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Technology

Motorcycle Diagnostics Kit

Quick Start Guide

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Revision history:

1	13.4.07	Derived from DO110
2	22.6.07	PicoScope 6 version

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1 Introduction

The Pico Technology Motorcycle Diagnostics Kit is based on our PicoScope 3000 Series Automotive PC Oscilloscopes and includes our own motorcycle-specific software. The PC Oscilloscope turns a laptop or desktop PC into a powerful motorcycle diagnostics tool for fault-finding the increasing number of sensors, actuators and electronic circuits found on today's bikes.

This manual is a quick start guide which lists the products in the kit and shows you how to make your first measurements using the Pico Motorcycle Diagnostics Kit.

For further information, you can consult the PicoScope 3000 Series Automotive user guide which contains detailed information about using the scope and its software. It includes all the information you will need to connect and set up your scope. The user guide is installed in electronic Windows Help format, but if you would prefer a paper copy, you can print the PDF file listed under 'User Manuals' on the CD-ROM.

2 Kit Contents

The Motorcycle Diagnostics Kit (PP401) contains the following parts and accessories.

Item		Part no.	Q'ty
	PicoScope 3223 two-channel PC Oscilloscope	PP279	1
	USB cable	MI106	1
	60 A DC current clamp	PP264	1
	600 A AC/DC current clamp	PP266	1
	20:1 attenuator	PP198	1
	Multimeter probe (black)	TA001	1
	Multimeter probe (red)	TA002	1
	Small croc clip (black)	TA003	1
	Small croc clip (red)	TA004	1
	Dolphin clip (black)	TA005	1
	Dolphin clip (red)	TA006	1
	Insulation-piercing probes (pack of 2)	TA007	1
	Acupuncture probe set	TA008	1
	Test lead	TA000	2
	Secondary ignition pickup lead	PP178	2
	Two-pin break-out lead	TA012	1
	Motorcycle software CD	DI046	1
	Motorcycle Diagnostic Kit Quick Start Guide	DO125	1
	Carry case	PP207	1

3 Installation Guide

IMPORTANT: Do not connect your PicoScope PC Oscilloscope to the PC before you have installed the PicoScope software.

3.1 Installing the software

The PicoScope Automotive software has been designed to run on computers with Windows XP SP2 and Vista. For limited support for older, versions of Windows, see **www.picoauto.com**.

1. Insert the Pico CD into your CD-ROM drive. If Auto Run is enabled then the CD will start up automatically, and you can go to step 5.
2. Press the **Start** button and select **Run**.
3. Type **d:\index** (where **d:** is the drive letter for your CD-ROM drive).
4. Press the **Enter** key.
5. Click the **Software** button.
6. Click the **Install PicoScope Automotive Software** button.
7. The program will guide you through the rest of the installation.

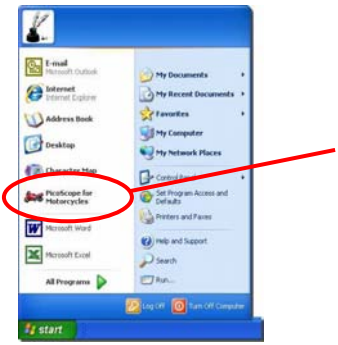
3.2 Connecting the PC Oscilloscope to your PC

From this point the software should already have been installed on the PC. If the software hasn't already been installed then please follow the steps in 3.1 on Installing the software.

Connect the USB connector on the PicoScope PC Oscilloscope to the USB port on the computer. **To minimise the risk of electromagnetic interference, please use the USB cable provided.** The light on the front of the oscilloscope should now be on or flashing, showing that the unit has power.

3.3 Starting the application software

The Motorcycle Diagnostics Kit is supplied with the PicoScope application program. To start PicoScope simply click the PicoScope icon in the Pico Technology group in the Start menu.

