



PicoScope® 4444

See the difference: high-resolution differential USB oscilloscope



4 true differential inputs

Flexible 12- or 14-bit resolution

20 MHz bandwidth

Up to 400 MS/s sampling rate

256 MS capture memory

High common-mode rejection ratio

Balanced high-impedance inputs for a low circuit load

Intelligent probe interface

Measure differential signals with a single channel

Measure non-ground-referenced signals

Reject common-mode voltages in electronic and biomedical applications

Safely probe single and 3-phase voltages with 1000 V CAT III probes

Measure power drawn by mobile and IoT devices

Choice of accessories for sensitive low-level, general electronic and 1000 V CAT III applications

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Specifications

VERTICAL		
	OSCILLOSCOPE SPECIFICATIONS	SPECIFICATIONS WITH PICOCONNECT 442 1000 V CAT III PROBE
Input channels	4 channels	One differential pair per connected probe
Analog bandwidth (-3 dB)	20 MHz with D9-BNC adaptors 15 MHz with PicoConnect 441 probe	10 MHz
Rise time (calculated)	17.5 ns with D9-BNC adaptors 23.3 ns with PicoConnect 441 probe	35 ns
Bandwidth limiter	100 kHz or 1 MHz (selectable)	100 kHz or 1 MHz (selectable)
Vertical resolution, 12-bit mode	12 bits on most input ranges 11 bits on ± 10 mV range	12 bits
Vertical resolution, 14-bit mode	14 bits on most input ranges 13 bits on ± 20 mV range 12 bits on ± 10 mV range	14 bits
Enhanced vertical resolution (PicoScope 6 software), 12-bit mode	Up to 16 bits on most input ranges Up to 15 bits on ± 10 mV range	Up to 16 bits
Enhanced vertical resolution (PicoScope 6 software), 14-bit mode	Up to 18 bits on most input ranges Up to 17 bits on ± 20 mV range Up to 16 bits on ± 10 mV range	Up to 18 bits
Input type	Differential 9-pin D-subminiature, female	Differential 2 x 4 mm sockets, shrouded
Input characteristics	1 M Ω $\pm 1\%$, in parallel with 17.5 pF ± 1 pF (each differential input to scope ground). <1 pF difference between ranges.	16.7 M Ω $\pm 1\%$, in parallel with 9.3 pF ± 1 pF (each differential input to scope ground)
Input coupling	AC or DC (selectable)	AC or DC (selectable)
Input sensitivity	2 mV/div to 10 V/div	± 0.5 V/div to ± 200 V/div
Input ranges (full scale)	± 10 mV, ± 20 mV, ± 50 mV, ± 100 mV, ± 200 mV, ± 500 mV, ± 1 V, ± 2 V, ± 5 V, ± 10 V, ± 20 V, ± 50 V	± 2.5 V, ± 5 V, ± 12.5 V, ± 25 V, ± 50 V, ± 125 V, ± 250 V, ± 500 V, ± 1000 V
Input common mode range	5 V on ± 10 mV to ± 500 mV ranges 50 V on ± 1 V to ± 50 V ranges	125 V on ± 2.5 V to ± 12.5 V ranges 1000 V on ± 25 V to ± 1000 V ranges
DC accuracy (DC to 10 kHz)	$\pm 1\%$ of full scale, ± 500 μ V	$\pm 3\%$ of full scale, ± 12.5 mV
Analog offset range	± 250 mV on ± 10 mV to ± 500 mV ranges ± 2.5 V on ± 1 V to ± 5 V ranges ± 25 V on ± 10 V to ± 50 V ranges	± 6.25 V on ± 2.5 V to ± 12.5 V ranges ± 62.5 V on ± 25 V to ± 125 V ranges ± 625 V on ± 250 V to ± 1000 V ranges
Analog offset accuracy	1% of offset setting in addition to basic DC accuracy	1% of offset setting in addition to basic DC accuracy
Overvoltage protection	± 100 V DC + AC peak (any differential input to ground) ± 100 V DC + AC peak (between differential inputs)	1000 V CAT III (any differential input to ground) 1000 V CAT III (between differential inputs)

