

PicoScope[®] 6 Automotive

Introductory Guide

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1. Guide to PicoScope 6 Automotive

This document gives a basic overview and introduction to PicoScope 6 Automotive, including both the software itself and the hardware (PicoScope unit) you'll be using. For more detail on any of these topics, please refer to the PicoScope 6 User's Guide, or consider attending one of our training courses.

Introduction to our equipment

Each PicoScope automotive oscilloscope is supplied with a base set of tools and components, allowing you to take the voltage and current measurements you need to perform a wide range of tests.

The PicoScope unit itself takes the readings from the probes and/or clamps attached and converts them into signals for your PC to display. It uses industry standard BNC connections, enabling the use of a wide variety of accessories, and is connected to the PC by a USB lead, which it also uses to draw power.

At the time of writing (February 2016), our starter kits contained the following items:

Item	Number	
	2-channel kit	4-channel kit
PicoScope 4225 or 4425 automotive oscilloscope	1	1
Premium test leads	2	4
10:1 attenuator	1	1
Flexible backpinning probe (red)	1	2
Flexible backpinning probe (black)	1	2
Small crocodile/gator clip (red)	1	2
Small crocodile/gator clip (black)	1	2
Battery clip (red)	1	1
Battery clip (black)	1	2
USB cable 1.8m ¹	1	1
PicoScope 6 Automotive software CD-ROM	1	1
Training resources DVD	1	1
Automotive Quick Start Guide	1	1

We also offer standard, diesel and advanced kits, with additional probes and leads and accessories such as current clamps and adaptors. Details can be found on our website, www.picoauto.com.

Once you have connected the PicoScope to the PC, start the software. Always start the software **after** connecting the PicoScope unit: otherwise it will run in demo mode.

The PicoScope way

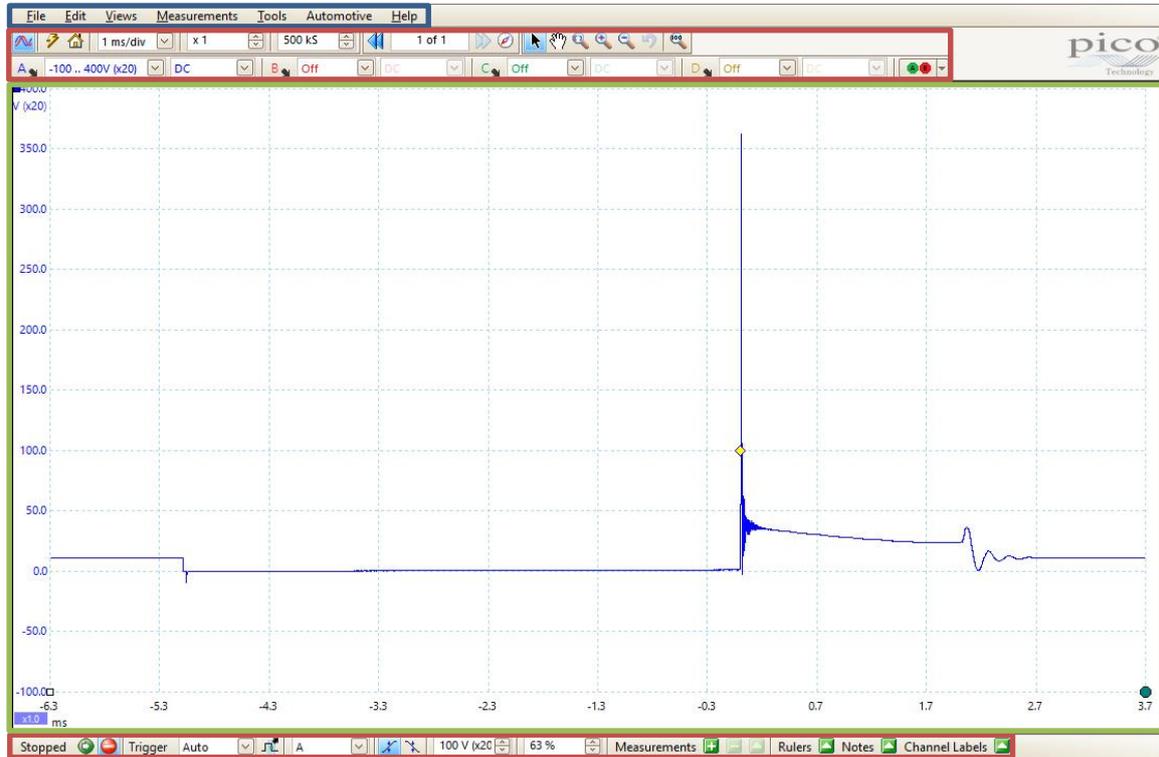
PicoScope 6 Automotive is an ever-evolving program, so it is important that the software installed on your PC is the latest version.

¹ Make sure you use the blue USB cable supplied – it has been specially designed to provide better grounding for your PicoScope. Please contact us if you need a replacement.

The software is designed to use as much of the PC/laptop display screen as possible to display the waveform being captured.

PicoScope 6 Automotive – introducing the software

The PicoScope 6 Automotive display is divided into three sections. The Signal View is highlighted in green in the image below and described in the next section of this document. The Toolbars are highlighted in red and discussed in Section 3, and the Menu bar (highlighted in blue) is covered in Sections 4 to 8.

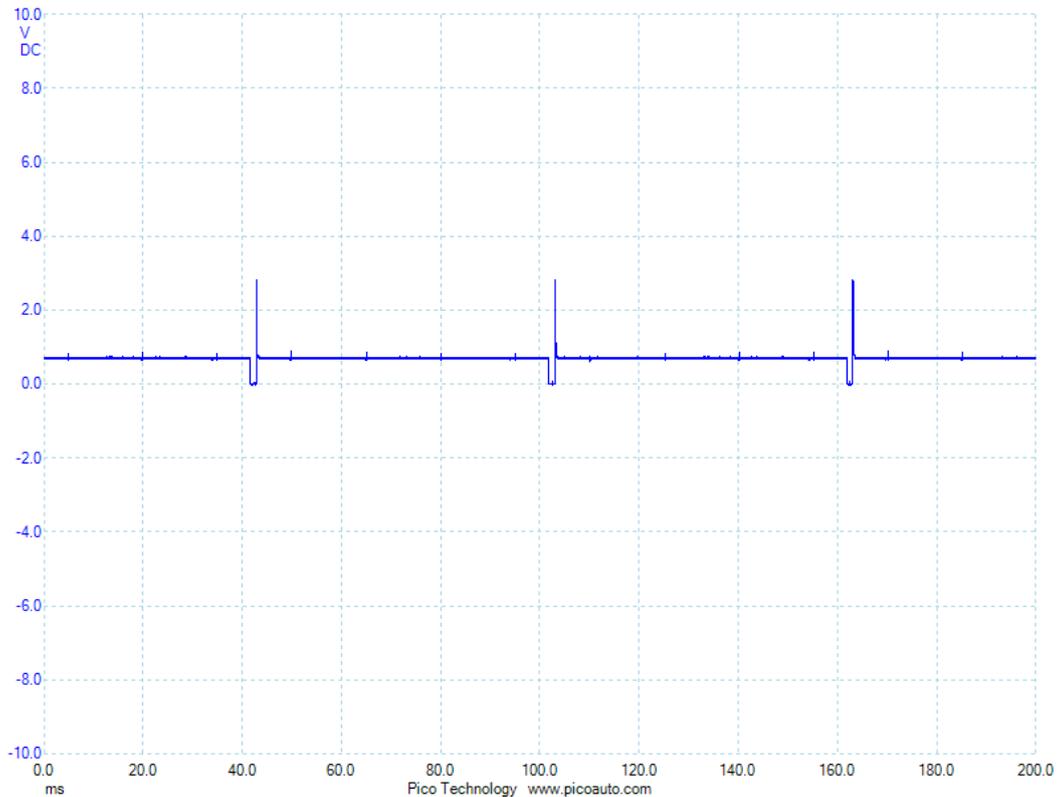


The 20:20 rule

If you aren't sure which settings to use to capture your signal, a timebase of 20 ms/div and a voltage range of ± 20 V are a good start. These settings are usually good enough to capture a general automotive signal, allowing you to refine your settings from there. Timebase and voltage range will both be covered in more detail later in this guide.

2. Signal view

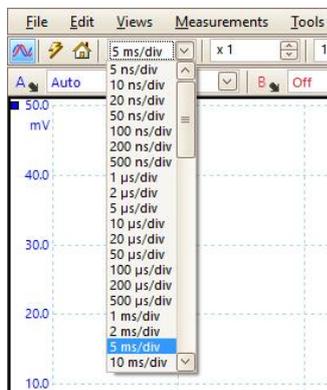
The signal view is split into a fixed 10 by 10 grid. The 10 vertical divisions represent the voltage range, while the horizontal ones represent time. The grid is fixed but the voltage and time (timebase) can be varied. The oscilloscope trace is drawn from left to right across the signal view.



Timebase

The timebase is set by default to 5 milliseconds per division (ms/div), but can be varied in multiples of 1, 2 and 5: for example 1 s/div, 2 s/div, 5 s/div. The minimum and maximum timebases depend on the sampling rate of your PicoScope. Our PicoScope 4225 and 4425 Automotive oscilloscopes have a maximum timebase of 5000 s/div.

As the image below shows, there are lots of timebases to choose from. These can be accessed by scrolling up and down.



By default, the timebase is set as time per division, but you can change it to show the total collection time instead (See [8. Preferences](#)).

Starting and stopping capture

The red and green buttons on the left hand side of the bottom (by default) toolbar start and stop the acquisition of data (this can also be done by pressing the spacebar). The blue highlight on either the red or the green button indicates whether or not the scope is capturing. The image below shows the green button highlighted, meaning the scope is capturing:

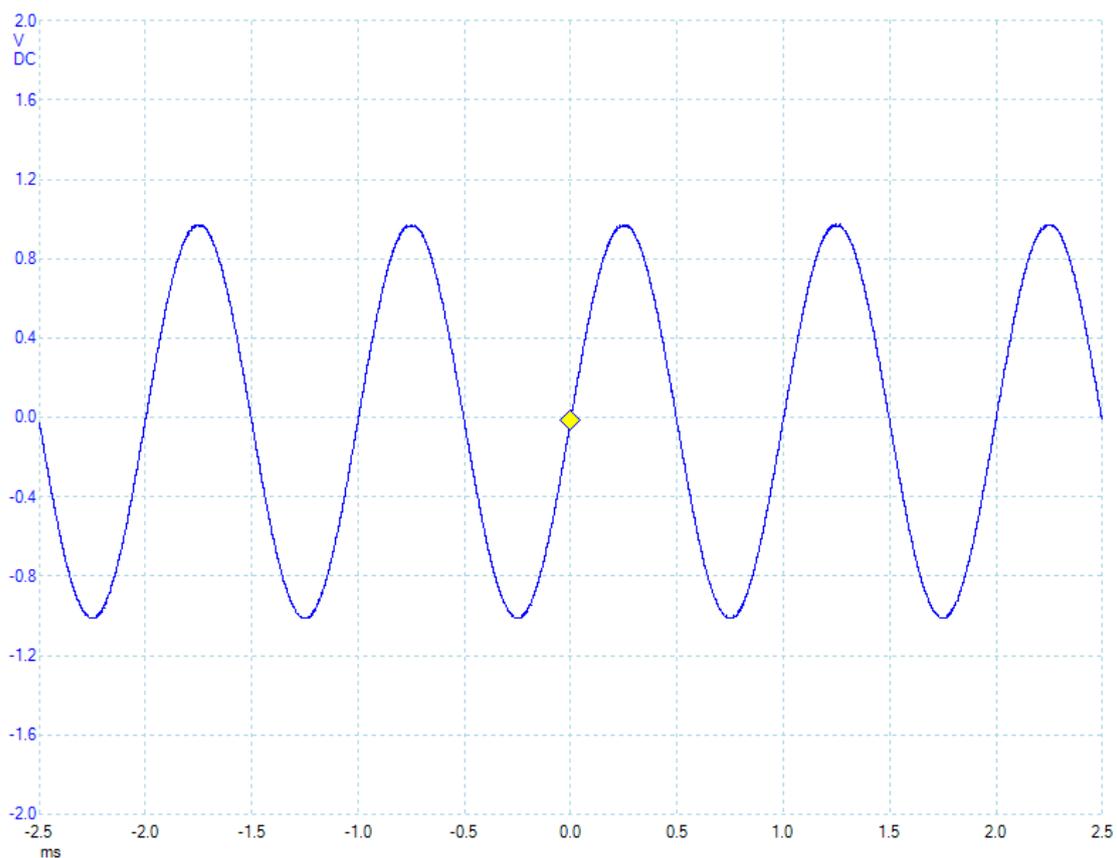


If you prefer, you can place this toolbar at the top of the screen (See [8. Preferences](#)).

Triggering

A trigger is a voltage level that, when a signal passes through it, causes the oscilloscope to capture or lock on to the waveform. If you don't set a trigger, the trace may not be stable on the screen, and you could also miss the signal you're looking for.

The image below shows the trigger diamond that appears when triggering is enabled.



