Ultrasonic Range Sensor Kit
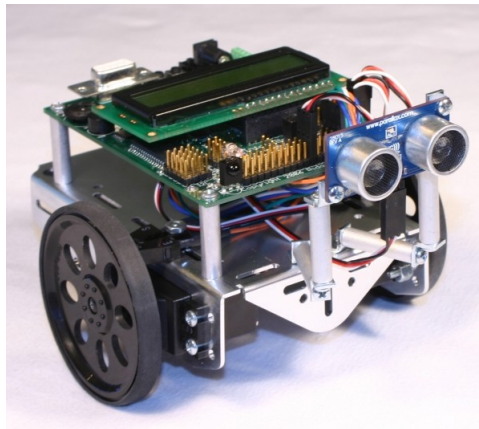
## Assembly Guide

Revision 2.0

Introduction

This guide provides step-by-step assembly instructions for the IntelliBrain™-Bot ultrasonic range sensor kit.

Ultrasonic Range Sensor Kit Parts

The ultrasonic range sensor kit includes the parts shown and listed below.

Parts List:

- 1 Parallax Ping))) ultrasonic sensor
- 1 cable
- 4 round standoffs
- 1 hex standoff
- 6 right angle brackets
- 2 nylon washers
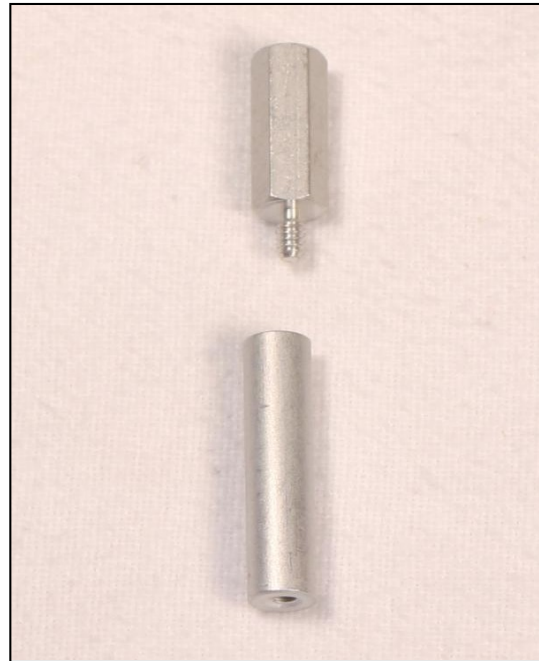- 12 1/4" round head screws
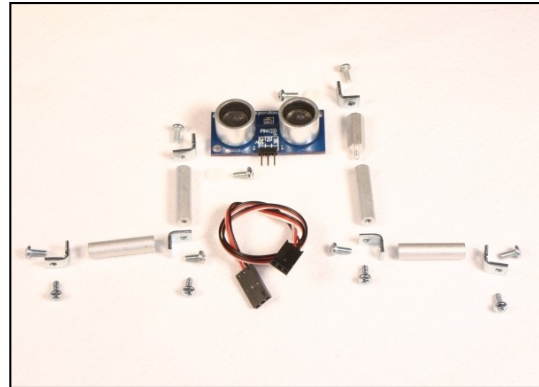
Assembly Tools

You will need a #1 tip Phillips screwdriver to assemble your sensor and attach it to your IntelliBrain-Bot.

Attaching Hex Standoff to Round Standoff

Parts:

- 1 round standoff
- 1 hex standoff

Instructions:

1. Screw the male end of the hex standoff into the round standoff.
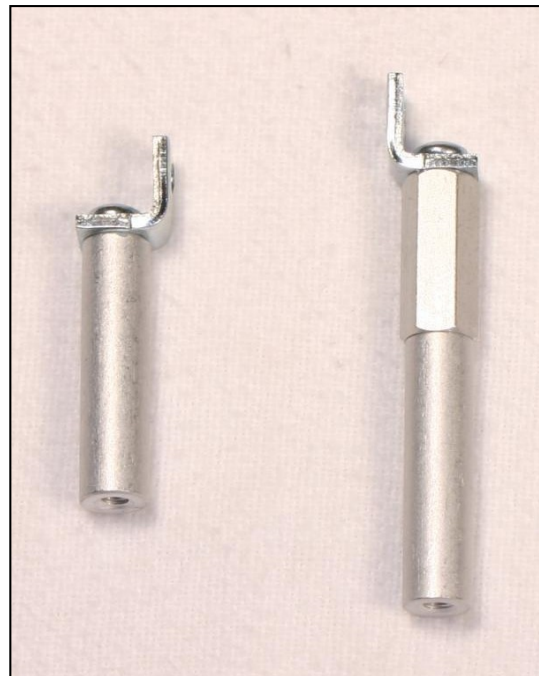
Attaching Brackets to Standoffs

