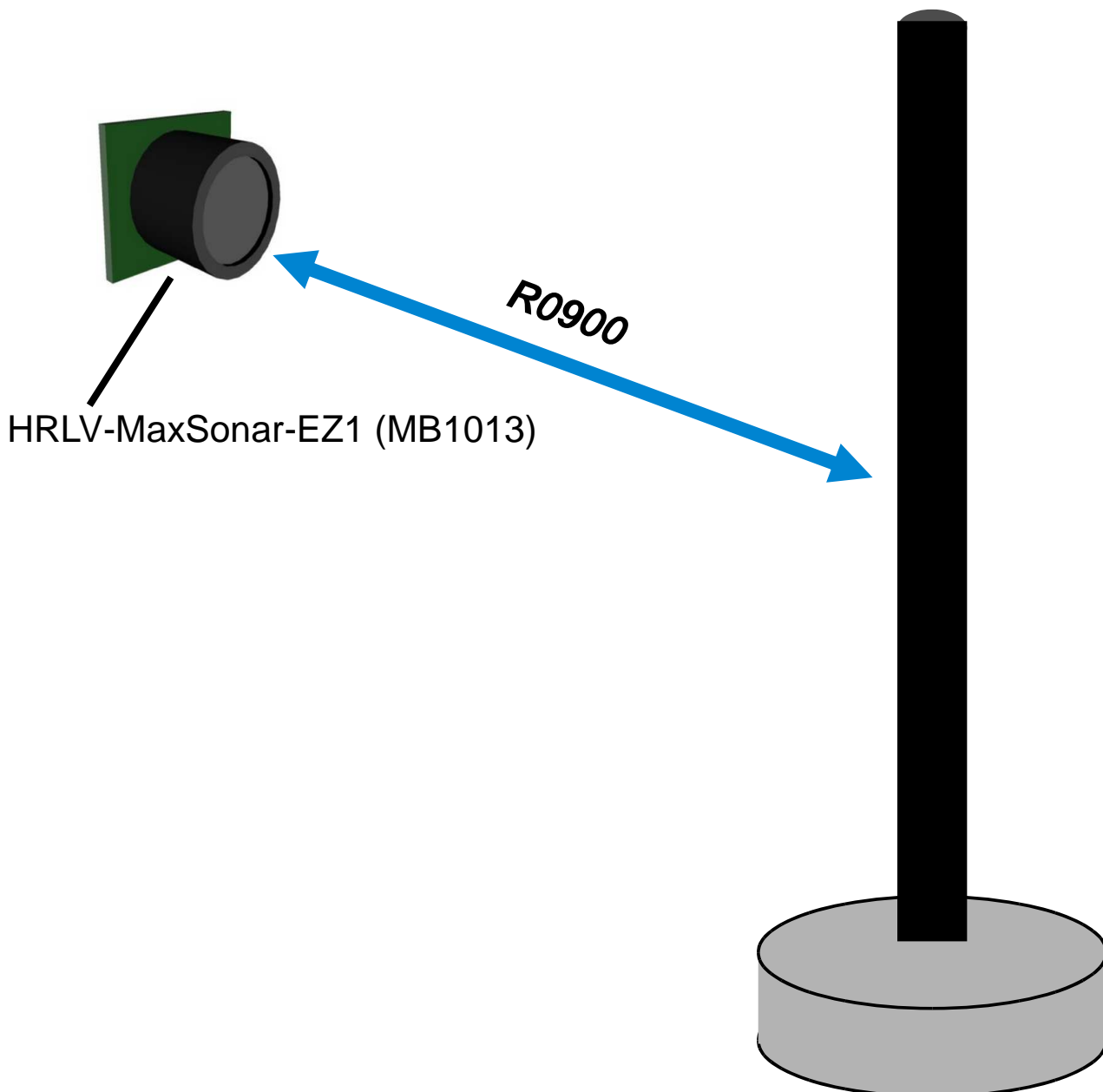# Direction and Distance to a Pole

MaxBotix Inc., MaxSonar ultrasonic sensors can be used in robotic applications such as finding direction and distance to objects such as poles. A single sensor can be used for distance to an object, but if direction is also needed, a second sensor is required.

