Marist School
Introduction to Robotics and Engineering
Using the Potentiometer Sensor

Description:

The potentiometer is a variable resistance sensor that changes the amount of charge flowing into a sensor port based on the position of the sensor.

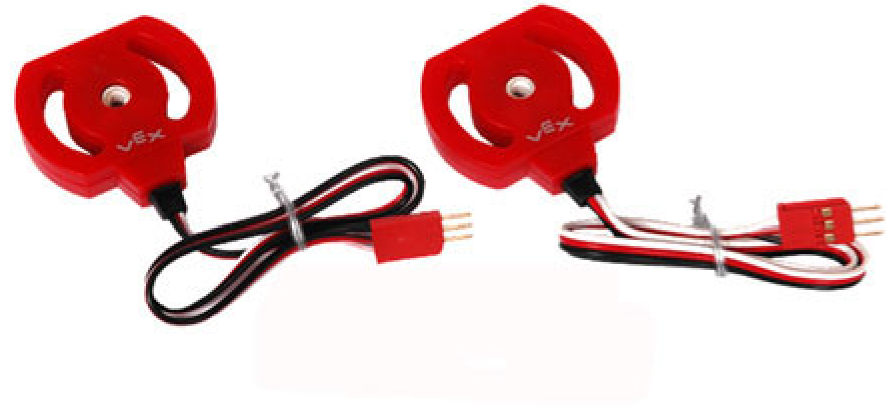
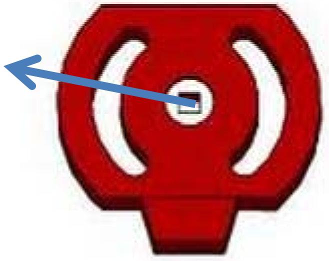
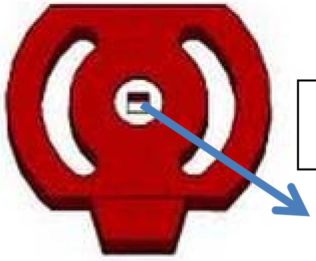


Figure 1. Potentiometer kit components

An axel shaft is inserted in the middle and then the potentiometer returns a value ranging from 0 to 4095 (12 bits of depth) depending on the rotation. Note that the rotation does not move through a full 360 degree range. For Vex potentiometers it rotates through about 250 degrees.

Returns a value of 0





Returns a value of 4095

The potentiometer is an analog sensor. So it needs to plug into an analog port.

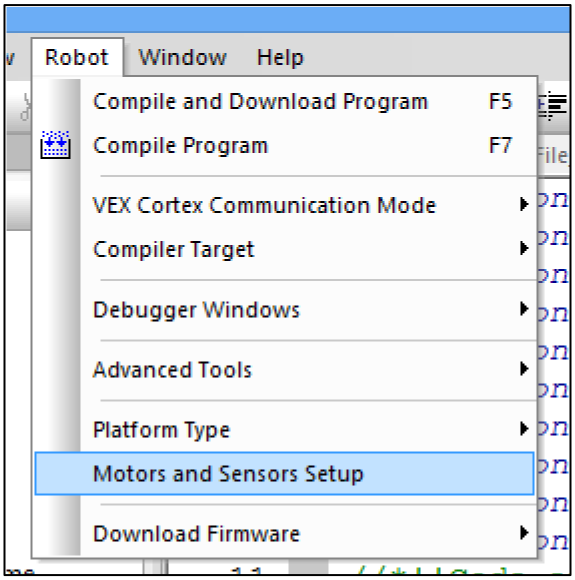
Example: (Double check the port numbers on your robot!)

