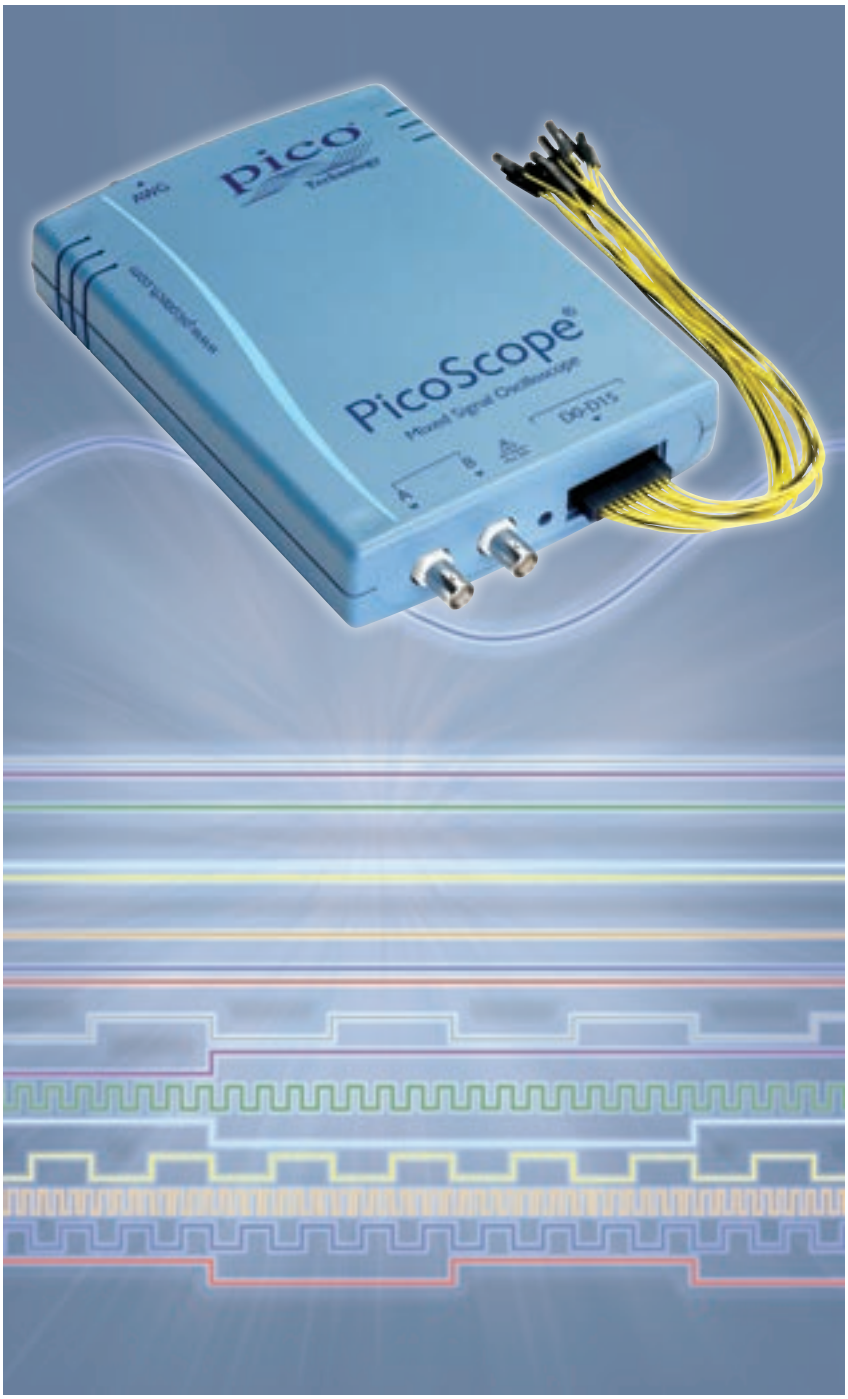
impac

PicoScope® 2205 MSO

MIXED SIGNAL OSCILLOSCOPE



2 analog channels
16 digital channels
Arbitrary waveform generator

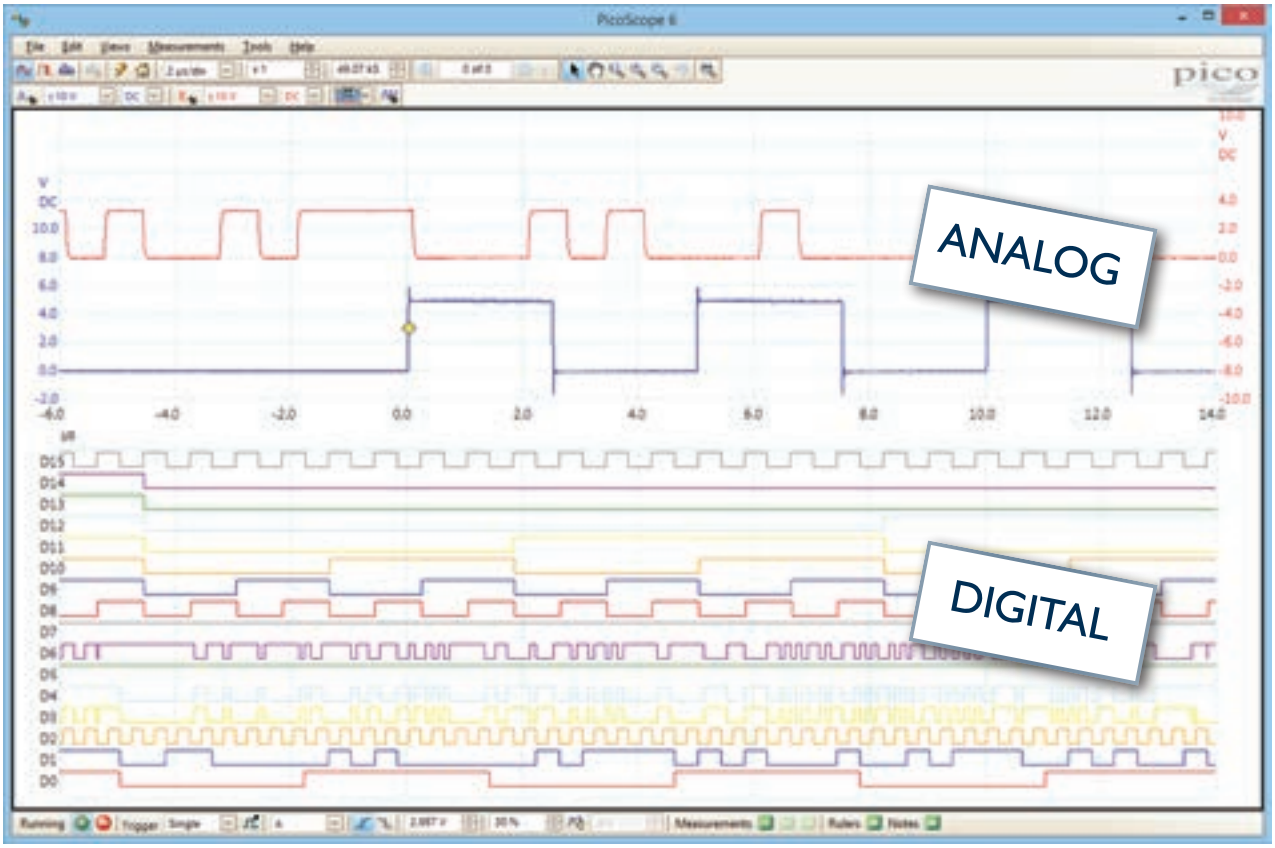
25 MHz bandwidth
100 MHz max. digital input frequency
200 MS/s mixed signal sampling
Advanced digital triggers

Free SDK includes example programs
Free technical support
Free updates
Compatible with Windows XP, Windows Vista, Windows 7 and Windows 8

FULL-FEATURED OSCILLOSCOPE

The PicoScope 2205 MSO from Pico Technology is a 2+16 channel, 8-bit resolution oscilloscope. This means that along with 2 analog channels, the PicoScope 2205 MSO also has 16 digital inputs, so you can view your digital and analog signals simultaneously.