It is recommended that the two sensors have matching sensitivity to prevent inconsistent data. With MaxBotix Sensors this can easily be achieved by purchasing two sensors of the same part number. All of our units are calibrated to have consistent detection profiles. For this solution MaxBotix Inc., recommends the MB1013 HRLV-MaxSonar-EZ1.

R0900

HRLV-MaxSonar-EZ1 (MB1013)

The recommended starting sensor for this application and similar applications is the MB1013 HRLV-MaxSonar-EZ1.

This sensor uses ultrasonic sound to calculate the distance to objects 10 times a second. This easy to use sensor can offer a perfect vision solution for finding directions to objects for robot placement.
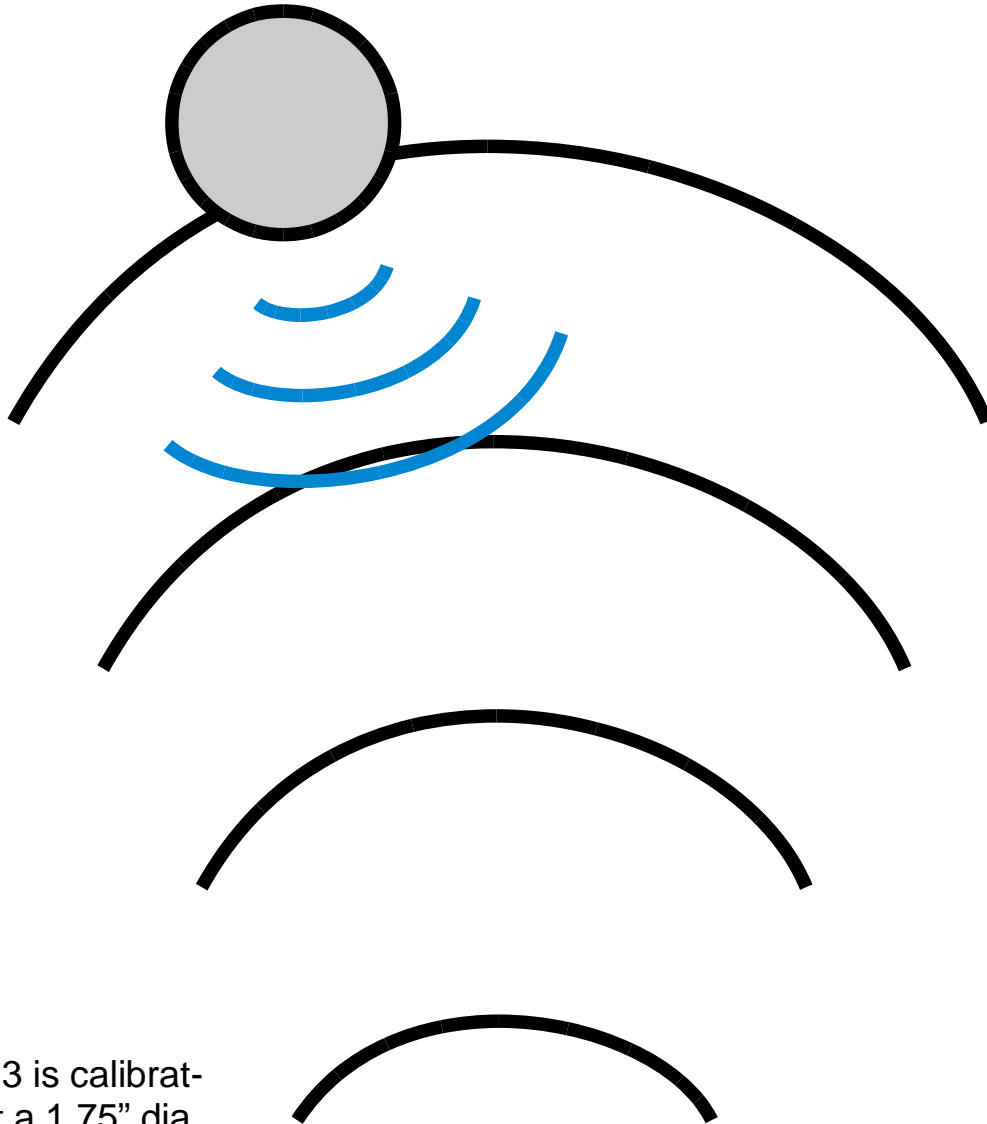
The MB1013 is calibrated to detect a 1.75" dia. pole out to 150 cm (~5 ft) within an angle of +/- 17 (deg) The sensor will also detect the pole to a greater distance over a smaller beam angle.