1. Plug the potentiometer into Analog port 2.

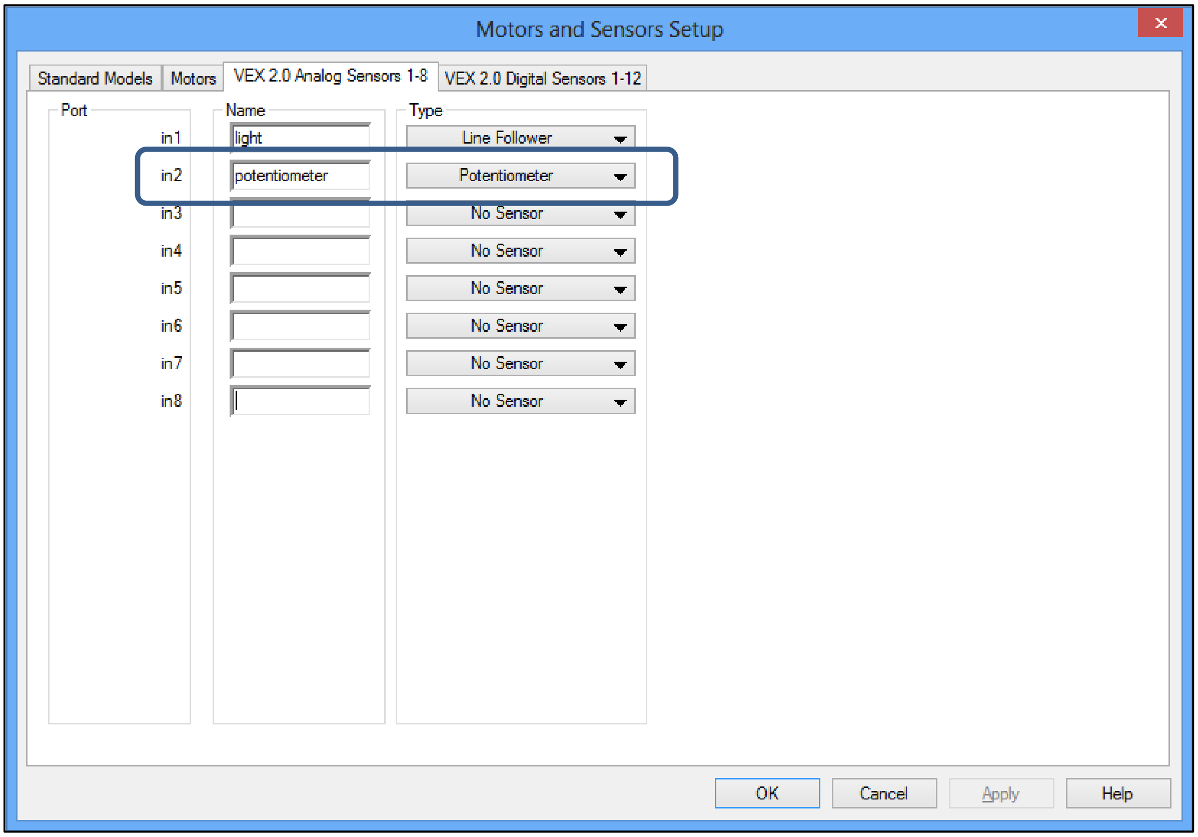
2. Start RobotC and select 'File – New'

3. Save the file as "potentiometer_test"

4. Go to 'Robot-Motors and Sensors Setup'



5. Type 'potentiometer' in port 'in2' and select Potentiometer from the drop down list.

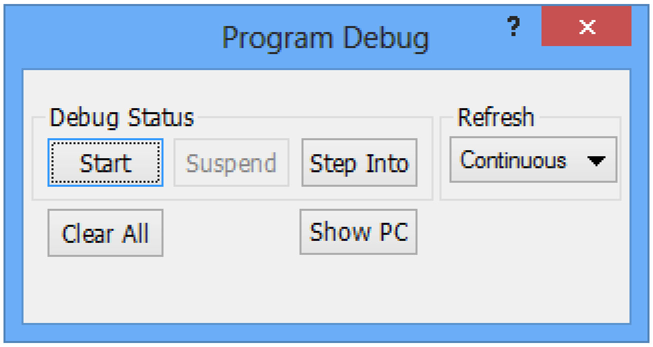


Port	Name	Type
in1	light	Line Follower
in2	potentiometer	Potentiometer
in3		No Sensor
in4		No Sensor
in5		No Sensor
in6		No Sensor
in7		No Sensor
in8		No Sensor

