob.
5. To move the math waveform vertically, press Position and use the Variable knob.
6. To clear the math result from the display, press the Math key again.

FFT

Panel operation
1. Press the Math key.
2. Press Operation repeatedly to select FFT.
3. Press Source repeatedly to select the source channel.
4. Press Window repeatedly to select the FFT window type.
5. The FFT result appears. For FFT, the horizontal scale changes from time to frequency, and the vertical scale from voltage to dB.
6. To move the FFT waveform vertically, press Position and use the Variable knob.
7. To select the vertical scale of FFT waveform, press Unit/Div repeatedly.
8. To clear the FFT result from the display, press the Math key again.
CONFIGURATION

Acquisition

Acquisition process samples the analog input signals and converts them into digital format for internal processing.

Select acquisition mode

Panel operation

1. Press the Acquire key.

2. Select the acquisition mode between Normal and Average.

Range

Normal

All of the acquired data is used to draw the waveform.

Average

Multiple acquired data are averaged. This mode is useful for drawing a noise-free waveform. To select the number, press Average repeatedly. Average number: 2, 4, 8, 16, 32, 64, 128, 256

3. To activate the Peak detect mode, press Peak-Detect. Only the minimum and maximum value pairs for each acquisition interval (bucket) are used. This mode is useful for catching abnormal glitches in the signal.

Peak detect effect using probe comp. waveform

1. One of the probe compensation waveforms can demonstrate peak detection mode. Connect the probe to the probe compensation output.

2. Press the Utility key.

3. Press ProbeComp.

4. Press Wave Type and select the waveform.

5. Press the Autoset key. GDS-1000 positions the waveform in the center of the display.

6. Press the Acquire key.

8. Press Peak-Detect and see that a spike noise is captured.

Real time vs Equivalent time sampling mode

Background
GDS-1000 automatically switches between two sampling modes, Real-time and Equivalent-time, according to the number of active channel and sampling rate.

Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Real-time sampling</th>
<th>Equivalent-time sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One sampled data is used to reconstruct a single waveform. Short-time events might get lost if the sampling rate gets too high. This mode is used when the sampling rate is relatively low.</td>
<td>Multiple numbers of sampled data are accumulated to reconstruct a single waveform. Restores greater waveform details but takes longer to update the waveform. This mode is used when the sampling rate becomes higher.</td>
</tr>
</tbody>
</table>

Switching threshold

<table>
<thead>
<tr>
<th>Input Channel</th>
<th>Number of active channel / sampling mode</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Real-time Sampling</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Equivalent-Time Sampling</td>
</tr>
</tbody>
</table>

Display

Select waveform drawing (vector/dot)

Panel operation
1. Press the Display key.

2. Press Type repeatedly to select the waveform drawing.

<table>
<thead>
<tr>
<th>Range</th>
<th>Dots</th>
<th>Vectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dots</td>
<td>Only the sampled dots are displayed.</td>
<td></td>
</tr>
<tr>
<td>Vectors</td>
<td>Both the sampled dots and the connecting line are displayed.</td>
<td></td>
</tr>
</tbody>
</table>

Accumulate waveform

Background
Accumulation preserves the old waveform drawings and overwrites new waveforms on top of it. It is useful for observing waveform variation.

Panel operation
1. Press the Display key.

2. Press Accumulate to turn On waveform accumulation.

3. To clear the accumulation and start over (refresh), press Refresh.

Set display contrast

Panel operation
1. Press the Display key.
2. Press Contrast.

3. Turn the Variable knob left to lower the contrast (dark display) or right to raise the contrast (bright display).

Freeze the waveform (Run/Stop)
For more details about Run/Stop mode, see page 39.

Panel operation
1. Press the Run/Stop key. To unfreeze the waveform, press the Run/Stop key again.
2. The waveform and the trigger freezes. The trigger indicator on the top right of the display shows Stop.

Select display grid

Panel operation
1. Press the Display key.
2. Press the grid icon repeatedly to select the grid.

Range
- Shows the full grid; X and Y axis for each division.
- Shows only the center X and Y frame.
- Shows only the outer frame.

Horizontal View
This section describes how to set the horizontal scale, position, and waveform display mode.

Move waveform position horizontally

Panel operation
- The horizontal position knob moves the waveform left/right.

Run mode
- In Run mode, the waveform keeps its relative position in the memory since the entire memory is continuously captured and updated.

Stop mode
- In Stop mode, the waveform moves until it reaches the end of the memory.

Select horizontal scale

Select horizontal scale
- To select the timebase (scale), turn the TIME/DIV knob; left (slow) or right (fast).

Range
- 1ns/Div ~ 10s/Div, 1-2-5 increment
- The corresponding sampling rate appears on the upper side of the display. The timebase indicator appears on the lower side.

Run mode
- In Run mode, the waveform size keep their proportion. When the timebase becomes slower, it automatically switches to Scan mode (see the next page).

Stop mode
- In Stop mode, the memory bar and waveform size changes according to the scale.
Select waveform update mode

Background
The display update mode is switched automatically or manually according to timebase and trigger. The indicator on the bottom left of the display shows the current mode.

Main mode
Updates the whole displayed waveform at once. Automatically selected when the timebase (sampling rate) is fast.
- Timebase: ≤50ms/div (≥500Sa/s)
- Trigger: all modes

Scan mode
Updates the waveform gradually from the left side of the display to the right. The waveform position is fixed. Automatically selected when the timebase (sampling rate) is slow.
- Timebase: ≥100ms/div (≤250Sa/s)
- Trigger: Auto mode only

Roll mode
Updates and moves the waveform gradually from the right side of the display to the left. Manually selected when the timebase (sampling rate) is slow.
- Timebase: ≥250ms/div (≤100Sa/s)
- Trigger: all modes

Select Roll mode manually
1. Press the Horizontal menu key.

