A-Z
OF OSCILLOSCOPE
MEASUREMENT TERMS
A-Z of oscilloscope measurement terms

This compact glossary covers many of the important terms associated with the use of oscilloscopes, whether in a bench-based electronics design and debug environment or in a general test & measurement or service role out in the field.

There are several ways to navigate this interactive PDF document:

- Use the navigation at the top of each page to jump to sections or use the page forward/back arrows
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- Use the scroll wheel on your mouse
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Aberrations – Any deviation from the ideal or norm, usually associated with the flat tops and bases of waveforms or pulses. It is important to determine whether the aberrations are actually part of the signal or the result of the measurement process. Generally, aberrations are specified as a percentage deviation from a flat response.

AC Coupling – Blocks the DC component of the signal, centering the waveform at 0 volts.

Accuracy – How closely a given measurement agrees with the measurement’s standard value.

Acquisition mode – See featured explanation above.

Acquisition sample – Samples are taken in evenly spaced intervals to construct the waveform.

Active probe – A probe containing transistors or other active devices as part of the probe’s signal conditioning network. Active probes are often used to reduce the loading of the circuit under test, especially as frequencies increase and capacitance affects the accuracy of the measurement.

Aliasing – Aliasing occurs when the oscilloscope does not sample the signal fast enough to construct an accurate waveform record. When this happens, the oscilloscope displays a waveform with a frequency lower than the actual input waveform, or triggers and displays an unstable waveform.

Alternating current (AC) – A signal in which the current and voltage vary in a repeating pattern over time. Also used to indicate signal coupling type.

Amplification – An increase in signal amplitude during its transmission from one point to another.

Amplitude – Refers to the value of voltage between two points in a circuit. Amplitude commonly refers to the maximum voltage of a signal measured from ground (zero volts).

Analog oscilloscope – An instrument that displays a waveform by applying the input signal (conditioned and amplified) to the vertical axis of an electron beam moving across a cathode-ray tube (CRT) screen horizontally from left to right. A chemical phosphor coated on the CRT creates a glowing trace wherever the beam hits.

Analog signal – A signal with continuously variable voltages.

Analog-to-Digital Converter (A/D, ADC) – A digital electronic component that converts an electrical signal into discrete binary values. The image shows a block diagram of a scope: the A/D actually has eight or more digital lines out.

Asynchronous signals – Signals between which no timing relationship exists, for example between a keyboard and the computer clock.

Attenuation – A decrease in signal amplitude during its transmission from one point to another.

Attenuator probe – A probe that effectively multiplies the scale factor range of an oscilloscope by attenuating the signal.

Auto mode – The oscilloscope sweeps, even without a trigger.

Autoset – A button that automatically adjusts the vertical, horizontal and trigger settings to quickly view your signal.

Averaging – Several waveforms are acquired and averaged point-by-point to obtain the average voltage at each time sample in the acquisition. Used to reduce (random) noise.
Bandwidth (BW) – The continuous band of frequencies that a network or circuit passes without reducing power more than 3dB from the mid-band power.

Bandwidth limit – Limits the bandwidth of the oscilloscope to reduce displayed noise. Restricts frequencies above the limit from being displayed.

Branch – In a schematic or circuit, a chain of components with a single current path.

Capacitance (C) – A measure of how much charge parallel plates in a circuit accumulate. No actual DC currents flow, but charges are added to and taken from the parallel plates giving the appearance of electron transfer as the voltage changes. One Farad is the size of a capacitor capable of holding 1 Coulomb at 1 Volt, C = Q/V. Capacitive reactance (in Ohms) \( X_C = \frac{1}{2\pi fC} \) where \( \pi = 3.14159... \), \( f \) = frequency in Hz, \( C \) = capacitance in Farads.

Circuit loading – See featured explanation above.

Common-Mode Rejection Ratio (CMRR) – A differential probe’s ability to reject any signal that is common to both test points in a differential measurement. CMRR is a key figure of merit for differential probes and amplifiers.

Communication triggering – On some scopes, acquires a wide variety of Alternate-Mark Inversion (AMI), Code-Mark Inversion (CMI), and Non-Return to Zero (NRZ) communication signals. Many standard communication protocols can be triggered on modern oscilloscopes.

