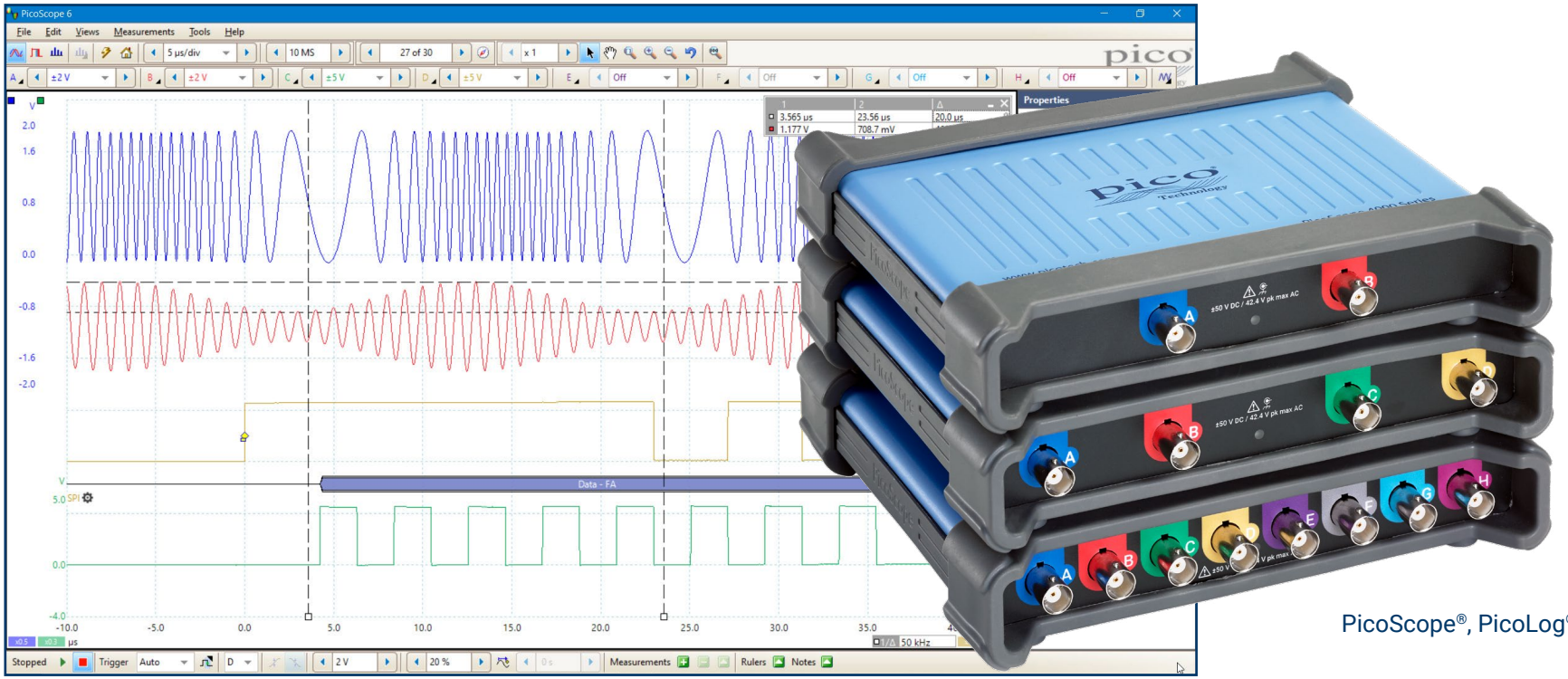
PicoScope® 4000A Series

Crystal-clear waveform analysis



2, 4 or 8 channels
20 MHz bandwidth
12-bit resolution
256 MS capture memory
80 MS/s sampling rate
1% DC accuracy
±10 mV to ±50 V input ranges
10 000 segment waveform buffer

80 MS/s AWG update rate
14-bit resolution AWG
Low-cost and portable
SuperSpeed USB 3.0 interface
Split-screen waveform viewing
Up to 70 dB SFDR
Advanced digital triggering
Serial bus decoding

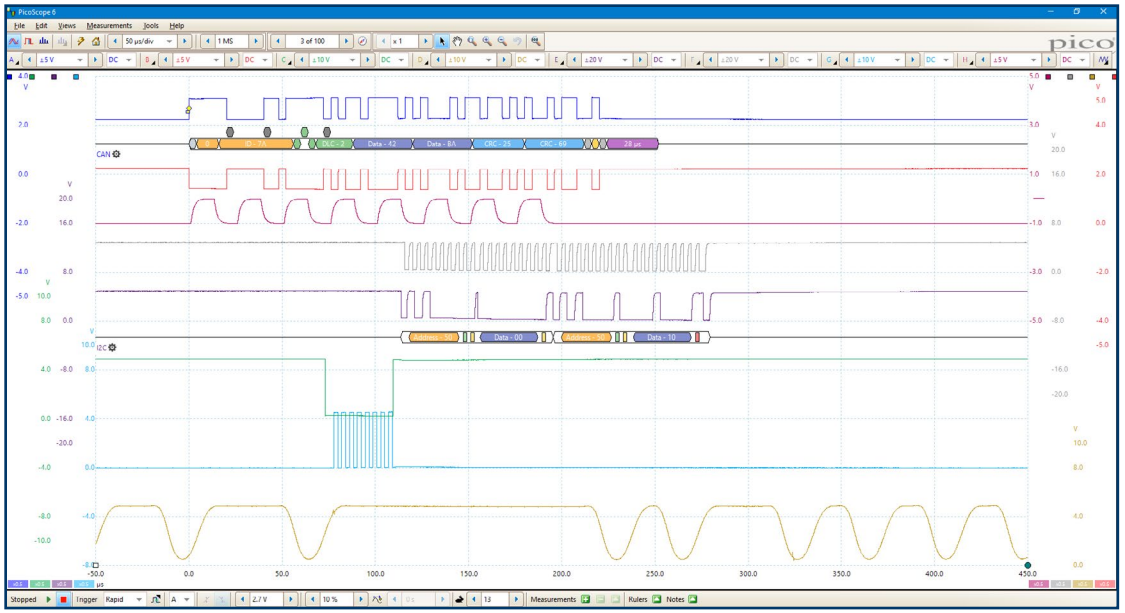
PicoScope®, PicoLog® and PicoSDK® software included

www.picotech.com

Up to 8 channels of high resolution

With the PicoScope 4000A Series providing a choice of either 2, 4 or 8 high-resolution analog channels you can easily view audio, ultrasonic, vibration and power waveforms, analyze timing of complex systems, and perform a wide range of precision measurement tasks on multiple inputs at the same time. The scopes have a small, compact footprint, yet the BNC connectors with a minimum 20 mm spacing still accept all common probes and accessories.

Despite their compact size, there is no compromise on performance. With a high vertical resolution of 12 bits, 20 MHz bandwidth, 256 MS buffer memory, and a fast sampling rate of 80 MS/s, the PicoScope 4000A Series has the power and functionality to deliver accurate results. With up to 8 channels, these oscilloscopes can analyze multiple serial buses such as UART, I²C, SPI, CAN and LIN plus control and driver signals.



Why choose the PicoScope 4000A Series oscilloscopes?

The PicoScope 4000A Series provides 20 MHz bandwidth, low noise, 12-bit resolution, deep capture memory and an integrated function and arbitrary waveform generator in a compact USB 3 connected PC-based package, together with a proven user interface.

This series of oscilloscopes is especially suited to engineers, scientists and technicians working on a wide range of electrical, mechanical, audio, lidar, radar, ultrasonic, NDT and predictive maintenance systems who need to make precise measurements and analysis of repetitive or single-shot long-duration waveforms.

The PicoScope 4000A Series is unlike conventional oscilloscopes with 8-bit resolution and limited capture memory or card-based digitizers that require an expensive mainframe and offers the following benefits:

- PicoScope 6 user interface with time- and frequency-domain waveform views
- Automatic measurements of important waveform parameters on up to a million waveform cycles with each triggered acquisition using DeepMeasure™
- Decoding of 18 popular industry serial bus standards.
- An application programming interface that provides direct control of the hardware
- Five years warranty included as standard

Suitable for a broad range of applications, including:

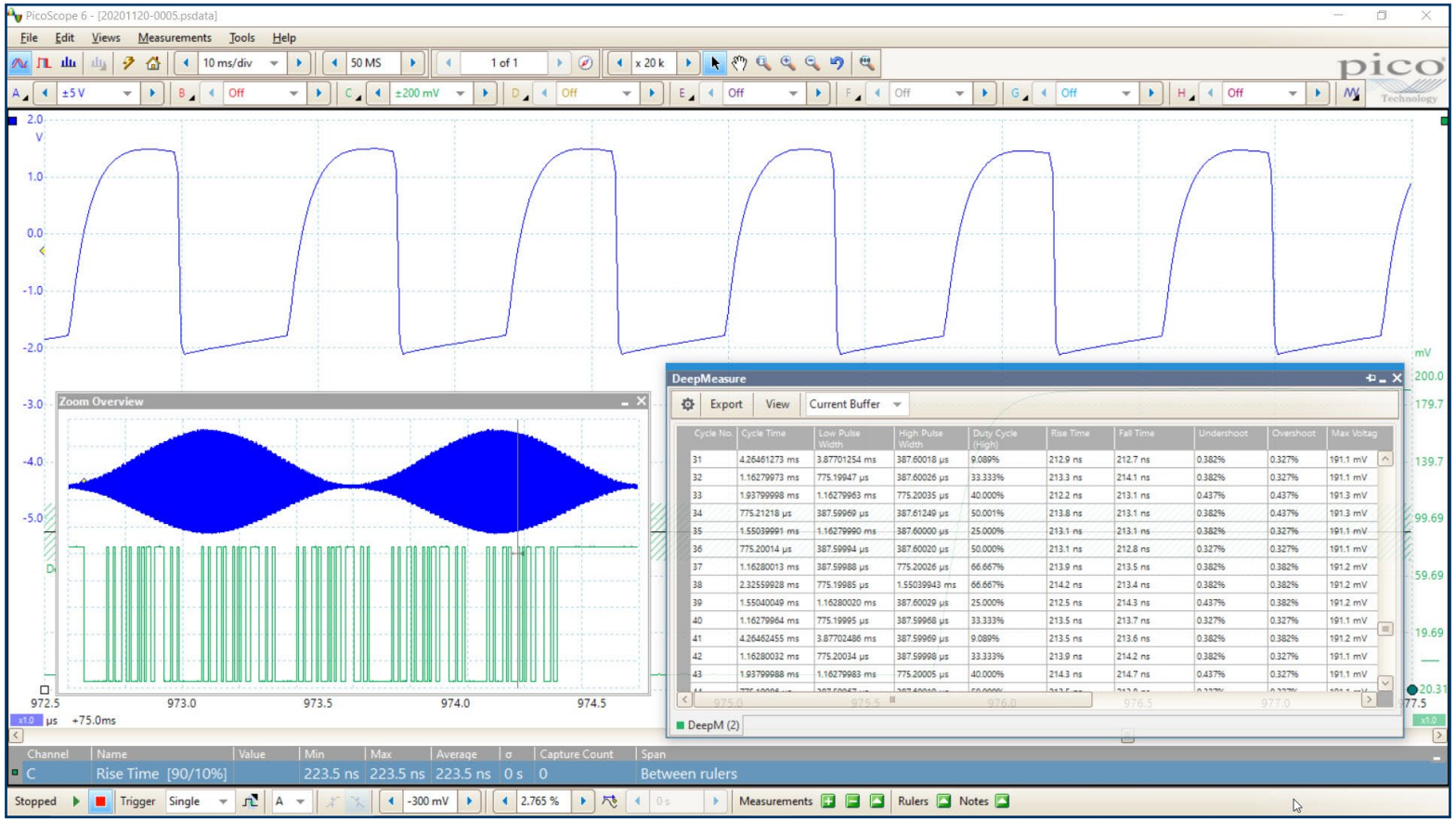
- Power supply start sequencing
- 7-channel audio systems
- Multi-sensor systems
- Multi-phase drives and controls
- Predictive/preventive maintenance
- Complex embedded system development
- Power harmonics analysis
- Vibration analysis and diagnostics
- Long-duration waveform capture
- Lubricant analysis
- Acoustic emission analysis
- Oil condition sensors
- Machine monitoring
- Motor condition monitoring and motor current signature analysis
- Model-based voltage and current systems

