GDB-03 Demo Module

USER MANUAL GW INSTEK PART NO. 82DB-03000EC1



ISO-9001 CERTIFIED MANUFACTURER



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GETTING STARTED

Using the demo board specially designed for GDS-1000B, GDS-2000E, GDS-2000A, MSO-2000 and GDS-3000, you can verify and observe various advanced functionalities for demonstration or your own education.

For viewing demo waveforms on the GDS-3000, please refer to page 17 through page 55.

For viewing demo waveforms on the GDS-2000A, please refer to page 56 through page 98.

For viewing demo waveforms on the GDS-2000E, please refer to page 99 through page 137.

For viewing demo waveforms on the MSO-2000, please refer to page 138 through page 145.

For viewing demo waveforms on the GDS-1000B, please refer to page 146 through page 173.

GDS-3000 Series Overview

Series lineup

The GDS-3000 series consists of 6 models, divided into 2-channel and 4-channel versions.

Model name	Frequency bandwidth	Input channels	Real-time Sampling Rate
GDS-3152	150MHz	2	2.5GSa/s
GDS-3252	250MHz	2	2.5GSa/s
GDS-3352	350MHz	2	5GSa/s
GDS-3502	500MHz	2	4GSa/s
GDS-3154	150MHz	4	5GSa/s
GDS-3254	250MHz	4	5GSa/s
GDS-3354	350MHz	4	5GSa/s
GDS-3504	500MHz	4	4GSa/s

The 2 channel and 4 channel models differ in the position of the horizontal controls, the math, reference and bus keys as well as the position of the EXT trigger.

2-Channel model

4-Channel model





GDS-2000A Series Overview

Series lineup

The GDS-2000A series consists of 8 models, divided into 2-channel and 4-channel versions.

Model name	Frequency bandwidth	Input channels	Real-time Sampling Rate
GDS-2072A	70MHz	2	2GSa/s
GDS-2102A	100MHz	2	2GSa/s
GDS-2202A	200MHz	2	2GSa/s
GDS-2302A	300MHz	2	2GSa/s
GDS-2074A	70MHz	4	2GSa/s
GDS-2104A	100MHz	4	2GSa/s
GDS-2204A	200MHz	4	2GSa/s
GDS-2304A	300MHz	4	2GSa/s

2-Channel model



input

4-Channel model



GDS-2000E Series Overview

Series lineup

The GDS-2000E series consists of 6 models, divided into 2-channel and 4-channel versions.

Model name	Frequency bandwidth	Input channels	Max. Real-time Sampling Rate
GDS-2072E	70MHz	2	1GSa/s
GDS-2102E	100MHz	2	1GSa/s
GDS-2202E	200MHz	2	1GSa/s
GDS-2074E	70MHz	4	1GSa/s
GDS-2104E	100MHz	4	1GSa/s
GDS-2204E	200MHz	4	1GSa/s

MSO-2000 Series Overview

Series lineup

The MSO-2000 series consists of 12 models, divided into 2-channel and 4-channel versions. MSO-2000E series has built-in 16 channel logic analyzer; MSO-2000EA series has built-in 16 channel logic analyzer and dual channel 25MHz arbitrary function generator.

Model name	Frequency bandwidth	Input channels	Max. Real-time Sampling Rate
MSO-2072E	70MHz	2	1GSa/s
MSO-2102E	100MHz	2	1GSa/s
MSO-2202E	200MHz	2	1GSa/s
MSO-2074E	70MHz	4	1GSa/s
MSO-2104E	100MHz	4	1GSa/s
MSO-2204E	200MHz	4	1GSa/s
MSO-2072EA	70MHz	2	1GSa/s
MSO-2102EA	100MHz	2	1GSa/s
MSO-2202EA	200MHz	2	1GSa/s
MSO-2074EA	70MHz	4	1GSa/s
MSO-2104EA	100MHz	4	1GSa/s
MSO-2204EA	200MHz	4	1GSa/s

GDS-1000B Series Overview

Series lineup

The GDS-1000B series consists of 4 models, divided into 2-channel and 4-channel versions.

Model name	Frequency bandwidth	Input channels	Max. Real-time Sampling Rate
GDS-1072B	70MHz	2	1GSa/s
GDS-1102B	100MHz	2	1GSa/s
GDS-1074B	70MHz	4	1GSa/s
GDS-1104B	100MHz	4	1GSa/s

Required tools

- GDS-3000 x 1 or GDS-2000A x 1 or GDS-2000E x 1 or MSO-2000 x 1 or GDS-1000B x 1
- Demo board x 1
- USB type A- type B cable x 1. Used for demo board's power
- Standard oscilloscope probe x 4
- DS2-08LA or DS2-16LA (For GDS-2000A)

Demonstration type

GDS-3000

- VPO (page24)
- Split window 1 (page 26) UART (page 41)
- Split window 2 (page 27) I²C (page 43)
- Auto Range Function (page 29) SPI (page 44)
- Autoset mode (page 30)
- XY mode (page 33)
- Gating Measurement (page 35) Video (page 50)
- Pulse Runt (page 36)
- Rise Fall (page 38)

- Pulse Width (page 39)

- Delay(page 46)
 - FM (page 48)

 - Generator (page 52)

GDS-2000A

- Autoset mode (page 63)
- XY mode (page 65)
- Gating Measurement (page 67) UART (page 83)
- Pulse Runt (page 68)
- Rise Fall (page 70)
- Search (page 71)
- Segments (page 73)
- Parallel (page 74)
- Pulse Width (page 76)
- Delay (page 78)

- LM(Long Memory)(page 80)
- Logic (page 82)
- I²C (page 85)
- SPI (page 86)
- CAN(page 88)
- LIN(page 89)
- FM (page 90)
- Video (page 93)
- Generator (page 95)

GDS-2000E

- Autoset mode (page 106)
- XY mode (page 108)
- Gating Measurement (page 110)
- Pulse Runt (page 111)
- Rise Fall (page 113)
- Search (page 114)
- Segments (page 116)
- Update (page 117)
- Pulse Width (page 119)
- Delay (page 121)
- LM(Long Memory)(page 123)

- FM (page 124)
- Generator(page 126)
- Video (page 130)
- UART (CH Decode Mode 1) (page 131)
- I²C (CH Decode Mode 2) (page 133)
- SPI (CH Decode Mode 3) (page 134)
- CAN (CH Decode Mode 4) (page 135)
- LIN (CH Decode Mode 5)(Page 136)

MSO-2000

The types of analog signals for displaying on the MSO-2000 and the GDS-2000E are the same, so we don't repeat the steps for displaying these signal types here. We only introduce new digital bus decoding function which consist Logic trigger, UART, I²C, SPI, CAN and LIN. Please refer to the following link pages for details about displaying waveform you desire.



Before displaying the digital channels, please insert the DO-D7 into the LA plug on the GDB-03 as shown in the picture below._____



- Logic (page 138)
- UART (page 139)
- I²C (page 141)

- SPI (page 142)
- CAN (page 143)
- LIN (Page 144)

GDS-1000B

- Autoset mode (page 153)
- XY mode (page 155)
- Gating Measurement (page 156)
- Pulse Runt (page 158)
- Rise Fall (page 159)
- Update (page 160)

- Pulse Width (page 161)
- Delay (page 163)
- LM(Long Memory)(page 164)
- FM (page 166)
- Generator(page 168)
- Video (page 172)

DEMO BOARD

The demo board is a signal generator board capable of producing waveforms which represent various real life scenarios you might encounter. You can use the board as a training kit to learn how to properly view signals, or use it as a generic signal generator.

Appearance



Specifications

Signal output	• 5 types for digital analyzer, 9 types for analog analyzer (For GDS-3000)			
	• 9 types for digital analyzer, 8 types for analog analyzer (For GDS-2000A)			
	• 8 types for digital analyzer, 8 types for analog analyzer (For GDS-2000E)			
	• 3 types for digital analyzer, 6 types for analog analyzer (For GDS-1000B)			
	• Sin / Square / Triangle Signal			
	Video signal			
Power supply	5V DC, USB or auxiliary	power input		
Accessory	USB cable type A – type	B x 1		
Dimensions	13(W)x14.5(H)			
Display system	Display Mode	Passive Matrix		
. , ,	Display Resolution	128x64		
	Display Color	White		
	Module Size	26.4x28.5x1.26 mm		
	Panel Size	26.4x19.7x1.26 mm		
Camera module	PCB size	32x32 mm		
	CCD sensor	1/4" VGA Progressive Color CMOS Sensor		
	Video analog Output	720x480I(NTSC) / 720x576I(PAL)		

GDS-3000

Demonstration setup

Step	1. Turn on the GDS-3000.	OWER
	2. Install the Demo module software. Please refer to the chapter "SOFTWARE INSTALLATION" on page 22 for details.	
Note	A. Please make sure that the firmware ver V1.14 or above for models with a band less than or equal to 350MHz.	sion is width of
	B. Please make sure that the firmware ver V1.0 or above for the model with 500M	rsion is IHz.
	C. Please refer to the "Appendix" chapter information about updating the firmw	for are.
	 Connect the USB cable as shown in the following diagram to power up the demo board. Connect the Type A plug to the GDS-3000 and the Type B plug to the demo board. 	



Note Make sure the power LED on the demo board turns on.

4. Select x10 as the attenuation on the probe to limit the input signal amplitude if the probe you are using is selectable from x1 and x10.



