

How Do Ultrasonic Sensors Work?

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Ultrasonic sensors emit an acoustic wave between 20 hertz and 20 kilohertz and determine the distance. Ultrasonic sensors can be used in many fields. For instance, it can be used as parking assistance sensors in cars.

Basic Ultrasonic Sensor Operation

Ultrasonic sensors emit ultrasonic pulses that travel in a cone-shaped beam by using a vibrating device known as a transducer, generating the ultrasonic wave. The frequency of vibration of the transducer determines the range of an ultrasonic sensor. The sound waves transmit for progressively shorter distances along with the frequency increases. Conversely, the sound waves transmit for progressively longer distances as the frequency decreases. Therefore, short-range ultrasonic sensors work best at higher frequencies, while long-range ultrasonic sensors work best at lower frequencies.

Configuration is Essential

According to the application, ultrasonic sensors come in a variety of configurations and typically use one or more transducers. If the ultrasonic sensor has multiple transducers, you should consider the space between the transducers. The cone-shaped beams emitted from each may cause unwanted interference if the transducers are spaced too closely together.

The Blind Zone

Blind zone is an unusable area that closes to the face of the sensor. The sensor cannot accurately receive the echo if the beam completes a detection cycle before the sensor completes its transmission.

Ultrasonic Sensor Best Practices

Place ultrasonic sensors in front of materials that readily reflect ultrasonic waves, such as metal, plastic and glass, thus it gives an accurate reading at a greater distance from the object in front of it. Note: the sensor must move closer to the object to give an

accurate reading when the sensor is placed in front of an object that readily absorbs ultrasonic waves. The object's angle will infect the accuracy of the reading.