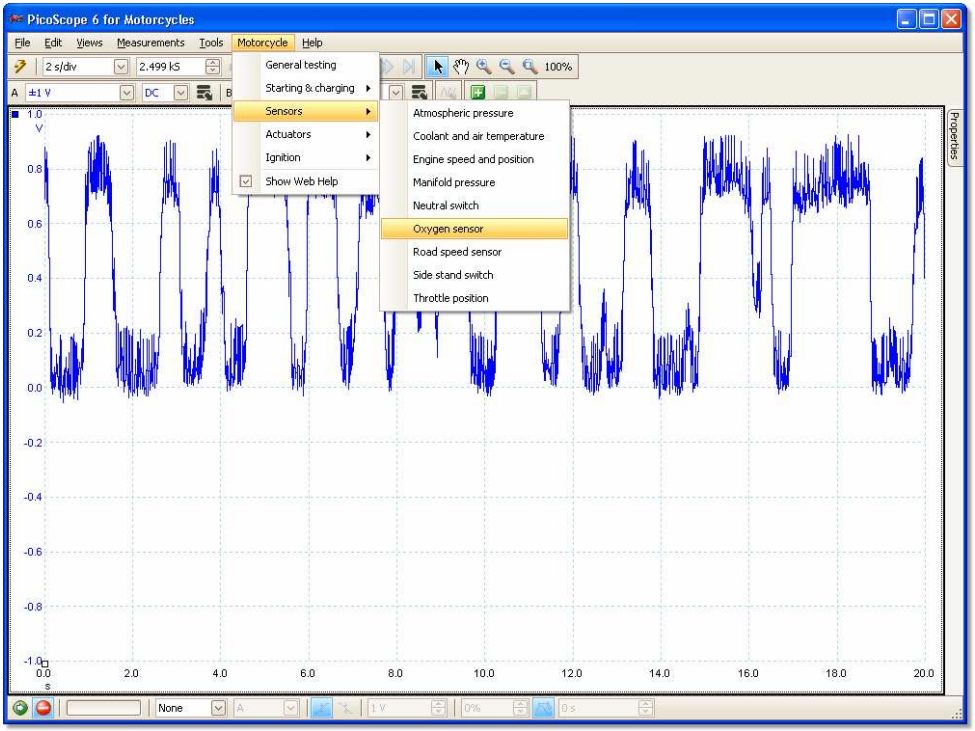


PicoScope is our PC Oscilloscope application with added features for Motorcycle Diagnostics.

3.4 Finding your way around PicoScope

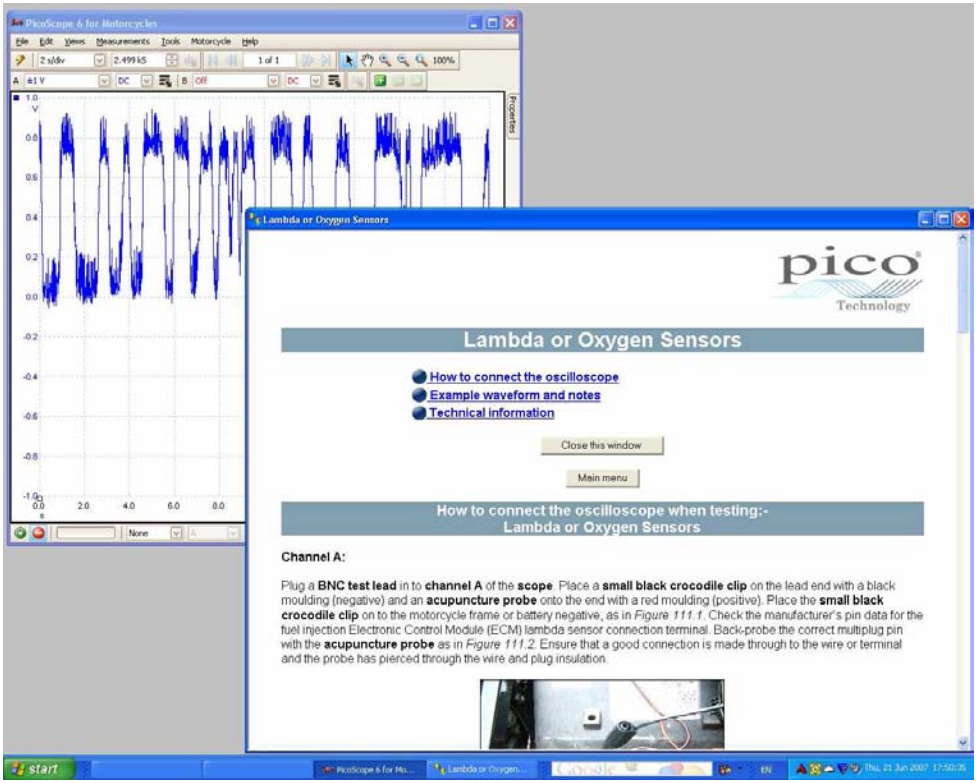
The drop-down menus and toolbars of the PicoScope display will be familiar to all users of Windows software.

The **Motorcycle** drop-down menu in the menu bar is an important feature of the Motorcycle Diagnostics software.



This menu displays a selection of the common measurements that can be taken using the Motorcycle Diagnostics Kit. When you select one of the measurement options from the menu, PicoScope will automatically:

- Load a sample waveform appropriate to the chosen measurement
- Change its settings to the defaults for the chosen measurement
- Display a web-based help page with information on the accessories needed to take the measurement, setting up the equipment, example captured waveforms and any additional technical information that may be useful.

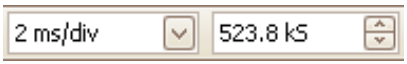


The top tool bar gives you all the frequently used controls for the oscilloscope. The first group of buttons on the left of the toolbar opens different windows:

Auto setup button. Adjusts the timebase and voltage range automatically for the best display.

Add measurement. Adds an automatic measurement, similar to a meter display but much more flexible.

Both channels are controlled by the timebase drop-down menus:



The first drop-down control specifies the amount of time that the trace takes to cross one square horizontally. The second control specifies the number of samples, which you do not need to adjust until you have an advanced understanding of the software.