 Depending on the type of waveform you want to display, connect the probes to the terminals marked, Analog CH1~CH4, Digital CH1~CH4, Video, FM as shown in the diagrams below. Connect the grounding clips to ground terminal ([±]/₂).

For displaying analog waveform



For displaying digital waveform



For displaying FM waveform



For displaying video waveform



6. Connect the other end of the probe(s) to the corresponding CH1 to CH4 terminals on the GDS-3000.

7. Adjust the *Variable* knob on the demo board to select which oscilloscope to demonstrate when the USB cable is connected to the demo board and the oscilloscope. The GDS-3000 is selected when it is highlighted on the OLED display.



Software installation

Step	1. Insert the USB memory stick with GDB03DemoMode.gz into the USB port on the front panel of the GDS-3000.
Note	GDB03DemoMode.gz comes from the GDB03DemoMode.zip file. When you unzip the zip file, two files are generated. One is GDB03DemoMode.gz for the software installation and the other is this user manual in PDF format.
	2. Press the <i>Utility</i> key. Utility
	3. Select <i>File Utilities</i> from the bottom File Utilities
	4. Use the Variable knob to select the USB memory stick and then press the Select button.

Select

- 5. Use the Variable knob to select GDB03DemoMode.gz file and then press the Select button to select it.

 Image: Comparison of the select button to select it.

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- 6. Press the Select button again to start installation.
- 7. The installation is complete when a message showing "Please turn off the oscilloscope and turn on again" is displayed.

Display demo board signal

The demo board can be used to display 9 types of analog signals, 5 types of digital signals, FM and video signals. Please follow the procedure listed below to display each signal in sequence.

Display VPO (Analog Mode 1)

Background	The oscilloscope can be used to clearly observe and analyze intermittent events by adjusting the intensity and persistence of waveforms.		
Step	 Connect the probes to the terminals marked Analog CH1~ CH4, and connect the grounding clips to ground terminal ([⊥]/₌). 		
	 Connect the probes to corresponding CH1~CH4 terminals on the GDS-3000. 		
	3. Press the <i>Test</i> key on the front panel of the GDS-3000.		
	4. Press the <i>Demo</i> button.		
	5. Press the <i>Down</i> button to select Analog Mode 1. A screen confirming that Analog Mode 1 is selected as shown on the next page appears.		
Note	If the Analog Mode is not selected, press the F1 button on the side menu. Use the <i>Variable</i> knob to select Analog Mode. Press the <i>Select</i> button to confirm Analog Mode 1 is selected. (Refer to Page 40 step 5)		

GWINSTEK		~~ <u>`</u> ~~~~	Auto M	12 Aug 2011 11:34:57
				Demo
Ana Log Ho VPO	odel:			Analog Mode 1
D				
				Run
				<2Hz
1) 50nV 🙆 100nV	() 188mU ()	100nV) (5ns	(H) 0.000s (1) HTSC	F1 1 AC
APP. Power Analysis	Demo			

6. Press the *Run* button to display the waveform.

Run



Step

Display Split windows 1 (Analog Mode 2)

Background	Display 4 unsynchronized waveforms at different frequencies in different separate split windows with different trigger settings
	00 0

- 1. Press the *Test* key on the front panel of the GDS-3000.
- 2. Press the *Demo* button.
- 3. Press the *Down* button to select Analog Mode 2. A screen confirming Analog Mode 2 is selected as shown below appears.







4. Press the *Run* button to display the waveforms in split windows as shown on the next page.

Run



Display Split windows 2 (Analog Mode 3)

Background	nd Display a signal (a more complex signal) that ca have different settings and be displayed in four split windows.											
Step	1. Press the <i>Test</i> key on the front panel of the GDS-3000.	Test										
	2. Press the <i>Demo</i> button.	Demo										
	3. Press the <i>Down</i> button to select Analog Mode 3. A screen confirming Analog Mode 3 is selected as shown on the next page appears.	Analog Mode 3										



4. Press the Run button to display a waveform in split window as shown below.





Display Auto-Range Function (Analog Mode 4)

Background	Demonstrate that the oscilloscope can automatically be adjusted to the best range setting according to changes in the input signal.
Step	1. Press the <i>Test</i> key on the front panel of the GDS-3000.
	2. Press the <i>Demo</i> button.
	3. Press the <i>Down</i> button to select Analog Mode 4. A screen confirming Analog Mode 4 is selected as shown below appears.
	Image: provide the second s

4. Press the *Run* button and *Auto-Range* key to display the waveform.





Display Autoset mode (Analog Mode 5)

Step	1. Press the <i>Test</i> key on the front panel of the GDS-3000.	Test
	2. Press the <i>Demo</i> button.	Demo
	3. Press the <i>Down</i> button to select Analog Mode 5. A screen	Г
	selected as shown on the next page appears.	Analog Mode 5



4. Press the *Run* button.



5. Press the *CH1* key to activate CH1.



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1	D		0 7	up \C	olii C	ng SN	D	Im	וף 1	ed MS	ar Ω	ıc	e		(l or	n\ 1	/e	rt Of	ff		в	an I	d۱ سا	vio	lth	1		B)	= x / G	pa Gro	na	l 1d		Ð	± F	Po: Se B.I	t to 100	or o (5			P Vo	ilta	be ige K	•

6. Set the *Coupling* to AC from the bottom menu.





7. Press the *Autoset* key on the panel.



8. A waveform as shown below appears.



Display XY mode (Analog Mode 6)

Background	Display 2 sets of X-Y waveform at the	same time.
Step	1. Press the <i>Test</i> key on the front panel of the GDS-3000.	Test
	2. Press the <i>Demo</i> button.	Demo
	3. Press the <i>Down</i> button to select Analog Mode 6. A screen confirming Analog Mode 6 is selected as shown below appears.	Analog Mode 6

GWINSTEK		~~~~~	Trig'd J"L	12 Aug 2011 11:46:31
				Demo
Analog Ho X¥ mode	de6 :			Analog Mode 6
				$\begin{bmatrix} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$
				$\Box $
				Run
		No. Free	G	2.08413kHz
APP. Analysis	Demo			2.120

4. Press the *Run* button to display the waveform.

Run


Step

Demo

Analog

Mode 7

Display Gating Measurement (Analog Mode 7)

- 1. Press the *Test* key on the front panel of the GDS-3000.
- 2. Press the *Demo* button.
- 3. Press the *Down* button to select Analog Mode 7. A screen confirming Analog Mode 7 is selected as shown below appears.



4. Press the *Run* button to display the waveform.



Note You can set the position of the cursors to set the range of the Gating Measurement.

Display Pulse Runt (Analog Mode 8)

Step	1.	Press the <i>Test</i> key on the front panel of the GDS-3000.	Test
	2.	Press the <i>Demo</i> button.	Demo
	3.	Press the <i>Down</i> button to select Analog Mode 8. A screen confirming Analog Mode 8 is selected as shown on the next page appears.	Analog Mode 8

GWINSTEK			~~~~	<u>~~~</u>	Trig'd [12 Aug 2011 13:26:28
1 -112us 2 82.0us	-286nV 178nV			0	8	Demo
<u></u>	Analog Hode8 Pulse runt					Analog Mode 8
						Run
						G
1 Max ?	1	in -208mV	() R	iseTime ?		
) 50nV (2)	108mV 🚱	100mV (2) 100nV)	100us 📳	-165.0us	∱ 48.0nV DC
APP.	Power Analysis	Demo				



Display Rise Fall (Analog Mode 9)

Step	1.	Press the <i>Test</i> key on the front panel of the GDS-3000.
	2.	Press the <i>Demo</i> button.
	3.	Press the <i>Down</i> button to select Analog Mode 9. A screen confirming Analog Mode 9 is selected as shown below appears.
		GWINSTEK Trigid (1) 12 Aug 2011 13 441 35 Demo Analog Mode 9 Rise fall
		() == 10 (c) ==

4. Press the *Run* button to display the waveform.



Display Pulse Width (Digital Mode 1)

Step	1.	Connect the probes to the terminals marked Digital CH1~ CH4, and grounding clips to ground terminal $(\frac{1}{2})$.	
	2.	Connect the probes to corresponding CH1~CH4 terminals on the GDS-3000.	
	3.	Press the <i>Test</i> key on the front panel of the GDS-3000.	Test
	4.	Press the <i>Demo</i> button.	Demo

5. Press the *Analog Mode* button (F1 button). Use the *Variable* knob to select Digital mode. Press the *Select* button to confirm Digital Mode 1 is selected.





6. Press the Run button to display the waveform.



Display UART (Digital Mode 2)

Step	1.	Press the <i>Test</i> key on the front panel of the GDS-3000.	Test
	2.	Press the <i>Demo</i> button.	Demo
	3.	Press the <i>Down</i> button to select Digital Mode 2. A screen confirming Digital Mode 2 is selected as shown on the next page appears.	Digtial Mode 2

Run



4. Press the *Run* button to display the waveform.



Step

Demo

Digtial

Mode 3

Display I²C (Digital Mode 3)

- 1. Press the *Test* key on the front panel of the GDS-3000.
 - 2. Press the *Demo* button.
 - 3. Press the *Down* button to select Digital Mode 3. A screen confirming Digital Mode 3 is selected as shown below appears.



