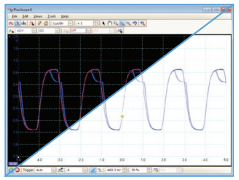
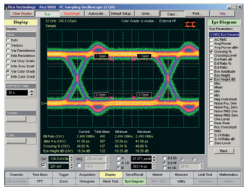
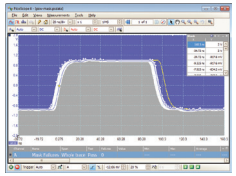

pico
PicoScope



TEST &
MEASUREMENT
CATALOGUE





Established in 1991, Pico Technology is a worldwide leader in the field of PC-based test equipment and data acquisition. Our products regularly win industry awards, with our past achievements including:

We offer all of our customers unbeatable technical support, with our team of experts on call to answer your query or to advise you on the best product to suit your need. Our stringent quality controls ensure that you receive the highest quality products with the very best level of service. We often get comments like this from our customers :

“I would like to add that in today’s world and economic climate it is truly refreshing to learn that there are still companies in this country which market products like yours, and who you can call up and get met with the level of help and support which I have been shown.” BC, UK.

CONTENTS

COMPACT AND PORTABLE UNITS
Unlike traditional bench-top instruments that contain a PC as well as the measuring hardware, Pico Technology's PC oscilloscopes are light and portable. When used with a laptop computer, a PC oscilloscope allows you to carry a complete electronics lab in the same bag as your PC.

A COMPLETE TEST AND MEASUREMENT LAB IN ONE UNIT
When you buy one of our PC oscilloscopes you don't just get an oscilloscope: you also get a spectrum analyzer, logic analyzer and data logger. Some models even include a built-in function generator, arbitrary waveform generator and, in MSO (Mixed Signal Oscilloscope) models, a logic analyzer too. So with a Pico Technology PC oscilloscope you really do get a complete test and measurement lab in one cost-effective unit.

PicoScope®

USE YOUR PC MONITOR AS A LARGE AND DETAILED COLOR DISPLAY
The screen size of a traditional oscilloscope is limited by the physical size of the product. There is no such restriction with a PC oscilloscope since the computer's display can be as large as your monitor, TV or projector screen. This makes our scopes ideal for training and education where the picture can be projected on an interactive whiteboard.

PC OSCILLOSCOPES - WE GIVE YOU MORE

NO UPGRADES NEEDED: HIGH END SOFTWARE FEATURES INCLUDED IN BASE PRICE

Most traditional oscilloscope suppliers charge customers a high premium on top of the advertised base unit price for 'optional' software upgrades. At Pico we don't believe in these optional extras and offer you everything you need in one price. Our standard software features include serial decoding, mask limit testing, advanced math and persistence display modes.

LIFETIME TECHNICAL SUPPORT

Free lifetime technical support is available for all customers, whether you would like one of our team to answer your query or to advise you on the best products to suit your needs.

5 YEAR WARRANTY

We cover all real-time oscilloscopes and data loggers with a 5 year warranty, and our sampling oscilloscopes with a 2 year warranty, against manufacturing defects.

SHARE YOUR CAPTURED WAVEFORMS AND INSTRUMENT SETTINGS EASILY WITH OTHERS

Need to show your customer or colleague the signal you have captured? Just save the waveform and email them a copy. They don't have a copy of the oscilloscope software? No problem – just export it as text, an image or in a binary format for use with third-party software.

FREE SOFTWARE UPDATES

If you're lucky you can return a traditional oscilloscope to the supplier for a firmware upgrade and maybe get improved functionality. With a PC oscilloscope new features and improved functionality can be added at any time with an easy software update. These free software updates mean that a PC oscilloscope is one of the few things that can actually become more powerful and useful with age.

PICOSCOPE®

AFFORDABLE EXPERTISE
Pico Technology offers you a wide range of oscilloscopes to meet any requirement, all benefiting from over 20 years of expertise and with all features included in one low-cost payment. PicoScope software is included in the price, with free upgrades for life.

A 5 year warranty comes as standard with all real-time USB PicoScopes, as well as access to our technical support team for all the peace of mind you need.

HUGE BUFFER MEMORY
These days most digital oscilloscopes have high sampling rates, but many of them let you down with a tiny memory buffer which means that you can only use the maximum sampling rate on a few timebases. We offer memory options from 8 kS to an enormous 1 GS with our PicoScope 6000 Series; this was the first oscilloscope on the market to offer 1 GS. This huge buffer allows it to capture at 5 GS/s down to 20 ms/div - that's a total duration of 200 ms. Managing all this data calls for some powerful tools, so our PicoScope software has a maximum zoom factor of 100 million.

WIDE BANDWIDTH, FAST SAMPLING RATE
PicoScopes offer a range of bandwidth and sampling rate choices to suit any application. Bandwidth options range from 5 MHz to 12 GHz, and sampling rates from 10 MS/s to 5 GS/s. For the PicoScope 6404A and PicoScope 6404B the 500 MHz analog bandwidth is complemented by a real-time sampling rate of 5 GS/s, and ETS mode boosts the maximum sampling rate for repetitive signals to up to 50 GS/s.

SIGNAL INTEGRITY
When DC accuracy and dynamic performance are essential, you can rely on PicoScope oscilloscopes. For example our 8-bit resolution PicoScope 3204A to PicoScope 3206B scopes provide a typical SFDR of 52 dB, 180 µV of noise and over 400:1 crosstalk rejection, while the 16-bit resolution PicoScope 4262 has an SFDR of 102 dB, only 8.5 µV of noise and over 50,000:1 crosstalk rejection.

FUNCTION GENERATOR & ARBITRARY WAVEFORM GENERATOR
Selected PicoScope models have a built-in function generator (FG) that can produce a range of standard signals such as sine waves, square waves and more. More advanced units include an arbitrary waveform generator (AWG), which can produce standard signals as well as an unlimited range of user-defined waveforms.

THERE'S A PICOSCOPE FOR EVERY APPLICATION

RESOLUTION OPTIONS

PicoScope oscilloscopes offer a wide range of vertical resolution options from 8 to 16 bits. This choice allows you to see as much detail as needed for your application. The higher the resolution, the greater the vertical accuracy. The PicoScope software can provide a selectable amount of enhanced resolution from 0.5 to 4 additional bits.

PRICED TO SUIT EVERY BUDGET

PicoScope oscilloscopes offer the most cost-effective way to get the specifications you want. Prices range from £125 / $206 / €151 for our 1 channel handheld scope to £13,995 / $23,091 / €16,933 for our optical sampling oscilloscopes.

PICOSCOPE 6 SOFTWARE SUPPLIED FREE WITH ALL OUR OSCILLOSCOPES

Our PicoScope 6 software is supplied free with all of our real-time PC oscilloscopes. We are continually seeking to improve our software with added functionality and useful features, which are available to download in software updates that are free for the life of the product. Our newsletter and website let you know when the latest software releases are available.

Our PicoScope 9000 Series oscilloscopes come with their own software especially designed for use in high speed serial bus analysis and signal characterization applications.

OSCILLOSCOPES





Oscilloscope	PicoScope 2000 Series handheld	PicoScope 2000 Series	PicoScope MSOs	PicoScope 3200 Series	PicoScope 3400 Series
Description	Power & performance in your hand	Superb value for money	Mixed Signal oscilloscope	Deep memory / Benchtop replacement	Deep memory / Benchtop replacement
Channels	1	2 + EXT	2 analog + 16 digital	2 + EXT	4 + EXT
Outputs	None	AWG	AWG	FG or AWG	FG or AWG
Bandwidth	10 or 25 MHz	10 to 200 MHz	25 to 200 MHz	60 to 250 MHz	60 to 200 MHz
Sampling	50 or 100 MS/s	100 MS/s to 1 GS/s	200 to 500 MS/s	500 MS/s to 1 GS/s	1 GS/s
Resolution (enhanced)	8 bits (12 bits)	8 bits (12 bits)	8 bits (12 bits)	8 bits (12 bits)	8 bits (12 bits)
Buffer memory	8 or 24 kS	8 to 40 kS	48 kS to 128 MS	8 to 512 MS	8 to 128 MS
Power	USB	USB	USB	USB 2.0 or 3.0	USB or AC adaptor

* See ordering page 57 for further details. FG - Function Generator, AWG - Arbitrary Waveform Generator.

OSCILLOSCOPES





Oscilloscope	PicoScope 4000 Series	PicoScope 4262	PicoScope 5000 Series	PicoScope 6000 Series	PicoScope 9000 Series
Description	High resolution	Digital oscilloscope for the analog world	Flexible Resolution oscilloscope	Highest performance USB scope available	Sampling oscilloscope
Channels	2 or 4	2 + EXT	2 or 4 + EXT	4 + AUX input	2 electrical + 1 optical
Outputs	None	Low distortion AWG	FG or AWG	FG or AWG	TDR Step generator (9211,9231)
Bandwidth	20 MHz	5 MHz	60 to 200 MHz	250 MHz to 1 GHz	12 GHz
Sampling	80 MS/s	10 MS/s	250 MS/s to 1 GS/s **	5 GS/s	5 TS/s (equivalent)
Resolution (enhanced)	12 bits (16 bits)	16 bits (20 bits)	8, 12, 14, 15 & 16 bits (hardware resolution +4 bits)	8 bits (12 bits)	16 bits
Buffer memory	32 MS	16 MS	8 to 512 MS	128 MS to 1 GS	4 kS
Power	USB	USB	2 Ch USB / 4 Ch AC adaptor	AC adaptor	A

* See ordering page 57 for further details. FG - Function Generator, AWG - Arbitrary Waveform Generator. ** See page 23 for full details

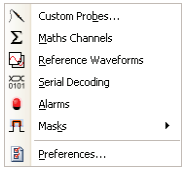
The PicoScope software, when used with a suitable PicoScope device, turns your PC into an oscilloscope, spectrum analyzer, chart recorder, serial protocol decoder, function generator and arbitrary waveform generator. When used with a mixed-signal oscilloscope it additionally acts as a logic analyzer. It is supplied free of charge with PicoScope oscilloscopes, and updates can be downloaded for free. It is available with a choice of over 20 interface languages.

A Commonly-used controls such as voltage range selection, timebase, memory depth and channel selection are placed on the toolbars for quick access, leaving the main display area clear for waveforms.

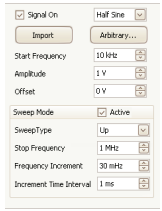
B Auto setup button: Configures the timebase, voltage ranges and trigger for a stable display of your signals.

C 

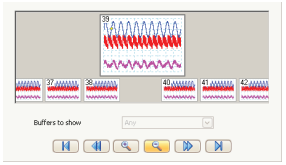
Channel Options give access to channel-specific settings such as custom probes, resolution enhancement, offset controls and filtering.

D 

More advanced controls and functions are located in the Tools menu.

E 

Signal Generator: allows the scope to generate standard signals or arbitrary waveforms. Includes frequency sweep options.

F 

Waveform Buffer Overview: PicoScope automatically records up to 10,000 of the most recent waveforms. You can quickly scan through to look for intermittent events. The buffer overview can be used with the mask test tools to display only failed waveforms.

G Zoom and pan tools: PicoScope provides a zoom factor of up to 100 million, which is necessary when working with deep memory scopes. Use the conventional zoom-in, zoom-out and pan tools, or try the zoom overview window for fast navigation.

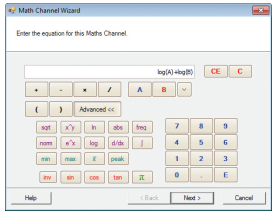
H Movable axes: The vertical axes can be dragged up and down. This feature is particularly useful when one waveform is obscuring another. There's also a command to rearrange and rescale all the axes automatically.

I The PicoScope display can be as simple or as complex as you need. Begin with a single view of one channel, and then expand the display to include any number of live channels, math channels and reference waveforms.

PicoScope is carefully designed to make the best use of the display area. You can add new scope and spectrum views, all of which are fully adjustable in size.

J Trigger marker: Shows the level and time of the trigger event. Drag with the mouse to adjust.

K Rulers: Each axis has two rulers that can be dragged onto the screen to make quick measurements of amplitude, time and frequency.

L 

Math channels: Combine input channels and saved reference waveforms using simple arithmetic, or use custom equations with trigonometric and other functions.

