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

Easy to use ultrasonic rangefinder

Indoor Use (or protected environments)

Outdoor Use (or rugged environments) IP67 Rated

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

LV-MaxSonar-EZ

Continued on page 2

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

XL-MaxSonar-EZ & XL-MaxSonar-AE Other XL Sensors available

Continued on page 2

- Real-time auto or power-up calibration
- Low cost
- Very small size

XL-MaxSonar-WR
XL-MaxSonar-WRA
LV-MaxSonar-WR
Other WR Sensors available

Continued on page 2

- Real-time auto or power-up calibration
- Low cost
- Smallest WR sensor available

XL-MaxSonar-WRC
XL-MaxSonar-WRCA
LV-MaxSonar-WRC
Other WRC Sensors available

Continued on page 2

Product Line

Features

	LV-MaxSonar-EZ	XL-MaxSonar-EZ XL-MaxSonar-AE	LV-MaxSonar-WR XL-MaxSonar-WR XL-MaxSonar-WRA	LV-MaxSonar-WRC XL-MaxSonar-WRC XL-MaxSonar-WRCA
				
Easy to use interface with Trigger or Free-run Operation and Stable Range Data	**Yes**	**Yes**	**Yes**	**Yes**
Range produced by Analog Voltage Output and Serial Output	**Yes**	**Yes**	**Yes**	**Yes**
Pulse Width Output	**Yes**	**Yes-(XL-EZ)** **No-(XL-AE)**	**Yes-(XL-WR, LV-WR)** **No-(XL-WRA)**	**Yes-(XL-WRC, LV-WRC)** **No-(XL-WRCA)**
Real-time Analog Envelope Output of the Acoustic Waveform	**No**	**No-(XL-EZ)** **Yes-(XL-AE)**	**No-(XL-WR, LV-WR)** **Yes-(XL-WRA)**	**No-(XL-WRC, LV-WRC)** **Yes-(XL-WRCA)**
IP67 Rated for Outdoor Use	**No** (can be mounted in a way that protects the sensor from exposure to the elements.)	**No** (can be mounted in a way that protects the sensor from exposure to the elements.)	**Yes**	**Yes**
Automatic Calibration to Compensate for Changes in Temperature, Voltage, Humidity and Noise.	**On power up only**	**Yes**	**Yes** **No- (LV-WR On power up only)**	**Yes** **No- (LV-WRC On power up only)**
Has noise canceling	**Some**	**Yes**	**Yes** **Some- (LV-WR)**	**Yes** **Some- (LV-WRC)**
Resolution	**1 inch**	**1 cm**	**1 cm- (XL-WR, XL-WRA)** **1 inch- (LV-WR)**	**1 cm- (XL-WRC, XL-WRCA)** **1 inch- (LV-WRC)**
Maximum Rate Readings are taken	**20Hz**	**10Hz**	**10Hz- (XL-WR, XL-WRA)** **20Hz- (LV-WR)**	**10Hz- (XL-WRC, XL-WRCA)** **20Hz- (LV-WRC)**
3.3V Operation, Average Current Draw	**1.6mA**	**2.1mA**	**2.1mA**	**2.1mA**
5V Operation, Average Current Draw	**1.9mA**	**3.4mA**	**3.4mA**	**3.4mA**
Acoustic Frequency	**42kHz**	**42kHz**	**42kHz**	**42kHz**
Minimum Object Detection Distance [2]	**0 inches**	**0 cm [1]**	**0 cm/inches**	**3 cm/inches**
Minimum Reported Distance [2]	**6 inches**	**20 cm**	**20 cm- (XL-WR, XL-WRA)** **12 inches- (LV-WR)**	**20 cm- (XL-WRC, XL-WRCA)** **12 inches- (LV-WRC)**
Maximum Range	**254 inches** **(6.45 meters)**	**765 cm[3]** **(25.1 feet)**	**765 cm[3]- (XL-WR, XL-WRA)** **254 inches- (LV-WR)**	**645 cm[5]- (XL-WRC, XL-WRCA)** **254 inches- (LV-WRC)**
Semi-custom solution available to meet almost any need	**Yes[4]**	**Yes[4]**	**Yes[4]**	**Yes[4]**

Note 1: Objects from 0-mm to 1-mm may not be detected.
Note 2: Objects closer than the minimum-distance-reported*, typically range as this value*.
Note 3: Sensors with a 1068cm maximum range are available.
Note 4: Contact MaxBotix Inc., to have your sensor solution evaluated.
Note 5: Sensors may intermittently detect large objects out 765cm. The maximum reported range is 765cm.