4. Press the *Run* button to display the waveform.



Display SPI (Digital Mode 4)

Step	1.	Press the Test key on the front panel of the GDS-3000.	Test
	2.	Press the <i>Demo</i> button.	Demo
	3.	Press the Down button to select Digital Mode 4. A screen	
		selected as shown on the next page appears.	Digtial Mode <u>4</u>

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an de la constante de la consta	a and a standard and	and the second of					Demo
	Digital Mode SPI	4:					Digtial Mode <u>4</u>
							∇
 00-(100 (Run
					0 000c		
APP.	Power Analysis	Demo		1110 (_)	0.0005		



Display Delay (Digital Mode	5)	
-----------------------------	----	--

Background	The Delay trigger works in tandem with the edge trigger, by waiting for a specified time or number of events before the edge trigger starts. This method allows pinpointing a location in a long series of trigger events.
Step	1. Disconnect the probe from the CH2 terminal on the GDS-3000 and move to the EXT TRIG terminal ●
	EXT TRIG
	2. Press the <i>Test</i> key on the front panel of the GDS-3000.
	3. Press the <i>Demo</i> button.
	4. Press the <i>Down</i> button to select Digital Mode 5. A screen confirming Digital Mode 5 is selected as shown on the next page appears.







Select

Display FM (FM mode)

Step	tep 1. Connect a probe to t terminal on the dem Connect the ground ground terminal (主		
	2.	Connect the other end of probe to CH1 terminal on the GDS-3000.	
	3.	Press the <i>Test</i> key on the front panel of the GDS-3000.	Test
	4.	Press the <i>Demo</i> button.	Demo
	5.	Press the <i>Digital</i> mode button (F1 button). Use the <i>Variable</i> knob to select FM mode. Press the <i>Select</i> button to confirm FM Mode 1 is selected.	Digtial Mode 5 Up Down VARIABLE





Select

Display Video (Video mode)

Step	1.	Connect a probe to the Video terminal on the demo board. Connect the grounding clip to the ground terminal $(\frac{1}{2})$.	
	2.	Connect the other end of probe to the CH1 terminal on the GDS-3000.	
	3.	Press the <i>Test</i> key on the front panel of the GDS-3000.	Test
	4.	Press the <i>Demo</i> button.	Demo
	5.	Press <i>FM</i> button (F1 button). Use the <i>Variable</i> knob to select Video mode. Press the <i>Select</i> button to confirm Video Mode 1 is selected.	FM Mode 1 Up/ Down VARIABLE

GWINSTEK			<u></u>	<u>~</u> ~	Trig'd (m	12 Aug 2011 13:55:36
							Demo
	Video Nodel: Video				Analog Digtial FM	;	Video Mode 1
					Generat	or	$\left[\right]$
							Run
0 A. 588eU	: 188mU @			2us 🗎	8 888s ¥	Ð	414.662kHz
APP.	Power Analysis	Demo		<u> </u>			



Display Sine, Square and Triangle waveform (Generator mode)

- Connect the probe to the terminal marked and on the demo board. Connect the grounding clip to the ground terminal ([⊥]/₂).
- 2. Connect the other end of probe to the CH1 terminal on the GDS-3000.
- 3. Press the *Test* key on the front panel of the GDS-3000.
- 4. Press the *Demo* button.
- 5. Press the *Video Mode* button (F1 button). Use the *Variable* knob to select Generator mode. Press the *Select* button to confirm Generator Mode 1 is selected.



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						Demo
	Generator Ho Generator	del:			Analog Digtial FM	Generator Mode 1
					Video Generator	$\left[\begin{array}{c} \\ \end{array}\right]$
						$\Box = \left\{ \begin{array}{c} & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & $
						Run
1 1) 5nV (2)	188nV (6)	188mV (4)	186nV) 58	Bus 📳 0.86	E	C CHz
APP.	Power Analysis	Demo				

6. Press the *Run* button.



7. Press the AutoSet button to display Autoset the Sine waveform.



8. Press the *Select* button on the demo board.



- 9. Adjust the Variable knob on the demo board to select the Wave Type. Wave Type is selected when it is highlighted on the OLED display.
- 10. Push the Select button to change the highlight to the bottom line on the OLED display.

- 11. Adjust the Variable knob on the demo board to select Square. Square is selected when it is highlighted on the OLED display.
- 12. Press the *AutoSet* button to display the Square waveform.

54







Generator







Wave Type Sin

Generator

- Adjust the *Variable* knob on the demo board to select *Triangle*. *Triangle* is selected when it is highlighted on the OLED display.
- Generator Wave Type Triangle

Autoset

14. Press the *AutoSet* button to display the Triangle waveform.





Demonstration setup

Step

1. Turn on the GDS-2000A.



 Install the Demo module software. Please refer to the chapter "SOFTWARE INSTALLATION" on page 61 for details.

Note

- A. Please make sure that the firmware version is V1.09 or above.
- B. Please refer to the "Appendix" chapter for information about updating the firmware.
- 3. Connect the USB cable as shown in the following diagram to power up the demo board. Connect the Type A plug to the GDS-2000A and the Type B plug to the demo board.



Note Make sure the power LED on the demo board turns on.

4. Select x10 as the attenuation on the probe to limit the input signal amplitude if the probe you are using is selectable from x1 and x10.



 Depending on the type of waveform you want to display, connect the probes to the terminals marked, Analog CH1~CH4, Digital CH1~CH4, Video, FM as shown in the diagrams below. Connect the grounding clips to ground terminal ([±]/₂).

For displaying analog waveform

For displaying digital waveform



For displaying FM waveform



For displaying video waveform



6. Connect the other end of the probe(s) to the corresponding CH1 to CH4 terminals on the GDS-2000A.

7. Connect the GDS-2000A and the demo board with the Logic Analyzer Probe as shown in the photo below for displaying the LA source.



8. Adjust the *Variable* knob on the demo board to select which oscilloscope to demonstrate when the USB cable is connected to the demo board and the oscilloscope. The GDS-2000A is selected when it is highlighted on the OLED display.



Software installation

Step	Insert the USB memory stick with GDB03DemoMode.gz into the USB port on the front panel of the GDS-2000A.		
Note	 GDS2kAGDB03DemoMode.gz comes from the GDS2kAGDB03DemoMode.zip file. When you unzip the zip file, two files are generated. One is GDS2kAGDB03DemoMode.gz for the software installation and the other is this user manual in PDF format. 		
	 Make sure the firmware version is V1.09 or higher. 		
	2. Press the <i>Utility</i> key. Utility		
	3. Select <i>File Utilities</i> from the bottom File Utilities		
	4. Use the Variable knob to select the USB memory stick and then press the Select button.		

Select



- 6. Press the Select button again to start installation.
- 7. The installation is complete when a message showing "Please turn off the oscilloscope and turn on again" is displayed.

Display demo board signal

The demo board can be used to display 8 types of analog signals, 9 types of digital signals, FM and video signals. Please follow the procedure listed below to display each signal in sequence.

Display Autoset mode (Analog Mode 1)



4. Press the *Run* button.

Mount

Remote Dis

Demo



6.

5. Press the *CH1* key to activate CH1.



GWINSTEK				~	uto 🗂	18 Har 2013 13:12:50
			÷			
			:			
1						
() 108nV ()	188nV 🕲	198mV ()	== 100mV) 1	8us (=) 0.008		<2Hz 8.00V DC
Coupling DC AC GND	Impedance 1MΩ	Invert On Off	Bandwidth Full	Expand By Ground	€ Position /	Probe Voltage 1 X
Set the bottom	Couplin	g to A	C from	the		upling
Set the bottom	Couplin menu.	g to A	C from	the	Cor DC A	upling C GND
Set the bottom	Couplin menu.	g to A	C from	the		upling C GND
Set the bottom	Couplin menu.	g to A	C from	the		upling C GND
Set the bottom	Couplin menu.	g to A	C from	the		upling C GND
Set the bottom	Couplin menu.	g to A	C from	the		upling C GND
Set the bottom	Couplin menu.	g to A	C from	the		upling C GND
Set the bottom	Couplin menu.	g to A	C from	the ~(<i>t</i>		
Set the bottom	Couplin menu.	g to A	C from	the		upling (C GND) 4 Nor 2013 10:30:47
Set the bottom	Couplin menu.		C from	the ~~(4		
Set the bottom	Couplin menu.	g to A	C from	the		
Set the bottom	Couplin menu.	g to A	C from	the .		
Set the bottom	Couplin menu.		C from	the		upling C GND 4 № 2013 0:33:47 0:34:47 0:34

7. Press the *Autoset* key on the panel.



8. A waveform as shown below appears.



Display XY mode(Analog Mode 2)

Display 2 sets of X-Y waveform at the s	ame time.
1. Press the <i>Test</i> key on the front panel of GDS-2000A.	Test
2. Press the <i>Demo</i> button.	Demo
3. Press the <i>Down</i> button to select Analog Mode 2. A screen confirming Analog Mode 2 is selected as shown on the next page	Analog Mode 2
	 Display 2 sets of X-Y waveform at the s Press the <i>Test</i> key on the front panel of GDS-2000A. Press the <i>Demo</i> button. Press the <i>Down</i> button to select Analog Mode 2. A screen confirming Analog Mode 2 is selected as shown on the next page appears







Step

Test

Demo

Analog

Mode 3

Display Gating Measurement (Analog Mode 3)

- 1. Press the *Test* key on the front panel of the GDS-2000A.
- 2. Press the *Demo* button.
- 3. Press the *Down* button to select Analog Mode 3. A screen confirming Analog Mode 3 is selected as shown below appears.



4. Press the *Run* button to display the waveform.



Note You can set the position of the cursors to set the range of the Gating Measurement.