3. Main toolbars

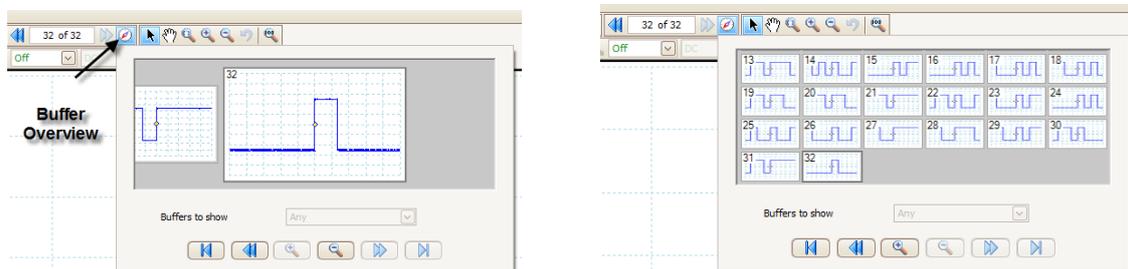


Number of samples

This defines the maximum number of samples across the screen: the more samples, the more detailed the signal trace (and the larger the saved file becomes). The actual number of samples is not always exactly what is selected, but it will not be greater. 1 MS is a good number to use as a starting point, but this can vary depending on the test.

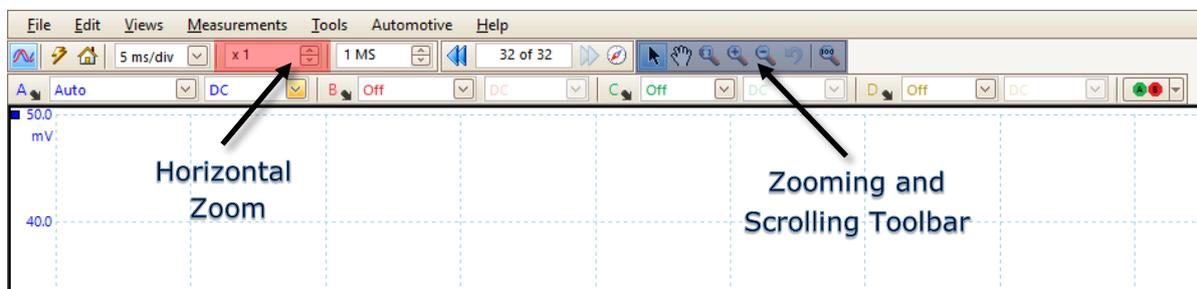
Buffer navigation toolbar

Each screen capture in PicoScope 6 Automotive is called a waveform. The software can store more than one waveform at a time, and the Buffer Navigation toolbar keeps a count of the number that have been captured. The maximum number of buffers is 10 000. You can navigate through these buffers either by clicking on the double arrows to move backwards and forwards or by using the **Buffer Overview**, which gives a thumbnail view.



Zooming and scrolling

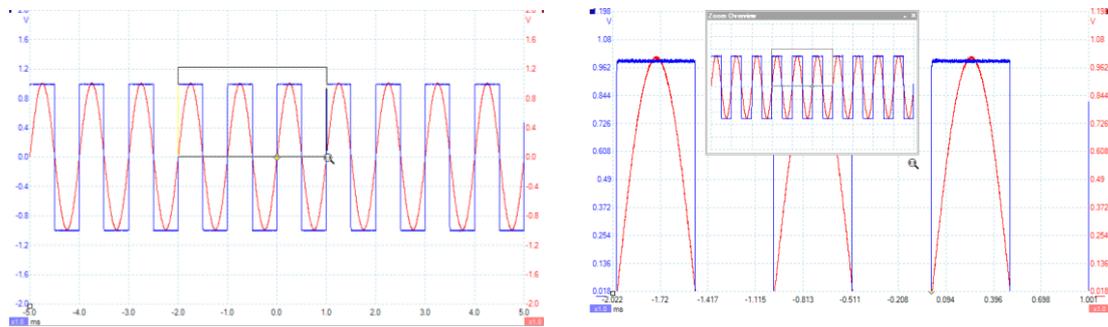
There are a number of ways to zoom into a signal and to scroll around the zoomed waveform. You can do this using the controls in the Zooming and Scrolling toolbar and the Horizontal Zoom control in the Capture Setup toolbar.



Window zoom



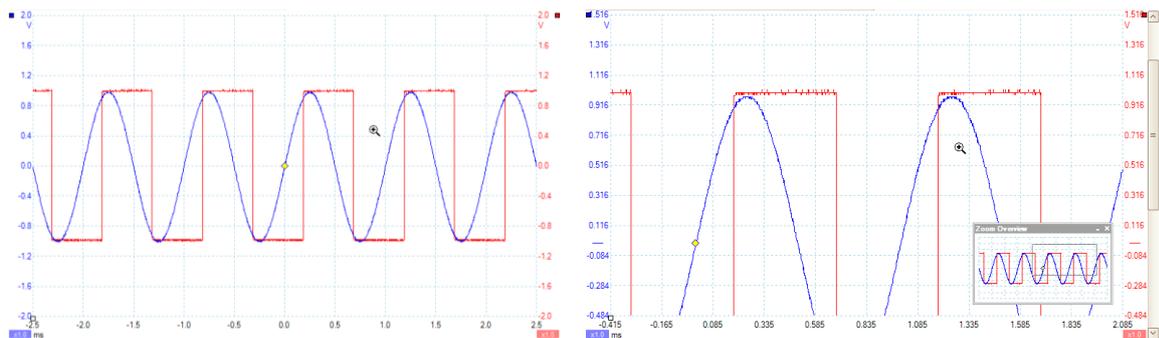
This button allows you to specify an area of interest by drawing a box around it.



Zoom in and out



These two buttons allow you to expand a point of interest just by clicking on it, and to zoom out again afterwards.

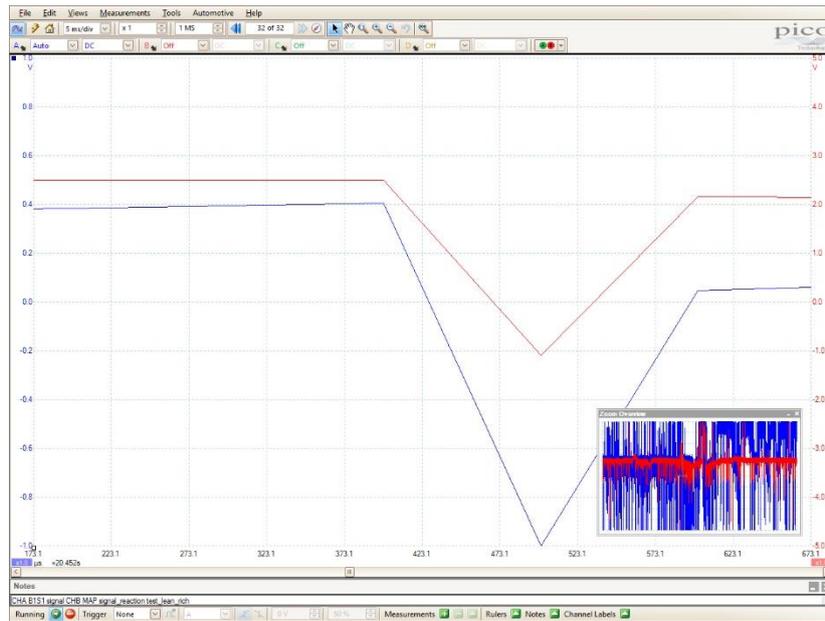


Horizontal zoom



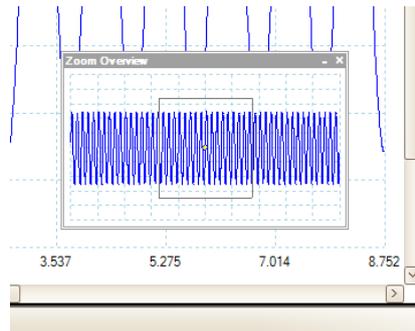
This allows you to zoom in the horizontal direction, subject to the capabilities of the device.

The image below shows PicoScope zoomed in 100 000 times horizontally.

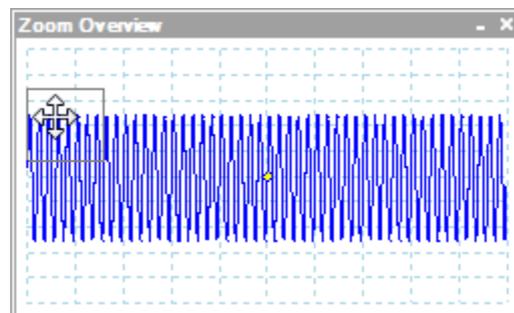
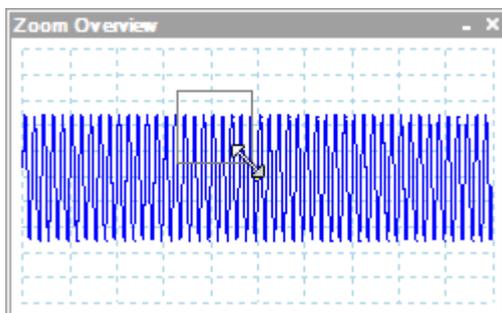


Zoom overview and scrolling

When the waveform is zoomed in, the **Zoom Overview** window appears, showing the whole waveform and a box marking the area that has been zoomed in.



This area can be resized by dragging the corners of the box, and moved by clicking and dragging within it.



You can also use the hand tool to move around a zoomed-in waveform. With this tool selected, you can click and drag the main signal view.

Channel toolbar

Channel selection

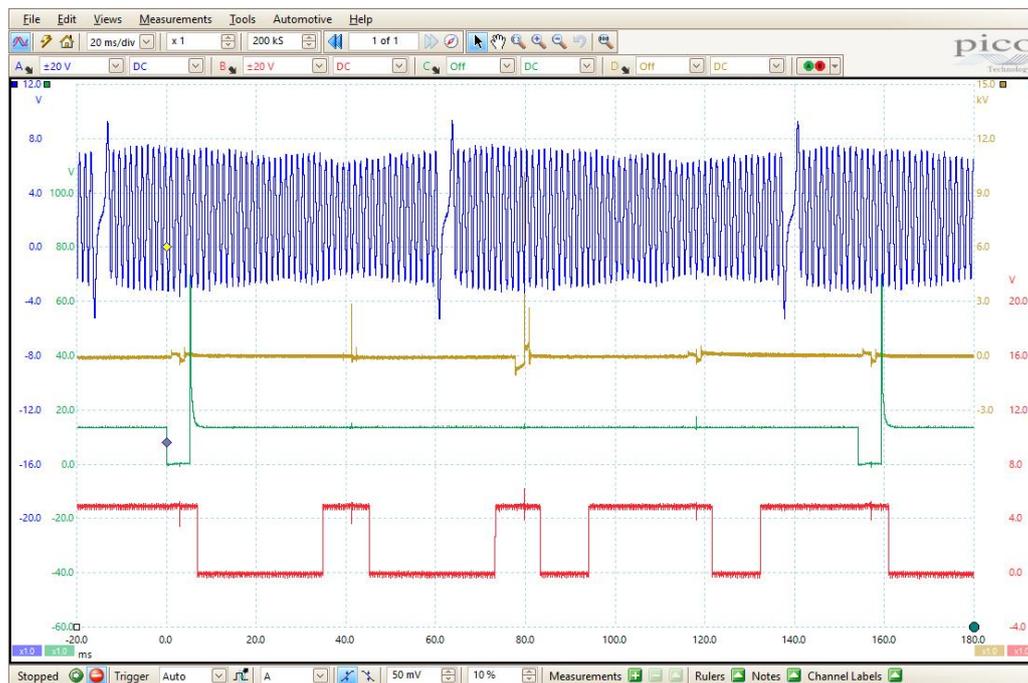
Multiple channels can be selected. Each one is identified with a different color trace and matching axis:

Channel A **Blue**

Channel B **Red**

Channel C **Green**

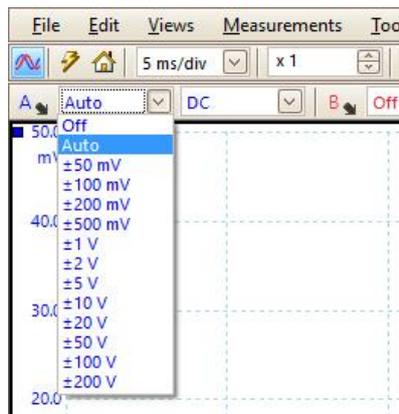
Channel D **Yellow**



Voltage range

The voltage ranges are selectable and go up in multiples of 1, 2 and 5, e.g. ± 100 mV, ± 200 mV, ± 500 mV, ± 1 V. While the timebase can be changed from time per division to the total collection time, the voltage scale is always set as the full voltage range across all 10 divisions, so each division on a ± 20 V range represents 4 V.

The PicoScope 4225 and 4425 Automotive oscilloscopes have a minimum voltage range of ± 50 mV and a maximum of ± 200 V.

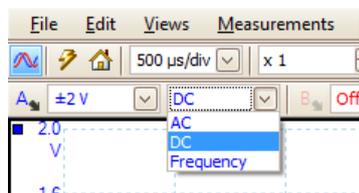


If the yellow warning icon  appears in the upper corner of the PicoScope screen, it means that a difference of more than 30 V is being applied between two grounds of the scope. When this warning appears, you should check the orientation of the test connections against the wiring diagrams. In some cases, you may need to provide a 0 V reference to the scope, using the M4 bolt on the rear of the unit.

If the red warning icon  appears, it means that the signal voltage is exceeding the normal measurement range. This icon appears in the upper corner of the screen, next to the relevant channel's vertical axis: you should increase the voltage range of the channel displaying this error.

Coupling

Sets up the input circuitry of the oscilloscope.