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LV-MaxSonar-EZ	XL-MaxSonar-EZ XL-MaxSonar-AE	LV-MaxSonar-WR XL-MaxSonar-WR XL-MaxSonar-WRA	LV-MaxSonar-WRC XL-MaxSonar-WRC XL-MaxSonar-WRCA
Some Features: • Easy to use interface • 1 inch resolution • Various calibrated beam widths • Size is less than 1 cubic inch	**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 **FOR THE ANALOG ENVELOPE (AE)** •Real-time analog envelope	**Some Features:** • Easy to use interface • IP67 rated • 1 cm (or 1 inch LV-WR) resolution • Calibrated beam width • Small size •High acoustic power **FOR THE WRA (ANALOG ENVELOPE)** •Real-time analog envelope	**Some Features:** •Easy to use interface •Smallest compact IP67 rated size available •1 cm (or 1 inch LV-WRC) resolution •Calibrated beam width •Real-time auto calibration •Real-time noise rejection •High acoustic power **FOR THE WRCA (ANALOG ENVELOPE)** •Real-time analog envelope
Possible Applications: • Educational and hobby robots • Distance measuring • UAV • Some industrial uses* • Autonomous navigation	**Possible Applications:** • Robots • Distance measuring • UAV • Industrial uses • Autonomous navigation • Bin levels • Changing environment conditions **FOR THE ANALOG ENVELOPE (AE)** •Troubleshooting and sensor integration • User signal processing •recommended for sensor integration process into systems	**Possible Applications:** • Robots • Distance measuring • Industrial uses •UAV • Autonomous navigation • Bin levels •Changing environment conditions • Tank levels • Proximity zone detection **FOR THE WRA (ANALOG ENVELOPE)** •Troubleshooting and sensor integration • User signal processing •recommended for sensor integration process into systems	**Possible Applications:** •Robots •Distance measuring •Industrial uses •UAV •Autonomous navigation •Bin levels •Changing environment conditions •Tank levels •Proximity zone detection **FOR THE WRCA (ANALOG ENVELOPE)** •Troubleshooting and sensor integration • User signal processing • recommended for sensor integration process into systems
Comments: • Power up calibration compensates for various mounting arrangements and environments. • * For best operation, must be clear of objects for 14 inches during power up calibration. • **NOTE:** Requires user to cycle the power to recalibrate sensor if the voltage, temperature or humidity change during operation.	**Comments:** • Automatically compensates for noisy and changing environmental conditions (temperature, voltage or humidity). • Auto calibration will compensate for and detect up close objects. **FOR THE ANALOG ENVELOPE (AE)** • Allows easy identification of troubleshooting issues using the real-time analog envelope.	**Comments:** • Auto calibration will compensate for and detect up close objects. •10 meter part detect larger targets to the long 10 meter range **FOR THE WRA (ANALOG ENVELOPE)** •allows easy identification of troubleshooting issues using the real-time analog	**Comments:** •Automatically compensates for noisy and changing environmental conditions (temperature, voltage or humidity). •Auto calibration will compensate for and detect up close objects. **FOR THE WRCA (ANALOG ENVELOPE)** •allows easy identification of troubleshooting issues using the real-time analog
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LV-MaxSonar-EZ
Part Numbers:

• **MB1000:** Recommended for applications that need the widest beam pattern and small object detection. Not recommended for industrial use.

• **MB1010:** The original LV-EZ sensor. Good compromise between small object detection and beam width. Not recommended for industrial use.

• **MB1020:** Good compromise between small object detection and narrow beam width. A little less sensitive than the MB1010. Not recommended for industrial use.

