

Digital Storage Oscilloscope

IDS-8000 series

Operation Manual



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Due to continuous improvements in the IDS-8000 series Digital Storage Oscilloscopes, information contained in this manual is subject to change without notice. Contact RS Components for revisions and corrections.

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Safety Instructions

For safe operation of this instrument, read these instructions completely before you use it and comply with them fully.

Failure to observe these warnings can result in **severe injury** or **death**.

If this equipment is used in a manner not specified in these instructions, the protection provided by the equipment may be impaired.

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Safety Symbols

The following safety symbols may appear in this manual or on the instrument.



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 the instrument or to other properties.



DANGER High Voltage



Attention - Refer to Manual



Protective Conductor Terminal



Earth (ground) Terminal

Safety Guidelines



CAUTION

- Do not apply more than 300V peak to the BNC connectors.
- Do not connect hazardous live voltages to the ground side of the BNC connectors as this may lead to fire or electrical shock.
- Do not place heavy objects on the instrument.
- Avoid severe impacts or rough handling that may damage the instrument.
- Use electrostatic discharge precautions while handling and making connections to the instrument.
- Use only correct mating connectors, not bare wires, to make connections to the instrument.

- Do not block or obstruct the cooling fan vent opening.
- Do not disassemble the instrument. If repair or calibration is required, contact RS Components for advice. The address is given at the end of these instructions.

Power Supply**WARNING**

- Input voltage: 100 ~ 240 V AC, 47 ~ 63Hz
- The power supply voltage should not fluctuate more than 10%.
- To avoid electrical shock, the power cord protective grounding conductor must be connected to earth ground.

Fuse**WARNING**

- Fuse type: T2A/ 250V High Breaking Capacity type (HBC), 20 x 5 mm.
 - For continued fire protection, replace the fuse with the specified type and rating only.
 - Disconnect the power cord before replacing the fuse.
 - Use a flat blade screwdriver to open the fuse drawer on the a.c. inlet socket.
 - If the fuse has blown, there is a fault. Investigate and rectify the cause of the fault before replacing the fuse.
-

Cleaning the instrument

- Disconnect AC Power Cord from the instrument before cleaning.
 - Use a soft cloth dampened in a solution of mild detergent and water. Do not allow any liquid to enter the instrument.
 - Do not use chemicals or cleaners containing benzene, toluene, xylene, acetone or other harsh chemicals.
-

Operating Environment

Location : Indoor use only.

Relative Humidity : < 80% non-condensating.

Altitude : < 2000m

Ambient Temperature : 0°C to 50°C

EN 61010-1:2001, CAT III 600V, Pollution Degree 2

Measurement Category I is for measurements performed on circuits not directly connected to mains. Examples include: Measurements on battery powered equipment and specially protected (internal) mains-derived circuits.

Measurement Category II is for measurements on circuits directly connected to the low voltage installation. Examples include: Household appliances, portable tools and similar equipment.

Measurement Category III is for measurements performed in the building installation. Examples include measurements on distribution boards, junction boxes, socket-outlets and wiring and cables in the fixed installation.

Measurement Category IV is for measurements performed at the source of the low-voltage installation. Examples include measurements on primary overcurrent protection devices and electricity meters.

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.
Note: 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

Location: Indoor

Environment

Relative Humidity: < 80%

Temperature: -20°C to 70°C

Power cord for the United Kingdom

When using the instrument 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



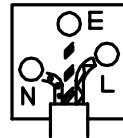
WARNING: THIS APPLIANCE MUST BE EARTHED

IMPORTANT: The wires in this lead are colour-coded 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 coloured 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 a competent electrician or contact RS Components for further advice.

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 0.75mm^2 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 or 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 the wiring label, this Instruction Book and comply with current wiring regulations.

Getting Started

Follow these instructions to correctly setup the instrument, especially if you are using it for the first time.

Oscilloscope Characteristics	Main Features	8
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	5. Start Measurements	8

Instrument characteristics

The instrument is a general purpose digital storage oscilloscope suitable for a wide range of applications, such as production testing, research, and field verification.

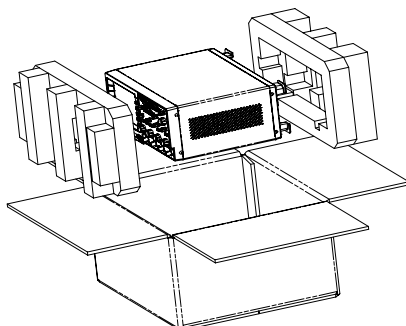
Main Features

- Wide selection range: 60MHz to 200MHz bandwidth, 2 or 4 channels
 - High Sampling rate: up to 25GS/s equivalent-time
 - Powerful display: 5.6 in. color TFT, wide viewing angle, 8 x 12 divisions waveform support
 - USB connection: to printers and storage devices
 - Deep memory: 25k points record length
 - Automatic measurements: maximum 27 types
 - Peak detection: up to 10ns
 - FFT analysis
 - Triggers: Video, Pulse width, Edge, Delay
 - Program and play mode
 - Go-No Go test
 - Built-in help
 - USB and RS-232 interfaces
-

Package Contents

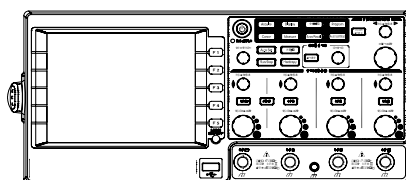
Before use, check all the items listed below are included in the box. If any item is missing, incorrect or damaged, contact RS Components for further advice.

Opening the box

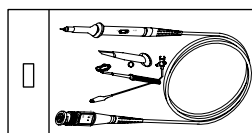


IDS-8000 Series Instrument

Contents



Probe sets (Qty 2 or 4, depending on instrument)



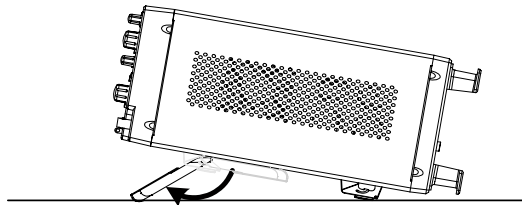
Power cord

User manual (this document)

Power Up

Prepare the instrument for use as follows:

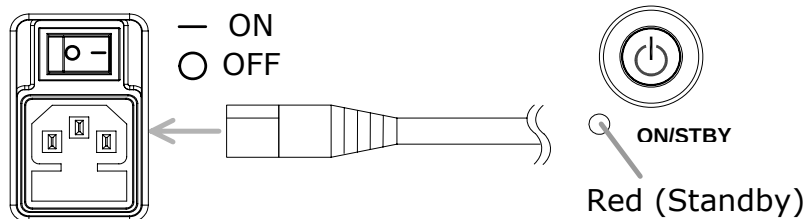
Tilt stand



Turn on the Main Power

1. Connect the Power Cord to the rear panel.

Turn On the Main Power Switch on the rear panel. Check the ON/STBY indicator on the front panel turns red.

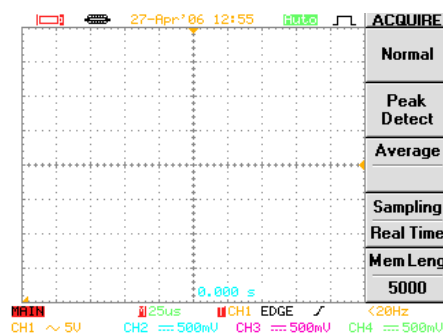


Press the ON / STBY button



Check the ON/STBY indicator on the front panel turns green.

Display view



After about 15 to 20 seconds the oscilloscope will initialise and revert to its last used operating mode.

Functionality check

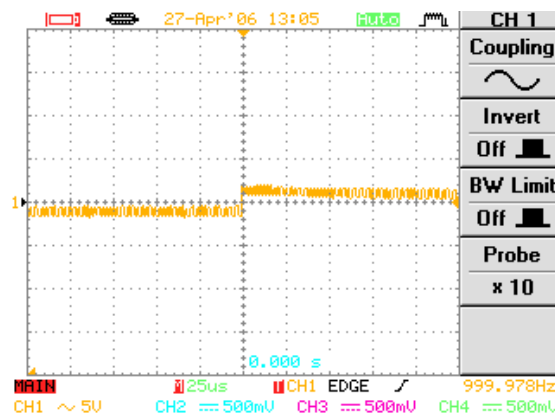
Before operating the instrument perform the following checks:

1. Connect the Probe

Connect a probe to the Channel 1 input terminal and to the probe calibration output ($2V_{pp} \pm 3\%$, 1kHz square wave).

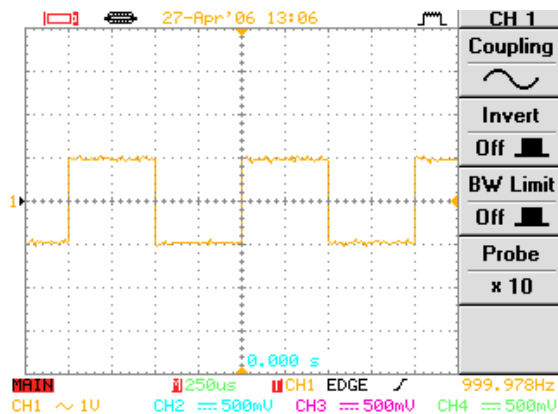
2. Capture the signal

Make sure the compensation signal appears on the display. If CH1 is inactive (CH1 button LED is Off), press the CH1 button and activate it (LED On).

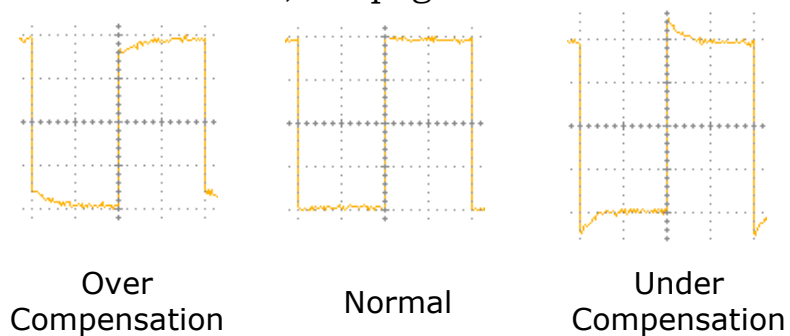


3. Set the scale

Press the Auto Set button ; the instrument automatically adjusts the horizontal scale, vertical scale, and trigger level to correctly display the waveform. For Auto Set details, see page 8.

**4. Compensate the probe**

Watch the reference signal edge and adjust the probe compensation until the waveform appears normal as shown in the diagram below: Adjust the Volts/Div (Vertical) and Time/Div (horizontal) controls as required to increase the size of the waveform on the screen. For more details, see page 8.

**5. Start Measurements**

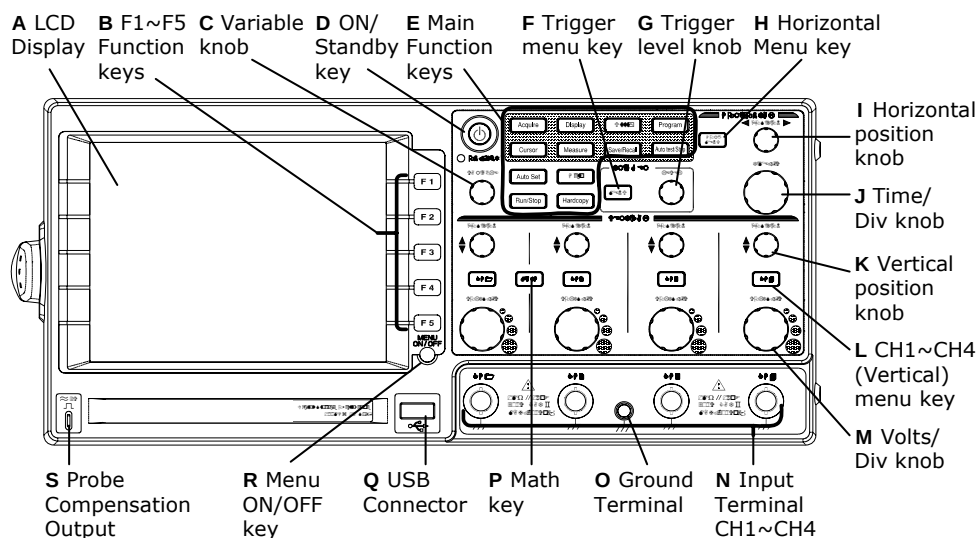
Continue with the measurements as required. For measurement setting shortcuts, see page 8. Detailed descriptions start from page 8.

Panel Descriptions

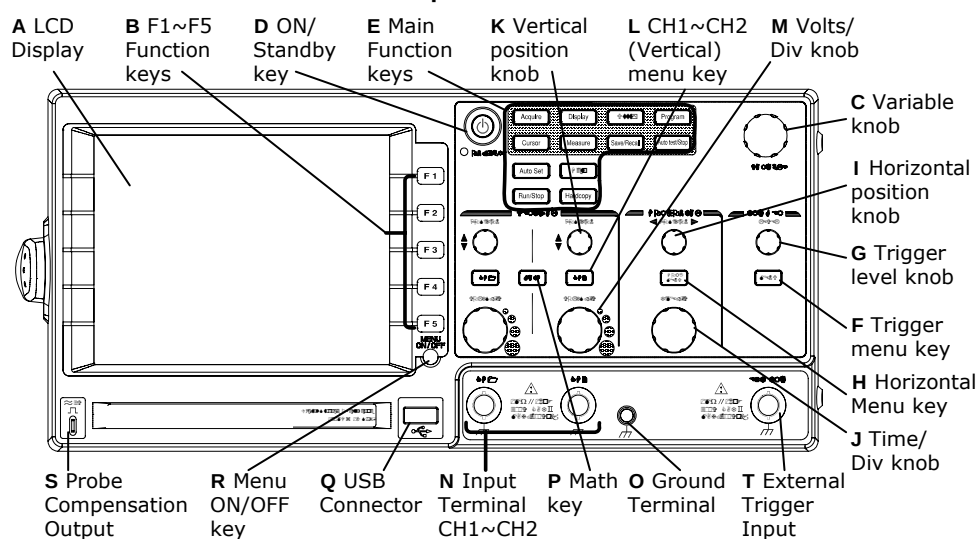
Front Panel	IDS-8064/ 8104/ 8204 front panel	8
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	Description of front panel items	8
Rear Panel	IDS-8062/ 8064/ 8102/ 8104/ 8202/ 8204 rear panel	8
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Display	IDS-8062/ 8064/ 8102/ 8104/ 8202/ 8204 display	8
	Description of displayed items	8

Front Panel

IDS-8064 / 8104 / 8204 front panel



IDS-8062 / 8102 / 8202 front panel



Description of front panel items

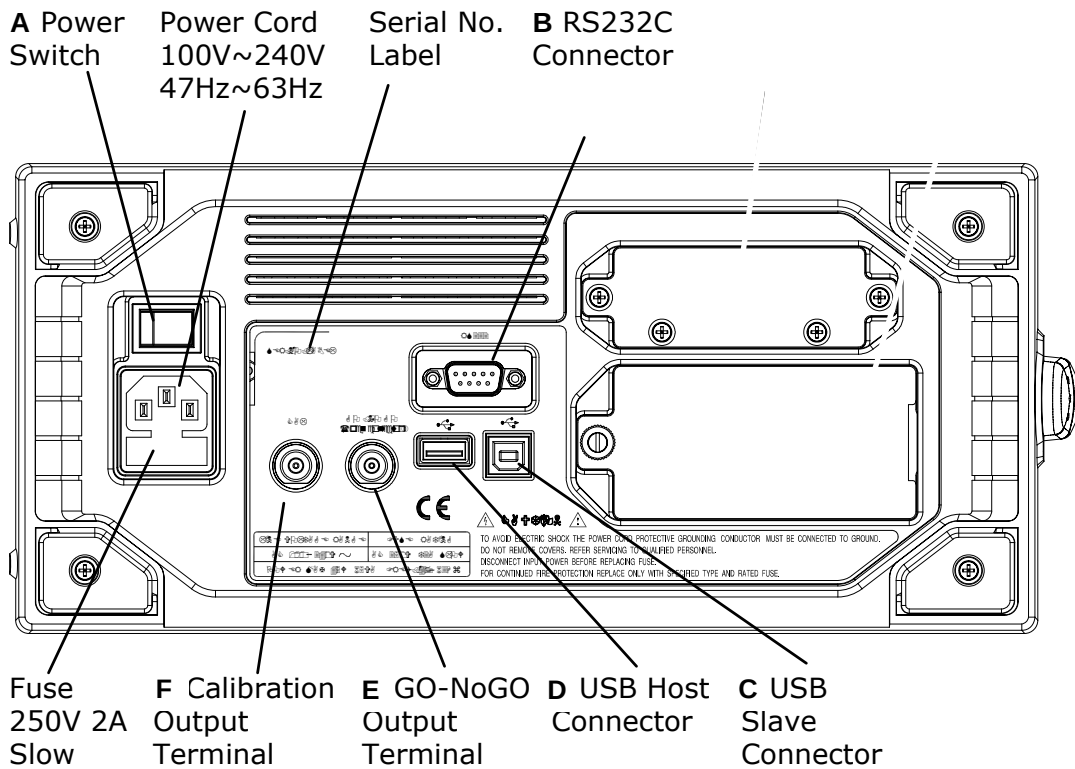
A	LCD Display	TFT Color, 320 x 234 resolution LCD display.
B	F1 ~ F5 Function buttons	‘Soft’ buttons linked to menu functions shown on the right-hand side of the display screen.
C	Variable knob	Clockwise: increase the value or move to the next parameter. Counterclockwise: decrease the value or go back to the previous parameter.
D	On/Standby button	Press once: Power On (green indicator). Press again: Standby (red indicator).
E	Main Function buttons	Acquire button is for configuring acquisition mode. See page 48. Display button is for configuring display settings. See page 8. Utility button is for configuring system settings (page 8), running Go-No Go test (page 8), printout and data transfer together with Hardcopy button (page 8), and running calibration (page 8). Program button and Auto test/Stop button are for Program and Play feature. See page 8. Cursor button is for configuring horizontal and vertical cursors. See page 8. Measure button is for configuring and running automatic measurements. See page 8. Help button is for displaying built-in help. See page 8. Save/Recall button is for saving and recalling image, waveform, and settings using USB storage or internal memory. See page 8. Auto Set button is for finding signals and setting scales automatically. See page 8. Run/Stop button is for freezing the signal

		view (Stop). See page 8.
F	Trigger menu button	For configuring trigger settings. See page 8.
G	Trigger level knob	Sets the trigger level: increase (clockwise) or decrease (counterclockwise).
H	Horizontal menu button	For configuring the horizontal view. See page 8.
I	Horizontal position knob	Moves the waveform right (clockwise) or left (counterclockwise).
J	Time / Div knob	For setting the horizontal scale: fine (clockwise) or coarse (counterclockwise).
K	Vertical position knob	Moves the waveform upward (clockwise) or downward (counterclockwise).
L	Channel (Vertical) menu button	For configuring the vertical view for each channel. See page 8.
M	Volts / Div knob	For setting the vertical scale for each channel: fine (clockwise) or coarse (counterclockwise).
N	Input Terminal	BNC male connector for signal input.
O	Ground Terminal	Terminal for connecting the DUT (Device Under Test) ground lead.
P	Maths button	For performing Maths operations using Channel 1 and 2 input signals. See page 8.
Q	USB connector	Type A host female, 1.1 / 2.0 compatible. For printing (page 8) and data transfer (page 8).
R	Menu On / Off button	Show (On) or hide (Off) the menu from the display. See page 8.

S	Probe compensation Output	2Vp-p signal output for probe compensation. See page 8.
T	External Trigger Input	(2CH model only) For external trigger signal used in advanced delay triggering. See page 8.

Rear Panel

IDS-8062 / 8064 / 8102 / 8104 / 8202 / 8204 rear panel

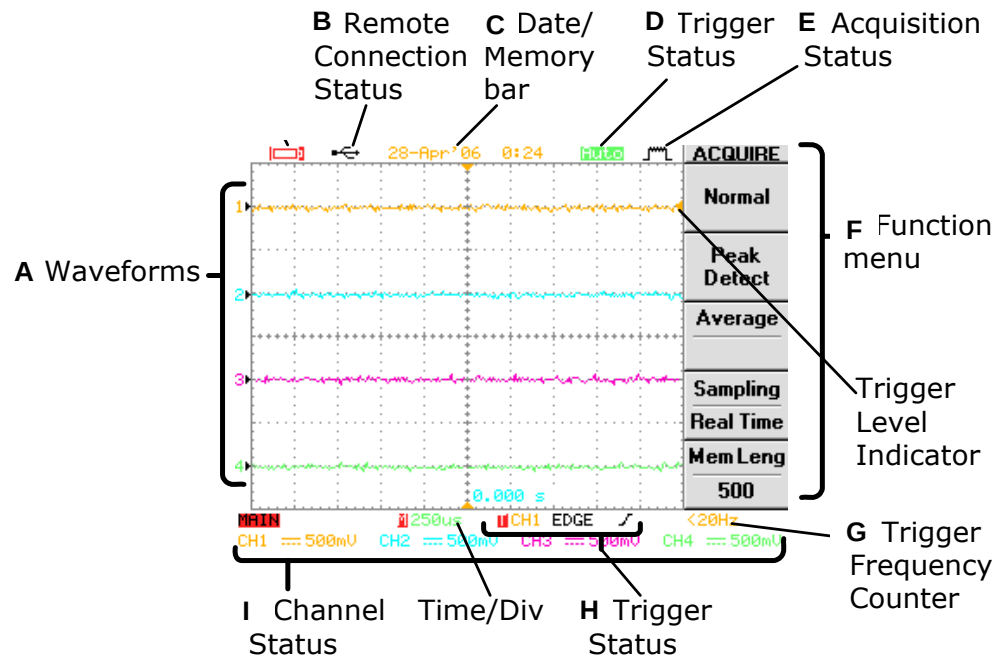


Description of rear panel items

A	Power Switch	—: ON (front panel indicator turns green) ○: OFF (front panel indicator turns red) For power up sequence, see page 8.
B	RS232C Connector	9 pin male connector for data communication. See page 8.
C	USB Device Connector	Type B slave female connector for data communication. See page 8. Note: USB rear panel host and rear panel slave connection cannot be used at the same time.
D	USB Host Connector	Type A host female, 1.1/2.0 full speed compatible, with the same functionality as the front panel USB connector. Note: USB rear panel host and rear panel slave connection cannot be used at the same time.
E	Go-NoGo Output Terminal	Provides a Go-No Go test result as a pulse signal. See page 8.
F	Calibration Output Terminal	Provides a calibration signal. See page 8.

