

Ultrasonic Distance Sensing, now Easier and more Accurate.

MaxBotix Inc., now offers the next generation of MaxSonar ultrasonic rangefinder. The HRLV-MaxSonar-EZ sensor line features amazing 1mm resolution, target size compensation for improved accuracy, simultaneous automatic multi-sensor operation, superior rejection of outside noise sources, temperature compensation, 5-meter range, and adds TTL serial output to the RS232, pulse width, and analog voltage outputs that are already standard on other MaxSonar products.

The 1mm resolution is so stable, that when measuring typical objects at a distance of one meter, the readings do not change by more than 1mm. The best stability is available with the TTL and RS232 serial outputs with a resolution of 1 mm. The pulse width has an output resolution of 1mm, while the rail-to-rail analog voltage output has a resolution of 5mm. Each sensor is factory calibrated at 1 meter, 5V, 22.5°C to 0.1% accuracy.

Most low cost ultrasonic rangefinders will report the range to smaller size targets as farther than the actual distance. In addition, they will also report the range to larger size targets as closer than the actual distance. The HRLV-MaxSonar-EZ sensor line correctly compensates for target size differences. This means that, if an object is large enough to be detected, the sensor will report the same distance regardless of target size.

Other ultrasonic rangefinders will fail when used with other ultrasonic sensors nearby. By comparison, the HRLV-MaxSonar-EZ sensors can be used with other sensors in close proximity. Other nearby ultrasonic sensors will have little to no effect on the reported range of the HRLV-MaxSonar-EZ sensors. The noise filtering of the HRLV-MaxSonar-EZ is now even better than the previous MaxSonar products, and will work in the presence of many more noise sources and outside noise sources with higher amplitudes. Most range readings are accurately reported, but if the range readings are affected, the effect is typically less than 2cm.

The HRLV-MaxSonar-EZ sensor allows for accurate speed of sound temperature compensation. The speed of sound changes about 0.6 meters per second per degree centigrade. To compensate for this effect the sensor must monitor the changes to air temperature, while ignoring self heating. Alternatively, an external temperature sensor can be used ignoring self-heating. Self-heating is an issue with internal temperature sensors, where the temperature increase is typically 2 to 9 degrees centigrade. If ignored, this will cause a drift of the reported range of up to 3%. Alternatively, when using an external temperature sensor, it will not be affected by self-heating of the main sensor electronics. The HR-MaxTemp is an external temperature sensor that can be easily connected to an HRLV-MaxSonar sensor. Once connected, the HRLV-MaxSonar sensor will auto detect the presence of the external temperature sensor, and it will accurately compensate for temperature effects. The HR-MaxTemp is available as an option for \$4.95 (MSRP). Alternatively, the HRLV-MaxSonar-EZ sensor has an on board temperature compensation as a standard feature with typical accuracy better than 1%.

The HRLV-MaxSonar-EZ comes with the easy to use outputs and standard pin configuration of the previous MaxSonar products. In addition to the three standard sensor outputs of RS232 serial, Analog Voltage, and Pulse Width, there is now a user selectable TTL serial output.

Similar ultrasonic products may have frequent side lobe detection and can even falsely trigger on objects behind or to the sides of the sensor. The HRLV-MaxSonar-EZ offers a controlled beam that is designed to reject small objects (clutter) outside of the central beam area and provides a long range

sensitivity without detecting frivolous or unwanted targets. The HRLV-MaxSonar-EZ is 100% factory calibrated and tested before it is bagged and shipped. This ensures proper sensor operation and consistent performance from sensor to sensor.

The final assembly is a small unit less than 1 cubic inch, weighs 4.3 grams, and operates from 3V to 5V. The HRLV-MaxSonar-EZ is available at www.maxbotix.com for a price of \$34.95 (MSRP).

(Possible Sidebar)

About Ultrasonic Sensors

Ultrasonic sensors use high frequency sound pulses to detect and localize objects in a variety of environments. These sensors measure the time of flight for sound which has been reflected off nearby targets before returning to the sensor. Ultrasonic sensors offer a number of unique benefits over other methods for object detection including: non-contact detection, wide area of detection, and detection that is not affected by color or other visual characteristics of the target object.