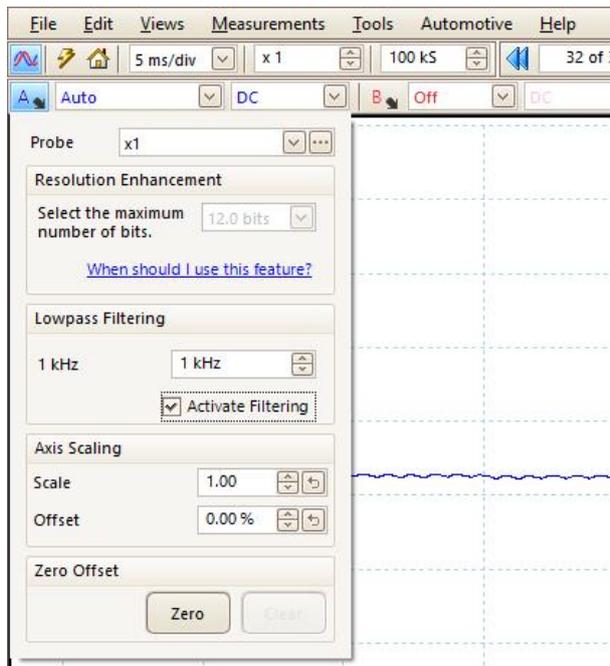
Three kinds of coupling are available:

Coupling type	Description
AC	Rejects frequencies below 1 Hz, useful for removing DC offset from an AC signal.
DC	Accepts all frequencies from DC to the scope's maximum bandwidth.
Frequency	Enables the built-in frequency counter, only available on some 4000 series Automotive oscilloscopes.

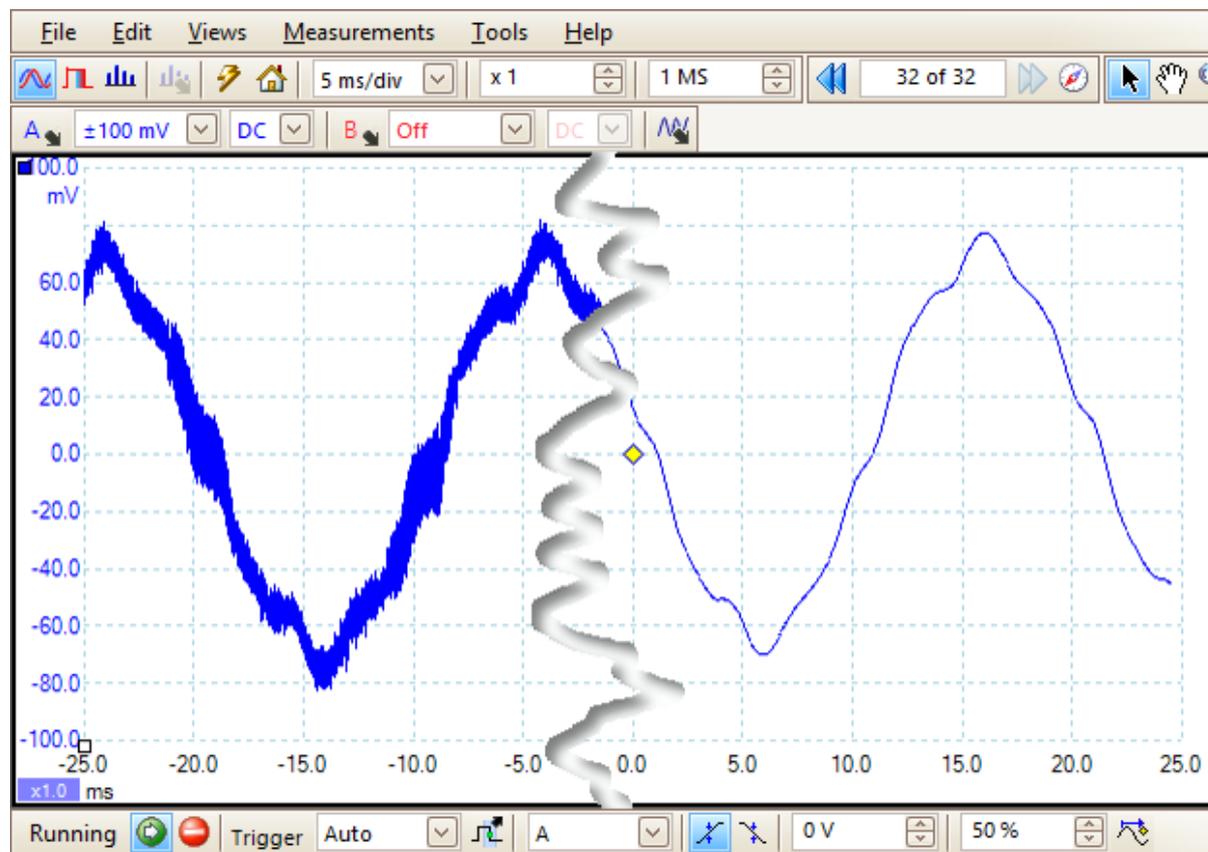
Lowpass filtering

Lowpass filtering is useful for eliminating noise from a signal. It does this by rejecting the high frequency data from any selected input channel. The filtering control is found in the Channel Options menu, which you can access by clicking the **Channel Options**

button  for the relevant channel. This control determines the cut-off frequency of the filter, which must be less than half the sampling rate (shown on the Properties sheet, which can be accessed from the Views menu or by right-clicking on the signal view. You will find more information about this in the PicoScope 6 User's Guide).



The split screenshot below shows the effect of applying a 1 kHz lowpass filter on a noisy signal. The underlying shape of the signal is preserved, but the high-frequency noise is eliminated:



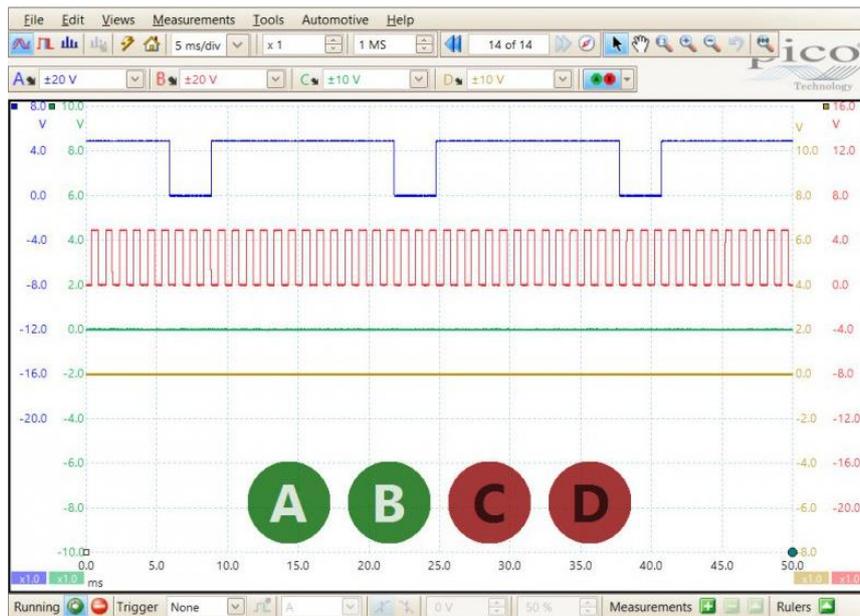
Left: before lowpass filtering. Right: after 1 kHz lowpass filtering.

ConnectDetect®

A new feature, only available on the PicoScope 4225 and 4425 automotive scopes, is ConnectDetect, a simple way to make sure your test probes are correctly attached to the components under test. To start using it, click the **ConnectDetect** button  in PicoScope 6 Automotive.

Every channel input on your PicoScope has an LED next to it. When ConnectDetect is activated, each channel's LED is either green, to indicate that the test probe is directly connected across a component, or red to indicate that it is not.

An icon representing the LED is also shown on the PicoScope screen, as in the example below, where ConnectDetect has been activated on all four channels, but only Channels A and B are properly connected.



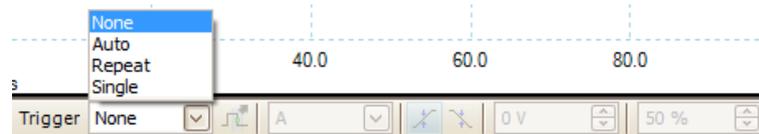
Note that ConnectDetect only works when you use probes that come into direct contact with the component under test. Sensors such as the TA204 coil-on-plug and signal probe, which works using electrical induction from the ignition coils attached to the spark plugs, do not make such a connection, so ConnectDetect will not work on them.

Triggering toolbar

You can use the Triggering toolbar to make five key adjustments to the triggers.



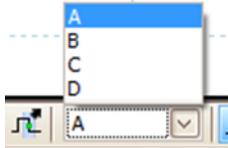
Trigger mode



- None:** No trigger condition is set and PicoScope acquires waveforms repeatedly without waiting for a signal to trigger on.
- Auto:** PicoScope waits for a trigger event before capturing the data. If, however, no trigger event occurs within a reasonable time, it captures the data anyway and it will keep on doing so until the capture is manually stopped.
- Repeat:** PicoScope waits indefinitely for a trigger event before capturing the data and will keep on doing so until the capture is manually stopped. If the trigger event never occurs, no data will be displayed.
- Single:** PicoScope waits for a trigger event before capturing the data and then once it acquires the waveform it stops capturing.

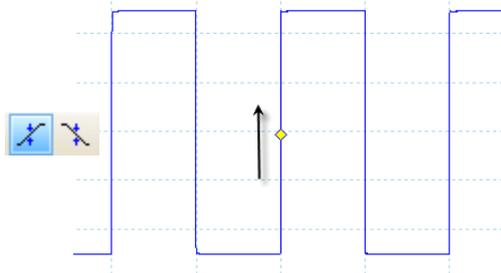
Trigger source

This option defines where the trigger will come from, and varies between models. One thing that is common across all our products is that their input data channels can be used as triggers.

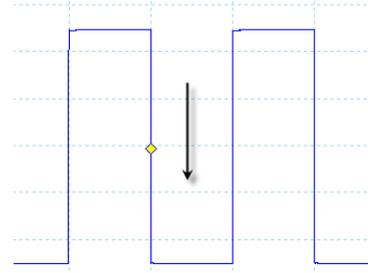


Rising/falling edge trigger

These buttons control which side of the waveform you set the trigger on. For example, if you set a 1 V rising edge trigger, your PicoScope will only capture data if the signal increases from below 1 V to above 1 V.



Rising Edge Trigger: Signal moves from below to above the trigger diamond



Falling Edge Trigger: Signal moves from above to below the trigger diamond

Trigger threshold



Use this box (highlighted in yellow above) to set the voltage of your trigger. In the rising/falling example above, the trigger threshold was set to 1 V.

Pre-trigger

This is a very useful adjustment as it allows you to control how much you see of what happened before the trigger event. The images below show an injector voltage on a 500 $\mu\text{s}/\text{div}$ timebase, giving a total of 5 ms across the screen. Figure 1 shows a 20% pre-trigger, with 1 ms of data before the trigger event. Looking at the signal, you cannot

see what happened to the waveform before this. Figure 2 shows a 50% pre-trigger, with 2.5 ms before the trigger event, which makes it much clearer what the signal does.