The PicoScope 2205 MSO is a full-featured oscilloscope. A function generator and arbitrary waveform generator are built in and include a sweep function. It also offers mask limit testing, math and reference channels, advanced digital triggering, serial decoding, automatic measurements and color persistence display.



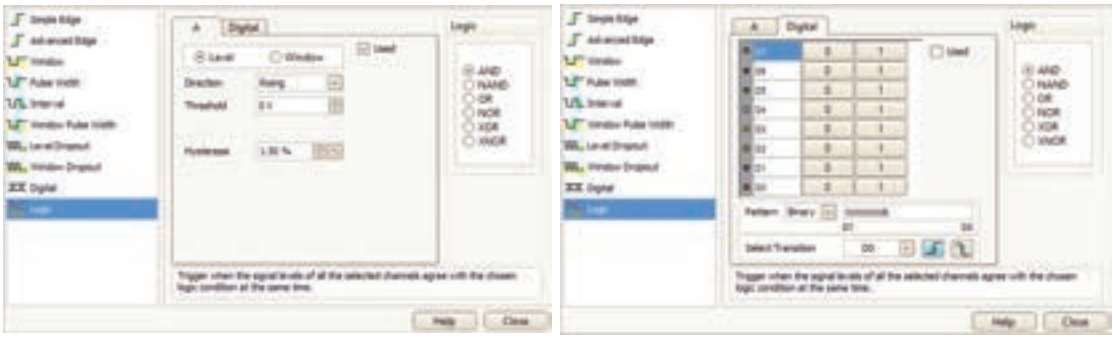
TRIGGERING

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 rearm delay and, combined with the segmented memory, allows the triggering and capture of events that happen in rapid sequence. The mask limit testing function can then scan through these waveforms to highlight failed waveforms for viewing in the waveform buffer.

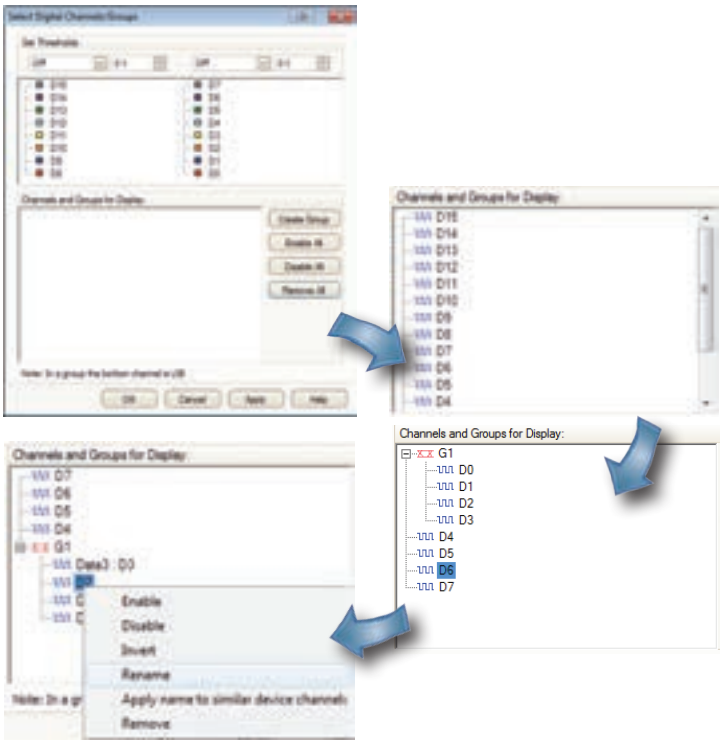
The 16 digital inputs can be displayed individually or in arbitrary groups labelled with binary, decimal or hexadecimal values. A separate logic threshold from –5 V to +5 V can be defined for each 8-bit input port. The digital trigger can be activated by any bit pattern combined with an optional transition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

