

Analog and Digital are the different forms of signals. Signals are used to carry information from one device to another. Analog signal is a continuous wave that keeps on changing over a time period. Digital signal is discrete in nature.

The fundamental difference between analog and digital signal is that analog signal is represented by the sine waves whereas, the digital signal is represented by square waves. Lets us learn some more differences between analog and digital signal with the help of comparison chart shown below.

Content: Analog Vs Digital Signal

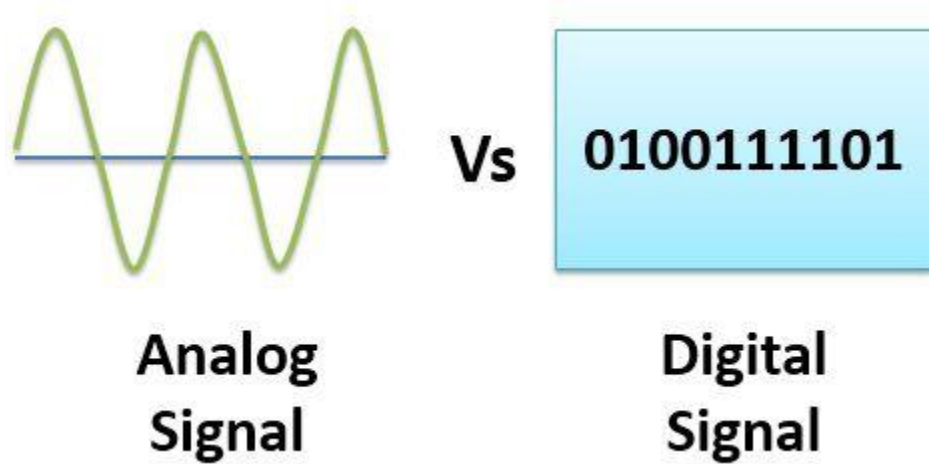
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Comparison Chart

BASIS FOR COMPARISON	ANALOG SIGNAL	DIGITAL SIGNAL
Basic	An analog signal is a continuous wave that changes over a time period.	A digital signal is a discrete wave that carries information in binary form.
Representation	An analog signal is represented by a sine	A digital signal is represented by square

BASIS FOR COMPARISON	ANALOG SIGNAL	DIGITAL SIGNAL
	wave.	waves.
Description	An analog signal is described by the amplitude, period or frequency, and phase.	A digital signal is described by bit rate and bit intervals.
Range	Analog signal has no fixed range.	Digital signal has a finite numbers i.e. 0 and 1.
Distortion	An analog signal is more prone to distortion.	A digital signal is less prone to distortion.
Transmit	An analog signal transmit data in the form of a wave.	A digital signal carries data in the binary form i.e. 0 nad 1.
Example	The human voice is the best example of an analog signal.	Signals used for transmission in a computer are the digital signal.

Difference Between Analog and Digital Signal



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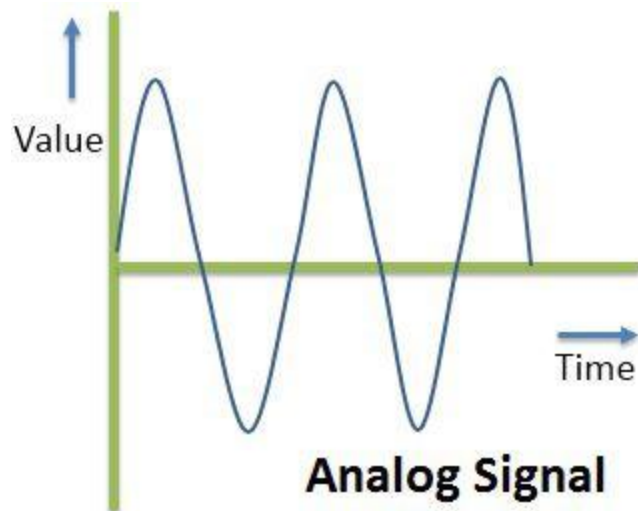
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Definition of Analog Signal

Analog signal is a kind of continuous wave form that changes over time. An anlaog signal is further classified into simple and composite signals. A simple analog signal is a sine wave that cannot be decomposed further. On the other hand, a composite analog signal can be further decomposed into multiple sine waves.

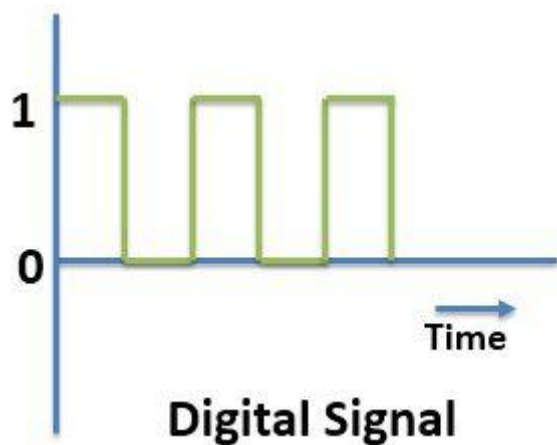
An analog signal is described using amplitude, period or frequency and phase. Amplitude marks the maximum height of the signal. Frequency marks the rate at which signal is changing. Phase marks the position of the wave with respect to time zero.



An analog signal is not immune to noise hence, it faces distortion and decrease the quality of transmission. The range of value in an analog signal is not fixed.

Definition of Digital Signal

Digital signals also carry information like analog signals but is somewhat is different from analog signals. Digital signal is noncontinuous, discrete time signal. Digital signal carries information or data in the binary form i.e. a digital signal represent information in the form of bits.



Digital signal can be further decomposed into simple sine waves that are called harmonics. Each simple wave has different amplitude, frequency and phase. Digital signal is described with bit rate and bit interval. Bit interval describes the time require for sending a single bit. On the other hand, bit rate describes the frequency of bit interval.

A digital signal is more immune to the noise; hence, it hardly faces any distortion. Digital signals are easier to transmit and are more reliable when compared to analog signals. Digital signal has a finite range of values. The digital signal consists 0s and 1s.

Key Differences Between Analog and Digital Signal

1. An analog signal represents a continuous wave that keeps changing over a time period. On the other hand, a digital signal represents a non continuous wave that carries information in a binary format and has discrete values.
2. An analog signal is always represented by the continuous sine wave whereas, a digital signal is represented by square waves.
3. While talking of analog signal we describe the behaviour of the wave in respect of amplitude, period or frequency, and phase of the wave. On the other hand, while talking of discrete signals we describe the behavior of the wave in respect of bit rate and bit interval.
4. The range of an analog signal is not fixed whereas the range of the digital signal is finite and which can be 0 or 1.
5. An analog signal is more prone to distortion in response to noise, but a digital signal has immunity in response to noise hence it rarely faces any distortion.
6. An analog signal transmits data in the form of wave whereas, a digital signal transmits the data in the binary form i.e. in the form of bits.
7. The best example of an analog signal is a human voice, and the best example of a digital signal is the transmission of data in a computer.

Conclusion

Digital signal is nowadays replacing the analog signal, but analog signal is still best for audio transmission.