Choose the Proper Ultrasonic Sensor for your Application

This guide will help you select the correct MaxSonar® sensor for your use. We believe that the MaxSonar® sensors are among the easiest to use ultrasonic rangefinders available.

Start Here

Indoor Use (or protected environments) → Easy to use ultrasonic rangefinder → Outdoor Use (or rugged environments) IP67 Rated

- Power-up calibration
- Very low cost
- Very small size

- Real-time auto calibration
- Low cost
- Very small size

- Real-time auto calibration
- Low cost
- Compact size

Compensates for user mounting

LV-MaxSonar-EZ

High accuracy pulse width output (and others)

XL-MaxSonar-EZ

Real-time analog envelope output (and others)

XL-MaxSonar-AE

High accuracy pulse width output (and others)

XL-MaxSonar-WR

Real-time analog envelope output (and others)

XL-MaxSonar-WRA

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## Product Line

<table>
<thead>
<tr>
<th>Features</th>
<th>LV-MaxSonar-EZ</th>
<th>XL-MaxSonar-EZ</th>
<th>XL-MaxSonar-AE</th>
<th>XL-MaxSonar-WR</th>
<th>XL-MaxSonar-WRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy to use interface</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Trigger or Free-run Operation</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Stable Range Data</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Serial Output</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Analog Voltage Range Output</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Pulse Width Output</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Real-time Analog Envelope Output of the Acoustic Waveform</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Outdoor Use (IP67 Rated)</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Recommended for Industrial Use</td>
<td>Some</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Recommended for Hobby Use</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Automatic Calibration to Compensate for Changes in Temperature, Voltage, Humidity and Noise.</td>
<td>On power up only</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Has noise canceling</td>
<td>Some</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Resolution</td>
<td>1 inch</td>
<td>1 cm</td>
<td>1 cm</td>
<td>1 cm</td>
<td>1 cm</td>
</tr>
<tr>
<td>Maximum Rate Readings are taken</td>
<td>20Hz</td>
<td>10Hz</td>
<td>10Hz</td>
<td>10Hz</td>
<td>10Hz</td>
</tr>
<tr>
<td>3.3V Operation, Average Current Draw</td>
<td>2mA</td>
<td>2.1mA</td>
<td>2.1mA</td>
<td>2.1mA</td>
<td>2.1mA</td>
</tr>
<tr>
<td>5V Operation, Average Current Draw</td>
<td>3mA</td>
<td>3.4mA</td>
<td>3.4mA</td>
<td>3.4mA</td>
<td>3.4mA</td>
</tr>
<tr>
<td>Acoustic Frequency</td>
<td>42kHz</td>
<td>42kHz</td>
<td>42kHz</td>
<td>42kHz</td>
<td>42kHz</td>
</tr>
<tr>
<td>Minimum Object Detection Distance</td>
<td>0&quot;</td>
<td>0 cm</td>
<td>0 cm</td>
<td>0 cm</td>
<td>0 cm</td>
</tr>
<tr>
<td>Minimum Reported Distance</td>
<td>6 inches</td>
<td>20 cm</td>
<td>20 cm</td>
<td>25 cm</td>
<td>25 cm</td>
</tr>
<tr>
<td>Maximum Range</td>
<td>254 inches (6.45 meters)</td>
<td>765 cm (25.1 feet)</td>
<td>765 cm (25.1 feet)</td>
<td>765 cm (25.1 feet)</td>
<td>765 cm (25.1 feet)</td>
</tr>
<tr>
<td>Semi-custom solution available to meet almost any need</td>
<td>Yes (3)</td>
<td>Yes (3)</td>
<td>Yes (3)</td>
<td>Yes (3)</td>
<td>Yes (3)</td>
</tr>
</tbody>
</table>

**Note 1:** Objects closer than the minimum-distance-reported*, range as this value*.  
**Note 2:** Available by request  
**Note 3:** Contact MaxBotix Inc., to have your sensor solution evaluated.

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**MaxBotix® Inc.**  
Date: August 26, 2009  
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Email: info@maxbotix.com Web: www.maxbotix.com
### LV-MaxSonar-EZ
**Some Features:**
- Easy to use interface
- 1 inch resolution
- Various calibrated beam widths
- Size is less than 1 cubic inch

**Part Numbers:**
- MB1000
- MB1010
- MB1020
- MB1030
- MB1040

**Possible Applications:**
- Robots
- Distance measuring
- UAV
- Some industrial uses
- Autonomous navigation

**Comments:**
- Power up calibration compensates for various mounting arrangements and environments.
- **NOTE:** requires user to cycle the power to recalibrate sensor if the voltage, temperature or humidity change during operation.

### XL-MaxSonar-EZ
**Some Features:**
- Easy to use interface
- 1 cm resolution
- Various calibrated beam widths
- Size is less than 1 cubic inch
- Real-time auto calibration
- Real-time noise rejection
- High acoustic power
- Real-time analog envelope

**Part Numbers:**
- MB1200
- MB1210
- MB1220
- MB1230
- MB1240

**Possible Applications:**
- Robots
- Distance measuring
- UAV
- Industrial uses
- Autonomous navigation
- Bin levels
- Changing environment conditions

**Comments:**
- Automatically compensates for noisy and changing environmental conditions (temperature, voltage or humidity).