HRLV-MaxSonar-EZ1 (MB1013)

The following diagram shows what distances an HRLV-MaxSonar-EZ1 will detect a 1" pole with 2.7V, 3.3V,V or 5V power. (A 1.75" pole will have a similar detection zone.)
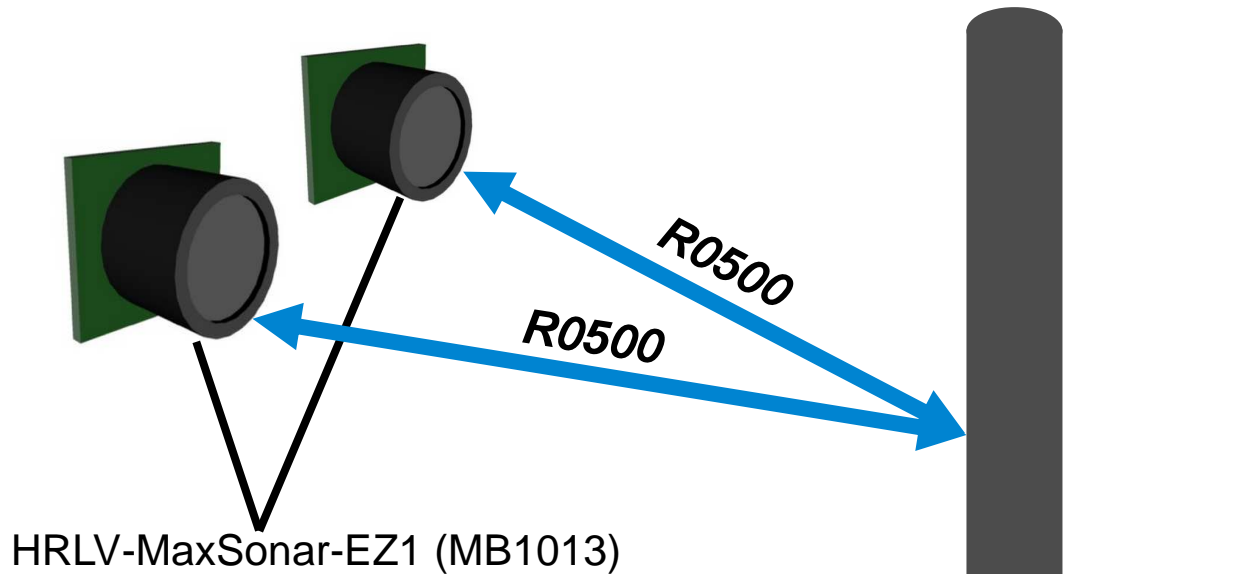
300 cm
~(10 ft)

150 cm
~(5 ft)