Parts:

- 2 standoffs
- 2 right angle brackets
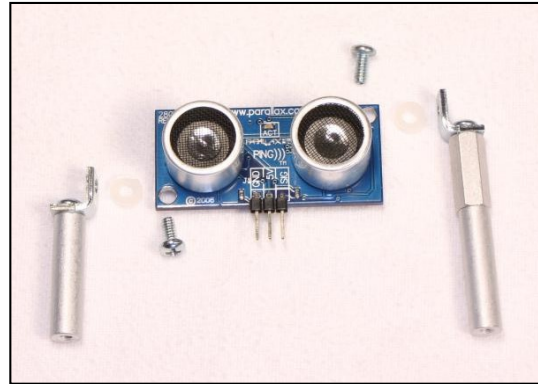- 2 screws

Instructions:

1. Insert a screw through the <u>unthreaded</u> hole in a bracket.
2. Thread the screw into the end of the hex standoff and tighten it.
3. Repeat the previous steps with the second set of parts, this time attaching the bracket to the round standoff.

Attaching the Sensor to the Standoffs

Parts:

- 1 Ping))) sensor
- 2 standoff assemblies
- 2 nylon washers
- 2 screws

Instructions:

1. With the writing on the sensor facing you, insert a screw through the upper right mounting hole.
2. Place a nylon washer on the screw on the back side of the sensor.
3. Screw the screw into the bracket on the hex standoff.
4. With the standoff facing straight down, loosely tighten the screw.
5. Repeat the previous steps, attaching the short standoff to the mounting hole on the lower left.
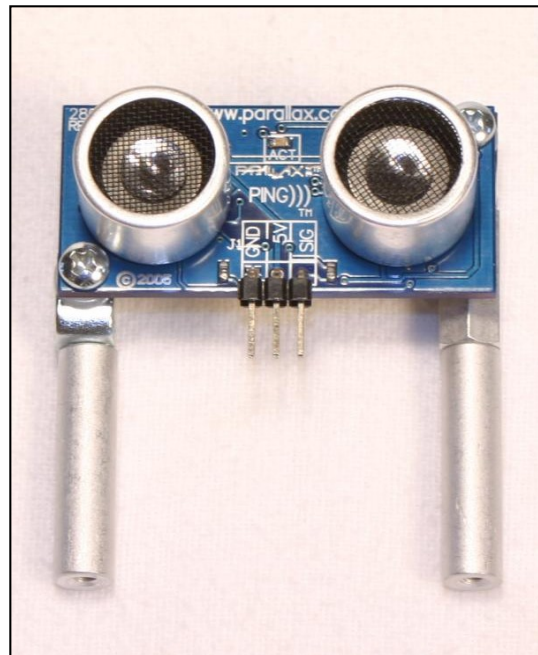
Assembling Base Brackets

Parts:

- 2 screws
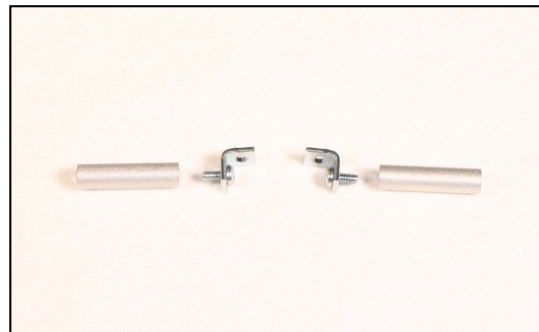- 2 right angle brackets

Instructions:

1. Screw a screw into the <u>threaded</u> hole in a bracket until it is tight.
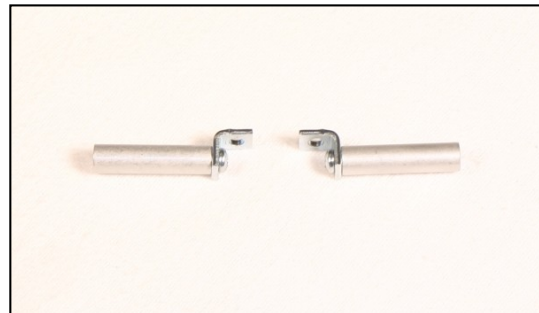2. Repeat with the second bracket.

