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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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4
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

- Do not apply more than 300V peak to the BNC connectors.

⚠️ CAUTION

- 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.

<table>
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<th>Storage Environment</th>
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<td>Relative Humidity: &lt; 80%</td>
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<td>Temperature: −20°C to 70°C</td>
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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 0.75\(\text{mm}^2\) 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.

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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

IDS-8000 Series Instrument

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.

   ![Power Switch](image)

   ON

   OFF

   Red (Standby)

**Press the ON/STBY button**

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

![ON/STBY Button](image)

**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 (2Vpp ± 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

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</tr>
<tr>
<td></td>
<td>Description of displayed items ..................................................... 8</td>
</tr>
</tbody>
</table>
Front Panel

**IDS-8064/ 8104/ 8204 front panel**

- **A** LCD Display
- **B** F1~F5 Function keys
- **C** Variable knob
- **D** ON/ Standby key
- **E** Main Function keys
- **F** Trigger menu key
- **G** Trigger level knob
- **H** Horizontal Menu key
- **I** Horizontal position knob
- **J** Time/ Div knob
- **K** Vertical position knob
- **L** CH1~CH4 (Vertical) menu key
- **M** Volts/ Div knob
- **N** Input Terminal CH1~CH4
- **O** Ground Terminal
- **P** Math key
- **Q** USB Connector
- **R** Menu ON/OFF key
- **S** Probe Compensation Output
- **T** External Trigger Input
- **U** Trigger level knob
- **V** Horizontal Menu key
- **W** Time/ Div knob
- **X** Main Function keys
- **Y** Vertical position knob
- **Z** Input Terminal CH1~CH2
- **AA** CH1~CH4 (Vertical) menu key
- **AB** Volts/ Div knob
- **AC** Probe Compensation Output
- **AD** Input Terminal CH1~CH2
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.
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<td>External Trigger Input</td>
<td>(2CH model only) For external trigger signal used in advanced delay triggering. See page 8.</td>
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</table>
Rear Panel

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

A Power Switch
B RS232C Connector
C USB Slave Connector
D USB Host Connector
E GO-NoGO Output Terminal
F Calibration Output Terminal
G Serial No. Label
H Calibration Output Terminal
I Power Cord 100V~240V 47Hz~63Hz
J Fuse 250V 2A Slow
### Description of rear panel items

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

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

**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 01:24: (Default) The current time and date is configured in the Utility menu. See page 8.

**D Trigger Status**

**E Acquisition Status**

**F Function menu**

**G Trigger Frequency Counter**

**H Trigger Status**

**I Channel Status**

**J Time/Div**
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
- **STOP**: Triggering is halted
- **ST**: Trigger condition is not met
For triggering details, see page 8.

**E** Acquisition Status
- **N**: Normal mode
- **P**: Peak Detect mode
- **A**: 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**: (From left) Channel, Bandwidth limit On, Coupling mode, Time/Div scale
For Channel (vertical scale) details, see page 8.
# Quick Reference

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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~F4** = 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
Select the display language | Utility→F4
---|---
Set the date/time | Utility→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
- Run Go-No Go test | Utility→F5→F4

**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

**Save and Recall**
- Quick save to USB | Utility→F1→F1
- Hardcopy
- Save all (image/setup/waveform) | Save/Recall→F5→F2→F1~F4
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<tr>
<th>Feature</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calibrate the instrument</td>
<td>Utility→F5→F1→F1~F3</td>
</tr>
<tr>
<td>Compensate the probe</td>
<td>Utility→F5→F5→F1→F1~F3</td>
</tr>
</tbody>
</table>
Menu Tree

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

**Acquire, Channel, Cursor, Display**

<table>
<thead>
<tr>
<th>Acquire</th>
<th>CH1</th>
<th>Coupling</th>
<th>Invert</th>
<th>BW Limit</th>
<th>Probe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>F 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak Detect</td>
<td>F 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>F 3</td>
<td>2/ 4/ 8/ 16/ 32/ 64/ 128/ 256</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sampling</td>
<td>F 4</td>
<td>Equ.Time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mem Leng</td>
<td>F 5</td>
<td>500/25000 (1CH) 500/12500 (2CH) 500/5000 (4CH)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cursor</th>
<th>Display</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td>F 1</td>
<td>(4CH) CH1/ 2/ 3/ 4/ MATH (2CH) CH1/ 2/ MATH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horizontal</td>
<td>F 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical</td>
<td>F 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Display</th>
<th></th>
<th>Type</th>
<th>Accumulate</th>
<th>Refresh</th>
<th>Contrast</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>F 1</td>
<td>F 2</td>
<td>F 3</td>
<td>F 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vectors/ Dots</td>
<td>On/ Off</td>
<td></td>
<td>(icon)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F 5</td>
</tr>
</tbody>
</table>

|                   |                |                |                |                |               |
### Horizontal, Maths, Measure (1 of 2)