Power measurements

The PicoScope 4000A Series is ideal for making a range of power measurements on high voltages and currents and low-voltage control signals. For the best results, use a Pico differential voltage probe (TA041 or TA057) in combination with a current clamp (TA167) or probes (TA167, TA325 or TA326). To improve the efficiency and reliability of power designs, the scope can display and analyze standby power dissipation, inrush current, and steady-state power consumption. PicoScope's built-in measurements and statistics of parameters such as true RMS, frequency, peak-to-peak voltage and THD allow accurate analysis of power quality.

Nonlinear loads and modern power-conversion equipment produce complex waveforms with significant harmonic content. These harmonics reduce efficiency by causing increased heating in equipment and conductors, misfiring in variable speed drives, and torque pulsations in motors. The 12-bit PicoScope 4000A Series has the precision to measure distortion typically up to the 100th harmonic. On the supply side, power quality issues such as sags and dips, swells and spikes, flicker, interruptions and long-term voltage and frequency variations can also be checked for regulatory compliance.

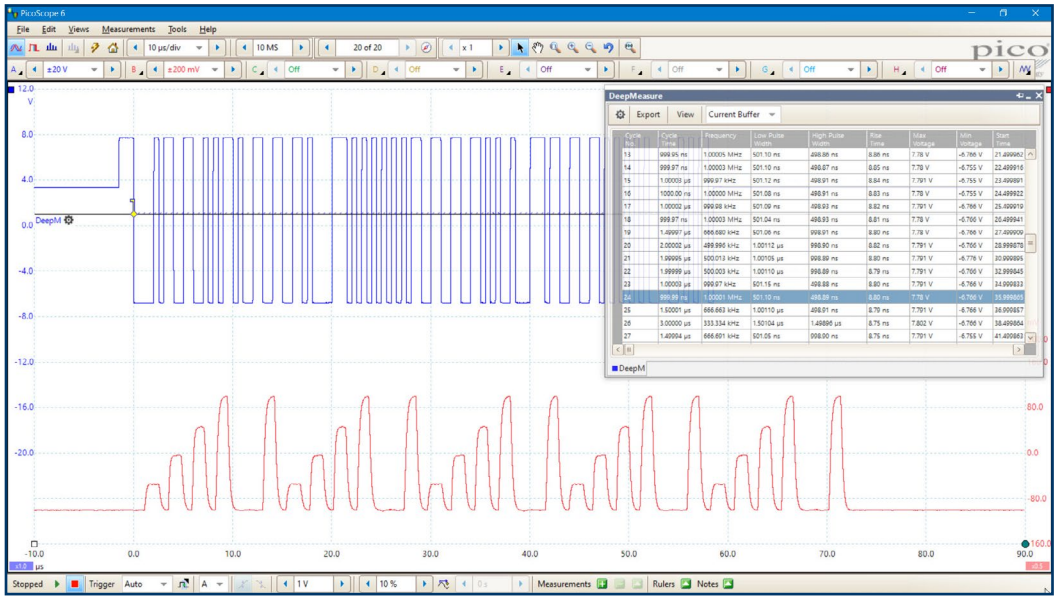
In a 3-phase distribution system, it is important to characterize and balance loads across phases. With up to 8 channels, the PicoScope 4000A Series can monitor waveforms of current and voltage on all 4 conductors of a 3-phase-plus-neutral system. This helps to identify mismatches that can cause breaker tripping, or transformer and conductor overheating.



DeepMeasure™

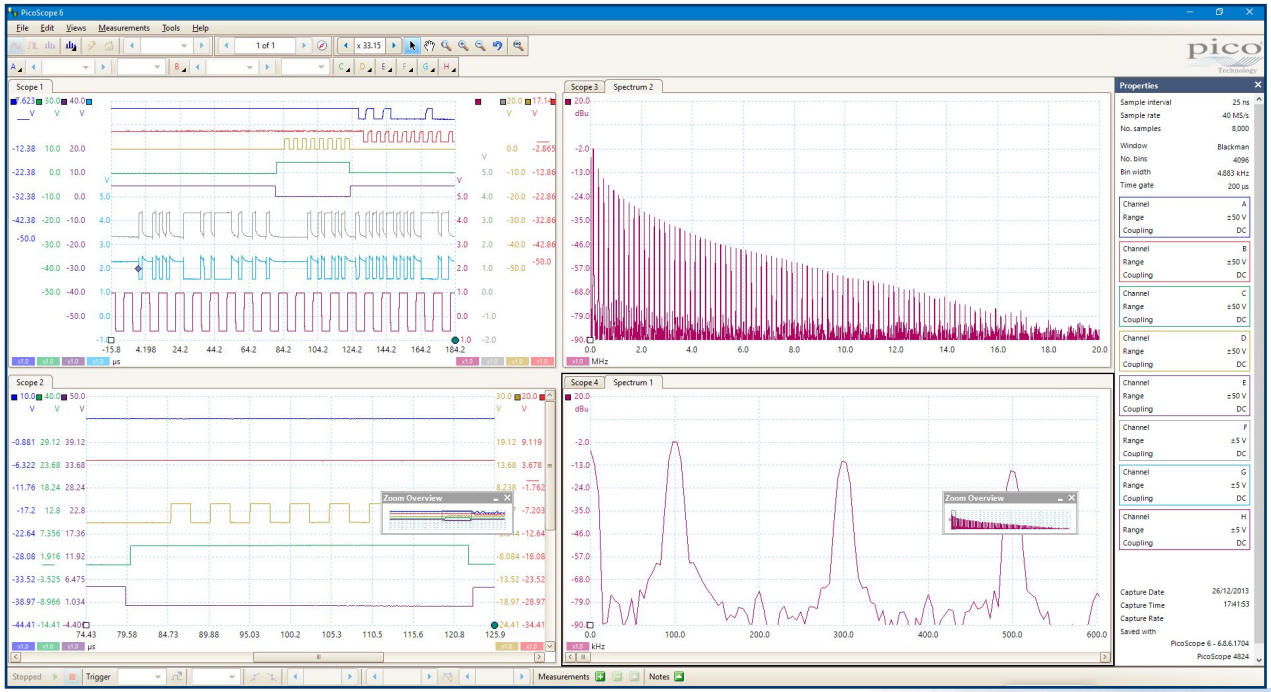
One waveform, millions of measurements.

Measurement of waveform pulses and cycles is key to verification of the performance of electrical and electronic devices. DeepMeasure delivers automatic measurements of important waveform parameters, such as pulse width, rise time and voltage. Up to a million cycles can be displayed with each triggered acquisition. Results can be easily sorted, analyzed and correlated with the waveform display.



Complex embedded systems

When debugging an embedded system with a scope, you can quickly run out of channels. You may need to look at an I²C or SPI bus at the same time as multiple power rails, DAC outputs and logic signals. With up to eight channels, the PicoScope 4000A Series can cope with all of this. Choose whether to decode up to eight serial buses, with analog waveforms and decoded data both visible, or a combination of serial buses and other analog or digital signals. PicoScope provides advanced triggering on all channels, so you can search for runt pulses, dropouts and noise as well as looking for data patterns using the 4-input Boolean logic trigger.



Split-screen display

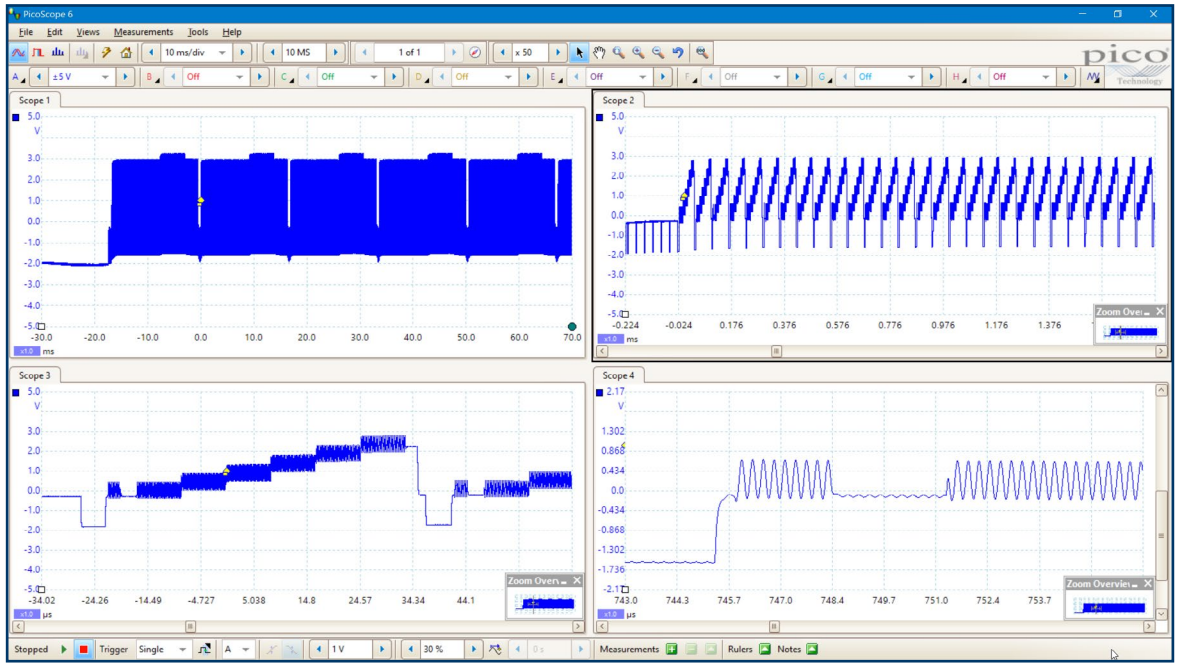
The PicoScope 6 software can display up to 16 scope and spectrum views at once, making comparisons and analysis even clearer. The split-screen display can be customized to show whichever combination of waveforms you need, to display multiple channels or different variants of the same signal. Additionally, each waveform shown works with individual zoom, pan, and filter settings for ultimate flexibility. Alongside the facility to use monitors many times larger than a fixed scope display, these are further reasons to choose a USB oscilloscope over a traditional benchtop model.