HORIZONTAL	
Maximum sampling rate (real time) 12-bit mode	1 channel: 400 MS/s 2 channels: 200 MS/s 3 or 4 channels: 100 MS/s
Maximum sampling rate (real time) 14-bit mode	1 channel: 50 MS/s 2 channels: 50 MS/s 3 or 4 channels: 50 MS/s
Maximum sampling rate (USB streaming)	10 MS/s
Capture memory (real time)	256 MS shared between active channels
Capture memory (USB streaming)	100 MS (shared between active channels)
Maximum duration of capture at fastest sampling rate (real time), 12-bit mode	500 ms
Maximum duration of capture at fastest sampling rate (real time), 14-bit mode	5 s
Maximum waveform buffer segments	10 000
Fastest real-time collection time, 12-bit mode	50 ns (5 ns/div)
Fastest real-time collection time, 14-bit mode	200 ns (20 ns/div)
Slowest real-time collection time	50 000 s (5000 s/div)
Collection time accuracy	±50 ppm (5 ppm/year aging)
Sample jitter	3 ps RMS typical
ADC sampling	Simultaneous sampling on all enabled channels

DYNAMIC PERFORMANCE (TYPICAL)		
	OSCILLOSCOPE SPECIFICATIONS	SPECIFICATIONS WITH PICOCONNECT 442 1000 V CAT III PROBE
Crosstalk	2000:1 DC to 20 MHz	2000:1 DC to 10 MHz
Harmonic distortion at 100 kHz, 90% of full scale	< -70 dB on ±50 mV ranges and higher < -60 dB on ±10 mV and ±20 mV ranges	< -70 dB
SFDR	> 70 dB	> 70 dB
ADC ENOB, 12-bit mode	10.8 bits	10.8 bits
ADC ENOB, 14-bit mode	11.8 bits	11.8 bits
Noise	< 180 µV RMS on ±10 mV range	< 5 mV RMS on ±2.5 V range
Bandwidth flatness	(+0.1 dB, -3 dB) DC to full bandwidth	(+0.1 dB, -3 dB) DC to full bandwidth
Common mode rejection ratio	60 dB typical, DC to 1 MHz	55 dB typical, DC to 1 MHz

TRIGGERING	
Source	Any channel
Trigger modes	None, auto, repeat, single, rapid
Trigger types	Edge, window, pulse width, window pulse width, dropout, window dropout, interval, runt pulse, logic
Trigger sensitivity	Digital triggering provides up to 1 LSB accuracy up to full bandwidth
Maximum pre-trigger capture	100% capture length
Maximum trigger time-delay	4 billion samples
Trigger rearm time	< 2 μ s on fastest timebase
Maximum trigger rate	10 000 waveforms in a 12 ms burst
PROBE COMPENSATION PINS	
Output level	4 V peak
Output impedance	610 Ω
Output waveforms	Square wave
Output frequency	1 kHz
Overtoltage protection	\pm 10 V
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, freq, derivative, integral, min, max, average, peak, delay, duty, highpass, lowpass, bandpass, bandstop
Operands	A, B, C, D, T (time), reference waveforms, constants, pi
AUTOMATIC MEASUREMENTS	
Scope mode	AC RMS, true RMS, frequency, cycle time, duty cycle, DC average, edge count, falling edge count, rising edge count, falling rate, rising rate, low pulse width, high pulse width, fall time, rise time, minimum, maximum, peak to peak
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 and standard deviation
SERIAL DECODING	
Protocols	1-Wire, ARINC 429, CAN, CAN FD, DCC, DMX512, Ethernet 10Base-T, FlexRay, I ² C, I ² S, LIN, PS/2, SENT, SPI, UART (RS-232 / RS-422 / RS-485), USB 1.0/1.1
MASK LIMIT TESTING	
Statistics	Pass/fail, failure count, total count

SDK/API DETAILS AND SPECIFICATIONS FOR USERS WRITING THEIR OWN SOFTWARE (see "HORIZONTAL" above for details when using PicoScope 6 software)

Supplied drivers	32- and 64-bit drivers for Windows 7, 8 and 10 Linux drivers Mac OS X drivers
Example code	C, C#, Excel VBA, VB.NET, LabVIEW, MATLAB
Maximum sampling rate (USB streaming)	50 MS/s
Capture memory (USB streaming)	Up to available PC memory
Segmented memory buffers	> 1 million