Note: When the update mode switches from Main to Scan, GDS-1000 automatically selects the Auto trigger mode. See page 64 for trigger details.

Zoom waveform horizontally

Panel operation/range
1. Press the Horizontal menu key.
2. Press Window.
3. Use the horizontal position knob to move the zoom range sideways, and TIME/DIV knob to change the zoom range width.

The width of the bar in the middle of the display is the actual zoomed area.

Zoom range
1ns ~ 1ms

4. Press Window Zoom. The specified range gets zoomed.

Note: The Roll mode locks the timebase to be at least 250ms/div (100Sa/s). If faster timebase or sampling rate is required, get out of the Roll mode by pressing Main.
5. To go back to the original view, press Main.

Show waveform in X-Y mode

Background
The X-Y mode compares the voltage of Channel 1 and Channel 2 waveforms in a single display. This mode is useful for observing the phase relationship between the two.

Panel operation
1. Connect the signals to Channel 1 (X-axis) and Channel 2 (Y-axis).
2. Make sure both Channel 1 and 2 are activated. Press the Channel key if necessary.
3. Press the Horizontal menu key.
4. Press XY. The display shows two waveforms in X-Y format; Channel 1 as X-axis, Channel 2 as Y-axis.
5. Horizontal Position knob and Time/Div knob are disabled under the X-Y mode. To move the waveform position, use the vertical position knob: Channel 1 knob moves the waveform horizontally, Channel 2 knob vertically.

Vertical View (Channel)
This section describes how to set the vertical scale, position, and coupling mode.

Move waveform position vertically

Panel operation
To move the waveform up or down, turn the vertical position knob for each channel.

As the waveform moves, the vertical position of the cursor appears at the bottom left corner of the display.

Run/Stop mode
The waveform can be moved vertically in both Run and Stop mode.

Select vertical scale

Panel operation
To change the vertical scale, turn the VOLTS/DIV knob; left (down) or right (up).

The vertical scale indicator on the bottom left of the display changes accordingly.

Range
2mV/Div ~ 5V/Div, 1-2-5 increments

Stop mode
In Stop mode, the vertical scale setting can be changed but the waveform shape stays the same.
Select coupling mode

Panel operation
1. Press the Channel key.
2. Press Coupling repeatedly to select the coupling mode.

Range
DC coupling mode. The whole portion (AC and DC) of the signal appears on the display.

Ground coupling mode. The display shows only the zero voltage level as a horizontal line. This mode is useful for measuring the signal voltage with respect to the ground level.

AC coupling mode. Only the AC portion of the signal appears on the display. This mode is useful for observing AC waveforms mixed with DC signal.

Invert waveform vertically

Panel operation
1. Press the Channel key.
2. Press Invert to invert the waveform.

Limit bandwidth

Background Bandwidth limitation puts the input signal into a 20MHz (−3dB) low-pass filter. This function is useful for cutting off high frequency noise to see the clear waveform shape.

Panel operation
1. Press the Channel key.
2. Press BW Limit to turn Off the limitation.

Example BW Limit Off BW Limit On

Select probe attenuation level

Background A signal probe has an attenuation switch to lower the original DUT signal level to the oscilloscope input range, if necessary. The probe attenuation selection adjusts the vertical scale so that the voltage level on the display reflects the real value on DUT.

Panel operation
1. Press the Channel key.
2. Press Probe repeatedly to select the attenuation level.
3. The voltage scale in the channel indicator changes accordingly. There is no change in the waveform shape.

<table>
<thead>
<tr>
<th>Range</th>
<th>x1, x10, x100</th>
</tr>
</thead>
</table>

**Note**
The attenuation factor adds no influence on the real signal. It just changes the voltage scale on the display.

---

### Trigger

Trigger configures the condition GDS-1000 captures the incoming signal.

#### Trigger type overview

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edge</td>
<td>Triggers when the signal crosses an amplitude threshold in either positive or negative slope.</td>
</tr>
<tr>
<td>Video</td>
<td>Extracts a sync pulse from a video format signal, and triggers on a specific line or field.</td>
</tr>
<tr>
<td>Pulse</td>
<td>Triggers when the pulse width of the signal is too narrow or too wide compared to the setting.</td>
</tr>
</tbody>
</table>

#### Trigger parameter overview

<table>
<thead>
<tr>
<th>Source</th>
<th>Description</th>
</tr>
</thead>
</table>
| Trigger source | CH1 ~ 4 Channel 1 ~ 4 input signals  
|              | Line AC mains signal  
|              | Ext External trigger input signal  |

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
</table>
| Trigger mode | Auto GDS-1000 generates an internal trigger if there is no trigger event, to make sure waveforms are constantly updated regardless of trigger events. Select this mode especially when viewing rolling waveform at slower timebase.  
|      | Normal GDS-1000 acquires waveform only when a trigger event occurs. |
**CONFIGURATION**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>GDS-1000 acquires waveform once when a trigger event occurs, then stop acquiring. Press the Single key to enter the single mode.</td>
</tr>
<tr>
<td>Auto level</td>
<td>In addition to behaving like the Auto mode, GDS-1000 automatically adjusts the trigger level to the center amplitude of the waveform.</td>
</tr>
</tbody>
</table>