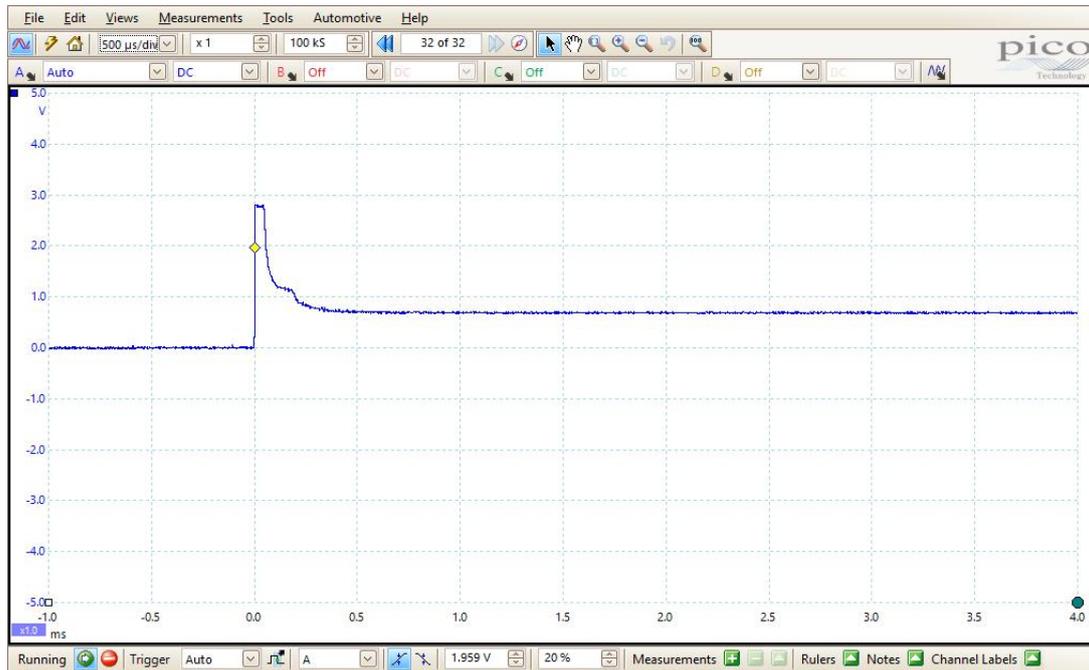


Figure 1

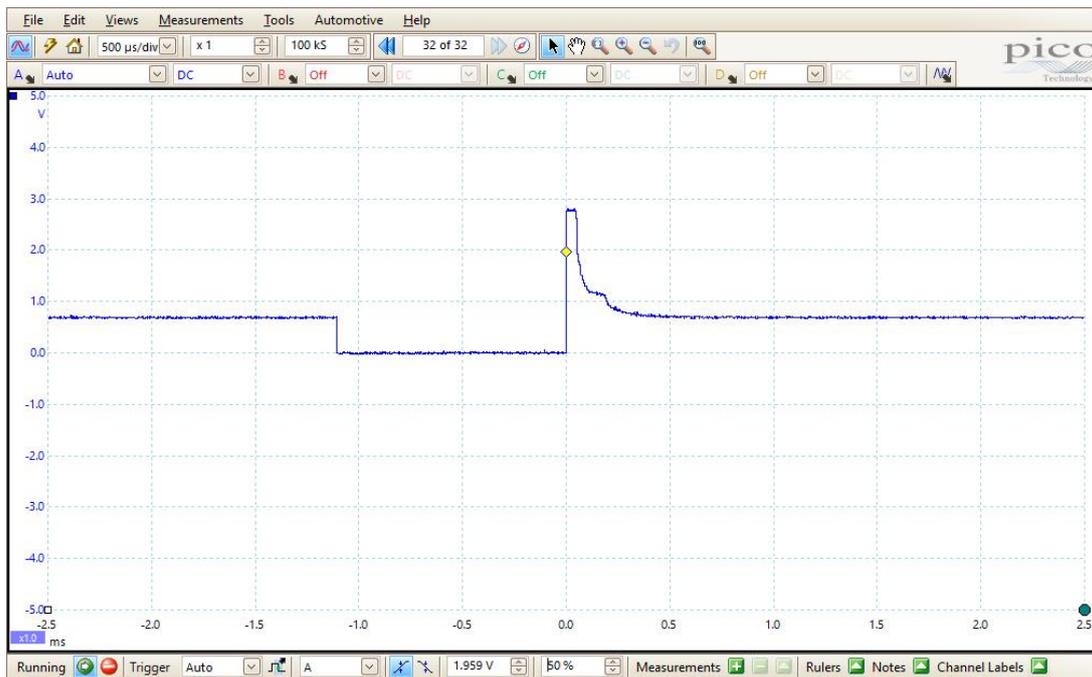
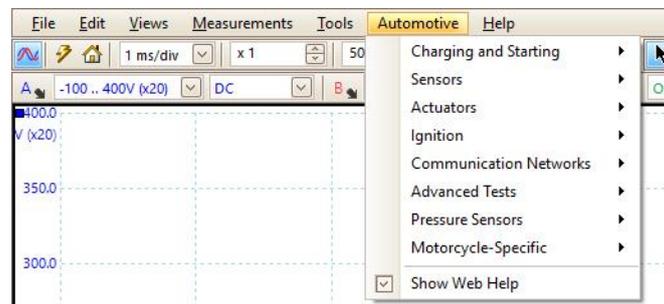


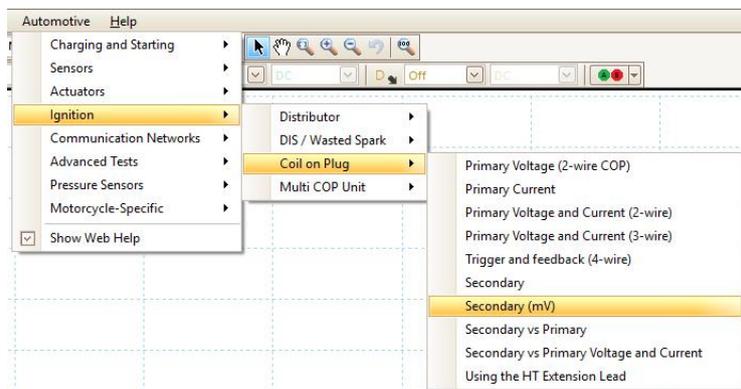
Figure 2

4. The Automotive menu

The Automotive menu is at the heart of PicoScope 6 Automotive, with over 150 pre-set tests that can be performed on vehicles.



The **Show Web Help** option at the bottom of the Automotive menu disables and enables guided tests. These are pages on the picoauto.com website, with full instructions for carrying out the test, along with some background information. This option affects all the pre-set tests, so if you clear the check box, the web pages will not appear. Web help is enabled by default.



pico
Technology

Ignition - Coil on plug - Secondary (Using mV range)

How to connect the oscilloscope when testing:- a coil on plug secondary pattern

Test Notes

This is a method for testing coil-on-plug units that are very well screened and cannot be tested using the standard COP Secondary preset. It uses the sensitive millivolt (mV) ranges of the oscilloscope to obtain the secondary waveform. Using this method, you will lose references to kilovolts (kV), but you will still be able to compare all the coil-on-plug units to try to identify any problems.

If you have a **COP Probe cable with ground clip (TA033)** then follow method 1 below. If not, use method 2.

1. Using the COP Probe cable with ground clip (TA033)

Connect the end of the **TA033 cable** with the ground clip to the scope's **Channel A** input and the other end to the COP Probe. Connect the ground clip to a reliable ground point on the engine block.

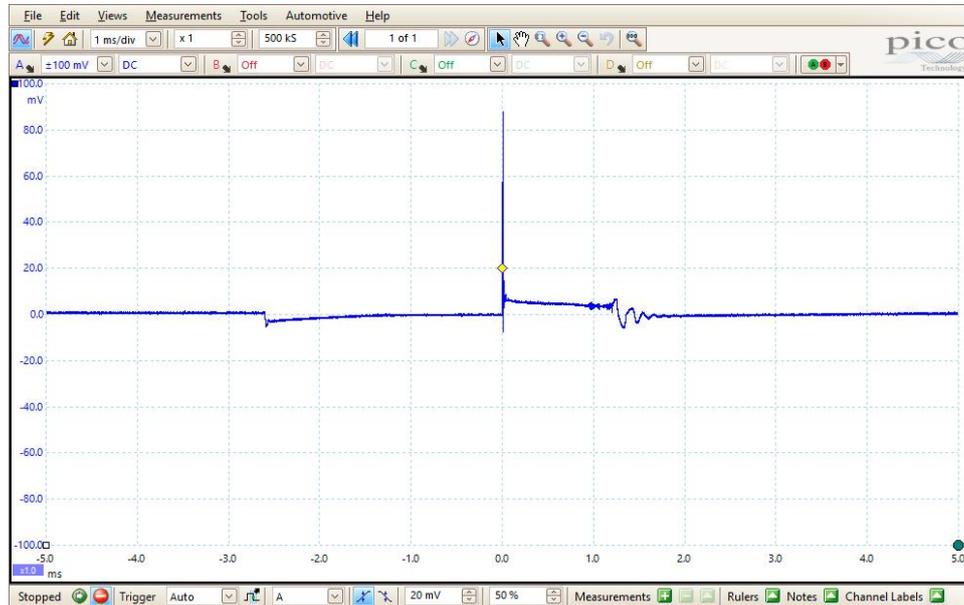
2. Using standard parts in Pico Oscilloscope Kit

Use two **BNC-to-4mm-plug test leads** and a **large black crocodile clip**. Connect the two coloured 4 mm plugs together, and then connect the two black 4 mm plugs together. Connect the pair of black 4 mm plugs to the

Figure 1 - COP Probe placed on a coil

An example waveform within the web help (guided test) topic shows how the signal should appear (the signal you see in PicoScope when you run the test will vary from one vehicle to the next). This will contain all the relevant settings to carry out the test, including correct timebase, voltage range, custom probe and triggering.

The waveform and settings also open in PicoScope 6 Automotive, whether web help is enabled or not. You may need to adjust these settings, as every vehicle is different, but they give a good starting point.



The guided test web help also provides notes on the waveform, to explain the detail of the signal. Below these, you will find technical information on the test in question.

- + How to connect the oscilloscope when testing:- a coil on plug secondary pattern
- + Example Waveforms
- Waveform Notes

The example waveform show a typical ignition picture from an engine fitted with electronic ignition. The waveform has been taken from the coil-on-plug.

The secondary waveform shows the length of time for which the HT flows across the spark plug's electrode after the initial peak of voltage required to jump the plug gap. This time is referred to as either the 'burn time' or the 'spark duration'. In the illustration, the horizontal voltage line in the centre of the oscilloscope is at fairly constant voltage, but then drops sharply into what is referred to as the 'coil oscillation' period. The 'burn time' is also illustrated in Figure 4

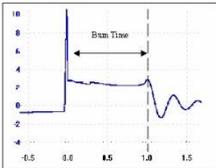


Figure 4

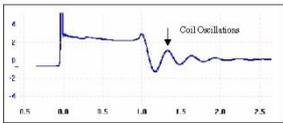


Figure 5

The coil oscillation period (as illustrated in Figure 5) should display at least 4 peaks (including upper and lower). A loss of peaks indicates that the coil needs substituting. The period between the coil oscillation and the next 'drop down' is when the coil is at rest and there is no voltage in the coil's secondary circuit. The 'drop down' is referred to as the 'negative polarity peak' (as illustrated in Figure 6) and produces a small oscillation in the opposite direction to the plug firing voltage. This is due to the initial switching on of the coil's primary current. The voltage within the coil is only released at the correct point of ignition when the HT spark ignites the air/fuel mixture.

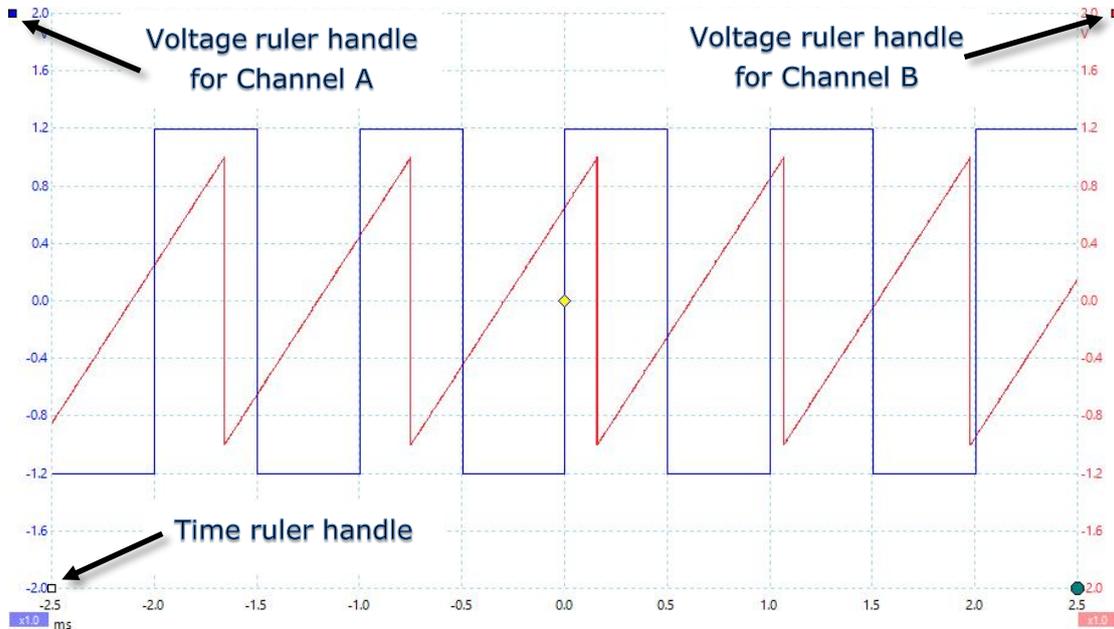
You can then start the test, using the red and green Start and Stop buttons.

5. Measurements

Measurements can be achieved using either rulers or automatic measurements.

Basic rulers

The image below shows the voltage ruler handles and the time ruler handle. The voltage ruler handles are the same color as the channel they are associated with, while the time ruler handle is white.



There are two rulers for time and two rulers per channel for voltage. The rulers can be used by moving the mouse over the ruler handles and dragging. You can move the time rulers left and right, and the voltage rulers up and down, at any time.

As soon as you start to move the first ruler, the ruler legend box appears, showing the ruler's exact position on the time or voltage scale. When you drag the second ruler into

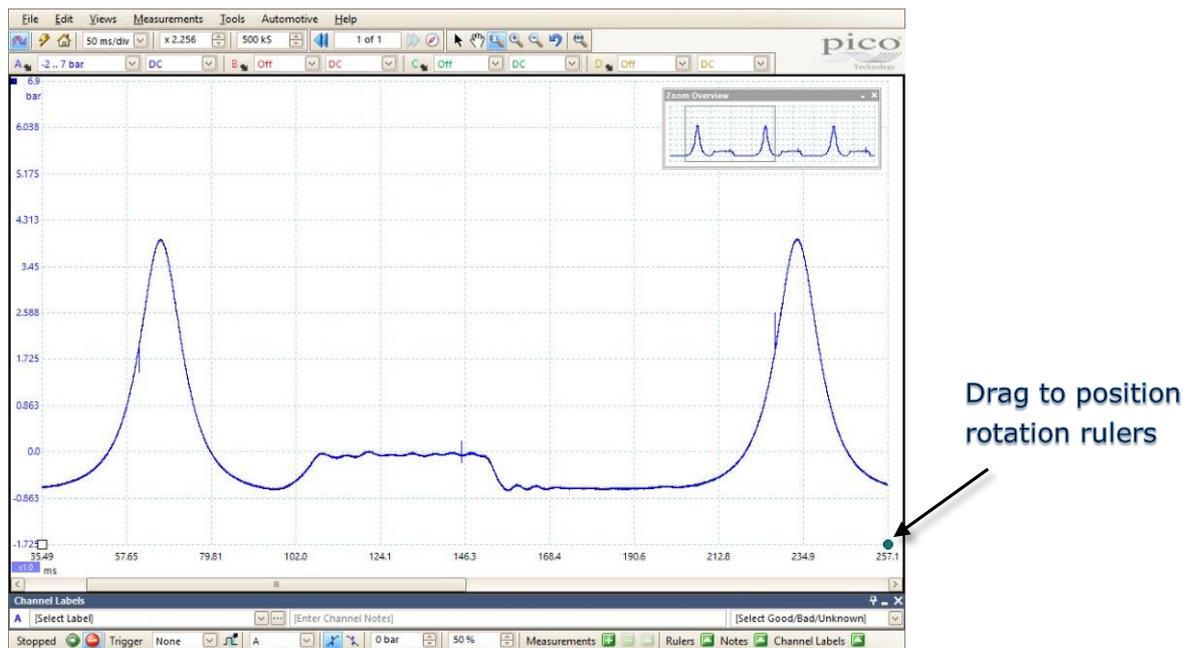
place, its position is added to the ruler legend box and the difference between the two values (Δ , delta) is displayed.