Display

IDS-8062 / 8064 / 8102 / 8104 / 8202 / 8204 display



Description of displayed items

A	Waveforms	Input signal waveforms are activated by pressing the corresponding Channel button: Channel 1: Amber Channel 2: Blue Channel 3: Pink Channel 4: Green
B	Remote Connection Status	Shows the active communication interface. □: RS232C □: USB
C	Date / Memory bar	28-Apr'06 0:24 : (Default) The current time and date is configured in the Utility menu. See page 8.

		 The memory bar will temporarily appear when configuring the horizontal scale (page 8) and memory length (page 8), indicating the ratio and the position of the displayed waveform compared with the internally stored information.
D	Trigger Status	Auto : Auto Trigger mode Wait : Trigger condition is not met STOP : Triggering is halted For triggering details, see page 8.
E	Acquisition Status	 : Normal mode  : Peak Detect mode  : Average mode For acquisition details, see page 45.
F	Function button	The active function button and menu corresponding to F1~F5 soft buttons.
G	Trigger Frequency Counter	The signal frequency of the selected channel. <20Hz shows the frequency is less than 20Hz and is outside of the instrument triggering range.
H	Trigger Status	CH1 EDGE  (From left) Trigger source channel, trigger type, and slope For trigger details, see page 8.
I	Channel Status	CH1  ~ 500mV (From left) Channel, Bandwidth limit On, Coupling mode, Time/Div scale For Channel (vertical scale) details, see page 8.

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Operation Shortcuts

This section describes the shortcuts for the various instrument functions and operations used in this manual.

Pushbutton sequence description:

Display→F1	= Press the Display button, then press F1
F1↵	= Press F1 repeatedly, if necessary
F1~F4	= Use all F1, F2, F3, and F4 to complete the operation

System Configuration

Acquisition

Select acquisition mode	Acquire→F1~F4
Select the memory length	Acquire→F5

Cursor

Select the horizontal cursor	Cursor→F1~F2
Select the vertical cursor	Cursor→F1, F3

Display

Freeze the waveform	Run/Stop
Refresh the display view	Display→F3
Select the display grid	Display→F5
Switch the vectors/dots waveform	Display→F1
Set the display contrast	Display→F4
Turn off the display menu	Menu ON/OFF
View accumulated waveform	Display→F2

Horizontal

Zoom the horizontal view	HORIMENU→F2~F3
Roll the horizontal view	HORIMENU→F4
View in XY mode	HORIMENU→F5

Vertical

Invert the waveform	CH1/2/3/4→F2
Limit the frequency bandwidth	CH1/2/3/4→F3
Select the coupling mode	CH1/2/3/4→F1
Select the probe attenuation	CH1/2/3/4→F4

Other Configurations

Select the buzzer sound	Utility→F3
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Select the display language	Utility→F4
Set the date/time	Utility→F5→F5→F2→F1↵
Configure data interface	Utility→F2→F1↵
View the system information	Utility→F5→F2

Measure the Signal

Automatic Measurements

Automatic Delay measurements	Measure→F5→F3↵
Automatically set the scale	Auto Set
Automatic Time measurements	Measure→F3→F3↵
View all measurement results	Measure→Measure→F1~F4
Automatic Voltage measurements	Measure→F1→F3↵

Go-No Go Test

Edit Go-No Go test template settings	Utility→F3→F2~F3 Utility→F3→F1→F1~F4 Utility→F5→F4 Utility→F5→F3→F4
Run Go-No Go test	

Maths Operation

Add/ Subtract	MATHS→F1↵→F2~F4
Run FFT operation	MATHS→F1↵→F2~F5

Program and Play

Edit the program steps	Program→F1↵→F2~F5
Play the program	Program→F1↵→F2~F5

Trigger

Use the Delay trigger (2CH only)	Trigger→F1↵→F2~F4→F5→F1~F4
Use the Edge trigger	Trigger→F1↵→F2~F3→F5→F1~F4
Use the Pulse width trigger	Trigger→F1↵→F2~F4→F5→F1~F4
Use the Video trigger	Trigger→F1↵→F2~F5

Print and Data Transfer

Printout

Printout display image/waveform	Utility→F1↵→F1 Hardcopy
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Save and Recall

Quick save to USB	Utility→F1→F1 Hardcopy
Save all (image/setup/waveform)	Save/Recall→F5→F2→F1~F4

Save image	Save/Recall→F5→F1→F1~F4
Save setup	Save/Recall→F3→F1~F4
Save waveform	Save/Recall→F4→F1~F4
Recall setup	Save/Recall→F5→F3→F1~F4
Recall waveform	Save/Recall→F5→F4→F1~F4
Configure folders in USB drive	Save/Recall→F3→F5→F1~F4

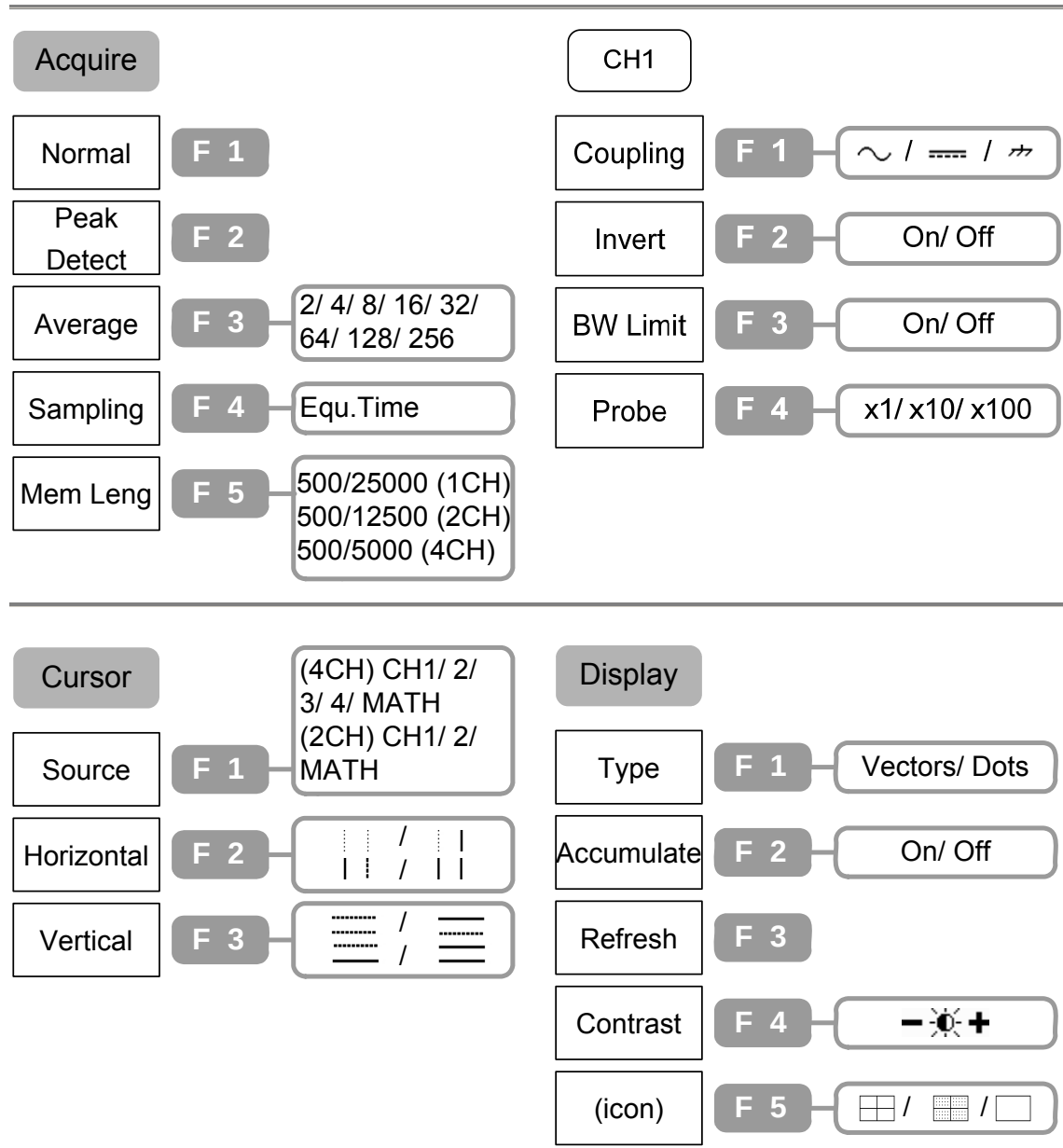
Calibration

Calibrate the instrument	Utility→F5→F1→F1~F3
Compensate the probe	Utility→F5→F5→F1→F1~F3

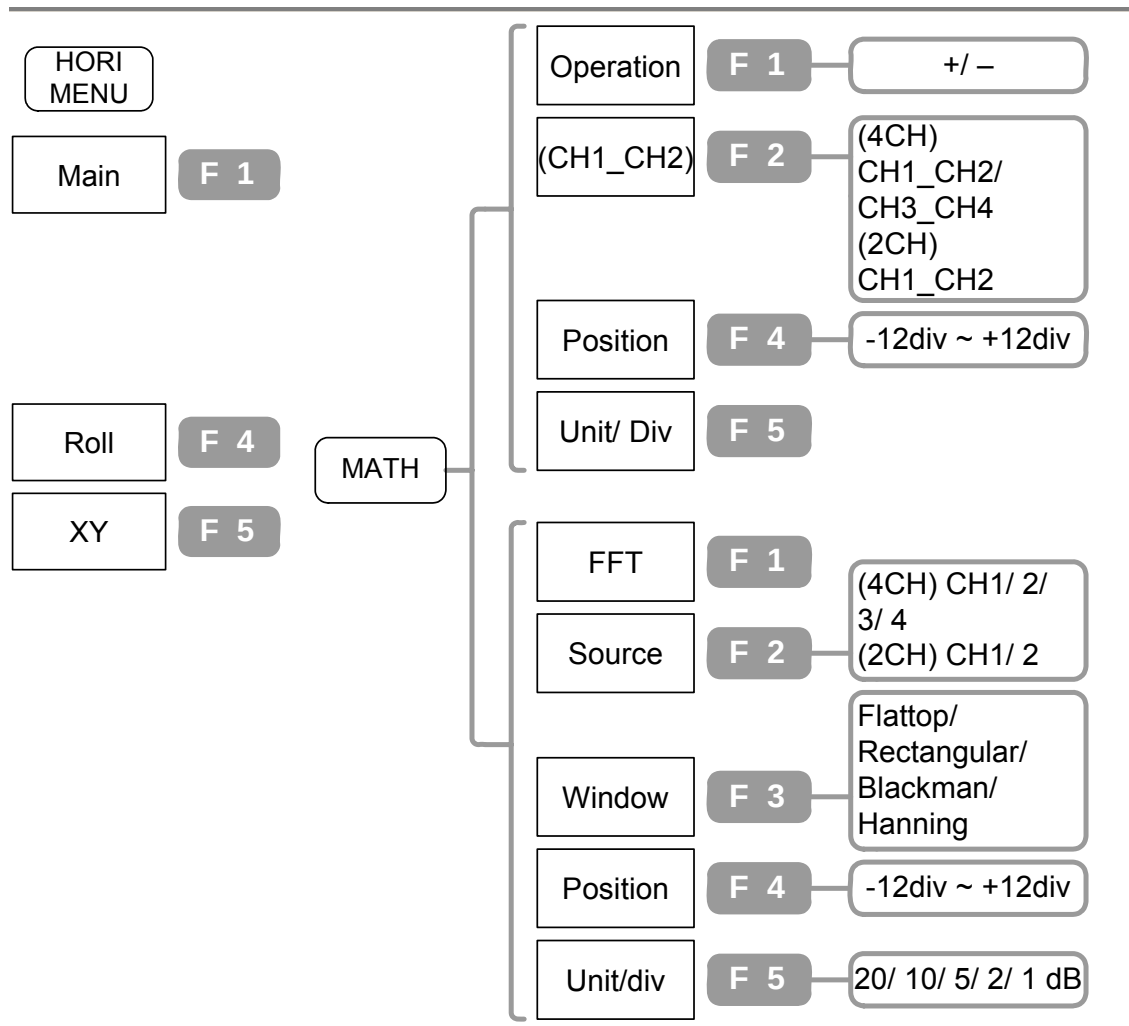
Menu Tree

No menu is available for the following buttons: Auto Set, Run/Stop, Help, Auto test/Stop, Hardcopy.

Acquire, Channel, Cursor, Display

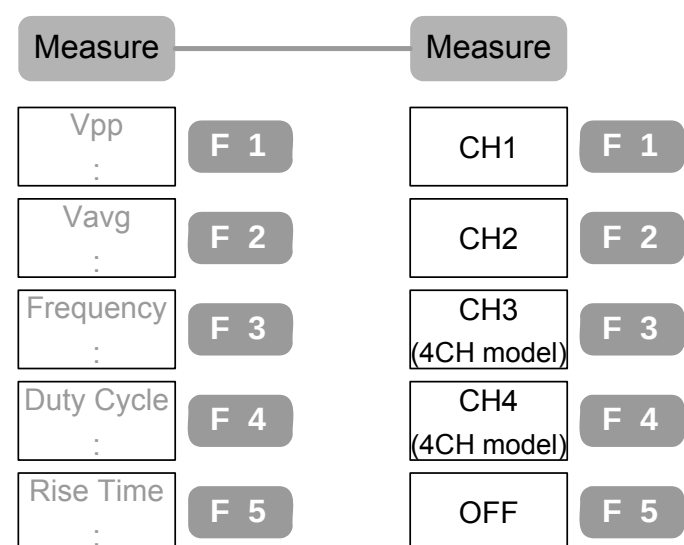


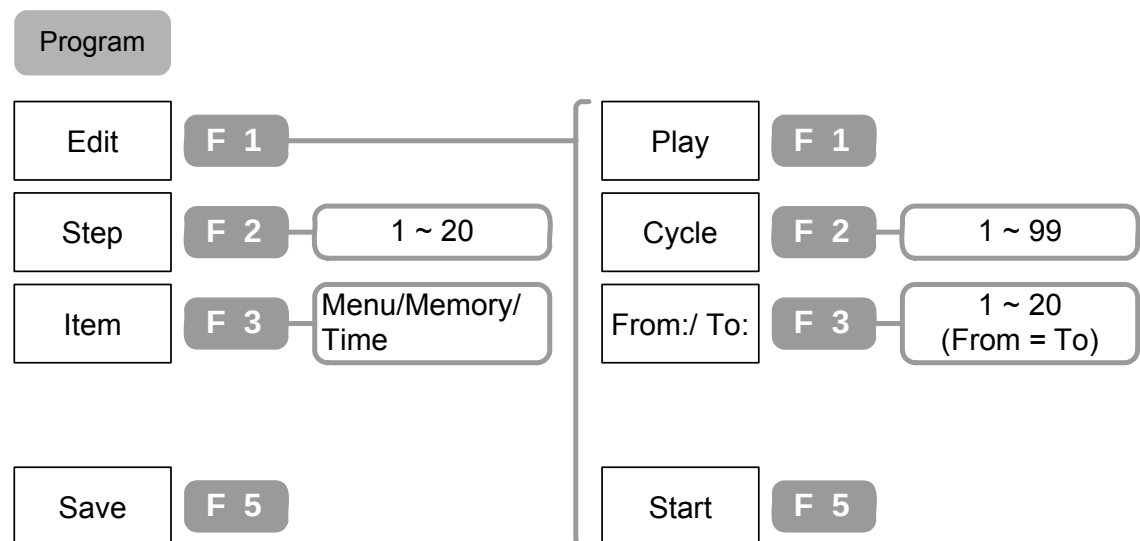
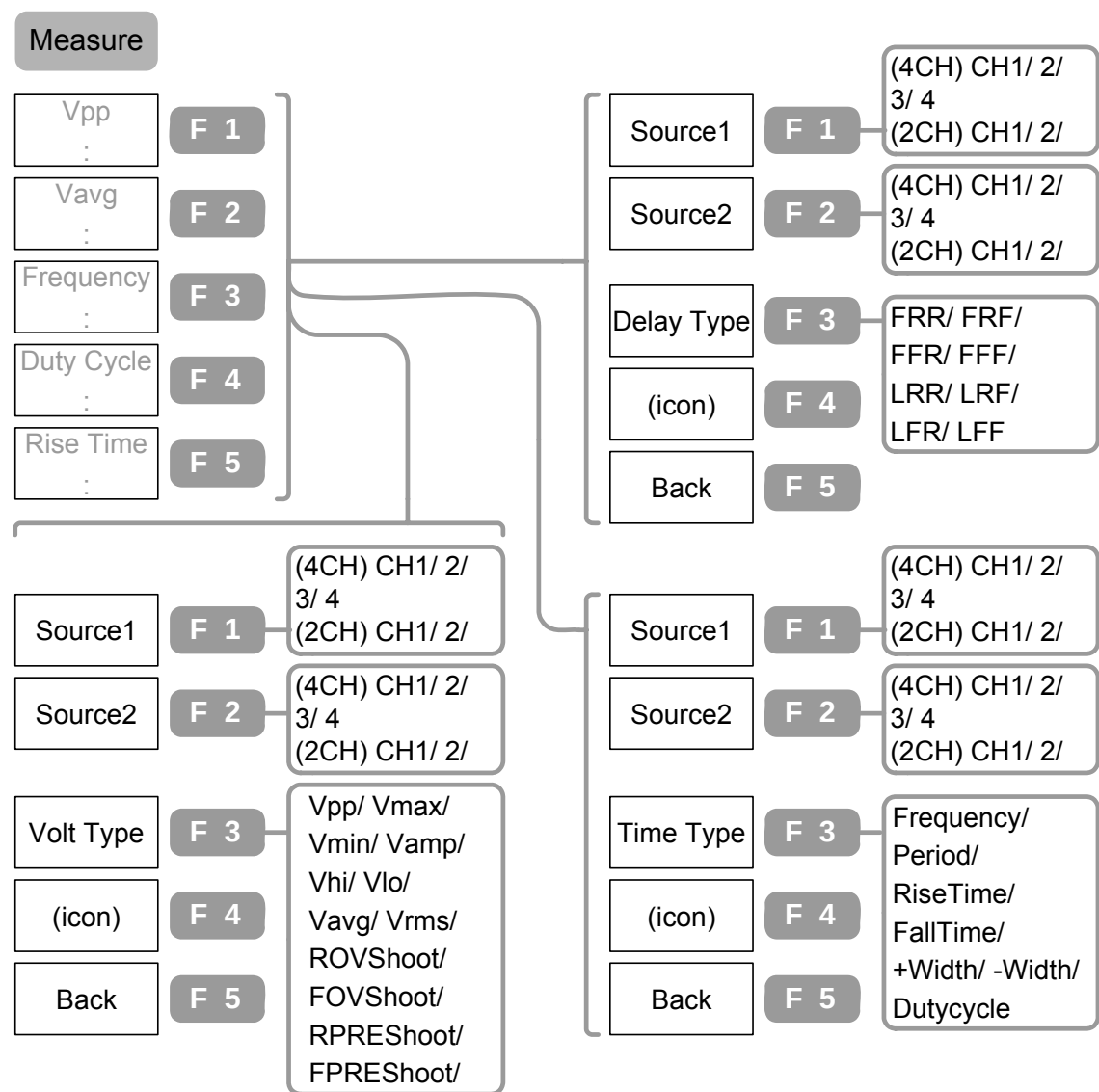
Horizontal, Maths, Measure (1 of 2)