PICOSCOPE SOFTWARE

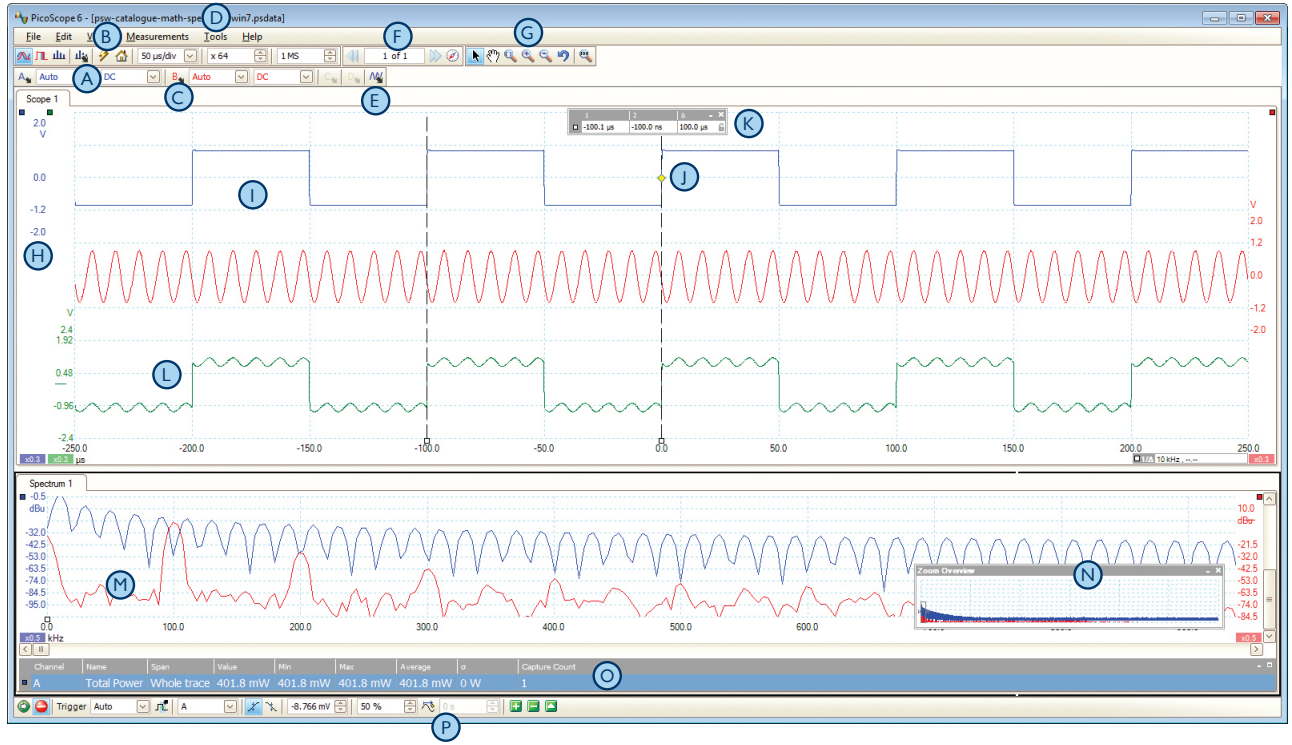
Ⓜ Spectrum views: One or more spectrum views can be added to show an FFT of the data in the scope view. Alternatively, PicoScope can be configured as a dedicated spectrum analyzer.

Ⓝ Zoom overview: When a scope or spectrum view is zoomed in, the overview window allows fast navigation using the mouse.

Ⓞ Automatic measurements: Display calculated measurements for troubleshooting and analysis. You can add as many measurements as you need on each view. Each measurement includes statistical parameters showing its variability.
Built in scope measurements: AC RMS, True RMS, DC Average, Cycle Time, Frequency, Duty Cycle, Falling Rate, Fall Time, Rising Rate, Rise Time, High Pulse Width, Low Pulse Width, Maximum, minimum, Peak to Peak.

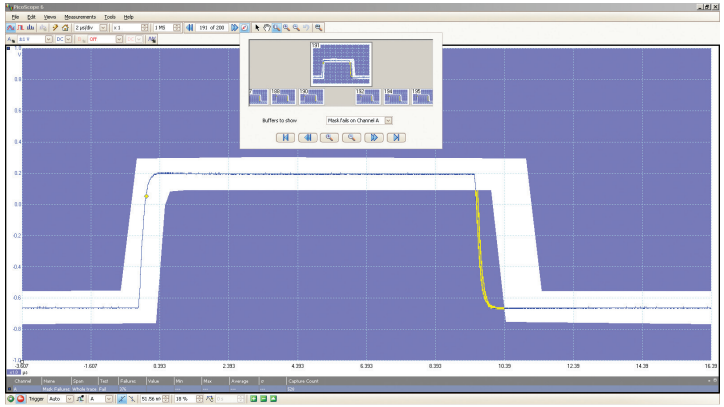
Built in spectrum measurements: frequency at peak, amplitude at peak, average amplitude at peak, total power, THD (% and dB), THD+N, SFDR, SINAD, SNR and IMD.

Ⓟ Trigger toolbar: Commonly-used controls are on the toolbar with more advanced trigger options available from a pop-up window.



Software compatible with Windows XP SP3, Windows Vista, Windows 7 and Windows 8 (not Windows RT)

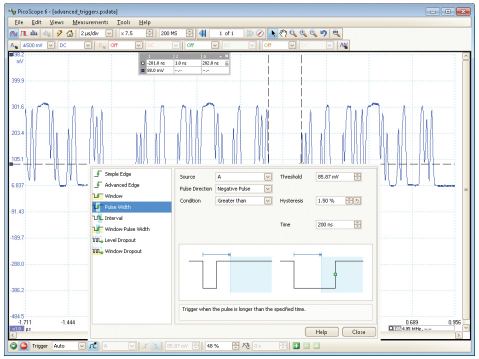
PICOSCOPE SOFTWARE



MASK LIMIT TESTING

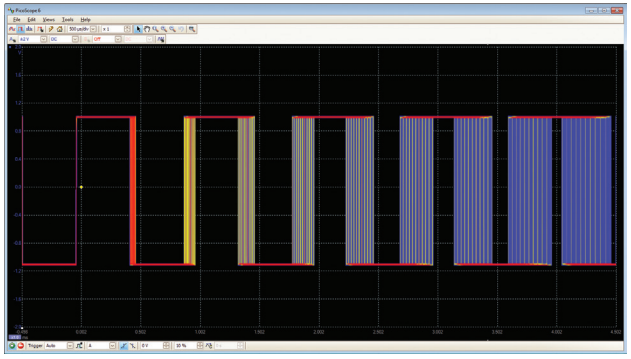
This feature is specifically designed for production and debugging environments. Capture a signal from a known working system, and PicoScope will draw a mask around it with your specified tolerance. Connect the system under test and PicoScope will highlight any parts of the waveform that fall outside the mask area. The highlighted details persist on the display, allowing the oscilloscope to catch intermittent glitches while you work on something else. The measurements window counts the number of failures and can display other measurements and statistics at the same time.

The numerical and graphical mask editors can be used separately or in combination, allowing you to enter accurate mask specifications and to modify existing masks. You can import and export masks as files.



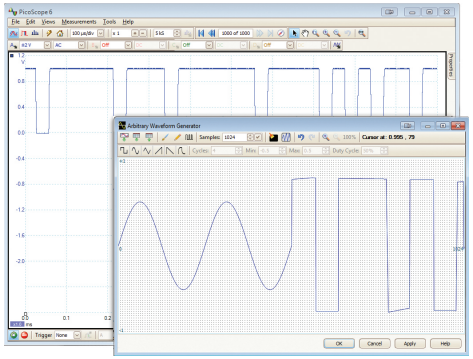
ADVANCED TRIGGERS AND RAPID TRIGGERING

PicoScope has a built-in set of advanced triggers to help you capture the data you need. Some models contain fast triggering hardware that can collect 10,000 waveforms in under 10 or 20 milliseconds. This improves your chances of spotting an infrequent glitch.



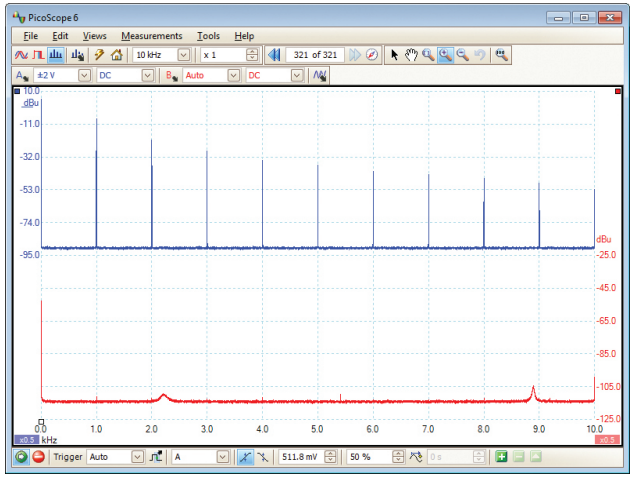
COLOR MODES

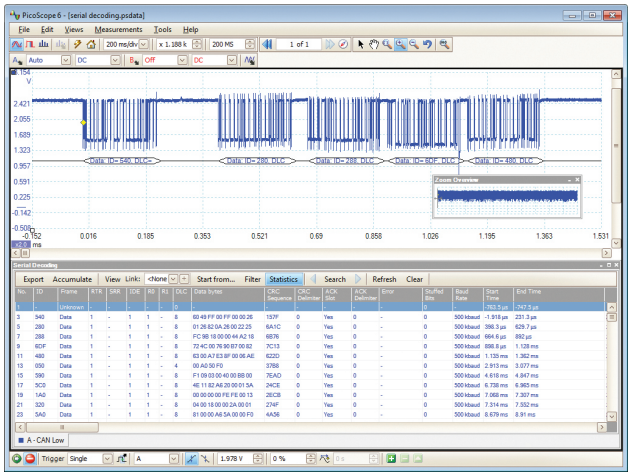
See old and new data superimposed, with new data in a brighter color or shade. This makes it easy to see glitches and drop-outs and to estimate their relative frequency. Choose between analog persistence and digital color, or create a custom display mode.



ARBITRARY WAVEFORM AND FUNCTION GENERATOR

Generate standard waveforms or define your own using the power of the built-in arbitrary waveform generator. You can import arbitrary waveforms from data files or draw them using the built-in AWG editor.





PICOSCOPE SOFTWARE

SPECTRUM ANALYZER

With the click of a button, you can open a new window to display a spectrum plot of the selected channels. The spectrum analyzer allows signals to be viewed in the frequency domain using FFTs of up to 1 million points. A full range of settings give you control over the number of spectrum bands, window types and display modes. A table of automatic measurements can be displayed.

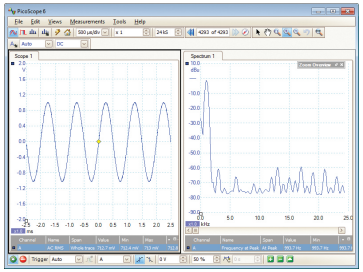
SERIAL BUS DECODING

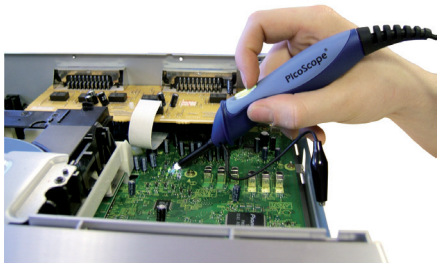
The PicoScope 3000, 4000 and 6000 Series oscilloscopes are recommended for serial decoding as their deep memory allows the software to collect long, uninterrupted sequences of data. For example, the PicoScope 6404A can collect many thousands of frames of CAN bus, FlexRay, I²C, I²S, SPI, LIN or UART data over several seconds into its 512 MS memory.

To decode serial data, you set up PicoScope in the usual way to display the signal or signals of interest and then select Serial Decoding. PicoScope gives you options to define the type of serial bus protocol you are using, including a selection of all the common data rates. It then displays the data in the format of your choice: “in view”, “in window”, or both at once.

“In view” format shows the decoded data beneath the waveform on a common time axis, with error frames marked in red. You can zoom in on these frames to look for noise or distortion on the waveform.

“In window” format shows a list of the decoded frames, including the data and all flags and identifiers. You can set up data filtering conditions to display only the frames you are interested in, search for frames with specified properties, or define a start pattern that the program will wait for before listing the data.





PICOSCOPE 2100 SERIES

POWER AND PERFORMANCE IN YOUR HAND

"EASY TO USE" JUST GOT EASIER

Using your PicoScope handheld oscilloscope could not be easier: plug-and-play technology allows you to simply install the software, plug the oscilloscope into a USB port and start using it straight away. No need for power supplies, additional oscilloscope probes or complex installation procedures.

Designed for single-handed operation, the oscilloscope can be controlled using a button located on the top of the scope. Press the button to start the oscilloscope; it will flash green to indicate the scope is running. A beam of light will illuminate the tip of the scope so you can clearly see the area being probed. Once you've captured your signal, press the button again; it will glow red to indicate the scope has stopped.

ALL YOU NEED IN A HANDHELD OSCILLOSCOPE

With oscilloscope and spectrum analyzer functions in an incredibly easy-to-use package, a PicoScope handheld oscilloscope gives you the performance, features and quality you would expect from a PicoScope oscilloscope, all at an affordable price.

PicoScope	2104	2105
Channels	1	
Bandwidth	10 MHz	25 MHz
Sampling rate - Real time	50 MS/s	100 MS/s
- Repetitive	1 GS/s	2 GS/s
Buffer memory	8 kS	24 kS
Resolution (enhanced)	8 bits (12 bits enhanced)	
Input ranges	±100 mV to ±20 V in 8 ranges	
Trigger	Modes: None, auto, repeat, single Edge: Rising, falling	
Power	USB	
Warranty	5 years	
Part number	PP317	PP315

PICOSCOPE 2200 SERIES

SUPERB VALUE FOR MONEY

PicoScope	2204	2205	2206	2207	2208
Channels	2 + EXT				
Bandwidth	10 MHz	25 MHz	50 MHz	100 MHz	200 MHz
Sampling rate - Real time	100 MS/s	200 MS/s	500 MS/s	1 GS/s	1 GS/s
- Repetitive	2 GS/s	4 GS/s	5 GS/s	10 GS/s	10 GS/s
Buffer memory	8 kS	16 kS	24 kS	32 kS	40 kS
Resolution	8 bits (12 bits enhanced)				
Input ranges	±50 mV to ±20 V in 9 ranges				
Trigger	Modes: None, auto, repeat, single Advanced: Rising, falling, dual edge, hysteresis, window, pulse width, window pulse width, window dropout, interval, logic, delayed		As PicoScope 2205 plus rapid (segmented memory) mode.		
AWG	Yes				
Power	USB				
Warranty	5 years				
Part number	PP419	PP420	PP800	PP801	PP802

ALL-IN-ONE INSTRUMENT

The PicoScope 2200 Series PC oscilloscopes are extremely versatile, with an oscilloscope, spectrum analyzer and arbitrary waveform generator included in every model. The compact, portable scopes fit easily in a laptop bag. Their robust cases have BNC connectors for input channels A and B, EXT trigger input (PicoScope 2206 to 2208 only) and AWG output, and a USB connector.