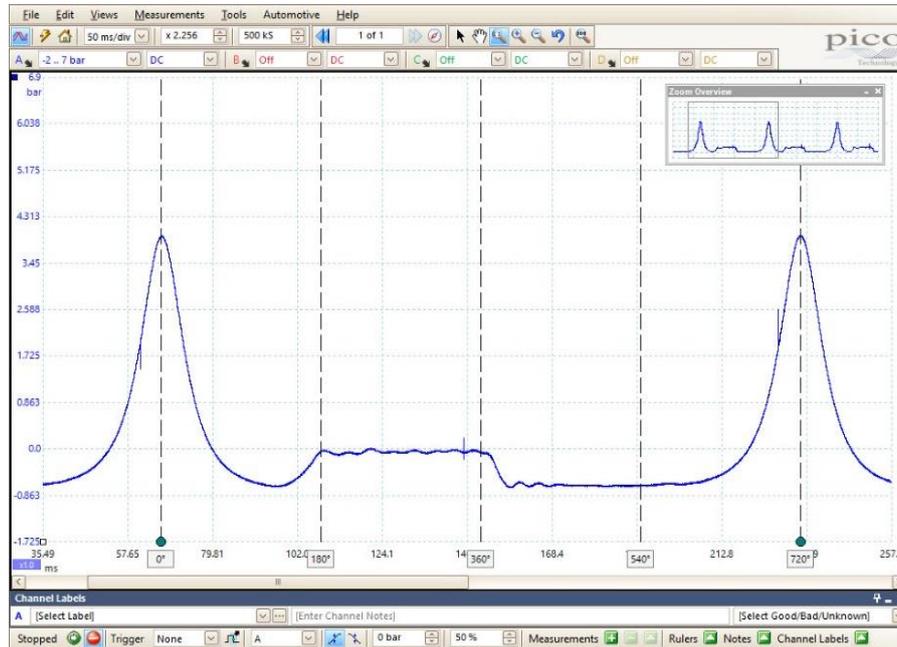
Rotation rulers

The rotation rulers help to measure the timing of a cyclic waveform on a scope view. Instead of measuring relative to the trigger point, as time rulers do, rotation rulers measure relative to the start and end of a time interval that you specify. Measurements may be shown in degrees, percent or a custom unit as selected by the Ruler settings box.

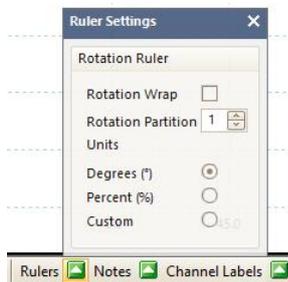
To use the rotation rulers, drag the two rotation ruler handles onto the waveform from their inactive position as shown below:



In the signal view below, the two rotation rulers have been dragged into place to mark the start and end of a cycle. The default start and end rotation values of 0° and 720° are shown below the rulers and can be edited to any custom value.

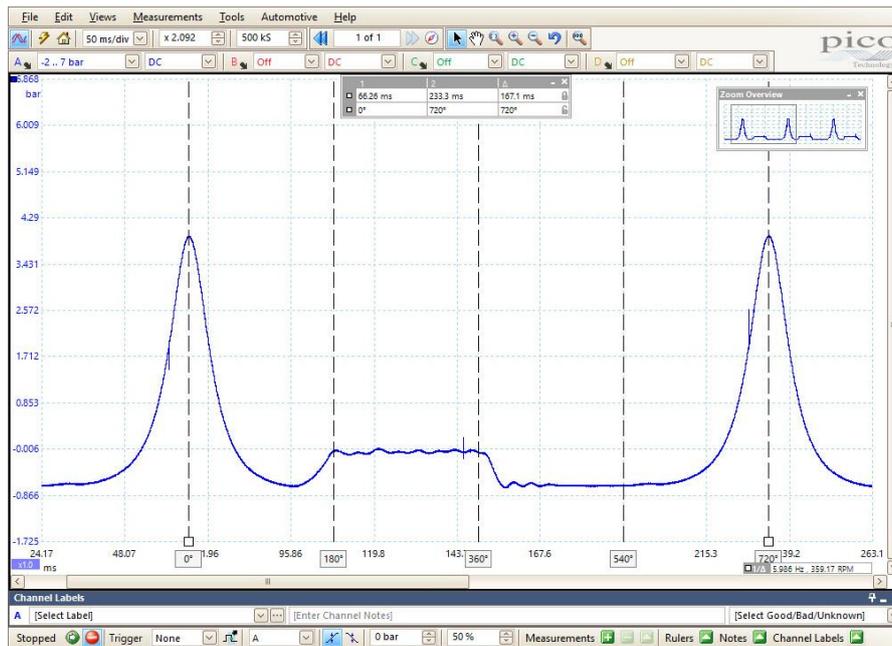


Notice that, as well as the 0° and 720° markers, lines have been drawn to mark 180°, 360° and 540°. These were inserted using the Rotation Partition option in the Ruler settings box, which appears when you click **Rulers** on the bottom toolbar.



Ruler legend

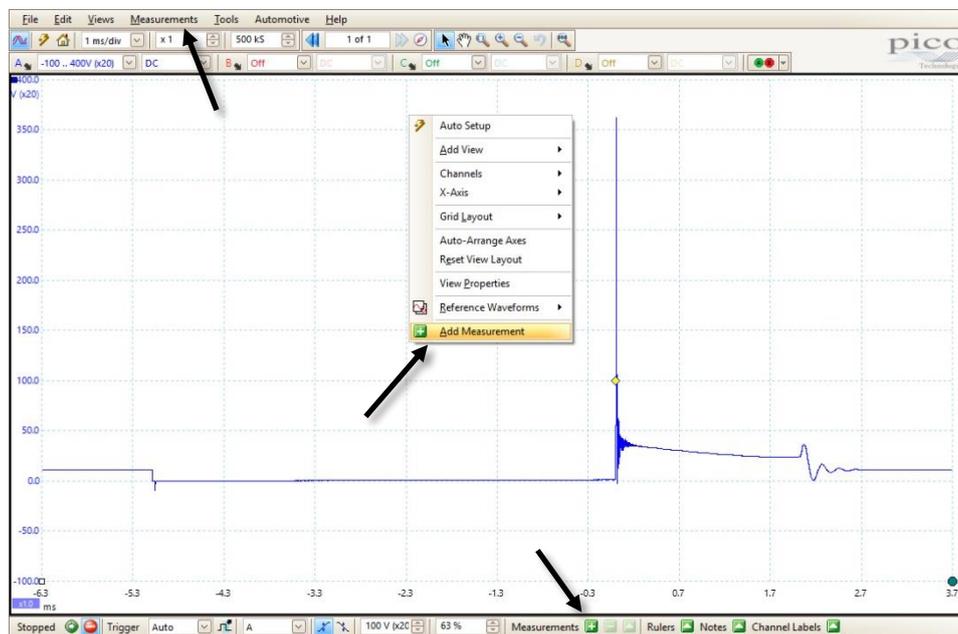
The rotation rulers become more powerful when used in conjunction with time rulers. When both types of rulers are used together, as shown in the image below, the ruler legend displays the positions of the time rulers in rotation units as well as in time units. If two time rulers are positioned, the legend also shows the rotation difference between them.



Closing the ruler legend dismisses all rulers, including the rotation rulers.

Automatic measurements

These can be added in three different ways: from the Measurements menu, by right-clicking on the screen, or using the Measurements toolbar at the bottom.



Whichever method is used, the **Add Measurements** window appears.

Add Measurement

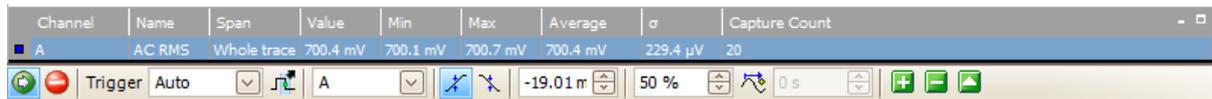
Select the channel to measure
 A

Select the type of measurement
 AC RMS

Choose which section of the graph will be measured
 Whole trace

Select the channel you want to take the measurements on by clicking on the first pull-down menu. Then choose the type of measurement. Finally, choose which section of the graph you want to take the measurements from: this could be across the whole trace, between two rulers or the cycle around one of the rulers.

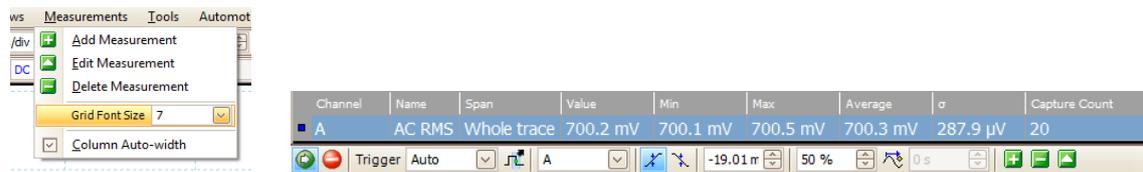
The measurements appear at the bottom of the screen. By default, the statistics are taken from the previous 20 captures (see [8. Preferences](#) for how to adjust this).



Channel	Name	Span	Value	Min	Max	Average	σ	Capture Count
A	AC RMS	Whole trace	700.4 mV	700.1 mV	700.7 mV	700.4 mV	229.4 μ V	20

Trigger: Auto | A | -19.01 m | 50 % | 0 s

You can also adjust the font size by going into the Measurements menu and selecting **Grid Font Size**:



ws Measurements Tools Automot

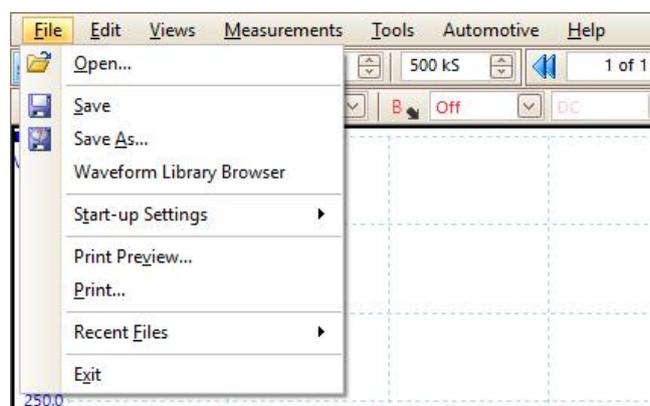
- /div Add Measurement
- DC Edit Measurement
- Delete Measurement
- Grid Font Size 7
- Column Auto-width

Channel	Name	Span	Value	Min	Max	Average	σ	Capture Count
A	AC RMS	Whole trace	700.2 mV	700.1 mV	700.5 mV	700.3 mV	287.9 μ V	20

Trigger: Auto | A | -19.01 m | 50 % | 0 s

6. File menu

You can access the File menu from the menu bar. It allows you to open and view saved files, view recent files, change start-up settings and print.



Save

This allows you to save the current waveform, all the waveforms in the buffer or a selection of waveforms from the buffer.

Save As

This allows you to save the current waveform, all the waveforms in the buffer or a selection of waveforms from the buffer as a new file.

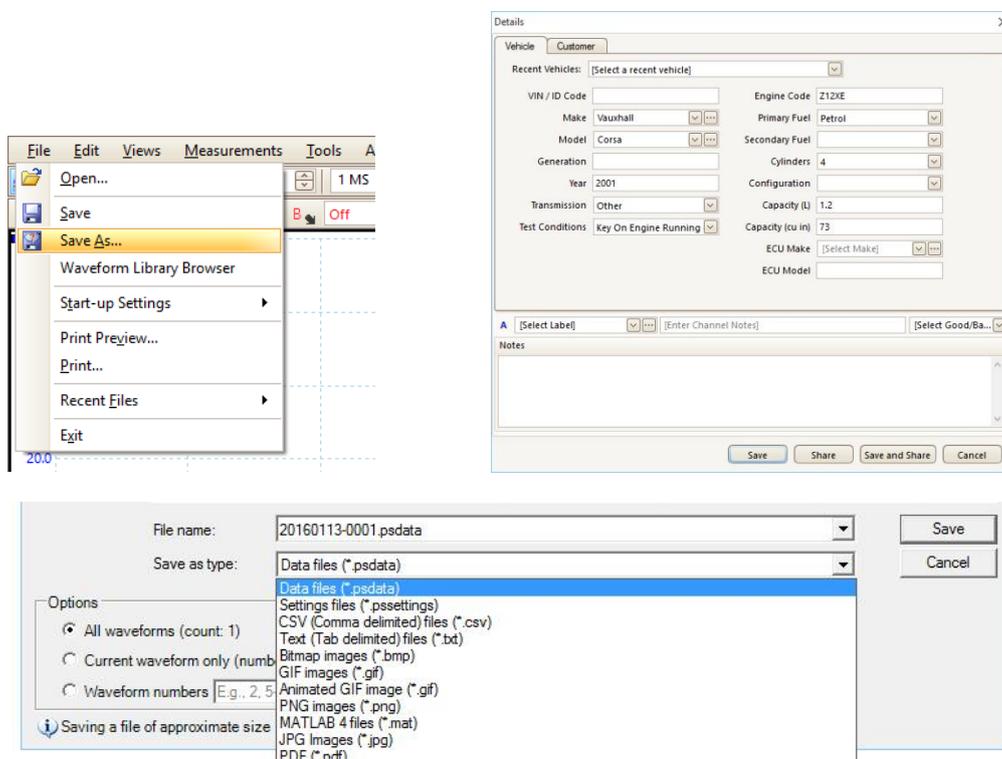
The following table shows a list of file formats that can be saved or opened in PicoScope 6:

Format	Description
psdata	PicoScope 6 format contains full waveform data and settings
pssettings	PicoScope 6 format contains settings
csv	Stores up to 1 million samples
txt	Stores up to 1 million samples
bmp	Image format
png	Image format
gif	Image format
Animated gif	Image format over a number of waveforms, showing an animation of all the waveforms in a continuous loop (only available when saving all waveforms)
MATLAB	MATLAB 4 .mat binary format: an open format with no limitation on the number of samples.
jpg	Image format
pdf	PDF format. Output file contains a snapshot of the waveform, with no borders.