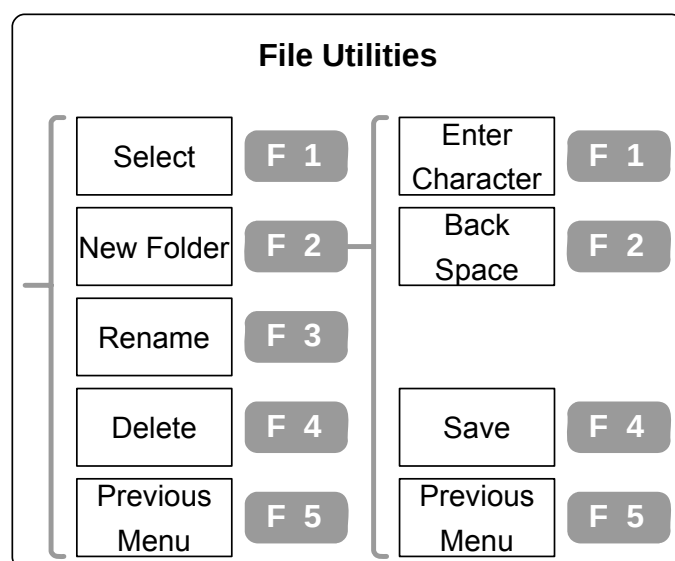
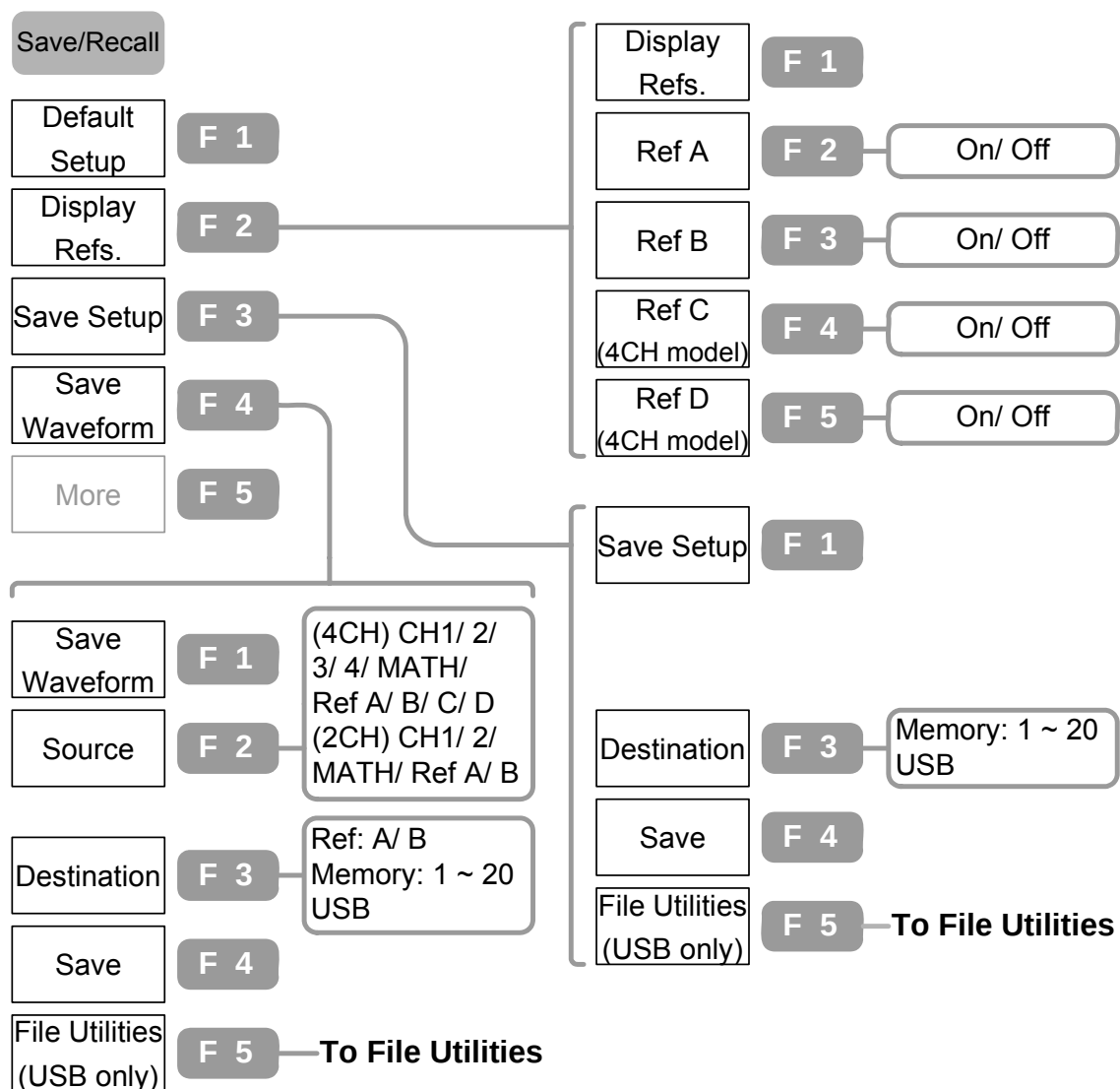
(Press once)

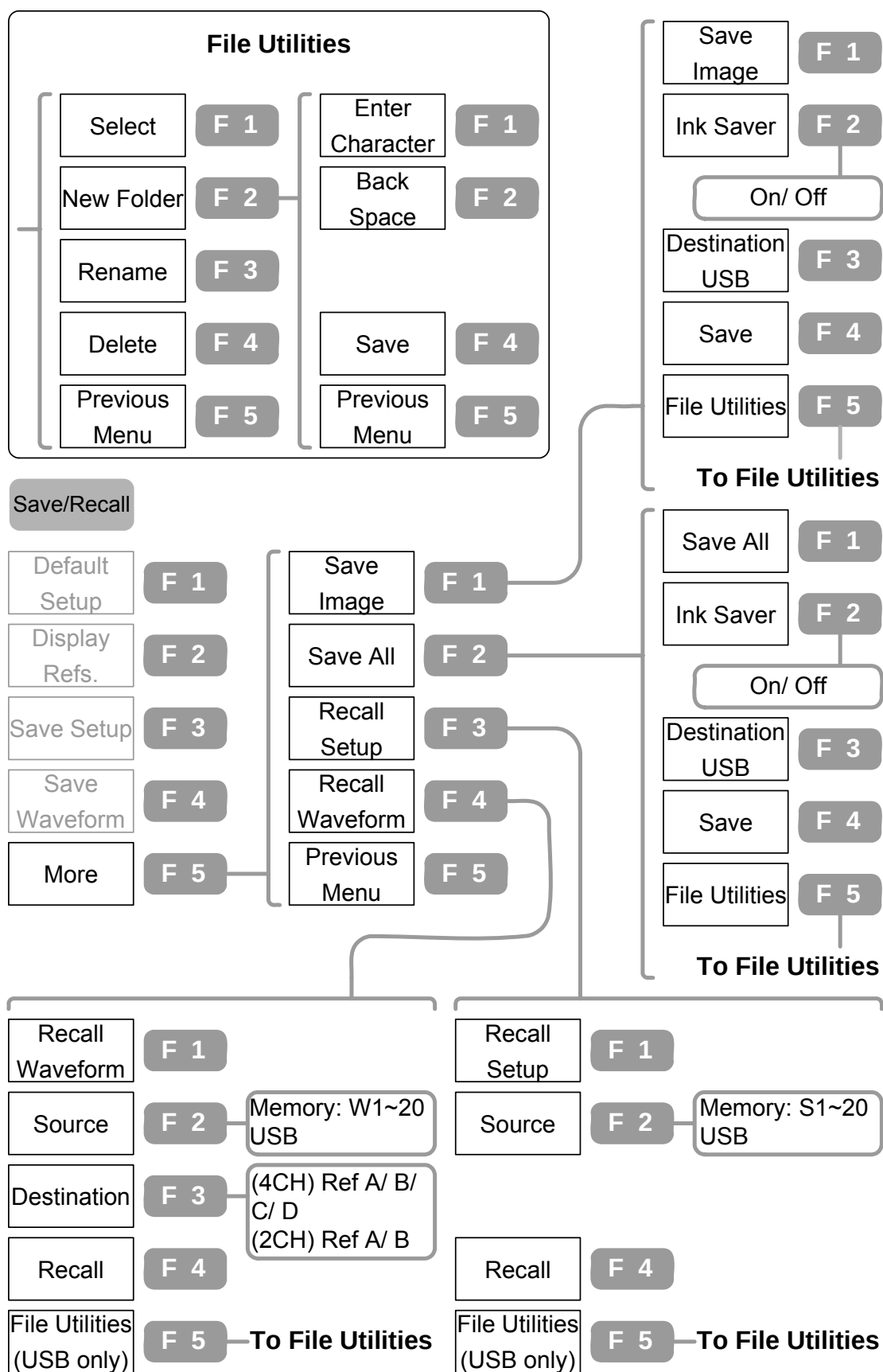
(Press twice)



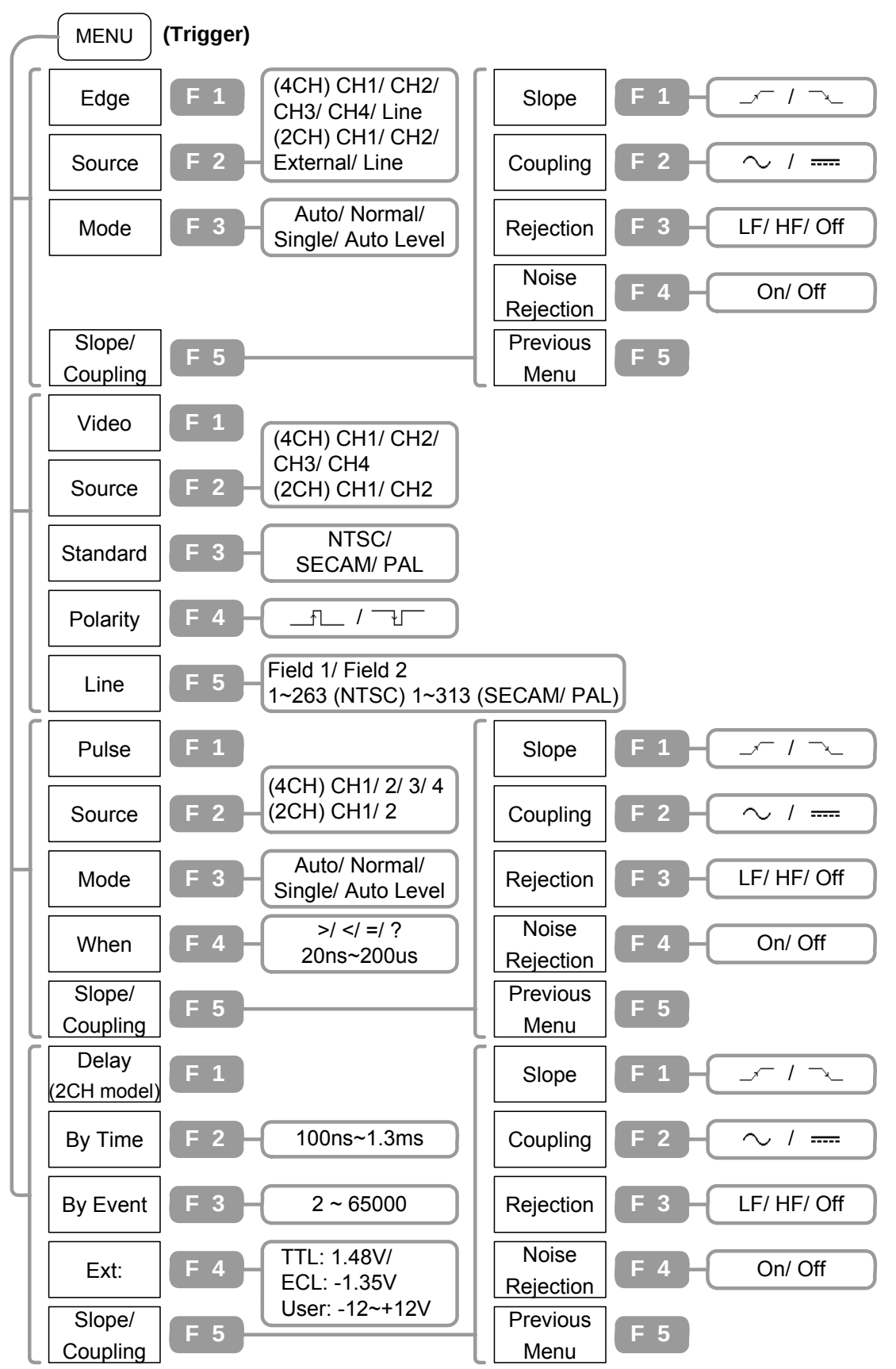
Measure (2 of 2), Program

Save / Recall (1 of 2)

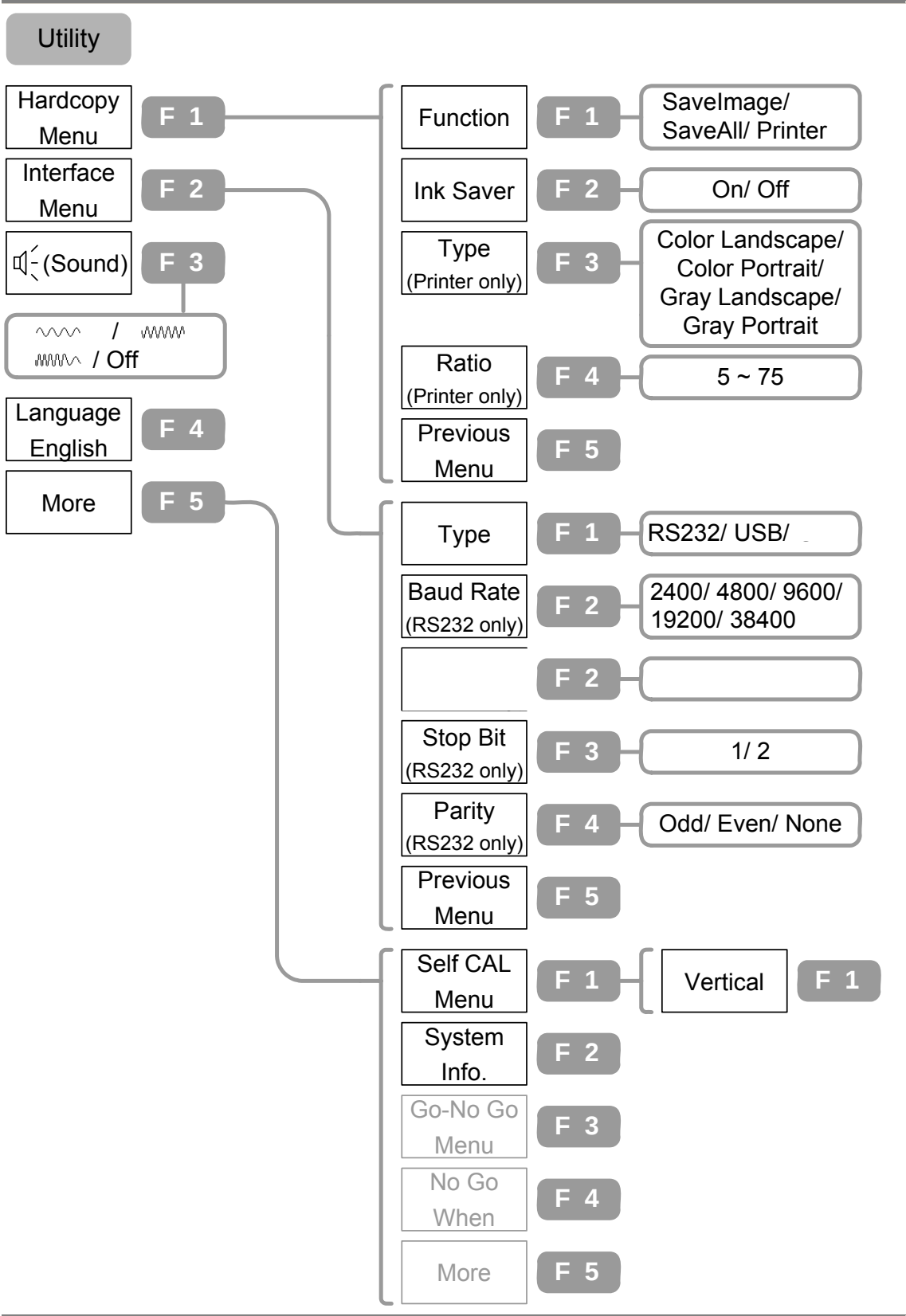


Save / Recall (2 of 2)

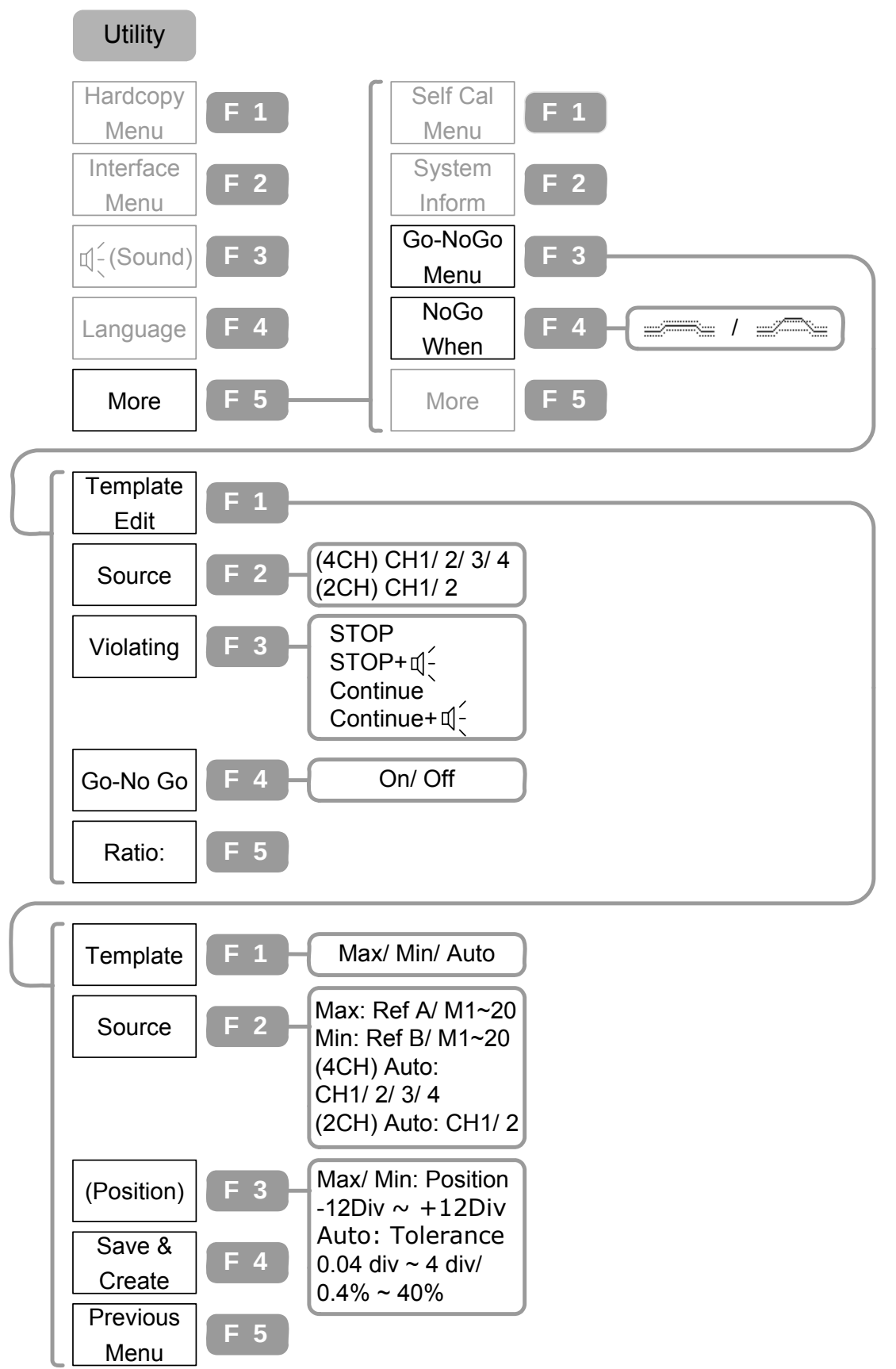
Trigger



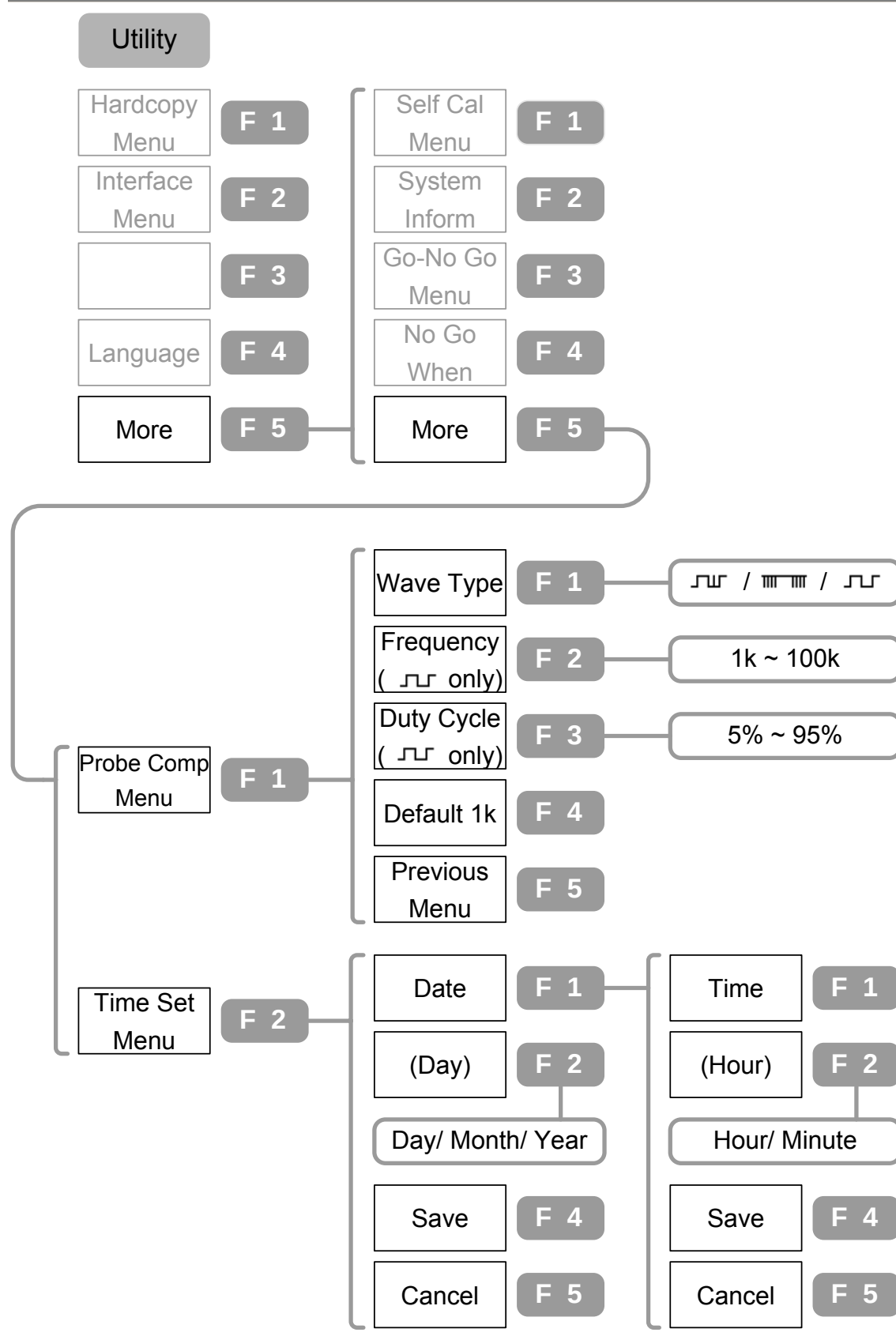
Utility (1 of 3)



