MODULE 10: ANALOG AND DIGITAL SIGNALS

WHAT IS A SIGNAL ?

A signal is an electromagnetic or electrical current that carries data from one system or network to another. In electronics, a signal is often a time-varying voltage that is also an electromagnetic wave carrying information, though it can take on other forms, such as current. There are two main types of signals used in electronics:

- Analog
- Digital

ANALOG SIGNAL

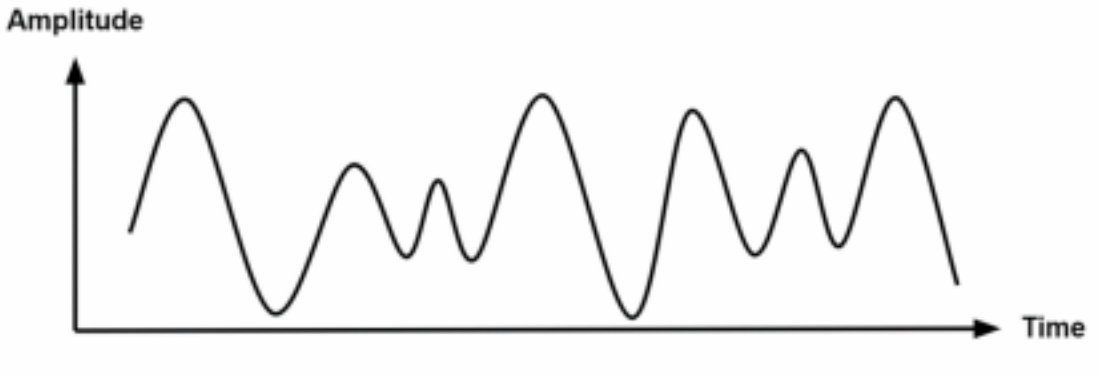
• An analog signal is time-varying and generally bound to a range (e.g. +12V to -12V), but there is an infinite number of values within that continuous range.

• An analog signal uses a given property of the medium to convey the signal's information, such as electricity moving through a wire.

• In an electrical signal, the voltage, current, or frequency of the signal may be varied to represent the information.

• Analog signals are often calculated responses to changes in light, sound, temperature, position, pressure, or other physical phenomena.

• When plotted on a voltage vs. time graph, an analog signal should produce a smooth and continuous curve.



DIGITAL SIGNAL

A digital signal is a signal that represents data as a sequence of discrete values. A digital signal can only take on one value from a finite set of possible values at a given time. With digital signals, the physical quantity representing the information can be many things:

- Variable electric current or voltage
- Phase or polarization of an electromagnetic field
- Acoustic pressure
- The magnetization of a magnetic storage media

Digital signals are used in all digital electronics, including computing equipment and data transmission devices.
When plotted on a voltage vs. time graph, digital signals are one of two values, and are usually between 0V and VCC (usually 1.8V, 3.3V, or 5V).