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



SELECTING DIGITAL CHANNELS, OR GROUPS

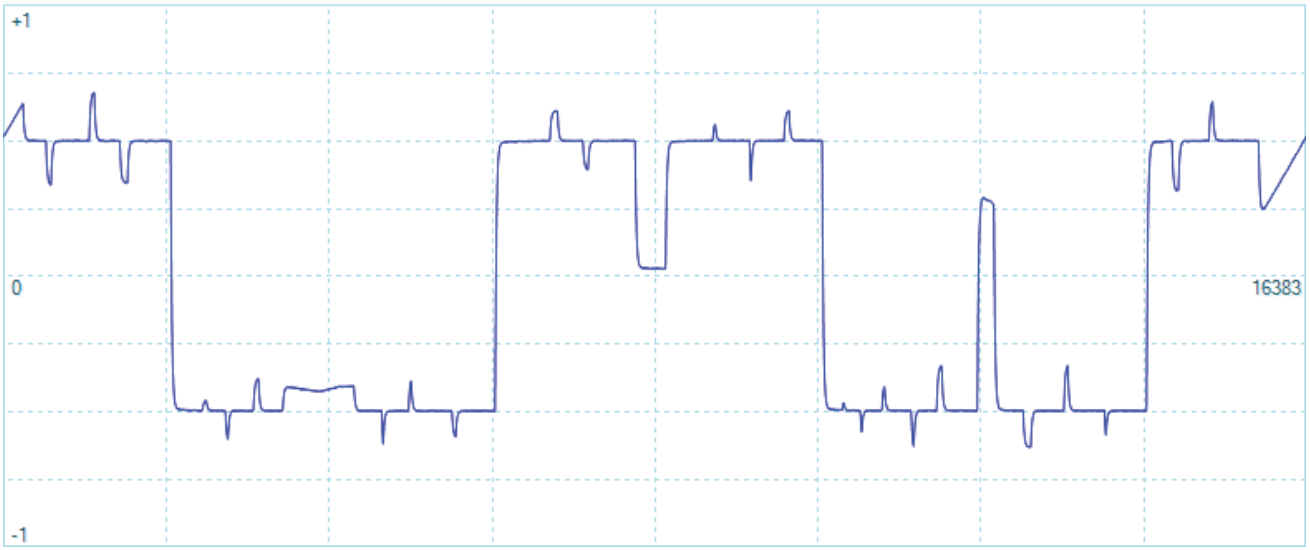
Selecting the digital channels in the software couldn't be easier. Just open the user interface ( ), and then drag and drop to add the channels you want to see. These channels can be arranged into any order, grouped, renamed, and even temporarily disabled if required.



ARBITRARY WAVEFORM AND FUNCTION GENERATOR

The unit has a built-in signal generator (sine, square, triangle, DC level). As well as basic controls to set level, offset and frequency, more advanced controls allow you to sweep over a range of frequencies.

Also included is a fully programmable arbitrary waveform generator with a 8 ksample buffer.



OUR COMMITMENT

To protect your investment, both the API and the firmware inside the unit can be updated. We have a long history of providing new features for free via our software downloads. Other companies make vague promises about future enhancements but we deliver on our promise of free updates, year after year.

Users of our products reward us by becoming lifelong customers, frequently recommending us to their colleagues.