Compensation – A probe adjustment for passive attenuation probes that balances the capacitance of the probe with the capacitance of the oscilloscope.
**Complex waves** – Some waveforms combine the characteristics of sines, squares, steps, and pulses to produce waveshapes that challenge many oscilloscopes. The signal information may be in the form of amplitude, phase, and/or frequency variations. For example, an ordinary composite video signal is composed of many cycles of higher-frequency waveforms embedded in a lower-frequency envelope. 

**Coulomb (C)** – One Ampere second. The charge on approximately $6.24 \times 10^{18}$ electrons (the charge on one electron is $1.6 \times 10^{-19}$C). 

**Coupling** – How two circuits connect together. Circuits connected with a wire are directly coupled (DC); circuits connected through a capacitor or transformer are indirectly (AC) coupled. 

**Crosstalk** – See featured explanation above. 

**Current (I)** – This is a base standard of SI units, and is measured as the amount of current needed to create a force of $2 \times 10^{-7}$ Newtons per meter of length between two infinitely long, small parallel wires 1 meter apart. One Amp is Coulomb/second. 

**Current probe** – A device to sense current flow in a wire and convert it to a voltage signal for measurement by an oscilloscope. 

**Cursor** – An on-screen marker that you can align with a waveform to make more accurate measurements. 

**DC Coupling** – Shows the whole input signal. 

**Decibel (dB)** – For power, response in dB = $10 \log (P_{out}/P_{in})$. Power is proportional to the voltage or current squared, so for them the response is $20 \log (V_{out}/V_{in})$ or $20 \log (I_{out}/I_{in})$. 

**Default setup button** – Returns the oscilloscope to a known state. 

**Delayed time base** – A time base with a sweep that can start (or be triggered to start) relative to a pre-determined time on the main time base sweep. Allows you to see events more clearly and to see events that are not visible solely with the main time base sweep. 

**Derate** – To reduce the rated value. Sample rates of digital scopes at slow sweep speeds are for example lower than the maximum due to limited memory. 

**Differential probe** – Although all probes are differential, most common probes measure the difference from ground to the node of interest. Differential probes allow for an easy measurement of two nodes without a ground reference.
Differential signals – Signals that are referenced to each other instead of earth ground.

Digital oscilloscope – An oscilloscope that uses an analog-to-digital converter (ADC) to convert the measured voltage into digital information. Types include digital storage, digital phosphor, mixed signal, and digital sampling oscilloscopes.

Digital Phosphor Oscilloscope (DPO) – See featured explanation above.

Digital Real-Time (DRT) – All samples are taken in a single cycle of the digitizing system, capturing and displaying the event in the same time frame in which it occurs.

Digital Sampling Oscilloscope – A type of digital oscilloscope that uses equivalent-time sampling to capture and display samples of a signal. Ideal for accurately capturing signals whose frequency components are much higher than the oscilloscope’s sample rate.

Digital signal – A signal whose voltage samples are represented by discrete binary numbers.

Digital Signal Processing (DSP) – Using software to improve the accuracy of measured signals.

Digital Storage Oscilloscope (DSO) – See next page.

Digitize – The process by which an analog-to-digital converter (ADC) in the horizontal system samples a signal at discrete points in time and converts the signal’s voltage at these points into digital values called sample points.

Direct current (DC) – A signal with a constant voltage and/or current. Also used with oscilloscopes to indicate signal coupling type.

Distributed elements (R, L and C) – Resistance and reactance that are spread out over the length of a conductor; distributed element values are typically small compared to lumped component values.

Division – Measurement markings on the oscilloscope graticule indicating major and minor marks.

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E

Earth ground – A conductor that connects electrical currents to the Earth.

Effective bits – A digital oscilloscope’s ability to accurately reconstruct a sine wave signal’s shape. This measurement compares the oscilloscope’s actual digitized sine wave to that of a theoretical “ideal” digitizer. Often specified as ENOB (Effective Number of Bits).

Energy (E) – A Joule is the energy taken to apply a force of one Newton (kg m/sec²) over a distance of one meter. A kilowatt hour is 3.6 x 10⁶ Joules.

Envelope – The outline of a signal’s highest and lowest points acquired over many displayed waveform repetitions.

Equivalent-time sampling – A sampling mode in which the oscilloscope constructs a picture of a repetitive signal by capturing a little bit of information from each repetition. Two types are random and sequential.