30 cm
~(1 ft)
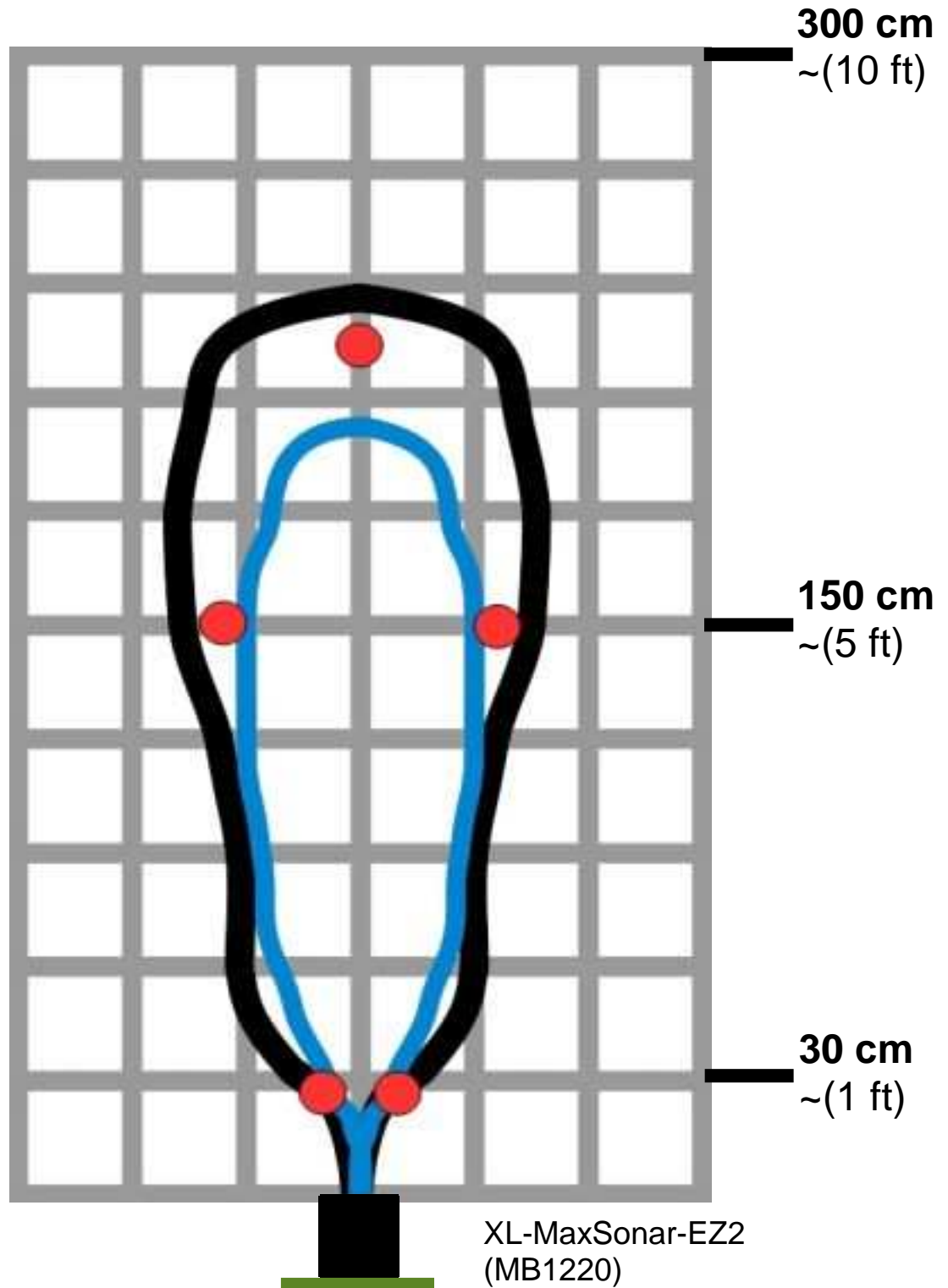
The black detection zone is for MB1013 sensors provided a clean 5V power supply. Detection for 2.7V and 3.3V is also shown.