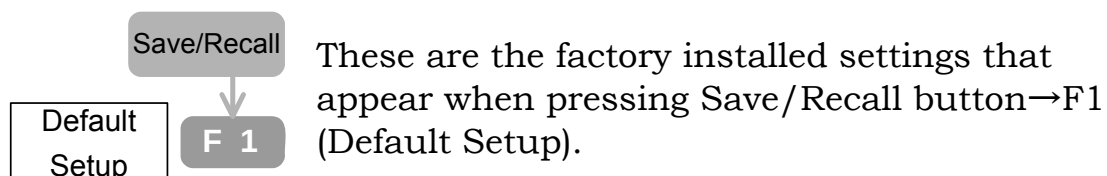
Utility (2 of 3)



Utility (3 of 3)



Default Settings



Acquisition	Mode: Normal	Memory Length: 500
Channel (Vertical)	Scale: 2V/Div Coupling: DC BW Limit: Off	Invert: Off Probe Attenuation: x1
Cursor	Source: CH1 Vertical: None	Horizontal: None
Display	Type: dots Graticule:	Accumulate: Off
Go-No Go	Go-No Go: Off NoGo when:	Source: CH1 Violating: Stop
Horizontal	Scale: 2.5us/Div	Mode: Main Timebase
Maths	Type: + Position: 0.00 Div	Channel: CH1+CH2 Unit/Div: 2V
Measure	Source1: CH1 Volt type: VPP Delay type: FRR	Source2: CH2 Time Type: Frequency
Program	Mode: Edit Item: Memory	Step: 1
Trigger	Type: Edge Mode: Auto Coupling: DC Noise Rejection : Off	Source: Channel1 Slope:
Utility	Hardcopy: SaveImage, Inksaver Off	Sound: Off

Configure the Settings

Acquisition	Select the Acquisition mode	8
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Horizontal View	Roll the horizontal view	8

View in XY mode 8

Vertical View	Select the coupling method 8
	Invert the waveform 8
	Limit the frequency bandwidth 8
	Select the probe attenuation 8

Other Settings	Select the buzzer sound 8
-----------------------	---------------------------------



1. Press the Utility button → F3.
 2. To select the buzzer setting, press F3 repeatedly.
-

Range		Low pitch
		High pitch
		Mixed pitch
	Off	No sound

View the Help information 8

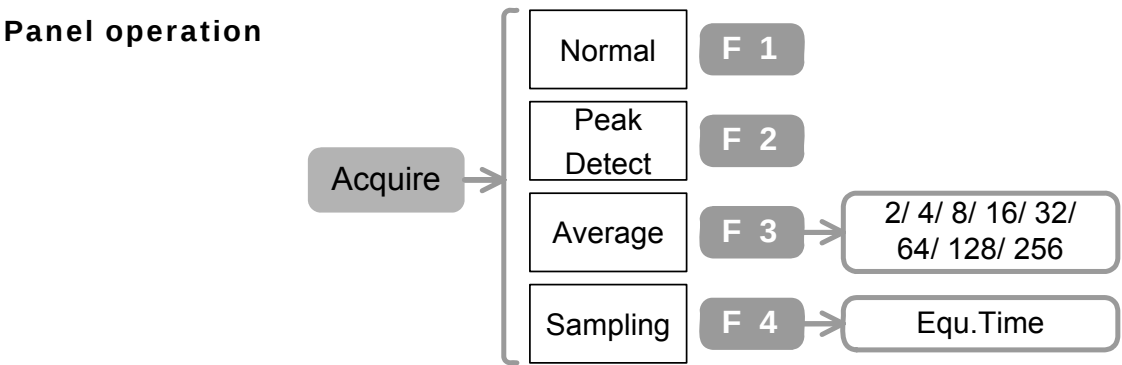
Set the Date 8

Set the Time 8

Acquisition

Acquisition process samples analog input signal and converts it into digital format, later to be reconstructed into a waveform.

Select the Acquisition mode



1. Press the Acquire button. Select the acquisition mode among F1~F3 and press it. The acquisition icon on the top right corner of the display changes accordingly.
2. (For Average mode) To select the number of samples, press F3 repeatedly.
3. To select the Sampling mode, press F4 repeatedly.

Range

Acquisition mode

Normal 	All the acquisition information is used to draw the waveform.
Peak Detect 	The minimum and maximum value pairs for each acquisition interval (bucket) are stored. This mode is useful in catching abnormal glitches in the signal.
Average 	Multiple acquisitions are averaged to draw a noise-free waveform. Average number 2, 4, 8, 16, 32, 64, 128, 256

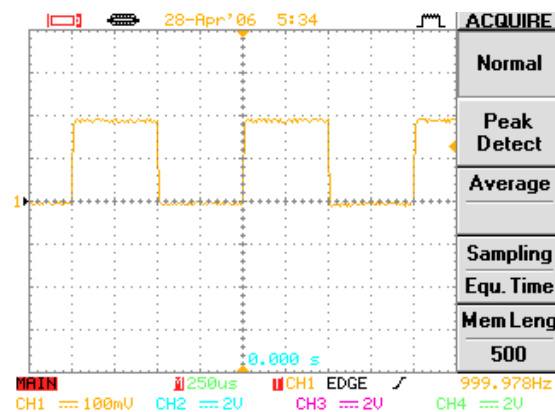
Sampling mode

The first sample during each acquisition interval is recorded.

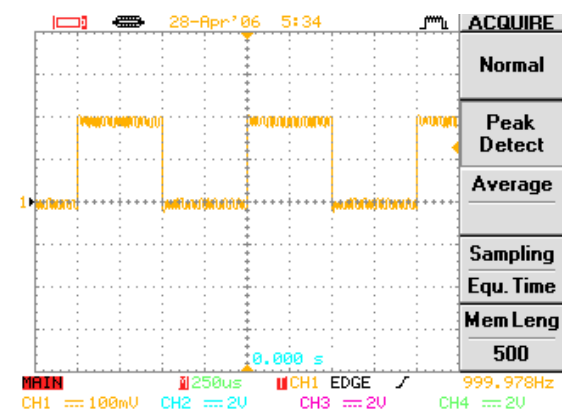
Equ. Time	Equivalent Time sampling. the instrument draws the waveform by accumulating the sample records. Useful for repetitive signal.
Real Time	Real Time sampling. The instrument draws the waveform from a single sampling record.

Example

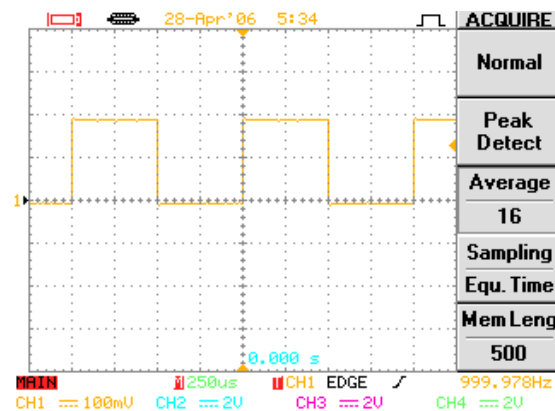
Normal mode



Peak Detect mode



Average mode



Waveform memory length

Panel operation



1. Press the Acquire button→F5.
2. To switch between short and long memory length, press F5 repeatedly.

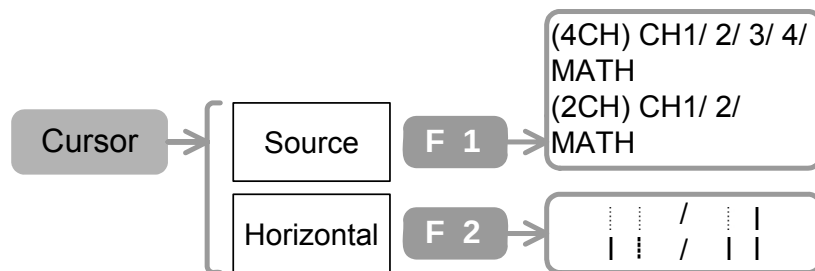
Range	500	Short memory length common for all number of channels: useful when catching high frequency signal.
	5000	Long memory length when three or four channels are active.
	12500	Long memory length when two channels are active.
	25000	Long memory length when only one channel is active.

Note that the display always shows 250 points (300 points when the menu is turned off).

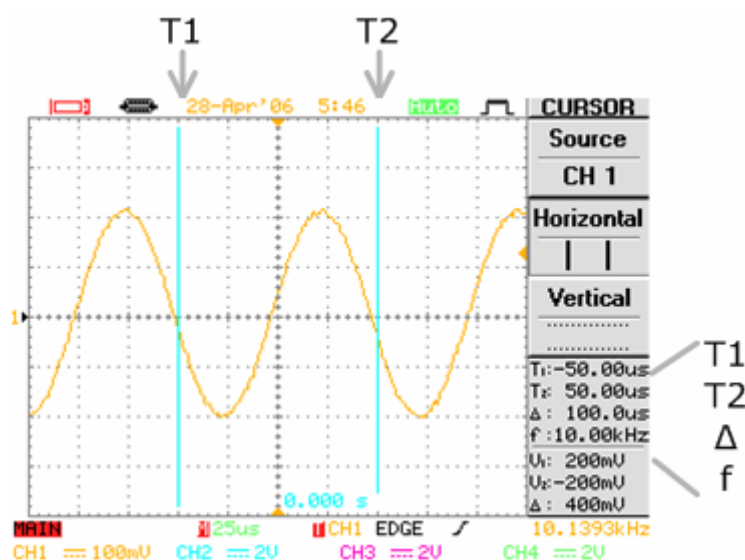
Cursor

Select the horizontal cursor type

Panel operation



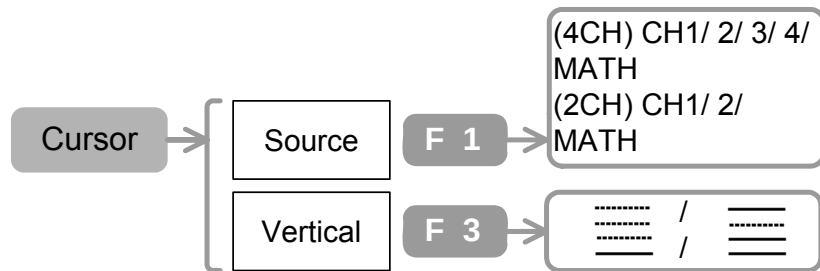
1. Press the Cursor button → F1. To select the channel, press F1 repeatedly.
2. To select the cursor to be activated, press F2 repeatedly.
3. To move the cursor, use the Variable knob.
4. The bottom right corner of the display shows the positions of two cursors (T1 & T2), their time difference (Δ), and the frequency (f).



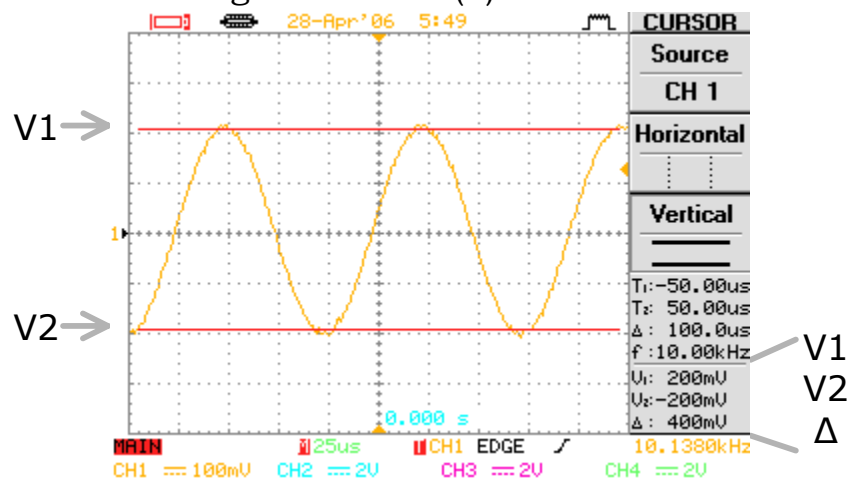
Range	Source
	CH1~CH4 Channel1~Channel2 waveform (4CH model)
	CH1~CH2 Channel1~Channel2 waveform (2CH model)
	MATHS The waveform as a result of the maths operation
	Horizontal (cursor type)
	: : Both T1 and T2 are invisible.
	: T2 is active, T1 is fixed. Variable knob moves only T2.
	: T1 is active, T2 is fixed. Variable knob moves only T1.
	Both T1 and T2 are active. Variable knob moves T1 and T2 together.

Select the vertical cursor type

Panel operation



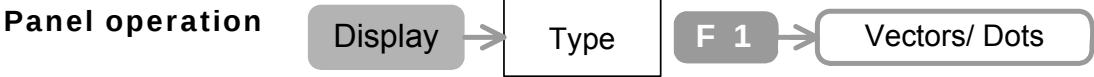
1. Press the Cursor button→F1. To select the channel, press F1 repeatedly.
2. To select the cursor to be activated, press F3 repeatedly.
3. To move the cursor, use the Variable knob.
4. The bottom right corner of the display shows the positions of two cursors (V1 & V2) and their voltage difference (Δ).



Range	Source	
	CH1~CH4 (4CH model)	Channel1~Channel4 waveform
	CH1~CH2 (2CH model)	Channel1~Channel2 waveform
	MATH	The waveform as a result of the Math operation.
	Vertical (cursor type)	
	-----	Both V1 and V2 are invisible.
	=====	V2 is active, V1 is fixed. Variable knob moves only V2.
	=====	V1 is active, V2 is fixed. Variable knob moves only V1.
	=====	Both V1 and V2 are active. Variable knob moves V1 and V2 together.

Display

Select the vector / dot waveform

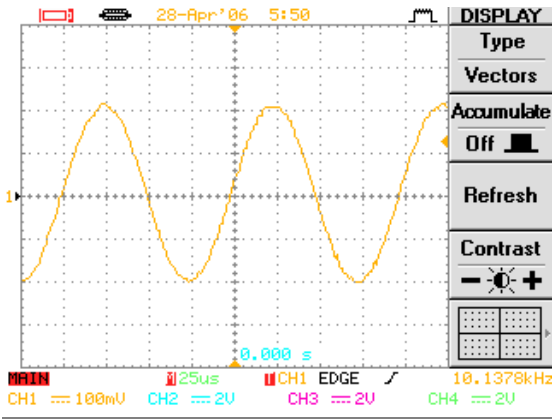


- 1. Press the Display button→F1.
- 2. To select the line format, press F1 repeatedly.

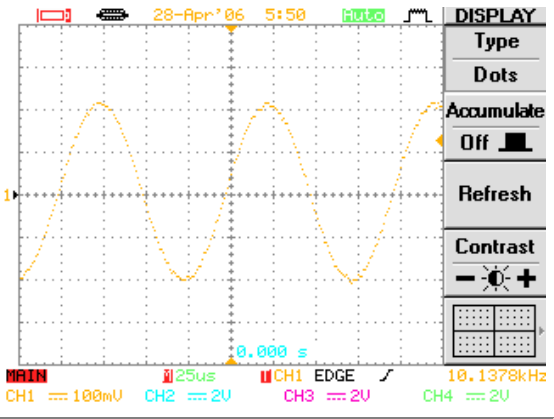
Range	Vectors	The sampled dots are connected to form a waveform line.
	Dots	Only the dots are shown on the display.

Example

Vectors

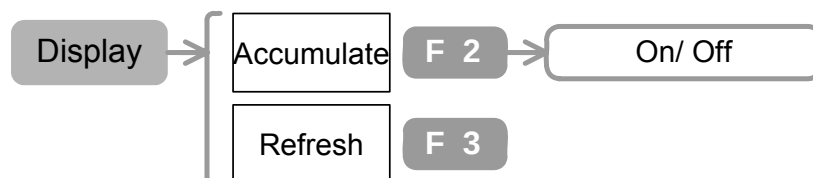


Dots



View accumulated waveform

Panel
operation

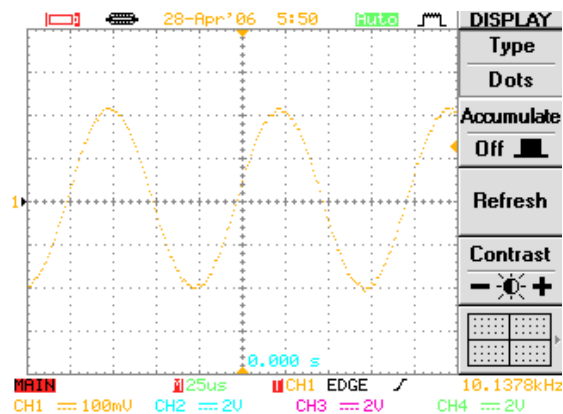


1. Press the Display button→F2.
2. To turn Off accumulation, press F2 again.
3. To clear the accumulated waveform, press F3.

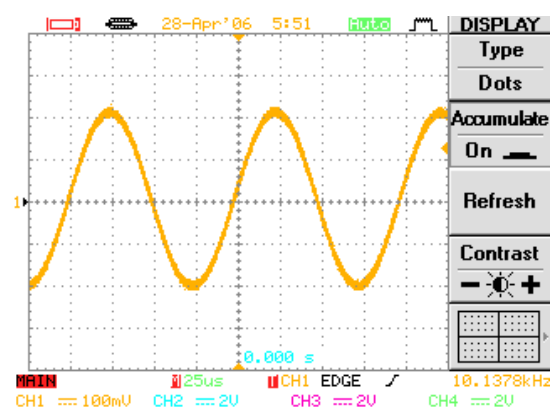
Range	On	The waveform is accumulated to show signal variation.
	Off	The waveform is refreshed each time.

Example

Accumulation Off



Accumulation On



Set the display contrast

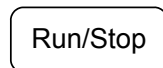
Panel operation



1. Press the Display button→F4.
 2. To change the contrast, use the Variable knob.
-

Freeze the waveform

Panel operation



1. To freeze the waveform (and the trigger), press the Run/Stop button.
 2. To unfreeze the waveform, press the Run/Stop button again.
-

Select the display grid type

Panel operation



1. Press the Display button→F5.
2. To select the grid type, press F5 repeatedly.

Range



Only displays X and Y axis



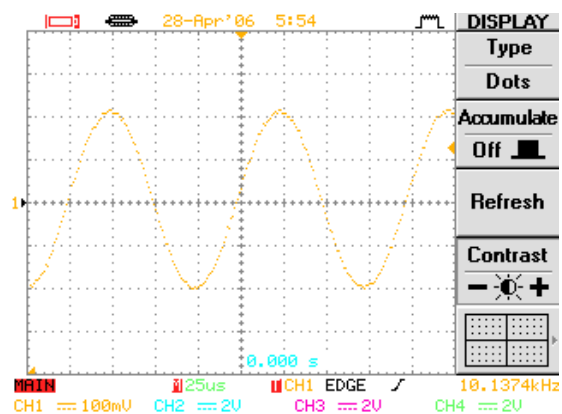
Displays full grid



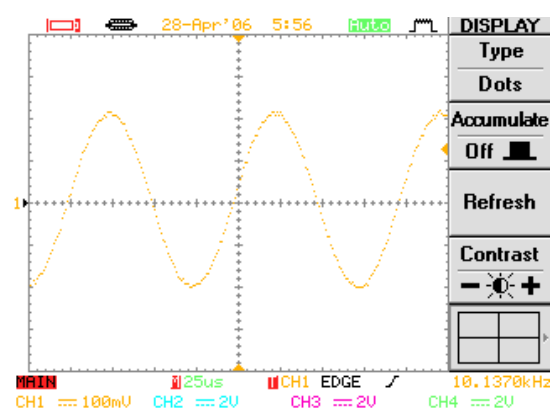
Only displays outer frame

Example

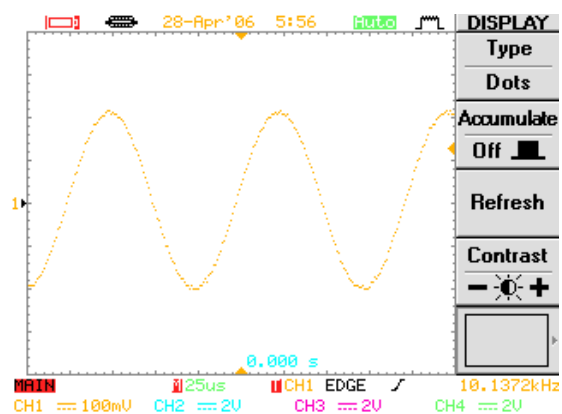
Full grid



X and Y axis only

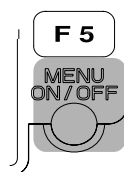


Outer frame only



Turn Off the display menu

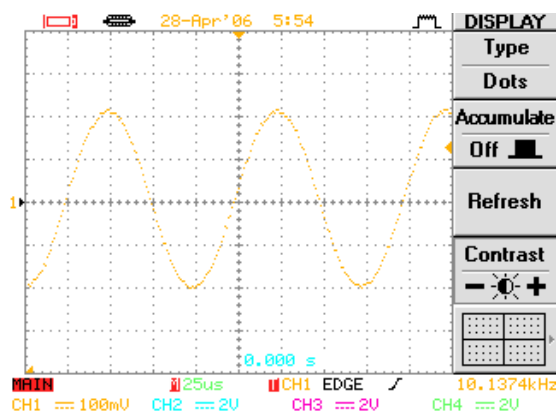
Panel operation



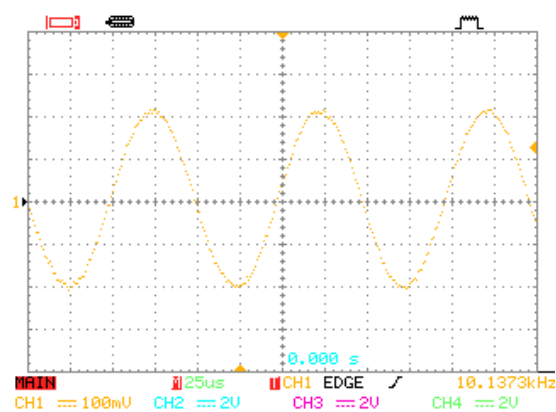
1. Press the MENU ON/OFF button.
2. To turn the menu On, press again.