Waveform Constructed
with Record Points

1st Acquisition Cycle
2nd Acquisition Cycle
3rd Acquisition Cycle
4th Acquisition Cycle

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Digital Storage Oscilloscope (DSO) – A digital oscilloscope that acquires signals using digital sampling (using an analogue-to-digital converter). It uses a serial processing architecture to control acquisition, user interface, and master display. A Digital Phosphor oscilloscope (DPO), shown, is an advanced type of DSO which employs a parallel processing architecture to deliver high waveform capture rates that result in a higher level of signal visualisation. The DPO displays signals in three dimensions: amplitude, time and the distribution of amplitude over time. Optional analysis modules support triggering, decode and search for popular serial buses such as USB. See here. Select record length, capture, freeze... and then view signals in detail. See here.
Focus – The analog oscilloscope control that adjusts the cathode-ray tube (CRT) electron beam to control the sharpness of the display.

Fast Fourier Transform (FFT) – See featured explanation above.

Field-Effect transistor (FET) – A voltage-controlled device in which the voltage at the gate terminal controls the amount of current through the device.

Floating measurements – Measurements that are made between two points, neither of which is at ground potential. Often used in measuring small signals *riding* on large signals.

Fourier transform – The Fourier transform shows that any waveform, no matter its shape, can be described as a sum of sinusoidal waveforms of various frequencies and magnitudes.

Frequency – The number of times a signal repeats in one second, measured in Hertz (cycles per second). The frequency equals 1/period.

Frequency response – Frequency response curves of an oscilloscope define the accuracy in representing the amplitude of the input signal as a function of the signal frequency. For maximum signal fidelity, the oscilloscope must have a flat (stable) frequency response across the entire bandwidth specified.

Gain accuracy – An indication of how accurately the vertical system attenuates or amplifies a signal, usually represented as a percentage error.

Gigahertz (GHz) – 1,000,000,000 Hertz, a unit of frequency.

Glitch – An intermittent, high-speed error in a circuit.

Glitch triggering – See featured explanation on next page.

Graticule – The grid lines on a display for measuring oscilloscope traces.

Ground – (1) That portion of a circuit that can be tied to the earth or safety power connections without current being drawn. Or, (2) An arbitrary reference for a given circuit that cannot necessarily be equated with earth ground.

Ground bounce – is a shift in a device’s ground reference caused by a current spike in its ground plane.

Ground coupling – Disconnects the input signal to show where 0 volts is on the screen.
**Grounding** – Since probes must draw some current from the signal source to make a measurement, the current must have a return path. This is provided by a probe ground lead that is attached to the circuit ground or common.

**Hall effect** – A voltage is generated perpendicular to both an electric current flowing along a conductor and an external magnetic field applied at right angles to the current. This effect is made use of by current probes.

**Harmonics** – Square waves, sawtooth waves, and other periodic non-sinusoidal waveforms contain frequency components that consist of the waveform’s fundamental frequency (1/period) and frequencies that are integer multiples (1x, 2x, 3x, ...), referred to as harmonic frequencies. The second harmonic of a waveform has a frequency twice that of the fundamental, the third harmonic frequency is three times the fundamental, and so on.

**Hertz (Hz)** – One cycle per second, the unit of frequency.

**HF Reject** – Attenuates the high-frequency components of the signal.

**Horizontal accuracy (time base)** – How accurately the horizontal system displays the timing of a signal, usually represented as a percentage error.

**Horizontal position control** – Moves the waveform left and right on the display.

**Horizontal scale control (seconds-per-division)** – Determines the amount of time displayed.

**Horizontal sweep** – The action of the horizontal system that causes a waveform to be drawn.

**Impedance** – The process of impeding or restricting current flow. Impedance is expressed in Ohms and consists of a resistive component (R) and a reactive component (X) that can be either capacitive (X_C) or inductive (X_L). Impedance (Z) is expressed in a complex form as \( Z = R + jX \) or as a magnitude and phase.
Inductance (L) – A property of an electric circuit that induces an electromotive force by changing current either in the circuit itself or in a neighbouring circuit. Inductance measures the unwillingness of a circuit or component to change current. It is the ratio of magnetic flux in a circuit to the current flowing in the circuit. One Henry provides 1 Volt when changing the current through a closed loop by 1 Amp/second. The inductive reactance (in Ohms) \( XL = 2\pi fL \), where \( \pi = 3.14159\ldots \), \( f \) = frequency in Hz, \( L \) = inductance in Henrys.

Insertion impedance (current probes) – The impedance that is transformed from the current probe’s coil (the secondary) into the current carrying conductor (the primary) that’s being measured.

Intensity grading – See featured explanation above

Interpolation – A “connect-the-dots” processing technique to estimate what a fast waveform looks like based on only a few sampled points. Two types are linear and \( \sin \frac{x}{x} \).