PicoScope performance and reliability

With over 25 years' experience in the test and measurement industry, we know what's important in an oscilloscope. The PicoScope 4000A Series delivers value for money by including a wide range of high-end features as standard. The PicoScope 6 software includes serial decoding and mask limit testing, and new functionality is regularly delivered through free upgrades to ensure that your device does not quickly become outdated. All Pico Technology devices are optimized with the help of feedback from our customers.

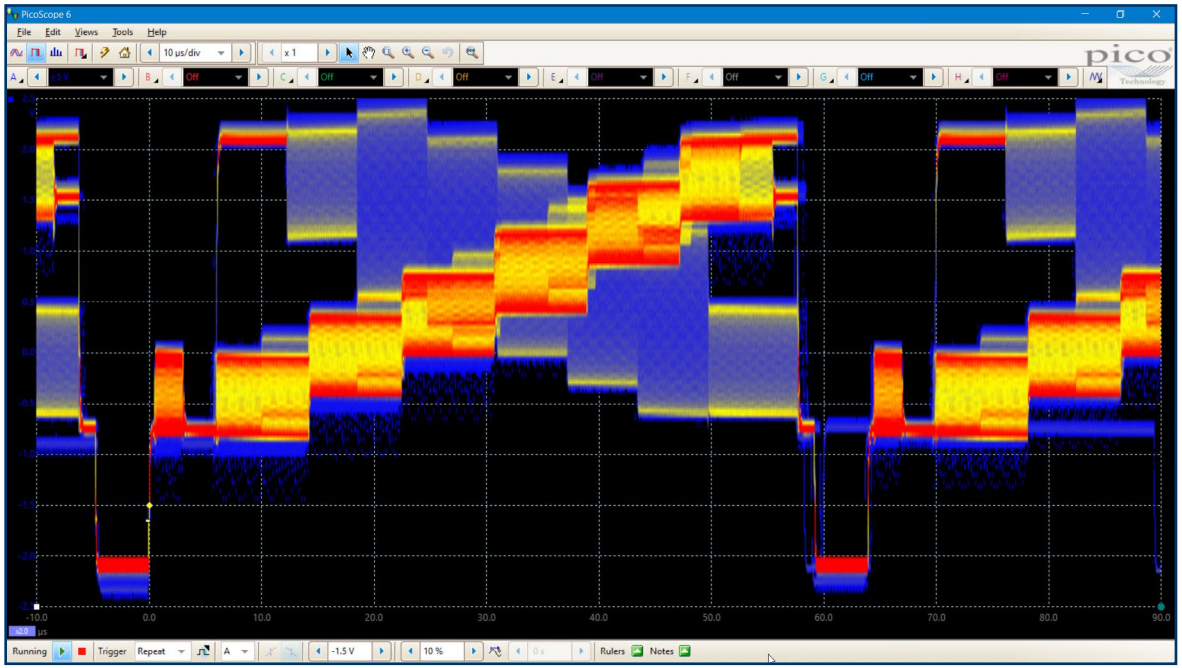
Zoom in and capture every last detail

The PicoScope zoom function lets you take a closer look at the fine detail on your signals. Using simple point-and-click tools you can quickly zoom in on both axes and reveal every last detail of the signal, whilst the undo zoom function lets you return to the previous view.



Color persistence modes

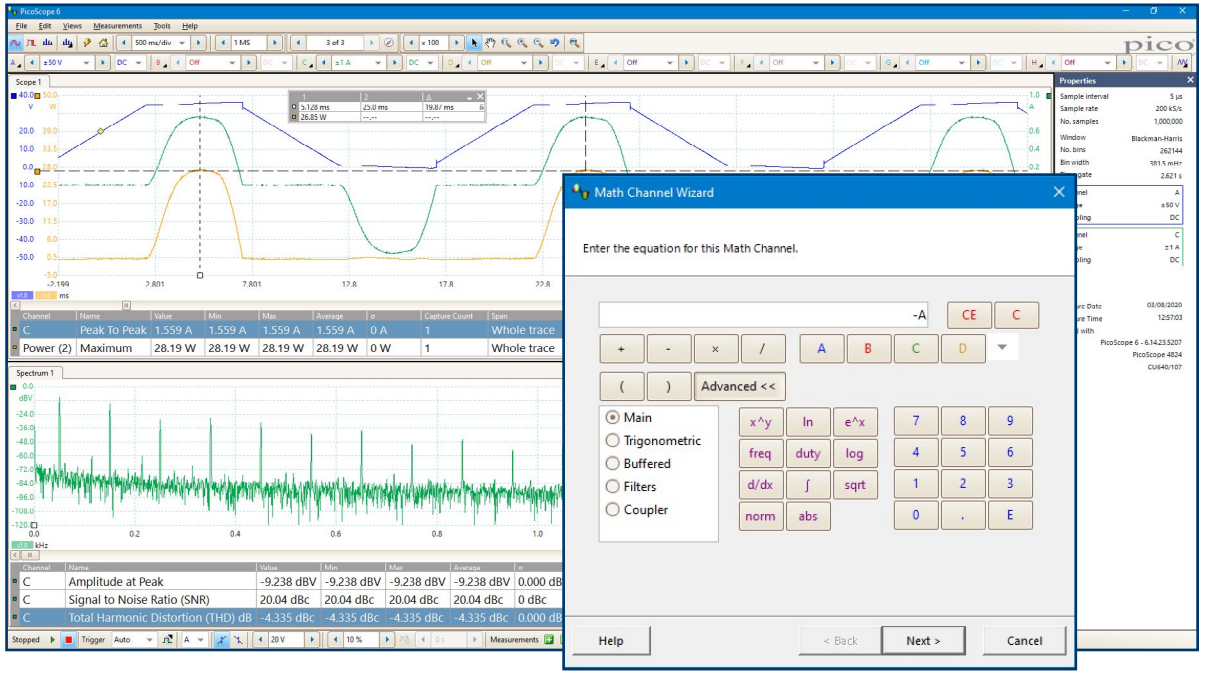
Advanced display modes allow you to see old and new data superimposed, with new data in a brighter color or shade. This makes it easy to see glitches and dropouts and to estimate their relative frequency. Choose between analog persistence, digital color, or custom display modes.



Math channels

With PicoScope 6 you can perform a variety of mathematical calculations on your input signals and reference waveforms.

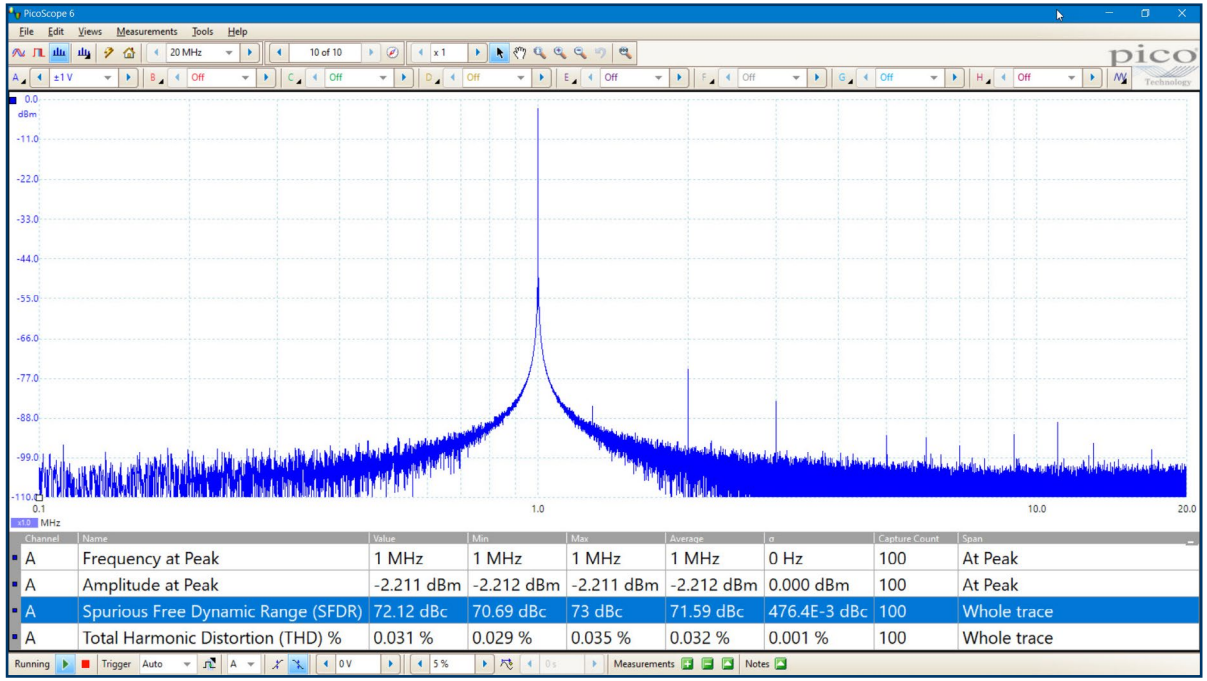
Use the built-in list for simple functions such as addition and inversion, or open the equation editor and create complex functions involving trigonometry, exponentials, logarithms, statistics, integrals and derivatives, filters, averaging and peak-detection.



Spectrum analyzer

With the click of a button, you can open a new window to display a spectrum plot of selected channels up to the full bandwidth of the oscilloscope. A comprehensive range of settings gives you control over the number of spectrum bands, window types and display modes.