**HORI MENU**

- **Main**
  - **Operation**
    - F1: +/-
    - F2: (4CH) CH1_CH2/ CH3_CH4 (2CH) CH1_CH2
  - **Position**
  - **Unit/ Div**

**Roll**

- **F4**

**XY**

- **F5**

**MATH**

- **FFT**
- **Source**
- **Window**
  - **Position**
  - **Unit/div**

**Measure**

- **Vpp**
  - F1
- **Vavg**
  - F2
- **Frequency**
  - F3
- **Duty Cycle**
  - F4
- **Rise Time**
  - F5

**Measure**

- **CH1**
- **CH2**
- **CH3** (4CH model)
- **CH4** (4CH model)
- **OFF**

(Press once)

(Press twice)
Measure (2 of 2), Program

**Measure**

- **Vpp** : F 1
- **Vavg** : F 2
- **Frequency** : F 3
- **Duty Cycle** : F 4
- **Rise Time** : F 5
- **Source1** : (4CH) CH1/ 2/ 3/ 4 (2CH) CH1/ 2/
- **Source2** : (4CH) CH1/ 2/ 3/ 4 (2CH) CH1/ 2/
- **Delay Type** : F 3
- **Volt Type** : F 3
- **(icon)** : F 4
- **Back** : F 5
- **Time Type** : F 3
- **(icon)** : F 4
- **Back** : F 5
- **Frequency/ Period/ RiseTime/ FallTime/ +Width/ -Width/ Dutycycle**

**Program**

- **Edit** : F 1
- **Step** : F 2
- **1 ~ 20**
- **Item** : F 3
- **Menu/Memory/ Time**
- **Save** : F 5
- **Play** : F 1
- **Cycle** : F 2
- **1 ~ 99**
- **From/: To:** F 3
- **1 ~ 20**
- **(From = To)**
- **Start** : F 5
Save/ Recall (1 of 2)

Save/Recall
- Default Setup (F 1)
- Display Refs. (F 2)
- Save Setup (F 3)
- Save Waveform (F 4)
- More (F 5)

Display Refs.
- Ref A (F 2)
- Ref B (F 3)
- Ref C (4CH model) (F 4)
- Ref D (4CH model) (F 5)

Save Setup (F 1)

Save Waveform
- Source (F 2)
- Destination (F 3)
- Save (F 4)

File Utilities (USB only)
- File Utilities (F 5) → To File Utilities

File Utilities
- Select (F 1)
- New Folder (F 2)
- Rename (F 3)
- Delete (F 4)
- Previous Menu (F 5)

(4CH) CH1/ 2/ 3/ 4/ MATH/ Ref A/ B/ C/ D
(2CH) CH1/ 2/ MATH/ Ref A/ B

Ref: A/ B
Memory: 1 ~ 20
USB

On/ Off

Destination (F 3)
- Memory: 1 ~ 20
USB
- Save (F 4)

File Utilities (USB only) (F 5) → To File Utilities

Enter Character (F 1)
- Back Space (F 2)
- Save (F 4)
- Previous Menu (F 5)
Save/Recall (2 of 2)

**File Utilities**
- Select [F 1]
- New Folder [F 2]
- Rename [F 3]
- Delete [F 4]
- Previous Menu [F 5]

Enter Character [F 1]
Back Space [F 2]
Save [F 4]
Previous Menu [F 5]

**Save/Recall**
- Default Setup [F 1]
- Display Refs. [F 2]
- Save Setup [F 3]
- Save Waveform [F 4]
- More [F 5]

**To File Utilities**
- Save Image [F 1]
- Ink Saver On/Off [F 2]
- Destination USB [F 3]
- Save [F 4]
- File Utilities [F 5]