CONVENIENCE AND SPEED

The PicoScope 2200 Series oscilloscopes obtain their power from the USB 2.0 interface, so there's no need for an external power supply. The USB port also delivers high-speed data to give you a responsive, high-resolution display.

ADVANCED SOFTWARE

The oscilloscopes are bundled with the same PicoScope software that comes with our high-end oscilloscopes. PicoScope is easy to use, and can export data in a variety of graphical, text and binary formats. Also included are drivers and example programs.

PICOSCOPE 2205 MSO

THINK LOGICALLY

DIGITAL INPUTS

The 16 digital inputs can be displayed individually or in arbitrary groups labelled with binary, decimal or hexadecimal values. A separate logic threshold can be defined for each 8-bit input port. The digital trigger can be activated by any bit pattern combined with an optional transition on any input.

TRIGGERING

The PicoScope 2205 MSO offers a comprehensive set of advanced digital triggers including: pulse width, windowed and dropout triggers to help you capture the data you need. Digital triggering reduces timing errors and allows our oscilloscopes to trigger on the smallest signals, even at the full bandwidth. Trigger levels and hysteresis can be set with high resolution.

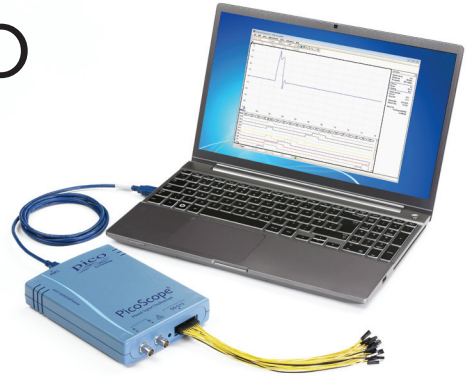
Digital triggering reduces re-arm delay and combined with the segmented memory allows the triggering and capture of events that happen in rapid sequence. Our Mask limit testing function can then scan through these waveforms to highlight failed waveforms for viewing in the waveform buffer.

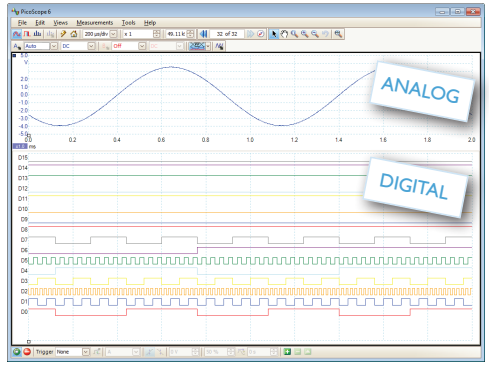
Advanced logic triggers can be set on either the analog or digital input channels, or both.

PicoScope	2205 MSO
Analog channels	2
Analog bandwidth	25 MHz
Analog resolution	8 bits (12 bits enhanced)
Analog input ranges	±50 mV to ±20 V in 9 ranges
Digital channels	16
Digital max. frequency	100 MHz
Digital input range	±20 V
Digital threshold range	±5 V
Max. sampling rate — Ch A / Ch A + 1 digital port:	200 MS/s
1 or 2 digital ports:	200 MS/s
All other combinations:	100 MS/s
Buffer memory	48 kS
AWG	Yes
Power	USB
Warranty	5 years

PICOSCOPE 3000 SERIES MSO

DEEP MEMORY MIXED SIGNAL OSCILLOSCOPES





MIXED-SIGNAL CAPABILITY

The PicoScope 3000 Series MSOs from Pico Technology are 2+16 channel, 8-bit resolution oscilloscopes. This means that along with 2 analog channels, the PicoScope 3000 Series MSOs also have 16 digital inputs. The result? With the PicoScope 3000 Series MSOs you can view your digital and analog signals simultaneously.

FULL-FEATURED OSCILLOSCOPE

The PicoScope 3000 Series MSOs are full-featured oscilloscopes. An arbitrary waveform generator is built-in and includes a sweep function. The oscilloscopes also offer mask limit testing, math and reference channels, advanced triggers, serial decoding, automatic measurements and color persistence display.

TRIGGERING

The PicoScope 3000 Series MSOs offer a comprehensive set of advanced triggers including pulse width, windowed and dropout triggers to help you capture the data you need. Digital triggering reduces timing errors and allows these oscilloscopes to trigger on the smallest signals, even at the full bandwidth. Trigger levels and hysteresis can be set with high resolution.

Digital triggering reduces re-arm delay and, combined with the segmented memory, allows the triggering and capture of events that happen in rapid sequence. For analog inputs the mask limit testing function can then scan through the buffer to highlight failed waveforms for viewing in the buffer navigator.

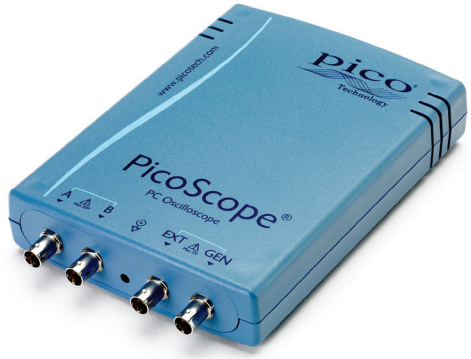
The 16 digital inputs can be displayed individually or in arbitrary groups labelled with binary, decimal or hexadecimal values. A separate logic threshold from -5 V to +5 V can be defined for each 8-bit input port. The digital trigger can be activated by any bit pattern combined with an optional transition on any input.

Advanced logic triggers can be set on either the analog or digital input channels, or both.

PicoScope	3204 MSO	3205 MSO	3206 MSO
Analog channels	2		
Analog bandwidth	60 MHZ	100 MHz	200 MHz
• Analog resolution 8 bits (12 bits enhanced) • Analog input ranges ±50 mV to ±20 V in 9 ranges			
• Digital channels 16 • Digital max. frequency 100 MHz • Digital input range ±20 V • Digital threshold range ±5 V			
Max. sampling rate Ch A or B:	500 MS/s		
Ch A or B + 1 digital port:	500 MS/s		
1 or 2 digital ports:	500 MS/s		
All other combinations:	250 MS/s		
Buffer memory	8 MS	32 MS	128 MS
Other	• Signal Generator: Function Generator + AWG • Power: USB • Warranty 5 years		
Part number	PP859	PP860	PP861

PICOSCOPE 3000 SERIES

2-CHANNEL, WITH THE POWER TO PERFORM



POWER, PORTABILITY AND VERSATILITY

The PicoScope 3000 Series has the power to perform in many applications, such as design, research, test, education, service and repair.

Pico USB-powered oscilloscopes are also small, lightweight and portable. They easily fit into a laptop bag making them ideal for the engineer on the move. There is no need for an external power supply, making them ideal for field use.

WIDE BANDWIDTH, FAST SAMPLING RATE

Most USB-powered oscilloscopes have real-time sampling rates of only 100 or 200 MS/s. The PicoScope 3000 USB 2.0 Series offers a market-leading 500 MS/s. We offer bandwidth options from 60 to 200 MHz to suit your needs.

HUGE BUFFER MEMORY

The PicoScope 3000 USB 2.0 Series offers memory depths up to 128 million samples, more than any other oscilloscope in this price range.

Other oscilloscopes have fast maximum sampling rates, but without deep memory they cannot sustain these rates on long timebases. The PicoScope 3206B can sample at 500 MS/s at timebases all the way down to 20 ms/div.

PicoScope	3204A	3204B	3205A	3205B	3206A	3206B
Channels	2 + EXT					
Bandwidth	60 MHz		100 MHz		200 MHz	
Sampling rate - Real time	500 MS/s					
Buffer memory	4 MS	8 MS	16 MS	32 MS	64 MS	128 MS
Signal generator	Function generator	AWG	Function generator	AWG	Function generator	AWG
Input ranges	±50 mV to ±20 V in 9 ranges					
Trigger	Modes: Auto, repeat, single, none, rapid (segmented memory) Advanced: rising, falling or dual edge with adjustable hysteresis, window, pulse width, window pulse width, dropout, window dropout, interval, logic, runt pulse					
Power	USB					
Warranty	5 years					
Part number	PP708	PP709	PP710	PP711	PP712	PP713

THE WORLD'S FIRST USB 3.0 OSCILLOSCOPE

PicoScope	3207A	3207B
Bandwidth	250 MHz	250 MHz
Sampling	1 GS/s	1 GS/s
Memory	256 MS	512 MS
Signal generator	Function generator	AWG
Power supply	From USB port	
Interface	USB 3.0	
Part number	PP875	PP876

PICOSCOPE 3000 SERIES

4-CHANNEL, FAST, SPACE-SAVING AND USB-POWERED

FAST SAMPLING RATE

The PicoScope 3000 Series 4-channel oscilloscopes deliver a market-leading 1 GS/s real-time sampling rate. ETS mode boosts the maximum effective sampling rate further to 10 GS/s, enabling even finer time resolution when used with repetitive signals.

This new range of USB-powered oscilloscopes is small, light and portable and has the power and performance for many applications, such as design, research, test, education, service and repair.

PicoScope	3404A	3404B	3405A	3405B	3406A	3406B
Channels	4					
Bandwidth	60 MHz		100 MHz		200 MHz	
Sampling rate - Real time	1 GS/s					
Buffer memory	4 MS	8 MS	16 MS	32 MS	64 MS	128 MS
Resolution (enhanced)	8 bits (12 bits)					
Signal generator	Function Generator	AWG	Function Generator	AWG	Function Generator	AWG
Input ranges	±50 mV to ±20 V in 9 ranges					
Trigger	Modes: Auto, repeat, single, none, rapid (segmented memory) Advanced: rising, falling or dual edge with adjustable hysteresis, window, pulse width, window pulse width, dropout, window dropout, interval, logic, runt pulse					
Power	USB or AC adaptor					
Warranty	5 years					
Part number	PP846	PP847	PP848	PP849	PP850	PP851

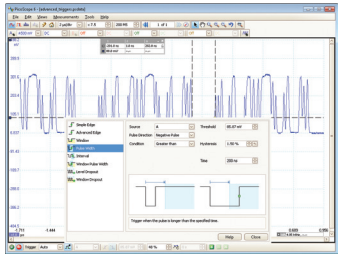
For full product specification please visit www.picotech.com

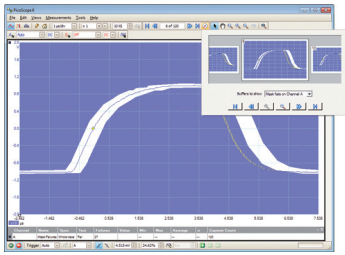
DEEP MEMORY

Other oscilloscopes have high maximum sampling rates, but without deep memory they cannot sustain these rates on long timebases. The PicoScope 3406B can sample at 1 GS/s at timebases all the way down to 10 ms/div.

Managing all this data calls for some powerful tools, so PicoScope has a choice of two zoom methods. There's a conventional set of zoom controls, plus an overview window that shows you the whole waveform while you zoom.

The deep memory can be segmented to store multiple waveforms, and has navigation tools allowing you to review up to 10,000 previous entries. No longer will you see a glitch on the screen only for it to vanish before you stop the scope. A mask can be applied to filter out waveforms of interest.





PICOSCOPE 3425

DIFFERENTIAL INPUT PC OSCILLOSCOPE

MEASURE FLOATING OR NON-GROUND-REFERENCED SIGNALS

With a maximum common mode and differential input range of 400 V, the PicoScope 3425 is capable of measuring both high-voltage and low-level signals. Typical high-voltage applications include capturing waveforms from switch mode power supplies, telephone cables, motor inverters and hybrid vehicles. The high-impedance differential inputs also allow measurements on sensitive amplifiers and from bridge type sensors for pressure, load and strain.

EASY AND INEXPENSIVE

With the PicoScope 3425 you don't need expensive differential preamplifiers or probes, as all the necessary circuitry is built in. Just connect the screened differential cables, supplied, to the circuit under test and use the device like a normal oscilloscope. The PicoScope software gives you all the advanced features of our standard oscilloscopes, such as math and reference waveforms, mask limit testing and automatic measurements. Data logging software is also included in case you need to make long-term measurements.

PicoScope	3425
Channels	4
Bandwidth	5 MHz
Sampling rate	20 MS/s
Buffer memory	512 kS
Resolution	12 bits (16 bits enhanced)
Signal generator	No
Input ranges	±100 mV to ±400 V in 12 ranges
Trigger	Modes: None, Auto, Repeat, Single, Edge: rising, falling
Power	USB
Warranty	5 years
Part number	PP454

PICOSCOPE 4224 & 4424

HIGH-RESOLUTION OSCILLOSCOPES

A POWERFUL HIGH RESOLUTION OSCILLOSCOPE

The 2 channel PicoScope 4224 and the 4 channel PicoScope 4424 are high resolution oscilloscopes that are suitable for general, scientific and field–service use. With 12 bit resolution (adjustable up to 16 bits in enhanced resolution mode) and 1% vertical accuracy they also make an excellent choice for noise, vibration and mechanical analysis.

NOW YOU CAN MEASURE EVERYTHING FROM SMALL SIGNALS TO LARGE VOLTAGES

The PicoScope 4000 Series have input ranges from ±50 mV to ±100 V so you can measure small signals from sensors as well as higher voltages from power supply circuits and motor drives.

DEEP MEMORY

The 32 M sample buffer is 'always on'. There is never a compromise between buffer size and waveform update rate, because the PicoScope 4000 Series always maximises both at the same time. Now you can capture every waveform with full detail.