PRODUCT SPECIFICATIONS

VERTICAL (Analog)	
Number of channels	2
Input connectors	BNC
Bandwidth (–3 dB)	25 MHz
Rise time	14 ns
Resolution	8 bits
Input impedance	1 MΩ ±1 % ‖ 14 pF ±2 pF
Input coupling	AC/DC
Input sensitivity	10 mV/div to 4 V/div (10 vertical divisions)
Input ranges	±50 mV, ±100 mV, ±200 mV, ±500 mV, ±1 V, ±2 V, ±5 V, ±10 V, ±20 V
DC accuracy	±3 % of full scale
Noise count	≤ 3 counts
Overvoltage protection	±100 V (DC + AC peak)
VERTICAL (Digital)	
Number of channels	16
Input connectors	2.54 mm, 10 x 2 way connector
Maximum input frequency	100 MHz
Input impedance (with TA136 cable)	200 kΩ ±2 % ‖ 8 pF ±2 pF
Digital threshold range	±5 V
Input dynamic range	±20 V
Overvoltage protection	±50 V
Threshold grouping	Two independent threshold controls - Port 0: D7-D0 and Port 1: D15-D8
Threshold selection	TTL, CMOS, ECL, PECL, User Defined
Threshold accuracy	±100 mV
Minimum input voltage swing	500 mV
Channel-to-channel skew	< 5 ns
Minimum input slew rate	10 V/µs
HORIZONTAL	
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
Maximum equivalent-time sampling (ETS) rate (repetitive signals)*	4 GS/s
Maximum sampling rate (continuous USB streaming)	1 MS/s on all scope channels and digital ports in PicoScope 6 (4 MS/s total) > 20 MS/s using supplied SDK (PC-dependent)
Buffer memory	48 kS shared between active channels and ports
Buffer memory (continuous streaming)	20 MS in PicoScope software. Up to available PC memory when using supplied SDK
Waveform buffer:	
PicoScope software	10 000 software segments
PicoScope software (rapid trigger mode)	32 hardware segments
SDK	32 hardware segments
SDK (user's software)	Unlimited
Timebase ranges	Real-time: 50 ns/div to 5000 s/div. ETS* mode: 2 ns/div to 5000 s/div.
Timebase accuracy	±100 ppm
Sampling jitter	< 300 ps RMS
DYNAMIC PERFORMANCE (Typical)	
Crosstalk	> 200:1 up to full bandwidth for equal voltage ranges
Harmonic distortion	< –55 dB @ 100 kHz full scale input
SFDR	> 55 dB @ 100 kHz full scale input
Noise	≤ 3 counts (all ranges)
Linearity	≤ 1 LSB
Pulse response	< 7% overshoot
Bandwidth flatness	–3 dB, +0.3 dB from DC to full bandwidth

* (ETS is available on analog channels only)

SPECIFICATIONS CONTINUED

TRIGGERING (General)	
Trigger modes	None, Auto, Repeat, Single, Rapid (segmented memory)
Max. pre-trigger capture	100% of capture size
Max. post-trigger delay	4 billion samples
Trigger rearm time	< 2 µs on fastest timebase
Max. trigger rate	32 waveforms in a 100 µs burst
TRIGGERING (Analog)	
Source	Ch A, Ch B
Trigger types	Rising, falling
Advanced triggers	Edge, Window, Pulse width, Window pulse width, Dropout, Window dropout, Interval, Runt pulse, Logic
Trigger sensitivity	Digital triggering provides 1 LSB accuracy up to full bandwidth of scope. ETS mode: Typical 10 mV p-p, at full bandwidth
TRIGGERING (Digital)	
Source	D15 to D0
Trigger types	Combined Level and Edge
Advanced triggers	Data pattern (can be grouped by user)
TRIGGERING (Logic)	
Source	Ch A, Ch B, and D15 to D0
Trigger types	Logic trigger across analog and digital inputs (using AND, NAND, OR, NOR, XOR, XNOR)
FUNCTION GENERATOR AND ARBITRARY WAVEFORM GENERATOR	
Connector	Rear panel, BNC
Standard waveforms	Sine, square, triangle, DC voltage, ramp, sinc, gaussian, half-sine, white noise
Standard signal frequency	DC to 100 kHz
Sweep modes	Up, down, dual with selectable start / stop frequencies and increments
Output frequency resolution	< 0.01 Hz
Output voltage range	±2 V
Output voltage adjustment	Signal amplitude and offset adjustable in 1 mV steps within overall ±2 V range
Amplitude flatness	< 1 dB to 100 kHz
DC accuracy	±1 % of full scale
SFDR	> 55 dB @ 1 kHz, full scale sine wave
Output resistance	600 Ω
Overvoltage protection	±10 V
AWG update rate	2 MS/s
AWG buffer size	8 ksamples
AWG resolution	12 bits
AWG bandwidth	100 kHz
AWG rise time (10-90 %)	< 2 µs
Buffer index mode	Repeat
Phase accumulator	32 bits
Pk-pk output range	±250 mV to ±2 V
Arbitrary waveform	Downloadable user defined waveforms. 1 sample to 8 ksamples (user-selectable)
SPECTRUM ANALYZER	
Frequency range	DC to 25 MHz
Display modes	Magnitude, average, peak hold
Windowing functions	Rectangular, Gaussian, triangular, Blackman, Blackman-Harris, Hamming, Hann, flat-top
Number of FFT points	Selectable from 128 to half available buffer memory in powers of 2
MATH CHANNELS	
Functions	+, −, *, /, sqrt, ^, exp, ln, log, abs, norm, sign, sin, cos, tan, asin, acos, atan, sinh, cosh, tanh, derivative, integral, freq, duty, min, max, average, peak
Operands	A, B (input channels), T (time), reference waveforms, constants, pi