**Source**
- Recall Waveform [F 1]
- Memory: W1~20 USB [F 2]
- (4CH) Ref A/ B/ C/ D [F 3]
- (2CH) Ref A/ B [F 4]

**To File Utilities**
- File Utilities (USB only) [F 5]
## Trigger

### MENU

<table>
<thead>
<tr>
<th>Edge</th>
<th>F 1</th>
<th>(4CH) CH1/ CH2/ CH3/ CH4 Line (2CH) CH1/ CH2/ External/ Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td>F 2</td>
<td></td>
</tr>
<tr>
<td>Mode</td>
<td>F 3</td>
<td>Auto/ Normal/ Single/ Auto Level</td>
</tr>
<tr>
<td>Slope/ Coupling</td>
<td>F 5</td>
<td></td>
</tr>
<tr>
<td>Video</td>
<td>F 1</td>
<td>(4CH) CH1/ CH2/ CH3/ CH4 (2CH) CH1/ CH2</td>
</tr>
<tr>
<td>Source</td>
<td>F 2</td>
<td></td>
</tr>
<tr>
<td>Standard</td>
<td>F 3</td>
<td>NTSC/ SECAM/ PAL</td>
</tr>
<tr>
<td>Polarity</td>
<td>F 4</td>
<td>_ / _</td>
</tr>
<tr>
<td>Line</td>
<td>F 5</td>
<td>Field 1/ Field 2 1<del>263 (NTSC) 1</del>313 (SECAM/ PAL)</td>
</tr>
<tr>
<td>Pulse</td>
<td>F 1</td>
<td></td>
</tr>
<tr>
<td>Source</td>
<td>F 2</td>
<td>(4CH) CH1/ 2/ 3/ 4 (2CH) CH1/ 2</td>
</tr>
<tr>
<td>Mode</td>
<td>F 3</td>
<td>Auto/ Normal/ Single/ Auto Level</td>
</tr>
<tr>
<td>When</td>
<td>F 4</td>
<td>&gt;1/ &lt;/ =/ ? 20ns~200us</td>
</tr>
<tr>
<td>Slope/ Coupling</td>
<td>F 5</td>
<td></td>
</tr>
<tr>
<td>Delay</td>
<td>F 1</td>
<td></td>
</tr>
<tr>
<td>(2CH model) By Time</td>
<td>F 2</td>
<td>100ns~1.3ms</td>
</tr>
<tr>
<td>By Event</td>
<td>F 3</td>
<td>2 ~ 65000</td>
</tr>
<tr>
<td>Ext:</td>
<td>F 4</td>
<td>TTL: 1.48V/ ECL: -1.35V User: -12~+12V</td>
</tr>
<tr>
<td>Slope/ Coupling</td>
<td>F 5</td>
<td></td>
</tr>
</tbody>
</table>
Utility (2 of 3)

Utility

Hardcopy Menu F 1
Interface Menu F 2
(Sound) F 3
Language F 4
More F 5

Self Cal Menu F 1
System Inform F 2
Go-NoGo Menu F 3
NoGo When F 4
More F 5

Utility

Template Edit F 1
Source F 2
Violating F 3
Go-No Go F 4
Ratio: F 5

Template

Max/ Min/ Auto F 1
Source F 2
(Max: Ref A/ M1~20 Min: Ref B/ M1~20
(4CH) Auto:
CH1/ 2/ 3/ 4
(2CH) Auto: CH1/ 2

(Position)

Save & Create F 4
Previous Menu F 5

Max/ Min: Position
-12Div ~ +12Div
Auto: Tolerance
0.04 div ~ 4 div/
0.4% ~ 40%
Utility (3 of 3)

Utility

Hardcopy Menu F 1

Interface Menu F 2

Language F 3

More F 5

Self Cal Menu F 1

System Inform F 2

Go-No Go Menu F 3

No Go When F 4

More F 5

Wave Type F 1

Frequency (only) F 2

Duty Cycle (only) F 3

Default 1k F 4

Previous Menu F 5

Probe Comp Menu F 1

Time Set Menu F 2

Date F 1

(Day) F 2

Day/ Month/ Year F 3

Save F 4

Cancel F 5

Time F 1

(Hour) F 2

Hour/ Minute F 3

Save F 4

Cancel F 5

1k ~ 100k

5% ~ 95%
# Default Settings

These are the factory installed settings that appear when pressing Save/Recall button→F1 (Default Setup).