PicoScope	4224	4424
Channels	2	4
Bandwidth	20 MHz	
Sampling rate - Real time	80 MS/s	
Continuous streaming mode	10 MS/s	
Buffer memory	32 MS	
Resolution (enhanced)	12 bits (16 bits enhanced)	
Input ranges	±50 mV to ±100 V in 11 ranges	
Trigger	Modes: Auto, repeat, single, rapid, none Advanced: rising & falling edge, edge with hysteresis, pulse width, runt pulse, dropout, windowed, rapid, save to file on trigger	
Power	USB	
Warranty	5 years	

PICOSCOPE 4262

A DIGITAL OSCILLOSCOPE FOR THE ANALOG WORLD

16 BITS

LOW NOISE LOW DISTORTION

The PicoScope 4262 from Pico Technology is a 2-channel, 16-bit high-resolution oscilloscope with a built-in low-distortion signal generator. With its 5 MHz bandwidth, it can easily analyze audio, ultrasonic and vibration signals, characterize noise in switched mode power supplies, measure distortion, and perform a wide range of precision measurement tasks.

FULL-FEATURED OSCILLOSCOPE

The PicoScope 4262 is a full-featured oscilloscope, with a function generator and arbitrary waveform generator that includes a sweep function to enable frequency response analysis. It also offers mask limit testing, math and reference channels, advanced digital triggering, serial decoding, automatic measurements and color persistence display modes.

DESIGNED FOR THE ANALOG WORLD

When used in spectrum analyzer mode, the scope provides a menu of eleven automatic frequency-domain measurements such as IMD, THD, SFDR and SNR. Its performance is so good that it rivals many dedicated audio analyzers and dynamic signal analyzers costing several times the price. Most digital oscilloscopes have been designed for viewing fast digital signals, and the trend has been to use new technology solely to increase sampling rate and bandwidth. With the PicoScope 4262 we have focused on what's important for measuring analogue signals: increasing the resolution, improving dynamic range, and reducing noise and distortion.

PicoScope	4262
Channels	2 + Ext trigger
Bandwidth	5 MHz (4 MHz on ±20 mV range, 3 MHz on ±10 mV range)
Sampling rate - Real time	10 MS/s
Buffer memory	16 MS
Resolution (enhanced)	16 bits (20 bits)
AWG	Yes
Input ranges	±10 mV to ±20 V in 11 ranges
Trigger	Modes: None, auto, repeat, single, rapid (segmented memory) Advanced: Rising, falling, edge, window, pulse width, dropout, interval, logic, runt pulse
Power	USB
Warranty	5 years

PICOSCOPE 5000 SERIES

FLEXIBLE RESOLUTION, HIGH PERFORMANCE AND HIGH SPEED

FLEXIBLE RESOLUTION - FROM 8 TO 16 BITS

Most digital oscilloscopes gain their high sampling rates by time-interleaving multiple 8 bit ADCs. Despite careful design, the interleaving process introduces errors that always make the dynamic performance worse than the performance of the individual ADC cores.

The new PicoScope 5000 Series scopes have a significantly different architecture in which multiple high-resolution ADCs can be applied to the input channels in different time-interleaved and parallel combinations to boost either the sampling rate or the resolution.

In time-interleaved mode, the ADCs are interleaved to provide 1 GS/s at 8 bits. Interleaving reduces the performance of the ADCs, but the resulting 60 dB SFDR is still much better than oscilloscopes that interleave 8 bit ADCs. This mode can also provide 500 MS/s at 12 bits resolution.

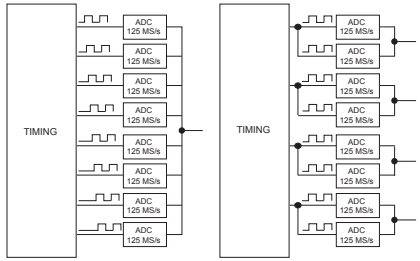
In parallel mode, multiple ADCs are sampled in phase on each channel to increase the resolution, improve dynamic performance and reduce noise. Using parallel mode, resolution is increased to 14 bits at 125 MS/s per channel (70 dB SFDR). If only two channels are required then resolution can be increased to 15 bits, and in single-channel mode all the ADCs are combined to give a 16 bit mode at 62.5 MS/s. The software user interface gives the choice of selecting the resolution or leaving the scope in “auto resolution” mode where the highest resolution possible is used for the chosen settings.

FRONT END DESIGN

Pico has over 20 years’ experience in the design of high-resolution oscilloscopes but, even so, developing a new analog front end to support an oscilloscope that can be switched between different resolutions was a significant challenge. Careful attention was required to support the high-resolution modes (with low noise, low distortion and bandwidth flatness) while maintaining the bandwidth, slew rate and pulse response necessary for the faster 8 bit mode.

PORTABILITY AND POWER

Pico Technology oscilloscopes are small, light and portable. In 2 channel mode the 5000 Series scopes can be powered from USB only, making them ideal for the engineer on the move. The external power supply is only needed when using 3 or 4 channels.

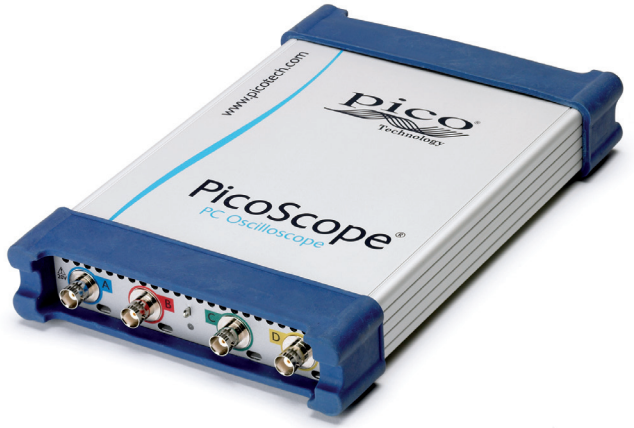


The PicoScope 5000 Series scopes use multiple high-resolution ADCs in either interleaved or simultaneous mode to give low-noise sampling at resolutions from 8 bits to 16 bits.

PicoScope	5242A	5442A	5242B	5442B	5243A	5443A	5243B	5443B	5244A	5444A	5244B	5444B
Channels	2	4	2	4	2	4	2	4	2	4	2	4
Bandwidth	All modes: 60 MHz				8 to 15-bit modes: 100 MHz 16-bit mode: 60 MHz				8 to 15-bit modes: 200 MHz 16-bit mode: 60 MHz			
Max. sampling rate Any 1 channel Any 2 channels Any 3 channels 4 channels	8-bit mode 1 GS/s 500 MS/s 250 MS/s 250 MS/s				12-bit mode 500 MS/s 250 MS/s 125 MS/s 125 MS/s				14-bit mode 125 MS/s 125 MS/s 125 MS/s 125 MS/s		15-bit mode 125 MS/s 125 MS/s - -	16-bit mode 62.5 MS/s - - -
Sampling rate (repetitive sampling)	2.5 GS/s				5 GS/s				10 GS/s			
Buffer memory (8-bit) *	16 MS		32 MS		64 MS		128 MS		256 MS		512 MS	
Buffer memory (≥ 12-bit) *	8 MS		16 MS		32 MS		64 MS		128 MS		256 MS	
Hardware resolution ** (Enhanced vertical resolution)	8 bits, 12 bits, 14 bits, 15 bits, 16 bits (Hardware resolution + 4 bits)				8 bits, 12 bits, 14 bits, 15 bits, 16 bits (Hardware resolution + 4 bits)				8 bits, 12 bits, 14 bits, 15 bits, 16 bits (Hardware resolution + 4 bits)			
Signal generator	Function Generator		AWG		Function Generator		AWG		Function Generator		AWG	
Input ranges	±10 mV to ±20 V full scale, in 11 ranges											
Trigger	None, Auto, Repeat, Single, Rapid (segmented memory) Advanced triggers: Edge, Window, Pulse width, Window pulse width, Dropout, Window dropout, Interval, Runt pulse, Logic											
Power	USB or AC adaptor											
Warranty	5 years											
Part number	PP863	PP869	PP864	PP870	PP865	PP871	PP866	PP872	PP867	PP873	PP868	PP874

* Shared between active channels

** Maximum effective resolution is limited on the lowest voltage ranges: ±10 mV = 8 bits • ±20 mV = 12 bits. All other ranges can use full resolution.



PICOSCOPE 6000 SERIES

HIGH BANDWIDTH, HIGH SAMPLING RATE
With a 250 MHz to 500 MHz analog bandwidth complemented by a real-time sampling rate of 5 GS/s, the PicoScope 6000 Series scopes can display single-shot pulses with 200 ps time resolution. ETS mode boosts the maximum sampling rate to 50 GS/s, giving higher timing resolution for repetitive signals.

MORE BUFFER MEMORY THAN ANY OTHER OSCILLOSCOPE
The PicoScope 6000 Series gives you the deepest buffer memory available as standard on any oscilloscope. Other oscilloscopes have high maximum sampling rates, but without deep memory they cannot sustain these rates on long timebases. The 1-gigasample buffer on the PicoScope 6404B allows it to capture at 5 GS/s down to 20 ms/div for a total duration of 200 ms. To help manage all this data, PicoScope can zoom in thousands of times using a choice of two zoom methods. There are zoom buttons as well as an overview window that lets you zoom and reposition the display by simply dragging with the mouse.

ADVANCED TRIGGERS
As well as the standard range of triggers found on most oscilloscopes, your PicoScope 6000 Series scope has a built-in set of advanced triggers to help you capture the data you need.

CUSTOM PROBE SETTINGS
The custom probes feature allows you to correct for gain, attenuation, offsets and nonlinearities in special probes, or to convert to different units of measurement. You can save definitions to disk for later use. Definitions for standard Pico-supplied probes are included.

PICOSCOPE 6000 SERIES

THE HIGHEST PERFORMANCE USB OSCILLOSCOPE AVAILABLE

ULTIMATE PERFORMANCE

The PicoScope 6404A and B have the highest bandwidth and sampling rate of any USB oscilloscope available, but are still only a fraction of the cost of a comparable full-sized oscilloscope. Their high speed means that they can display single-shot pulses with a time resolution as short as 200 ps.

DEEP MEMORY

The PicoScope 6404B also has the deepest buffer memory available as standard on any oscilloscope. Deep memory allows the scope to sample at higher speeds for longer periods without gaps. For example, even at the maximum sampling rate of 5 GS/s, the PicoScope 6404B can capture 200 ms of uninterrupted data. Zoom, pan and buffer overview tools in the PicoScope software make it easy to find details of interest.

PicoScope	6402A	6402B	6403A	6403B	6404A	6404B
Channels	4					
Bandwidth	250 MHz		350 MHz		500 MHz	
Sampling Rate	5 GS/s					
Memory	128 MS	256 MS	256 MS	512 MS	512 MS	1 GS
Resolution (enhanced)	8 bits (12 bits)					
AWG or function generator	Function Generator	AWG	Function Generator	AWG	Function Generator	AWG
Input ranges	±50 mV to ±20 V in 9 ranges					
Trigger	Modes: Auto, rapid, repeat, single, none, Advanced: rising & falling edge, edge with hysteresis, logic level, pulse width, runt pulse, dropout, window, delayed, save to file on trigger					
Power	AC adaptor					
Warranty	5 years					
Part number	PP838	PP839	PP840	PP841	PP842	PP843

For full product specification please visit www.picotech.com

PICOSCOPE 6000 SERIES PROBES

Probe specifications	TA150	TA133
Attenuation	10:1	
Resistance at probe tip	10 MΩ	
Capacitance at probe tip	9.5 pF	
Scope input impedance	1 MΩ	
Compatibility	PicoScope 6402A/B, 6403A/B	PicoScope 6404A/B
Probe bandwidth (3 dB)	350 MHz	500 MHz
System bandwidth (3 dB)		
Risetime (10% to 90%)	1 ns	700 ps
Compensation range	10 to 25 pF	
Safety standard	IEC/EN 61010-031	
Cable length	1.3 m	

Your PicoScope 6000 Series scope is supplied complete with four high-impedance probes. Replacement probes are available.

These probes have been designed for use with individual models of the PicoScope 6000 Series and are factory-compensated to match each scope's input characteristics.

Each high-quality probe is supplied with a range of accessories for convenient and accurate high-frequency measurements.

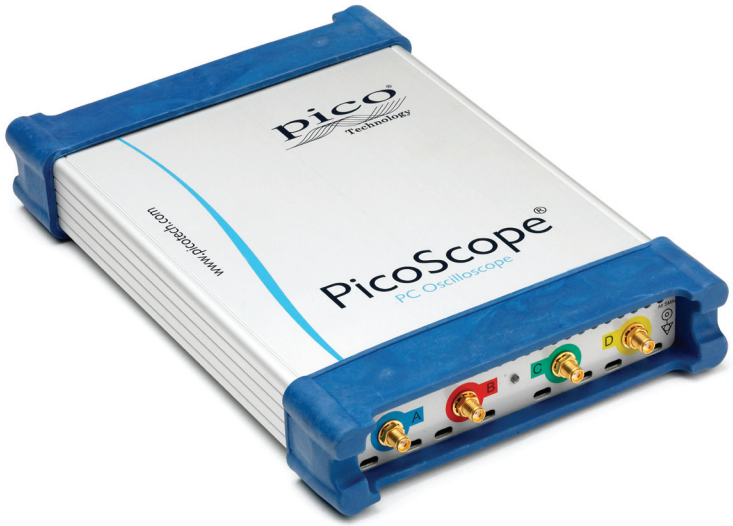
Accessories included:

TA150

- Instruction manual
- Solid tip 0.5 mm
- Coding rings, 3 x 4 colors
- Ground lead 15 cm
- Ground spring 2.5 mm
- Trim tool
- Insulating cap 2.5 mm
- Sprung hook 2.5 mm

TA133

- Instruction manual
- Solid tip 0.5 mm
- Coding rings, 3 x 4 colors
- Ground lead 15 cm
- Ground spring 2.5 mm
- Trim tool
- Insulating cap 2.5 mm
- Sprung hook 2.5 mm
- Spring tip 0.5 mm
- Ground blade 2.5 mm
- 2 self-adhesive copper pads
- Protection cap 2.5 mm
- IC caps 0.5 to 1.27 mm pitch
- PCB adapter kit 2.5 mm



PICOSCOPE 6407

1 GHz BANDWIDTH HIGH-PERFORMANCE USB DIGITIZER

PicoScope	6407
Channels	4 (SMA)
Bandwidth	1 GHz
Sampling rate - Real time	5 GS/s
Buffer memory	1 GS
Resolution (enhanced)	8 bits (12 bits)
AWG	Yes
Input range	±100 mV *
Trigger	Modes: Auto, rapid, repeat, single, none, Advanced: rising & falling edge, edge with hysteresis, logic level, pulse width, runt pulse, dropout, window, delayed, save to file on trigger
Bandwidth (AUX trigger)	25 MHz
Power	AC adaptor
Warranty	5 years
Part number	PP795

* If your input signal is larger than ±100 mV, adding an external 50 ohm attenuator to the input SMA connector will expand the analog input range. Choose one of our attenuators from page 30.