• **MB1030:** Used for narrow beam application that require a little more small object detection than the MB1040. Not recommended for industrial use.

• **MB1040:** Used for narrow beam applications that require the least amount of small object detection. This is also the best sensor when you want to only detect large objects and avoid clutter (small object in the detection pattern). Not recommended for industrial use.

(Please see additional information on page 5)

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XL-MaxSonar-EZ
XL-MaxSonar-AE
Part Numbers:

• **MB1200 / MB1300:** Most sensitive sensor for small and large object detection with the widest beam pattern. Recommended for industrial use.

• **MB1210 / MB1310:** Very sensitive for small and large object detection and wide beam width. Good for applications that require a lot of sensitivity but the MB1200/MB1300 has too much. Recommended for industrial use.

• **MB1220 / MB 1320:** Best compromise between small object sensitivity, beam width, and noise rejection. Performance and low cost makes this product the best starting place for most protected environments. Recommended for industrial use.

• **MB1230 / MB 1330:** Used for narrow beam application that require a little more sensitivity than the MB1240/MB1340. Recommended for industrial use.

• **MB1240 / MB 1340:** Used for narrow beam applications that require the least amount of sensitivity . This is also the best sensor when you want to only detect large objects and avoid clutter. Recommended for industrial use.

• **MB1260/ MB1360:** Similar to the MB1200 / MB1300 and it will detect medium to large sized targets to 10 meters. Recommended for industrial use.

• **MB1261/ MB1361:** Similar to the MB1210 / MB1310 and it will detect medium to large sized targets to 10 meters. Recommended for industrial use.

(Please see additional information on page 5)

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LV-MaxSonar-WR
XL-MaxSonar-WR
XL-MaxSonar-WRA
Part Numbers:

• **MB7001:** Not recommended for industrial use.

• **MB7060 / MB7070:** Real-time auto calibration and noise rejection. Strongly recommended for industrial use.

• **MB7062 / MB7072:** Uses advanced filtering that evaluates multiple readings to ensure that only valid range readings are reported. Recommended for applications where a target is always present like tank level measurement & monitoring. (Filtering must have a detectable target within the detection zone of 765cm to report a distance) Strongly recommended for most industrial uses.

• **MB7066 / MB7076:** Similar to the MB7060 / MB7070 and the sensor detects medium to large sized targets to 10 meters. Recommended for industrial use.

• **MB7092:** Has advanced filtering that detects the largest acoustic return in the presence of other detectable clutter. Not available for purchase online but please contact MaxBotix Inc. for more information.

• **F Option:** The fluorosilicone option allows use in applications that are not silicone tolerant such as diesel fuel. In addition, surface potting allows for superior dust protection.

(Please see additional information on page 5)

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LV-MaxSonar-WRC
XL-MaxSonar-WRC
XL-MaxSonar-WRCA
Part Numbers:

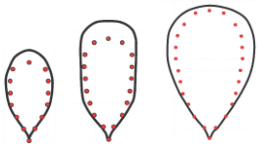
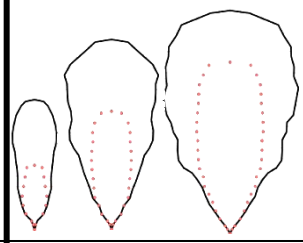
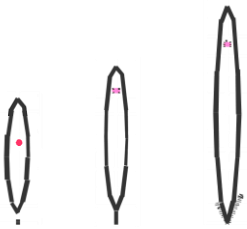
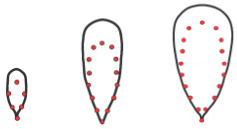
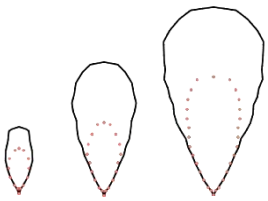
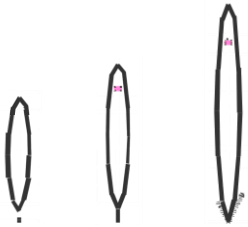
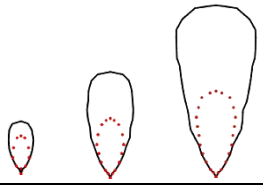
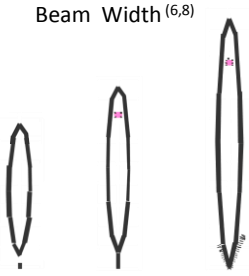
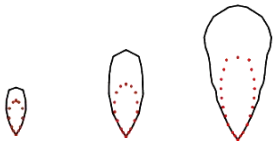
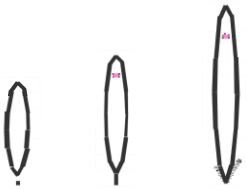
• **MB7067 / MB7077:** Similar to the MB7060 / MB7070. Has a compact housing and is slightly less sensitive because the horn is removed. Recommended for industrial use.