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

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## Configure the Settings

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acquisition</strong></td>
<td>Select the Acquisition mode</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Waveform memory length</td>
<td>8</td>
</tr>
<tr>
<td><strong>Cursor</strong></td>
<td>Select the horizontal cursor type</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Select the vertical cursor type</td>
<td>8</td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td>Select the vector/dot waveform</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>View accumulated waveform</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Set the display contrast</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Freeze the waveform</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Select the display grid type</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Turn Off the display menu</td>
<td>8</td>
</tr>
<tr>
<td><strong>Horizontal</strong></td>
<td>Roll the horizontal view</td>
<td>8</td>
</tr>
<tr>
<td><strong>View</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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

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

Range
\[\text{Low pitch} \quad \text{High pitch} \quad \text{Mixed pitch} \]
\[\text{Off} \quad \text{No sound}\]

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

Panel operation

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

![Normal mode graph]

### Peak Detect mode

![Peak Detect mode graph]

### Average mode

![Average mode graph]
Waveform memory length

Panel operation

1. Press the Acquire button→F5.

2. To switch between short and long memory length, press F5 repeatedly.

Range

<table>
<thead>
<tr>
<th>Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>Short memory length common for all number of channels: useful when catching high frequency signal.</td>
</tr>
<tr>
<td>5000</td>
<td>Long memory length when three or four channels are active.</td>
</tr>
<tr>
<td>12500</td>
<td>Long memory length when two channels are active.</td>
</tr>
<tr>
<td>25000</td>
<td>Long memory length when only one channel is active.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH1~CH4</td>
<td>Channel1~Channel2 waveform</td>
</tr>
<tr>
<td>(4CH model)</td>
<td></td>
</tr>
<tr>
<td>CH1~CH2</td>
<td>Channel1~Channel2 waveform</td>
</tr>
<tr>
<td>(2CH model)</td>
<td></td>
</tr>
<tr>
<td>MATHS</td>
<td>The waveform as a result of the maths operation</td>
</tr>
</tbody>
</table>

#### Horizontal (cursor type)

- ![Cursor type 1](image) | Both T1 and T2 are invisible.  
- ![Cursor type 2](image) | T2 is active, T1 is fixed. Variable knob moves only T2.  
- ![Cursor type 3](image) | T1 is active, T2 is fixed. Variable knob moves only T1.  
- ![Cursor type 4](image) | Both T1 and T2 are active. Variable knob moves T1 and T2 together.  

---

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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).
<table>
<thead>
<tr>
<th>Range</th>
<th>Source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH1~CH4</td>
<td>Channel1~Channel4 waveform</td>
<td>(4CH model)</td>
</tr>
<tr>
<td>CH1~CH2</td>
<td>Channel1~Channel2 waveform</td>
<td>(2CH model)</td>
</tr>
<tr>
<td>MATH</td>
<td>The waveform as a result of the Math operation.</td>
<td></td>
</tr>
</tbody>
</table>

**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

Panel operation

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

<table>
<thead>
<tr>
<th>On</th>
<th>The waveform is accumulated to show signal variation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>The waveform is refreshed each time.</td>
</tr>
</tbody>
</table>

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 Channel1 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**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Coupling Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>~</td>
<td>AC coupling</td>
</tr>
<tr>
<td>⋯</td>
<td>DC coupling</td>
</tr>
<tr>
<td></td>
<td>Ground coupling</td>
</tr>
</tbody>
</table>

**Example**

Observe the AC portion of a signal using AC coupling

---

**DC Coupling**

![DC Coupling Diagram](image)

**AC Coupling**

![AC Coupling Diagram](image)
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

<table>
<thead>
<tr>
<th>x1</th>
<th>No attenuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>x10</td>
<td>Attenuation factor 10</td>
</tr>
<tr>
<td>x100</td>
<td>Attenuation factor 100</td>
</tr>
</tbody>
</table>
Other Settings

Select the buzzer sound

Panel operation

3. Press the Utility button→F3.

4. To select the buzzer setting, press F3 repeatedly.

Range

<table>
<thead>
<tr>
<th>Low pitch</th>
<th>High pitch</th>
<th>Mixed pitch</th>
<th>No sound</th>
</tr>
</thead>
<tbody>
<tr>
<td>低音</td>
<td>高音</td>
<td>混音</td>
<td>无声</td>
</tr>
</tbody>
</table>