HIGH-SPEED DATA ACQUISITION

The PicoScope 6407 Digitizer is a compact USB plug-in device that turns your PC or laptop into a high-speed digitizer. It can easily digitize a 1 GHz sine wave with a timing resolution of 200 ps.

HUGE BUFFER MEMORY

The PicoScope 6407 digitizer has a memory depth of 1 billion samples. Other digitizers have high maximum sampling rates, but without deep memory they cannot sustain these rates on long timebases. The PicoScope 6407 can sample at 5 GS/s at timebases all the way down to 20 ms/div, giving a total acquisition time of 200 ms. If that's not enough, the driver supports streaming mode for capturing unlimited gap-free data directly to the PC's RAM or hard disk at over 10 MS/s.

The large buffer enables the use of segmented memory. Each captured waveform segment is stored in the buffer so you can rewind and review thousands of previous waveforms. No longer will you see a glitch on the screen only for it to vanish before you stop the scope.

ADVANCED TRIGGERS

As well as the standard range of triggers found on all oscilloscopes, the PicoScope 6407 offers a comprehensive set of advanced triggers including pulse width, windowed and dropout triggers to help you capture the data you need.

PicoScope 9000

SAMPLING OSCILLOSCOPES

THE ULTIMATE IN PRICE AND PERFORMANCE

If you need to measure high-speed repetitive signals, the PicoScope 9000 sampling oscilloscopes deliver the ultimate performance in their price range. The PicoScope 9000 Series oscilloscopes are designed to look at repetitive signals and are therefore not suitable for real-time or single-shot applications.

At prices starting from under £6000 (about $10000 / €7000) – less than half the price of comparable sampling oscilloscopes – the PicoScope 9000 Series has all the features and performance you need at a price you can afford. Unlike other manufacturers, all software functionality is included in the cost of the oscilloscope, and software updates are provided free of charge for the life of the product.

SAMPLING OSCILLOSCOPES COMPARED TO PC OSCILLOSCOPES:

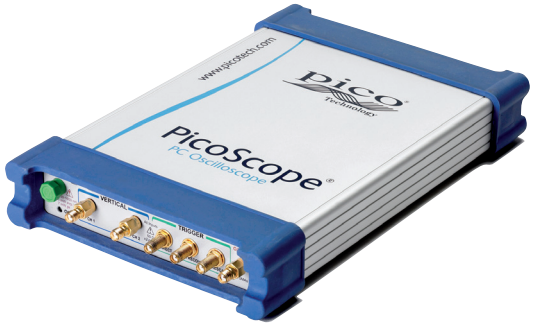
- Can only capture repetitive waveforms
- Have lower real-time sampling rate to increase ADC resolution
- Lower noise floor
- Wider bandwidth for lower budget
- Lower intrinsic jitter
- Eye diagram analysis with mask testing
- Can be used for TDR/TDT measurement
- Lower cost of ownership compared to benchtop sampling scopes

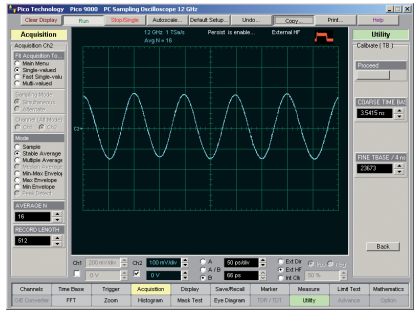
HIGH-SPEED ELECTRICAL AND OPTICAL SIGNALS

Designed specifically for the complex task of analyzing high-speed electrical and optical signals, PicoScope 9000 sampling oscilloscopes are ideal for many advanced applications including: signal analysis, timing analysis, testing and design of high-speed digital communication systems, network analysis, semiconductor testing, and research and development.

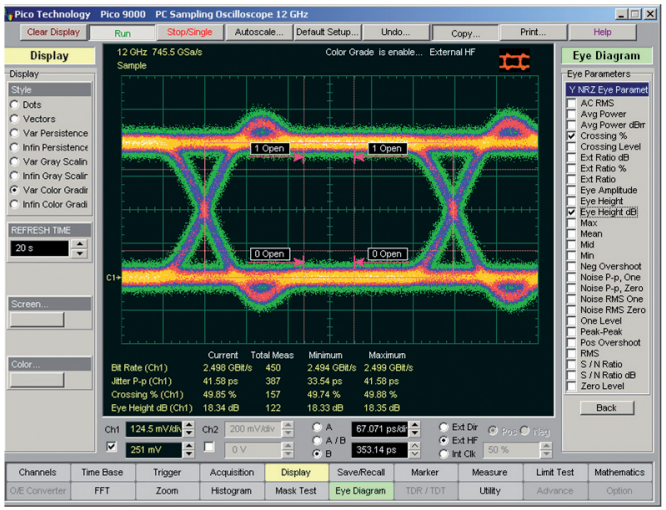
TDR/TDT

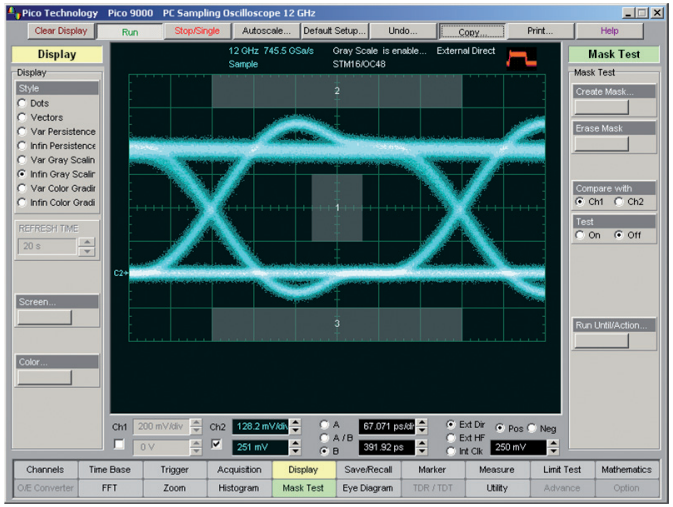
The PicoScope 9211A and 9231A sampling oscilloscopes are specially designed for time-domain reflectometry (TDR) and time-domain transmission (TDT) measurements. They provide a low-cost method of analyzing cables, connectors, circuit boards and IC packages.





PICOSCOPE 9000 SOFTWARE





EYE DIAGRAM ANALYSIS

The PicoScope 9200 scopes can measure more than 40 parameters used to characterize serial data signals. Up to four parameters can be measured simultaneously, with statistics also shown. The measurement points and levels used to generate each parameter can be shown dynamically. Eye diagram analysis can be made even more powerful with the addition of mask testing.

RZ AND NRZ EYE DIAGRAM MEASUREMENTS

The PicoScope 9000 Series scopes quickly measure 42 NRZ (non-return-to-zero) and 43 RZ (return-to-zero) parameters.

MASK TESTING

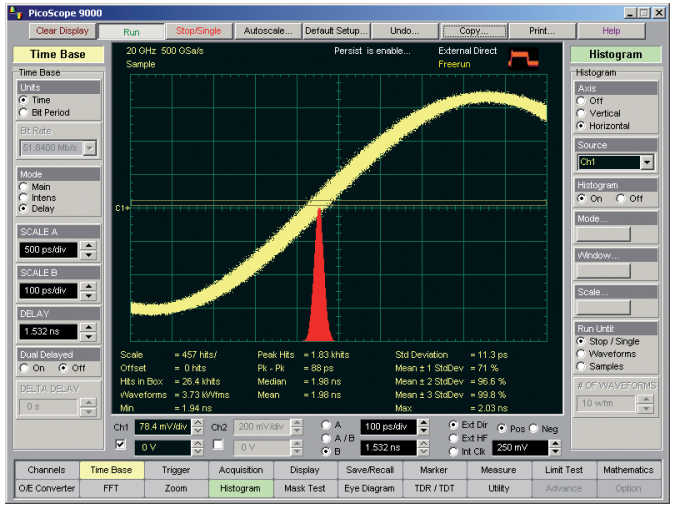
For eye-diagram masks, such as those specified by the SONET and SDH standards, the PicoScope 9000 supports on-board mask drawing for visual comparison. The display can create grey-scaled or colour-graded displays to aid in analyzing noise and jitter in eye-diagrams.

Mask testing quickly characterizes:

- Noise
- Jitter
- Aberrations

The on-board mask drawing capability allows simple, operator-independent visual comparison of a signal with a standard mask.

PICOSCOPE 9000 SOFTWARE



TDR/TDT

Time Domain Reflectometry (TDR) is a method of characterizing a transmission line or network by sending a step signal into one end and monitoring the electrical reflections.

A TDR step can also be used to make Time Domain Transmission (TDT) measurements. TDT is a technique that allows you to measure the response of a system by sending a fast edge through a device and monitoring the output of the device.

HISTOGRAM ANALYSIS

A histogram is a probability distribution that shows the distribution of acquired data from a source within a user-definable histogram window. The information gathered by the histogram is used to perform statistical analysis on the source.

Histograms can be constructed on waveforms on either the vertical or horizontal axes. The most common use for a vertical histogram is measuring and characterizing noise on displayed waveforms, while horizontal histograms are most often used for measuring and characterizing jitter on displayed waveforms.

PICOSCOPE 9000 SERIES

- **12 GHz BANDWIDTH ON 2 CHANNELS**
- **DUAL TIMEBASES DOWN TO 10 ps/DIV**
- **UP TO 10 GHz TRIGGER BANDWIDTH**
- **OPTICAL AND ELECTRICAL INPUTS**
- **ACTIVEX COMPONENT INCLUDED**

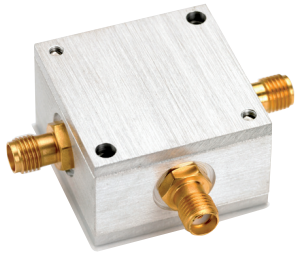
If you're looking for an affordable way to measure high-speed electrical signals, you can't do better than the PicoScope 9000 Series of PC Sampling Oscilloscopes.

Designed specifically for the complex task of analysing high-speed electrical signals, PicoScope 9000 Sampling Oscilloscopes are ideal for many advanced applications including: signal analysis, timing analysis, testing and design of high-speed digital communication systems, network analysis, semiconductor testing, and research and development.

Typical applications include:

- Electrical standards compliance testing
- Semiconductor characterization
- Telecom service and manufacturing
- Timing analysis
- Digital system design and characterization
- TDR/TDT measurement and analysis (PicoScope 9211A and 9231A only)
- Automatic pass/fail limit testing
- High-speed serial bus pulse response

ACCESSORIES



2-WAY RESISTIVE POWER SPLITTER SMA, 4200 MHz
- For use with the PicoScope 9000 Series and PicoScope 6407 Digitizer
- Very wideband, DC to 4200 MHz
- Low insertion loss, 0.1 dB typical
- Excellent amplitude unbalance, 0.02 dB typical
- Rugged shielded case

Power splitter SMA. TA079

TDR/TDT ACCESSORY KIT included with 9211A & 9231A
- 30 cm precision cable
- 80 cm precision cable
- 0 Ω short
- 50 Ω terminator
- Coupler
- 2 way resistive power splitter
- SMA wrench

ATTENUATOR SMA TO SMA Bandwidth DC to 6 GHz
Attenuator 3 dB.
Attenuator 6 dB.
Attenuator 10 dB.
Attenuator 20 dB.