**Video standard (video trigger)**
- **NTSC**: National Television System Committee
- **PAL**: Phase Alternative by Line
- **SECAM**: SEquential Couleur A Memoire

**Sync polarity (video trigger)**
- Positive polarity
- Negative polarity

**Video line (video trigger)**
- **Selects the trigger point in the video signal.**
  - **field**: 1 or 2
  - **line**: 1~263 for NTSC, 1~313 for PAL/SECAM

**Pulse condition (pulse trigger)**
- **Sets the pulse width (20ns ~ 200us) and the triggering condition.**
  - Longer than (
  - Equal to =
  - Shorter than <
  - Not equal to ≠

**Trigger slope**
- Triggers on the rising edge.
- Triggers on the falling edge.

**Trigger coupling**
- **AC**: Triggers only on the AC component.
- **DC**: Triggers on AC+DC component.

---

**Use edge trigger**

**Panel operation**

1. Press the Trigger menu key.

2. Press **Type** repeatedly to select edge trigger. The edge trigger indicator appears at the bottom of the display.

3. Press **Source** repeatedly to select the trigger source.
   - **Range**: Channel 1, 2, Line, Ext

4. Press **Mode** repeatedly to select the trigger mode.
   - **Range**: Auto, Normal, Auto Level

5. Press **Slope/coupling** to set trigger slope and coupling.

6. Press **Slope** repeatedly to select the trigger slope, which also appears at the bottom of the display.
   - **Range**: Rising edge, falling edge

**Frequency rejection**
- **LF**: Puts a high-pass filter and rejects the frequency below 50kHz.
- **HF**: Puts a low-pass filter and rejects the frequency above 50kHz.

**Noise rejection**: Rejects noise signal.
<table>
<thead>
<tr>
<th>Configuration</th>
<th>Use video trigger</th>
<th>Use pulse width trigger</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Press <em>Coupling</em> repeatedly to select the trigger coupling.</td>
<td>Panel operation</td>
<td>1. Press the Trigger menu key.</td>
</tr>
<tr>
<td>Range DC, AC</td>
<td>2. Press <em>Type</em> repeatedly to select video trigger. The video trigger indicator appears at the bottom of the display.</td>
<td>2. Press <em>Type</em> repeatedly to select pulse width trigger. The pulse width trigger indicator appears at the bottom of the display.</td>
</tr>
<tr>
<td>8. Press <em>Rejection</em> to select the frequency rejection mode.</td>
<td>3. Press <em>Source</em> repeatedly to select the trigger source channel.</td>
<td>3. Press <em>Source</em> repeatedly to select the trigger source.</td>
</tr>
<tr>
<td>Range LF, HF, Off</td>
<td>Range Channel 1, 2</td>
<td>Range Channel 1, 2, Line, Ext</td>
</tr>
<tr>
<td>9. Press <em>Noise Rej</em> to turn the noise rejection On/Off.</td>
<td>4. Press <em>Standard</em> repeatedly to select the video standard.</td>
<td>4. Press <em>Mode</em> repeatedly to select the trigger mode.</td>
</tr>
<tr>
<td>Range On, Off</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Use single trigger mode


Force trigger level to 50% of input signal amplitude

Panel operation 1. Press the trigger Force key. The trigger level automatically becomes 50% of the input signal amplitude. For manual adjustment, use the trigger Level knob.


2. Press the trigger Force key. The trigger level automatically becomes 50% of the input signal amplitude. For manual adjustment, use the trigger Level knob.

5. Press *When* repeatedly to select the pulse condition. Then use the Variable knob to set the pulse width.

Condition: >, <, =, ≠
Width: 20ns ~ 200us

6. Press *Slope/Coupling* to set trigger slope and coupling.

7. Press *Slope* repeatedly to select the trigger slope, which also appears at the bottom of the display.
Range: Rising edge, falling edge

8. Press *Coupling* repeatedly to select the trigger coupling.
Range: DC, AC

9. Press *Rejection* to select the frequency rejection mode.
Range: LF, HF, Off

10. Press *Noise Rej* to turn the noise rejection On/Off.
Range: On, Off

11. Press *Previous* menu to go back to the previous menu.
**System Setting**

**View system information**

Panel operation

1. Press the Utility key.


3. Press System Info. The upper half of the display shows the system information in the following format.
   - Manufacturer
   - Model
   - Serial number
   - Firmware version

4. Press any other key to go back to the waveform display mode.

**Select menu language**

Parameter

Language selection differs according to the region to which GDS-1000 is shipped.
- English
- Chinese (traditional)
- Chinese (simplified)

Panel operation

1. Press the Utility key.

2. Press Language repeatedly to select the language.

**SAVE/RECALL**

**File Format/Utility**

**Display image file format**

Format: DSxxxx.bmp or Axxxx.bmp (Windows bitmap format)

Contents: The current display image in 234 x 320 pixels, color format. The background color can be inverted (Ink saver function).

**Waveform file format**

Format: DSxxxx.csv or Axxxx.csv (Comma-separated values format, can be opened in spreadsheet applications such as Microsoft Excel)

Waveform type

- CH1, 2: Input channel signal
- Math: Math operation result (page 48)

Storage location

W1 ~ W15: Waveform file stored in the internal memory. Stored waveforms can be copied to SD card for transfer, or to Ref. A, B for showing on the display (W1 ~ W15 waveforms cannot be directly recalled on the display).
Reference waveform stored in the internal memory, separate from W1 ~ W15. From Ref A/B, waveforms can be recalled directly on the display with amplitude and frequency information. Useful for reference purpose in measurements.