### XL-MaxSonar-AE
**Some Features:**
- Easy to use interface
- 1 cm resolution
- Various calibrated beam widths
- Size is less than 1 cubic inch
- Real-time auto calibration
- Real-time noise rejection
- High acoustic power
- Real-time analog envelope

**Part Numbers:**
- MB1300
- MB1310
- MB1320
- MB1330
- MB1340

**Possible Applications:**
- Troubleshooting and sensor integration
- User signal processing
- Robots
- Distance measuring
- Industrial uses
- UAV
- Autonomous navigation
- Bin levels
- Changing environment conditions
- Tank levels
- Proximity zone detection

**Comments:**
- Same as the XL-MaxSonar-EZ but allows easy identification of troubleshooting issues using the real-time analog envelope.

### XL-MaxSonar-WR
**Some Features:**
- Easy to use interface
- IP67 rated
- 1 cm resolution
- Calibrated beam width
- Super compact size
- Real-time auto calibration
- Real-time noise rejection
- High acoustic power
- Real-time analog envelope output

**Part Numbers:**
- MB7060
- MB7066: longer range

**Possible Applications:**
- Robots
- Distance measuring
- UAV
- Industrial uses
- Autonomous navigation
- Bin levels
- Changing environment conditions
- Tank levels
- Proximity zone detection

**Comments:**
- Same as the XL-MaxSonar-WR but allows easy identification of troubleshooting issues using the real-time analog envelope.

### XL-MaxSonar-WRA
**Some Features:**
- Easy to use interface
- IP67 rated
- 1 cm resolution
- Calibrated beam width
- Super compact size
- Real-time auto calibration
- Real-time noise rejection
- High acoustic power
- Real-time analog envelope output

**Part Numbers:**
- MB7070
- MB7076: Longer range

**Possible Applications:**
- Troubleshooting and sensor integration
- User signal processing
- Robots
- Distance measuring
- Industrial uses
- UAV
- Autonomous navigation
- Bin levels
- Changing environment conditions
- Tank levels
- Proximity zone detection

**Comments:**
- Same as the XL-MaxSonar-WR but allows easy identification of troubleshooting issues using the real-time analog envelope.

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<table>
<thead>
<tr>
<th>LV-MaxSonar-EZ</th>
<th>XL-MaxSonar-EZ(4)</th>
<th>XL-MaxSonar-AE(4)</th>
<th>XL-MaxSonar-WR(5)</th>
<th>XL-MaxSonar-WRA(5)</th>
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<tbody>
<tr>
<td>MB1000</td>
<td>MB1200</td>
<td>MB1300</td>
<td>MB7060</td>
<td></td>
</tr>
<tr>
<td>Beam Width(6,9)</td>
<td>Beam Width(6,9)</td>
<td>Standard AE output(7)</td>
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<tr>
<td>MB1010</td>
<td>MB1210</td>
<td>MB1310</td>
<td>MB7070</td>
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<tr>
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</tr>
<tr>
<td>MB1020</td>
<td>MB1220</td>
<td>MB1320</td>
<td></td>
<td>More sensors in WR</td>
</tr>
<tr>
<td>Beam Width(6,9)</td>
<td>Beam Width(6,9)</td>
<td>Standard AE output(7)</td>
<td>product line coming</td>
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</tr>
<tr>
<td>MB1030</td>
<td>MB1230</td>
<td>MB1330</td>
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</tr>
<tr>
<td>Beam Width(6,9)</td>
<td>Beam Width(6,9)</td>
<td>Standard AE output(7)</td>
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<tr>
<td>MB1040</td>
<td>MB1240</td>
<td>MB1340</td>
<td></td>
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</tr>
<tr>
<td>Beam Width(6,9)</td>
<td>Beam Width(6,9)</td>
<td>Standard AE output(7)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Part Number Selection**

This section is designed to help users select the right part number for their application. Use the beam width and analog envelope output to compare the products and select the best sensor for your application.

**Note 4: Part Similarities** The MB12XX and MB13XX parts have the same operational characteristics except the MB12XX parts have pulse width output and the MB13XX have the real-time analog envelope of the wave form.

**Note 5: Part Similarities** The MB706X and MB707X part(s) have the same operational characteristics except the MB706X parts have pulse width output and the MB707X have the real-time analog envelope of the wave form.

**Note 6: Beam Width** Targets are from left to right 0.6cm dia., 2.5cm dia., & 8.9cm dia. Part to part beam widths scale is approximately equal. Black line is 5V, red dot is 3.3V.

**Note 7: Standard AE Output** Targets are from left to right 0.6cm dia. at 66cm, 2.5cm dia. at 111cm, & 8.9cm dia. at 189cm. Notice the change in amplitude of the signals to compare the various parts.

**Note 8: Clutter Present** Target is 30cm sq. at 2 meters. Conditions are 1.5 meter wide hallway with cluttered sides.

**Note 9: Custom beam patterns available.**

Please download the datasheet(s) from [www.maxbotix.com](http://www.maxbotix.com) for complete information.

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