6. Set the motors and other sensors you need. Click Apply.

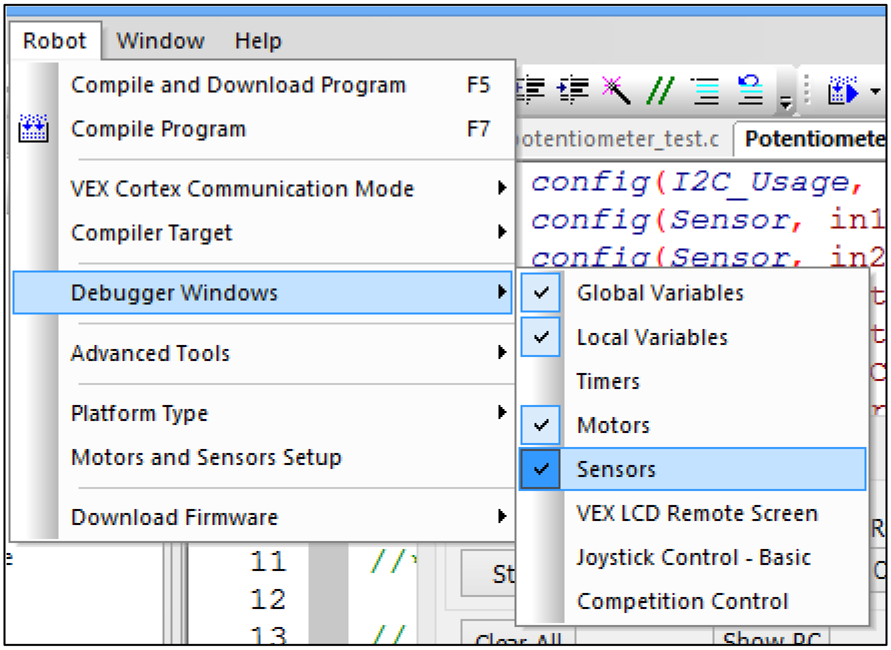
7. We will now test the potentiometer sensor. Save the program and download the program to the robot ('Robot – Compile and Download Program') (Or press F5).