**Contents:**

- **waveform data**
  - The waveform data can be used for detailed analysis. It consists of horizontal and vertical position of the waveform for the entire memory length.
  - One division includes 25 points of horizontal and vertical data. The vertical point starts from the center line. The horizontal point starts from the leftmost waveform.
  - The time length or voltage level which each data point represents differs according to the vertical and horizontal scale. For example:
    - Vertical scale: 10mV/div (4mV per point)
    - Horizontal scale: 100us/div (4us per point)

**Contents:**

- **other data**
  - The following information is also included in the waveform file.
    - Memory length
    - source channel
    - vertical offset
    - vertical scale
    - coupling mode
    - waveform last dot address
    - date and time
    - trigger level
    - vertical position
    - time base
    - probe attenuation
    - horizontal view
    - horizontal scale
    - sampling period
    - sampling mode

---

**Setup file format**

**Format**

DSxxx.set or Axxxx.set (proprietary format)

The setup file saves or recalls the following setting:

**Contents**

<table>
<thead>
<tr>
<th>Acquire</th>
<th>mode</th>
<th>memory length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cursor</td>
<td>source channel</td>
<td>cursor on/off</td>
</tr>
<tr>
<td></td>
<td>cursor location</td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>dots/vectors</td>
<td>accumulation on/off</td>
</tr>
<tr>
<td></td>
<td>grid type</td>
<td></td>
</tr>
<tr>
<td>Measure</td>
<td>item</td>
<td>source channel</td>
</tr>
<tr>
<td>Utility</td>
<td>hardcopy type</td>
<td>ink saver on/off</td>
</tr>
<tr>
<td></td>
<td>menu language</td>
<td></td>
</tr>
<tr>
<td>Horizontal</td>
<td>display mode</td>
<td>scale</td>
</tr>
<tr>
<td></td>
<td>position</td>
<td></td>
</tr>
<tr>
<td>Trigger</td>
<td>trigger type</td>
<td>source channel</td>
</tr>
<tr>
<td></td>
<td>trigger mode</td>
<td>video standard</td>
</tr>
<tr>
<td></td>
<td>video polarity</td>
<td>video line</td>
</tr>
<tr>
<td></td>
<td>pulse timing</td>
<td>slope/coupling</td>
</tr>
<tr>
<td>Channel (vertical)</td>
<td>vertical scale</td>
<td>vertical position</td>
</tr>
<tr>
<td></td>
<td>coupling mode</td>
<td>invert on/off</td>
</tr>
<tr>
<td></td>
<td>bandwidth limit</td>
<td>probe attenuation</td>
</tr>
<tr>
<td></td>
<td>on/off</td>
<td></td>
</tr>
<tr>
<td>Math</td>
<td>operation type</td>
<td>source channel</td>
</tr>
<tr>
<td></td>
<td>vertical position</td>
<td>unit/div</td>
</tr>
<tr>
<td></td>
<td>FFT window</td>
<td></td>
</tr>
</tbody>
</table>

---


SD card utility

Background For SD card, file deletion, folder creation, file/folder rename are available from the front panel. This feature is not available for internally stored files.

Panel operation 1. Connect the card to the card slot.
2. Press the Save/Recall key. Select any save or recall functionality, for example SD card destination in Save image function.
3. Press File Utility. The display shows the SD card contents in root directory.
4. Use the Variable knob to move the cursor. Press Select to go into the folder or go back to the previous directory level.

Create new folder / Rename file or folder
1. Move the cursor to the file or folder location and press New Folder or Rename. The file/folder name and the character map appear on the display.

Delete folder/file
1. Move the cursor to the folder or file location and press Delete. A message appears at the bottom of the display, asking additional confirmation.
2. If the file/folder still needs to be deleted, press Delete again to complete deletion. To cancel deletion, press any other key.
3. The SD card content is updated. Press Previous Menu to go back to Save/Recall menu.
### Quick Save (HardCopy)

#### Background
The Hardcopy key works as a shortcut for saving or printing out information.

Once set, subsequent file saving only requires pressing the Hardcopy key. Hardcopy key can be configured into two operations: save image and save all (image, waveform, setup).

Using the Save/Recall key can also save files but with more configurations. For details, see page 79.

#### Functionality
<table>
<thead>
<tr>
<th>Save image (*.bmp)</th>
<th>Saves the current display image into an SD card connected to the front or rear panel terminal.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Save all</td>
<td>Saves the following items into an SD card connected to the front or rear panel terminal.</td>
</tr>
<tr>
<td></td>
<td>• Current display image (*.bmp)</td>
</tr>
<tr>
<td></td>
<td>• Current system setup (*.set)</td>
</tr>
<tr>
<td></td>
<td>• Current waveform data (*.csv)</td>
</tr>
<tr>
<td></td>
<td>• Last stored system setup (*.set)</td>
</tr>
<tr>
<td></td>
<td>• Last stored waveform data (*.csv)</td>
</tr>
</tbody>
</table>

#### Panel operation
1. Connect the SD card to the slot.
2. Press the Utility key.
Save

File type/source/destination

<table>
<thead>
<tr>
<th>Item</th>
<th>Source</th>
<th>Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel setup (DSxxxx.set)</td>
<td>Front panel settings</td>
<td>Internal memory: S1 ~ S15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>External memory: SD card</td>
</tr>
<tr>
<td>Waveform data (DSxxxx.csv)</td>
<td>Channel 1, 2</td>
<td>Internal memory: Reference waveform A, B, W1 ~ W15</td>
</tr>
<tr>
<td></td>
<td>Math operation result</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reference waveform A, B</td>
<td></td>
</tr>
<tr>
<td>Display image (DSxxxx.bmp)</td>
<td>Display image</td>
<td>External memory: SD card</td>
</tr>
<tr>
<td>Save All (Axxxx.bmp)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Waveform data (Axxxx.csv)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Front panel settings (Axxxx.set)</td>
<td></td>
</tr>
</tbody>
</table>

Panel operation

1. (For saving to an external SD card) Connect the card to the slot.