Jitter – The short-term variations of a digital signal’s significant instants from their ideal positions in time.

Kilohertz (kHz) – 1,000 Hertz, a unit of frequency.

LF reject – Blocks the DC component and attenuates the low-frequency components of the signal.

Linear phase – Where the phase of an applied sine wave to a network is shifted linearly with increasing sine wave frequency. A network with linear phase shift maintains the relative phase relationships of harmonics in non-sinusoidal waveforms to avoid phase-related distortion.

Load – That portion of a circuit that dissipates power or modifies input power, but does not generate power. The impedance that’s placed across a signal source, for example an open circuit would be “no load”.

Loading – The unintentional interaction of the probe and oscilloscope with the circuit being tested which distorts a signal. Where a load applied to a source draws current from the source.

Logic analyzer – An instrument used to show the logic states of many digital signals. It analyzes the digital data and can represent the data as real-time software execution, data flow values, state sequences, etc.
Logic probe – See featured explanation above.
Logic triggering – Allows you to trigger on any logical combination of available input channels, especially useful in verifying the operation of digital logic.

Low-capacitance probe – A passive probe that has very low input capacitance. Important when probing high frequencies so the probe does not present significant capacitive loading.

M

Megahertz (MHz) – 1,000,000 Hertz, a unit of frequency.
Megasamples per second (MS/s) – A sample rate unit equal to one million samples per second.
Microsecond (μs) – A unit of time equivalent to 0.000001 seconds.
Millisecond (ms) – A unit of time equivalent to 0.001 seconds.
Mixed Domain Oscilloscope (MDO) – See next page.
Mixed Signal Oscilloscope (MSO) – A type of digital oscilloscope that combines the basic functions of a 16-channel logic analyzer with the performance of a 4-channel digital phosphor oscilloscope.
MOSFET – Metal-oxide semiconductor field-effect transistor, one of two major types of FET.

N

Nanosecond (ns) – A unit of time equal to 0.000000001 seconds.
Node – In a schematic or circuit, a point where multiple branches in the circuit join. A point with no voltage difference.
Noise – An unwanted voltage or current in an electrical circuit.
Mixed Domain Oscilloscope (MDO) – A type of digital oscilloscope that combines an RF spectrum analyzer with a MSO or DPO to correlate views of signals from the digital, analog and RF domains.

See the spectrum analyzer here
Noise reject – Adds hysteresis (memory) to the trigger circuitry to reduce the chance of falsely triggering on noise. It ensures that the signal stays past the trigger point long enough so the scope does not trigger on noise.

Non-periodic signals – Signals that constantly change, analogous to a moving picture.

Normal trigger mode – The oscilloscope only sweeps if the input signal reaches the set trigger point, otherwise the last acquired waveform remains on the display.

Open circuit – A circuit through which no current flows.

Optical probe – A device to sense light power... read more

Oscilloscope – An instrument used to display voltage changes over time. The word oscilloscope comes from “oscillate,” since oscilloscopes are often used to measure oscillating voltages. A typical oscilloscope comprises the elements shown in this block diagram.

Passive probe – A probe whose network equivalent consists only of resistive (R), inductive (L), and/or capacitive (C) elements; a probe that contains no active components.

Peak (Vp) – The maximum voltage level measured from a zero reference point.
Peak Detect – The highest and lowest values of the input signal are captured and used to construct the waveform. This mode will capture narrow pulses that may be missed in Sample Mode.

Peak-to-peak (Vp-p) – The voltage measured from the maximum point of a signal to its minimum point.

Period – The amount of time it takes a wave to complete one cycle. The period equals 1/frequency.

Periodic signals – Repetitive signals, analogous to a still picture.

Phase – The amount of time that passes from the beginning of a cycle to the beginning of the next cycle, measured in degrees (how much of the period has elapsed): ¼ period = 90°, ½ period = 180°.

Phase shift – See featured explanation above.

Power (P) – A watt is defined as the amount of power that consumes one Joule per second. Imaginary power does not convert to heat at the load.

Pre-trigger viewing – The ability of a digital oscilloscope to capture what a signal did before a trigger event. Determines the length of viewable signal both preceding and following a trigger point.