SPECIFICATIONS

VERTICAL	All Models
Channels	2
Bandwidth	DC to 12 GHz
Rise time	29.2 ps
Resolution	16 bits
RMS noise	<2.0 mV
Vertical gain accuracy	±2 %
Input range	±1 V
HORIZONTAL	All Models
Dual timebase	10 ps/div to 50 ms/div
Time interval accuracy	±0.2% ±15 ps
Resolution	200 fs minimum
Buffer size	Up to 4 kS/channel
TRIGGER	All Models
Direct trigger bandwidth	DC to 1 GHz
Prescaled trigger bandwidth	10 GHz
Trigger RMS jitter	<3.5 ps + 20 ppm of delay setting, typical
TDR/TDT	9211A and 9231A
Channels	2
Vertical scales	Volts, Rho (2 mrho/div to 2 rho/div), Ohm (1 ohm/div to 100 ohm/div)
Horizontal scale	Time or distance (Meter, Foot, Inch)
FUNCTION GENERATOR	9211A and 9231A
Modes	Step, Coarse timebase, Pulse, NRZ and RZ
Rise time	100 ps (typ) for Step (TDR)

MEASUREMENTS AND ANALYSIS	All Models
Markers	Horizontal and vertical bars or waveform markers (x and +)
Automatic measurements	Up to 40
FFT	Up to two FFTs simultaneously
OPTICAL - ELECTRICAL CONVERTER	9221A and 9231A
Unfiltered bandwidth	DC to 8 GHz typical
Effective wavelength range	750 nm to 1650 nm
Fiber input	Single-mode (SM) or multi-mode (MM)
Input return loss	SM: 24 dB, typical. MM: 16 dB, typical
UTILITY	Autoscale, automatic calibration, demo signals
GENERAL	Weight: 1 kg Size: 170 x 40 x 255 mm

Model comparison	9201A	9211A	9221A	9231A
12 GHz sampling oscilloscope	•	•	•	•
USB port	•	•	•	•
LAN port		•		•
Clock recovery trigger		•	•	•
Pattern sync trigger		•	•	•
Dual signal generator outputs		•		•
Electrical TDR/TDT capability		•		•
8 GHz optical-electrical converter			•	•

Oscilloscope Accessories

PASSIVE PROBES

Our passive oscilloscope probes are available in bandwidths from 60 MHz up to 1.5 GHz. The table below shows their characteristics:

SPECIFICATION	MI007		TA132		TA131		TA150 (for 6402, 6403)	TA133 (for 6404)	TA061	TA062
Attenuation	1:1	10:1	1:1	10:1	1:1	10:1	10:1	10:1	10:1	10:1
Bandwidth	DC to 15 MHz	DC to 60 MHz	DC to 10 MHz	DC to 150 MHz	DC to 10 MHz	DC to 250 MHz	DC to 350 MHz	DC to 500 MHz	DC to 1.5 GHz	DC to 1.5 GHz
Rise time	23.3 ns	5.8 ns	35 ns	2.33 ns	35 ns	1.4 ns	1 ns	700 ps	240 ps	240 ps
Input resistance	1 MΩ	10 MΩ	1 MΩ	10 MΩ	1 MΩ	10 MΩ	10 MΩ	10 MΩ	500 Ω	500 Ω
Input capacitance	46 pF	15 pF	57 pF	15 pF	57 pF	15 pF	9.5 pF	9.5 pF	2 pF	2 pF
Working voltage	600 V PK CAT II		600 V PK CAT II		600 V PK CAT II		300 V RMS CAT II	300 V RMS CAT II	12 V PK	12 V PK
Connector	BNC		BNC		BNC		BNC	BNC	SMA	BNC

MI007 SCOPE PROBE 60 MHz
This high-quality general-purpose oscilloscope probe has a 60 MHz bandwidth. A two-position slide switch selects attenuation of either x1 or x10.

TA132 SCOPE PROBE 150 MHz
& TA131 SCOPE PROBE 250 MHz
These high-quality general-purpose oscilloscope probes have a 150 MHz or 250 MHz bandwidth. A two-position slide switch selects attenuation of either x1 or x10.

TA150 & TA133 SCOPE PROBE 350 & 500 MHz
These high-quality general-purpose oscilloscope probes have 350 MHz and 500 MHz bandwidths. Each probe is supplied with a range of accessories for convenient, accurate measurements.

TA061 & TA062 SCOPE PROBE 1.5 GHz
These very high-bandwidth 1.5 GHz probes are suitable for use with high-speed oscilloscopes and spectrum analyzers. They have either an SMA or a BNC connector.

ACTIVE PROBES

SPECIFICATION	TA042	TA043	TA044
Description	100 MHz 1400 V differential probe	100 MHz 700 V differential probe	70 MHz 7000 V differential probe
Attenuation	100:1, 1000:1	10:1, 100:1	100:1, 1000:1
Bandwidth	100 MHz	100 MHz	70 MHz
Rise Time	3.5 ns	3.5 ns	5 ns
Differential voltage ranges	140 V DC + peak AC 100 V RMS	70 V DC + peak AC 70 V RMS	700 V DC + peak AC 500 V RMS
	1400 V DC + peak AC 1000 V RMS	700 V DC + peak AC 500 V RMS	7000 V DC + peak AC 5000 V RMS
Common mode range	1400 V DC + peak AC 1000 V RMS	700 V DC + peak AC 500 V RMS	7000 V DC + peak AC 2500 V RMS
Input impedance	4 MΩ/7 pF each side to ground	4 MΩ/7 pF each side to ground	10 MΩ/10 pF each side to ground
Power requirements	4 x AA cells (supplied)	4 x AA cells (supplied)	4 x AA cells (supplied)
Safety rating	CAT III	CAT III	CAT I

SPECIFICATION	TA045
Attenuation	10:1
Bandwidth	200 MHz
Common mode	±60 V
Differential	±20 V
Input impedance	500 kΩ / 7 pF
Battery power	Optional (TA047)
Safety rating	CAT I

ACTIVE DIFFERENTIAL PROBE 20 V, 200 MHz

The TA045 is a CAT I rated differential oscilloscope probe that can measure up to ±20 volts.

SPECIFICATION	TA046
Attenuation	10:1
Bandwidth	800 MHz
Common mode	±30 V
Differential	±15 V
Input impedance	100 kΩ / 2 pF

ACTIVE DIFFERENTIAL PROBE 15 V, 800 MHz, x 10

The TA046 is a high-bandwidth differential probe. It is ideal for measuring high-speed differential signals.

ACTIVE DIFFERENTIAL PROBE 700 TO 7000 V, 70 TO 100 MHz

The TA042, TA043 and TA044 are active differential oscilloscope probes. They let you use a conventional earthed oscilloscope to measure signals that are not referenced to ground, including mains voltages with the TA042 and TA043. They can also be used to measure and observe the waveforms of three-phase supplies or the gate and control signals of semiconductor circuits. They are ideal for investigating motor speed controls, uninterruptible power supplies, switch mode power supplies and process controllers.

TETRIS 1000 AND 1500 WIDE BANDWIDTH SINGLE ENDED ACTIVE PROBES

SPECIFICATION	TETRIS 1000/TA112	TETRIS 1500/TA113
Attenuation	10:1	10:1
Bandwidth	1 GHz	1.5 GHz
Input impedance	1 MΩ	1 MΩ
Input capacitance	0.9 pF	0.9 pF
Working voltage	20 V	20 V
Cable length	1.3 m	1.3 m

The TETRIS active probes can contact adjacent square pins in 2.54 mm (0.1") pitch simultaneously. The probe's housing is T-shaped so that many probes can be attached side by side.

ACTIVE DIFFERENTIAL PROBE 70 V, 50 MHz, x10, CAT I

SPECIFICATION	TA058
Attenuation	10:1
Bandwidth	50 MHz
Common mode	±700 V or 600 V RMS
Differential	±70 V or 70 V RMS
Battery power	Optional (TA047)
Input impedance	1.6 MΩ / 7 pF
Safety rating	CAT I

The TA058 is a CAT I rated differential oscilloscope probe that can measure up to ±70 volts.

ACTIVE DIFFERENTIAL PROBE 700 V OR 1400 V CAT III

SPECIFICATION	TA041	TA057
Attenuation ranges	10:1, 100:1	20:1, 200:1
Bandwidth	DC to 25 MHz (-3 dB)	DC to 25 MHz (-3 dB)
Differential voltage ranges	±70 V or 70 V RMS ±700 V or 700 V RMS	±140 V or 1000 V RMS ±1400 V or 1000 V RMS
Common mode voltage range	±700 V or 700 V RMS	±1400 V or 1000 V RMS
Input impedance	4 MΩ / 5.5 pF	4 MΩ / 5.5 pF
Safety rating	CAT III	CAT III

The probe permits a conventional earthed oscilloscope to measure signals that are not referenced to earth, enabling mains voltages to be tested. Ideal for investigation of motor speed controls, uninterruptible power supplies, switch mode power supplies and process controllers.

ACCESSORIES FOR ACTIVE PROBES

The TA047 is an optional 4AA battery pack for the TA045 and TA058 active differential probes. We also offer power supplies should you need to buy a new one. The PS008 is a 9 V power supply for all TA differential probes. The PS009 is a 15 V power supply for the TA046 only.

TA047

PS008 & PS009

CABLES AND CONNECTORS

BNC TO 4 mm CABLE (3 m)
A wide range of probes and clips can be plugged into the 4 mm connectors at the end of the cable. TA000

BNC TO 4 mm CABLE (1.8 m)
Test lead - BNC plug to 4 mm plugs.
MI029

BNC TO BNC CABLE (1.2 m)
Test lead - BNC plug to BNC plugs.
MI030

BNC TO CROCODILE CLIPS CABLE (1.8 m)
Test lead - BNC plug to crocodile clips
MI031

BNC TO 4 mm ADAPTER
The BNC to 4 mm adapter converts two 4 mm (“banana”) plugs to a BNC plug.
MI078

DATA CABLES
We also offer a range of data cables. All cables are 1.8 m in length.

SERIAL CABLE D9M - D9F	MI010
PARALLEL CABLE D25M - D25F	MI004
USB CABLE A-B	MI106

(High-quality cable made especially for PicoScopes)

GENERAL ACCESSORIES

ATTENUATOR SET: BNC 50 Ω, 1 W, 1 GHz, 3, 6, 10 AND 20 dB

The TA050 attenuator set consists of four coaxial attenuators designed for use with signals up to 1 GHz. Each attenuator has a male and a female BNC connector.

SPECIFICATION	TA050
Attenuation	3, 6, 10, 20 dB
Bandwidth	DC to 1 GHz
Max. power dissipation	1 W
Input impedance	50 Ω
Output impedance	50 Ω
VSWR	1.5:1 or better
Dimensions	56 x 20 x 17 mm
Connectors	BNC, 1 male + 1 female

FEED-THROUGH TERMINATOR

SPECIFICATION	TA051
Bandwidth	DC to 1 GHz
Max. power dissipation	1 W
Input impedance	50 Ω
Dimensions	56 x 20 x 17 mm
Connectors	BNC, 1 male + 1 female

The TA051 feed-through terminator is a coaxial terminator with BNC connectors. It is useful for connecting signals from 50 ohm sources into instruments with high-impedance inputs, such as oscilloscopes.

CURRENT CLAMP 60 A AC/DC (4 mm BANANA PLUG OR BNC)

Current clamps offer a safe, cost-effective, simple and accurate way to take current measurements. They enable you to measure currents without breaking the electric circuit. Current clamps are designed with jaws that can be opened, placed around the conductor and clamped closed to form a magnetic loop around the conductor.

The Pico range of current clamps can be used with Pico oscilloscopes and data loggers, as well all major brands of oscilloscopes and multimeters.

CURRENT CLAMP 60 A

CURRENT CLAMP 600 A

SPECIFICATION	60 A	600 A
Range	10 mA to 60 A	0 to 600 A
Frequency range	DC to 20 kHz	DC to 400 Hz
Max. conductor size	9 mm	30 mm
Operational temp. and humidity	0°C to 50°C, 70% RH	0°C to 50°C, 70% RH
	PP218 4mm	PP179 4mm

PicoLog®

DATA LOGGERS

Data logging products from Pico Technology provide a straightforward answer to your data logging requirements.

WHAT IS A DATA LOGGER?
A data logger is an electronic device that is used to record measurements over time. Pico Technology data loggers require no external power supply and simply plug into a serial or USB port on your PC.

WHAT CAN I MEASURE?
By connecting suitable sensors, Pico Technology data acquisition products can be used to measure temperature, pressure, relative humidity, light, resistance, current, power, speed, vibration... in fact, any physical parameter.

WHAT SOFTWARE DO I NEED?
Pico Technology data loggers are supplied complete with PicoLog software. This powerful but flexible data acquisition software allows you to collect, analyze and display data. With PicoLog the data is viewable both during and after data collection, in both spreadsheet and graphical format. You can also export the data for use in other applications.

PICO DATA LOGGER RANGE
Along with voltage-input data loggers, the Pico Technology data logger range also includes loggers designed for specific applications:

- For measuring temperature and humidity, loggers such as the TC-08 thermocouple data logger and PT-104 temperature data logger offer an accurate solution.
- Current monitoring can be carried out by our PicoLog CM3 3 channel current data logger which is suitable for single or three phase alternating current.
- pH can be measured using the DrDAQ pH Kit. This kit allows you to measure the full pH scale with automated temperature compensation.

Whatever your data logging requirements, a Pico Technology data logger gives you an easy-to-use and accurate solution at a competitive price.

PICOLOG SOFTWARE

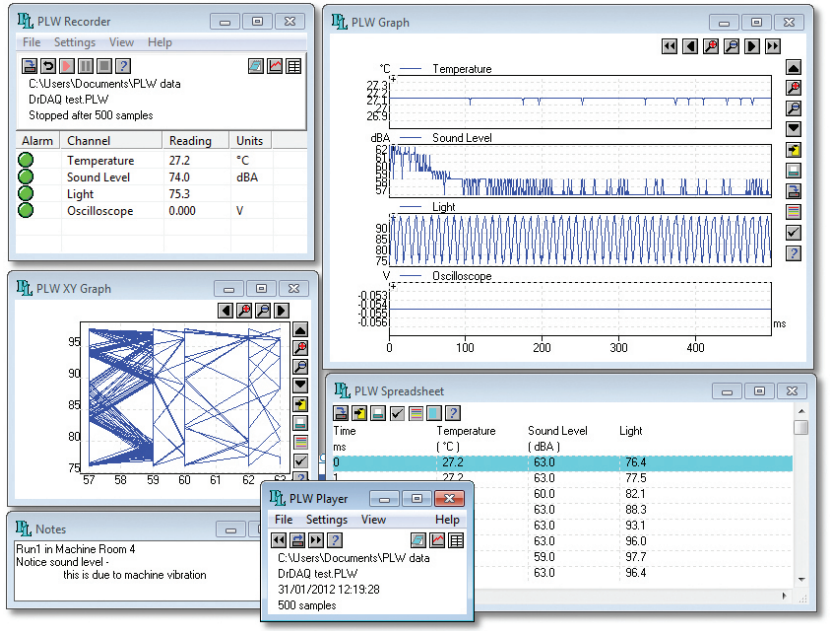
PicoLog is a powerful and flexible program for collecting, analyzing and displaying data.