View the Help information

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

Panel operation

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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
<td>1~31</td>
</tr>
<tr>
<td>Month</td>
<td>1~12</td>
</tr>
<tr>
<td>Year</td>
<td>2000~2037</td>
</tr>
</tbody>
</table>
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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hour</td>
<td>0~23</td>
</tr>
<tr>
<td>Minute</td>
<td>0~59</td>
</tr>
</tbody>
</table>
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:  

(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.
**Range** *(RS232C Only)*

<table>
<thead>
<tr>
<th>Baud Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2400, 4800, 9600, 19200, 38400</td>
</tr>
</tbody>
</table>

**Stop Bit**

1, 2

**Parity**

Odd/ Even/ None
# Measurements

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

<table>
<thead>
<tr>
<th>Acquisition</th>
<th>Mode:</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop after:</td>
<td>RUN/STOP button only</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Display</th>
<th>Style:</th>
<th>Vectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format:</td>
<td>YT</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Horizontal</th>
<th>Scale:</th>
<th>Signal frequency dependent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position:</td>
<td>Centered in the display</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trigger</th>
<th>Coupling:</th>
<th>DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position:</td>
<td>Center</td>
<td></td>
</tr>
<tr>
<td>Slope:</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Type:</td>
<td>Edge</td>
<td></td>
</tr>
<tr>
<td>Source:</td>
<td>Highest frequency</td>
<td></td>
</tr>
<tr>
<td>Level:</td>
<td>Midpoint of the trigger source</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vertical</th>
<th>Bandwidth:</th>
<th>Full</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offset:</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Coupling:</td>
<td>Signal dependent</td>
<td></td>
</tr>
<tr>
<td>Scale:</td>
<td>Signal dependent</td>
<td></td>
</tr>
</tbody>
</table>
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.
<table>
<thead>
<tr>
<th>Range</th>
<th><strong>Source 1, 2</strong></th>
<th><strong>Volt type</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(4CH) CH1~CH4</td>
<td><strong>Vpp</strong></td>
</tr>
</tbody>
</table>
|       | (4CH model) Channel1~Channel2 | Difference between positive and negative peak voltage.  
(=Vmax−Vmin) |
|       | (2CH) CH1,CH2  | **Vmax**      |
|       | (2CH model) Channel1,Channel2 | 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. |
|       |                 | **FPREShoot** |
|       |                 | 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.
\[(=100 \times \text{Pulse Width}/\text{Cycle})\]

### Delay Type

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRR</td>
<td>Time between Source1 signal <strong>first rising</strong> edge and Source2 signal <strong>first rising</strong> edge.</td>
</tr>
<tr>
<td>FRF</td>
<td>Time between Source1 signal <strong>first rising</strong> edge and Source2 signal <strong>first falling</strong> edge.</td>
</tr>
<tr>
<td>FFR</td>
<td>Time between Source1 signal <strong>first falling</strong> edge and Source2 signal <strong>first rising</strong> edge.</td>
</tr>
<tr>
<td>FFF</td>
<td>Time between Source1 signal <strong>first falling</strong> edge and Source2 signal <strong>first falling</strong> edge.</td>
</tr>
<tr>
<td>LRR</td>
<td>Time between Source1 signal <strong>first rising</strong> edge and Source2 signal <strong>last rising</strong> edge.</td>
</tr>
<tr>
<td>LRF</td>
<td>Time between Source1 signal <strong>first rising</strong> edge and Source2 signal <strong>last falling</strong> edge.</td>
</tr>
<tr>
<td>LFR</td>
<td>Time between Source1 signal <strong>first falling</strong> edge and Source2 signal <strong>last rising</strong> edge.</td>
</tr>
<tr>
<td>LFF</td>
<td>Time between Source1 signal <strong>first falling</strong> edge and Source2 signal <strong>last falling</strong> edge.</td>
</tr>
</tbody>
</table>
View automatic measurement results

**Panel operation**

<table>
<thead>
<tr>
<th>Measurement Result</th>
<th>View mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vpp</td>
<td>CH1</td>
</tr>
<tr>
<td>Vavf</td>
<td>CH2</td>
</tr>
<tr>
<td>Frequency</td>
<td>CH3</td>
</tr>
<tr>
<td>Dutycycle</td>
<td>CH4</td>
</tr>
<tr>
<td>RiseTime</td>
<td>OFF</td>
</tr>
</tbody>
</table>

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.
10. To return to the previous menu, press F5.
IDS-8000 series Operation Manual

Measurements

<table>
<thead>
<tr>
<th>Range</th>
<th>Go-No Go When (violation condition)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Go = the subject signal is within the template.</td>
</tr>
<tr>
<td></td>
<td>No Go = the subject signal is violating the template.</td>
</tr>
</tbody>
</table>

**Template**

<table>
<thead>
<tr>
<th>Max</th>
<th>Sets the maximum level of the template.</th>
</tr>
</thead>
</table>

**Template source**

- RefA: One of the four reference waveforms.
- M1~20: One of the twenty internally stored waveforms.