Example

Menu On



Menu Off



Horizontal View

Roll the horizontal view

Panel operation

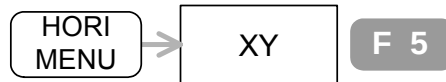


1. Press the Horizontal button→F4.
 2. To go back to the default (main) view, press F1.
-

View in XY mode

XY mode compares Channel 1 and 2 Voltage levels. Not available for Channel 3 and Channel 4

Panel operation



1. Feed Channel 1 (horizontal) and Channel 2 (vertical) signal.
2. Press the Horizontal button→F5.
3. To set the horizontal scale and position, use Channel 1 Volts/Div knob and Position knob.
4. To set the vertical scale and position, use Channel 2 Volts/Div knob and Position knob.

Vertical View

Select the coupling method

Panel operation



1. Press the Channel button→F1.
2. To select the coupling, press F1 repeatedly.

Range



AC coupling



DC coupling

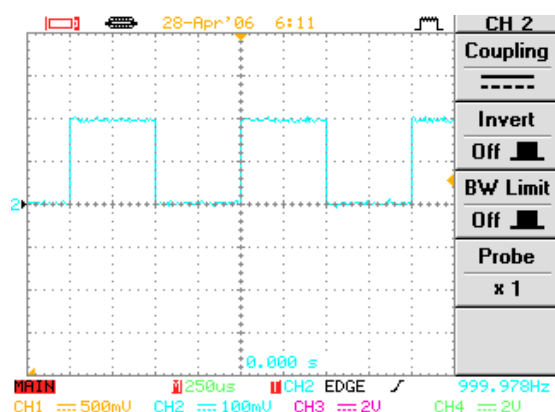


Ground coupling

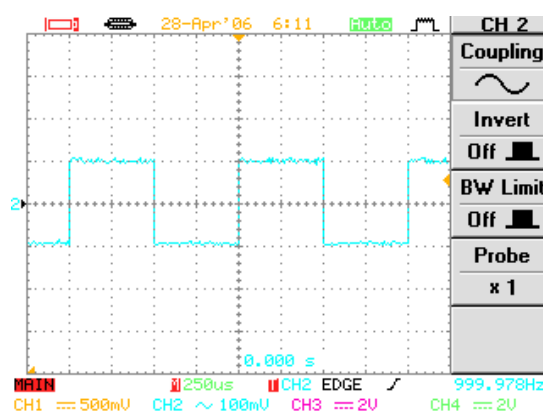
Example

Observe the AC portion of a signal using AC coupling

DC Coupling



AC Coupling



Invert the waveform

Panel operation

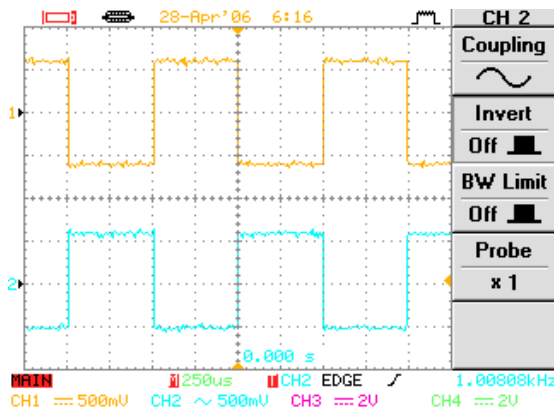


1. Press the Channel button→F2.

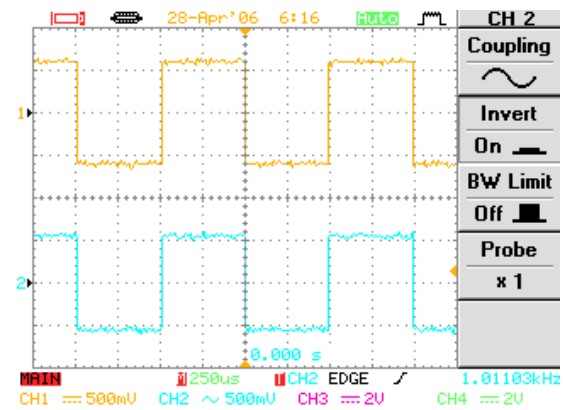
To cancel the effect, press F2 again.

Example

CH2 (lower waveform) Invert Off



CH2 Invert On



The trigger is also inverted.

Limit the frequency bandwidth

Panel operation



1. Press the Channel button→F3.
2. To cancel the effect, press F3 again.

Range	BW Limit On	Frequency bandwidth is limited to 20MHz (-3dB).
	BW Limit Off	The full rating frequency bandwidth is used.

Select the probe attenuation

Panel operation



1. Press the Channel button→F4.
2. To select the attenuation level, press F4 repeatedly.
3. Adjust the vertical scale accordingly.

Range	x1	No attenuation
	x10	Attenuation factor 10
	x100	Attenuation factor 100

Other Settings

Select the buzzer sound



- 3. Press the Utility button→F3.
- 4. To select the buzzer setting, press F3 repeatedly.

Range	~~~~~	Low pitch
	~~~~~	High pitch
	~~~~~	Mixed pitch
	Off	No sound

View the Help information

The instrument has built-in help accessible from the front panel.



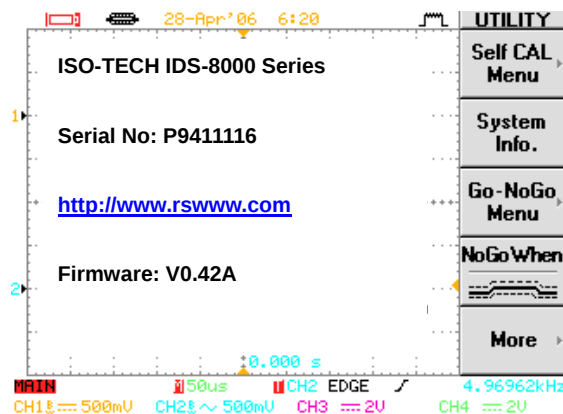
- 1. Press the Help button. The waveform freezes and the display switches to “Help” mode.
- 2. To view the built-in help, select a button from the following and press it. The display shows the relevant functionalities.
Acquire, Cursor, Display, Measure, Program, Utility
- 3. To go back to normal operation, press the Help button again.

View the system information

Panel operation



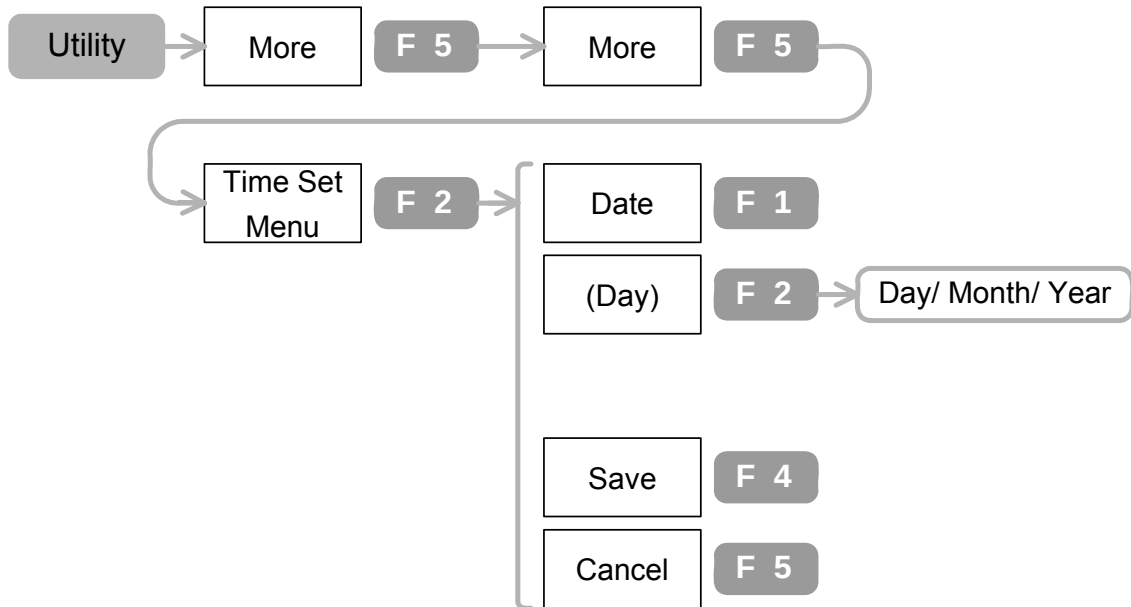
1. Press the Utility button→F5→F2.
2. The display shows the following information:
Model name, Serial No and Firmware version.



3. To return to the signal view, press any other button.

Set the Date

Panel operation

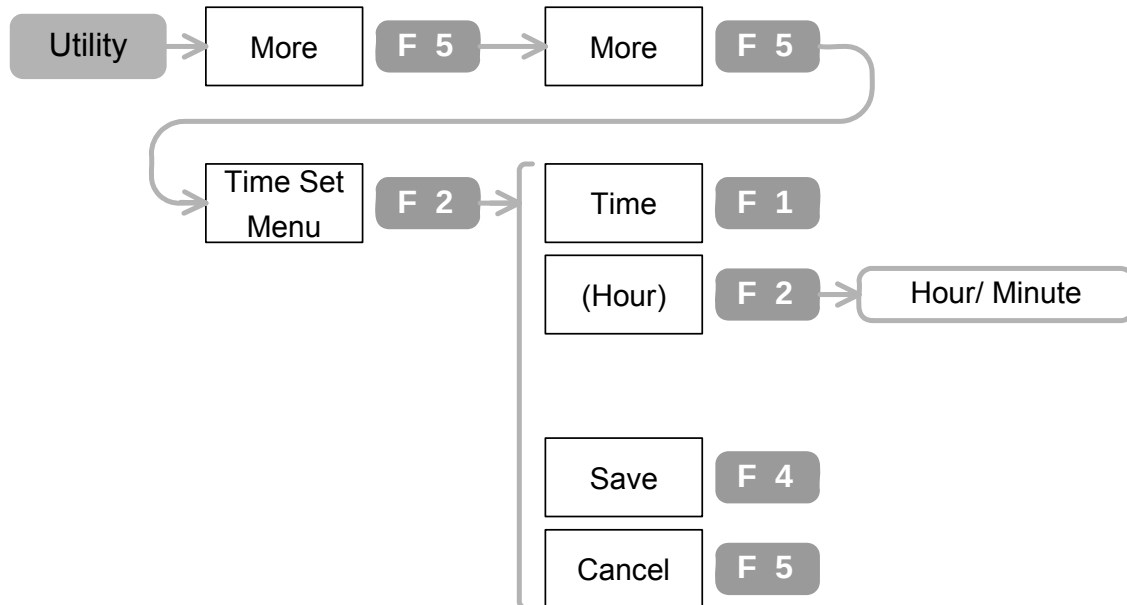


1. Press the Utility button→F5→F5→F2.
Press F1 again if “Date” does not appear.
2. To select the item, press F2 repeatedly.
3. To set the parameter, use the Variable knob.
4. To save the change, press F4 twice.
5. To return to the previous menu, press F5.

Range	Day	1~31
	Month	1~12
	Year	2000~2037

Set the Time

Panel operation

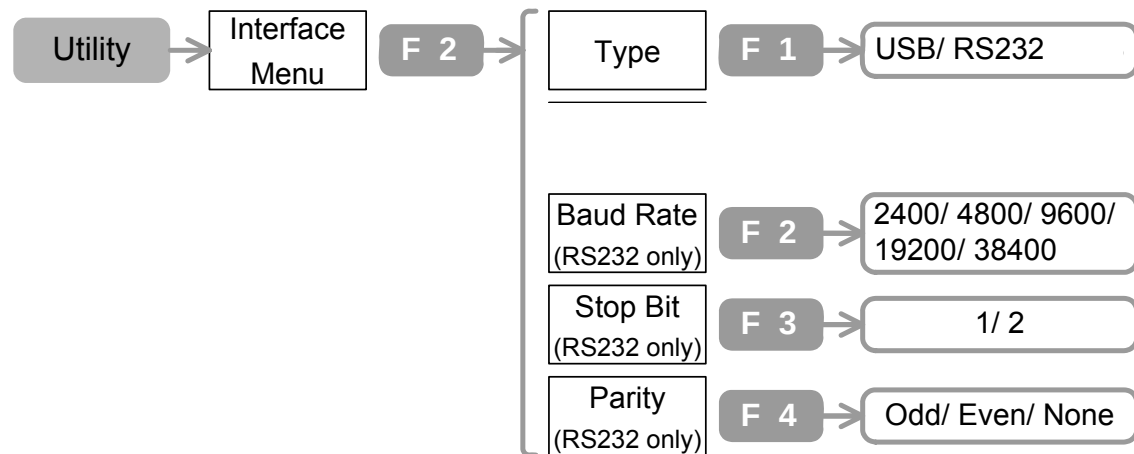


1. Press the Utility button→F5→F5→F2→F1.
Press F1 again if “Time” does not appear.
2. To select the item, press F2.
3. To set the parameter, use the Variable knob.
4. To save the change, press F4 twice.
5. To return to the previous menu, press F5.

Range	Hour	0~23
	Minute	0~59

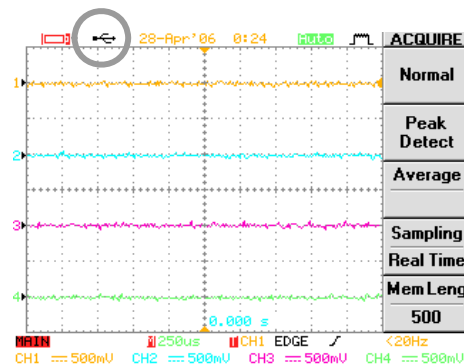
Set the Communication Interface

Panel operation



1. Press the Utility button→F2.
2. To select the interface, press F1 repeatedly.
3. The interface icon appears on the top left side of the display:
 USB: 
 RS232C: 

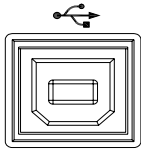
Interface Icon



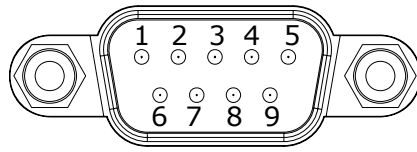
(For RS232C only) To configure the RS232C interface, press F2 (Baud rate), F3 (Stop Bit), and F4 (Parity) repeatedly.

Connect the USB/RS232C cable to the rear panel.

USB



RS-232C



2: RxD, 3: TxD, 5: GND
1, 4, 6~9: No connection

Range**(RS232C Only)****Baud Rate**

2400, 4800, 9600, 19200, 38400

Stop Bit

1, 2

ParityOdd/ Even/ None

Measurements

Automatic Measurements	Auto Set.....	8
	Run automatic measurements	8
	View automatic measurement results	8
Go-No Go Test	Edit Go-No Go test condition	8
	Run Go-No Go test.....	8
Maths Operation	Add/ Subtract signals	8
	Run FFT operation	8
Program and Play	Edit the program steps	8
	Play the program	8
Trigger	Use the Edge trigger	8
	Use the Video trigger	8
	Use the Pulse width trigger	8
	Use the Advanced delay trigger	8

Automatic Measurements

Auto Set

Auto Set automatically finds the appropriate settings (vertical, horizontal and trigger) for the input signals.

Limitation: Signals under 30mV or 30Hz are not recognized.

Panel Operation

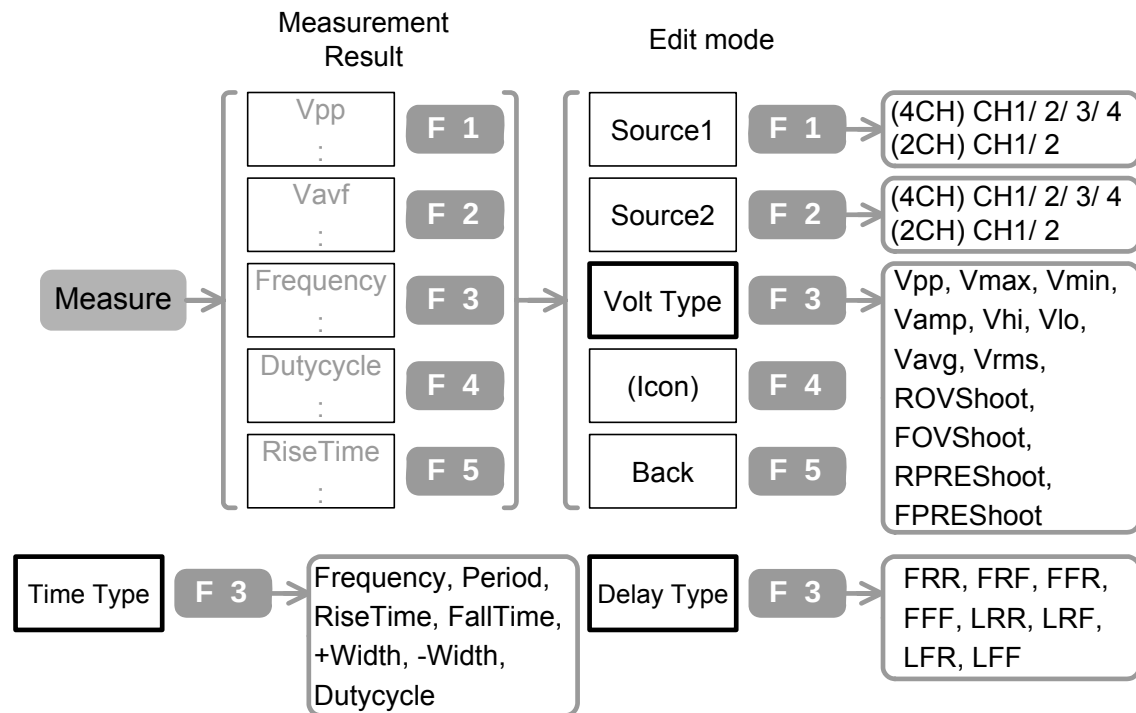


The following is the Auto Set configuration.

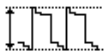
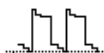
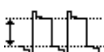
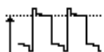
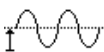
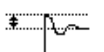
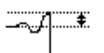
Acquisition	Mode:	Sample
	Stop after:	RUN/STOP button only
Display	Style:	Vectors
	Format:	YT
Horizontal	Scale:	Signal frequency dependent
	Position:	Centered in the display
Trigger	Coupling:	DC
	Position:	Center
	Slope:	Positive
	Type:	Edge
	Source:	Highest frequency
	Level:	Midpoint of the trigger source
Vertical	Bandwidth:	Full
	Offset:	0
	Coupling:	Signal dependent
	Scale:	Signal dependent

Run automatic measurements

Panel operation



1. Press the Measure button. F1 to F5 shows the result from the previous measurement.
2. Press any of the F1~F5 buttons. The menu switches to edit mode.
3. To select the first channel to be measured, press F1 repeatedly.
4. To select the second channel to be measured, press F2 repeatedly (essential for Delay measurement).
5. To select the measurement type (Voltage, Time and Delay), press F3 repeatedly.
6. To select the measurement item, use the Variable knob. The corresponding icon is shown on F4.
7. To return to the measurement result view, press F5.