Parts:

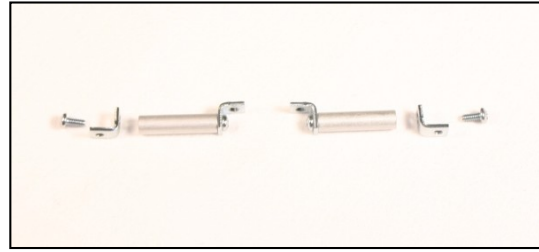- 2 bracket assemblies
- 2 standoffs

Instructions:

1. Screw a standoff on to the screw extending from the bracket until it is tight.
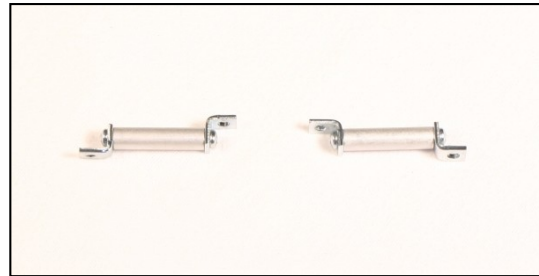2. Repeat with the second bracket and standoff pair.

Parts:

- 2 bracket and standoff assemblies
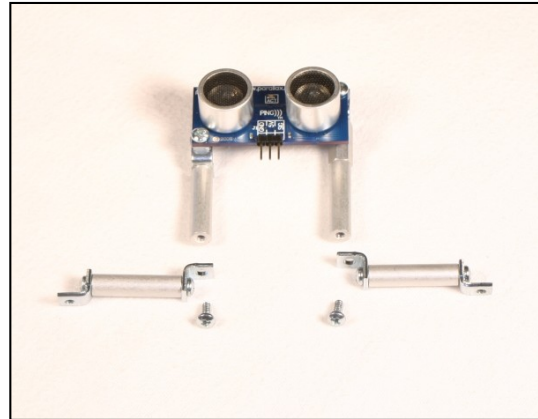- 2 brackets
- 2 screws

Instructions:

1. Insert a screw through the <u>unthreaded</u> hole in a bracket.
2. Thread the screw into the end of a standoff.
3. Loosely tighten the screw.
4. Orient the bracket such that its base is <u>parallel</u> with the base of the bracket at the other end of the standoff, as shown.
5. Tighten the screw, maintaining the orientation of the brackets.
6. Repeat with the second set of parts.
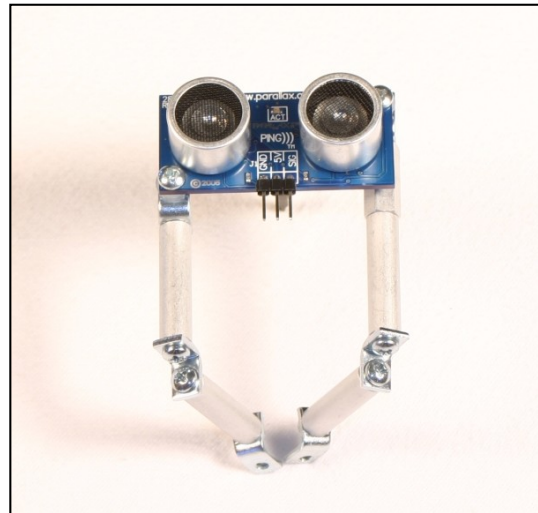
Attaching Base Brackets to Sensor Assembly

Parts:

- 1 sensor assembly
- 2 base bracket assemblies
- 2 screws

Instructions:

1. Insert a screw through the <u>unthreaded</u> hole in base bracket assembly.
2. Thread the screw into the end of a standoff.
3. Loosely tighten the screw.
4. Orient the base bracket as shown.
5. Tighten the screw, maintaining the orientation of the bracket.
6. Repeat with the second base bracket.

Attaching the Sensor to Your IntelliBrain-Bot

Parts:

- 1 sensor assembly
- 2 screws
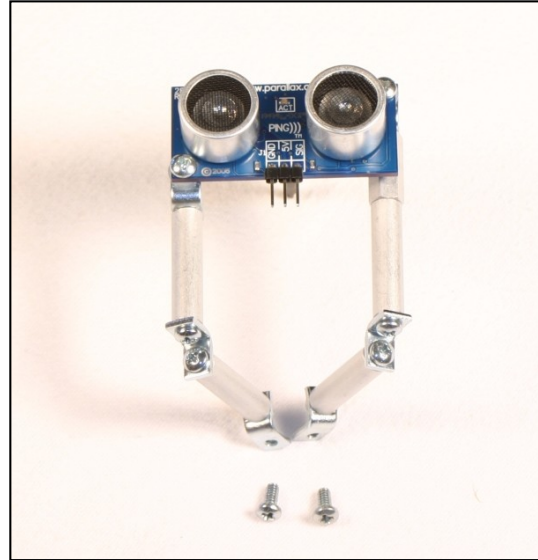
Instructions:

