Distance Sensor Kit

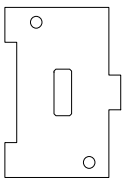
Kit Contents

Item	Qty	Vendor
PCB (printed circuit board)	1	
Sharp GP2Y0D340K	1	Mark III Robot Store
1 Ohm resistor	1	Digi-Key
1 uF capacitor	1	Jameco
4-40 x 5/8” machine screw	2	McMaster-Carr
4-40 lock nut	2	McMaster-Carr
3/16” nylon spacer	2	McMaster-Carr
3-conductor ribbon cable, 8"	1	Jameco

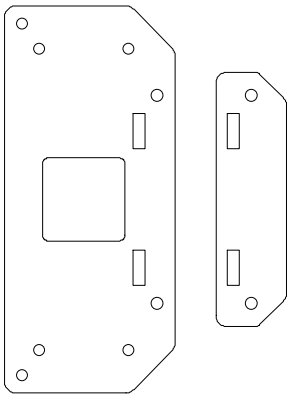
Sensor Board Assembly Instructions

- Remove the Sharp GP2Y0D340K sensor from the PCB.
- Insert the resistor (orientation does not matter) and solder it in place. Trim the leads.
- Insert the capacitor with the stripe and ‘+’ toward the interior of the board, and the shorter lead toward the edge of the board, then solder it in place. Trim the leads.
- Insert the sensor -- place the row of five leads in the holes and then gently rock it back to snap the larger tabs into place -- then solder all seven connections.
- Separate the wires of the ribbon cable for about 1/2” to 1”. Strip insulation off about 1/8” from each wire. Insert the wires *from the back* of the board to the +5, GND, and V0 connections, then solder the connections.
- On the other end of the cable, separate the wires and strip insulation off about 1/4” from each wire. Tin these wires so that they can be inserted into header sockets or a breadboard.

Installing onto the SRS Robot



The sensor board is designed to be mounted to the “sonar plate,” pictured on the left, which is one of the leftover chassis parts from the Level 1 kit. It mounts with the single tab into a slot near the front of the top plate and the double-tab side held in place by one of the following “cap” pieces.



Either of the pieces pictured on the right can be used as a “cap” for the sonar plate. They are mounted above the top plate via the 4-40 x 1” standoffs and 4-40 x 1/4” screws from the Level 1 kit (two sets for the small piece, all four sets for the large piece).

If you have added the Level 2 kit to your robot, you may already be using the larger plate to hold the LCD. Alternatively, if the LCD is mounted directly to the top plate, you can use the smaller plate as the “cap” and the sensor board assembly will sit in front of the LCD.

To mount the sensor board to the chassis plate:

- Hold the chassis plate so that the single tab is at the bottom, and the round mounting holes are in the lower left and upper right corners. (Flip the piece over if the holes are in the upper left and lower right corners.)
- Hold the sensor board so that the text is right side up. The mounting holes should align with the holes in the chassis plate.

- Thread the ribbon cable through the hole in the chassis plate (from the front).
- Insert a 4-40 x 5/8" machine screw through the sensor board (from the front).
- Put a nylon spacer on the screw.
- Insert the screw into the chassis plate.
- Place a lock nut on the screw, but don't tighten it all the way, yet.
- Repeat with the other screw, spacer, and nut.
- Tighten both screw/nut assemblies with a screwdriver and small wrench.

To install the plate onto the robot:

- Select the desired "cap" plate.
- Align it over the top plate of the chassis to identify the corresponding holes for mounting the standoffs.
- Install the 4-40 x 1" standoffs (from the Level 1 kit) in the top plate using the 4-40 x 1/4" screws (from the Level 1 kit). You will install two standoffs for the smaller "cap" plate, or all four standoffs for the larger plate.
- Place the tab of the sensor board's plate into the top plate of the chassis. Hold the sensor board plate vertical and place the "cap" plate over it. Fasten the "cap" plate to the standoffs using 4-40 x 1/4" screws.

Using the Sensor Board

If you are using a Level 2 kit, connect the +5 and GND wires to appropriate locations on the breadboard, and plug the V0 wire into one of the socket headers on the ARC board, selecting an unused pin. (See the Pin Mapping section in the Level 2 manual for guidance.)

If you are using a Level 1 kit, this sensor will replace the left bumper. Disconnect the bumper wires from the 1x3 socket labeled "left." Find the '1' by that socket, indicating Pin 1, and make the following connections:

- Pin 1: V0
- Pin 2: GND
- Pin 3: +5V

To use this new input in a program, set up a *digital* input on the appropriate pin -- this will be A0 for the Level 1 connections above. When the signal is low, that indicates that an object is within the sensor's range.