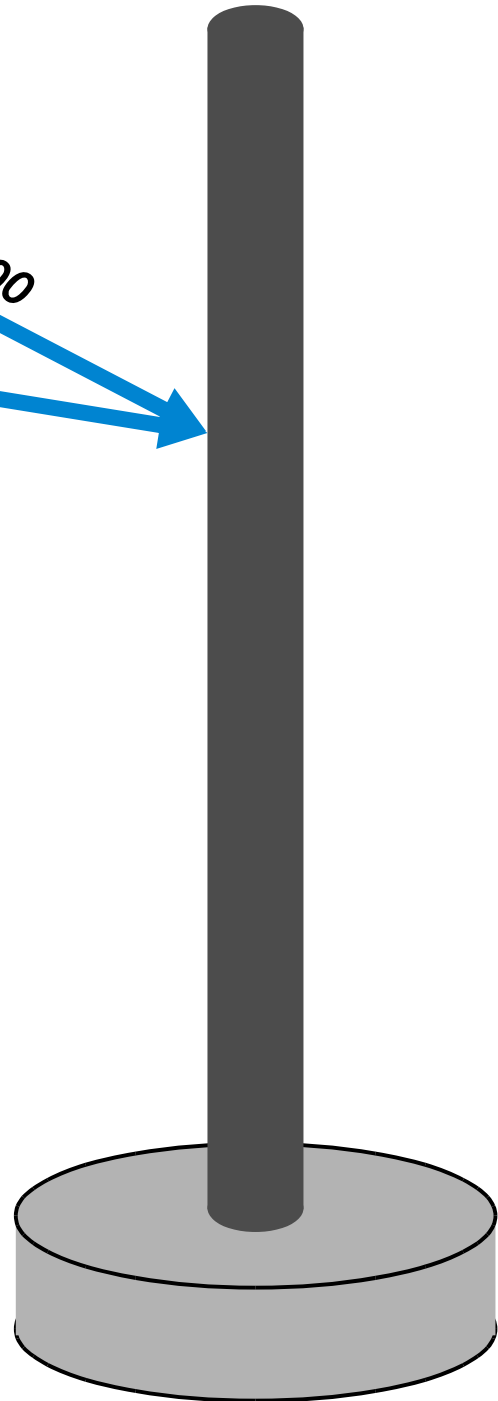|	
■	**5.0V**
●	**3.3V**
▬	**2.7V**

XL-MaxSonar-EZ2
(MB1220)

Using two of the MaxBotix Inc., XL-MaxSonar-EZ Ultrasonic Sensors to solve for distance, direction, and alignment.

R0500

R0500

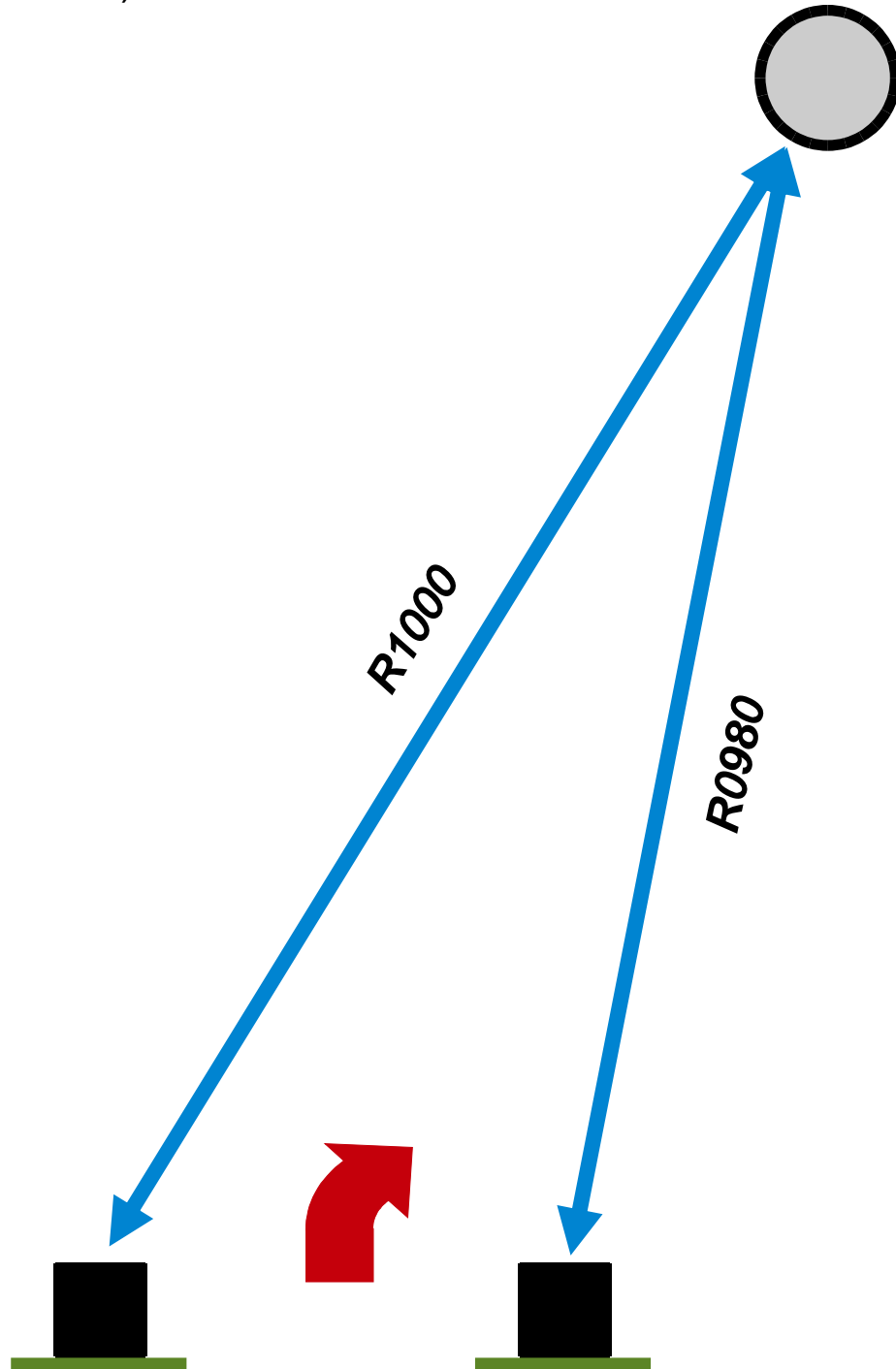HRLV-MaxSonar-EZ1 (MB1013)