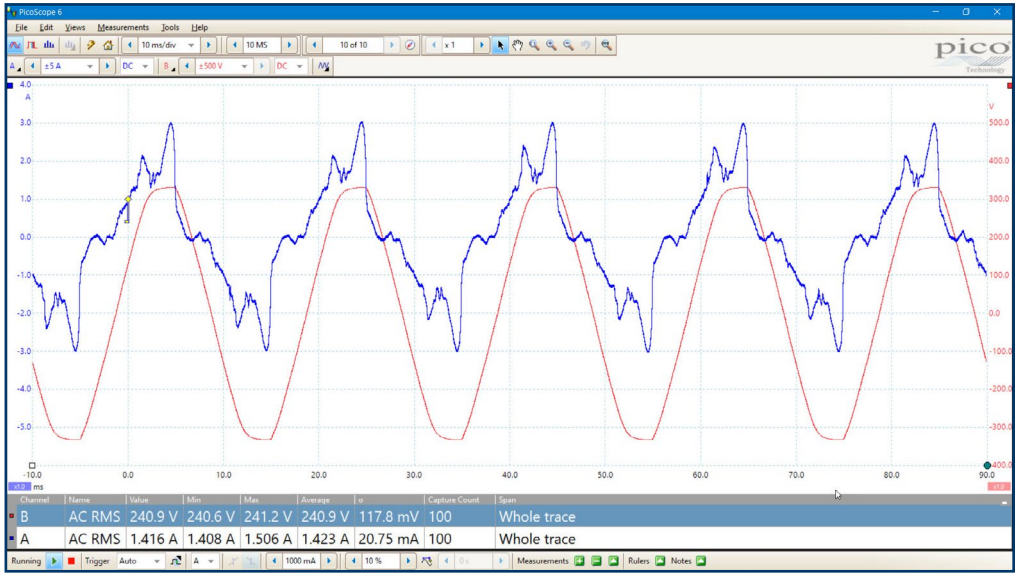
A comprehensive set of automatic frequency-domain measurements can be added to the display, including THD, THD+N, SINAD, SNR, SFDR and IMD. You can even use the AWG and spectrum mode together to perform swept scalar network analysis, and you can apply mask testing to the spectrum display to speed up fault-finding.



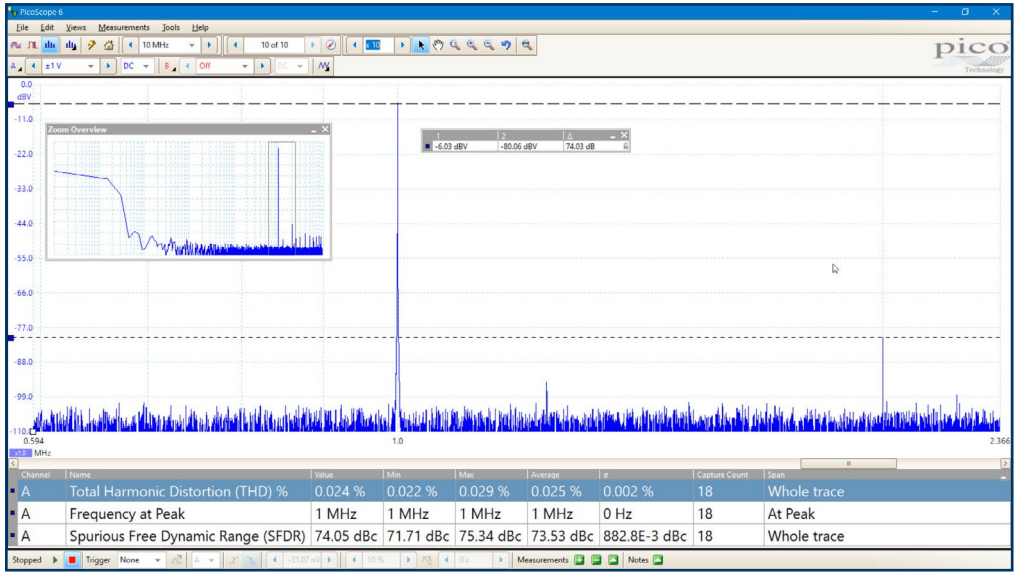
Automatic measurements

PicoScope allows you to display a table of automated measurements for troubleshooting and analysis: 15 scope and 11 spectrum mode measurements are available.

Using the built-in measurement statistics you can see the average, standard deviation, maximum and minimum of each measurement as well as the live value. You can add as many measurements as you need on each view. Each measurement includes statistical parameters showing its variability. For information on the measurements available in scope and spectrum modes, see Automatic Measurements in the Specifications table.



Scope mode measurements

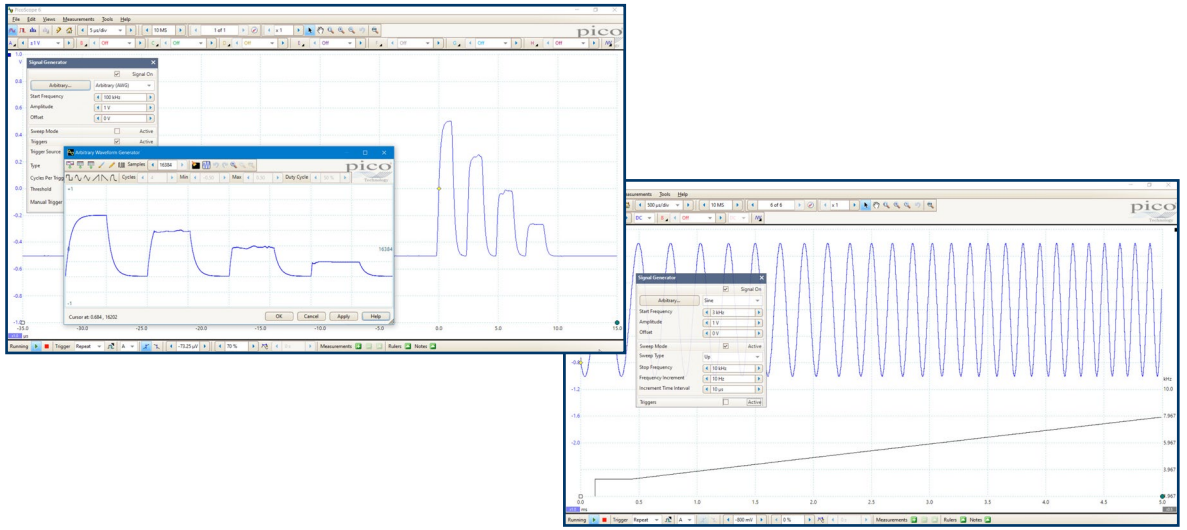


Spectrum mode measurements

Arbitrary waveform and function generators

In addition, all models in the PicoScope 4000A Series have a built-in low-distortion, 80 MS/s, 14-bit arbitrary waveform generator (AWG), which can be used to emulate missing sensor signals during product development, or to stress-test a design over the full intended operating range. Waveforms can be imported from data files or created and modified using the built-in graphical AWG editor.

A function generator is also included, with sine, square, and triangle waves up to 1 MHz, along with DC level, white noise, and many more standard waveforms. As well as level, offset and frequency controls, advanced options allow you to sweep over a range of frequencies. Combined with the spectrum peak hold option, this creates a powerful tool for testing amplifier and filter responses.



Serial decoding

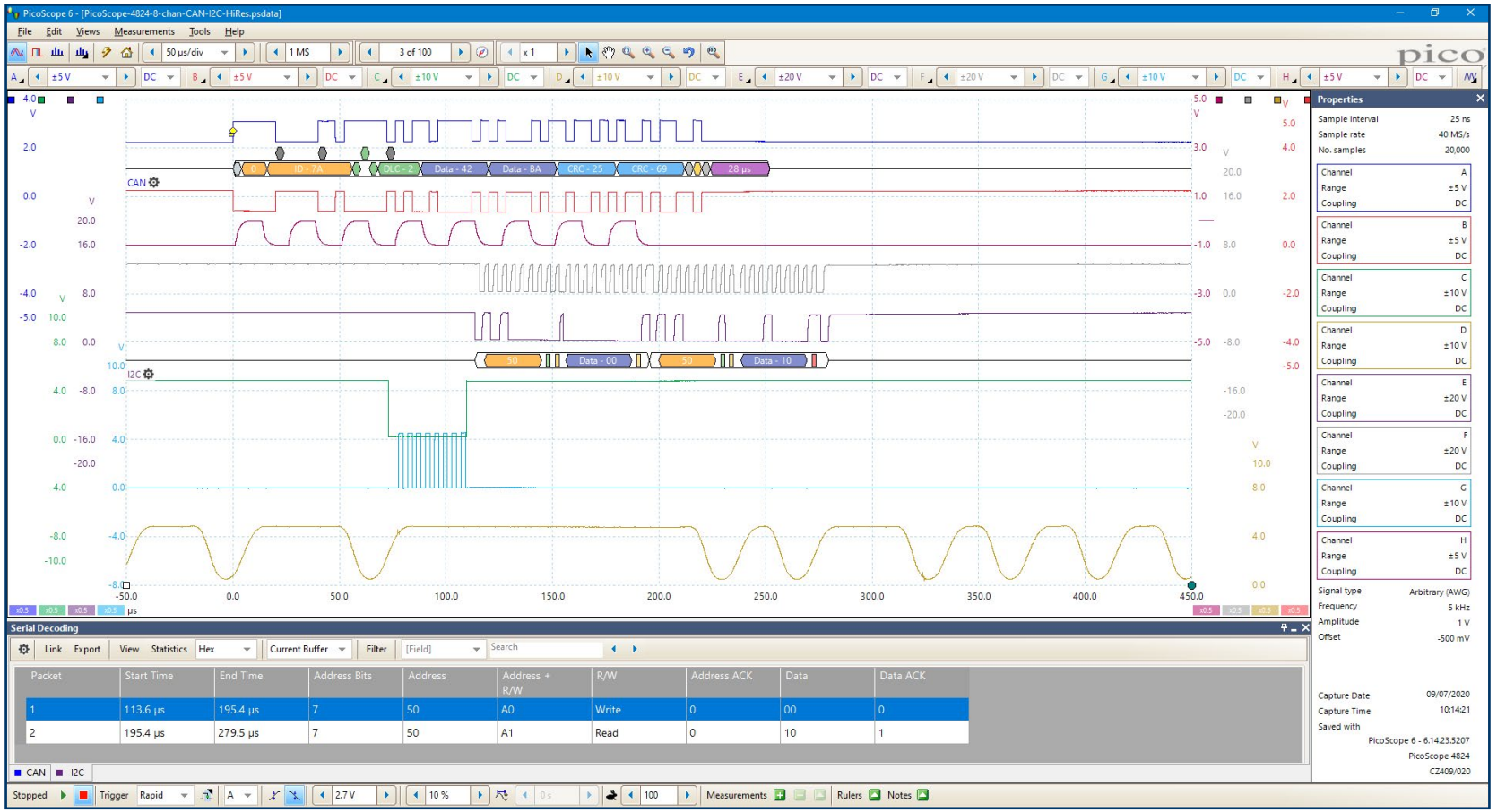
The PicoScope 4000A Series includes serial decoding capability across all channels as standard. PicoScope software can decode 1-Wire, ARINC 429, CAN, DALI, DCC, DMX512, Ethernet 10Base-T, FlexRay, I²C, I²S, LIN, Manchester, Modbus ASCII, Modbus RTU, PS/2, SENT, SPI, and UART protocol data as standard, with more protocols in development and available in the future with free-of-charge software upgrades.

The decoded data can be displayed in the format of your choice: in graph, in table, or both at once.

- **Graph** format shows the decoded data beneath the waveform on a common time axis, with error frames marked in red. These frames can be zoomed to investigate noise or distortion.

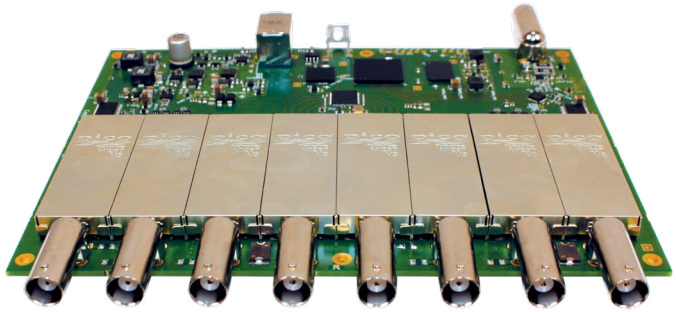
- **Table** format shows a list of the decoded frames, including the data and all flags and identifiers. You can set up filtering conditions to display only the frames you are interested in, search for frames with specified properties, or define a start pattern to signal when the program should list the data.

PicoScope can also import a spreadsheet to decode the hexadecimal data into user-defined text strings.



High signal integrity

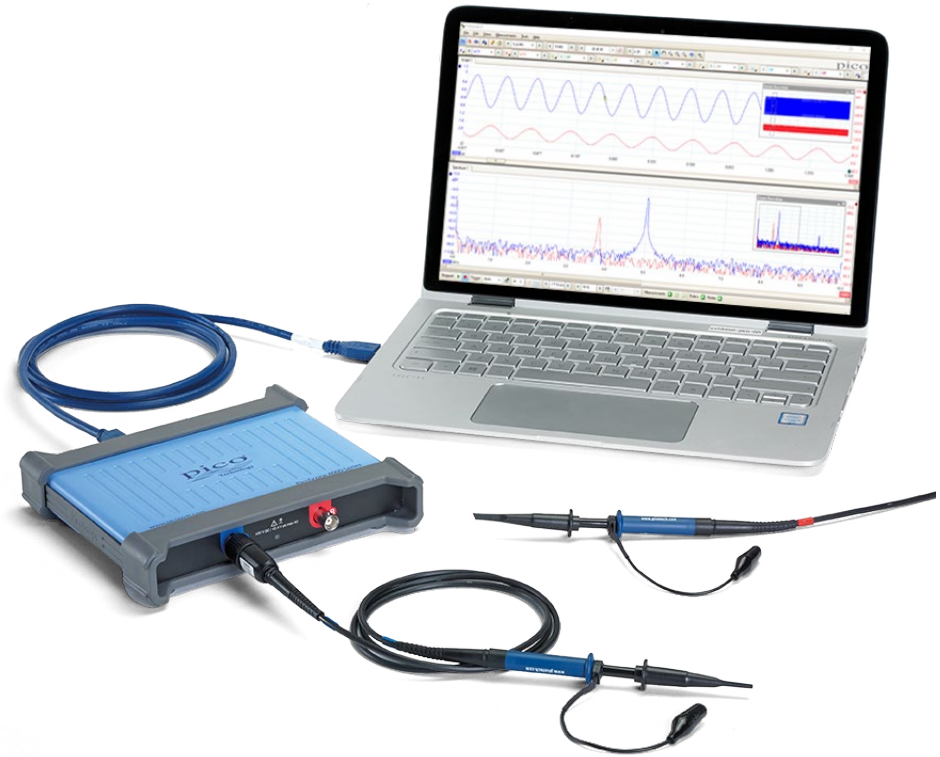
Careful front-end design and shielding reduce noise, crosstalk and harmonic distortion, meaning we are proud to publish the specifications for our scopes in detail. Decades of oscilloscope design experience can be seen in improved pulse response and bandwidth flatness, and low distortion. The scope features 12 input ranges from ±10 mV to ±50 V full scale and a huge spurious free dynamic range of up to 70 dB. The result is simple: when you probe a circuit, you can trust in the waveform you see on the screen.



High-end features as standard

Buying a PicoScope is not like making a purchase from other oscilloscope companies, where optional extras considerably increase the price. With our scopes, high-end features such as resolution enhancement, mask limit testing, serial decoding, advanced triggering, automatic measurements, math channels, XY mode, segmented memory, and a signal generator are all included in the price.

To protect your investment, both the PC software and firmware inside the scope can be updated. Pico Technology has a long history of providing new features for free through software downloads. We deliver on our promises of future enhancements year after year, unlike many other companies in the field. Users of our products reward us by becoming lifelong customers and frequently recommending us to their colleagues.



USB connectivity

The SuperSpeed USB 3.0 connection not only allows high-speed data acquisition and transfer, but also makes printing, copying, saving, and emailing your data from the field quick and easy. USB powering removes the need to carry around a bulky external power supply, making the kit even more portable for the engineer on the move.

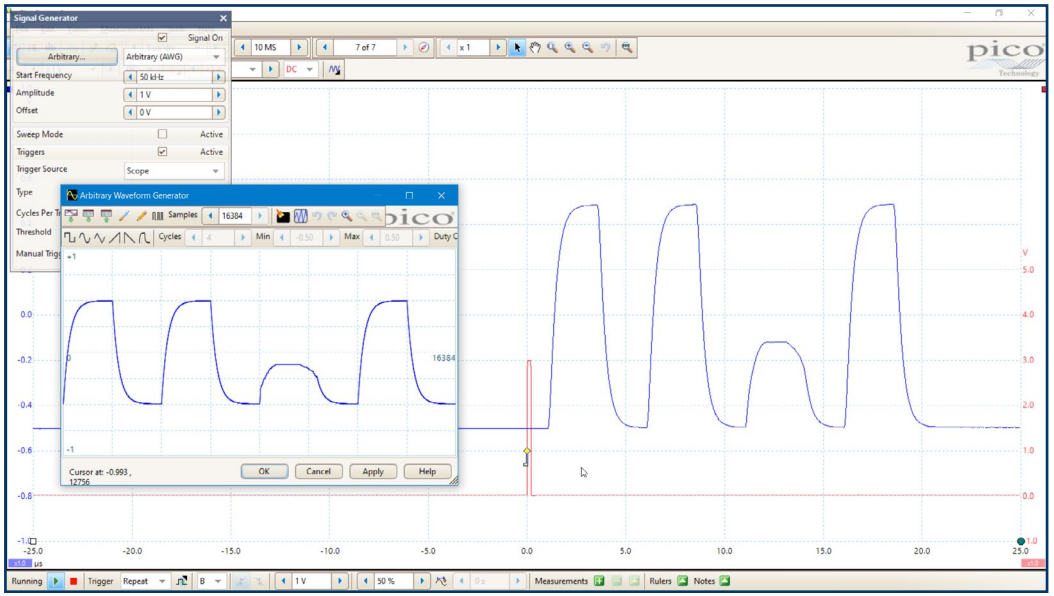
The Software Development Kit (SDK) allows unlimited data collection and fast streaming.

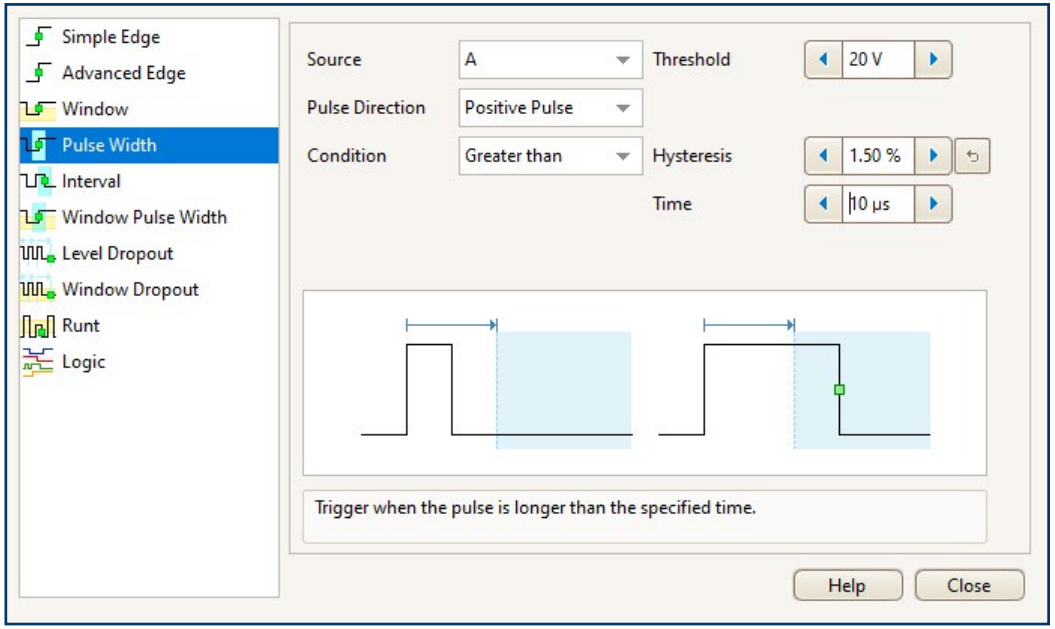
Digital triggering

Most digital oscilloscopes still use an analog trigger architecture based on comparators. This can cause time and amplitude errors that cannot always be calibrated out. The use of comparators often limits the trigger sensitivity at high bandwidths and can also create a long trigger rearm delay.

In 1991 Pico set an innovation milestone by pioneering the use of full digital triggering using the actual digitized data. This reduces trigger errors and allows our oscilloscopes to trigger on the smallest signals, even at the full bandwidth. All real-time triggering is digital, resulting in high threshold resolution with programmable hysteresis and optimal waveform stability.

The reduced rearm delay provided by digital triggering, together with segmented memory, allows the capture of events that happen in rapid sequence. At the fastest timebase, rapid triggering can capture a new waveform every 3 microseconds until the buffer is full.





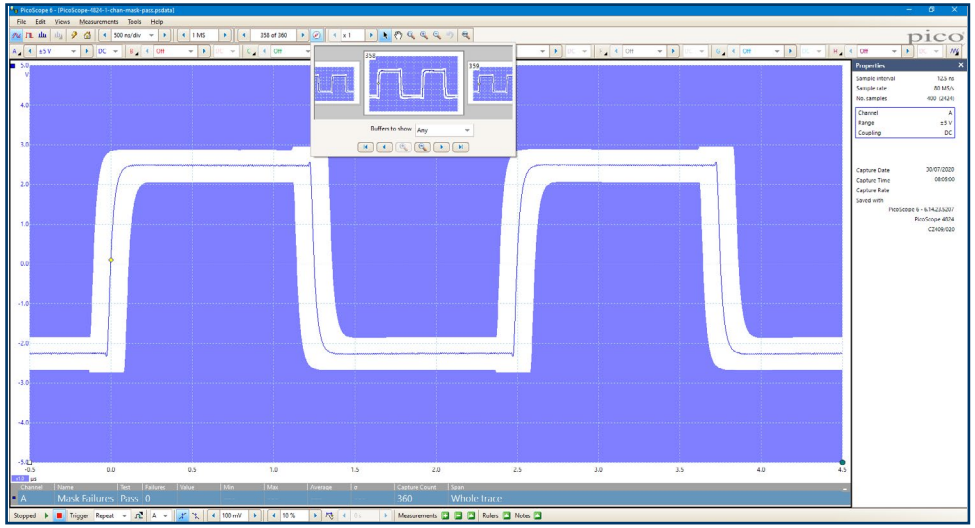
Advanced triggers

As well as the standard range of triggers found on most oscilloscopes, the PicoScope 4000A Series has a comprehensive set of advanced triggers built in to help you capture the data you need. These include pulse width, windowed, and dropout triggers to help you find and capture your signal quickly.

