

Glossary of Terms

An **Analog Signal** is a continuously-valued signal. In other words, an analog signal is any signal that can take any value between the signal's minimum and maximum value.

An **Analog-to-Digital Converter (ADC)** converts an analog signal to a digital signal. The output of the sensors described in this manual are analog, and therefore must be converted to a digital signal by an ADC, such as that within many microcontrollers, prior to being used by its onboard software.

Calibration includes a set of methods and tools to compare the results of a sensor to a calibration standard of known accuracy. For the purposes of this manual, the term is used to describe the process of converting a change in a measured electrical property (resistance or capacitance) to a mechanical or environmental property (force, acceleration, temperature, etc.) depending on the sensor.

A **Cantilever Beam** is any beam (or rod) that is fixed to a wall or surface on one end and is 'free' (unsupported) at its other end.

The **Conductive Traces** are long continuous lengths of conductive filament which allow current to pass through. They act as *sensing elements* (see below) and to connect electrical contacts to complete an electrical circuit.

A **Digital Signal** is a signal that can only take specific (discrete) values. All computers – including the microprocessor onboard a microcontroller – can only read from (or create) a digital signal and not an analog signal.

Electrical Contacts, also called contact pads, are large rectangular areas of conductive material allowing easy access for measuring electrical properties.

Fused Deposition Modelling (FDM) is a 3D printing process wherein plastic filaments are heated and extruded through a dispensing nozzle. 3D objects are printed onto a *print bed* or *build plate* in a layer-by-layer process. 3D printers using FDM are by far the most common and least expensive.

The **Infill Pattern** defines the shape and structure of the inside of a 3D printed part. Infill pattern affects the amount of material used as well as a printed part's strength and weight.

Polylactic Acid (PLA) is a plastic commonly used in 3D printing. PLA-based plastics are used for the structural and conductive components of all sensors described in this manual.

Polyvinyl Acetate (PVA) is a water-soluble plastic commonly used in 3D printing to produce temporary support structures. This material is often used to improve the print quality of difficult-to-print objects.

A **Proof Mass** is a weight of known mass used in measurement equipment. Accelerometers typically use a relatively heavy proof mass to obtain a better measurement of applied acceleration.

A **Sensing Element** is any electrically conductive element that can be used to measure a specific mechanical or environmental property, such as force or temperature.

Sensitivity, when used to describe a sensor, is the ratio of an output signal of a sensor and the measured property. In other words, a more sensitive force sensor has a larger change in resistance for a given applied force. More sensitive sensors can readily detect smaller changes in the measured property (for example, force) than a less sensitive one.