2. Press the Save/Recall key twice.

3. Press Save Setup. The display shows the available file destinations.

4. Press Destination repeatedly to select the saved location. Use the Variable knob to change the memory location (S1 ~ S15) or the file name (DSxxxx.set).

5. Press Save to confirm saving. When completed, a message appears at the bottom of the display.

Note: The file will not be saved if the power is turned Off or SD card is taken out before the message.
File utility  
To edit SD card contents (create/ delete/ rename files and folders), press File Utility. For details, see page 75.

Save waveform

Panel operation
1. (For saving to an external SD card) Connect the card to the slot.
2. Press the Save/Recall key twice.
3. Press Save Waveform. The display shows the available source and destination options.
4. Press Source. Use the Variable knob to select the source signal.
5. Press Destination repeatedly to select the file destination. Use the Variable knob to select the memory location or file name.

Save display image

Panel operation
1. (For saving to an external SD card) Connect the card to the slot.
2. Press the Save/Recall key twice.
3. Press Save Image. The display shows the available file destinations.
4. Press Ink Saver repeatedly to invert the background color (On) or not (Off).
5. Press Destination. Use the Variable knob to select the file name.

SD card External card, no practical limitation on the amount of file. When saved, the image file is placed in the root directory.

6. Press Save to confirm saving. When completed, a message appears at the bottom of the display.

Note: The file will not be saved if the power is turned Off or SD card is taken out before the message.

File utility To edit SD card contents (create/ delete/ rename files and folders), press File Utility. For details, see page75.

Save All

Panel operation 1. (For saving to an external SD card) Connect the card to the slot.

2. Press the Save/Recall key twice.

3. Press Save All. The display shows the available file destinations. The following files are saved, contained in a folder.
   - Setup file (Axxxx.set) Two types of setups are saved: the current panel setting and the last internally saved setting (one of S1 ~ S15).
   - Display image (Axxxx.bmp) The current display image in bitmap format.
   - Waveform data (Axxxx.csv) Two types of waveform data are saved: the currently active channel data and the last internally saved data (one of W1 ~ W15).

4. Press Ink Saver repeatedly to invert the background color (On) or not (Off) for the display image.

5. Press Destination. Use the Variable knob to select the file name.

SD card External card, no practical limitation on the amount of file. When saved, the folder is placed in the root directory.

6. Press Save to confirm saving. When completed, a message appears at the bottom of the display.
Note: The file will not be saved if the power is turned Off or SD card is taken out before the message.

7. Together with the current setup/waveform/image, the last saved waveform file (one from W1 ~ W15) and setup file (one from S1 ~ S15) are also included in the folder.

File utility

To edit SD card contents (create/ delete/ rename files and folders), press File Utility. For details, see page 75.

Recall

File type/source/destination

<table>
<thead>
<tr>
<th>Item</th>
<th>Source</th>
<th>Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default panel setup</td>
<td>• Factory installed setting</td>
<td>• Current front panel setting</td>
</tr>
<tr>
<td>Reference waveform</td>
<td>• Internal memory: A, B</td>
<td>• Current front panel</td>
</tr>
<tr>
<td>Panel setup (DSxxxx.set)</td>
<td>• Internal memory: S1 ~ S15</td>
<td>• Current front panel</td>
</tr>
<tr>
<td></td>
<td>• External memory: SD card</td>
<td></td>
</tr>
<tr>
<td>Waveform data (DSxxxx.csv)</td>
<td>• Internal memory: W1 ~ W15</td>
<td>• Reference waveform A, B</td>
</tr>
<tr>
<td></td>
<td>• External memory: SD card</td>
<td></td>
</tr>
</tbody>
</table>

Recall default panel setting

Panel operation

1. Press the Save/Recall key.

2. Press Default Setup. The factory installed setting is recalled and replaces the current panel setting.

Setting contents

The following is the default setting contents.

Acquisition: Mode: Normal
## SAVE/RECALL

<table>
<thead>
<tr>
<th>Channel</th>
<th>Scale: 2V/Div</th>
<th>CH1: On, CH2/3/4: Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coupling: DC</td>
<td>Invert: Off</td>
<td></td>
</tr>
<tr>
<td>BW limit: Off</td>
<td>Probe attenuation: x1</td>
<td></td>
</tr>
<tr>
<td>Cursor</td>
<td>Source: CH1</td>
<td>Horizontal: None</td>
</tr>
<tr>
<td></td>
<td>Vertical: None</td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>Type: Dots</td>
<td>Accumulate: Off</td>
</tr>
<tr>
<td></td>
<td>Graticule:</td>
<td></td>
</tr>
<tr>
<td>Horizontal</td>
<td>Scale: 2.5us/Div</td>
<td>Mode: Main Timebase</td>
</tr>
<tr>
<td>Math</td>
<td>Type: + (Add)</td>
<td>Channel: CH1+CH2</td>
</tr>
<tr>
<td></td>
<td>Position: 0.00 Div</td>
<td>Unit/Div: 2V</td>
</tr>
<tr>
<td>Measure</td>
<td>Source1: CH1</td>
<td>Measurement: Off</td>
</tr>
<tr>
<td>Trigger</td>
<td>Type: Edge</td>
<td>Source: Channel1</td>
</tr>
<tr>
<td></td>
<td>Mode: Auto</td>
<td>Slope: _____________</td>
</tr>
<tr>
<td></td>
<td>Coupling: DC</td>
<td>Rejection: Off</td>
</tr>
<tr>
<td></td>
<td>Noise Rejection: Off</td>
<td></td>
</tr>
<tr>
<td>Utility</td>
<td>SaveImage, InkSaver Off</td>
<td></td>
</tr>
</tbody>
</table>