Mask limit testing

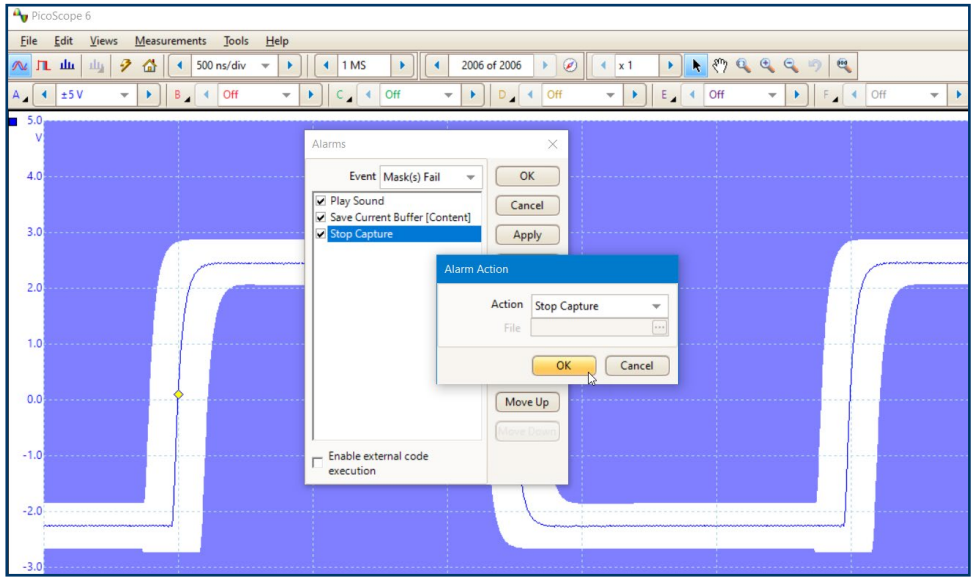
PicoScope allows you to draw a mask around any signal, in either the scope view or the spectrum view, with user-defined tolerances. This has been designed specifically for production and debugging environments, enabling you to compare signals. Simply capture a known good signal, draw a mask around it, and then attach the system under test. PicoScope will capture any intermittent glitches and can show a failure count and other statistics in the **Measurements** window.

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



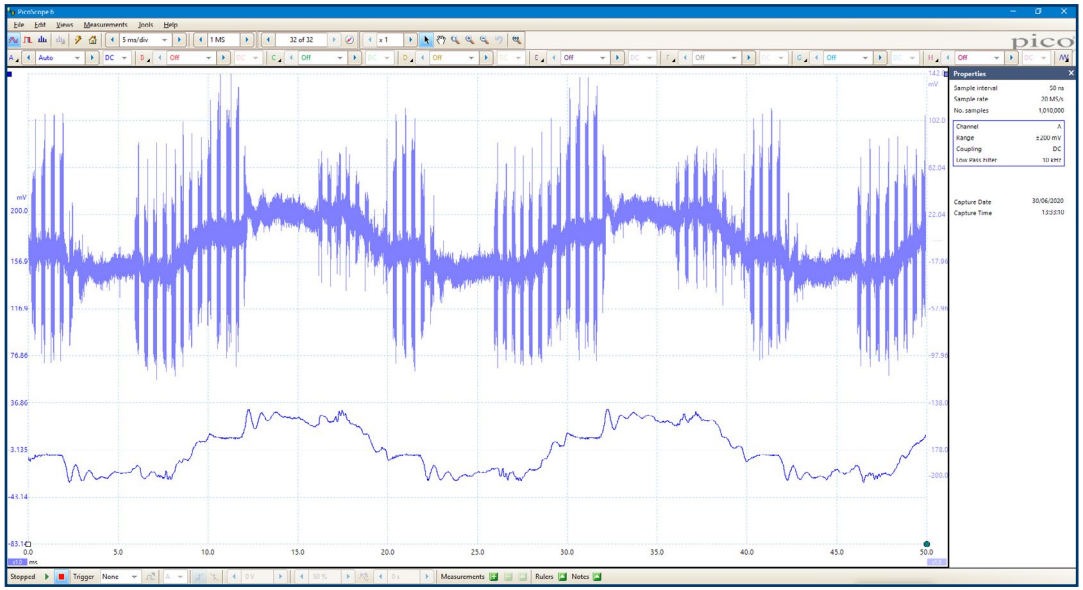
Alarms

PicoScope can be programmed to execute actions when certain events occur. The events that can trigger an alarm include mask limit fails, trigger events and buffers full. The actions that PicoScope can execute include saving a file, playing a sound, executing a program and triggering the signal generator or the AWG. Alarms, coupled with mask limit testing, help create a powerful and time-saving waveform monitoring tool. Capture a known good signal, auto-generate a mask around it and then use the alarms to automatically save any waveform (complete with a time/date stamp) that does not meet specification.



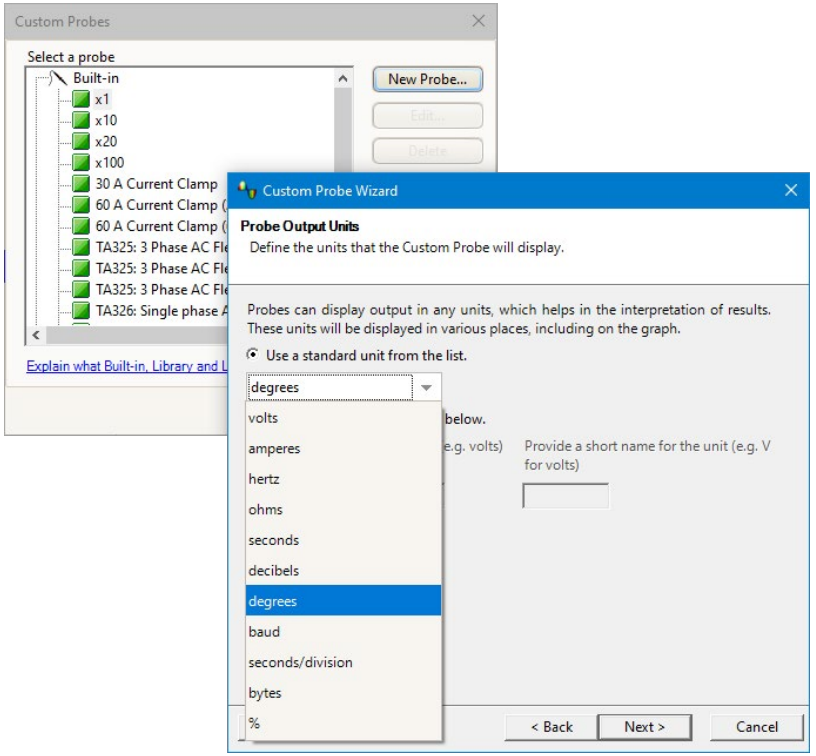
Digital low-pass filtering

Each input channel has its own digital low-pass filter with independently adjustable cut-off frequency from 1 Hz to the full bandwidth of the scope. This enables you to reject noise on selected channels while viewing high-bandwidth signals on the others.



Custom probe settings

The custom probes menu allows you to correct for gain, attenuation, offsets and nonlinearities of probes and transducers, or convert to different measurement units. Definitions for standard Pico-supplied probes are built in, and you can also create your own using linear scaling or even an interpolated data table, and save them to disk for later use.



PicoScope 6 software

The display can be as simple or as advanced 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.

Tools: Including serial decoding, reference channels, macro recorder, alarms, mask limit testing and math channels.

Trigger marker: Drag the yellow diamond to adjust trigger level and pre-trigger time.

Waveform replay tools: PicoScope 6 automatically records up to 10 000 of the most recent waveforms. You can quickly scan through to look for intermittent events, or use the **Buffer Navigator** to search visually.

Zoom and pan tools: PicoScope 6 allows a zoom factor of several million, which is necessary when working with the deep memory of the PicoScope 4000A Series oscilloscopes.

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

Auto setup button: Configures the collection time and voltage range for clear display of signals.

Signal generator: Generates standard signals or arbitrary waveforms. Includes frequency sweep mode.

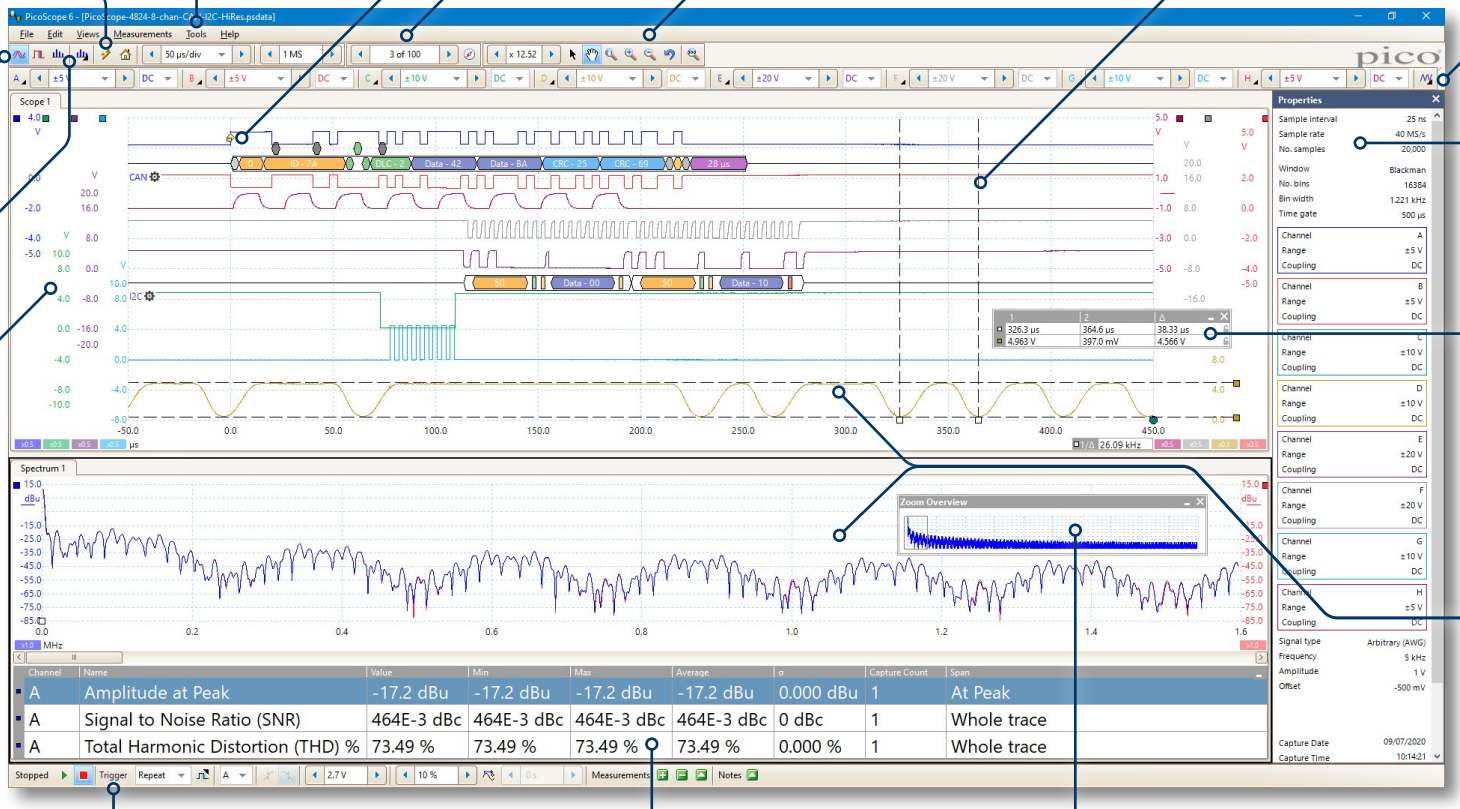
Channel options: Filtering, offset, resolution enhancement, custom probes and more.