8. Click 'Start' on Program Debug.

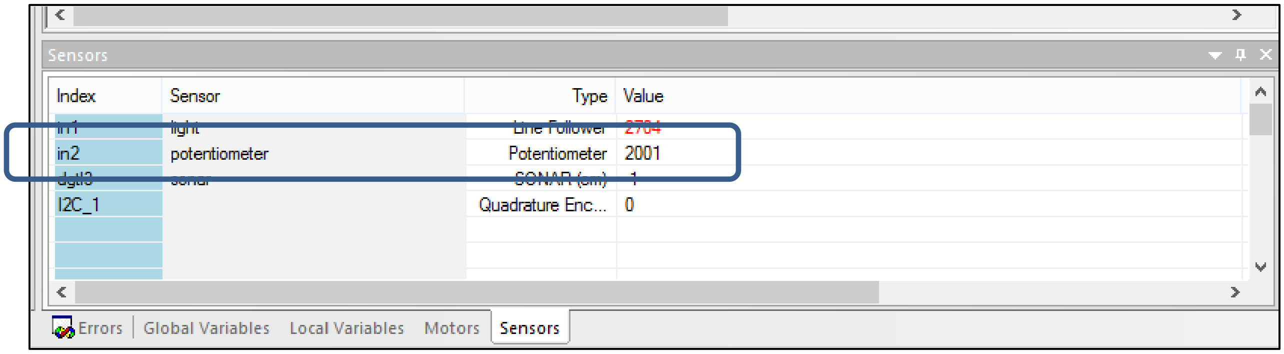


Refresh: Continuous

9. Select “Robot – Debugger Windows – Sensors” to bring up the Sensor view.

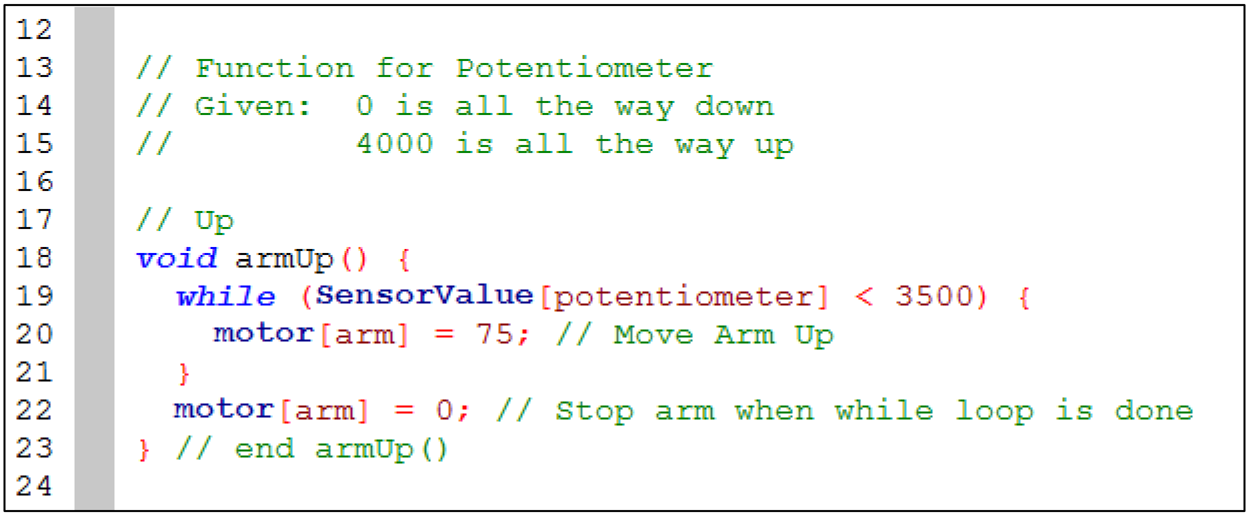


10. Make sure the robot is turned on. You then can note the value of the potentiometer as you move the robot arm. (Note that in the example below the current value is 2001.


Sensors

Index	Sensor	Type	Value
in1	light	Line Follower	2704
in2	potentiometer	Potentiometer	2001
dgtl3	sonar	SONAR (cm)	-1
I2C_1		Quadrature Enc...	0

11. Below is an example function for moving a robot arm connected to a potentiometer. In the example the potentiometer reads about 4000 when the Arm is up and 0 when the Arm is down. Remember that you will need to adjust your code based in the individual characteristics of your robot.



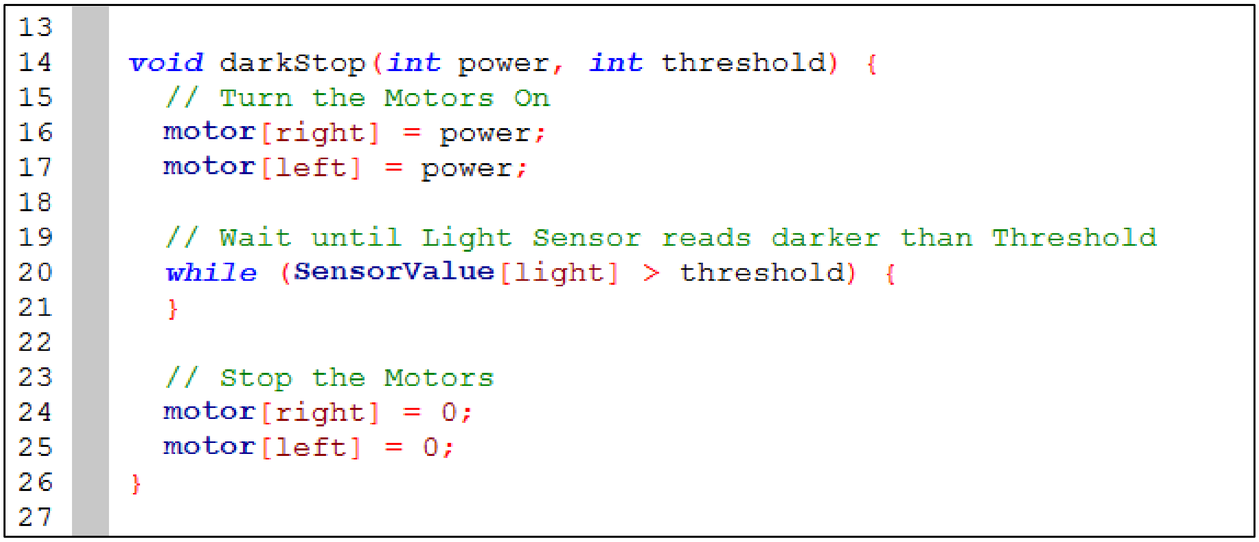
```

// Function for Potentiometer
// Given:  0 is all the way down
//         4000 is all the way up

// Up
void armUp() {
  while (SensorValue[potentiometer] < 3500) {
    motor[arm] = 75; // Move Arm Up
  }
  motor[arm] = 0; // Stop arm when while loop is done
} // end armUp()

```

Note that this code is very much like the darkStop() or the sonicStop() functions:



```

void darkStop(int power, int threshold) {
  // Turn the Motors On
  motor[right] = power;
  motor[left] = power;

  // Wait until Light Sensor reads darker than Threshold
  while (SensorValue[light] > threshold) {
  }

  // Stop the Motors
  motor[right] = 0;
  motor[left] = 0;
}

```