Range	Source1, 2	
	(4CH) CH1~CH4	(4CH model) Channel1~Channel2
	(2CH) CH1,CH2	(2CH model) Channel1,Channel2
Volt type		
Vpp		Difference between positive and negative peak voltage. (=Vmax-Vmin)
Vmax		Positive peak voltage.
Vmin		Negative peak voltage.
Vamp		Difference between global high and global low voltage. (=Vhi - Vlo).
Vhi		Global high voltage.
Vlo		Global low voltage.
Vavg		Averaged voltage of the first cycle.
Vrms		Root Mean Square voltage.
ROVShoot		Rise Overshoot voltage.
FOVShoot		Fall Overshoot voltage.
RPRESshoot		Rise Preshoot voltage.
FPRESshoot		Fall Preshoot voltage.
Time Type		
Freq		Frequency of the waveform.
Period		Waveform cycle time. (=1 / Freq)
Risetime		Rising time of the pulse (~90%)

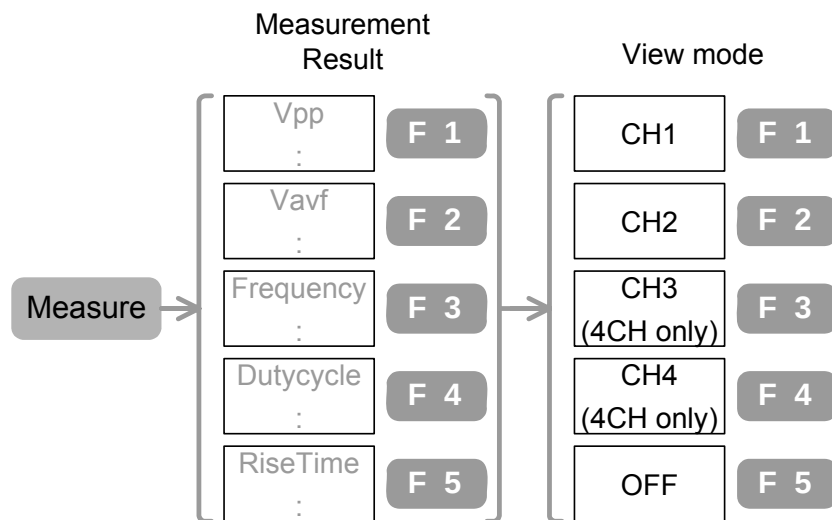
Falltime		Falling time of the pulse (90%~)
+Width		Positive pulse width.
-Width		Negative pulse width.
Duty Cycle		The ratio of the signal pulse compared with the whole cycle. (=100 x Pulse Width/Cycle)

Delay Type

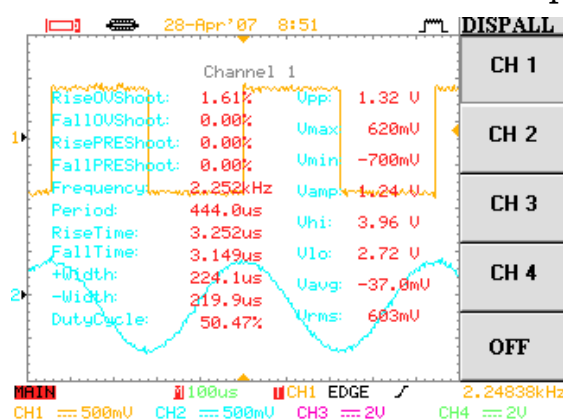
FRR		Time between Source1 signal first rising edge and Source2 signal first rising edge.
FRF		Time between Source1 signal first rising edge and Source2 signal first falling edge.
FFR		Time between Source1 signal first falling edge and Source2 signal first rising edge.
FFF		Time between Source1 signal first falling edge and Source2 signal first falling edge.
LRR		Time between Source1 signal first rising edge and Source2 signal last rising edge.
LRF		Time between Source1 signal first rising edge and Source2 signal last falling edge.
LFR		Time between Source1 signal first falling edge and Source2 signal last rising edge.
LFF		Time between Source1 signal first falling edge and Source2 signal last falling edge.

View automatic measurement results

Panel operation

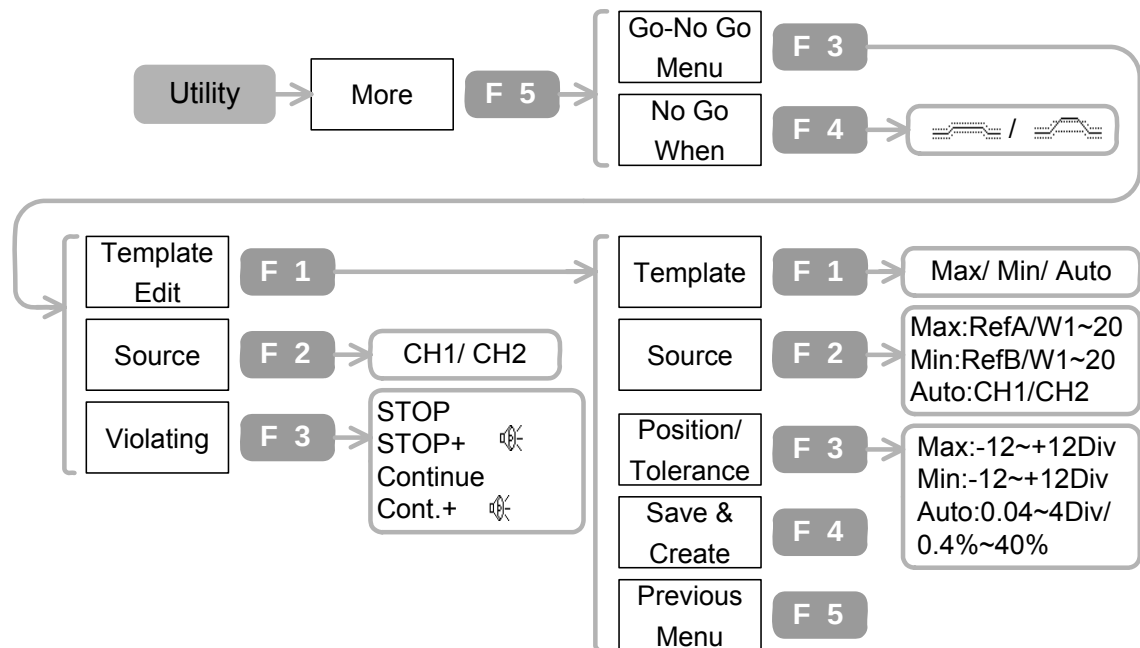


1. Two viewing modes are available: selected results on the menu and full results on the main display.
2. To view the selected result, press the Measure button repeatedly until the Result mode appears.
3. To view the full measurement result, press the Measure button again. Select the channel from F1~F4 and press it. The instrument runs all the applicable Voltage and Time type measurements and the results are shown on the display.



4. To return to the normal view, press F5.

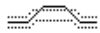
Go-No Go Test

Edit Go-No Go test condition**Panel operation**

1. Press the Utility button→F5. To select No Go When (violation condition), press F4 repeatedly.
2. Press F3 and go into Go-No Go menu.
3. To select the test subject signal, press F2 repeatedly.
4. To select the violation event, press F3 repeatedly.
5. Press F1 and go into template edit menu.
6. To select the template, press F1 repeatedly.
7. To select the template source, press F2 repeatedly.
8. To select the template position (Maximum/Minimum) or tolerance (Auto), use Variable knob.
9. To save the edited template, press F4.
10. To return to the previous menu, press F5.

Range**Go-No Go When (violation condition)**

Go = the subject signal is within the template.



No Go = the subject signal is violating the template.

Template**Max**

Sets the maximum level of the template.

Template source

RefA: One of the four reference waveforms.

M1~20: One of the twenty internally stored waveforms.

To store a waveform (template), see page8.

Template position

$\pm 12/\text{Div}$

Min

Sets the minimum level of the template.

Template source

RefB: One of the four reference waveforms.

W1~W20: One of the twenty internally stored waveforms.

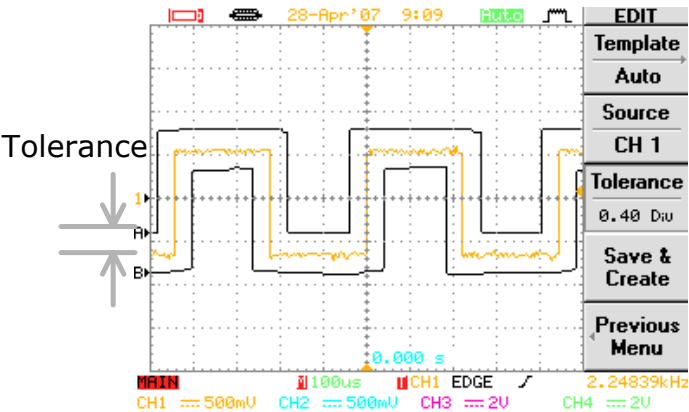
To store a waveform (template), see page8.

Template position

$\pm 12/\text{Div}$

Auto	Automatically creates the maximum and minimum template from an input signal, specifying the margin (tolerance) around the waveform. Template source CH1: Use Channel1 signal CH2: Use Channel2 signal Template tolerance 0.4%~40%
------	--

Creating a template in Auto mode



Source signal

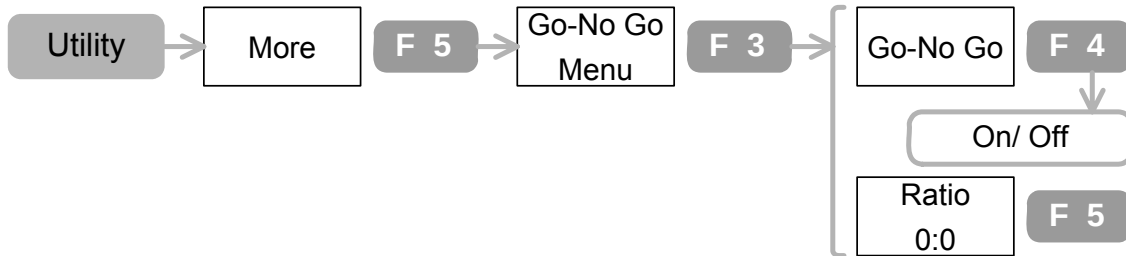
CH1	Channel1 as the subject of test
CH2	Channel2 as the subject of test

Violation Condition

Stop	The test stops in case of violation.
Stop+ 	The test stops with a buzzer sound in case of violation.
Continue	The test continues even in case of violation.
Cont.+ 	The test continues but with a buzzer sound in case of violation.

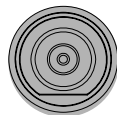
Run Go-No Go test

Panel operation



1. Edit the test condition. See page8.
2. Press the Utility button→F5→F3.
3. To run Go-No Go test, press F4.
4. To stop Go-No Go test, press F4 again.
5. The test result is shown on F5 as (Number of test: Number of violation).
6. The instrument outputs the test result as a 10us pulse signal from the rear panel.

GO / NO GO

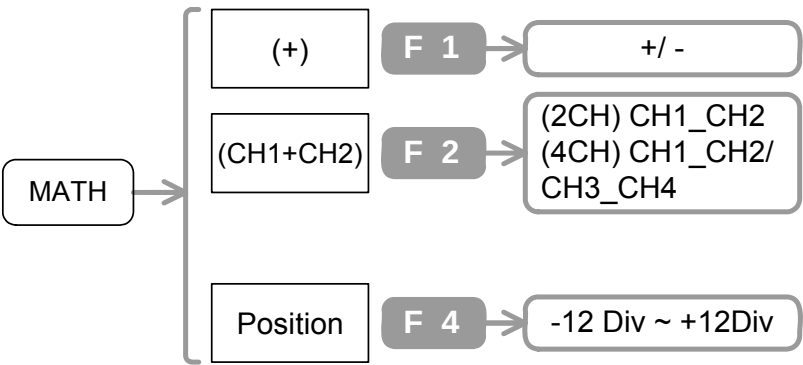


Rear panel output terminal (Open Collector)

Maths Operation

Add / Subtract signals

Panel operation



- 1. Press the Maths button.
- 2. To select the operation (add or subtract), press F1 repeatedly.
- 3. (For 4CH model) To select the channel pairs, press F2 repeatedly.
- 4. To set the position of the resulted waveform, press F4. Then use the Variable knob.

Range

Maths Operation type

- + Addition
- Subtraction

Channel Pair

- CH1_CH2 Maths operation between Channel1 and Channel2
- CH3_CH4 Maths operation between Channel3 and Channel4 (only for 4CH model)

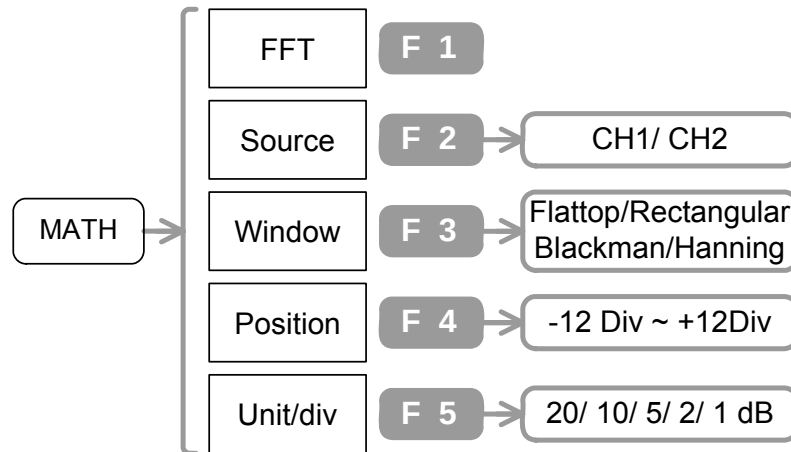
Position

-12Div~+12Div

Run FFT operation

Not available for Channel3 and Channel4.

Panel operation



1. Press the Maths button→F1. Press F1 repeatedly until “FFT” appears.
2. To select the subject channel, press F2 repeatedly.
3. To select the FFT window type, press F3 repeatedly.
4. To set the position of the resultant waveform, press F4 then use the Variable knob.
5. To select the amplitude scale, press F5 repeatedly.

Range

Channel: 1 or 2

FFT window type: Rectangular, Blackman, Hanning, Flattop

Position: ± 12 div

Amplitude scale: 20/ 10/ 5/ 2/ 1 dB/div

Range

FFT Window

Rectangular

Suitable for transient analysis.

Blackman

Frequency resolution is

	not as good as Hanning, but has better sidelobe rejection.
Hanning	Higher frequency resolution.
Flattop	Higher magnitude accuracy.

Position

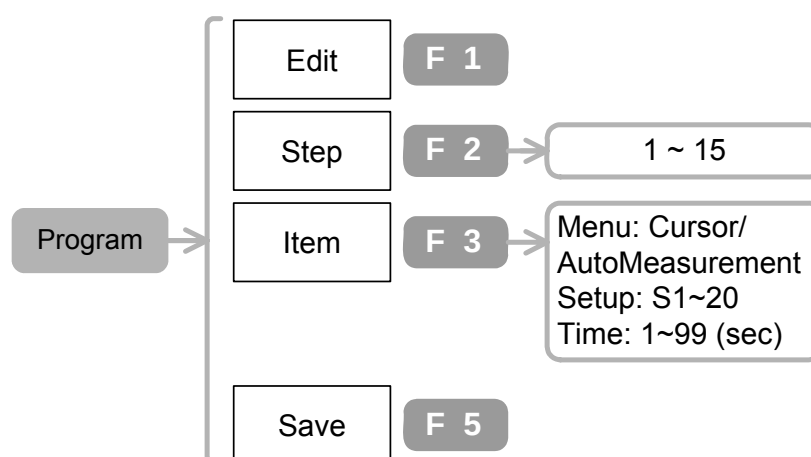
-12Div~+12Div

1, 2, 5, 10, 20 dB/Div

Program and Play

Edit the program steps

Panel operation

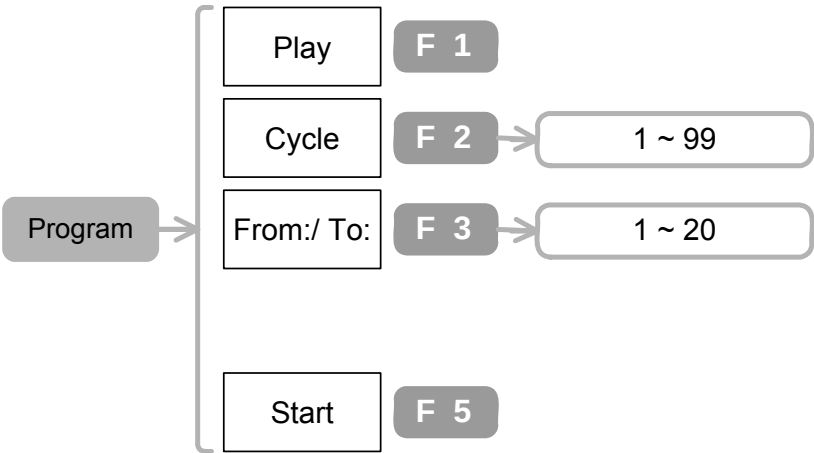


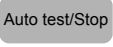
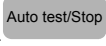
1. Press the Program button→F1. In case the “Edit” menu does not appear, press F1 again.
2. To select the step to be edited, press F2. Then use Variable knob. The cursor in the display also moves accordingly.
3. To select the program item, press F3. Then use Variable knob and select the parameter.
4. To save the edited step, press F5.
5. Repeat the above for the other steps.

Range	Step (number)
	1~20
	Item
	Menu “AutoMeasure” or “Cursor”. Setup S1~S20 internal setups. To store setups, see page8.
	Time 1~99 seconds for each step.

Play the program

Panel operation



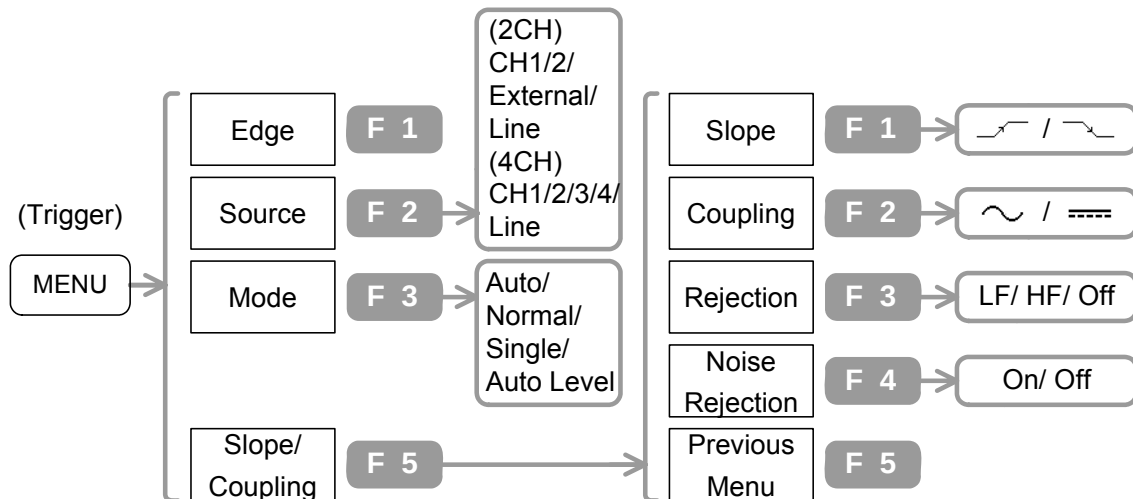
1. Edit the program. See page 8.
2. Press Program button→F1. In case “Play” menu does not appear, press F1 again.
3. To set the number of repetitions (cycles), press F2, then use the Variable knob.
4. To select “From:” step (beginning of the program), press F3. In case “From:” menu does not appear, press F3 again, then use the Variable knob.
5. To select “To:” step (end of the program), press F3. In case “To:” menu does not appear, press F3 again, then use the Variable knob.
6. To start the program, press F5 or press Auto test/Stop button .
7. To stop the program, press Auto test/Stop button  again.

Range	Cycle (number of repetition)	
	1~99	
	From: / To: (beginning and end step)	
	1~20	From: ≤ To:

Trigger

Use the Edge trigger

Panel operation



1. Press the Trigger menu button. Press F1 repeatedly until “Edge” appears.
2. To select the trigger source signal, press F2 repeatedly.
3. To select the trigger mode, press F3 repeatedly.
4. To select the Slope/Coupling menu, press F5.
5. To select the trigger slope, press F1 repeatedly.
6. To select the trigger coupling, press F2 repeatedly.
7. To select the frequency rejection mode, press F3 repeatedly.
8. To turn on noise rejection, press F4. To turn off, press F4 again.
9. To return to the previous menu, press F5.

Range**Trigger source**

CH1~CH2	Channel 1~Channel 2 (2CH model)
CH1~CH4	Channel 1~Channel 4 (4CH model)
External	Signal from the External trigger input (only for 2CH model)
Line	AC Power supply signal

Trigger mode

Auto	the instrument generates an internal trigger if there is no trigger event. Select this mode when viewing rolling waveform at slower timebase, maximum 10s/div.
Normal	the instrument acquires waveform in a trigger event.
Single	the instrument acquire waveform only once in a trigger event. Press Run/Stop button to acquire again.
Auto Level	the instrument automatically adjusts the trigger level indicator to the center part of the waveform.

Slope

Rising edge



Falling edge

Coupling

AC coupling



DC coupling

(Frequency) Rejection

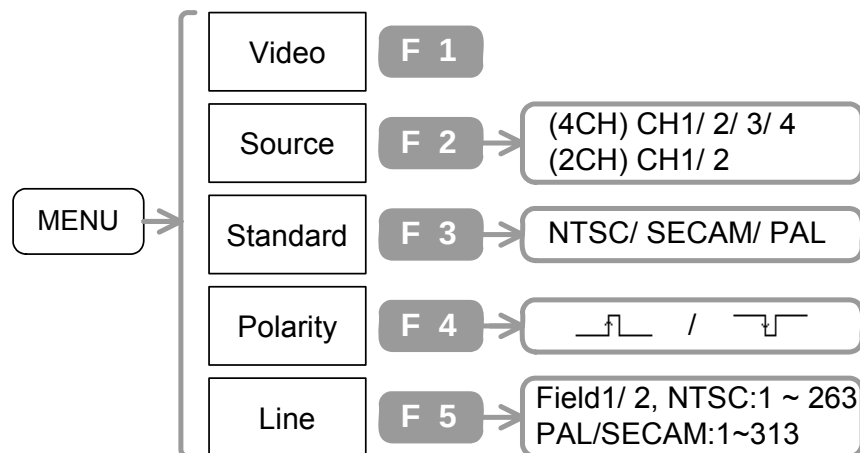
LF	Low Frequency rejection. Rejects frequency below 50kHz.
HF	High Frequency rejection. Rejects frequency above 50kHz.
Off	Rejection disabled.