Properties sheet: Shows a summary of the settings that PicoScope is using.

Oscilloscope controls: Controls such as voltage range, scope resolution, channel enable, timebase and memory depth.

Ruler legend: Absolute and differential ruler measurements are listed here.

Movable axes: The vertical axes can be scaled and dragged up or down. This feature is particularly useful when one waveform is obscuring another. There's also an **Auto Arrange Axes** command.



Views: PicoScope 6 is carefully designed to make the best use of the display area. You can add new scope, spectrum and XY views with automatic or custom layouts.

Trigger toolbar: Quick access to main controls, with advanced triggers in a pop-up window.

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.

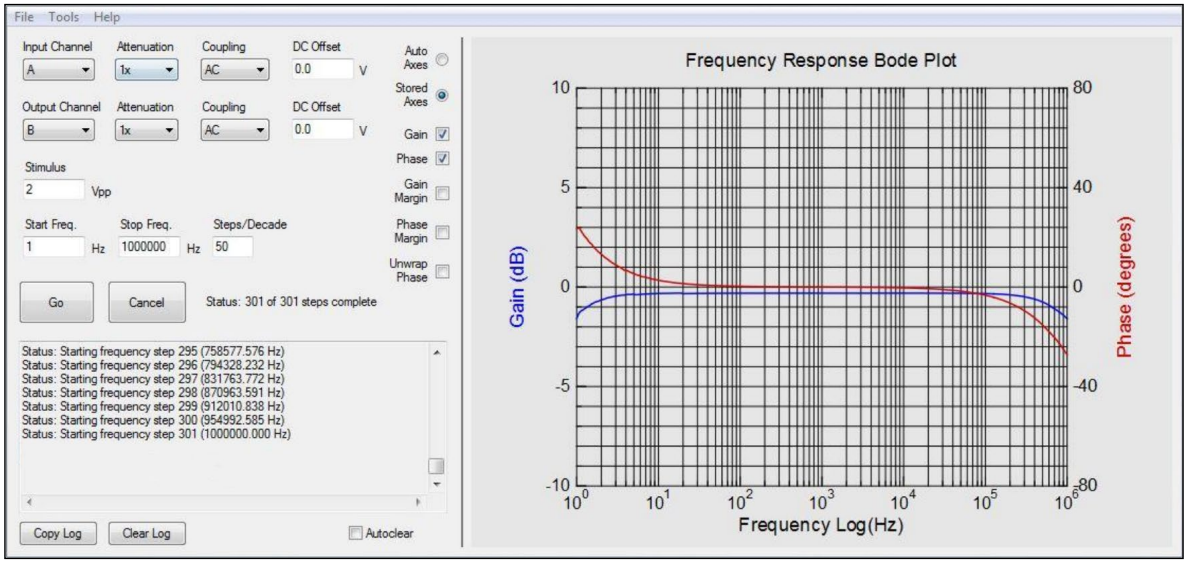
Zoom overview: Click and drag for quick navigation in zoomed views.

PicoSDK - write your own apps

Our free software development kit, PicoSDK, allows you to write your own software and includes drivers for Windows, macOS and Linux. Example code supplied on our GitHub organization page shows how to interface to third-party software packages such as National Instruments LabVIEW and MathWorks MATLAB.

PicoSDK supports data streaming, a mode that captures gap-free continuous data over USB 3.0 direct to the PC's RAM or hard disk, at a rate of up to 80 MS/s on one channel (up to 160 MS/s split between multiple channels), so you are not limited by the size of the scope's buffer memory. Sampling rates in streaming mode are subject to PC specifications and application loading.

There is also an active community of PicoScope users who share both code and whole applications on our Test and Measurement Forum and the PicoApps section of the website. The Frequency Response Analyzer shown here is a popular application on the forum.




```
ScopeSettingsPropTree.clear();
    wstring appVersionStringW = wstring_convert<codecvt_utf8<wchar_t>>().from_bytes(appVersionString);
    ScopeSettingsPropTree.put( L"appVersion", appVersionStringW );
    ScopeSettingsPropTree.put( L"picoScope.inputChannel.name", L"A" );
    ScopeSettingsPropTree.put( L"picoScope.inputChannel.attenuation", ATTEN_1X );
    ScopeSettingsPropTree.put( L"picoScope.inputChannel.coupling",PS_AC );
    ScopeSettingsPropTree.put( L"picoScope.inputChannel.dcOffset", L"0.0" );
    ScopeSettingsPropTree.put( L"picoScope.inputChannel.startingRange", -1 ); // Base on stimulus
    ScopeSettingsPropTree.put( L"picoScope.outputChannel.name", L"B" );
    ScopeSettingsPropTree.put( L"picoScope.outputChannel.attenuation", ATTEN_1X );
    ScopeSettingsPropTree.put( L"picoScope.outputChannel.coupling", PS_AC );
    ScopeSettingsPropTree.put( L"picoScope.outputChannel.dcOffset", L"0.0" );
    ScopeSettingsPropTree.put( L"picoScope.outputChannel.startingRange", pScope->GetMinRange(PS_AC) );

    midSigGenVpp = floor((pScope->GetMinFuncGenVpp() + pScope->GetMaxFuncGenVpp()) / 2.0);

    stimulusVppSS << fixed << setprecision(1) << midSigGenVpp;
    maxStimulusVppSS << fixed << setprecision(1) << pScope->GetMaxFuncGenVpp();
    startFreqSS << fixed << setprecision(1) << (max(1.0, pScope->GetMinFuncGenFreq())); // Make frequency at least 1.0 since 0.0 (DC) makes no sense for FRA
    stopFreqSS << fixed << setprecision(1) << (pScope->GetMaxFuncGenFreq());
```

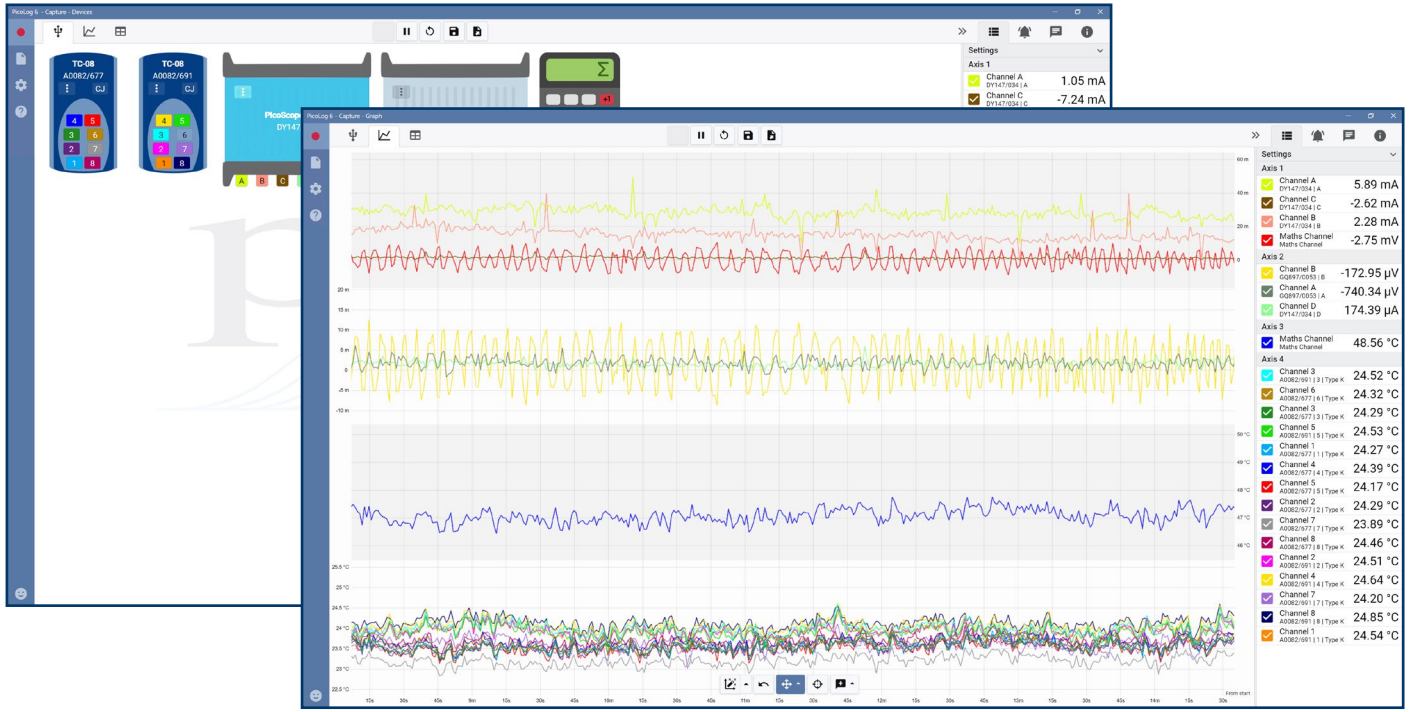
PicoLog 6 software

The PicoScope 4000A Series oscilloscopes are also supported by the PicoLog 6 data logging software, allowing you to view and record signals on multiple units in one capture.

PicoLog 6 allows sample rates of up to 1 kS/s per channel, and is ideal for long-term observation of general parameters, such as voltage or current levels, on several channels at the same time, whereas the PicoScope 6 software is more suitable for waveshape or harmonic analysis.

You can also use PicoLog 6 to view data from your oscilloscope alongside a data logger or other device. For example, you could measure voltage and current with your PicoScope and plot both against temperature using a TC-08 thermocouple data logger, or humidity with a DrDAQ multipurpose data logger.

PicoLog 6 is available for Windows, macOS, Linux and Raspberry Pi OS.



