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DS1000B Series

Digital Oscilloscope

DS1074B, DS1104B, DS1204B

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Safety Notice

Review the following safety precautions carefully to avoid any personal injuries or damages to the instrument and any products connected to it. To avoid potential hazards, please use the instrument as specified by this manual only.

The instrument should be serviced by Authorized personnel only.

To Avoid Fire or Personal Injury.

Use Proper Power Cord. Use the power cord designed for the instrument and authorized in your country only.

Ground The Instrument. The oscilloscope is grounded through the grounding conductor of the power cord. To avoid electric shock the instrument, grounding conductor(s) must be grounded properly, before making connections to the input or output terminals of the instrument.

Connect The Probe. The probes' ground terminals are at the same voltage level of the instrument ground. Do not connect the ground terminals to a high voltage.

Observe All Terminal Ratings. To avoid fire or shock hazard, observe all ratings and marks on the instrument. Follow the user's guide for further ratings information before making connections to the instrument.

Do Not Operate Without Covers. Do not operate the instrument with covers or panels removed.

Use Proper Fuse. Use the fuse of the type, voltage and current ratings as specified for the instrument.

Avoid Circuit or Wire Exposure. Do not touch exposed connections and components when power is on.

Do Not Operate With Suspected Failures. If suspected damage occurs with the instrument, have it inspected by qualified service personnel before further operations.

Provide Proper Ventilation. Refer to the installation instructions for proper ventilation of the instrument.

Do not Operate in Wet/Damp Conditions.

Do not Operate in an Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

The disturbance test of all the models meet the limit values of A in the standard of EN 61326: 1997+A1+A2+A3, but can't meet the limit values of B.

Measurement Category

The DS1000B series Digital Oscilloscope is intended to be used for measurements in Measurement Category I.

Measurement Category Definitions

Measurement Category I is for measurements performed on circuits not directly connected to MAINS. Examples are measurements on circuits not derived from MAINS, and specially protected (internal) MAINS derived circuits. In the latter case, transient stresses are variable; for that reason, the transient withstand capability of the equipment is made known to the user.

WARNING

IEC Measurement Category I. The input terminals may be connected to circuit terminal in IEC Category I installations for voltages up to 300Vrms. To avoid the danger of electric shock, do not connect the inputs to circuit's voltages above 300Vrms. Transient overvoltage is also present on circuits that are isolated from mains. The DS1000B series Digital Oscilloscopes is designed to safely withstand occasional transient overvoltage up to 1000Vpk. Do not use this equipment to measure circuits where transient overvoltage could exceed this level.

Safety Terms and Symbols

Terms in This Guide. These terms may appear in this manual:



WARNING: Warning statements indicate the conditions or practices that could result in injury or loss of life.



CAUTION: Caution statements indicate the conditions or practices that could result in damage to this product or other property.

Terms on the Product. These terms may appear on the product:

DANGER indicates an injury or hazard that may be immediately happen.

WARNING indicates an injury or hazard that may be not immediately happen.

CAUTION indicates that a potential damage to the instrument or other property might occur.

Symbols on the Product. These symbols may appear on the product:



**Hazardous
Voltage**



**Safety
Warning**



**Protective
Earth
Terminal**



**Chassis
Ground**



**Earth
Ground**

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Necessary Inspection

1. Inspect the shipping container for damage.

Keep the damaged shipping container or cushioning material until the contents of the shipment have been checked for completeness and the instrument has been checked mechanically and electrically.

2. Inspect the instrument.

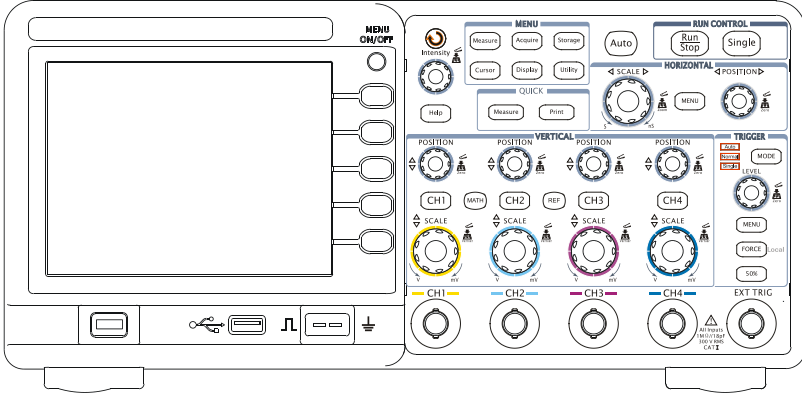
In case there is any mechanical damage or defect, notify the **RIGOL** Sales Representative. If the shipping container is damaged, or the cushioning materials show signs of stress, notify the carrier as well as the **RIGOL** sales office. Keep the shipping materials for the carrier's inspection.

3. Check the accessories.

Accessories supplied with the instrument are listed in the following pages.

If the contents are incomplete or damaged notify the **RIGOL** Sales Representative.

I. Front Panel of the instrument



DS1000B Series Front Panel

II. Standard accessories

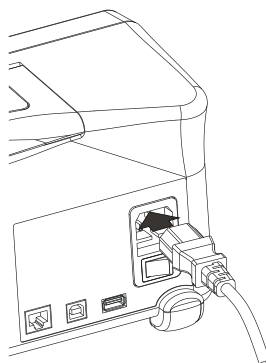
- A Power Cord
- Four Passive Probes
- A USB Cable
- A Quick Guide

III. Optional accessories

- BNC Cable
- USB-GPIB Adapter
- Instrument Carrying Case

How to Connect Power Cord

After inspecting the instrument and the accessories, connect the power cord as shown in the following figure.