• **MB7081:** Similar to the MB7001. Has a compact housing and is slightly less sensitive because the horn is removed. Not recommended for industrial use.

• **F Option:** The fluorosilicone option allows use in applications that are not silicone tolerant like diesel fuel. In addition, surface potting allows for superior dust protection.

(Please see additional information on page 5)

Continued on page 5

LV-MaxSonar-EZ	XL-MaxSonar-EZ [4]	XL-MaxSonar-WR [5]
MB1000 Beam Width [6,8] 	MB1200 & MB1300[7] Beam Width [6,8] 	MB7060 & MB7070[7] Beam Width [6,8] 
MB1010 Beam Width [6,8] 	MB1210 & MB1310[7] Beam Width [6,8] 	MB7062 & MB7072[7] Beam Width [6,8] 
MB1020 Beam Width [6,8] 	MB1220 & MB1320[7] Beam Width [6,8] 	MB7066 & MB7076[7] Beam Width [6,8] 
MB1030 Beam Width [6,8] 	MB1230 & MB1330[7] Beam Width [6,8] 	
MB1040 Beam Width [6,8] 	MB1240 & MB1340[7] Beam Width [6,8] 	XL-MaxSonar-WRC [5] MB7067, MB7077[7] & MB7081 Beam Width [6,8] 

Please contact us if one of our standard sensor doesn't fit your application. We can evaluate your application and send you a quote for a semi-custom sensor for volumes as low as 10 units.

Part Number Selection

This section is designed to help users select the right part number for their application. Use the beam width patterns 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.

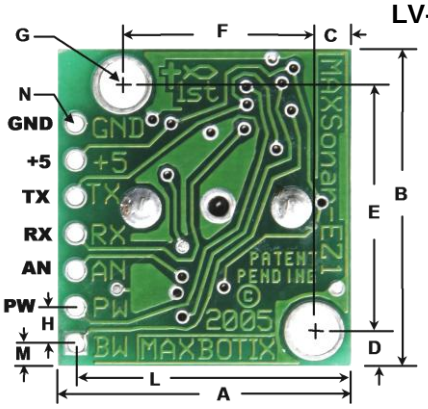
Note 6: Beam Width Targets are from left to right 0.6cm dia., 2.5cm dia., & 8.9cm dia. All part beam widths are scaled to each other. Black line is 5V, red dot is 3.3V.

Note 7: Standard AE Output Please see the datasheet s for a representation of the analog voltage envelope.

Note 8: Custom beam patterns available.

Please download the datasheet(s) from www.maxbotix.com for complete information

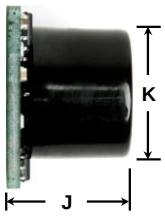
LV-MaxSonar-EZ Mechanical Dimensions



A	0.785"	19.9 mm
B	0.870"	22.1 mm
C	0.100"	2.54 mm
D	0.100"	2.54 mm
E	0.670"	17.0 mm
F	0.510"	12.6 mm
G	0.124" dia.	3.1 mm dia.