Pack contents

- PicoScope 4000A Series 2-, 4- or 8-channel oscilloscope
- Oscilloscope probes
- USB 3.0 cable 1.8 m
- Quick Start Guide
- Carry case

PicoScope 4000A Series specifications

	PicoScope 4224A	PicoScope 4424A	PicoScope 4824A
Vertical			
Input channels	2	4	8
Connector type	BNC		
Bandwidth (−3 dB)	20 MHz (50 mV to 50 V ranges) 10 MHz (10 mV and 20 mV ranges)		
Rise time (calculated)	17.5 ns (50 mV to 50 V ranges) 35.0 ns (10 mV and 20 mV ranges)		
Vertical resolution	12 bits		
Software-enhanced vertical resolution	Up to 16 bits		
Input type	Single-ended		
Input ranges	±10 mV to ±50 V full scale, in 12 ranges		
Input sensitivity	2 mV/div to 10 V/div (10 vertical divisions)		
Input coupling	AC / DC		
Maximum input voltage	±50 V DC / 42.4 V pk max AC		
Input characteristics	1 MΩ ‖ 19 pF		
DC accuracy	±(1% of full scale + 300 µV)		
Analog offset range (vertical position adjustment)	±250 mV (10 mV to 500 mV ranges) ±2.5 V (1 V to 5 V ranges) ±25 V (10 V to 50 V ranges)		
Analog offset control accuracy	±1% of offset setting additional to basic DC accuracy		
Overvoltage protection	±100 V (DC + AC peak)		
Horizontal timebase			
Maximum sampling rate (real-time)	80 MS/s (up to four channels in use) 40 MS/s (five or more channels in use)		
Maximum sampling rate (USB 3.0 streaming)	20 MS/s using PicoScope 6 software, shared between channels 80 MS/s max. for a single channel using PicoSDK. 160 MS/s total across all channels. (PC-dependent)		
Timebase ranges (real-time)	20 ns/div to 5000 s/div		
Buffer memory (shared between active channels)	256 MS		
Buffer memory (streaming mode)	100 MS in PicoScope software. Up to available PC memory when using PicoSDK		
Waveform buffer	10 000 segments (rapid block mode) 10 000 waveforms (PicoScope 6 circular buffer)		
Timebase accuracy	±20 ppm (+5 ppm/year)		
Sampling jitter	25 ps RMS typical		

	PicoScope 4224A	PicoScope 4424A	PicoScope 4824A
Dynamic performance (typical)			
Crosstalk (full bandwidth)	−76 dB		
Harmonic distortion	< −60 dB, 10 mV range < −70 dB, 20 mV and higher ranges		
SFDR	> 60 dB, 20 mV and 10 mV ranges > 70 dB, 50 mV and higher ranges		
Noise	45 µV RMS on 10 mV range		
Pulse response	< 1% overshoot		
Bandwidth flatness	DC to full bandwidth (+0.2 dB, −3 dB)		
Triggering			
Source	All channels		
Trigger modes	None, auto, repeat, single, rapid (segmented memory)		
Trigger types	Rising or falling edge		
Advanced trigger types	Simple edge, advanced edge, window, pulse width, interval, window pulse width, level dropout, window dropout, runt		
Trigger sensitivity	Digital triggering provides 1 LSB accuracy up to full bandwidth		
Pre-trigger capture	Up to 100% of capture size		
Post-trigger delay	Zero to 4 billion samples (settable in 1 sample steps)		
Trigger rearm time	< 3 µs on fastest timebase		
Maximum trigger rate	Up to 10 000 waveforms in a 30 ms burst		
Advanced digital trigger levels	All trigger levels, window levels and hysteresis values settable with 1 LSB resolution across input range		
Advanced digital trigger time intervals	All time intervals settable with 1 sample resolution from 1 sample (minimum 12.5 ns) up to 4 billion sample intervals		
Function generator			
Standard output signals	Sine, square, triangle, DC voltage, ramp up, ramp down, sinc, Gaussian, half-sine.		
Pseudorandom output signals	White noise, selectable amplitude and offset within output voltage range Pseudorandom binary sequence (PRBS), selectable high and low levels within output voltage range, selectable bit rate up to 1 Mb/s		
Standard signal frequency	0.03 Hz to 1 MHz		
Output frequency accuracy	±20 ppm		
Output frequency resolution	< 0.02 Hz		
Sweep modes	Up, down, dual with selectable start/stop frequencies and increments		
Triggering	You can trigger a counted number of waveform cycles or sweeps (from 1 to 1 billion) from the scope trigger or manually from software.		
Output voltage range	±2 V		
Output voltage adjustment	Signal amplitude and offset are adjustable in approximately 300 µV steps, within an overall ±2 V range.		
DC accuracy	±1% of full scale		
Amplitude flatness	< 0.5 dB to 1 MHz, typical		
SFDR	87 dB typical		
Output resistance	600 Ω		
Connector type	Rear-panel BNC		
Overvoltage protection	±10 V		

	PicoScope 4224A	PicoScope 4424A	PicoScope 4824A
Arbitrary waveform generator			
Update rate	80 MS/s		
Buffer size	16 k samples		
Vertical resolution	14 bits (output step size approximately 300 µV)		
Bandwidth	1 MHz		
Rise time (10% to 90%)	150 ns		
Sweep modes, triggering, frequency accuracy and resolution, voltage range and accuracy and output characteristics as for function generator.			
Spectrum analyzer			
Frequency range	DC to 20 MHz		
Display modes	Magnitude, average, peak hold		
Y axis	Logarithmic (dbV, dBu, dBm, arbitrary dB) or linear (volts)		
X axis	Linear or logarithmic		
Windowing functions	Rectangular, Gaussian, triangular, Blackman, Blackman–Harris, Hamming, Hann, flat-top		
Number of FFT points	Selectable from 128 to 1 million in powers of 2		
Math channels			
Functions	−x, x+y, x−y, x*y, x/y, x^y, sqrt, exp, ln, log, abs, norm, sign, sin, cos, tan, arcsin, arccos, arctan, sinh, cosh, tanh, delay, average, frequency, derivative, integral, min, max, peak, duty, highpass, lowpass, bandpass, bandstop		
Operands	A to B, D or H (input channels), T (time), reference waveforms, pi, constants		
Automatic measurements			
Scope mode	AC RMS, cycle time, DC average, duty cycle, edge count, fall time, falling edge count, falling rate, frequency, high pulse width, low pulse width, maximum, minimum, negative duty cycle, peak-to-peak, rise time, rising edge count , rising rate, true RMS		
Spectrum mode	Frequency at peak, amplitude at peak, average amplitude at peak, total power, THD %, THD dB, THD+N, SFDR, SINAD, SNR, IMD		
Statistics	Minimum, maximum, average, standard deviation		
DeepMeasure™			
Parameters	Cycle number, cycle time, frequency, low pulse width, high pulse width, duty cycle (high), duty cycle (low), rise time, fall time, undershoot, overshoot, max. voltage, min. voltage, voltage peak to peak, start time, end time		
Serial decoding			
Protocols	1-Wire, ARINC 429, CAN, DALI, DCC, DMX512, Ethernet 10Base-T, FlexRay, I²C, I²S, LIN, Manchester, Modbus ASCII, Modbus RTU, PS/2, SENT, SPI, UART (subject to number of channels available)		
Mask limit testing			
Statistics	Pass/fail, failure count, total count		
Mask creation	User-drawn, table entry, auto-generated from waveform or imported from file		
Display			
Interpolation	Linear or sin(x)/x		
Persistence modes	Digital color, analog intensity, custom, fast		
Output			
File formats	bmp, csv, gif, animated gif, jpg, mat, pdf, png, psdata, pssettings, txt		
Functions	Save, copy to clipboard, print		

	PicoScope 4224A	PicoScope 4424A	PicoScope 4824A
General			
PC connectivity	USB 3.0 SuperSpeed USB 2.0 Hi-Speed compatible		
PC connector type	USB 3.0 type B		
PC requirements	Processor, memory and disk space: as required by the operating system Ports: USB 3.0 (recommended) or 2.0 (compatible)		
Power requirements	Powered from USB		
Ground terminal	M4 screw terminal, rear panel.		
Dimensions	190 x 170 x 40 mm (including connectors)		
Weight	0.55 kg		
Temperature range	Operating: 0 °C to 45 °C (20 °C to 30 °C for stated accuracy) Storage: −20 °C to +60 °C.		
Humidity range	Operating: 5% to 80% RH non-condensing Storage: 5% to 95% RH non-condensing.		
Altitude range	Up to 2000 m		
Pollution degree	EN 61010 pollution degree 2: “only nonconductive pollution occurs except that occasionally a temporary conductivity caused by condensation is expected”		
Safety compliance	Designed to EN 61010-1; LVD compliant		
EMC compliance	Tested to meet EN 61326-1 and FCC Part 15 Subpart B.		
Environmental compliance	RoHS and WEEE		
Warranty	5 years		
Software			
Windows software (32-bit or 64-bit)*	PicoScope 6, PicoLog 6, PicoSDK		
macOS software (64-bit)*	PicoLog 6 (including drivers)		
Linux software (64-bit)*	PicoScope 6 Beta software and drivers, PicoLog 6 (including drivers) See Linux Software and Drivers to install drivers only		
Raspberry Pi 4B (Raspberry Pi OS)*	PicoLog 6 (including drivers) See Linux Software and Drivers to install drivers only		
* See the picotech.com/downloads page for more information.			
Languages supported, PicoScope 6	Chinese (simplified), Chinese (traditional), Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Romanian, Russian, Spanish, Swedish, Turkish		
Languages supported, PicoLog 6	Simplified Chinese, Dutch, English (UK), English (US), French, German, Italian, Japanese, Korean, Russian, Spanish		

PicoScope 4000A Series inputs and outputs

PicoScope 4224A

Input channels A and B

PicoScope 4424A

Input channels A to D

PicoScope 4824A

Input channels A to H

Rear panel

Function generator and
arbitrary waveform generator output

USB port

Ground terminal

Ordering information

Order code	Description
PQ288	PicoScope 4224A 2-channel 20 MHz oscilloscope kit with 2 TA375 probes
PQ289	PicoScope 4424A 4-channel 20 MHz oscilloscope kit with 4 TA375 probes
PQ290	PicoScope 4824A 8-channel 20 MHz oscilloscope kit with 4 TA375 probes
Optional accessories	
TA375	100 MHz 1:1/10:1 passive switchable probe
TA041	25 MHz 10:1/100:1 active differential probe, ±700 V CAT III
TA057	25 MHz 20:1/200:1 active differential probe, ±1400 V CAT III
TA044	70 MHz 100:1/1000:1 differential probe, ±7000 V
PS008	Optional power supply for TA041 and TA057 probes
TA167	2000 A AC/DC current clamp
PP877	Three-axis accelerometer and oscilloscope interface
PP969	Carry case

Calibration service

Order code	Description
CC028	Calibration certificate for the PicoScope 4000A Series oscilloscopes

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