Noise Rejection

ON	Uses DC coupling with low sensitivity to reject noise.
OFF	Noise rejection disabled.

Use the Video trigger

Panel operation



1. Press the Trigger menu button. Press F1 repeatedly until "Video" appears.
2. To select the trigger source signal, press F2 repeatedly.
3. To select the video standard, press F3 repeatedly.
4. To select the trigger polarity, press F4 repeatedly.
5. To select the trigger field line, press F5, then use the Variable knob.

Range

Trigger source

CH1~2(4) Channel 1~Channel 2 (Channel 4)

Video standard

NTSC National Television System Committee video standard.

PAL Phase Alternate Line video standard.

SECAM SEquential Couleur A Memoire video standard.

Polarity



Positive pulse



Negative pulse

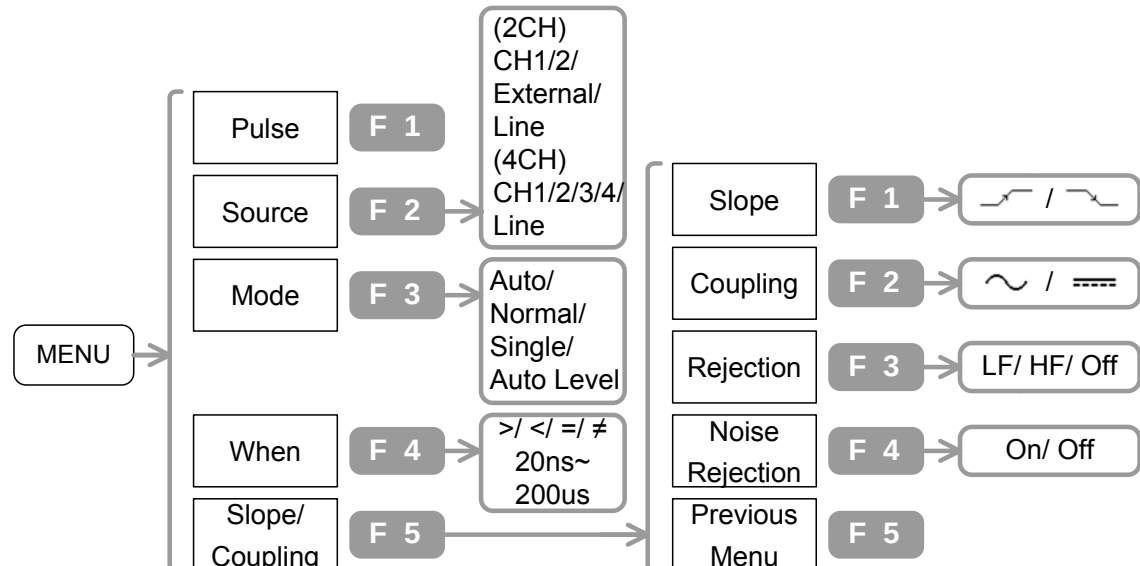
Video Field

1 ~ 263 For NTSC

1 ~ 313 For PAL/ SECAM

Use the Pulse width trigger

Panel operation



1. Press the Trigger menu button. Press F1 repeatedly until “Pulse” appears.
2. To select the trigger source signal, press F2 repeatedly.
3. To select the trigger mode, press F3 repeatedly.
4. To select the trigger condition, press F4 repeatedly. To set the parameter, use the Variable knob.
5. To enter the Slope/Coupling menu, press F5.
6. To select the trigger slope, press F1 repeatedly.
7. To select the trigger coupling, press F2 repeatedly.
8. To select the frequency rejection mode, press F3 repeatedly.
9. To turn on noise rejection, press F4. To turn off, press again.
10. To return to the previous menu, press F5.
11. To set the trigger level, use the Trigger knob.

Range

Trigger source

CH1~CH4 Channel 1~Channel 4
External External trigger input signal (only)

Line for 2CH model)
AC power input

Trigger mode

Auto The instrument generates an internal trigger if there is no trigger event.

Normal The instrument acquires a waveform in a trigger event.

Single The instrument acquires a waveform only once in a trigger event. Press the Run/Stop button to acquire again.

Auto Level The instrument automatically adjusts the trigger level indicator to the center part of the waveform.

Time compare factor

< Triggers on pulse width smaller than the time setting.

> Triggers on pulse width larger than the time setting.

= Triggers on pulse width equal to the time setting.

≠ Triggers on pulse width different from the time setting.

Slope



Triggers on the positive pulse width
Triggers on the negative pulse width

Coupling



AC coupling
DC coupling

(Frequency) Rejection

LF Low Frequency rejection. Rejects frequency below 50kHz.

HF High Frequency rejection. Rejects frequency above 50kHz.

Off Rejection disabled.

Noise Rejection

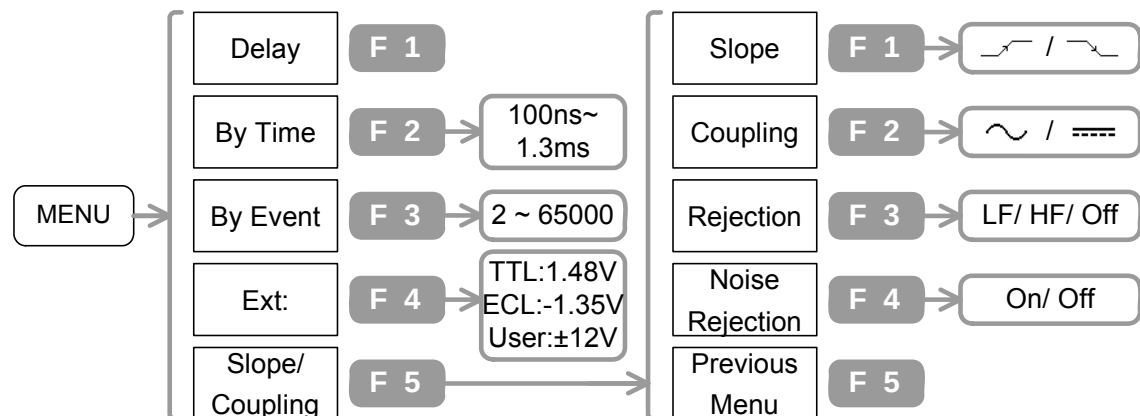
On Uses DC coupling with low sensitivity to reject noise.

Off Noise rejection disabled.

Use the Advanced delay trigger

Advanced delay trigger is available only in 2CH models.

Panel operation



1. Connect the trigger signal to the External trigger input terminal, and the main signal to Channel 1 or 2.
2. Press the Trigger menu button→F1. Press F1 until “Delay” appears.
3. To set the delay time, press F2, then use the Variable knob.
4. To set the number of trigger events, press F3, then use the Variable knob.
5. To set the triggering level of start signal, press F4 repeatedly. For user level adjustment, use the Variable knob.
6. To select the trigger slope, press F5, then press F1 repeatedly.
7. To select the coupling mode, press F2 repeatedly.
8. To select the frequency rejection mode, press F3 repeatedly.
9. To select the noise rejection mode, press F4 repeatedly.

Range

By Time (Trigger delay time)

100ns ~ 1.3ms

By Event

2 ~ 65000

Ext. (Trigger level of the start signal)

TTL +1.4V

ECL -1.3V

USER $\pm 12V$ range user defined level

Slope



Rising edge



Falling edge

Coupling



AC coupling



DC coupling

(Frequency) Rejection

LF Low Frequency rejection. Rejects frequency below 50kHz.

HF High Frequency rejection. Rejects frequency above 50kHz.

Off Rejection disabled.

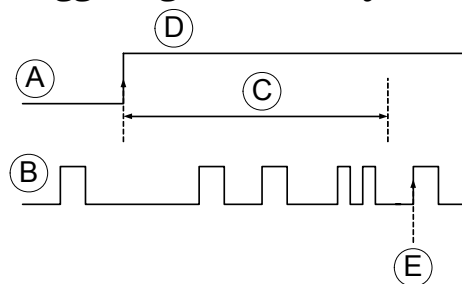
Noise Rejection

On Uses DC coupling with low sensitivity to reject noise.

Off Noise rejection disabled.

Example:

Triggering occurs only after a pre-defined period of time (T)



A: Start Trigger (External)

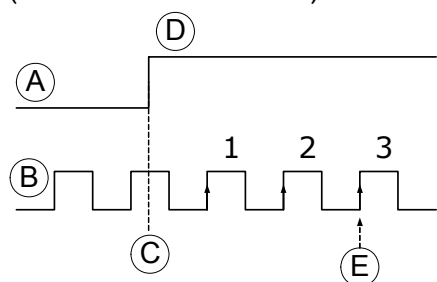
B: Main Trigger (CH1 or 2)

C: Set Time (T)

D: Trigger

E: Trigger point

Triggering occurs only after a pre-defined number of user event (three in this case)



A: Start Trigger (External)

B: Main Trigger (CH1 or 2)

C: Start point of External trigger count

D: Trigger

E: Trigger point

Printout / Data Transfer

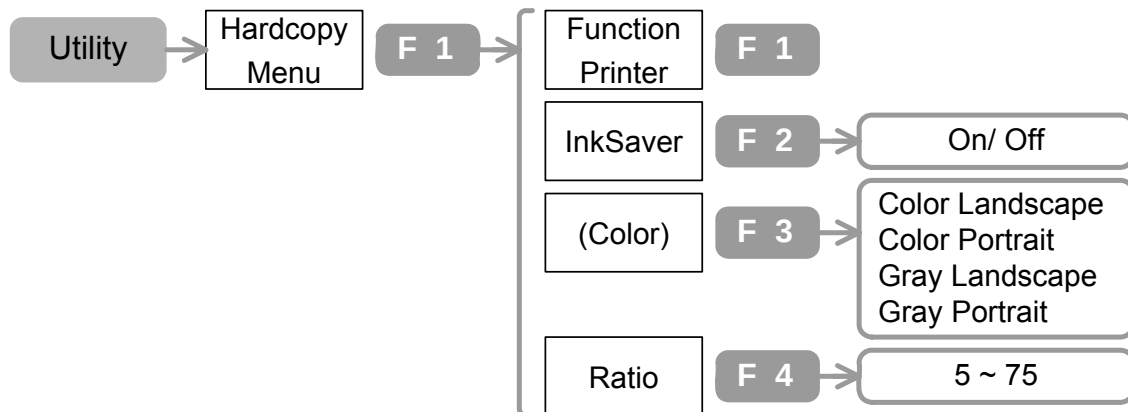
Printout	Printout display image.....	8
-----------------	-----------------------------	---

Save / Recall		
	Quick save via USB	8
	Save image/ waveform/ setup	8
	Configure folders and files in USB flash drive .	8
	Recall waveform/ setup	8
	Recall default settings	8

Printout

Printout display image

Panel operation

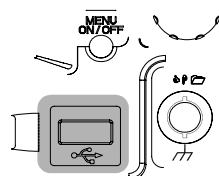


HardCopy

1. Press Utility button→F1. Press F1 repeatedly until “Printer” appears.
2. To select the display background color, press F2 repeatedly.
3. To select the color and portrait, press F3 repeatedly.
4. To select the image size, press F4, then use the Variable knob.
5. Connect the printer to the front or rear panel USB connector.

Note: The USB rear panel host and rear panel slave connections cannot be used at the same time.

Front panel USB



Rear panel USB



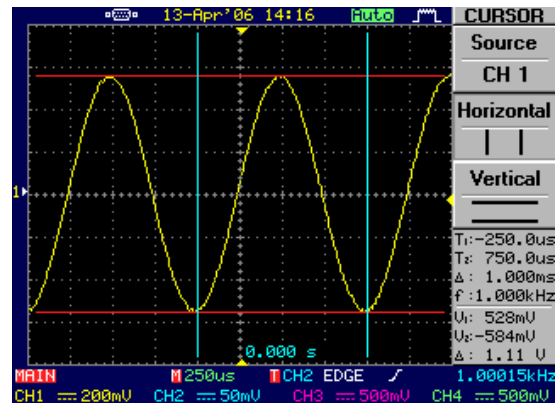
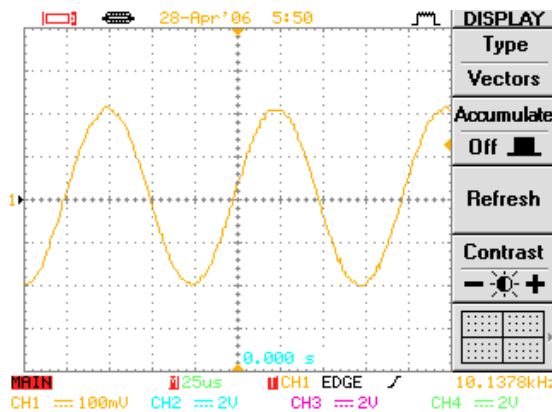
6. To start printing, press the Hardcopy button.
(The instrument stores the current printout settings each time they are changed.)

Range

InkSaver (Display background colour)

InkSaver On

InkSaver Off

**Colour/ Portrait**

Colour Landscape

Colour Portrait

Gray Landscape

Grey Portrait

Ratio (Image size)

5~75

**Confirmed
printers**

The Following printers have been confirmed:

HP Deskjet 970CXI

HP Laserjet 1010/ 1015/ 1300

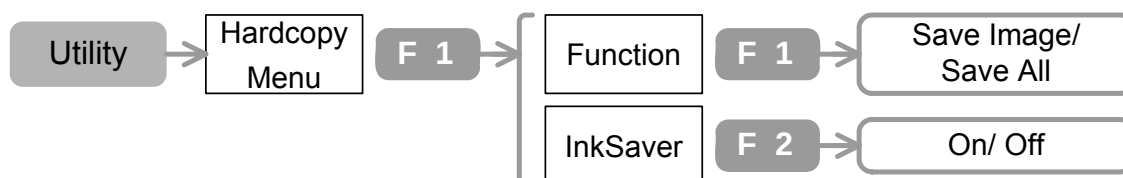
Epson AL-C8600

For further compatible printers please contact the
RS Technical Helpline

Save / Recall

Quick save via USB flash drive

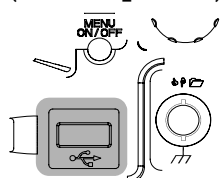
Panel operation



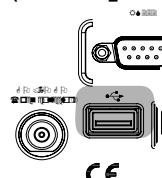
HardCopy

1. Press Utility button→F1.
2. To select the saved information, press F1 repeatedly.
3. To select the display background color, press F2 repeatedly.
4. Connect the USB flash drive to the front or rear panel USB connector. Note: The USB rear panel host and rear panel slave connections cannot be used at the same time.

(Front panel)



(Rear panel)

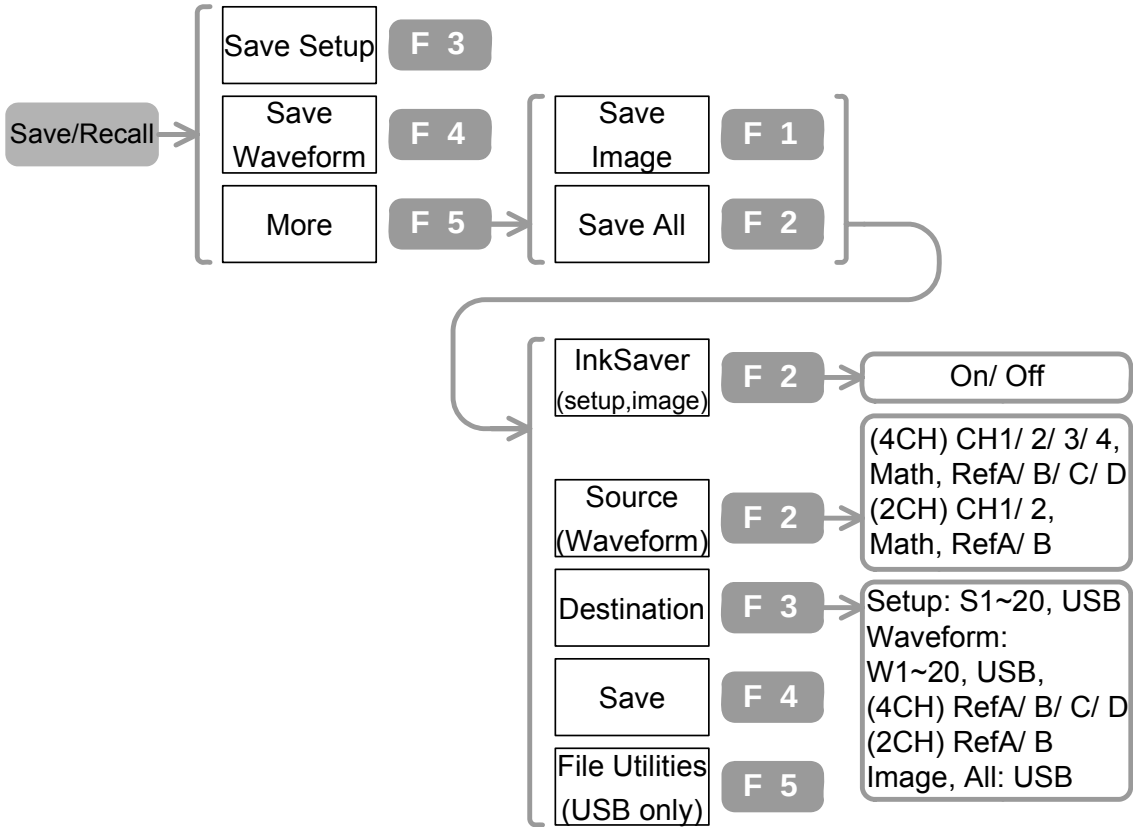


To store the information, press the Hardcopy button.
(The instrument stores the current printout settings each time they are changed.)

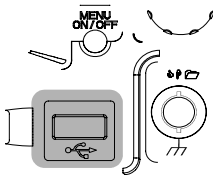
Range	Image	Saves the display image (GWxxxx.BMP).
	All	Saves the following data in a folder (Allxxxx). Display image: Axxx.BMP Waveform: Axxx.CSV Setup: Axxx.SET
	InkSaver (Display background color)	
	On/Off	For an example, see the previous page.

Save image / waveform / setup

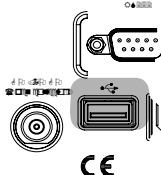
Panel operation



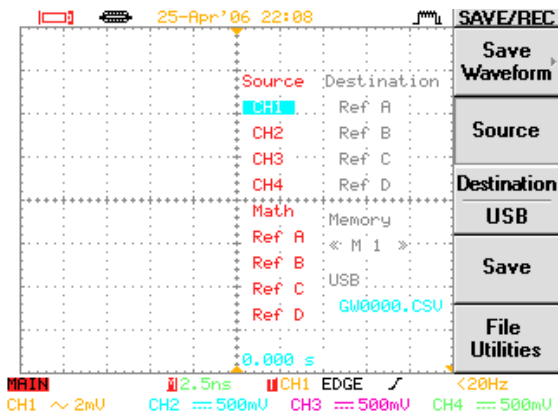
Front panel USB



Rear panel USB



Save dialog screen



To save the file, press F4.

To configure USB folders, see page8.

Range

File type

Setup

Setup file (Gxxx.SET).

Waveform	Waveform file (Gxxx.CSV).
Image	Image file (Gxxx.BMP).
All	A folder (Axxx) containing setup (Axxx.SET), waveform (Axxx.CSV), and image file (Axxx.BMP).

InkSaver (Display background colour)

On/Off See page 8 for the actual effect.

Source

MATHS	The waveform generated by maths operations (page 8).
Ref A~D	Internal reference waveforms A~D.

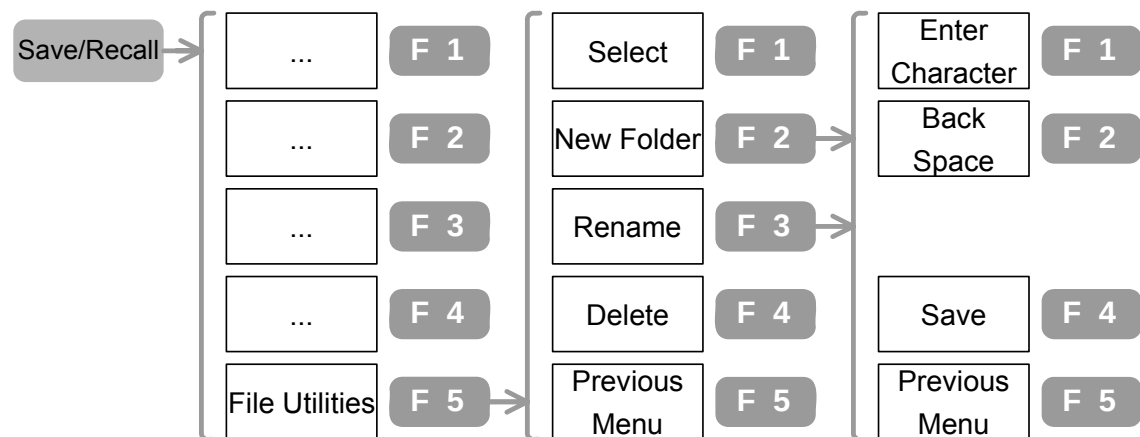
Destination

RefA~D (4CH)	Internal reference waveforms
RefA/B (2CH)	A~D.
Setup	S1~S20 internal setups.
Waveform	W1~W20 internal waveforms.
USB	USB flash drive.