To store a waveform (template), see page 8.

**Template position**

- ±12/Div

<table>
<thead>
<tr>
<th>Min</th>
<th>Sets the minimum level of the template.</th>
</tr>
</thead>
</table>

**Template source**

- RefB: One of the four reference waveforms.
- W1~W20: One of the twenty internally stored waveforms.

To store a waveform (template), see page 8.

**Template position**

- ±12/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

Utility \[\rightarrow\] More \[F 5\] \[\rightarrow\] Go-No Go Menu \[F 3\] \[\rightarrow\] Go-No Go \[F 4\]

1. Edit the test condition. See page 8.

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.

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.

<table>
<thead>
<tr>
<th>Range</th>
<th>Maths Operation type</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>Addition</td>
</tr>
<tr>
<td>-</td>
<td>Subtraction</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Channel Pair</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH1_CH2</td>
<td>Maths operation between Channel1 and Channel2</td>
</tr>
<tr>
<td>CH3_CH4</td>
<td>Maths operation between Channel3 and Channel4</td>
</tr>
<tr>
<td></td>
<td>(only for 4CH model)</td>
</tr>
</tbody>
</table>

| 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: ±12div
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.

<table>
<thead>
<tr>
<th>Range</th>
<th>Step (number)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1~20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Menu</td>
<td>“AutoMeasure” or “Cursor”.</td>
</tr>
<tr>
<td>Setup</td>
<td>S1~S20 internal setups. To store setups, see page8.</td>
</tr>
<tr>
<td>Time</td>
<td>1~99 seconds for each step.</td>
</tr>
</tbody>
</table>
Play the program

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.

<table>
<thead>
<tr>
<th>Range</th>
<th>Cycle (number of repetition)</th>
<th>From: / To: (beginning and end step)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1~99</td>
<td>1~20 From: ≤ To:</td>
</tr>
</tbody>
</table>
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.
<table>
<thead>
<tr>
<th>Range</th>
<th>Trigger source</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH1~CH2</td>
<td>Channel 1~Channel 2 (2CH model)</td>
</tr>
<tr>
<td>CH1~CH4</td>
<td>Channel 1~Channel 4 (4CH model)</td>
</tr>
<tr>
<td>External</td>
<td>Signal from the External trigger input (only for 2CH model)</td>
</tr>
<tr>
<td>Line</td>
<td>AC Power supply signal</td>
</tr>
</tbody>
</table>

**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

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.

<table>
<thead>
<tr>
<th>Range</th>
<th>Trigger source</th>
<th>Video standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH1~2(4)</td>
<td>Channel 1~Channel 2 (Channel 4)</td>
<td>NTSC National Television System Committee video standard.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PAL Phase Alternate Line video standard.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SECAM SEquential Couleur A Memoire video standard.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Polarity</th>
<th>Positive pulse</th>
<th>Negative pulse</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Field 1/2, NTSC: 1~263</td>
<td>PAL/SECAM: 1~313</td>
</tr>
</tbody>
</table>
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.
10. To return to the previous menu, press F5.
11. To set the trigger level, use the Trigger knob.

<table>
<thead>
<tr>
<th>Range</th>
<th>Trigger source</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH1~CH4</td>
<td>Channel 1~Channel 4</td>
</tr>
<tr>
<td>External</td>
<td>External trigger input signal (only)</td>
</tr>
</tbody>
</table>
for 2CH model)

Line 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

<table>
<thead>
<tr>
<th>By Time</th>
<th>(Trigger delay time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100ns ~ 1.3ms</td>
<td></td>
</tr>
</tbody>
</table>

By Event

| 2 ~ 65000 |
**Ext.** (Trigger level of the start signal)
- TTL: +1.4V
- ECL: -1.3V
- USER: ±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       C
B

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
B 1 2 3

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

<table>
<thead>
<tr>
<th>Printout</th>
<th>Printout display image</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Save/ Recall</td>
<td>Quick save via USB</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Save image/ waveform/ setup</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Configure folders and files in USB flash drive</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Recall waveform/ setup</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Recall default settings</td>
<td>8</td>
</tr>
</tbody>
</table>
Printout

Printout display image

Panel operation

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.