Simple:

When the range values from the two sensors match, the sensors are pointed at the target.

MaxBotix® **Inc.**
Copyright 2005 - 2012 MaxBotix Incorporated
Patent 7,679,996

Here the left sensor reads a high output value than the right sensor. To correct course, the robot should move forward and turn right (or move backward and turn left) until the two values match.

R1000

R0980

The distance the sensors are placed apart depends on your robot. Separation of the sensors will affect pole detection and alignment accuracy. When using more than one sensor, to prevent interference, use the RX pin and read the range on one sensor, then read the range on the next sensor.
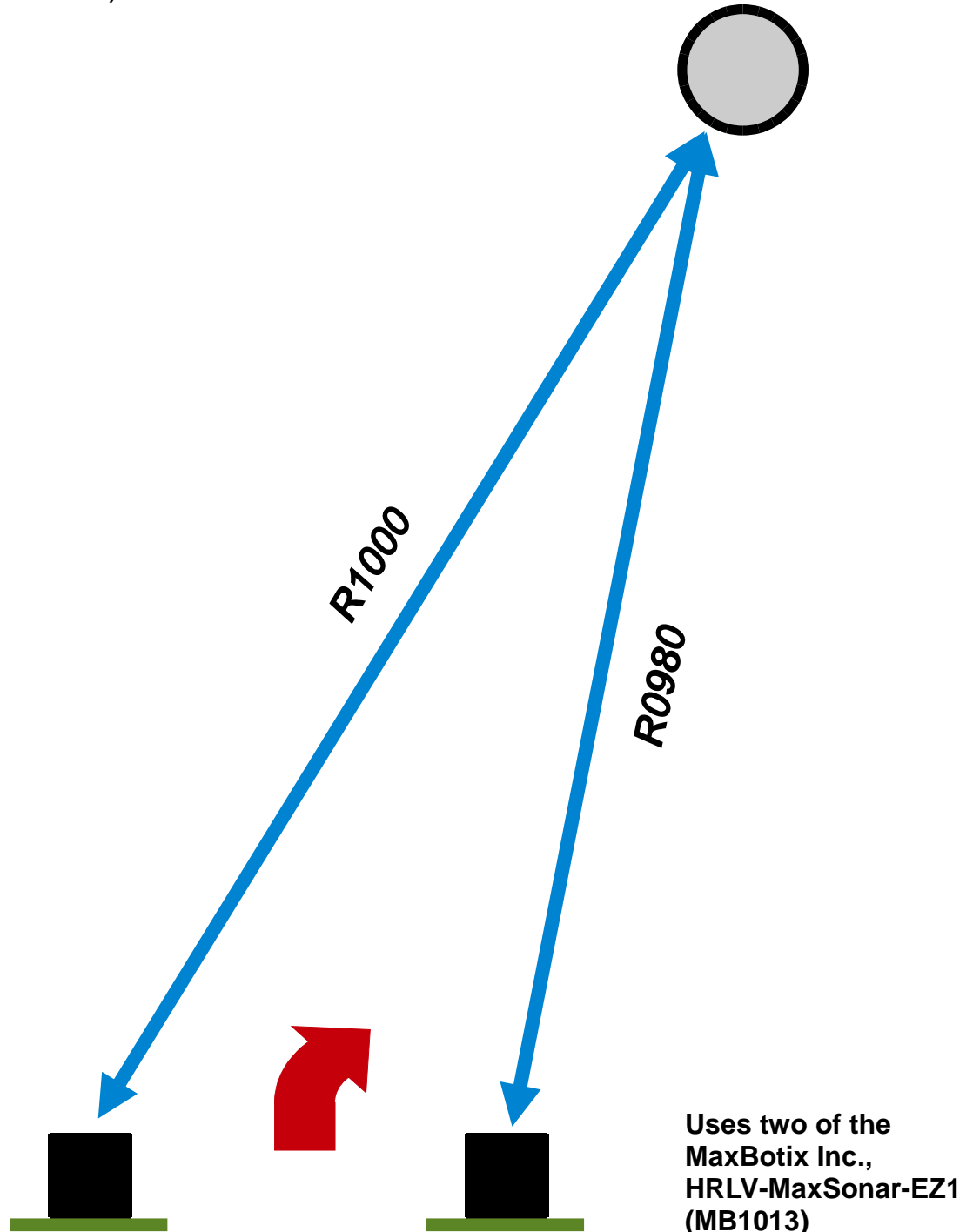
Here the left sensor reads a high output value than the right sensor. To correct course, the robot should move forward and turn right (or move backward and turn left) until the two values match.

R1000

R0980

Uses two of the MaxBotix Inc., HRLV-MaxSonar-EZ1 (MB1013)

The distance the sensors are placed apart depends on your robot. Separation of the sensors will affect pole detection and alignment accuracy. When using more than one sensor, to prevent interference, use the RX pin and read the range on one sensor, then read the range on the next sensor.

Direction and Distance to a Pole

Here the robot has moved until the two values match. This solution follows the KISS principle by turning until two values match. It doesn't get any simpler (and more reliable) than that!

Sensors can be continuously monitored as the robot drives forward to maintain the correct heading.

The distance the between the two sensors will decrease.