### Recall reference waveform on the display

**Panel operation**

1. The reference waveform must be stored in advance. See page 81 for waveform store details.

2. Press the Save/Recall key.


4. Select the reference waveform from `Ref A` to `Ref B` and press it. The waveform appears on the display and the period and amplitude of the waveform appears in the menu.

5. To clear the waveform from the display, press `Ref A/B` again.
Recall panel setting

Panel operation

1. (For recalling from an external SD card) Connect the card to the slot.

2. Press the Save/Recall key.

3. Press Recall Setup. The display shows the available file sources.

4. Press Source repeatedly to select the file source, internal or external memory. Use the Variable knob to change the memory.

   Memory
   - Internal memory, S1 ~ S15
   - SD card
     - External card, no practical limitation on the amount of file. The setup file must be placed in the root directory to be recognized.

5. Press Recall to confirm recalling. When completed, a message appears at the bottom of the display.

   Note: The file will not be saved if the power is turned Off or SD card is taken out before the message.

File utility

To edit SD card contents (create/ delete/ rename files and folders), press File Utility. For details, see page 75.

Recall waveform

Panel operation

1. (For recalling from an external SD card) Connect the card to the slot.

2. Press the Save/Recall key.

3. Press Recall Waveform. The display shows the available source and destination options.

4. Press Source repeatedly to select the file source, internal memory or external SD card. Use the Variable knob to change the memory location (W1 ~ W15) or the file name (DSxxxx.csv).

   Memory
   - Internal memory, W1 ~ W15
   - SD card
     - External flash drive, no practical limitation on the amount of file. The waveform file must be placed in the root directory to be recognized.

5. Press Destination. Use the Variable knob to select the memory location.

   RefA, B  Internally stored reference waveforms A, B
SAVE/RECALL

6. Press *Recall* to confirm recalling. When completed, a message appears at the bottom of the display.

**Note / !** The file will not be saved if the power is turned Off or SD card is taken out before the message.

File utility

To edit SD card contents (create/ delete/ rename files and folders), press *File Utility*. For details, see page75.

---

MAINTENANCE

Two types of maintenance operations are available: calibrate vertical resolution, and compensate the probe. Run these operations when using GDS-1000 in a new environment.

Vertical Resolution Calibration

**Panel operation**

1. Press the Utility key.

2. Press *More*.

3. Press *Self Cal Menu*.

4. Press *Vertical*. A message appears at the bottom of the display.

5. Connect the calibration signal from the rear panel CAL out to Channel1 input.

6. Press the specified key and start calibration.

7. The calibration for Channel1 starts and ends automatically in less than 5 minutes.
8. When finished, connect the calibration signal to Channel2 and repeat the procedure.

9. When the calibration for all channels are completed, the display goes back the default state.

**Probe Compensation**

**Panel operation**

1. Connect the probe between Channel1 input and the probe compensation output (2Vp-p, 1kHz square wave) on the front panel. Set the probe attenuation to x10.

2. Press the Utility key.

3. Press **ProbeComp**.

4. Press **Wavetype** repeatedly to select the standard square wave.

5. Press the Autoset key. The compensation signal appears on the display.

6. Press the Display key, then **Type** to select the vector waveform.

7. Turn the adjustment point on the probe until the signal edge becomes sharp.
FAQ

- The input signal does not appear on the display.
- I want to remove some contents from the display.
- The waveform does not update (frozen).
- The probe waveform is distorted.
- Autoset does not catch the signal well.
- I want to clean up the cluttered panel settings.
- The accuracy does not match the specification.
- The SD card slot does not accept my card.

The input signal does not appear on the display.

Make sure you have activated the channel by pressing the CH key.

I want to remove some contents from the display.

To clear automatic measurement result, press the Measure key twice, then Press Indication (Off). See page43 for details.
To clear FFT result, press the Math key twice. See page48 for details.
To clear Help result, press the Help key again. See page36 for details.

The waveform does not update (frozen).

Press the Run/Stop key to unfreeze the waveform. See page39 for details.
If this does not help, the trigger mode might be set to Single. Press the Single trigger key again. See page64 for trigger setting details.

The probe waveform is distorted.

You might need to compensate the probe. For details, see page93.
Note that the frequency accuracy and duty factor are not specified for probe compensation waveform and therefore it should not be used for other reference purpose.

Autoset does not catch the signal well.

Autoset function cannot catch signals under 30mV or 30Hz. Please use the manual operation. See page38 for Autoset details.

I want to clean up the cluttered panel settings.

Recall the default settings by pressing Save/Recall key→Default Setting. For default setting contents, see page35.

The saved display image is too dark on the background.

Use the Inksaver function which reverses the background color. For details, see page82.

The accuracy does not match the specification.

Make sure the device is powered On for at least 30 minutes, within +20°C~+30°C. This is necessary to stabilize the unit to match the specification.

The SD card slot does not accept my card.