Display Pulse Runt (Analog Mode 4)

Step	1.	Press the <i>Test</i> key on the front panel of the GDS-2000A.	Test
	2.	Press the <i>Demo</i> button.	Demo
	3.	Press the <i>Down</i> button to select Analog Mode 4. A screen confirming Analog Mode 4 is selected as shown on the next page appears.	Analog Mode 4





Display Rise Fall (Analog Mode 5)

Step	1.	Press the <i>Test</i> key on the front panel of the GDS-2000A.
	2.	Press the <i>Demo</i> button.
	3.	Press the <i>Down</i> button to select Analog Mode 5. A screen confirming Analog Mode 5 is selected as shown below appears.
		GWINSTEK
		Demo Demo Analog Mode5 Analog Mode5
		0 == 10 @ == 10 @ == 10 () == 10)(Ins (2) 8.8888)(F€ 0 H 2.880 PC
		APP Demo Mount Remote Disk

4. Press the *Run* button to display the waveform.


Display Search (Analog Mode 6)

Step	1.	Press the <i>Test</i> key on the front panel of the GDS-2000A.	Test
	2.	Press the <i>Demo</i> button.	Demo
	3.	Press the <i>Down</i> button to select Analog Mode 6. A screen confirming Analog Mode 6 is selected as shown on the next page appears.	Analog Mode 6

Run

	G₩INSTEK		\sim		Trig	'd [m]	16 Jan 2013 16:07:51
							Demo
		Amalog HodeE Search for a	nalog signals		Ar Di	alog gital M	Analog Mode 6
B	77 88				Gen Vi	erator deo BB 44	
							$\Box = \left\{ \begin{array}{c} & \\ & \\ & \\ & \\ \end{array} \right\}$
							Run
						
	APP	<u>10</u> 87	Demo	Mount Remote Disk	us 📳 0.000s		*********

4. Press the *Run* button to display the waveform.



Step

Test

Demo

Analog

Mode 7

Display Segments (Analog Mode 7)

- 1. Press the *Test* key on the front panel of the GDS-2000A.
 - 2. Press the *Demo* button.
 - 3. Press the *Down* button to select Analog Mode 7. A screen confirming Analog Mode 7 is selected as shown below appears.



- 4. Press the *Run* button to display the waveform.
- 5. The function key on the demo board should be press down before the segments waveform can be outputted.



Mode 8



Display Parallel (Analog Mode 8)



appears.

GWINSTEK	· · · · · · · · · · · · · · · · · · ·	Trig'd Im	16 Jan 2013 16:10:19
			Demo
Analog Hode8 Parallel			Analog Mode 8
<u>1</u> <u>80 (81</u>		8C (8D)	
			Run
) 10 (2) 10 (3)	- 1Ψ () - 1Ψ) Sus 🛱 θ. Ι	3085 (B) Dat	a
АРР	Demo Mount Remote Disk		

4. Press the *Run* button to display the waveform.





Select

Display Pulse Width (Digital Mode 1)

Step	1.	Connect the probes to the terminals marked Digital CH1~ CH4, and grounding clips to ground terminal $(\frac{1}{z})$.	
	2.	Connect the probes to corresponding CH1~CH4 terminals on the GDS-2000A.	
	3.	Press the <i>Test</i> key on the front panel of GDS-2000A.	Test
	4.	Press the <i>Demo</i> button.	Demo
	5.	Press the <i>Analog Mode</i> button (F1 button). Use the <i>Variable</i> knob to select Digital mode. Press the <i>Select</i> button to confirm Digital Mode 1 is selected.	Analog Mode 8 Up Down VARIABLE



6. Press the Run button to display the waveform.



Display Delay (Digital Mode 2)

Background	The Delay trigger works in tandem with the edge trigger, by waiting for a specified time or number of events before the edge trigger starts. This method allows pinpointing a location in a long series of trigger events.
Step	1. Disconnect the probe from the CH2 CH2

ep 1. Disconnect the probe from the CF terminal on the GDS-2000A and move to the EXT TRIG terminal



- 2. Press the *Test* key on the front panel of the GDS-2000A.
- 3. Press the *Demo* button.
- 4. Press the *Down* button to select Digital Mode 2. A screen confirming Digital Mode 2 is selected as shown on the next page appears.





G ^w INSTEK			Trig'd 🧊	05 Feb 2013 10:07:35
		-		Demo
Digi Dela	tal Mode2: Y			Digital Mode 2
1				Γ Γ
				Run
			E	48.8306kHz
) <u>~ 10 (2</u>	Demo	Mount Remote Disk		> 2.88us DC

5. Press the *Run* button to display the waveform.



Display LM (Long Memory) (Digital Mode 3)

1. Press the *Test* key on the front Step panel of the GDS-2000A. 2. Press the Demo button. Demo 3. Press the *Down* button to select Digital Mode 3. A screen confirming Digital Mode 3 is Digtial selected as shown below appears. Mode 3 GWINSTEK Jan 2013 16:11:19 (Trig'd) (jm Demo nni († 1111) 10 for da fanda annan nnn 1111) 111 (1110) 10 for an annan ann Digital Mode 3 Run Pulses 9 58us 📳 0.000s Mount Demo Remote Di

4. Press the *Run* button to display the waveform.



Note If we compare the waveforms shown above, we can see that we can observe more of the waveform under long memory.

Display Logic (Digital Mode 4)

Step	1.	Press the Test I panel of the GI	key on th DS-2000A	ie front 4.		Test
	2.	Press the Demo	button.			Demo
	3.	Press the Down Digital Mode 4 confirming Dig selected as sho	n button . A scree gital Moc wn below	to select n le 4 is w appears	3. C	Digtial lode 4
		G ^w INSTEK			Trig'd Jm	16 Jan 2013 16:11:55
		Dimital Mode Logic				Demo Digital Mode 4
					BB 44	
						Run
			- 10 (4)	1V) 50us 😭 0	.000s	XX XXXX HHHT
		APP	Demo Ren	nount note Disk		

4. Press the *Run* button to display the waveform.

GWINSTEK		~~~ (Tri	g'd (M)	16 Jan 2013 15:36:27
				Logic Inputs
		DI ACKA	Clock	Select
			- H H	41
		8	н	
		4C	×	Clock
		6	×	
2	· · ·	EL	×	High (H)
		191	×	
		11C	×	
		12	×	Low(L)
	· · · · · · · · · · · · · · · · · · ·	141	×	
		150	×	Don't Care (X)
0 - 10 0 - 10 8	<u> </u>	0us 🗎 0.000s		XXXX HHHT
Type Define Logic Inputs	When Goes True Thresholds	Clock Edge	Mode Auto	Holdoff 10.0ns

Display UART (Digital Mode 5)

Step	1.	Press the <i>Test</i> key on the front panel of the GDS-2000A.	Test
	2.	Press the <i>Demo</i> button.	Demo
	3.	Press the <i>Down</i> button to select Digital Mode 5. A screen	
		confirming Digital Mode 5 is selected as shown below appears.	Digtial Mode 5

GMIU2	TEK				<u> </u>	~~~	Tr	ig'd 📶	16 Jan 2013 16:12:26
									Demo
		Digita UART	l Mode5:			<u></u>			Digital Mode 5
B	1								
9 și	<u>'n'</u>	-11.11						- <u>i_dru</u>	
									Run
n == 10				10 0		Ins	(E) 9.999		Data
APF	,			Demo	Moun Remote I	t Disk			

4. Press the *Run* button to display the waveform.

	GWINSTEK			~~t~~		rig'd 📶 🖡	4 Mar 2013 10:19:15
	J		-				
B	(1)		13 A4 A	_ <u>[#5]</u> []	<u>[н7]</u>		
ĉ							
60				1000	11 1 1 1 1		
4	11_11			ากกก. ก.	10. 1.110		nni <u> </u>
20	n				ก กาก		uu un i
ç	n			ากการ กา	n: v.m:		uu:unt
							· · · · · · •
	- 10 🙆	10 🚱	- 10 0	= 10 (C	lns 🖪 0.000	5 🕕 Ix Da	ta
	Bus B UART	Define Inputs	Threshold	Configure 19208-8-N	Bus Display	Event Table	Edit Labels

Step

Display I²C (Digital Mode 6)

Press the *Test* key on the front panel of the GDS-2000A.
 Press the *Demo* button.
 Press the *Down* button to select Digital Mode 6. A screen confirming Digital Mode 6 is selected as shown below appears.

