Electronics

A radar system has a transmitter that emits radio waves that are reflected by the target and detected by a receiver, typically In the same location as the transmitter. Although the radio signal returned is usually very weak, radio signals can easily be amplified. This enables radar to detect objects at ranges where other emissions, such as sound or visible light, would be too weak to detect. Radar is used in many contexts, including meteorological detection of precipitation, measuring ocean surface waves, traffic control, police detection of speeding traffic, and by the military. ULTRASONIC ultrasonic sensors (also known as transceivers when they both send and receive) work on a principle similar to radar or sonar which evaluate attributes of a target by interpreting the echoes from radio or sound waves respectively. Ultrasonic sensors generate high frequency sound waves and evaluate the echo which is received back by the sensor. Sensors calculate the time interval between sending the signal and receiving the echo to determine the distance to an object.

This technology can be used for measuring: wind speed and direction (anemometer fullness of a tank and speed through air or water. For measuring speed or direction a device uses multiple detectors and calculates the speed from the relative distances to participate in the air or water. To measure the amount of liquid in a tank, the sensor measures the distance to the surface of the fluid. Further applications include: humidifiers, sonar, medical , burglar alarms and non- destructive testing.

Systems typically use a transducer which generates sound waves in the ultrasonic range, above 20, 000 hertz, by turning electrical energy into sound, then upon receiving the echo turn the sound waves into electrical

energy which can be measured and displayed. Proximity, or distance measuring applications. These devices typically transmit a short burst of ultrasonic sound toward a target, which reflects the sound back to the sensor. The system then measures the time for the echo to return to the sensor and computes the distance to the target using the speed of sound in the medium .

The wide variety of sensors currently on the market differ from one another in their mounting configurations, environmental sealing, and electronic features. Acoustically, they operate at different frequencies and have different radiation patterns. It is usually not difficult to select a sensor that best meets the environmental and mechanical requirements for a particular application, or to evaluate the electronic features available with different models. Still, many users may not be aware of the acoustic subtleties that can have major effects on ultrasonic sensor operation and he measurements being made with them.