Probe – A device that makes a physical and electrical connection between a test point or signal source and an oscilloscope. It usually has a pointed metal tip for making electrical contact with a circuit element, a lead to connect to the circuit’s ground reference, and a flexible cable for transmitting the signal and ground to the oscilloscope.
Probe power – Power that’s supplied to the probe from some source such as the oscilloscope, a probe amplifier, or the circuit under test. Probes that require power typically have some form of active electronics, and so are referred to as being active probes.

Propagation delay – Every probe offers some small time delay or phase shift that varies with signal frequency. This is a function of the probe components and the time it takes for the signal to travel through these components from probe tip to oscilloscope connector.

Pulse – A common waveform shape that has a fast rising edge, a width, and a fast falling edge. A pulse indicates sudden changes in voltage, similar to the voltage changes you would see if you turned a power switch on and then off again. A pulse might represent one bit of information travelling through a computer circuit or it might be a glitch, or defect, in a circuit. A collection of pulses travelling together creates a pulse train.

Pulse train – A collection of pulses travelling together.

Pulse width – The amount of time a pulse takes to go from low to high and back to low again, conventionally measured at 50% of full voltage.

Pulse width triggering – Used to monitor a signal and trigger on the first occurrence of a pulse whose duration (pulse width) is outside the allowable limits.

Ramps – Transitions between voltage levels, most often used in measuring the linear progression of a square or triangle wave (unlike sine waves).

Raster – A type of display.

Reactance – An impedance element that restricts the current flow of an AC signal based on the signal’s frequency.

Readout – Alphanumeric information displayed on an oscilloscope screen to provide waveform scaling information, measurement results, or other information.

Real-time sampling – A sampling mode in which the oscilloscope collects all samples needed to reconstruct the signal from one triggered acquisition.

Record length – See featured explanation above.

Rectangular wave – Rectangular waves are like square waves except that the high and low times are not of equal length.

Resistance (R) – Resistance is that property of a conductor that opposes the flow of current. It causes the dissipation of real power. One Ohm is the resistance needed to generate 1 Volt with 1 Amp of current.
Ringing – See featured explanation above.
Rise time – The time taken for the leading edge of a pulse to rise from its low to high values, typically measured from 10% to 90%.
Runt pulse triggering – Allows you to capture and examine pulses that cross one logic threshold, but not both.

Sample point – The raw data from an ADC used to calculate waveform points.
Sample rate – How frequently a digital oscilloscope takes a sample of the signal, specified in samples per second (S/s). Top-end scopes can sample at 80 GS/s.
Sampling – Converting an input signal into a number of discrete electrical values for storing, processing and/or displaying on an oscilloscope. Two types are real-time and equivalent-time sampling.
Sawtooth waves – The result from circuits which control voltages linearly, such as the horizontal sweep of an analog oscilloscope or the raster scan of a television. The transitions between voltage levels of these waves change at a constant rate. These transitions are called ramps.
Sensor – A device that converts a specific physical quantity such as sound, pressure, strain, or light intensity into an electrical signal.

Setup-and-hold triggering – Lets you trap a single violation of setup-and-hold time that would almost certainly be missed by other trigger modes. This makes it easy to capture specific signal quality and timing details when a synchronous data signal fails to meet setup-and-hold specifications.

Shielding – A grounded conductive sheet of material between a circuit and noise sources that intercepts noise signals and conducts them away from the circuit.
Short circuit – A circuit across which no voltage can be developed.
**Signal averaging** – Summing multiple acquisitions of repetitive waveform and calculating an average waveform.

**Signal fidelity** – The degree to which the signal as it occurs at the probe tip is duplicated at the oscilloscope input.

**Signal integrity** – See featured explanation above.

**Signal source** – A test device that injects a signal into a circuit input; the circuit’s output is then read by an oscilloscope. Also known as a signal generator, Arbitrary Function Generator (AFG), etc.

**Signal-to-Noise Ratio (SNR)** – The ratio of signal amplitude to noise amplitude, usually expressed in dB: SNR = 20 log (Vsignal/Vnoise).

**Simple resonance** – In AC circuits with parallel RLC elements, damping describes the amount of energy stored in a circuit compared to that consumed. In a purely resistive circuit, the energy stored is equal to zero. Reactive circuits (circuits containing capacitors and/or inductors) can store energy during a transient to be dissipated later.

**Sine wave** – The sine wave is the fundamental wave shape for several reasons. It is the height of a point as it goes round a circle. The voltage in your wall outlet varies as a sine wave, and most AC power sources produce sine waves. The damped sine wave is a special case in a circuit that oscillates, but decays over time.