G≌INSTEK			\sim	\sim	\sim		rig'd 📶	14 Mar 2013 10:41:16
								Demo
	Digita I2C	l Mode6:						Digital Mode <u>6</u>
—(A1)—								
							- <u>1_111</u>	
								Run
	; ;		;				J	
APP	 10	8	10 (A) Demo	Mour Remote	l 1ns nt Disk	(1) 0.881	ðs 🖪 Ix	Data

4. Press the *Run* button to display the waveform.

Run

Mode 6



Display SPI (Digital Mode 7)

Step	1.	Press the Test key on the front panel of the GDS-2000A.	Test
	2.	Press the <i>Demo</i> button.	Demo
	3.	Press the Down button to select Digital Mode 7. A screen	
		selected as shown on the next page appears.	Digital Mode 7

	GWINSTEK		\sim	~~~~	~~~	(Trig'	d m	14 Mar 2013 10:42:29
								Demo
		Digital Mode7: SPI		· · · · · · · · · · · · · · · · · · ·	<u> </u>			Digital Mode 7
9 6 5						יייים היותיות ($\overline{\mathbf{v}}$
						nnnnn nnnnn nnnnn		Run
			: 	: : : : : : : : :				
	APP	<u> </u>	10 (1) Demo	Mount Remote D	500us (isk	0.000s	B Date	

4. Press the *Run* button to display the waveform.

	GWINSTEK			~~~	Trig	14 Jm 14	tar 2013 0:23:40
	A3	A4	2	A5	A6	A7	
6		<u></u> nn_r		uu ui	n		
			w	mm			
q	10 🖉	- 1V 🚯	10 (4)		580us 🖹 0.000s	MOSIANIS	
	Type Bus	Source Bus B SPI	Trigger On MOSI & MISO	Data			Mode Auto

Display CAN (Digital Mode 8)

Step	1.	Press the Te panel of the	est key or GDS-20	n the fro 00A.	nt	Т	est
	2.	Press the De	emo butto	on.		D	emo
	3.	Press the Do Digital Moc confirming selected as	own butt le 8. A sc Digital N shown be	ion to se creen Aode 8 is elow app	lect 5 pears.	D	igital ode 8
		GWINSTEK		~~~	Trig	۱ ۱۳۱)	11 Sep 2013
		Digita	I Mode8:				Demo Digital Mode B
							Run
			<u>6</u> == 10 <u>(</u>)) 1V)(580	3us (=) 0.808s	MOSI&	MISO
		APP	Demo	Mount Remote Disk	Data Logging		

4. Press the *Run* button to display the waveform.



Display LIN (Digital Mode 9)

Step	1.	Press the Test key on the front panel of the GDS-2000A.	Test
	2.	Press the <i>Demo</i> button.	Demo
	3.	Press the Down button to select Digital Mode 9. A screen confirming Digital Mode 9 is selected as shown on the next page appears.	Digital Mode 9

Run

G≌I∩STEK				····	rig'd 📶	11 Sep 2013 11:29:31
						Demo
	Digital Mode9 LIN	1:				Digital Mode 9
					<u>п</u>	$\left[\begin{array}{c} \Gamma \\ \Gamma \end{array}\right]$
						Run
0 10 0	- 10 😗	1V ()	1V) 10	0us 📳 0.000	s 🕕 Ider	ntifier
APP		Demo	Mount Remote Disk	Data Logging		

4. Press the *Run* button to display the waveform.

GWINSTEK		Trig'd (71) 11 Sep 2013 11:30:01
(Break		
°		
0 - 10 0 - 10 0		0.808s 🕕 Identifier
Type Source Bus Bus B LIN	Trigger On Identifier	Mode

Display FM (FM mode)

 Connect a probe to the FM terminal on the demo board. Connect the grounding clip to the ground terminal ([⊥]/₂).

Step

Test

- 2. Connect the other end of probe to CH1 terminal on the GDS-2000A.
- 3. Press the *Test* key on the front panel of the GDS-2000A.
- 4. Press the *Demo* button.
- 5. Press the *Digital* mode button (F1 button). Use the *Variable* knob to select FM mode. Press the *Select* button to confirm FM Mode 1 is selected.





6. Press the *Run* button to display the waveform.



Display Video (Video mode)

Step	1.	Connect a probe to the Video termi demo board. Connect the ground in ground terminal $(\frac{1}{2})$.	nal on the g clip to the
	2.	Connect the other end of probe to t terminal on the GDS-2000A.	he CH1
	3.	Press the <i>Test</i> key on the front panel of the GDS-2000A.	Test
	4.	Press the <i>Demo</i> button.	Demo
	5.	Press <i>FM</i> button (F1 button). Use the <i>Variable</i> knob to select Video mode. Press the <i>Select</i> button to confirm Video Mode 1 is selected.	FM Mode 1 Up Down VARIABLE

Select

Run

GWINSTEK			~~~		Trig'd (Jm	12 Aug 2011 13:55:36
						Demo
	Video Node1: Video				Analog Digtial FM	Video Mode 1
					Video Generator	
1						
						Run
				li de co		
O a 599a11	- 199all @			2ue 🗊	9 999:	F 414.662kHz
APP.	Power Analysis	Demo		203 [1]		1 0.000 DC

6. Press the *Run* button to display the waveform.



Display Sine, Square and Triangle waveform (Generator mode)

- Connect the probe to the terminal marked
 initial on the demo board. Connect the grounding clip to the ground terminal ([⊥]/₌).
- 2. Connect the other end of probe to the CH1 terminal on the GDS-2000A.
- 3. Press the *Test* key on the front panel of the GDS-2000A.
- 4. Press the *Demo* button.
- 5. Press the *Video Mode* button (F1 button). Use the *Variable* knob to select Generator mode. Press the *Select* button to confirm Generator Mode 1 is selected.



Test



6. Press the *Run* button.



7. Press the AutoSet button to display the Sine waveform.





8. Press the *Select* button on the demo board.



- 9. Adjust the Variable knob on the demo board to select the Wave Type. Wave Type is selected when it is highlighted on the OLED display.
- 10. Push the *Select* button to change the highlight to the bottom line on the OLED display.

- demo board to select Square. Square is selected when it is highlighted on the OLED display.
- 12. Press the AutoSet button to display the Square waveform.









Generator Wave Type Sin





 Adjust the *Variable* knob on the demo board to select *Triangle*. *Triangle* is selected when it is highlighted on the OLED display.



Autoset

14. Press the *AutoSet* button to display the Triangle waveform.



Step

POWER



Demonstration setup

2. Install the Demo module software. Please refer to the chapter "SOFTWARE INSTALLATION" on page 104 for details. A. Please make sure that the firmware version is Note V1.09 or above. B. Please refer to the "Appendix" chapter for information about updating the firmware. Connect the USB cable as shown in the following diagram to power up the demo board. Connect the Type A plug to the GDS-2000E and the Type B plug to the demo board.

1. Turn on the GDS-2000E.



Note Make sure the power LED on the demo board turns on.

4. Select x10 as the attenuation on the probe to limit the input signal amplitude if the probe you are using is selectable from x1 and x10.



 Depending on the type of waveform you want to display, connect the probes to the terminals marked, Analog CH1~CH4, Digital CH1~CH4, Video, FM as shown in the diagrams below. Connect the grounding clips to ground terminal ([±]/₂).

For displaying analog waveform



For displaying digital waveform



For displaying FM waveform



For displaying video waveform



6. Connect the other end of the probe(s) to the corresponding CH1 to CH4 terminals on the GDS-2000E.

7. Adjust the *Variable* knob on the demo board to select which oscilloscope to demonstrate when the USB cable is connected to the demo board and the oscilloscope. The New GDS-Series is selected when it is highlighted on the OLED display.



Software installation

Step	. Insert the USE GDB03.fun in the front pane	b memory stick with to the USB port on al of the GDS-2000E.	
Note	GDB03.fun con GDB03.zip file. zip file, two file: is GDB03.fun fo installation and manual in PDF	nes from the When you unzip the s are generated. One or the software the other is this user format.	
	 Make sure the f V1.00 or higher 	irmware version is	
	e. Press the Utili	<i>ty</i> key.	Utility
	. Select <i>File Util</i> menu.	<i>ities</i> from the bottom	File Utilities
	 Use the Varial USB memory the Select butt Image: System Date Tree Tree Tree Tree Tree Tree Tree Tr	ole knob to select the stick and then press con.	VARIABLE

Select

- 5. Use the Variable knob to select GDB03.fun file and then press the Select button to select it.
- 6. Press the Select button again to start installation.
- 7. The installation is complete when a message showing "Please turn off the oscilloscope and turn on again" is displayed.

Display demo board signal

The demo board can be used to display 8 types of analog signals, 8 types of digital signals, 5 types of CH decode signals, FM and video signals. Please follow the procedure listed below to display each signal in sequence.

Display Autoset mode (Analog Mode 1)



4. Press the *Run* button.



10us 📳 0.000s
CH1

5. Press the *CH1* key to activate CH1.

6. Set the *Coupling* to AC from the bottom menu.



G ^W INSTEK	100k pts	1GSa/s		🗕 🖵 Αι	to 12 Feb 26	15 16:16:31
		-				
					<u></u>	
		1	<u> </u>	: : : : : : : : : : : : : : : : : : :	(F)	<2Hz
	0 - 10	m 10	<u>0 - 10)</u>	10us 🗎 0.000	<u>s () f</u>	8V DC
Coupling	Impedance	Invert	Bandwidth	Expand	♥ Position /	Probe
DC AC GND	1MΩ	On Off		By Ground	0.000V	10X

7. Press the *Autoset* key on the panel.



8. A waveform shown as the next page appears.



Display XY mode(Analog Mode 2)

Background	Display 2 sets of X-Y waveform at the same time.					
Step	1. Press the <i>APP</i> key on the front panel of GDS-2000E.					
	2. Press the <i>Demo</i> button.					
	3. Press the <i>Down</i> button to select Analog Mode 2. A screen confirming Analog Mode 2 is selected as shown on the next page appears.					

