

User's Guide

DSO-2090 USB

PC Based Digital Oscilloscope

Operation Manual

Certificate of Product Warranty

This product's warranty, provided by our company, covers a period of 1 year from the date of purchase. All faulty parts and/or functions, resulting despite user's normal use, will be repaired and/or replaced at no charge during the warranty period.

However, if any of the malfunctions are caused by user carelessness, inadequate maintenance, or natural disaster, we will provide repair and/or replacement services for a fee regardless of warranty period.

In the event our product does not prove suitable for your application you can return the product for an exchange or refund. To claim, the product must be returned in good condition within 14 days. Before returning a product, please contact and provide us a serial number. The customer is responsible for all shipping costs.

Products covered by this warranty are limited to those that are registered at the We headquarter or branch offices and repairs, replacements, or refunds will be issued according to manufacturer's discretion. When in need of warranty services, the purchaser may visit our headquarter or one of our sales offices with the product or send the product with a detailed description of services required via postal service to any of our sales offices (the purchaser will be responsible for packaging, postage, and any postal insurance). Once repair services are completed, the supplier will return the product to the purchaser (return postage will be paid by the supplier).

However, if we determined required services to be outside the boundaries of the warranty coverage, we will first contact the purchaser and provide an estimate of repair costs and obtain authorization to conduct services before any work is done. In such a case, return postage along with the repair costs will be billed to the purchaser when the repaired product is returned.

We do not warrant that the software and the product with which it was supplied are completely error free or that will function correctly in all operating environments. It is essential that you, the users, should verify that the software

and product are functioning to your requirements before relying caused on them or the data that they generate. We do not accept responsibility for any loss or injury caused by the use of the product or software. It is the user's responsibility to ensure that the product is suitable for the user's application.

We will not be held legally for any malfunction resulting from user carelessness, abnormal use, and/or natural disaster. Even if we are in receipt of prior notification of such dangers, we will not be held legally liable.

Product Warranty Guide

Please read through the "Precautions for Safety" carefully to obtain a long and safe use of this product.

This product has been processed through careful quality control and testing procedures. Any malfunctions occurring during normal use are covered under the guidelines of the "Certificate of Product Warranty" which is included in this Manual.

If you experience product malfunction, please contact our headquarters or any of our sales offices.

Precautions for Safety

The following instructions are provided for safe and correct use of the product and to prevent a potentially dangerous situation or damage in advance. Be sure to read through them before you use the product.

Recommended Usage Environment

- | The ambient temperature and relative humidity should be 0-40 °C and 10-80% respectively for the normal operation of the product.

Power Source

- | The USB terminal and DSO-2090 USB are connected via a USB cable for DC +5V power from the PC. The product does not require an outside power source.

Warning: Be careful not to input excessive power voltage

- | The product's input power capacity is fixed as shown below to prevent electric shock and/or fire. Please DO NOT use voltage higher than that prescribed below.

(Warning) Be sure to check the probe attenuation before measuring the voltage. The voltage that is higher than the maximum input voltage can cause damage to the device and you. In particular, there is the risk of an electric shock when measuring high voltage. So you need to pay extra attention not to have your hand touch the terminal.

- | Please eliminate all unused probes or tester leads so that they do not come in contact with surrounding high voltage parts.
- | Make sure that the PC's power source is grounded.

Handling Precautions

- | The probe ground lead is at ground potential. Do not connect the ground lead to an elevated voltage. Connect the ground lead of the probe to earth ground only.
If measuring the floating potential, we will recommend the measurement by the differential motion method using CH1 and CH2.
- | Do not connect or disconnect the product with the probe or test lead which is connected to a voltage source.
- | Do not attempt to operate the product at the situation that a risk of dysfunction or shock expected to happen.
- | Stop using the product immediately when you notice something unusual about the smell, smoke or sound.
And then remove the USB connection form your computer.
- | Keep the product out of the reach of children or those who cannot be trusted with the use.
- | Do not use the product with your hands wet. It can cause an electric shock.
- | Do not try the product for the purposes other than those stated.

Usage Location

- | If the products crevice is exposed to electric conductors (solids or liquids), the product will short circuit and possibly create dangers of electric shock or fire. Please keep this product away form humidity, water, or dust.
- | DO NOT use this product near gas as well as other flammable and/or explosive materials.
- | Store the product where direct sunlight can't reach.
- | DO NOT use the product where it's dirty, other machines are operated, or there is a high level of electromagnetic waves.
- | DO NOT place the product on an unstable cart, stand, or tripod. Such usage creates the dangers of accident and/or damage to product.