The *psdata* format is the PicoScope data format, which saves an exact copy of the waveform. Saving in this format also saves the settings, such as voltage range, timebase and triggering, along with any notes that have been made. The *pssettings* format just saves the settings and not the waveform, which can be useful as the files allow multiple settings to be saved for different tests and are often much smaller in size.

A key feature of PicoScope 6 Automotive is that the software is free and can be downloaded by anyone – with or without a PicoScope oscilloscope. Thus, anyone can view saved waveforms in the same detail they were captured in.

PicoScope 6 Automotive allows you to save vehicle and customer information alongside your waveform. You can choose not to enter this information by leaving the form blank, but it is useful reference data, particularly if you choose to upload the file to the online Waveform Library.

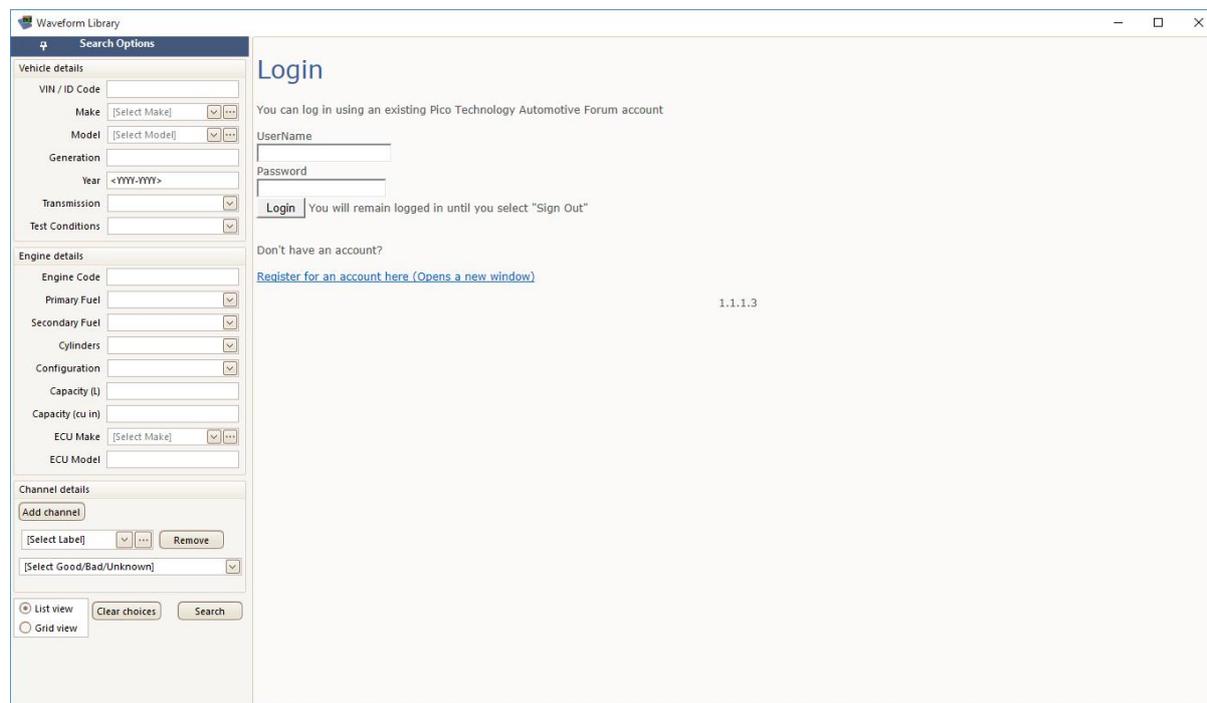


Waveform Library Browser

If you use a PicoScope Automotive oscilloscope, then you have access to an ever-increasing collection of user-generated waveforms through our online Waveform Library. You can use this to share your own examples of good and bad waveforms or to browse the waveforms other people have shared. You can also use it as an online backup for your waveform files.

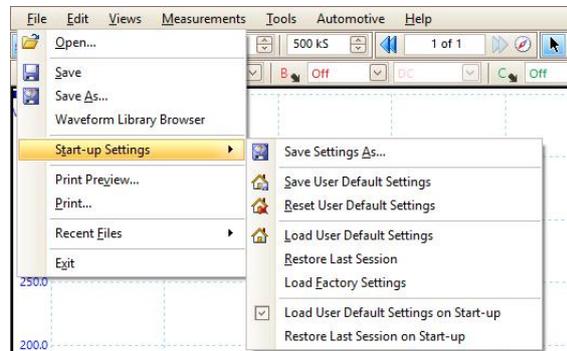
To log in to the waveform library, make sure your PicoScope is connected to the computer, then click on **File > Waveform Library Browser**. Your login details will be the same as those you use on the Pico Technology Automotive Forum – if you don't have

an account there, you can register for free via the link on the Waveform Library login page.



Startup Settings

The startup settings can be changed from the File menu:



Selecting **Save Settings As** stores all the current settings in *psettings* format, allowing you to create a library of different setups.

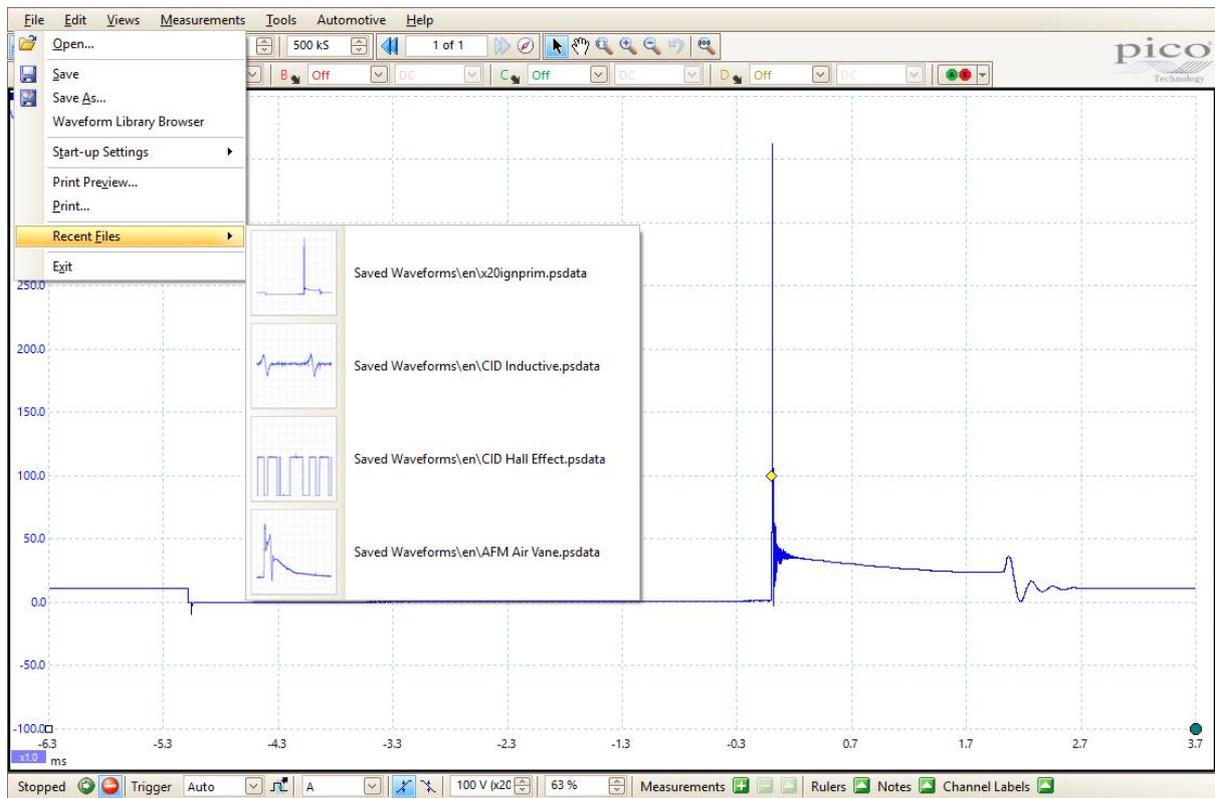
Selecting **Save User Default Settings** saves the current settings as the default and also assigns them to the Home button . **Reset Startup Settings** loads the factory default settings. You can revert to the original factory settings by selecting **Reset User Default Settings**.

Print and Print Preview

Use the Print and Print Preview options to print a paper copy of your waveform and to check how it will look on the page beforehand.

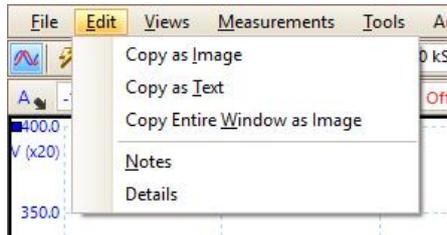
Recent Files

This shows a list of the most recently viewed waveforms, which appear as thumbnails for quick and easy viewing.



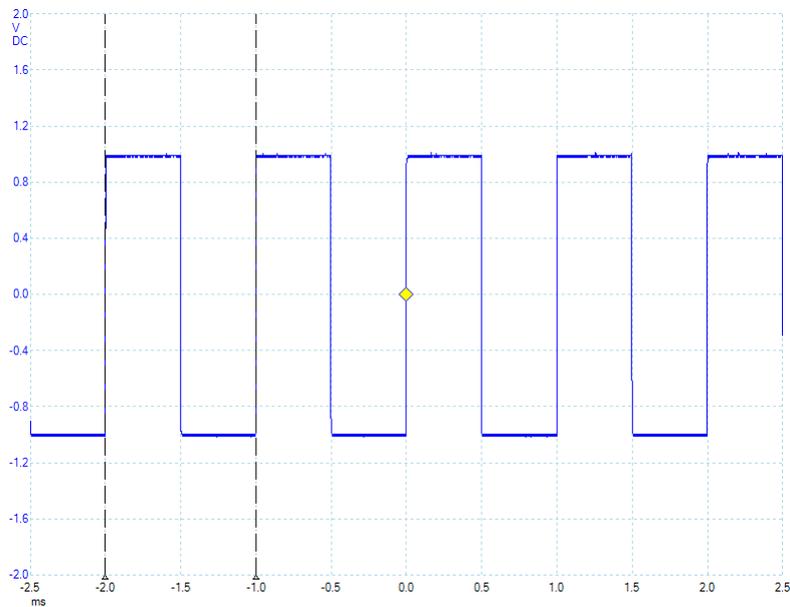
7. Edit menu

The Edit menu is located on the menu bar:



Copy as Image

This allows you to copy just the signal view, excluding measurements and the ruler legend box.



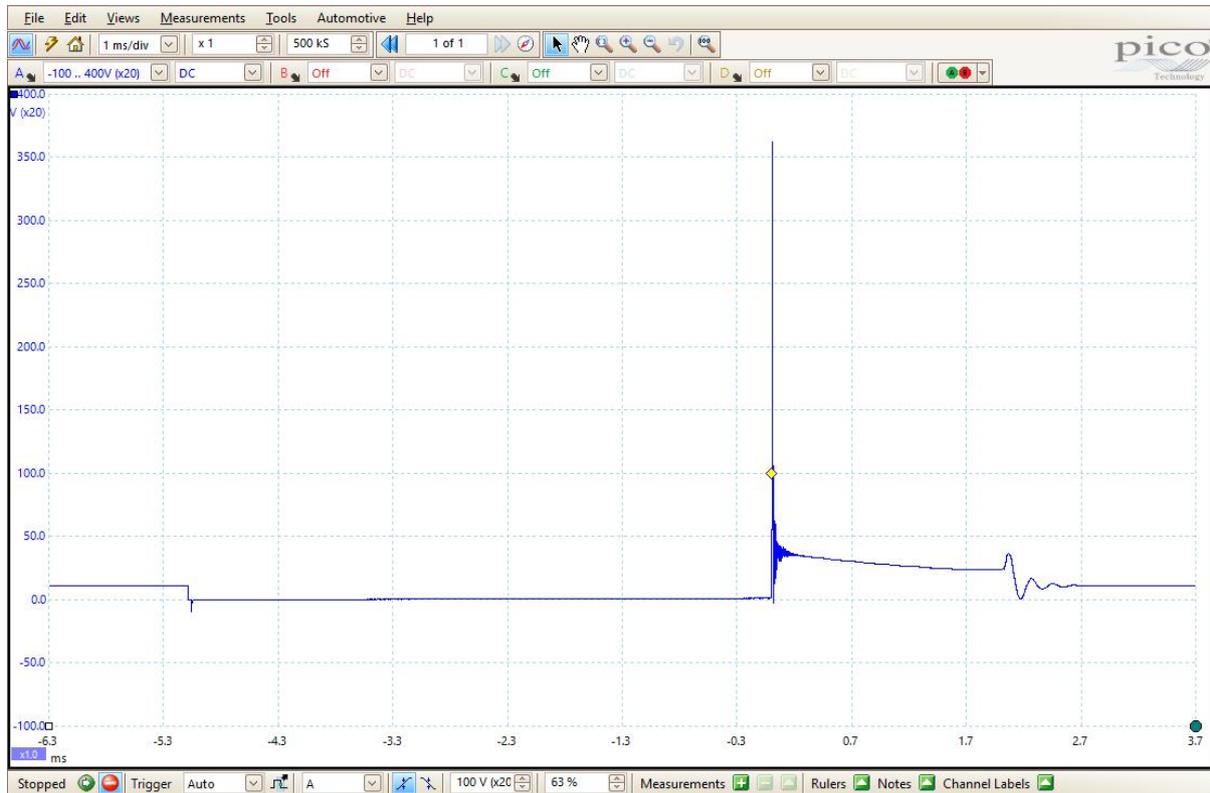
Copy as Text

This copies the raw data in text format and can copy up to 1 million samples per channel, which you can then paste into a spreadsheet.