Make sure it is a standard SD card. MMC and SDHC are not supported.
For more information, contact your local dealer or GWInstek at www.gwinstek.com.tw / marketing@goodwill.com.tw.
**APPENDIX**

**Fuse Replacement**

*Step 1.* Take off the power cord and remove the fuse socket using a minus driver.

*Step 2.* Replace the fuse in the holder.

Rating

T1A, 250V

---

**GDS-1000 Specification**

The specifications apply when GDS-1000 is powered on for at least 30 minutes under +20°C~+30°C.

**Model-specific**

<table>
<thead>
<tr>
<th>Model</th>
<th>Bandwidth (−3dB)</th>
<th>Bandwidth Limit</th>
<th>Trigger Sensitivity</th>
<th>External Trigger Sensitivity</th>
<th>Rise Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDS-1022</td>
<td>DC coupling: DC – 25MHz</td>
<td>None</td>
<td>Approx. 0.5div or 5mV</td>
<td>– 50mV</td>
<td>&lt; 14ns</td>
</tr>
<tr>
<td></td>
<td>AC coupling: 10Hz – 25MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDS-1042</td>
<td>DC coupling: DC – 40MHz</td>
<td>None</td>
<td>0.5div or 5mV (DC – 25MHz)</td>
<td>– 50mV</td>
<td>&lt; 8.75ns</td>
</tr>
<tr>
<td></td>
<td>AC coupling: 10Hz – 40MHz</td>
<td></td>
<td>1.5div or 15mV (25MHz~40MHz)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDS-1062</td>
<td>DC coupling: DC ~ 60MHz</td>
<td>20MHz (−3dB)</td>
<td>0.5div or 5mV (DC – 25MHz)</td>
<td>– 50mV (DC~25MHz)</td>
<td>&lt; 5.8ns</td>
</tr>
<tr>
<td></td>
<td>AC coupling: 10Hz – 60MHz</td>
<td></td>
<td>1.5div or 15mV (25MHz~60MHz)</td>
<td>– 100mV (25MHz~60MHz)</td>
<td></td>
</tr>
<tr>
<td>GDS-1102</td>
<td>DC coupling: DC – 100MHz</td>
<td>20MHz (−3dB)</td>
<td>0.5div or 5mV (DC – 25MHz)</td>
<td>– 50mV (DC~25MHz)</td>
<td>&lt; 3.5ns</td>
</tr>
<tr>
<td></td>
<td>AC coupling: 10Hz – 100MHz</td>
<td></td>
<td>1.5div or 15mV (25MHz~100MHz)</td>
<td>– 100mV (25MHz~100MHz)</td>
<td></td>
</tr>
</tbody>
</table>
### Common

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vertical</strong></td>
<td>Sensitivity: 2mV/div–5V/Div (1-2-5 increments)</td>
</tr>
<tr>
<td></td>
<td>Accuracy: ± (3% x Readout) + 0.1div + 1mV</td>
</tr>
<tr>
<td></td>
<td>Bandwidth: See model-specific specifications</td>
</tr>
<tr>
<td></td>
<td>Rise Time: See model-specific specifications</td>
</tr>
<tr>
<td>Input Coupling</td>
<td>AC, DC, Ground</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>1MΩ±2%, 1nF</td>
</tr>
<tr>
<td>Polarity</td>
<td>Normal &amp; Invert</td>
</tr>
<tr>
<td>Maximum Input</td>
<td>300V (AC+AC peak), CAT II</td>
</tr>
<tr>
<td>Math Operation</td>
<td>+, –, FFT</td>
</tr>
<tr>
<td>Offset Range</td>
<td>2mV/div–50mV/div: ± 0.4V</td>
</tr>
<tr>
<td></td>
<td>10mV/div–500mV/div: ± 4V</td>
</tr>
<tr>
<td></td>
<td>1V/div–5V/Div: ± 40V</td>
</tr>
<tr>
<td><strong>Trigger</strong></td>
<td>Sources: CH1, CH2, Line, EXT</td>
</tr>
<tr>
<td></td>
<td>Modes: Auto-Level, Auto, Normal, Single, TV, Edge, Pulse Width, Time-Delay, Event-Delay</td>
</tr>
<tr>
<td>Time Delay Range</td>
<td>100ns to 1.3ms</td>
</tr>
<tr>
<td>Event Delay Range</td>
<td>2 to 65000</td>
</tr>
<tr>
<td>Start Trigger Level</td>
<td>± 12V, adjustable (for USER mode)</td>
</tr>
<tr>
<td>Coupling</td>
<td>AC, DC, LF, Noise, Noise rej</td>
</tr>
<tr>
<td>TV Trigger</td>
<td>0.5div of synchronization signal</td>
</tr>
<tr>
<td><strong>External trigger</strong></td>
<td>Range: DC: ± 15V, AC: ± 2V</td>
</tr>
<tr>
<td></td>
<td>Sensitivity: See model-specific specifications</td>
</tr>
<tr>
<td></td>
<td>Input Impedance: 1MΩ±2%, 1nF</td>
</tr>
<tr>
<td></td>
<td>Maximum Input: 300V (DC+AC peak), CAT II</td>
</tr>
<tr>
<td><strong>Horizontal</strong></td>
<td>Range: 1ns/div–10ns/div, 1-2-5 increment</td>
</tr>
<tr>
<td></td>
<td>Modes: Main, Window, Window zoom, Roll, X-Y</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.01%</td>
</tr>
<tr>
<td>Pre-Trigger</td>
<td>10 div maximum</td>
</tr>
<tr>
<td>Post-Trigger</td>
<td>1000 div</td>
</tr>
<tr>
<td><strong>X-Y Mode</strong></td>
<td>X-Axis Input: Channel 1</td>
</tr>
<tr>
<td></td>
<td>Y-Axis Input: Channel 2</td>
</tr>
<tr>
<td>Phase Shift</td>
<td>±3° at 100kHz</td>
</tr>
<tr>
<td><strong>Signal Acquisition</strong></td>
<td>Real-Time: 250MSa/s maximum</td>
</tr>
<tr>
<td></td>
<td>Equivalent: 25G Sa/s maximum</td>
</tr>
<tr>
<td></td>
<td>Vertical: 8 bits</td>
</tr>
<tr>
<td>Resolution</td>
<td></td>
</tr>
<tr>
<td>Record Length</td>
<td>4k points</td>
</tr>
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### GDS-1000 Series User Manual