PicoLog can be used with the following product ranges:

- All data acquisition and data logging products
- PicoScope 2204, 2205 & 3425 Oscilloscopes (for high-speed data acquisition and logging)
- Temperature and humidity converters and loggers.

Some of the features of PicoLog are listed here. To see for yourself just how good it is, download your free demo copy.

- Collects up to 1 million samples
- Easy and intuitive to use
- Free upgrades and technical support
- Supports 32- and 64-bit editions of Windows XP (SP3 and above), Windows Vista and Windows 7 and Windows 8 (Not Windows RT)
- International language versions (French, Italian, German, Spanish, Czech and Swedish)
- Easy to set up and use, with online help
- Real-time data collection, analysis and display
- Programmable alarm limits can be set for each channel
- Data can be exported to spreadsheets and databases
- Save multiple setups for different tests and experiments
- Can be used with desktop or laptop PCs
- Supports multiple loggers on the same PC
- Uses PC monitor to give large colour display, ideal for education and training
- Waveforms can be saved, printed, faxed or e-mailed from your PC
- Scaling, filtering
- IP networking



PROGRAM MODES

PicoLog for Windows works in two modes: player mode for displaying previously recorded data, and recorder mode for recording new data. You can have more than one copy of PicoLog running at once, so you can use the player to analyze old data while recording new data.

PicoLog can collect data from up to 20 converters at the same time. This not only allows a mix of voltage input units to be used on the same PC, but also allows other PC-based instruments such as the TC-08 thermocouple data logger to be used at the same time.

EXPORTING DATA

Data can easily be transferred (either as graphs or raw data) to other Windows applications by using the clipboard (copy and paste). Graphs can also be saved to disk as bitmaps, and data from the spreadsheet can be saved in text format. Current readings can be transferred using Dynamic Data Exchange (DDE).

PICOLOG SOFTWARE

MULTIPLE VIEWS
PicoLog displays data in a number of views, which can be activated as and when required, both during and after data collection.

RECORDER VIEW
Enables you to start and stop recording and specify recording files. It shows the current readings and alarm conditions for each channel. All settings such as scaling, channels and sampling are controlled from the recorder view.

XY GRAPH VIEW
Displays one parameter against another. Useful for plotting voltage against current, for example.

SPREADSHEET VIEW
Displays text data in a format that can be easily copied and pasted into other applications. Data can also be saved to disk in standard text format.

GRAPH VIEW
Graphs can be displayed both during and after data collection. Each channel can be displayed in its own graph, or multiple channels can be displayed in the same graph. Axes can be set up manually, automatically or in chart recorder mode. Multipliers allow you to magnify areas of interest. Graphs can be copied into the clipboard and then pasted into reports.

NOTES VIEW
Notes view allows you to attach notes to data.

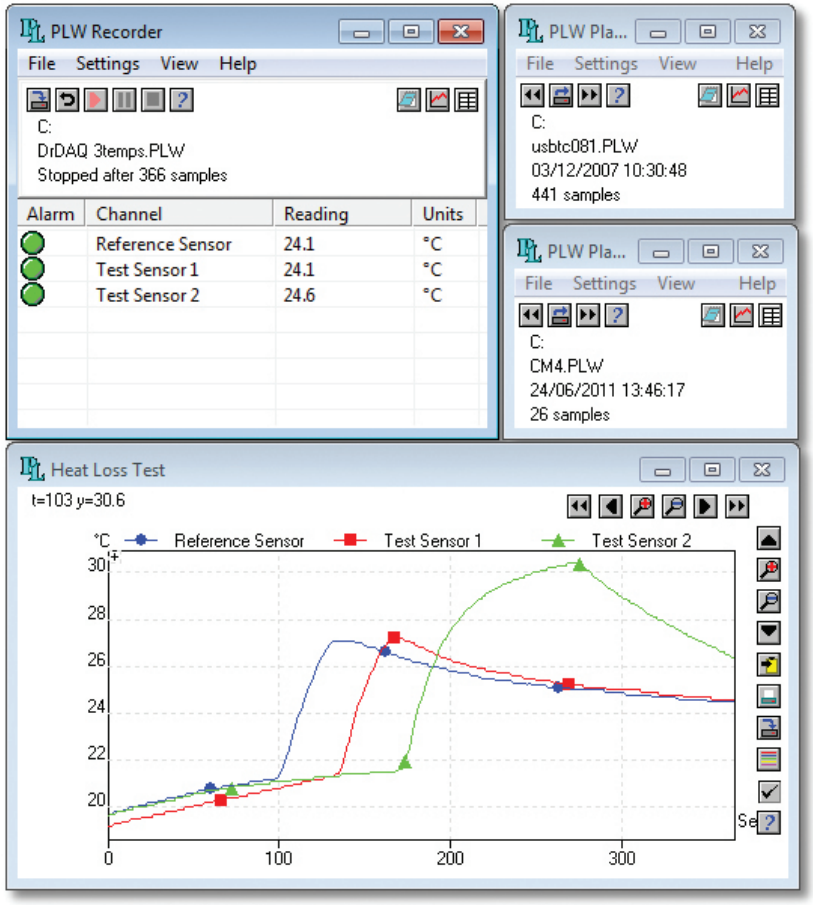
PLAYER VIEW
Displays previously recorded data. It enables you to scroll quickly through stored files to compare results on successive runs. The player can be used to examine old data whilst new data is still being recorded.

PARAMETER SCALING
Can be used to convert raw data into standard engineering units. A wide range of equation and table lookup scaling options are provided.

ADDITIONAL PARAMETERS
For example, to calculate power output from a boiler, you can multiply a flow reading from one channel by the temperature difference between two further channels.

ALARM LIMITS
Can be set for each channel to alert the user should a parameter go out of a specified range.

IP NETWORKING
PicoLog data acquisition software supports IP networking. This enables remote data collection from Pico Technology's full range of data acquisition products.



PICOLOG CM3

CURRENT DATA LOGGER

- **3 CHANNEL CURRENT DATA LOGGER**
- **SUITABLE FOR SINGLE OR THREE PHASE ALTERNATING CURRENTS**
- **LOW CONVERSION TIME**
- **HIGH RESOLUTION AND ACCURACY**

The new PicoLog CM3 USB/Ethernet Current Data Logger is a compact, easy-to-use instrument for measuring the current consumption of buildings and machinery. With three channels, high accuracy and low noise, it is ideal for recording data from both single-phase and three-phase AC supplies. The logger is supplied complete with three AC current clamps and all necessary software. The USB and Ethernet interfaces allow the logger to be used as a USB-only device, as a USB-powered device with Ethernet interface, or as a Power-over-Ethernet (PoE) device. Using the Ethernet interface, the PicoLog CM3 can be located anywhere on a LAN or on the internet.

DATA COLLECTION

PicoLog is a powerful but flexible data acquisition program designed for collecting, analyzing displaying data over long or short periods of time. Data can be viewed both during and after collection in spreadsheet or graphical format. If required, the data can also be easily exporte other applications.

PicoLog	CM3
Channels	3
Range (voltage input)	0 to 1 V AC RMS
Accuracy (voltage input)	±1 % (to 200 mV) ±2.5 % (to 1 V)
Range (current clamp)	0.1 to 200 A AC RMS
Accuracy (current clamp)	±2 %, ±0.5 A
Resolution	24 bit ADC
Reading rate	<1 second per conversion
Input connectors	4 mm socket
PC connection	USB or Ethernet
Dimensions	184 x 135 x 36 mm
Part number - Logger only	PP815

VOLTAGE DATA LOGGERS

PICOLOG 1000 SERIES

- **UP TO 16 UNIPOLAR ANALOG INPUT CHANNELS**
- **UP TO 12-BIT RESOLUTION WITH 0.5% ACCURACY**
- **UP TO 4 SOFTWARE-CONFIGURABLE DIGITAL OUTPUT LINES**
- **UP TO 1 MS/s SAMPLING RATE**

A DISTINGUISHED PEDIGREE

The PicoLog 1000 Series is the result of a distinguished lineage that goes back to the release of our first multi-channel data logger — the ADC-11 — in 1993. The original ADC-11, and its successor the USB ADC-11, proved to be the perfect choice for users wanting a low-cost way to measure and record multiple signals. The PicoLog 1000 Series builds on this success to give you the same low-cost data acquisition but with greater power and performance. (Because the ADC-11 was so popular we've also added a USB ADC-11 compatibility mode, which allows you to use your PicoLog 1000 logger as a direct replacement for the USB ADC-11.)

AN EXPANDABLE DATA ACQUISITION SYSTEM

The budget PicoLog 1012 model has 12 input channels. The more powerful PicoLog 1216 has 16. Need more channels? No problem. Using PicoLog you can connect up to 20 Pico data loggers to one PC — giving you a potential 250 channel PicoLog 1000 Series data acquisition system, or the ability to use your PicoLog 1000 logger with other devices such as the USB TC-08 thermocouple data logger.

PICOLOG 1000 TERMINAL BOARD

This optional terminal board with screw terminals lets you easily and quickly connect your sensors to the logger. The board also has solder pads on which you can fit resistors to widen the measuring range for each input.
Terminal board PP545 £15 $25 €18

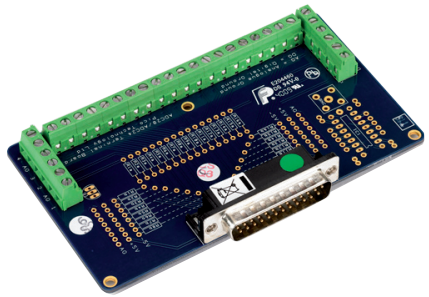
PicoLog	1012	1216
Channels	12	16
Resolution	10 bits	12 bits
Input ranges	0 to 2.5 V	0 to 2.5 V
Part number - with terminal board	PP546	PP547

VOLTAGE DATA LOGGERS

ADC-20 AND ADC-24

- **UP TO 8 TRUE DIFFERENTIAL OR 16 SINGLE-ENDED INPUTS**
- **24-BIT RESOLUTION**
- **ACCURATE TO WITHIN 0.1%**
- **FAST CONVERSION TIME**

ADC-20 AND ADC-24 TERMINAL BOARD
This optional terminal board provides screw terminals to allow you to quickly connect and disconnect different sensors.
Terminal board PP310 £25 $42 €30



THE ULTIMATE IN RESOLUTION AND ACCURACY
With up to 24 bit resolution, the ADC-20 and ADC-24 USB data loggers are able to detect the smallest signal changes. Features such as true differential inputs, galvanic isolation and software selectable sampling rates all contribute to a superior noise-free resolution, and ensure that your measurements are reliable and accurate to within 0.1%.

FLEXIBLE MULTI-CHANNEL ACQUISITION
Both the ADC-20 and ADC-24 feature true differential inputs for excellent noise rejection. Each differential input can also be configured as 2 single-ended inputs. With up to 8 differential or 16 single-ended inputs on the ADC-24, this flexibility gives you complete control over the type of inputs you use. For example, you may configure the ADC-24 to use 4 differential and 8 single-ended inputs, or 2 differential and 12 single-ended inputs; and so on: the choice is yours.

With up to 7 bipolar voltage ranges, the ADC-20 and ADC-24 are also versatile enough to be used with a wide range of sensors and signal types.

Model	ADC-20	ADC-24
Channels	4 diff/8 single-ended	8 diff/16 single-ended
Resolution	20 bits	24 bits
Voltage ranges	±2500 mV ±1250 mV	±2500 mV, ±1250 mV ±625 mV, ±312 mV ±156 mV, ±78 mV ±39 mV
Part number - Logger only	PP308	PP309

TEMPERATURE & HUMIDITY DATA LOGGERS

TC-08

- **8 CHANNEL THERMOCOUPLE DATA LOGGER**
- **MEASURES FROM -270°C TO +1820°C**
- **AUTOMATIC COLD JUNCTION COMPENSATION**
- **HIGH RESOLUTION AND ACCURACY**

WIDE TEMPERATURE RANGE

The TC-08 thermocouple data logger is designed to measure a wide range of temperatures using any thermocouple that has a miniature thermocouple connector. Additionally, the TC-08 can measure other sensors using a 70 mV range.

Featuring built-in cold junction compensation (CJC), the TC-08 has an effective temperature range of -270°C to +1820°C. (The actual temperature range depends on the thermocouple being used.)

ALL THE BENEFITS OF USB

The TC-08 connects to the USB port of a Windows-based PC and enables the host PC to automatically detect the TC-08, avoiding the need for any complex setup procedures. The USB connection also allows the TC-08 to be powered directly by the USB port, eliminating the need for an external power supply and making the TC-08 ideal for measuring temperatures both in the lab and in the field.

TC-08 TERMINAL BOARD

This is an optional terminal board for the TC-08. The screw terminals allow wires to be attached to the data logger without soldering and enable the TC-08 to measure voltages from 0 to +5 V, or 4-20 mA loop current.
Terminal board PP624

Model	TC-08
Channels	8
Resolution	20 bits
Voltage input range	±70 mV
Conversion time	100 ms
Temperature accuracy	Sum of ±0.2 % of reading and ±0.5°C
Voltage accuracy	Sum of ±0.2 % of reading and ±10 µV
Power	PC connection - USB
Thermocouple types supported	B, E, J, K, N, R, S, T
Part number	PP222

THERMOCOUPLES

Pico Technology offers a range of popular type K thermocouples for use with the TC-08 thermocouple data logger and other suitable temperature measuring devices.