GWINSTEK	100k pts	20HSa/s		m	Trig'd 12 Feb	
	- and the state of the	Second self these	Sector Statements		A REAL PROPERTY AND A REAL	Demo
	Analog Mode XY Mode	e2 :	an calification			Analog Mode 2
1						
						Run
1 ~ 58nV	e = 10	 (6) == 10	() == 10) 5 8	30us (1) 0.	808s 1 f	
APP		Demo	Mount Remote Disk			



Display Gating Measurement (Analog Mode 3)

Step	1. Press pane	the <i>APP</i> key or l of the GDS-200	A	PP	
	2. Press	the <i>Demo</i> butto	n.		emo
	3. Press Anal- confi select	the <i>Down</i> butto og Mode 3. A so rming Analog N ted as shown be	n to select reen 10de 3 is low appears.	Ar	nalog ode 3
		TEK 1988 pts 2005a/s Description Holes: Cating U 20 m 10 2 m 10 Demo		rig'd 12 Feb 22 △ 46 1.25m 120 - 3.280 120 - 3.280 120 - 3.280 120 - 3.280 1400 18.20 -400 1.620 -400 1.620 -400 1.620 -400 - 5 -400 - 5	Demo Analog Mode 3

4. Press the *Run* button to display the waveform.



Note You can set the position of the cursors to set the range of the Gating Measurement.

Display Pulse Runt (Analog Mode 4)

Step	1.	Press the <i>APP</i> key on the front panel of the GDS-2000E.	АРР
	2.	Press the <i>Demo</i> button.	Demo
	3.	Press the <i>Down</i> button to select Analog Mode 4. A screen confirming Analog Mode 4 is selected as shown on the next page appears.	Analog Mode 4





Step

Display Rise Fall (Analog Mode 5)



4. Press the *Run* button to display the waveform.

Demo

Mount Remote D

Run

-10



Display Search (Analog Mode 6)

- 1. Press the *APP* key on the front panel of the GDS-2000E.
- 2. Press the *Demo* button.
- 3. Press the *Down* button to select Analog Mode 6. A screen confirming Analog Mode 6 is selected as shown below appears.



APP

Demo



Step



Display Segments (Analog Mode 7)

Step	1.	Press the <i>APP</i> key on the front panel of the GDS-2000E.		АРР
	2.	Press the <i>Demo</i> button.		Demo
	3.	Press the <i>Down</i> button to select Analog Mode 7. A screen confirming Analog Mode 7 is selected as shown below appears.	A	Inalog Iode 7
		Guildenties 111 115 <th< td=""><td></td><td>Demo Analog Mode 7</td></th<>		Demo Analog Mode 7

4. Press the *Run* button to display the waveform.

Demo

Mount Remote Disk

5. The function key on the demo board should be press down before the segments waveform can be outputted.



Step



Display Update (Analog Mode 9)

- 1. Press the *APP* key on the front panel of the GDS-2000E.
- 2. Press the *Demo* button.
- 3. Press the *Down* button to select Analog Mode 9. A screen confirming Analog Mode 9 is selected as shown on the next page appears.



APP

Demo





Display Pulse Width (Digital Mode 1)

Step	1.	Connect the probes to the terminals marked Digital CH1~ CH4, and grounding clips to ground terminal $(\frac{1}{2})$.	
	2.	Connect the probes to corresponding CH1~CH4 terminals on the GDS-2000A.	
	3.	Press the <i>APP</i> key on the front panel of GDS-2000E.	АРР
	4.	Press the <i>Demo</i> button.	Demo
	5.	Press the <i>Analog Mode</i> button (F1 button). Use the <i>Variable</i> knob to select Digital mode. Press the <i>Select</i> button to confirm Digital Mode 1 is selected.	Analog Mode 9 VARIABLE

Select





Display Delay (Digital Mode 2)

Background	The Delay trigger works in tandem with the edge trigger by waiting for a specified time or number
	of events before the edge trigger starts. This
	method allows pinpointing a location in a long
	series of trigger events.

Step1. Press the APP key on the front
panel of the GDS-2000E.

2. Press the *Demo* button.





Digital Mode 2

3. Press the *Down* button to select Digital Mode 2. A screen confirming Digital Mode 2 is selected as shown on the next page appears.



4. Press the *Run* button to display the waveform.



Step

Display LM (Long Memory) (Digital Mode 3)

- 1. Press the *APP* key on the front APP panel of the GDS-2000E. 2. Press the *Demo* button. Demo 3. Press the *Down* button to select Digital Mode 3. A screen confirming Digital Mode 3 is selected as shown below appears. Digital Mode 3 12 Demo Digital ТМ Run 10us 🗎 0.000s 🕕 🗛 2 ---10
 - 4. Press the *Run* button to display the waveform.

Demo

Mount Remote Dis



Note If we compare the waveforms shown above, we can see that we can observe more of the waveform under long memory.

Display FM (FM mode)

Step	1.	Connect a probe to the FM terminal on the demo board. Connect the grounding clip to the ground terminal $(\frac{1}{2})$.
	2.	Connect the other end of probe to CH1 terminal on the GDS-2000E.

- 3. Press the *APP* key on the front panel of the GDS-2000E.
- 4. Press the *Demo* button.
- 5. Press the *Digital* mode button (F1 button). Use the *Variable* knob to select FM mode. Press the *Select* button to confirm FM Mode 1 is selected.



G ^w INS	TEK	10k pts	100MSa/s	· · · · · · · · · · · · · · · · · · ·	m	Auto 12 Fe	Demo
1		FM Model: FM	<u> </u>	;		Analog Digital FM Generator Video CH Decode	FM Mode 1
	19940	0 m 188au	9 == 189aU		1Aus (E)	A 1999s 0	Run
API	P		Demo	Mount Remote Disk			



Display Sine, Square and Triangle waveform (Generator mode)

- Connect the probe to the terminal marked and on the demo board. Connect the grounding clip to the ground terminal ([⊥]/₂).
- 2. Connect the other end of probe to the CH1 terminal on the GDS-2000E.
- 3. Press the *APP* key on the front panel of the GDS-2000E.
- 4. Press the *Demo* button.



FM

 Press the *FM Mode* button (F1 button). Use the *Variable* knob to select Generator mode. Press the *Select* button to confirm Generator Mode 1 is selected.



GUINSTEK	10k pts	1GSa∕s			Trig'd	12 Feb	
							Demo
	Generator Generator	lode1:		<u> </u>	Anal Digit FM	og :al	Generator Mode 1
///					Gener Vide CH Dec	ator :o code	\square
D							
							Run
						E	
1 🔨 500nV	Q == 1V	@ 10	<u> </u>	lus 🖪	3.800s	1 🕕	
APP		Demo	Mount Remote Disk		_ ι		

6. Press the *Run* button.



Autoset

7. Press the AutoSet button to display the Sine waveform.



- 8. Press the *Select* button on the demo board.
- 9. Adjust the *Variable* knob on the demo board to select the Wave Type. *Wave Type* is selected when it is highlighted on the OLED display.
- 10. Push the *Select* button to change the highlight to the bottom line on the OLED display.

11. Adjust the *Variable* knob on the demo board to select *Square*. *Square* is selected when it is highlighted on the OLED display.











Generator Wave Type Sin



12. Press the *AutoSet* button to display the Square waveform.



13. Adjust the *Variable* knob on the demo board to select *Triangle*. *Triangle* is selected when it is highlighted on the OLED display.



14. Press the *AutoSet* button to display the Triangle waveform.





Select

Display Video (Video mode)

Step	1.	Connect a probe to the Video terminal on the demo board. Connect the grounding clip to the ground terminal $(\frac{1}{z})$.	
	2.	Connect the other end of probe to the CH1 terminal on the GDS- 2000E.	
	3.	Press the <i>APP</i> key on the front panel of the GDS-2000E.	АРР
	4.	Press the <i>Demo</i> button.	Demo
	5.	Press <i>Generator mode</i> button (F1 button). Use the <i>Variable</i> knob to select Video mode. Press the <i>Select</i> button to confirm Video Mode 1 is selected.	Generator Mode 1 VARIABLE



Run



Display UART (CH Decode Mode 1)



3. Press the *Video Mode* button (F1 button). Use the *Variable* knob to select CH Decode. Press the *Select* button to confirm CH Decode Mode 1 is selected.



Gu	IN	51(ΞK	1	dk pt	s	50MSa/s				m	Auto	12 Feb	Domo
				CI	nanne	l Deci	ode Model	:				Ana	log	CH Decode
				Uf	RT							FI	VI	Mode 1
												Gene	rator	
												Vid CH De	eo	
١.														ļДļ
														Run
												J		
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			÷		÷			-	-			-	F	
		50	8nV	2		1V	6 :	LU	() - IV	20u	s 🕀 I	0.000s	1 HTSC F	
	AF	PP					Dem	0	Mount Remote Dis	k				

4. Press the Run button to display the waveform.



Step

Display I²C (CH Decode Mode 2)



4. Press the *Run* button to display the waveform.



Display SPI (CH Decode Mode 3)

- 1. Press the *APP* key on the front panel of the GDS-2000E.
- 2. Press the *Demo* button.
- 3. Press the *Down* button to select CH Decode Mode 3. A screen confirming CH Decode Mode 3 is selected as shown below appears.



APP

Demo



Step

Run

4. Press the *Run* button to display the waveform.



Display CAN (CH Decode Mode 4)

Step	1. Press the <i>APP</i> key on the front panel of the GDS-2000E.	АРР
	2. Press the <i>Demo</i> button.	Demo
	3. Press the Down button to select CH Decode Mode 4. A screen confirming CH Decode Mode 4 is	
	selected as shown below appears.	CH Decode Mode 4



Run



Display LIN (CH Decode Mode 5)

Step 1	1.	Press the <i>APP</i> key on the front panel of the GDS-2000E.		APP
2	2.	Press the <i>Demo</i> button.	C	emo

3. Press the *Down* button to select CH Decode Mode 5. A screen confirming CH Decode Mode 5 is selected as shown below appears.