**Single-ended signals** – Signals referenced to ground.

**Single shot** – A signal measured by an oscilloscope that only occurs once (also called a transient event).

**Single sweep** – A trigger mode to display one triggered screen of a signal and then stop.

**Slew rate triggering** – High-frequency signals with slew rates faster than expected (or needed) can radiate troublesome energy. Slew rate triggering improves on conventional edge triggering by adding the element of time and allowing you to selectively trigger on fast or slow edges.

**Slope** – On a graph or an oscilloscope display, the ratio of a vertical distance to a horizontal distance. A positive (negative) slope increases (decreases) from left to right.

**Source** – The origination point or element of a signal voltage or current, the part of a circuit that can generate power. Also, one of the elements in a FET (field effect transistor).
**Source impedance** – The impedance seen when looking back into a source.

**Spectrum analyzer** – Measures the value of an input signal against frequency across the instrument’s full frequency range.

**Square wave** – Another common wave shape, a voltage that turns on and off (or goes high and low) at regular intervals. It is a standard wave for testing amplifiers – good amplifiers increase the amplitude of a square wave with minimum distortion. Television, radio and computer circuitry often use square waves for timing signals.

**Step** – A step indicates a sudden change in voltage, similar to the voltage change you would see if you turned on a power switch.

**Sweep** – One horizontal pass of an analog oscilloscope’s electron beam from left to right across the CRT screen.

**Sweep speed** – Same as time base, and described in time per division.

**Synchronous signals** – When a timing relationship exists between two signals like clock, data and address signals inside a computer.

**Time base** – Oscilloscope circuits that control the timing of the sweep. The time base is set by the seconds/division control.

**Time Domain Reflectometry (TDR)** – A measurement technique...

**Trace** – The visible shapes drawn on a CRT by the movement of the electron beam.

**Trace ID** – Allows a particular waveform in a multiple waveform trace to be identified as coming from a particular probe or oscilloscope channel. Momentarily pressing the trace ID button on a probe momentarily changes the corresponding waveform trace on the oscilloscope to identify that trace.

**Transient** – A signal measured by an oscilloscope that only occurs once (also called a single-shot event).

**Triangle wave** – Results from circuits that control voltages linearly, such as the horizontal sweep of an analog oscilloscope or the raster scan of a television. The transitions between voltage levels of these waves change at a constant rate. These transitions are called ramps.

**Trigger** – The circuit that starts a horizontal sweep on an oscilloscope.

**Trigger holdoff** – A control that allows you to adjust the period of time after a valid trigger during which the oscilloscope cannot trigger.

**Trigger level** – The voltage level that a trigger source signal must reach before the trigger circuit starts a sweep.
**Trigger mode** – Determines the type of trigger. Normal (triggered) demands a valid trigger to acquire the waveform, while in Auto mode if a valid trigger is not present the scope will create a trigger so the user can see the signal present.

**Trigger slope** – Determines whether the trigger point is on the rising (positive slope) or falling (negative slope) edge of a signal.

**Trigger source** – Determines which signal is compared to the trigger settings.

**Typical value** – An indication only, not a measured or guaranteed value.

**Vertical position control** – Moves the waveform up and down on the display by changing the voltage setting.

**Vertical resolution** – How precisely an analog-to-digital converter (ADC) in a digital oscilloscope can convert input voltages into digital values, measured in bits. Calculation techniques like hi-res acquisition mode can improve the effective resolution.

**Vertical sensitivity** – How much the vertical amplifier can amplify a weak signal – usually measured in millivolts (mV) per division.

**Vertical scale control (Volts-Per-Division)** – Varies the size of the waveform on the screen.

**Volt** – The unit of electric potential difference.

**Voltage** – The difference in electric potential – or signal strength – between two points in a circuit. Usually, one of these points is ground, or zero volts, but not always. You may want to measure the voltage from the maximum to the minimum peaks of a waveform (the peak-to-peak voltage). Expressed in volts: a volt is the Electromotive Force (EMF) required to drive 1 Amp of current into a 1 Watt load.

**Waveform capture rate** – See featured explanation above.

**Waveform point** – A digital value that represents the voltage of a signal at a specific point in time. Waveform points are calculated from sample points and stored in memory.

**XY mode** – A measurement technique that involves inputting one signal into the vertical system as usual, and one into the horizontal system to trace voltages on both the X and Y axis.

**Z axis** – The display attribute on an oscilloscope that shows brightness variations as the trace is formed.