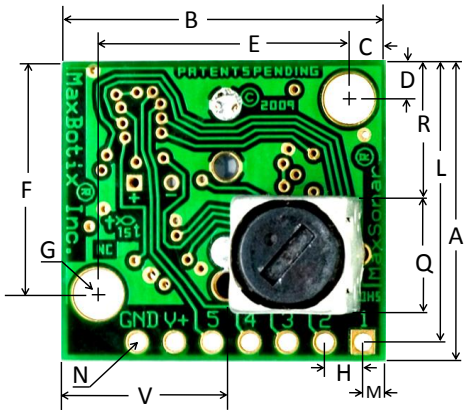
H	0.100"	2.54 mm
J	0.610"	15.5mm
K	0.645"	16.4mm
L	0.735"	18.7 mm
M	0.065"	1.7 mm
N	0.038" dia.	1.0 mm dia.
weight, 4.3 grams		

values are nominal

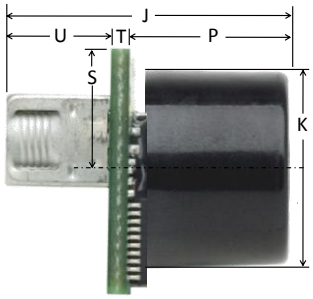


approximately actual size

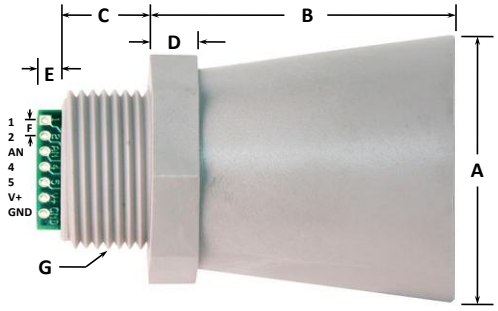
XL-MaxSonar-EZ & AE Mechanical Dimensions



A	0.785"	19.9mm	L	0.735"	18.7mm
B	0.870"	22.1mm	M	0.065"	1.7mm
C	0.100"	2.54mm	N	0.038" dia.	1.0mm dia.
D	0.100"	2.54mm	P	0.537"	13.64mm
E	0.670"	17.0mm	Q	0.304"	7.72mm
F	0.610"	15.5mm	R	0.351"	8.92mm
G	0.124" dia.	3.1mm dia.	S	0.413"	10.5mm
H	0.100"	2.54mm	T	0.063"	1.6mm
J	0.989"	25.11mm	U	0.368"	9.36mm
K	0.645"	16.4mm	V	0.492"	12.5mm
values are nominal			Weight, 5.9 grams		

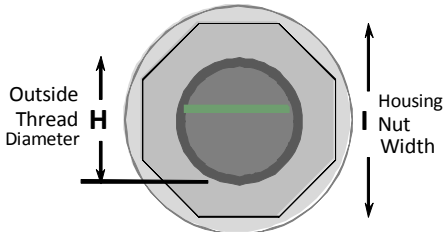


MaxSonar-WR & WRA Mechanical Dimensions

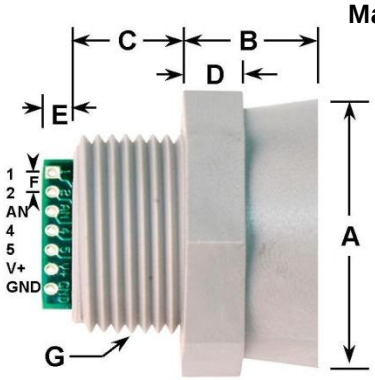


A	1.72" dia.	43.8 mm dia.
B	2.00"	50.7 mm
C	0.58"	14.4 mm
D	0.31"	7.9 mm
E	0.23"	5.8 mm
F	0.1"	2.54 mm
G	3/4"-14 National Pipe Thread Straight	
H	1.032" dia.	26.2 mm dia.
I	1.37"	34.8 mm
weight, 1.76 oz., 50 grams		

values are nominal



MaxSonar-WRC & WRCA Mechanical Dimensions



A	1.37" dia.	34.7 mm dia.
B	0.70"	17.9 mm
C	0.57"	14.4 mm
D	0.31"	7.9 mm
E	0.23"	5.8 mm
F	0.1"	2.54 mm
G	3/4"-14 National Pipe Thread Straight	
H	1.032" dia.	26.2 mm dia.
I	1.37"	34.8 mm
weight, 1.23 oz., 32 grams		

values are nominal