4. Press the *Run* button to display the waveform.





Display demo board signal

Except for the following new Logic analyzer display functions, the remaining functions are the same with that of GDS-2000E.

Display LM (Long Memory)

Step
1. Press the *APP* key on the front panel of the MSO-2000.
2. Press the *Demo* button.
3. Press the *Down* button to select Digital Mode 4. A screen confirming Digital Mode 4 is selected as shown below appears.

Run

GWINSTEK	10k pts	1MSa/s		, m	rig'd 20 Mar	Demo
	Digital Mode	• 4 •			ה ה הר ר	Digital
	Logic					Mode 4
R) (A1)					(AB)	
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	L					
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			<u> </u>			
0 10	@ == 1V		<u> </u>	1ms (Ħ) 0.0	00s 🛛 🚯 Tx 🛛	
		Demo	Mount			
		Denio	Remote Disk			

4. Press the *Run* button to display the waveform.

G≝INSTEK	10k pts	20MSa/s	and the second se	📕 j‴ʻl Trigʻd	20 Mar 2017	16:18:41
C		<u> </u>	<u> </u>	<u> </u>	<u> </u>	
4						
			· · · · · · · · · · · · · · · · · · ·			
		<u> </u>				
	· · · · · · · · · · · ·			· · · · ·	· · · · · · · · ·	
n == 10	Ø == 1V		; 	50us 🖺 0.000s	XXXX XXXX XX	XX HHHT
Type	Define	When		Clock Edge	Mode	Holdoff
Logic	Inputs		Thresholds	<u>x</u>	Auto	4.000ns

Note If we compare the waveforms shown above, we can see that we can observe more of the waveform under long memory.

Display UART

Step	1.	Press the <i>APP</i> key on the front	APP
		panel of MSO-2000.	

- 2. Press the *Demo* button.
- 3. Press the *Down* button to select Digital Mode 5. A screen confirming Digital Mode 5 is selected as shown below appears.



Run





Mode 5

APP

Demo

Digital Mode 6

Display I²C

Step

1.	Press the <i>APP</i> key on the front
	panel of the MSO-2000.

- 2. Press the *Demo* button.
- 3. Press the *Down* button to select Digital Mode 6. A screen confirming Digital Mode 6 is selected as shown below appears.



4. Press the *Run* button to display the waveform.

GWIN	5TEK	10k	pts	2MSa/s	and a second second	<u>л</u> т т	rig'd 20	Mar 2017	16:21:09
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	40		42		- 30	40		42	
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ec III	nnnnn		יייייייי	INNN	ການການການ	ມມາມາກກາ			
ц <u>е</u> П				Π <u></u> .					
(<u>4</u> 3 1111	nnnann		nnnnn	innin 🔤 🗌			1	nnnnnn	
1 II.			<u> </u>	п			1		
	INNAAA		<u>ההחהה ו</u>	nnn	ninninnini	ากกกกกก	1	nnnnnn	
10 N	Π.			Π			1 :	ПП	
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		<u></u>				C00	20-	D-4-	
						ວອອແຮ (=) 0.00	305	Data _	
Ту	pe	Sour	ce Bus	Trigger On					Mode
B	IS	B	(12C)	Data		Data			Auto
				- and	1		1		

Display SPI

Step	1.	Press the <i>APP</i> key on the front panel of the MSO-2000.	АРР
	2.	Press the <i>Demo</i> button.	Demo
	3.	Press the <i>Down</i> button to select Digital Mode 7. A screen confirming Digital Mode 7 is	∇

selected as shown below appears.




Run



Display CAN

Step	1. Press the <i>APP</i> key on the front panel of the MSO-2000.	АРР
	2. Press the <i>Demo</i> button.	Demo
	3. Press the Down button to select Digital Mode 8. A screen	
	selected as shown below appears.	Digital Mode 8

GWINSTEK	10k pts	1MSa/s		l m	Trig'd 20 I	lar
			· · · · ·			Demo
	Digital Node CAN	:8 :	<u>:</u>			Digital Mode 8
(A1)						
2 2 3						
						Run
				Ins 🖨 A		
APP		Demo	Mount Remote Disk			

Run

G		10k pts	10MSa/s	and the second s	📕 🦵 Trig	'd 20 Mar 20	17 16:21:21
		n el	i n	199	E EC20	- i 1	1
		E/F	I\	123 - 1	10 10 10		
Ϋ́́	пг			ւեւերուս	ריי_רית היי	Π	
Ē						n	
4			/			П	
Ξī.	n ir		i	ນ ມະ ທິທ	nn nn millim	п	- initial
21	пг			າວວຽວກາກ	ריו_רית היות ה	Π	
44						1	
			U				
		Ø == 10			100us 🖺 0.000s	3 B Identi	fier
	Type	Source Bus	Trigger On			Direction	Mode
	Bus	B CAN	Identifier	Identifier		Write	Auto

Display LIN

Step	1.	Press the <i>APP</i> key on the front panel of the MSO-2000.	АРР
	2.	Press the <i>Demo</i> button.	Demo

3. Press the *Down* button to Digital Mode 9. A screen confirming Digital Mode 9 is selected as shown below appears.





4. Press the *Run* button to display the waveform.

G≝INSTEK	10k pts	500kSa/s		Trig'd 20 Mar 20	17 16:21:42
Break Sum	20 57	32 76		Break Sunc (3C) 88 FF	EF S
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0		سيستبرجه وترجار وا		سيورد أوريس بومومو والاراب	
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		บบบบบบ			i i i i i i i i i i i i i i i i i i i
÷	ուսուրուներ	บบบบบ	· · · . · · · ·		
0 1V	🙆 == 10		<u>)(</u>	6.000ms 🚺 Identi:	fier
Туре	Source Bus	Trigger On	Identifier		Mode
Bus		Identifier	luenuner		Auto



Demonstration setup

Step

1. Turn on the GDS-1000B.



2. Install the Demo module software. Please refer to the chapter "SOFTWARE INSTALLATION" on page 151 for details.

Note

- A. Please make sure that the firmware version is V1.0 or above.
- B. Please refer to the "Appendix" chapter for information about updating the firmware.
- 3. Connect the USB cable as shown in the following diagram to power up the demo board. Connect the Type A plug to the GDS-1000B and the Type B plug to the demo board.



Note Make sure the power LED on the demo board turns on.

4. Select x10 as the attenuation on the probe to limit the input signal amplitude if the probe you are using is selectable from x1 and x10.



 Depending on the type of waveform you want to display, connect the probes to the terminals marked, Analog CH1~CH4, Digital CH1~CH4, Video, FM as shown in the diagrams below. Connect the grounding clips to ground terminal ([±]/₂).

For displaying analog waveform

For displaying digital waveform



For displaying FM waveform



For displaying video waveform



6. Connect the other end of the probe(s) to the corresponding CH1 to CH4 terminals on the GDS-1000B.

7. Adjust the *Variable* knob on the demo board to select which oscilloscope to demonstrate when the USB cable is connected to the demo board and the oscilloscope. The New GDS-Series is selected when it is highlighted on the OLED display.



Software installation

Step	1. Insert the USB memory stick with GDB03.fun into the USB port on the front panel of the GDS-1000B.
Note	• GDB03.fun comes from the GDB03.zip file. When you unzip the zip file, two files are generated. One is GDB03.fun for the software installation and the other is this user manual in PDF format.
	 Make sure the firmware version is V1.00 or higher.
	2. Press the <i>Utility</i> key.
	3. Select <i>File Utilities</i> from the bottom menu.
	4. Use the Variable knob to select the USB memory stick and then press the Select button.



- 6. Press the Select button again to start installation.
- 7. The installation is complete when a message showing "Please turn off the oscilloscope and turn on again" is displayed.

Display demo board signal

The demo board can be used to display 8 types of analog signals, 3 types of digital signals, FM and video signals. Please follow the procedure listed below to display each signal in sequence.

Display Autoset mode (Analog Mode 1)



4. Press the Run button.

5. Press the *CH1* key to activate CH1.



6. Set the *Coupling* to AC from the bottom menu.



CH1

GUINSTEK	100k pts	1GSa/s		Auto		
			· · · · · · · · · · · · · · · · · · ·			
						1
L						1 1
fara a c S a i						Sin en mi
		- Constanting of the local data	personal residence in the second second		- particular and a second second	
						(01)
						<2HZ
$(1) \sim 10$	2 == 10	6) == 10	<u>(4)</u> == 10	10us 📋 0.000s	1 1	BÔ DC
Coupling	Impedance	Invert	Bandwidth	Evpand 0	Position /	Probe
	impedance		Danawidan	Duconnal	Set to 0	Voltage
DC AC GND	1MS2	Un Un	Full	By Ground	0.000V	

- 7. Press the *Autoset* key on the panel.
- Autoset
- 8. A waveform shown as the next page appears.