GENERAL SPECIFICATIONS

Connectivity	USB 3.0, USB 2.0
Device connector type	USB 3.0, Type B
Power requirements	USB port or external DC PSU, depending on connected accessories
Dimensions	190 x 170 x 40 mm including connectors
Weight	< 0.5 kg
Temperature range, operating	0 °C to 45 °C
Temperature range, operating, for quoted accuracy	15 °C to 30 °C
Temperature range, storage	-20 °C to 60 °C
Humidity range, operating	5% to 80% RH non-condensing
Humidity range, storage	5% to 95% RH non-condensing
Altitude	Up to 2000 m
Pollution degree	Pollution degree 2
Safety approvals	Designed to EN 61010-1:2010
EMC approvals	Tested to EN 61326-1:2013 and FCC Part 15 Subpart B
Environmental approvals	RoHS and WEEE compliant
Software	PicoScope 6, Linux drivers, Windows SDK and example programs
PC requirements	Windows 7, 8 or 10, 32-bit or 64-bit. Hardware requirements as operating system.

Ordering information

Oscilloscope kits

Order code	Product name	Description	USD*	EUR*	GBP*
PQ073	PicoScope 4444 standard kit	High-resolution differential oscilloscope with three PicoConnect 441 1:1 passive differential voltage probes and one TA271 single-ended D9-BNC adaptor	1535	1325	1075
PQ074	PicoScope 4444 1000 V CAT III kit	High-resolution differential oscilloscope with three PicoConnect 442 1000 V CAT III passive differential voltage probes and one TA271 single-ended D9-BNC adaptor	1915	1625	1345
PQ088	PicoScope 4444 oscilloscope	High-resolution differential oscilloscope. Not available separately: must be purchased with at least one of the Pico D9 accessories listed below.	1285	1085	899

Accessories

Order code	Product name	Description	Connector	USD*	EUR*	GBP*
PQ098	PicoConnect 441 probe	Passive differential 1:1 15 MHz voltage measurement probe. Supplied with detachable black and red sprung hook probe tips.	Pico D9	42	36	29
PQ087	PicoConnect 442 probe	1000 V CAT III, passive differential 25:1 10 MHz voltage measurement probe. Supplied with detachable shrouded black and red sprung hook probe tips.	Pico D9	179	149	125
TA300	TA300 AC/DC current probe	40 A AC/DC, 300 V CAT III, 100 kHz current measurement probe	Pico D9	329	279	235
TA301	TA301 AC/DC current probe	200/2000 A AC/DC, 150 V CAT II, 20 kHz current measurement probe	Pico D9	199	169	139
TA325	TA325 flex current probe 3-phase	Flexible 3-phase switched-range 30/300/3000 A AC RMS, 1000 V CAT III, 10 Hz to 20 kHz current probe. Requires 3x TA271 D9-BNC adaptor (sold separately).	3x BNC	769	649	499
TA326	TA326 flex current probe	Flexible single-phase switched-range 30/300/3000 A AC RMS, 1000 V CAT III, 10 Hz to 20 kHz current probe. Requires 1x TA271 D9-BNC adaptor (sold separately).	BNC	369	309	239
TA271	TA271 D9-BNC adaptor	D9-BNC adaptor suitable for ground-referenced measurements using a single voltage or current probe with BNC connector	Pico D9	18	15	12
TA299	TA299 D9-dual BNC adaptor	D9-dual BNC adaptor suitable for differential measurements using two single-ended probes with BNC connectors	Pico D9	26	22	18
PA149	Carry case	Portable carry case to hold the PicoConnect 4444 and its accessories	N/A	119	105	85

Additional accessories are available for the PicoConnect 441 and 442 probes: see online for details.

UK headquarters

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

☎ +44 (0) 1480 396 395
☎ +44 (0) 1480 396 296
✉ sales@picotech.com

US headquarters

Pico Technology
320 N Glenwood Blvd
Tyler
Texas 75702
United States

☎ +1 800 591 2796
☎ +1 620 272 0981
✉ sales@picotech.com

* Prices correct at the time of publication. Sales taxes not included. Please check www.picotech.com for the latest prices before ordering.

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