SPECIFICATIONS CONTINUED

AUTOMATIC MEASUREMENTS		
Oscilloscope		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
Spectrum		Frequency at peak, amplitude at peak, average amplitude at peak, total power, THD %, THD dB, THD plus noise, SFDR, SINAD, SNR, IMD
Statistics		Minimum, maximum, average and standard deviation
SERIAL DECODING		
Protocols		I²C, I²S, SPI, RS-232/UART, CAN, LIN, FlexRay
MASK LIMIT TESTING		
Statistics		Pass/fail, failure count, total count
DISPLAY		
Interpolation		Linear
Persistence modes		Digital color, analog intensity, custom, or none
GENERAL		
PC connectivity		USB 2.0 hi-speed
Dimensions		200 x 140 x 40 mm (including connectors)
Weight		< 0.5 kg
Power requirements		Powered from USB port
Operating:	Temperature range	0 °C to 50 °C (20 °C to 30 °C for stated accuracy)
	Humidity range	5% to 80% RH, non-condensing
Storage:	Temperature range	–20 °C to +60 °C
	Humidity range	5% to 95% RH, non-condensing
Safety approvals		Designed to EN 61010-1:2010
EMC approvals		CE: Tested to EN61326-1:2006. FCC: Tested to part 15 subpart B
Environmental approvals		RoHS and WEEE compliant
Software/PC requirements		PicoScope 6, SDK and example programs. Microsoft Windows XP, Windows Vista, Windows 7 or 8 (32-bit or 64-bit).
Languages		English, Chinese (Simplified), Chinese (Traditional), Czech, Danish, Dutch, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Norwegian, Polish, Portuguese, Romanian, Russian, Spanish, Swedish, Turkish

PRODUCT PACKS

The following Product Packs are available for the PicoScope 2205 MSO:

PP798

- PicoScope 2205 MSO
- TA136 digital cable
- 2 x TA139 pack of 10 test clips
- 2 x MI007 probes
- PicoScope probe pouch
- Software and Reference CD
- Quick Start Guide
- USB cable

PP823

- PicoScope 2205 MSO
- Software and Reference CD
- Quick Start Guide
- USB cable

ACCESSORIES

The following accessories for the PicoScope 2205 MSO are also available separately:

PP787

- 2 x MI007 probes

TA136

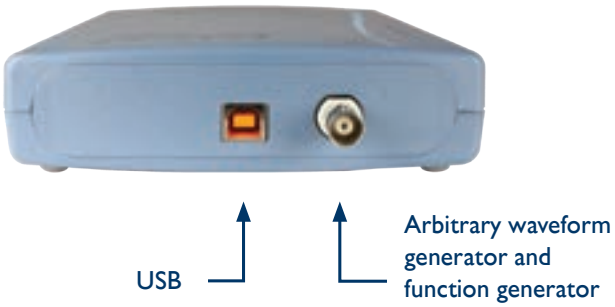
- 20-way 25 cm digital cable

TA139

- Pack of 10 test clips

CONNECTIONS

The front panel of the PicoScope 2205 MSO has two BNC analog input channels and a 20-way connector with 16 digital inputs.



The rear panel of the PicoScope 2205 MSO has two connections: a USB port for connection to the PC, and a BNC for the AWG/function generator connection.

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