	A	B
1	Time	Channel A
2	(ms)	(V)
3		
4	-2.50087	0.990936
5	-2.50055	0.97293
6	-2.50023	0.648274
7	-2.49991	0.143254
8	-2.49959	-0.32557
9	-2.49927	-0.65023
10	-2.49895	-0.81252
11	-2.49863	-0.90274
12	-2.49831	-0.93881

Copy Entire Window as Image

This copies the entire PicoScope 6 window, including everything you can see.



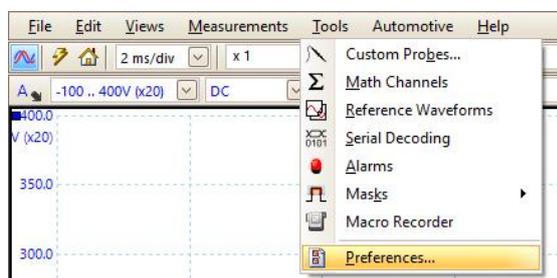
Notes

A Notes box is added at the bottom of the page. It is visible when printed and is preserved when the file is saved.

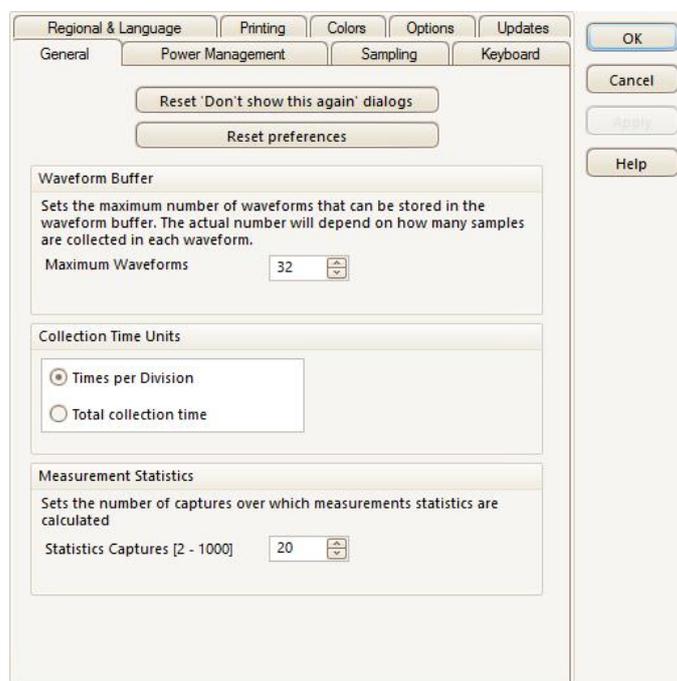


8. Preferences

The Preferences allow you to set options for the PicoScope software. You can do this from the Tools menu, by selecting Preferences.

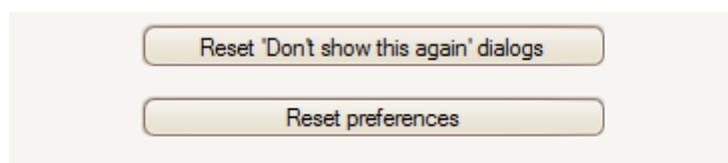


The Preferences options are split into tabs:

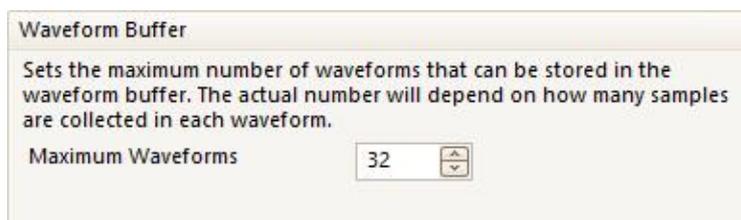


General

The Reset Preferences button deletes any changes you have made and returns the preferences to the factory settings.



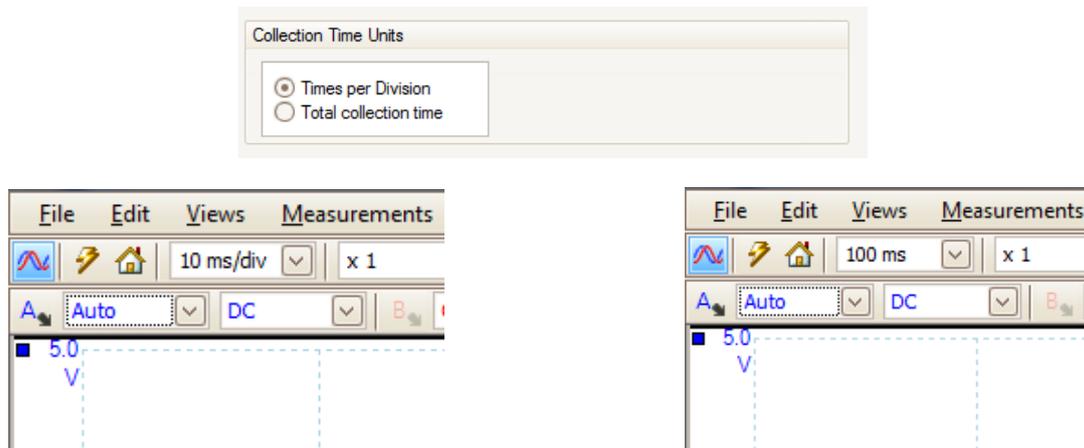
Waveform Buffer



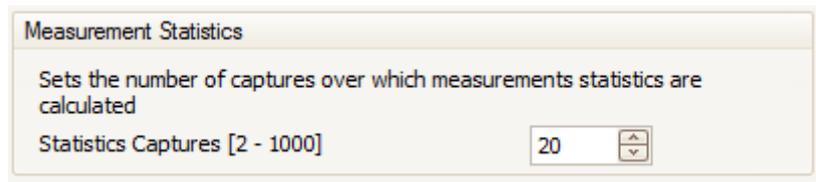
By default, the waveform buffer is set to 32, but you can change this to any number between 1 and 10 000. The actual number of waveforms may vary due to a number of factors: the device that is being used, whether the device is in block or streaming mode, the number of samples per waveform and the type of triggering used.

Collection Time Units

By default, the timebase of the scope is given in seconds per division. The total collection time, on the other hand, represents the time across all ten divisions of the screen. For example, a 10 ms/div timebase is equivalent to a total collection time of 100 ms.

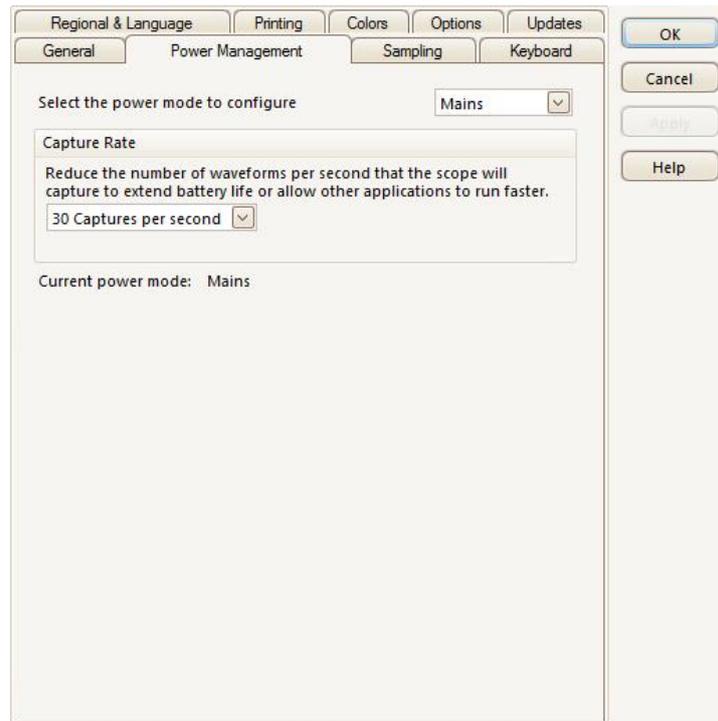


Measurement Statistics



When you make an automatic measurement, PicoScope 6 Automotive presents statistics recorded over a number of captures. This section of the Preferences allows you to control the number of captures you use. By default, it is set to 20, but you can increase it to 1000.

Power Management



This control limits the speed at which PicoScope captures data from the scope. The other PicoScope settings, the type of scope and the speed of the computer will all affect whether this limit can actually be reached. PicoScope automatically selects the appropriate limit according to whether the computer is running on batteries or on mains (line) power.

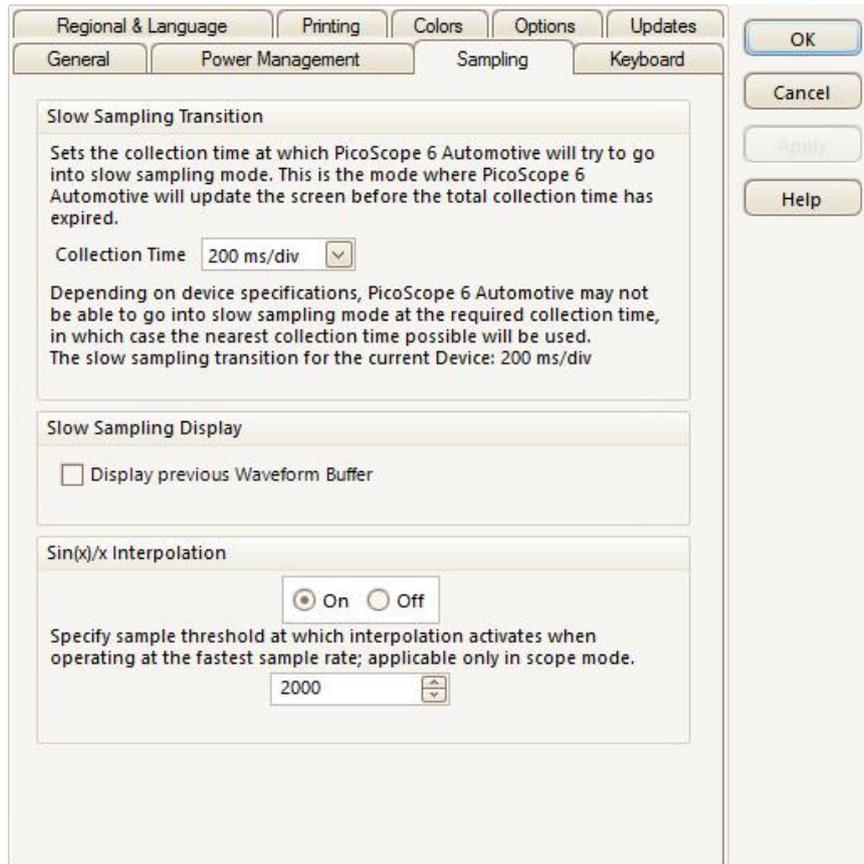
The capture rate is in captures per second. By default, it is set to **30 Captures per second**. If other applications run too slowly on the PC whilst PicoScope is capturing, reduce the capture rate limit. When the computer is running on battery power, PicoScope imposes a performance limit to save the battery. You can increase this manually, but doing so will cause the battery power to drain very quickly.

Sampling

Slow Sampling Transition

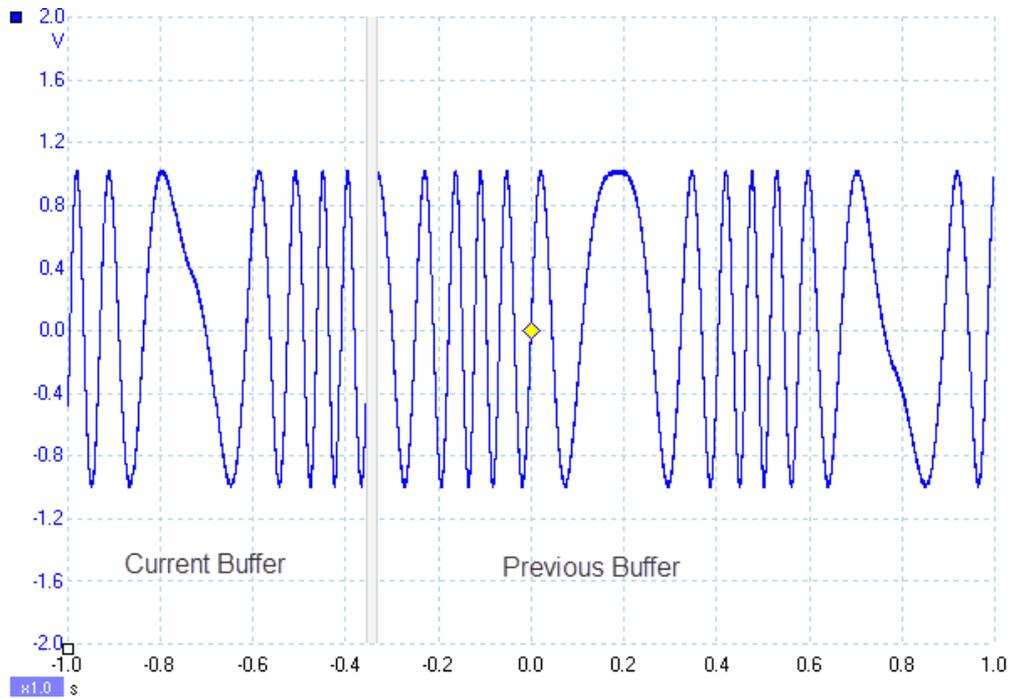
The oscilloscope has two modes of operation: block mode and streaming mode. In block mode, the device captures data to its own internal memory and then transfers it to the PC, so the trace appears on the screen once the buffer is complete. In streaming mode, the device continuously streams data to the PC, so the trace is drawn in real time.