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

- InkSaver On

**InkSaver (Display background colour)**

- 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

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.

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

Range

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Image</td>
<td>Saves the display image (GWxxxx.BMP).</td>
</tr>
<tr>
<td>All</td>
<td>Saves the following data in a folder (Allxxxx).</td>
</tr>
<tr>
<td></td>
<td>Display image: Axxx.BMP</td>
</tr>
<tr>
<td></td>
<td>Waveform: Axxx.CSV</td>
</tr>
<tr>
<td></td>
<td>Setup: Axxx.SET</td>
</tr>
</tbody>
</table>

InkSaver (Display background color)

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>On/Off</td>
<td>For an example, see the previous page.</td>
</tr>
</tbody>
</table>
Save image/ waveform/ setup

Panel operation

Save/Recall
- Save Setup: F 3
- Save Waveform: F 4
- More: F 5

Save/Recall
- Save Image: F 1
- Save All: F 2

InkSaver
- On/ Off: F 2

Source
- (Waveform): F 2

Destination
- Setup: S1~20, USB
- Waveform: W1~20, USB
- (4CH) CH1/ 2/ 3/ 4, Math, RefA/ B/ C/ D
- (2CH) CH1/ 2, Math, RefA/ B

Save
- F 4

File Utilities
- (USB only): F 5

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 A~D.

RefA/B (2CH) S1~S20 internal setups.

Setup W1~W20 internal waveforms.

Waveform 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

![Diagram showing panel operation]

Display the recalled waveform

![Diagram showing display operation]

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

97
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.


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

<table>
<thead>
<tr>
<th>Range</th>
<th>File type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waveform</td>
<td>Waveform file (xxxx.CSV).</td>
<td></td>
</tr>
<tr>
<td>Setup</td>
<td>Panel setup file (xxxx.SET).</td>
<td></td>
</tr>
</tbody>
</table>

**Source**

| Setup | S1~S20 internal setups. |
| Waveform | W1~W20 internal waveforms. |
| USB | USB flash drive (Gxxx.SET) |

**Destination**
<table>
<thead>
<tr>
<th>Reference</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ref A~D (4CH)</td>
<td>Reference waveforms stored internally.</td>
</tr>
<tr>
<td>Ref A/B (2CH)</td>
<td></td>
</tr>
</tbody>
</table>


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 | Invert: Off |
| Coupling: DC | Probe Attenuation: x1 |
| BW Limit: Off | |
| Cursor | Source: CH1 | Horizontal: None |
| Vertical: None | |
| Display | Type: dots | Accumulate: Off |
| Graticule: | |
| Go-NoGo | Go-NoGo: Off | Source: CH1 |
| NoGo when: | Violating: Stop |
| Horizontal | Scale: 2.5us/Div | Mode: Main Timebase |
| Maths | Type: + | Channel: CH1+CH2 |
| Position: 0.00 Div | Unit/Div: 2V |
| Measure | Source1: CH1 | Source2: CH2 |
| Volt type: VPP | Time Type: Frequency |
| Delay type: FRR | |
| Program | Mode: Edit | Step: 1 |
| Item: Memory | |
| Trigger | Type: Edge | Source: Channel1 |
| Mode: Auto | Slope: | |
| Coupling: DC | Rejection: Off |
| Noise Rejection : Off | |
| Utility | Hardcopy: SaveImage, | Sound: Off |
| Inksaver 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 ± 5°C
   - Relative humidity: ≤ 80%

2. Connect the rear panel Calibration output to Channel1. (Use a good quality 50 Ohm BNC male – male connecting cable)

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 $\text{ 산 }$.

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.
### Wave type

<table>
<thead>
<tr>
<th>Range</th>
<th>Wave type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Probe compensation signal, 2Vpp at x10 probe attenuation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Demonstration signal for showing the effects of deep memory length.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Demonstration signal for showing the effects of peak detection.</td>
<td></td>
</tr>
</tbody>
</table>

**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 page 8.

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 page 8 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.