Configure folders and files in USB flash drive

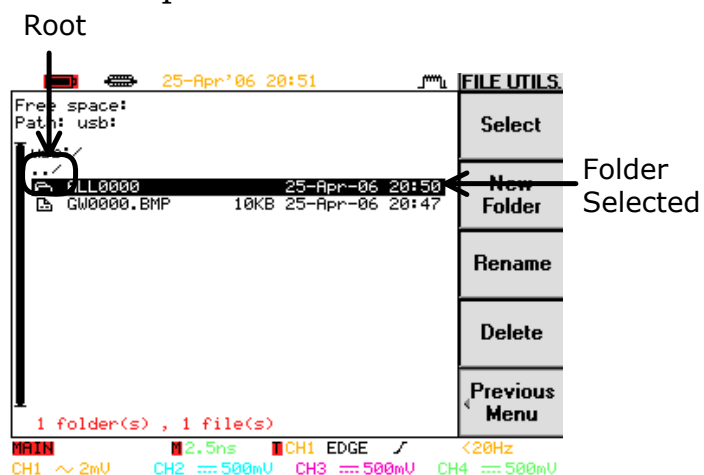
This part assumes you have connected a USB flash drive to the instrument and have already selected F5 “File Utilities” in other save and recall menus.

Panel operation



View the folder contents

1. Use the Variable knob to select the folder.
2. To enter the folder, press F1.
3. To go back to the previous level, select the root and press F1.



Create a new folder & rename a file / folder

1. Press F2 (new folder) or F3 (rename a file or a folder). The editing screen appears.



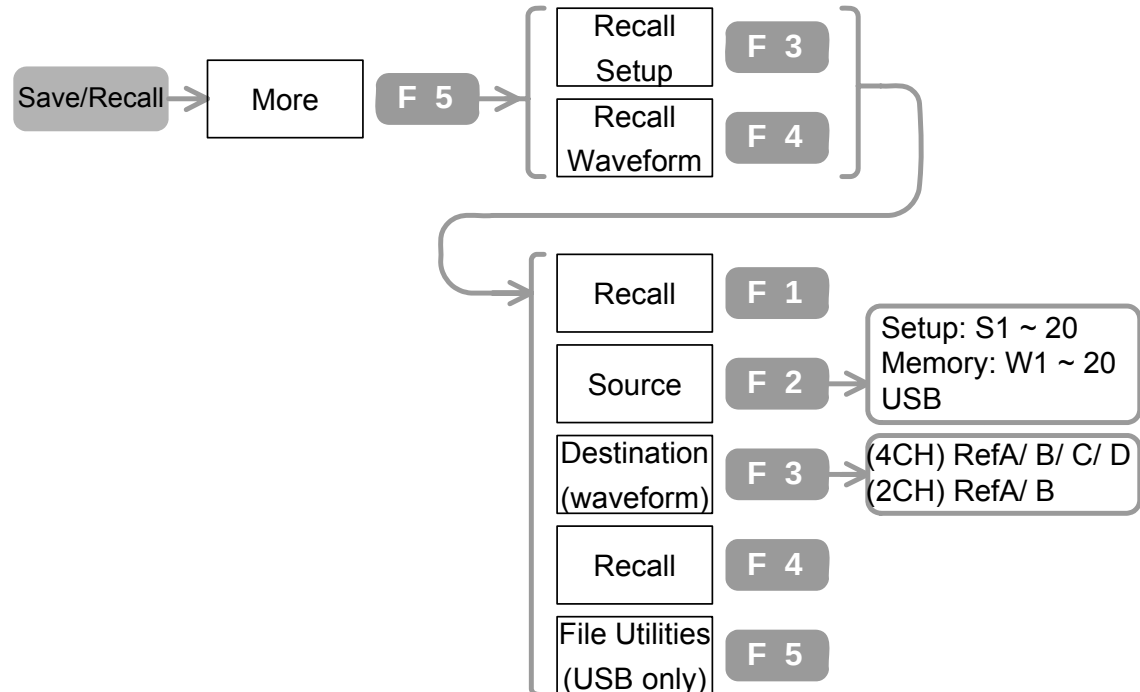
2. To enter a character, select the letter using the Variable knob and press F1.
3. To delete a character, press F2.
4. To save the result, press F4.

Delete a file / folder

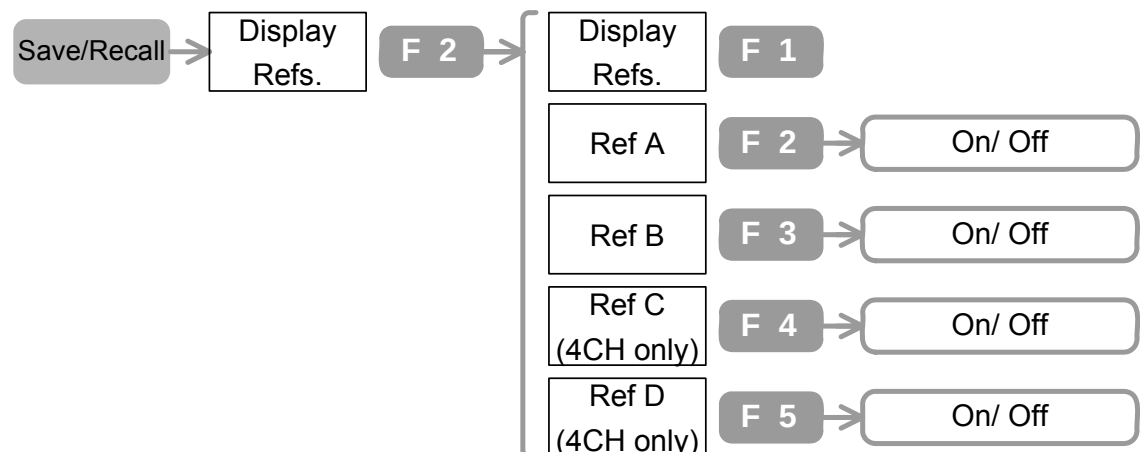
1. Use the Variable knob and move to the file or folder.
 2. Press F4. Press again to confirm deletion.
-

Recall waveform / setup

Panel operation



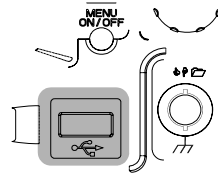
Display the recalled waveform



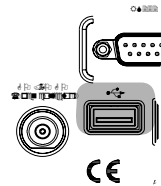
1. Press the **Save/Recall** button → **F5** → **F3** (setup) / **F4** (waveform).
2. To select the source, press **F2** repeatedly.
3. To select the memory location, use the Variable knob.
4. Connect the flash drive (Recalling from USB flash drive only) to the front or the rear USB connector.
Note: The USB rear panel host and rear panel slave connections

cannot be used at the same time.

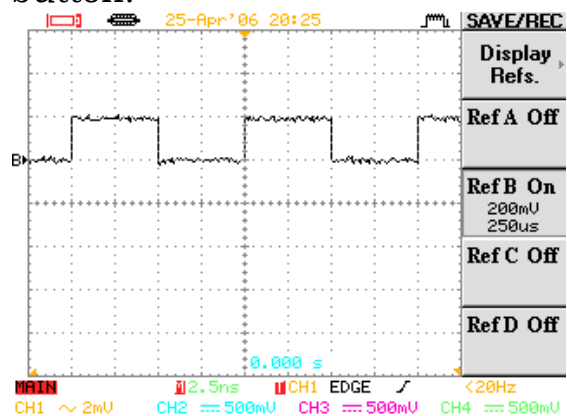
Front panel USB



Rear panel USB



5. To select the destination for a recalled waveform (reference waveform), press F3 repeatedly.
6. To recall a waveform/setup, press F4.
7. To configure USB drive folders, see page 8.
8. To show the recalled waveform, press the Save/Recall button→ F2. To show the waveform, select from F2~F4 and press the button.



Ref B waveform recalled

Range	File type	
	Waveform	Waveform file (xxxx.CSV).
	Setup	Panel setup file (xxxx.SET).
	Source	
	Setup	S1~S20 internal setups.
	Waveform	W1~W20 internal waveforms.
	USB	USB flash drive (Gxxx.SET)
	Destination	

Ref A~D (4CH)	Reference waveforms stored
Ref A/B (2CH)	internally.

Recall default settings

Panel Operation



Press Save/Recall button→F1. The instrument recalls the factory installed panel settings as listed below.

Acquisition	Mode: Normal	Memory Length: 500
Channel (Vertical)	Scale: 2V/Div Coupling: DC BW Limit: Off	Invert: Off Probe Attenuation: x1
Cursor	Source: CH1 Vertical: None	Horizontal: None
Display	Type: dots Graticule:	Accumulate: Off
Go-NoGo	Go-NoGo: Off NoGo when:	Source: CH1 Violating: Stop
Horizontal	Scale: 2.5us/Div	Mode: Main Timebase
Maths	Type: + Position: 0.00 Div	Channel: CH1+CH2 Unit/Div: 2V
Measure	Source1: CH1 Volt type: VPP Delay type: FRR	Source2: CH2 Time Type: Frequency
Program	Mode: Edit Item: Memory	Step: 1
Trigger	Type: Edge Mode: Auto Coupling: DC Noise Rejection : Off	Source: Channel1 Slope: Rejection: Off
Utility	Hardcopy: SaveImage, Inksaver Off	Sound: Off

Calibration

Calibrate the vertical scale

Calibrate the instrument if either of the following conditions apply:

- 1 When using the instrument in a new environment, such as measurements in the field.
- 2 When the ambient temperature changes more than 5°C.

Panel operation

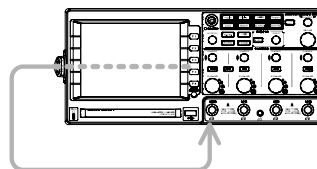


1. Make sure the calibration environment complies with these conditions:
Temperature: $26 \pm 5^{\circ}\text{C}$
Relative humidity: $\leq 80\%$
2. Connect the rear panel Calibration output to Channel1. (Use a good quality 50 Ohm BNC male – male connecting cable)

Calibration Output



Connect to Channel1

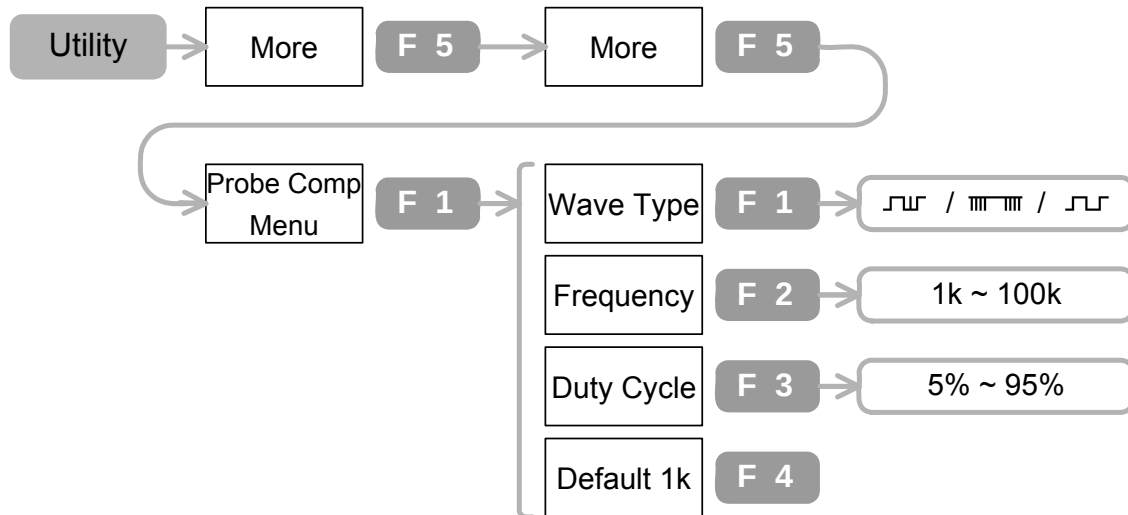


3. Press the Utility buttons → F5 → F1 → F1
4. Press F5 to start the calibration procedure, which takes approximately 2 minutes.
5. When calibration is complete, change the connection to channel 2. Repeat the above process for channel 2.
6. Repeat the above process for channels 3 & 4 as applicable.

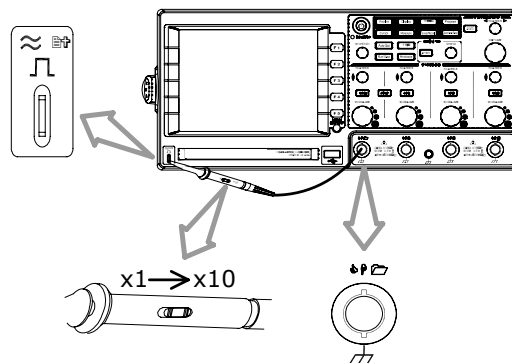
Compensate the probe

Use the probe compensation function when using a new probe.

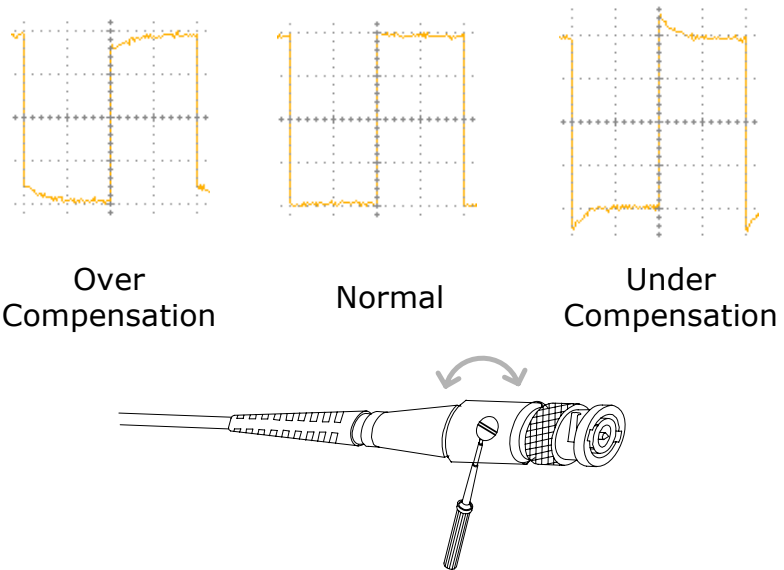
Panel operation



1. Connect the probe to Channel 1 and reference signal output.



2. Press the Utility button → F5 → F5 → F1 → F1.
Press F1 again and select the wave type $\square$.
3. Press F2 and use the Variable knob to set the frequency.
4. Press F3 and use the Variable knob to set the Duty cycle.
5. Use a small screwdriver to adjust the probe to give the correct waveform shape.



Range	Wave type	
		Probe compensation signal, 2Vpp at x10 probe attenuation.
		Demonstration signal for showing the effects of deep memory length.
		Demonstration signal for showing the effects of peak detection.
	Frequency	
	1k~100k	1k step.
	Duty Cycle	
	5%~95%	5% step.

FAQ

- I pressed the Power (On/Standby) button on the front panel but nothing happens.
 - The probe waveform is distorted.
 - I connected the signal but it does not appear on screen.
 - Autoset does not catch the signal well.
 - I want to clean up the cluttered panel settings.
 - The display image printout is too dark on the background.
 - The date and time setting is not correct.
 - USB does not work.
 - The accuracy does not match the specification.
-

I pressed the Power (On/Standby) button on the front panel but nothing happens.

Make sure you turned the rear panel Power switch On. For details, see page 8.
Note that it takes around 15~20 seconds for the instrument to initialize and the display to become active.

The probe waveform is distorted.

Ensure the probe has been compensated. For details, see page 8. Note that the frequency, accuracy and duty factor are not specified for probe compensation waveforms, so they should not be used for other reference purposes.

I connected the signal but it does not appear on screen.

Ensure the channel is activated by pressing the channel button (the channel LED turns On).

Autoset does not catch the signal well.

Autoset function cannot catch signals under 30mV or 30Hz. Use the manual settings to display signals below these levels.

I want to clean up the cluttered panel settings.

Press the Save/Recall button→F1 to recall the default settings. For details, see page8.

The display image printout is too dark on the background.

Use the Inksaver function which reverses the colours from displaying a white waveform on a black background, to display coloured waveforms on a white background. For details, see page8 and 8.

The date and time setting is not correct.

To set date and time, see page 8. If the clock does not maintain the correct time or cannot be set, the internal clock battery may be exhausted and require replacement. Contact RS Components for further advice, the address is given at the end of this Instruction Manual.

USB does not work.

The USB rear panel host and rear panel slave connections cannot be used at the same time. Disconnect all USB devices, turn the instrument off and on again and try again.

The accuracy does not match the specification.

Ensure the instrument has been turned on for at least 30 minutes and the ambient temperature is between +20°C and +30°C. This is necessary to stabilize the unit to match the specification.

If there is still a problem, please contact RS Components, the address is given at the end of this Instruction Manual

Appendix

Specifications

The specifications apply under the following conditions: the instrument is powered on for at least 30 minutes, within +20°C~+30°C.

	IDS-8062 / 64	IDS-8102 / 04	IDS-8202 / 04
Channels	2/4	2/4	2/4
Bandwidth	DC~60MHz (-3dB)	DC~100MHz (-3dB)	DC~200MHz (-3dB)
Rise Time	5.8ns approx.	3.5ns approx.	1.75ns approx.

IDS-8062 / 2064 / 8102 / 8104 / 8202 / 8204

Vertical	Sensitivity	2mV/div~5V/Div (1-2-5 increments)
	Accuracy	± (3% x Readout + 0.05div x Volts/div + 0.8mV)
	Input Coupling	AC, DC, & Ground
	Input Impedance	1MΩ±2%, ~16pF
	Polarity	Normal & Invert
	Maximum Input	300V (DC+AC peak), CATII
	Waveform Signal Process	+, -, FFT
	Offset Range	2mV/div~20mV/div: ±0.5V 50mV/div~200mV/div: ±5V 500mV/div~2V/div: ±50V 5V/div: ±300V
	Bandwidth Limit	20MHz (-3dB)
Trigger	Sources	CH1, CH2, Line, EXT(for 2ch model only), CH3&CH4(for 4ch model only)
	Modes	Auto-Level, Auto, Normal, Single, TV, Edge, Pulse Width (2ch model only: Time-Delay and Event-Delay)
	Coupling	AC, DC, LFrej, HFrej, Noise rej

	Sensitivity	DC~25MHz: Approx. 0.5div or 5mV 25MHz~max: Approx. 1div or 10mV
Ext Trigger (for 2ch model only)	Range	±15V
	Sensitivity	DC~30MHz: ~50mV 30MHz~max: ~100mV
	Input Impedance	1MΩ±2%, ~16pF
	Maximum Input	300V (DC + AC peak), CATII
Horizontal	Range	1ns/div~10s/div, 1-2-5 increment
	Modes	Main, Roll, X-Y
	Accuracy	±0.01%
	Pre-Trigger	20 div maximum
	Post-Trigger	1000 div
X-Y Mode	X-Axis Input	Channel 1
	Y-Axis Input	Channel 2
	Phase Shift	±3° at 100kHz
Signal Acquisition	Equivalent	25G Sa/s maximum
	Vertical	8 bits
	Resolution	
	Record Length	25K Dots Maximum
	Acquisition Mode	Sample, Peak Detect, Average
	Peak Detection	10ns
	Average	2, 4, 8, 16, 32, 64, 128, 256
Cursors and Measurement	Voltage	Vpp, Vamp, Vavg, Vrms, Vhi, Vlo, Vmax, Vmin, Rise Preshoot/ Overshoot, Fall Preshoot/ Overshoot
	Time	Freq, Period, Rise Time, Fall Time, Positive Width, Negative Width, Duty Cycle
	Delay	FRR, FRF, FFR, FFF, LRR, LRF, LFR, LFF
	Cursors	Voltage difference (ΔV) Time difference (ΔT)
	Trigger	Resolution: 6 digits
	Frequency	Accuracy: ±2%
	Counter	Signal source: All available trigger source except the Video trigger

Control Panel Function	Auto Set	Automatically adjust vertical Volt/div, Horizontal Time/div, and Trigger level
	Save Setup	Internal memory: 20 sets USB Flash drive: > 20 sets
	Save Waveform	Internal memory: 20 sets + 4 Reference waveforms USB Flash drive: > 20 sets
Display	LCD	5.6 inch, TFT, brightness adjustable
	Resolution (dots)	234 (Vertical) x 320 (Horizontal)
	Graticule	8 x 10 divisions (menu On) 8 x 12 divisions (menu Off)
Interface	Go-No Go Output RS-232C	5V max/ 10mA TTL open collector DTE DB 9-pin male
	USB	Host: Flash drive, Printer Device: Data communication
Power Source	Line Voltage	100V~240V AC, 47Hz~63Hz
Miscellaneous	Multi-Language Selection	English/ Traditional Chinese/ Simplified Chinese
	On-Line Help	English/ Traditional Chinese/ Simplified Chinese
	Time Clock	Display: yy/mm/dd/hh/ss (time stamp for saved data)
Dimensions	254D x 142H x 310W (mm)	
Weight	Approx. 4.3kg	
Temperature	Operating	0°C~50°C
	Storage	-20°C~70°C
Humidity	Operating	80% R.H. @35°C
	Storage	80% R.H. @70°C

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