R1000   **R1000**

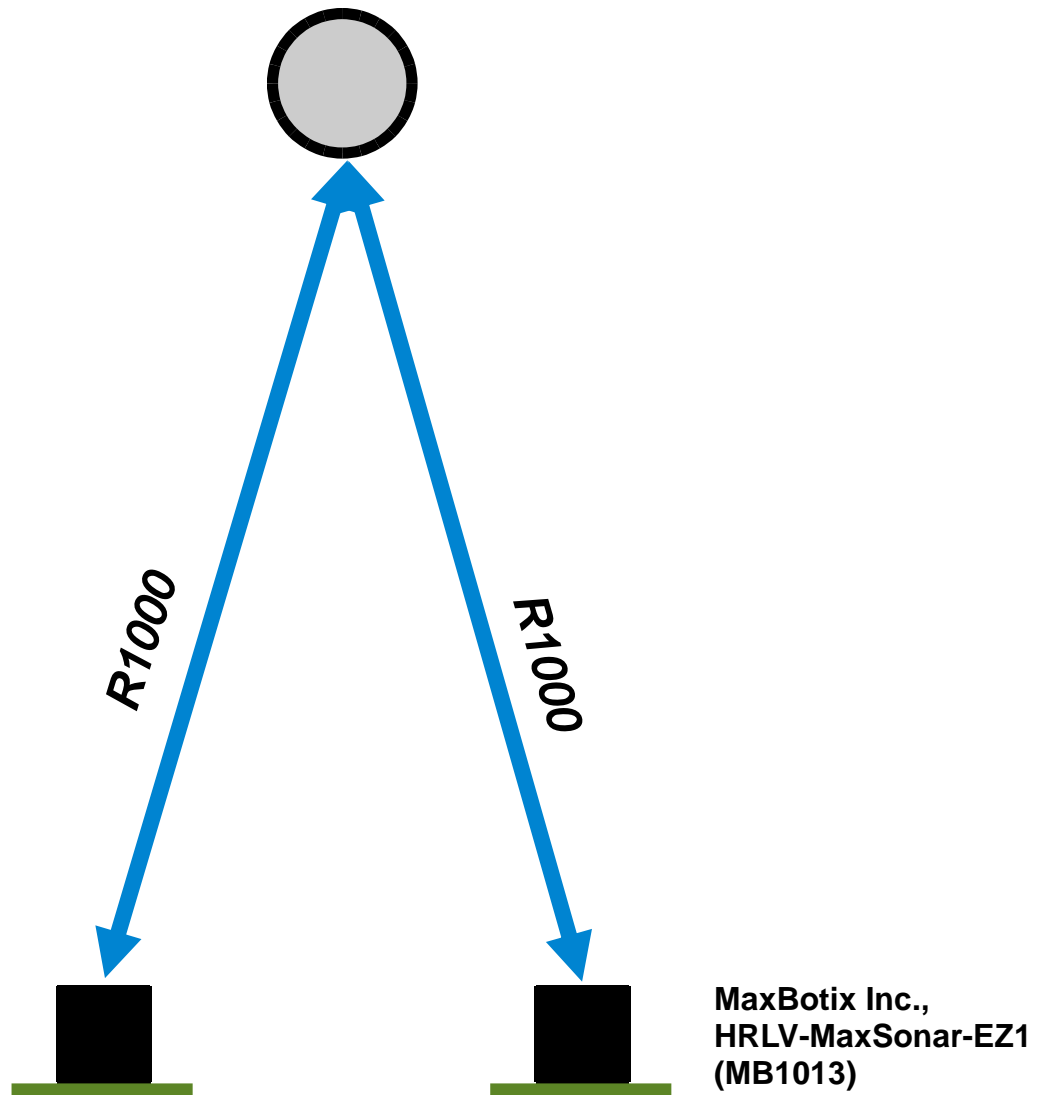**MaxBotix Inc.,
HRLV-MaxSonar-EZ1
(MB1013)**

The distance the sensors are placed apart depends on your robot. Separation of the sensors will affect pole detection and alignment accuracy. When using more than one sensor, to prevent interference, use the RX pin and read the range on one sensor, then read the range on the next sensor.

Direction and Distance to a Pole

Questions or comments...
please email us at info@maxbotix.com

To place an order by phone, please call during our preferred business hours of 9:00am - 3:00pm CST, Monday through Thursday, 9:00am - 12:00pm Friday. Orders placed after 3:00pm Thursday typically ship the following Monday.

MaxBotix® Inc.
7594 South Long Lake bay Road
Brainerd, MN 56401
Phone: 00-1-218-454-0766
Fax: 00-1-218-454-0768

The names MaxBotix, MaxSonar, ProxSonar, EZ0, EZ1, EZ2, EZ3, EZ4, EZL0, EZL1, AE0, AE1,AE2, AE3, AE4, AEL0, AEL1, WR1, WRA, WRL, WRLA, WRM, and WRMA are trademarks of MaxBotix Inc. All other trademarks mentioned herein are the property of their respective company.

Follow us on Facebook: http://www.facebook.com/pages/MaxBotix-Inc/125159384204938

MaxBotix® **Inc.**

Page 8

Copyright 2005 - 2012 MaxBotix Incorporated
SUNSTAR   http://www.sensor-ic.com/ TEL: 0755-83376489 FAX 0755-83376182 E-MAIL: szss20@163.con

Web: www.maxbotix.com

Patent 7,679,996

PD10426b