Display XY mode (Analog Mode 2)

Background	Display 2 sets of X-Y waveform at the	same time.
Step	1. Press the <i>APP</i> key on the front panel of GDS-1000B.	АРР
	2. Press the <i>Demo</i> button.	Demo
	3. Press the <i>Down</i> button to select Analog Mode 2. A screen	
	selected as shown on the next page appears.	Analog Mode 2

G≌INSTEK	100k pts 20NSa/s		ا Trig'd (Demo
	- openited in the state of the		this case of a dist little	Demo
	Analog Mode2:			Analog
	XY Mode			Mode 2
			a e di a a	
			10 No. 10 No. 10 No. 10	
			an an an an an an	
			an a' an	Run
	L			
1 A. 58mU	Ø == 10 Ø == 10		Rus 🗊 8,888s 🚺 🐔	
		Mount		
APP	Demo	Remote Disk		

Run



Display Gating Measurement (Analog Mode 3)



Note

3. Press the *Down* button to select Analog Mode 3. A screen confirming Analog Mode 3 is selected as shown below appears.





4. Press the *Run* button to display the waveform.

Run



You can set the position of the cursors to set the range of the Gating Measurement.

Display Pulse Runt (Analog Mode 4)



4. Press the *Run* button to display the waveform.

Step



Display Rise Fall (Analog Mode 5)

1. Press the *APP* key on the front panel of the GDS-1000B.
2. Press the *Demo* button.
3. Press the *Down* button to select Analog Mode 5. A screen confirming Analog Mode 5 is selected as shown below appears.



Run

4. Press the *Run* button to display the waveform.

 GWINSTEK
 198k pts
 2845a/s
 Img/d

 Img/d
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 Img/

Display Update (Analog Mode 9)

Step	1.	Press the <i>APP</i> key on the front panel of the GDS-1000B.	АРР
	2.	Press the <i>Demo</i> button.	Demo
	3.	Press the <i>Down</i> button to select Analog Mode 9. A screen confirming Analog Mode 9 is selected as shown on the next page appears.	Analog Mode 9



Run



Display Pulse Width (Digital Mode 1)

Step

 Connect the probes to the terminals marked Digital CH1~ CH4, and grounding clips to ground terminal ([⊥]/_−).

2. Connect the probes to corresponding CH1~CH4 terminals on the GDS-1000B.





Display Delay (Digital Mode 2)

Background	The Delay trigger works in tandem with trigger, by waiting for a specified time of events before the edge trigger starts, method allows pinpointing a location i series of trigger events.	th the edge or number This n a long
Step	 Press the <i>APP</i> key on the front panel of the GDS-1000B. Press the <i>Demo</i> button. 	APP Demo
	3. Press the <i>Down</i> button to select Digital Mode 2. A screen confirming Digital Mode 2 is selected as shown on the next page appears.	Digital Mode 2



Run



Display LM (Long Memory) (Digital Mode 3)



3. Press the *Down* button to select Digital Mode 3. A screen confirming Digital Mode 3 is selected as shown below appears.





4. Press the *Run* button to display the waveform.



Note If we compare the waveforms shown above, we can see that we can observe more of the waveform under long memory.

Display FM (FM mode)

Step	1.	Connect a probe to the FM terminal on the demo board. Connect the grounding clip to the ground terminal $(\frac{1}{2})$.
	2.	Connect the other end of probe to CH1 terminal on the GDS-1000B.

- 3. Press the *APP* key on the front panel of the GDS-1000B.
- 4. Press the *Demo* button.
- 5. Press the *Digital* mode button (F1 button). Use the *Variable* knob to select FM mode. Press the *Select* button to confirm FM Mode 1 is selected.



G	TENIE	EK	10k pts	100MSa/s	· · · · · · · · · · · · · · · · · · ·	jm.	Auto	12 Feb	Demo
			FM Model: FM				Anal Digit FM	og tal	FM Mode 1
							Gener Vide CH De	ator eo code	$\left[\begin{array}{c} \uparrow \\ \uparrow \end{array} \right]$
1		1 .							
									Run
						: : :	:	F	
0	10	9 0n 9	🙆 188mV	🚯 == 100nV	0 = 100 mV	10us 🕒 0	9.000s	1 1	
APP				Demo	Mount Remote Disk		— (



Display Sine, Square and Triangle waveform (Generator mode)

- Connect the probe to the terminal marked and on the demo board. Connect the grounding clip to the ground terminal ([⊥]/₂).
- 2. Connect the other end of probe to the CH1 terminal on the GDS-2000E.
- 3. Press the *APP* key on the front panel of the GDS-1000B.
- 4. Press the *Demo* button.



FM

 Press the *FM Mode* button (F1 button). Use the *Variable* knob to select Generator mode. Press the *Select* button to confirm Generator Mode 1 is selected.



GUINSTEK	10k pts	1GSa∕s		l m	Trig'd 12 Fe	b
			· · · · · ·			Demo
	Generator I Generator	4ode1 :		·	Analog Digital FM	Generator Mode 1
///					Generator Video CH Decode	
D						
						Run
					C	
🕦 🔨 500nV	@ == 1V	6) == 1V	0 - 10	lus 🖪 B	1.000s 📋 👖	f
APP		Demo	Mount Remote Disk			

6. Press the *Run* button.



Autoset

7. Press the AutoSet button to display the Sine waveform.



- 8. Press the *Select* button on the demo board.
- 9. Adjust the *Variable* knob on the demo board to select the Wave Type. *Wave Type* is selected when it is highlighted on the OLED display.
- 10. Push the *Select* button to change the highlight to the bottom line on the OLED display.

11. Adjust the *Variable* knob on the demo board to select *Square*. *Square* is selected when it is highlighted on the OLED display.









Generator Wave Type Sin



12. Press the *AutoSet* button to display the Square waveform.



13. Adjust the *Variable* knob on the demo board to select *Triangle*. *Triangle* is selected when it is highlighted on the OLED display.



14. Press the *AutoSet* button to display the Triangle waveform.





Select

Display Video (Video mode)

Step	1.	Connect a probe to the Video terminal on the demo board. Connect the grounding clip to the ground terminal $(\frac{1}{z})$.	
	2.	Connect the other end of probe to the CH1 terminal on the GDS- 1000B.	
	3.	Press the <i>APP</i> key on the front panel of the GDS-1000B.	АРР
	4.	Press the <i>Demo</i> button.	Demo
	5.	Press <i>Generator mode</i> button (F1 button). Use the <i>Variable</i> knob to select Video mode. Press the <i>Select</i> button to confirm Video Mode 1 is selected.	Generator Mode 1 VARIABLE







Upgrading the GDS-3000/GDS-2000A/GDS-2000E/GDS-1000B Firmware

Upgrade Procedure

This firmware upgrade guide describes how to upgrade both the DSO firmware and the operating system kernel.



The following note is for the GDS-3000 only.

If the existing firmware version is earlier than v1.07, please repeat this firmware upgrade procedure twice.

For firmware versions earlier than v1.07 (v1.00~v1.06), please upgrade both the DSO firmware and the OS kernel (follow the operation steps 1 to 10). This means that you need to do the same upgrade procedure <u>twice</u>.

If upgrading the firmware from V1.07 to v1.08 or later, only update the firmware. The kernel upgrade is not required (follow operation steps 1 to 6).

Upgrade firmware 1. Insert a USB flash disk containing the firmware file, **xxx.upg** into the front panel USB slot.

File Utilities

VARIABLE

Down

Up/

- 2. Remove all probes and cables from the BNC terminals.
- 3. Press the *Utility* key and select *File Utilities* from the bottom menu.
- 4. Rotate the *Variable* knob to select the USB directory and then press the *Select* key.



5. Rotate the *Variable* knob to select the **xxx.upg** file and then press the *Select* key. Press the *Select* key again to begin the upgrade procedure.





	6. When the procedure has completed restart the scope.					
Note	For the GDS-3000 models:					
	Steps 7 & 8 only apply to 5GSa/s models (GDS- 3154, GDS-3254, GDS-3352/4).					
	2.5GSa/s models (GDS-3152 & GDS-3252) will bypass these two steps.					
Upgrade Kernel	7. When the screen goes "blank" during the booting process, press the lit CH1 key <u>three times</u> . (For GDS-3154, GDS-3254, GDS- 3352/4, 5GSa/s models only)					



- 8. The scope will return to the main screen after the *CH1* key has been pressed. (For GDS-3154, GDS-3254, GDS-3352/4, 5GSa/s models only)
- 9. Repeat steps 3~6 to upgrade the kernel. The same file is used again to upgrade the kernel.

10. When the calibration message appears for the second time after the oscilloscope has restarted, press "TEST" in order to perform the phase calibration officially. (For GDS-3154, GDS-3254, GDS-3352/4, 5GSa/s models only)

<u>Please note that the entire phase calibration may</u> <u>take about 10 minutes.</u>

11. The upgrade procedure is complete after the second upgrade.

For more information, contact your local dealer or GWInstek at www.gwinstek.com / marketing@goodwill.com.tw.

Upgrading the GDB-03 Demo Board Firmware

Step

- 1. Please copy the gdb3h.rom, gdb3m.rom and gdb3s.rom (3 files in total) from GDB-03 CD to root directory of an SD card.
- 2. Insert the SD card into the SD card slot on the GDB-03 demo board and connect the USB cable to the GDS-2000A, GDS-2000E or GDS-3000.



3. When "GW INSTEK" is displayed on the GDB-03 OLED screen, quick turn the *Variable* knob to trigger the firmware upgrading process. A message on the OLED screen as shown in the photo will appear.


4. Press the *Function* button key to start the procedure. A message on the OLED screen as shown in the photo below will appear during upgrading process.





5. Upgrading the firmware is complete. Disconnect the USB cable. Reconnect USB cable and adjust the *Variable* knob to select which model (GDS-3000, GDS-2000A or New GDS Series) the demo board will be used for.