Please contact our technical support team if you require any further information on thermocouples that are suitable for your application.

TYPE K THERMOCOUPLES

	(EXPOSED WIRE, FIBERGLASS INSULATED)			(EXPOSED WIRE, PTFE INSULATED)				AIR PROBE	INSERTION PROBE	RIBBON SURFACE PROBE
	SE001	SE030	SE031	SE000	SE027	SE028	SE029	SE002	SE003	SE004
Tip diameter	1.5 mm			1.5 mm				4.5 mm	3.3 mm	8 mm
Tip temperature	-60 to +350°C			-75 to +250°C				-50 to +250°C	-50 to +250°C	-10 to +250°C
Probe length	NA			NA				120 mm	120 mm	120 mm
Cable length	1 m	2 m	5 m	1 m	2 m	3 m	10 m	1 m	1 m	1 m

TEMPERATURE & HUMIDITY DATA LOGGERS

PT-104 PRT DATA LOGGER

- **MEASURES TEMPERATURE, RESISTANCE AND VOLTAGE**
- **HIGH RESOLUTION AND ACCURACY**
- **CONNECT VIA USB OR ETHERNET PORT**

ACCURACY AND RESOLUTION

Although accurate temperature sensors are widely available, it has been difficult to find a measuring device that can take advantage of them without introducing excessive errors. The PT-104, however, is inherently accurate due to its novel design. Rather than relying on voltage references (which tend to be temperature-sensitive) it uses 'reference' resistors which are extremely stable (low temperature coefficient and drift). The exact value of each resistor is stored in an EEPROM to provide the ultimate in accuracy (annual recalibration is recommended). To achieve the 0.001°C resolution, a highly advanced ADC is used that can resolve to better than 1 part in 16 million.

TEMPERATURE

The PT-104 measures temperature using platinum resistance thermometers (PRTs). Both common industry standards (PT100 and PT1000) are supported. The unit is compatible with 2, 3 and 4 wire sensors (4 wire PT100 sensors are recommended for accurate measurements). A wide range of PT100 sensors are available for use with the PT-104.

PT-104 SCREW TERMINAL ADAPTER

The PT-104 Screw Terminal Adapter allows PT100 probes that are not fitted with a mini-DIN connector to be used with the data logger without the need for soldering. Terminal adaptor PP660

SPECIFICATION	Temperature	Resistance	Voltage
Sensor	PT100, PT1000	N/A	N/A
Range	-200 to 800°C	0 to 375 Ω 0 to 10 kΩ	0 to 115 mV 0 to 2.5 V
Accuracy (Unit@23±2°C)	0.015°C + 0.01% of reading	20 ppm @ 100 Ω	0.4%
Temperature coefficient		5 ppm/°C	100 ppm/°C
Resolution	0.001°C	1 µΩ	0.156 µV
Number of channels	4		
Part number	PP682		

PT100 TEMPERATURE SENSORS

GENERAL-PURPOSE LOW-COST PT100 PROBES

PT100 CLASS A SENSOR/SE011

PT100 GENERAL PURPOSE/SE019

SPECIFICATION	SE011	SE019
Temperature range	-30 to +200°C	-75 to +260°C
Accuracy	±0.15°C @ 0°C	±0.15°C @ 0°C
Dimensions	Length 200 mm Diameter 6 mm	Length 120 mm Diameter 3 mm
Cable	1 m	
Material	Stainless steel probe, PVC cable	
Handle	No	Yes

INSERTION PT100 PROBES

PT100 INSERTION PROBE/SE015

PT100 INSERTION PROBE HEAVY DUTY/SE016

SPECIFICATION	SE015	SE016
Temperature range	-75 to +250°C	-150 to +650°C
Accuracy	±0.15°C @ 0°C	±0.15°C @ 0°C
Dimensions	Length 120 mm Diameter 3.3 mm	Length 150 mm Diameter 4 mm
Cable	1 m	
Material	Stainless steel probe, PVC cable	
Handle	Yes	

IMMERSION PT100 PROBES

PT100 1/10 DIN SENSOR/SE012

PT100 IMMERSION PROBE/SE014

SPECIFICATION	SE012	SE014
Temperature range	-50 to +250°C	-75 to +250°C
Accuracy	±0.03°C @ 0°C	±0.15°C @ 0°C
Dimensions	Length 200 mm Diameter 4 mm	Length 120 mm Diameter 3.3 mm
Cable	1 m	
Material	Stainless steel probe, PTFE cable	Stainless steel probe, PVC cable
Handle	No	Yes

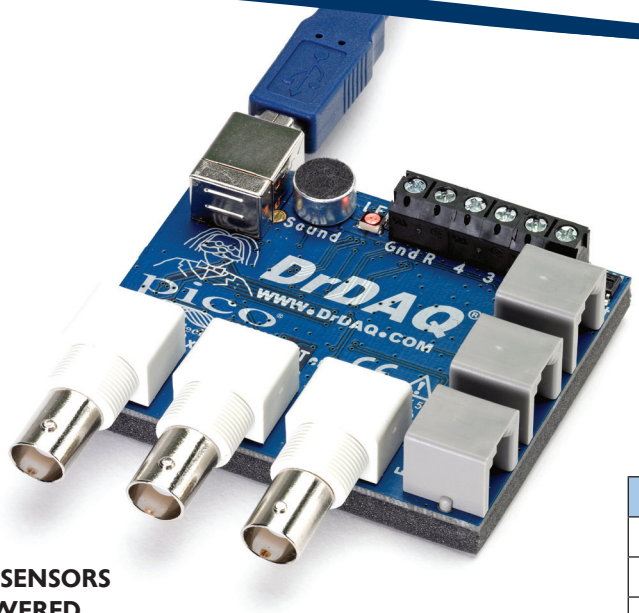
AIR PT100 PROBES

PT100 AIR PROBE FAST/SE017

PT100 AIR PROBE HIGH/SE018

SPECIFICATION	SE017	SE018
Temperature range	-75 to +250°C	-150 to +650°C
Accuracy	±0.15°C @ 0°C	±0.15°C @ 0°C
Dimensions	Length 120 mm Diameter 3.3 mm	Length 150 mm Diameter 4 mm
Cable	1 m	
Material	Stainless steel probe, PVC cable	
Handle	Yes	

DrDAQ



- **17 INPUTS, OUTPUTS AND SENSORS**
- **USB-CONNECTED AND POWERED**
- **USE UP TO 20 USB DrDAQS ON A SINGLE PC**

Whether you're a teacher, student, hobbyist or professional, the USB DrDAQ Data Logger gives you an inexpensive entry into the world of PC-based data logging.

MORE THAN JUST A DATA LOGGER
Thanks to the power of PicoScope, you can also use your DrDAQ as an oscilloscope and spectrum analyzer. Just run the supplied PicoScope software and your DrDAQ becomes a single-channel scope with 100 kHz bandwidth, 8-bit resolution and the ability to measure voltages up to 10 V.

SENSORS, LED AND DIGITAL I/O
With its built-in sensors for light, sound and temperature, you can start using your USB DrDAQ data logger straight out of the box. The USB DrDAQ also has an RGB LED that you can program to show any of 16.7 million colours.

Your USB DrDAQ also includes 4 digital input/outputs. In input mode these give you even more monitoring options. When used as outputs they enable you to use your DrDAQ to control external devices.

SPECIFICATION	DrDAQ		
Sound waveform	±100 units, 0.2 unit resolution		
Sound level	55 to 100 dBA, 1 dBA resolution, 5 dBA accuracy		
Temperature	-10 to +70 °C, 0.1° resolution, 2 °C accuracy		
Light sensor	0 to 100 units, 0.1 unit resolution		
RGB LED	16.7 million colours		
pH	0 to 14 pH, 0.02 pH resolution, accuracy sensor-dependent, BNC input		
Redox/ORP (Oxidation/reduction)	±2 V @10^{12} Ω, 1.2 mV resolution, accuracy sensor-dependent, BNC input shared with pH		
Resistance	0 to 1 MΩ, 250 Ω resolution @ 10 kΩ, screw terminal		
External sensors	0 to 2.5 V, 0.1 mV resolution, 1% accuracy, 3x FCC68 4/4		
Digital I/O	4 channels (screw terminals); 2 with 1 MHz pulse-counting input and PWM output; 0 to 5 V input, 3.3 V / 2.2 kΩ output		
Dimensions	77 x 70 x 23 mm (including BNC connectors)		
Part number	PP706 DrDAQ	PP707 kit	PP716 pH kit

For a full list of optional external sensors please visit www.drdaq.com

DrDAQ accessories

DD100
TEMPERATURE SENSOR
A high-accuracy general purpose temperature sensor with a 2 metre lead. Suitable for air, surface or liquid measurements.

DD011 PH ELECTRODE
The Pico pH sensor is a robust epoxy bodied pH electrode ideal for educational use. The pH sensor consists of a standard electrode capable of measuring the full 0 to 14 pH range. Supplied with storage solution to help prevent it drying out.

DD163
HUMIDITY SENSOR
The Humidity Sensor measures humidity using a 'non-condensing' technique. It has a short response time and plugs into the external sensor connections of USB DrDAQ.

PP066 REED SWITCH
Used to detect the presence of a magnetic field such as from a bar magnet or an electromagnet. Alternatively, a simple external switch can be wired to the internal screw terminals. It has a fast response time of 2 ms so can be used as an alternative to a light gate for timing applications.

DD103 OXYGEN SENSOR
The oxygen sensor is used to measure the percentage of oxygen in a gas. The sensor plugs into the external sensor sockets of a USB DrDAQ using the supplied cable.

PP216
MAGNETIC INDUCTION KIT
Over 170 years ago British scientist Michael Faraday discovered electromagnetic induction - the "induction" or generation of electricity in a wire by means of the electromagnetic effect of a current in another wire. Now with the Pico Magnetic Induction Kit and a DrDAQ data logger you too can perform your own electromagnetic induction experiments

Other Products

EDUCATION KIT

THE WORLD-CLASS KIT FOR YOUR CLASSROOM
Developed for both students and teachers, the PicoScope Education Kit is a versatile and affordable kit that has many educational uses.

KIT CONTENTS

PicoScope 2205
Speed of sound apparatus
Faraday's Law apparatus
AC dynamo apparatus
Software CD
Installation guide
2 x BNC to 4mm plug cables
BNC to crocodile clip cable
USB cable
Durable carry case

PICOSCOPE FOR EDUCATION
THE EASY WAY TO TEACH & LEARN
The Education Kit comes with these experiments which are fully documented, with instructions and automatic setups built in to the software:

- Speed of sound
- AC dynamo
- Faraday's law
- Measuring the value of a capacitor
- Serial data
- Speed of a pulse along a cable
- Acceleration due to gravity

AUTOMOTIVE SCOPE KITS

POWERFUL
We offer the automotive PicoScope 4000 Series scopes that turn your PC or laptop into a powerful automotive tool. The two main diagnostic techniques, ECU Fault codes and scopes, both have advantages but used together are very powerful. Scopes enable the actual signals to be viewed on your monitor ensuring a large high-quality display.

The kit can be used to test and measure virtually all of the electrical and electronic components and circuits in the modern vehicle, including:

- Ignition (primary & secondary)
- ABS sensors, crank & cam sensors
- Lambda, airflow, knock & MAP sensors
- FlexRay, CAN & LIN bus
- Injectors & fuel pumps
- Starter & charging currents
- Glow plugs/timer relays
- Relative compression tests

For more information please request our automotive catalogue online at www.picoauto.com.

Customer Comments

CUSTOMER COMMENTS

Uses a 3204A for: Microcontroller development.
Perfect handling, reliability, small and lightweight, good software
10 out of 10

Uses a TC-08 Thermocouple Data Logger for: Temperature and vacuum data logging for aerospace composites curing, as required by the FAA.
Dollar for dollar, the best data logging system "out there". Affordable, easy to set-up & easy to use!!
10 out of 10

Uses a 2000 Series for: Troubleshooting RS-485 networks.
I like the size of the scope. I can carry the scope in my laptop bag.
10 out of 10

Uses a 4226 for: It helps everyday during development.
This scope is as important to me as a cup of tea in the morning - Very good product - thanks
10 out of 10

Uses a 3204 for: General lab and off-site work.
Nice unit. Does what I need it to do. Simple, quick set up and with the software updates adding new functionality a really useful piece of kit.
10 out of 10

Uses a 4226 for: Audio development work.
This is a product that doesn't age...
I.E. if you purchase a dedicated instrument, it will rapidly fall out of date. With PicoScope there are regular software updates that help keep your instrument 'new'. - very happy camper! :-)
10 out of 10

Uses a 5203 for: General laboratory signal measurement.
What I like best about Pico products is the constant improvement to the software.
Pico Technology Rocks!
10 out of 10

Uses a 4424 for: Process control troubleshooting, serial comm. troubleshooting, three phase power quality checks, hobby.
Continuing development of the software, along with dedicated support; makes for a scope that delivers ever increasing capability == maximum performance for the investment.
10 out of 10

Uses a 3204 for: Electrical systems integration / development / fault-finding.
Like best: the portability / size of the products. I carry a laptop to site; with a PicoScope in my bag, I have a 'scope (with a 15" display and full functionality) ready to use.
9 out of 10

Uses a 4262 for: a Senior Design project on electronic noise suppression for shot-noise limited dual-beam measurements.
The Picoscope software is incredibly easy to use. I found the controls and menus to be intuitive, simple, and elegant.
10 out of 10

Uses a 2205 MSO for: Debug low level software i2c, spi, serial in ultra low power application environments (Bluetooth 4.0)
I like the performance/price ratio!
10 out of 10

Ordering

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