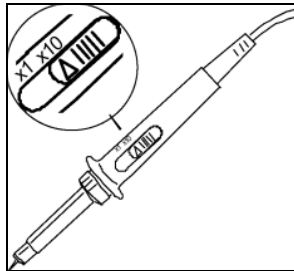
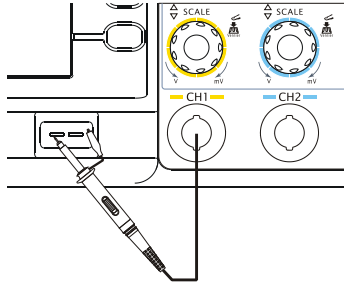
Turn on the switch which is under the power socket, the instrument then is powered on, and the power key on the front panel is lit up (twinkle like breathing), press the key to start up the instrument.

If unable to power the instrument, take the following steps:

- (1) Check the power cord connection;
- (2) Check if the power switch on the rear panel has been turn on;
- (3) If the above inspections, the power key on the front panel is not lit, please take out the fuse and check, refer to the fuse specification shown in the User' Guide to change the fuse if needed;
- (4) After the above inspections, the power key on the front panel is still not lit, please contact **RIGOL** for help.

How to Connect Probe or BNC

1. Connect the probe



As shown in the above figures, set the attenuation switch on the probe to 10X and connect the probe to Channel 1 on the oscilloscope, push and rotate clockwise to lock the probe in place.

If your probe is a new one, or if it is the first time you connect to the oscilloscope, before use it, please do the following compensation operation:

- (1) Set the attenuation switch on the probe to 10X and connect the probe to Channel 1 on the oscilloscope. Attach the probe tip and ground lead to the PROBE COMP connector. Press **CH1**, and set the attenuation menu to 10X. Then press **AUTO**.
- (2) View the waveform displayed on the screen.



Over Compensated



Correctly Compensated

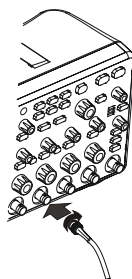


Under Compensated

- (3) If necessary, use a non-metallic tool to adjust the variable capacitor of the probe for the flattest square wave (Correctly Compensated) being displayed on the oscilloscope.
- (4) Repeat if necessary.

2. Connect the BNC

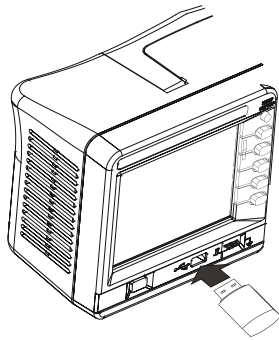
As shown in the following figure, insert the the BNC cable to the BNC connector on the front pannel, rotate clockwise to lock the BNC.



BNC Connecting Instruction

How to Connect USB Devices

DS1000B series oscilloscope support the USB flash drive and connections to PC or printer through USB. The instrument provides two USB Hosts and a USB Device.



Connect USB Host (Front Panel)



Connect USB Host (Rear Panel)



Connect USB Device(Rear Panel)

Troubleshooting

1. After the oscilloscope is powered on, the screen remains dark (no display):

- (1) Check the power cord connection.
- (2) Ensure the power switch is turned on.
- (3) After the above inspection, restart the oscilloscope.
- (4) If the problem still remains, please contact **RIGOL** for help.

2. After the signal acquisition the waveform does not appear:

- (1) Check the probes connected with the signals.
- (2) Check the probes connected to the channels firmly.
- (3) Check the probes connected with the object being tested.
- (4) Check the circuit generates signal at the test point.
- (5) Repeat the acquisition.

3. The measurement result is 10 times higher or lower than the value expected.

Check if the probe attenuation is the same as the channel attenuation.

4. If the oscilloscope does not get a stable waveform display:

- (1) Check the **Trigger Source** and notice if it is set to the channel in use.
- (2) Check the **Trigger Type**. Use "Edge" for normal signals, and use "Video" for VIDEO signals.
- (3) Switch the **coupling** into **HF Rejection** or **LF Rejection** in order to filter the noise which disturbs trigger.
- (4) Adjust the trigger **Sensitivity** and the **hold off** time.

5. After pressing the **RUN/STOP button, the oscilloscope does not display any waveform on screen.**

Check whether the **Trigger Mode** is set to "Normal" or "Single" and see whether the trigger level is out of the signal range. If yes, set the trigger level in proper range by turning the **LEVEL** knob or pressing the **50%** button. Or set the Trigger Mode as "AUTO". Moreover, push **AUTO** button to display the waveform on screen.

6. After the Acquisition is set to "Averages" or Display Persistence is set ON, the waveform refreshes slowly.

It is normal in these settings.

7. The signal is displayed as ladder like waveform.

- (1) The time base setting maybe is too slow. Turn the horizontal **SCALE** knob to increase horizontal resolution to improve the display.
- (2) Maybe the display **Type** is set to "Vectors", and set it to "Dots" mode to improve the display.

8. Unable to connect to PC or the PictBridge printer by USB:

- (1) When connected to PC, if the message "Unknown device" appears or prompting scanner or camera was found. Press **Utility** to choose the I/O Setting menu, you may see the **USB Device** menu has been set to be "PictBridge", you should switch it to "Auto Detect" or "Computer". If necessary, restart the oscilloscope.
- (2) If connecting to a PictBridge printer or the printing is unsuccessful, maybe the **USB Device** menu has been set to be "Computer", you should switch it to "Auto Detect" or "PictBridge". If necessary, restart the oscilloscope.

Contact Us

If you have any problem or requirement when using our products or this manual, please contact **RIGOL**.

E-mail: service@rigol.com

Website: www.rigol.com