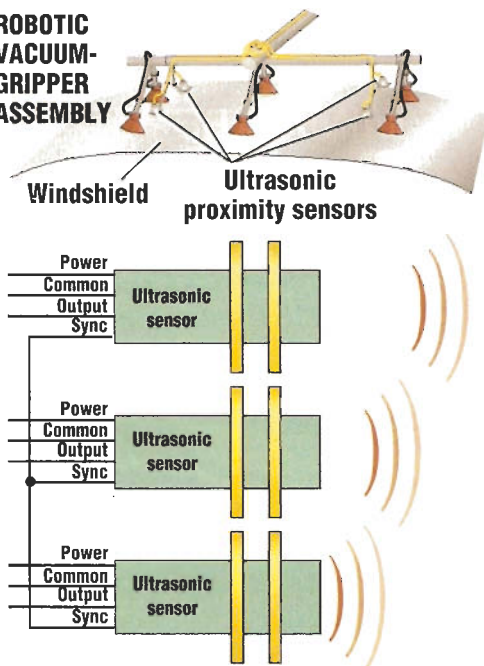# Eliminating ultrasonic cross talk

Proximity sensors that use ultrasonic sound waves calculate distance to an object using the time it takes to receive the echo from an ultrasonic burst. But, similar bursts from other sensors in close proximity may interfere with the echo timing. When that happens, the sensors suffer from a condition called cross talk. Interference from cross talk produces incorrect readings and erroneous outputs. One common technique used to eliminate cross talk is multiplexing.

Multiplexing automatically staggers the ultrasonic bursts from each sensor such that no two sensors simultaneously send and receive. Bursts sent at different times eliminate the possibility of any sensor mistaking their neighbor's ultrasonic burst or echo as their own.

Many ultrasonic sensors incorporate a multiplex feature that is easily activated by simply wiring the synchronize inputs on every sensor to a common connection. Typically, the synchronize inputs can handle up to five sensors connected in this manner. Once linked, even sensors mounted side by side are no longer bothered by cross talk.

As an example, multiple ultrasonic sensors detect the distance and position of a car windshield for pickup by a robotic arm. The sensors ensure that the windshield is grabbed evenly and placed correctly. Because windshield glass is not perfectly flat, the sound waves reflect at multiple angles creating potentially significant cross-talk problems that would result in broken windshields. Multiplexed sensors operate without the danger of cross talk to sense the angled glass perfectly every time. **MD**

Four multiplexed ultrasonic proximity sensors detect the windshield angle for proper alignment of a robotic vacuum-gripper assembly. Multiplexing the ultrasonic bursts from each sensor prevents interference between sensors. Wiring the sync inputs of each sensor together as shown activates the multiplex feature.

Edited by Robert Repas