<table>
<thead>
<tr>
<th></th>
<th>IDS-8062/64</th>
<th>IDS-8102/04</th>
<th>IDS-8202/04</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Channels</strong></td>
<td>2/4</td>
<td>2/4</td>
<td>2/4</td>
</tr>
<tr>
<td><strong>Bandwidth</strong></td>
<td>DC~60MHz</td>
<td>DC~100MHz</td>
<td>DC~200MHz</td>
</tr>
<tr>
<td></td>
<td>(−3dB)</td>
<td>(−3dB)</td>
<td>(−3dB)</td>
</tr>
<tr>
<td><strong>Rise Time</strong></td>
<td>5.8ns approx.</td>
<td>3.5ns approx.</td>
<td>1.75ns approx.</td>
</tr>
</tbody>
</table>

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

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vertical</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensitivity</td>
<td>2mV/div~5V/Div (1-2-5 increments)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>± (3% x</td>
<td>Readout</td>
<td>+0.05div x Volts/div +0.8mV)</td>
</tr>
<tr>
<td>Input Coupling</td>
<td>AC, DC, &amp; Ground</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Impedance</td>
<td>1MΩ±2%, ~16pF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polarity</td>
<td>Normal &amp; Invert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum Input</td>
<td>300V (DC+AC peak), CATII</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waveform Signal Process</td>
<td>+, −, FFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offset Range</td>
<td>2mV/div<del>20mV/div: ±0.5V 50mV/div</del>200mV/div: ±5V 500mV/div~2V/div: ±50V 5V/div: ±300V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandwidth Limit</td>
<td>20MHz (−3dB)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Trigger**

<table>
<thead>
<tr>
<th>Sources</th>
<th>CH1, CH2, Line, EXT(for 2ch model only), CH3&amp;CH4(for 4ch model only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modes</td>
<td>Auto-Level, Auto, Normal, Single, TV, Edge, Pulse Width (2ch model only: Time-Delay and Event-Delay)</td>
</tr>
<tr>
<td>Coupling</td>
<td>AC, DC, LFrej, HFrej, Noise rej</td>
</tr>
</tbody>
</table>
### 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 Resolution**: 8 bits
- **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
<table>
<thead>
<tr>
<th><strong>Control Panel Function</strong></th>
<th>Auto Set</th>
<th>Automatically adjust vertical Volt/div, Horizontal Time/div, and Trigger level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Save Setup</td>
<td>Internal memory: 20 sets USB Flash drive: &gt; 20 sets</td>
<td></td>
</tr>
<tr>
<td>Save Waveform</td>
<td>Internal memory: 20 sets + 4 Reference waveforms USB Flash drive: &gt; 20 sets</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Display</strong></th>
<th>LCD</th>
<th>5.6 inch, TFT, brightness adjustable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution (dots)</td>
<td>234 (Vertical) x 320 (Horizontal)</td>
<td></td>
</tr>
<tr>
<td>Graticule</td>
<td>8 x 10 divisions (menu On) 8 x 12 divisions (menu Off)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Interface</strong></th>
<th>Go-No Go Output</th>
<th>5V max/ 10mA TTL open collector</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-232C</td>
<td>DTE DB 9-pin male</td>
<td></td>
</tr>
<tr>
<td>USB</td>
<td>Host: Flash drive, Printer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Device: Data communication</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Power Source</strong></th>
<th>Line Voltage</th>
<th>100V<del>240V AC, 47Hz</del>63Hz</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Miscellaneous</strong></th>
<th>Multi-Language Selection</th>
<th>English/ Traditional Chinese/ Simplified Chinese</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>On-Line Help</td>
<td>English/ Traditional Chinese/ Simplified Chinese</td>
</tr>
<tr>
<td></td>
<td>Time Clock</td>
<td>Display: yy/mm/dd/hh/ss (time stamp for saved data)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Dimensions</strong></th>
<th>254D x 142H x 310W (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weight</strong></td>
<td>Approx. 4.3kg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Temperature</strong></th>
<th>Operating 0°C~50°C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Storage -20°C~70°C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Humidity</strong></th>
<th>Operating 80% R.H. @35°C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Storage 80% R.H. @70°C</td>
</tr>
</tbody>
</table>
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<th>$V$</th>
<th>vertical</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>coupling</td>
</tr>
<tr>
<td></td>
<td>cursor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$W$</th>
<th>waveform</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>accumulation</td>
</tr>
<tr>
<td></td>
<td>freeze</td>
</tr>
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