Getting your robot to reliably detect the white band around the perimeter of the sumo platform is essential. The down-facing sensors included in the Mobile Robot Sensor Expansion Pack can be a little tricky to troubleshoot. This document is intended to help those competitors having difficulty with their down-facing sensors.

Adjusting the Height

The down sensors have a very limited sight range. If the sensors are set too high, they will fail to "see" light-colored surfaces. If the sensors are set too low, they may be too sensitive. The ideal height is usually about 6 to 7 millimeters (about 1/4 of an inch).

1. Place your robot on a flat surface.

2. Gently loosen the connecting screw, and adjust the height of the sensors to be about 6 to 7 millimeters (about 1/4 inch). NOTE: The extra standoffs provided with some kits can be used to gauge the appropriate height, as shown in Figure 1.

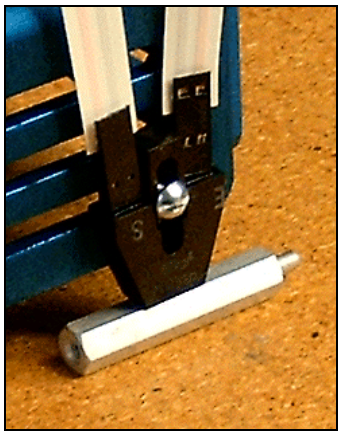

Figure 1. Setting sensor height.

Testing the Sensor

If your left down-facing sensor is working properly, congratulations! If not, try the following steps:

1. Make sure the flat-flex cables are securely fastened and properly oriented, with the red strands on the outside and the dark strands on the inside at both the sensor end and the board end.

2. Place your robot on the practice platform, with the down-facing sensor positioned over the white band.

3. With your robot's wheels suspended off the platform, turn your robot on, and gently raise and lower the front of the robot, as shown in Figure 2. Note the precise height at which the wheels reverse direction, and adjust the height of your sensors accordingly.

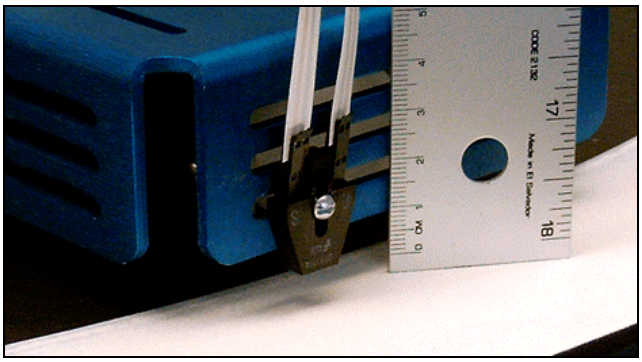

Figure 2. Troubleshooting the sensors.

Using Different Resistors

If your sensors are having trouble "seeing" the white band, you may need to change the resistor connected to the emitter side of the device. Try substituting a 100-Ohm resistor for the 220-Ohm resistor, as shown in Figure 3. This will make the emitter "brighter" and make it easier for the sensor to detect the reflected infrared light.

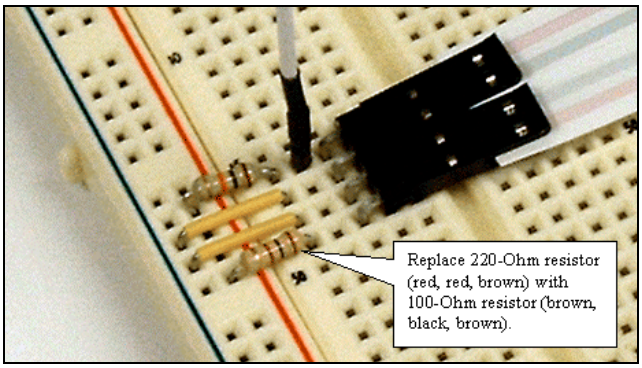

Figure 3. Exchanging resistors.