The PicoScope 3223 PC Oscilloscope has two channels: A and B. Each channel is controlled by its own set of controls in the top toolbar:

The first drop-down control selects the range of signal that you are interested in measuring. If any custom ranges are defined, these will also be displayed here.

The second drop-down control selects either AC or DC coupling.

The third drop-down controls selects advanced options.

Additional information on the rest of the drop-down controls in the top toolbar can be found in the help menu installed with the software.

On the bottom toolbar, the **Start** and **Stop** buttons start and stop the capturing of waveforms (you can also press the spacebar for the same effect). When you stop the oscilloscope, it holds the last waveform on the display.

The bottom toolbar also contains the controls for setting up the triggering conditions for the oscilloscope. Triggering is used to select the moment when PicoScope starts to collect data to display. This is usually at some fixed time before or after a trigger event. There is only one set of trigger settings, which applies to all views.

A trigger event occurs when a specified channel crosses a voltage threshold (while rising or falling). PicoScope can start collecting data immediately after the trigger event or at a fixed time interval before or after the trigger event.

After PicoScope has collected a block of data and displayed it, it can either start looking for the next trigger event (Repeat and Auto modes), or stop collecting (Single mode), and leave the data after the trigger on the display.

3.5 *Making your first measurement*

We suggest that you first use the Motorcycle Diagnostics Kit to capture the current and voltage waveforms from the alternator. You will find this option in the **Motorcycle** menu under **Motorcycle | Starting & charging | Charging volts & amps**. The help page that appears automatically shows you how to connect the different parts of the Motorcycle Diagnostics Kit and gives you a basic understanding of the kit.

4 Safety Warnings

We strongly recommend that you read the general safety information below and also the product-specific safety warning in the user guide before using your product for the first time. If you do not use the equipment in the manner specified, then you may impair the protection provided. This could result in damage to your computer or injury to yourself or others.

The PicoScope 3000 Series Automotive user guide is installed on your computer when you install the supplied software.

Maximum input range
The maximum input range of the PicoScope 3000 Series Automotive PC Oscilloscopes is ±50 V, and overload protection is ±100 V. Always operate the product within the maximum input range. Operation outside the range of the overload protection is likely to cause permanent damage to the unit.

Measuring inductive signals
When using the PicoScope 3000 Series Automotive PC Oscilloscopes to measure signals from a fuel injector, primary ignition waveforms or any other inductive signal, you must fit the PP198 attenuator.

The PP198 provides increased input protection against overloads when working with primary ignition and injector waveforms. Under no circumstances attempt to use this attenuator to measure any other waveforms. Use the PP178 Secondary Ignition Pickup lead to measure secondary ignition (HT) waveforms.

Using the secondary ignition pickup PP178
When attaching or removing secondary ignition pickups from damaged HT leads there is a possibility of getting an electric shock. To eliminate this danger, attach and remove the secondary ignition pickup with the ignition turned off.

Mains voltages
No Pico products are designed for use with mains voltages. To measure mains we recommend the use of a differential isolating probe specifically designed for such measurements.

Safety grounding
The ground of every product is connected directly to the ground of your computer through the provided USB cable. This is done in order to minimise interference. Always use the provided cable to attach the product to your computer.

As with most oscilloscopes, you should take care to avoid connecting the ground input of the product to anything which may be at some voltage other than ground. If in doubt, use a meter to check that there is no significant AC or DC voltage. Failure to check may cause damage to the product or computer and could cause injury to yourself or others.

You should assume that the product does not have a protective safety earth. Incorrect configuration or use on voltages outside the maximum input range can be hazardous.

Loose items
Make sure that you keep yourself, your clothes, test equipment and other objects away from any moving parts such as pulleys and fans.

Condition of equipment
Before using any of the probes, sensors or test equipment, make sure they are not damaged in any way.

Repairs
The unit contains no user-serviceable parts. Repair or calibration of the unit requires specialised test equipment and must be performed by Pico Technology Limited or its authorised distributors.

5 Technical Support

Pico Technology can give technical support on the products within the Motorcycle Diagnostics Kit, but we cannot give advice on how to diagnose problems with your vehicles.

The Pico Technology web site contains regularly updated technical support at www.picotech.com. You can also contact our technical support team directly:

Tel: +44 (0) 1480 396 395
Fax: +44 (0) 1480 396 296
Email: support@picotech.com

6 Key Specifications of the PicoScope 3000 Series Automotive PC Oscilloscope

Model	PicoScope 3223
Channels	2
Maximum sampling rate 1 channel 2 channels	 20 MS/s 10 MS/s
Input connectors	2 x BNC
Analog bandwidth	10 MHz (5 MHz on 20 mV range)
Buffer size 1 channel 2 channels	 512 kilosamples 256 kilosamples
Resolution	12 bits
Accuracy	±1% voltage
Voltage ranges	±50 V, ±20 V, ± 10V, ±5 V, ±2 V, ±1 V, ±500 mV, ±200 mV, ±100 mV, ±50 mV, ±20 mV
Input impedance	1 MΩ
Overload protection	±100 V (any input to ground)
PC connection	USB 2.0 Compatible with USB 1.1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