Maintenance and Storage

- | If not using it for a long term, remove the USB cable from the product.
- | The recommended temperature and humidity for equipment storage is 25 at 50% humidity.

After Service

- | There are no parts that you can replace inside the product. Do not attempt replacing a part yourself. It can give you an electric shock.
- | Do not attempt to open the case or repair yourself. It can cause an electric shock or other safety accidents.
- | Once you open the case, you cannot have the privilege of an after-sales service.

Minimum System Requirements

To install and run DSO-2090 USB, you should have the following.

Operating System

Windows 98/ME/2000/XP/VISTA

Memory

128Mbyte

Graphic Card

Microsoft DirectX supported

Screen resolution: 800x600

Color depth: 16bit

Hardware Specification

Input	
Max. sample rate	Realtime sampling: 100MS/s using one channel, 50MS/s using two channels
Channels	2
Bandwidth	40MHz analog bandwidth
Vertical resolution	8 bits/channel
Gain range	10mV ~ 5V/div @ x1 probe(10mV, 20mV, 50mV, 100mV, 200mV, 500mV, 1V, 2V, 5V/div1,2,5 sequence) 100mV ~ 50V/div @ x10 probe 1V ~ 500V/div @ x100 probe 10V ~ 5KV/div @ x1000 probe
Range	8 divisions
Offset level	+/-4 divisions
Coupling	AC, DC
Offset increments	0.02 div
Impedance	1M ohm
DC accuracy	+/-3%
Input protection	35Vpk (DC + peak AC < 10 kHz, without external attenuation)
Display Mode	Y-T, X-Y
Timebase	
Timebase range	4ns/div ~ 1h/div(4ns, 10ns, 20ns, 40ns, 100ns, 200ns, 400ns, 1us, 2us, 4us, 10us, 20us, 40us, 100us, 200us, 400us, 1ms, 2ms, 4ms, 10ms, 20ms, 40ms, 100ms, 200ms, 400ms, 1s,2s, 4s, 10s,20s,40s,10m,20m,40m,1h /div

DSO-2090 USB Manual

	1-2-4 sequence)
Acquisition mode	Realtime sampling: 4ns /div ~ 400ms/div Roll mode: 1s/div ~ 1h/div
Range	10 divisions
Buffer size	10K ~ 64K samples
Trigger	
Mode	Auto, Normal and Single
Type	Edge trigger: Rising edge, falling edge.
Autoset	Yes
Range	10 divisions
Trigger level	+/-4 divisions
Settability	0.02 div increments
Math	
Measurements	Vp-p, Vmax, Vmin, Vmean, Vrms, Vamp, Vhigh, Vlow, positive overshoot, negative overshoot, cycle mean, cycle rms, period, frequency, positive pulse width, negative pulse width, rise time (10%~90%), fall time (10%~90%), positive duty cycle, negative duty cycle
Cursor	Time/frequency difference, voltage difference Frequency only in FFT mode
Math	Addition, Subtraction, Multiplication, Division
FFT	Rectangular, Hanning, Hamming, Blackman Window
Physical	
Interface	Universal Serial Bus
Power	No external power source required. Bus-powered from USB

Dimensions	187 x100 x 33(mm)
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Introduction

DSO-2090 USB developed by our company. is a portable PC-based Digital Oscilloscope.

High performance

DSO-2090 USB has the following features: 40MHz analog bandwidth, 100MHz real-time sampling.

USB connected

DSO-2090 USB uses USB that supports plug'n play, with 12Mbps communication speed.

Best performance for your dollar

DSO-2090 USB has many features that are comparable to the high speed stand-alone DSOs. But it costs a fraction of the price.

No external power required

DSO-2090 USB does not need an external power source, because it is bus-powered from USB

Easy to use

DSO-2090 USB is easy to use. It is intuitive and easy to understand.

Big screen

You can change DSO-2090 USB screen size as you need.

Various data format processing

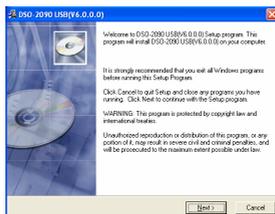
DSO-2090 USB can save waveform in the following formats: text file, jpg/bmp graphic file, MS excel/word file.