1. Insert a screw from underneath through the middle slot at the front edge of your robot.
2. Thread the screw into the threaded hole in a bracket on the sensor assembly.
3. Loosely tighten the screw.
4. Repeat the previous steps, this time attaching the other bracket to the middle slot.
5. Spread the two brackets such that they attach to opposite ends of the middle slot.
6. Make adjustments to other bracket positions such that the sensor faces directly forward and is centered.
7. Fully tighten all screws.
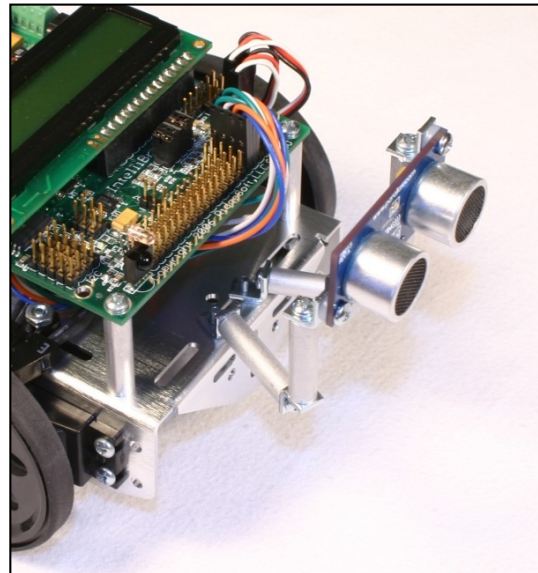
Attaching the Sensor Cable

Parts:

- 1 cable
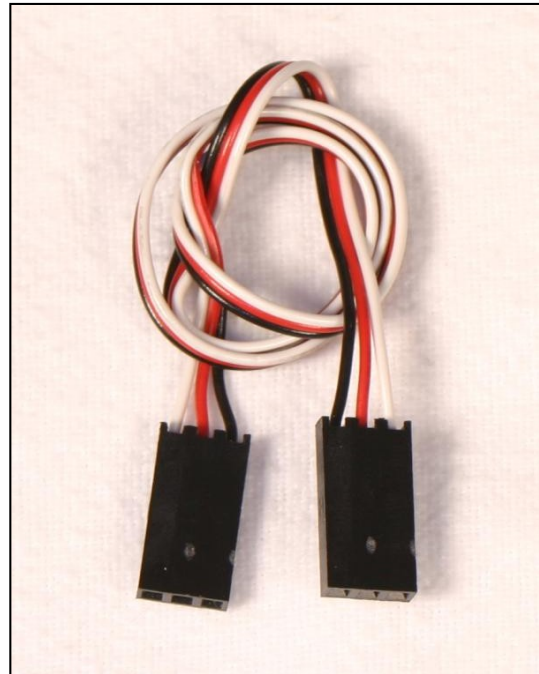
Instructions:

1. Attach the cable to the sensor such that the <u>black</u> lead is attached to the pin marked "<u>GND</u>".

2. Connect the other end of the cable to the port marked "<u>IO3</u>", positioning the <u>black</u> lead such that it is on the <u>pin nearest the front edge</u> of the IntelliBrain 2 controller board.

   Note: The Ping))) sensor may be attached to port IO3, IO4, IO5 or IO6; however, the example program used below assumes it is attached to port IO3.
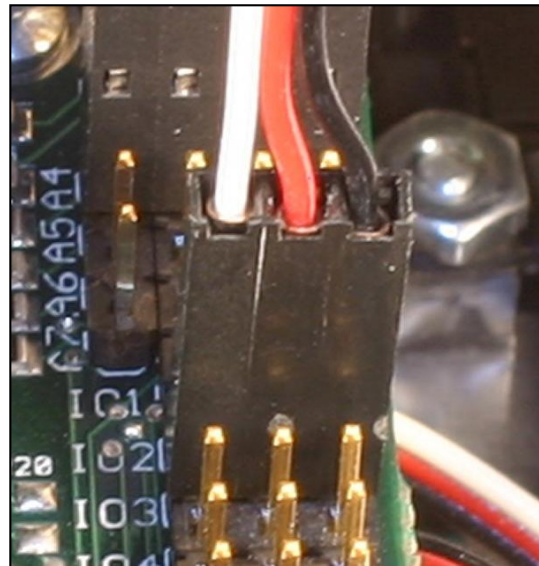
Testing

1. Using RoboJDE, load the "IntelliBrainBotSonarFollower" example program from the folder:
   "\Program Files\RoboJDE\Examples\IntelliBrainBot\SonarFollowing".
2. Press the START button.
3. Verify that as move your hand in front of the sensor the value displayed on the LCD screen corresponds to the number of inches your hand is from the sensor.
4. Position your robot on the floor.
5. Press the START button a second time.
6. Place you hand approximately six inches in front of the robot. As you move your hand away from the robot it will move forward. As you move your hand toward the robot it will back away from your hand.