<table>
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<tr>
<th>Feature</th>
<th>Specification</th>
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<tr>
<td><strong>Single shot</strong></td>
<td>4k points record, 25MHz bandwidth</td>
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<tr>
<td><strong>Acquisition</strong></td>
<td>Normal, Peak Detect, Average</td>
</tr>
<tr>
<td><strong>Peak Detection</strong></td>
<td>10ns (500ns/div – 10s/div)</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>2, 4, 8, 16, 32, 64, 128, 256</td>
</tr>
<tr>
<td><strong>Cursor and Measurement</strong></td>
<td>Voltage: Vpp, Vamp, Vrms, Vhi, Vlo, Vmax, Vmin, Rise Preshoot, Overshoot, Fall Preshoot, Overshoot</td>
</tr>
<tr>
<td><strong>Time</strong></td>
<td>Freq, Period, Rise Time, Fall Time, – Width, – Width, Duty Cycle</td>
</tr>
<tr>
<td><strong>Cursors</strong></td>
<td>Voltage difference (ΔV) and Time difference (ΔT) between cursors Reciprocal of ΔT in Hertz (1/ΔT)</td>
</tr>
<tr>
<td><strong>Auto Counter</strong></td>
<td>Resolution: 6 digits, Accuracy: ±2% Signal source: All available trigger source except the Video trigger</td>
</tr>
<tr>
<td><strong>Trigger Frequency Counter</strong></td>
<td>Resolution: 6 digits Frequency Range: 20Hz minimum to rated bandwidth Accuracy: ±2% Signal Source: All trigger source except the Video trigger</td>
</tr>
<tr>
<td><strong>Control Panel Function</strong></td>
<td>Autoset: Automatically adjust Vertical Volt/div, Horizontal Time/div, and Trigger level</td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td>LCD: 5.6 inch, TFT, brightness adjustable Resolution (dots): 234 (Vertical) x 320 (Horizontal) Graticule: 8 x 10 divisions Display Contrast: Adjustable</td>
</tr>
<tr>
<td><strong>Interface</strong></td>
<td>USB Slave: (printers and flash disk not supported) SD Card Slot: Image (BMP) and waveform data (CSV)</td>
</tr>
<tr>
<td><strong>Probe</strong></td>
<td>Frequency range: 1kHz – 100kHz adjustable, 1kHz step Compensation: Duty cycle: 5% – 95% adjustable, 5% step Power Source: Line Voltage: 100V–240V AC, 47Hz–63Hz</td>
</tr>
<tr>
<td><strong>Power Source</strong></td>
<td>Power: 18W, 25VA maximum Voltage: 100V–240V AC, 47Hz–63Hz</td>
</tr>
<tr>
<td><strong>Operation Environment</strong></td>
<td>Ambience temperature: 0° – 50°C Fuse Rating: 1A slow, 250V</td>
</tr>
<tr>
<td><strong>Storage Environment</strong></td>
<td>Relative humidity: ≤ 80% @ 35°C Power Source: Line Voltage: 100V–240V AC, 47Hz–63Hz</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>140 (D) x 142 (H) x 310 (W) mm Weight: Approx. 2.5kg</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>Approx. 2.5kg</td>
</tr>
</tbody>
</table>
Declaration of Conformity

We
GOOD WILL INSTRUMENT CO., LTD.
(1) No.7-1, Jhongsing Rd., Tucheng City, Taipei County, Taiwan
(2) No. 69, Lu San Road, Suzhou City (Xin Qu), Jiangsu Sheng, China
declare, that the below mentioned product
Type of Product: Digital Storage Oscilloscope
Model Number: GDS-1022, GDS-1042, GDS-1062, GDS-1102
are herewith confirmed to comply with the requirements set out in the
relating to Electromagnetic Compatibility (89/336/EEC, 92/31/EEC,
For the evaluation regarding the Electromagnetic Compatibility and
Low Voltage Directive, the following standards were applied:

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<th>Safety</th>
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<td>Current Harmonics</td>
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<td>EN 61000-3-2: 2000 + A2:2005</td>
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<tr>
<td>Voltage Fluctuations</td>
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<td>Electrostatic Discharge</td>
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<td>Radiated Immunity</td>
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<tr>
<td>EN 61000-4-3: 2002 + A1:2002</td>
<td></td>
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<tr>
<td>Electrical Fast Transients</td>
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<tr>
<td>EN 61000-4-4: 2004</td>
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<tr>
<td>Surge Immunity</td>
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<tr>
<td>Conducted Susceptibility</td>
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<tr>
<td>Power Frequency Magnetic Field</td>
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<tr>
<td>EN 61000-4-8: 1993 + A1:2001</td>
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<tr>
<td>Voltage Dip/ Interruption</td>
<td></td>
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<tr>
<td>EN 61000-4-11: 2004</td>
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