Software Installation

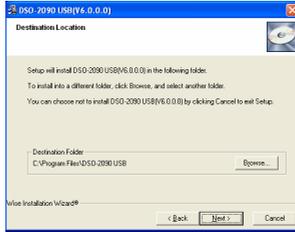
1. While in Windows, insert the installation CD into the CD-ROM drive.
2. The installation should start up automatically. Otherwise in Windows Explorer, switch to the CD-ROM drive and run `Setup.exe`



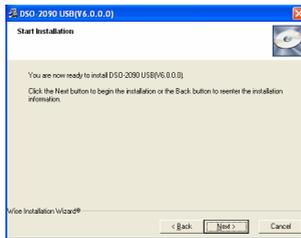
3. The DSO-2090 USB Installation is started. Click 'Next' to continue.



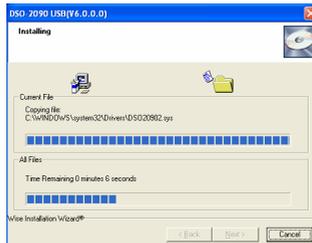
4. Choose a destination directory. Click 'Next' to continue.



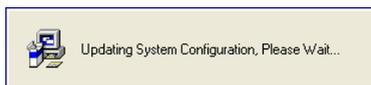
5. Check the setup information. Click Next to start copying of files.



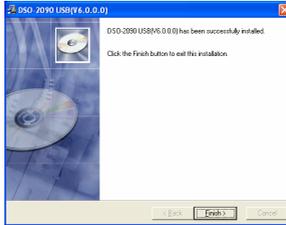
6. This Status dialog is displayed during copying of files.



7. Updating Your System Configuration.



8. The installation is complete.



Hardware Setup

1. Connect the A-Type Plug of USB cable to your PC'S USB port.



2. Connect the B-Type Plug of USB cable to DSO-2090 USB'S USB port.



3. New hardware is found.



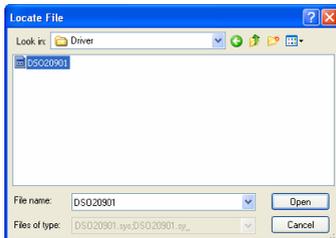
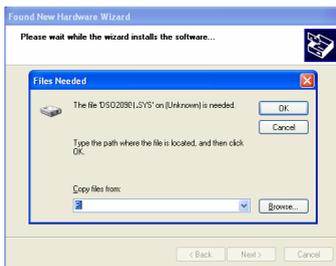
4. New hardware search wizard starts.



5. New hardware search wizard starts to search



6. New hardware wizard installs software



7. Finish new hardware search wizard.



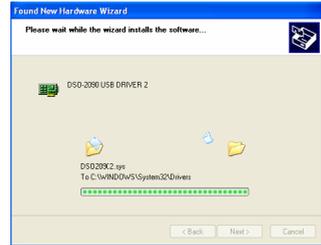
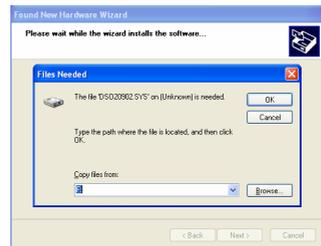
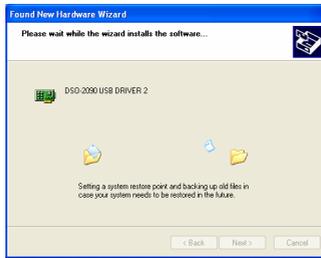
8. New hardware is found.



9. New hardware search wizard starts to search



10. New hardware search wizard starts to search.



11. New hardware wizard installs software and finish new hardware search wizard.



Setup DSO-2090 USB.inf under windows 2000

When DSO-2090USB.inf file is not detected automatically, you see the following dialog box.

In this case you must install DSO-2090 USB.inf file manually.

1. Choose 'Search for a suitable driver for my device' button. Click Next to continue.
2. Specify a location. Click Next to continue.
3. The DSO-2090 USB.inf file is located in DSO-2090 USB CD-ROM root directory. Specify the location by either entering or browsing.
4. DSO-2090 USB.inf file is detected automatically. Click Next to continue.
5. Click Finish.

Probe Calibration

DSO-2090 USB Calibration

1. When manufactured, DSO-2090 USB is calibrated manually to obtain maximum performance.
2. You may calibrate DSO-2090 USB 5 or 6 months after purchase.

Probe Compensation

1. You must use a probe with more than 40MHz bandwidth to get undistorted signal.
2. Probe should be compensated whenever it is connected for the first time.
3. Connect calibration signal to channel 1, then push AUTOSSET.
4. Check the shape of the displayed waveform.
5. Adjust the probe until the displayed waveform is compensated.