The Slow Sampling Transition control alters the timebase at which the device changes from block mode to streaming mode. You can choose from a number of different timebases, between 100 ms/div and 500 s/div. By default, it is set to 200 ms/div.



Slow Sampling Display

This displays the previous buffer as the new one is being drawn. The image below gives a clearer view of this.

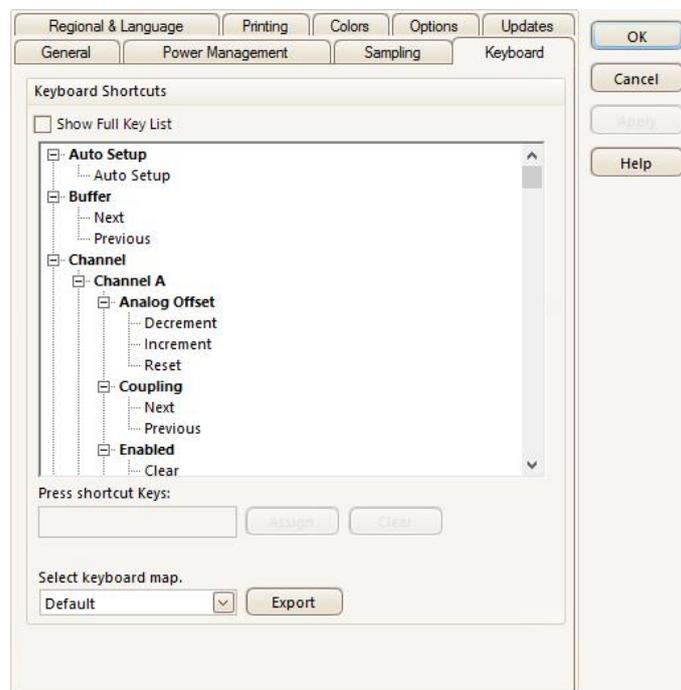


Colors

Under this tab, you can change the colors of the traces, background, masks and a number of other aspects of the display. You can also adjust the line thickness of the traces and the grid.

Keyboard shortcuts

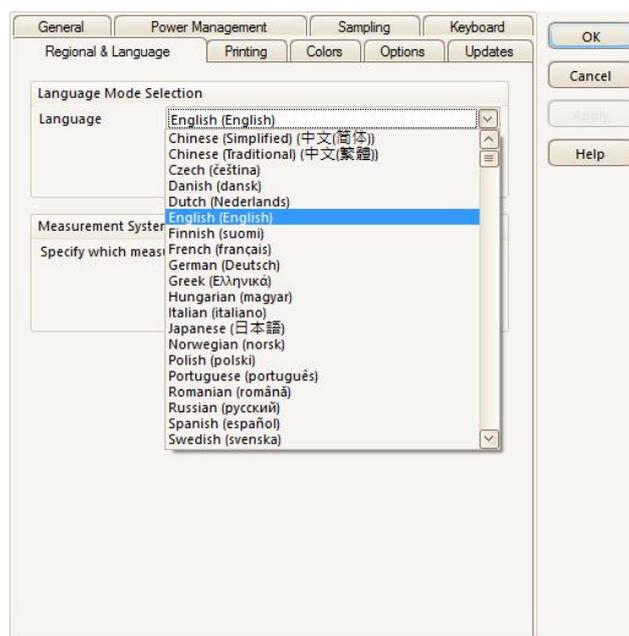
PicoScope 6 Automotive allows the use of shortcuts to the vast majority of its features. These can be accessed from the **Keyboard** tab of the Preferences.



Highlighting an action allows you to enter the desired shortcut keys. You can use up to four keys for one shortcut, including up to three modifiers (**Ctrl**, **Alt** and **Shift**). Clicking the **Assign** button confirms entry, and upon clicking **OK** the new shortcut keys are ready to use.

Regional & Language

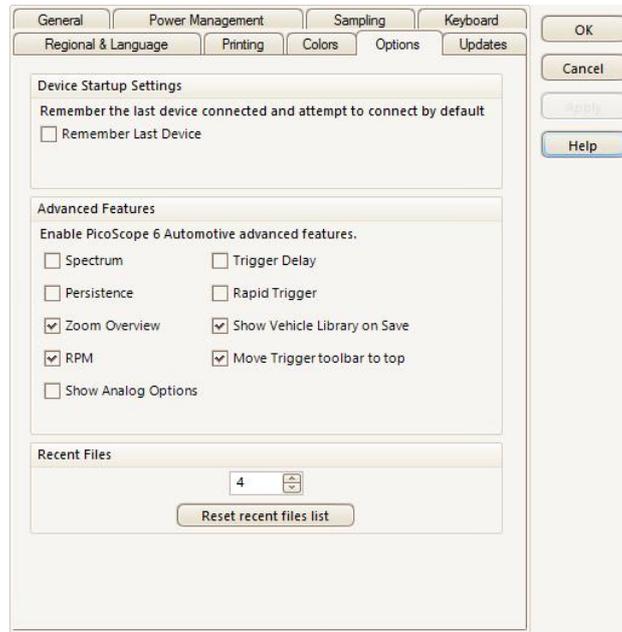
In this section, you can change the language of the software and select metric or U.S. units. This can be done easily by selecting the language or units and then clicking **OK**.



You will then be prompted to restart the software. Clicking **Yes** will automatically exit the software and then start it up again in the language and units you selected.

Options

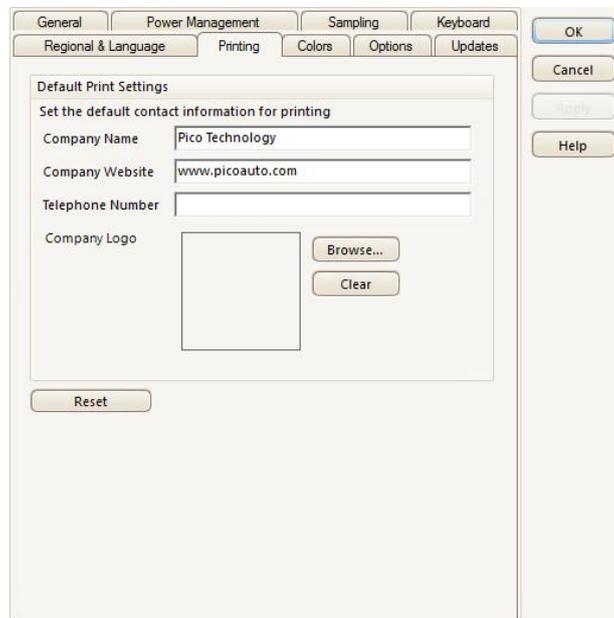
The **Advanced features** settings allow you to enable various features, adding buttons controlling them to the relevant toolbars. You can also choose whether the Trigger toolbar (Start/Stop etc.), which appears at the bottom of the waveform screen by default, appears at the top.



Recent files refers to the list of files that have been opened that is shown in the File menu. You can modify this list to show up to 32 items.

Printing

When you print a waveform, some default text appears at the top and bottom of the page. You can modify this by editing the appropriate fields in this tab, and can view the results by opening a print preview.



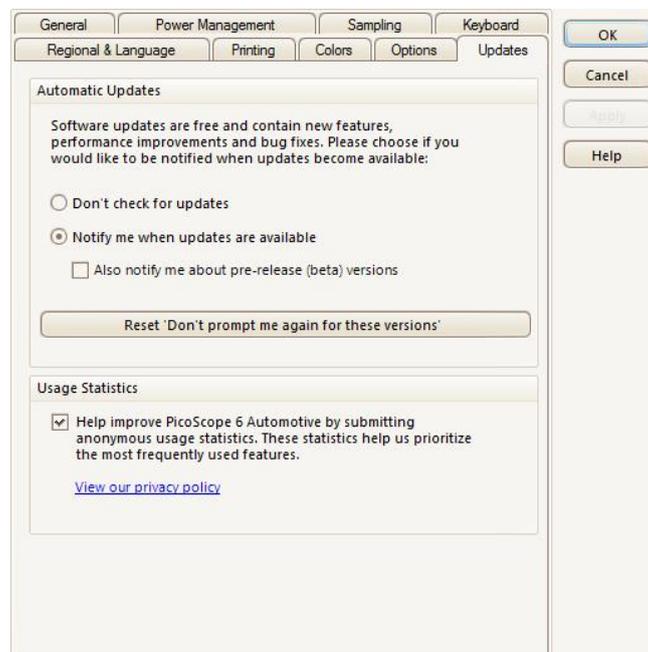
The screenshot shows the 'Default Print Settings' dialog box within the PicoScope 6 software. The dialog has several tabs: 'General', 'Power Management', 'Sampling', 'Keyboard', 'Regional & Language', 'Printing', 'Colors', 'Options', and 'Updates'. The 'Printing' tab is selected. The dialog contains the following fields and controls:

- Default Print Settings**: Set the default contact information for printing.
- Company Name**: Text field containing 'Pico Technology'.
- Company Website**: Text field containing 'www.picoauto.com'.
- Telephone Number**: Empty text field.
- Company Logo**: A square placeholder box with a 'Browse...' button to its right and a 'Clear' button below it.
- Reset**: A button at the bottom left of the dialog.

On the right side of the dialog, there are buttons for 'OK', 'Cancel', 'Apply', and 'Help'.

Updates

While you can check for software updates at any time, you may prefer to set up automatic updates, to make sure you always have the most up-to-date version of PicoScope 6 Automotive. This menu also gives you the option to stay informed of software released under beta testing.



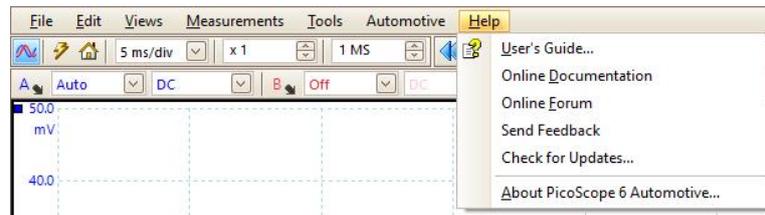
The screenshot shows the 'Automatic Updates' dialog box within the PicoScope 6 software. The dialog has several tabs: 'General', 'Power Management', 'Sampling', 'Keyboard', 'Regional & Language', 'Printing', 'Colors', 'Options', and 'Updates'. The 'Updates' tab is selected. The dialog contains the following sections and controls:

- Automatic Updates**: Software updates are free and contain new features, performance improvements and bug fixes. Please choose if you would like to be notified when updates become available:
 - Don't check for updates
 - Notify me when updates are available
 - Also notify me about pre-release (beta) versions
- Reset 'Don't prompt me again for these versions'**: A button below the update options.
- Usage Statistics**:
 - Help improve PicoScope 6 Automotive by submitting anonymous usage statistics. These statistics help us prioritize the most frequently used features.
 - [View our privacy policy](#)

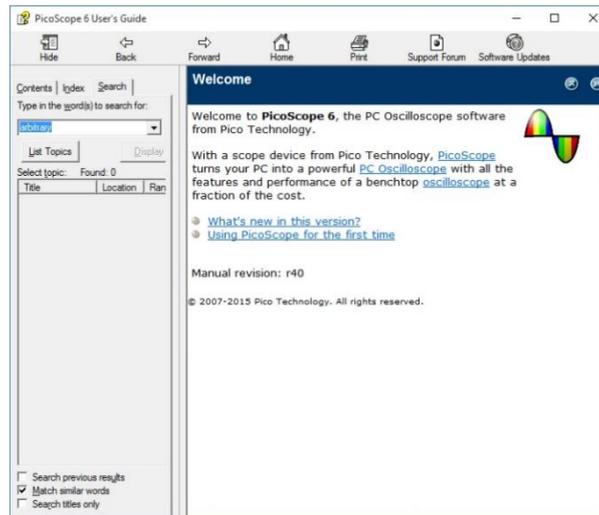
On the right side of the dialog, there are buttons for 'OK', 'Cancel', 'Apply', and 'Help'.

9. Help menu

The Help menu can be accessed from the menu bar:



User's Guide opens the help file:



Online Documentation is a link to Pico Technology's library of automotive case studies, training, videos and tutorials, whilst **Online Forums** connects you to our support forum.

Send Feedback opens a dialog to send us your comments on PicoScope 6 Automotive from within the software.

Check for Updates

If a web connection is active, you can check the latest version of the software and install it if necessary. Alternatively, you can set up automatic updates (see [8. Preferences](#)).

About PicoScope 6 Automotive

This contains information about the software version you are using, and also information read from the scope.



United Kingdom headquarters

Pico Technology
James House
Colmworth Business Park
St. Neots
Cambridgeshire
PE19 8YP
United Kingdom

Tel: +44 (0) 1480 396 395
Fax: +44 (0) 1480 396 296

sales@picoauto.com
support@picoauto.com

www.picoauto.com

United States headquarters

Pico Technology
320 N Glenwood Blvd
Tyler
Texas 75702
United States

Tel: +1 800 591 2796
Fax: +1 620 272 0981

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