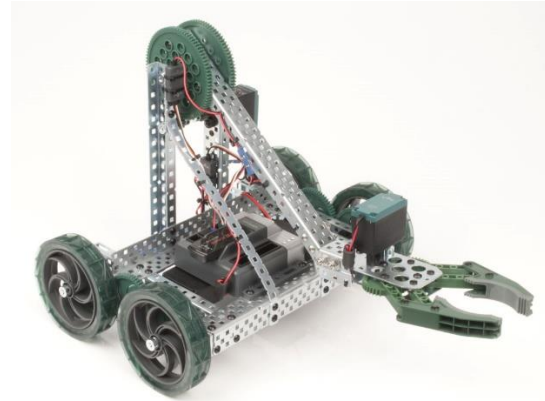


Marist School Robotics Teams
Directions for Writing Driver Control Program
ClawBot Training Robot

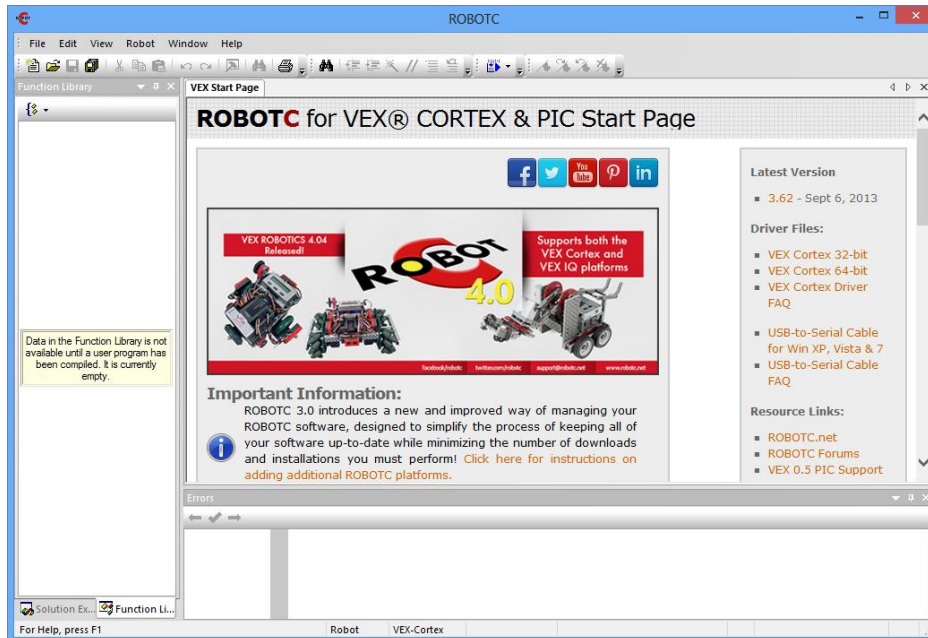


Description:

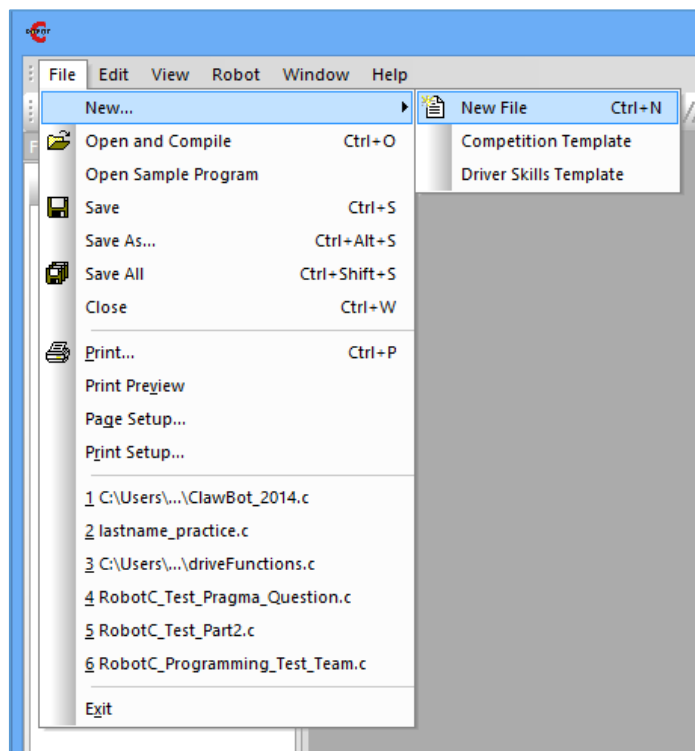
These directions will work through setting up the Pragma code and writing functions to tele-operate (remote control) the VEX ClawBot. We will use the Vex ClawBot for robot training before we build the competition robot.

Process:

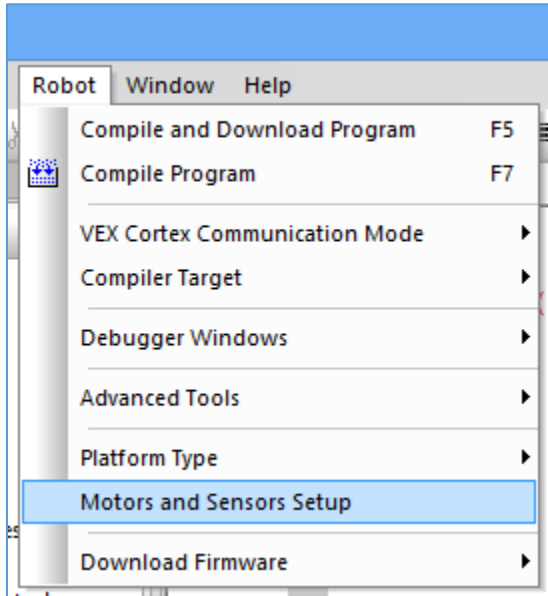
1. Start RobotC on your computer. (You may download RobotC at http://downloads.robotc.net/vex/ROBOTCforCortexPIC_362.exe)



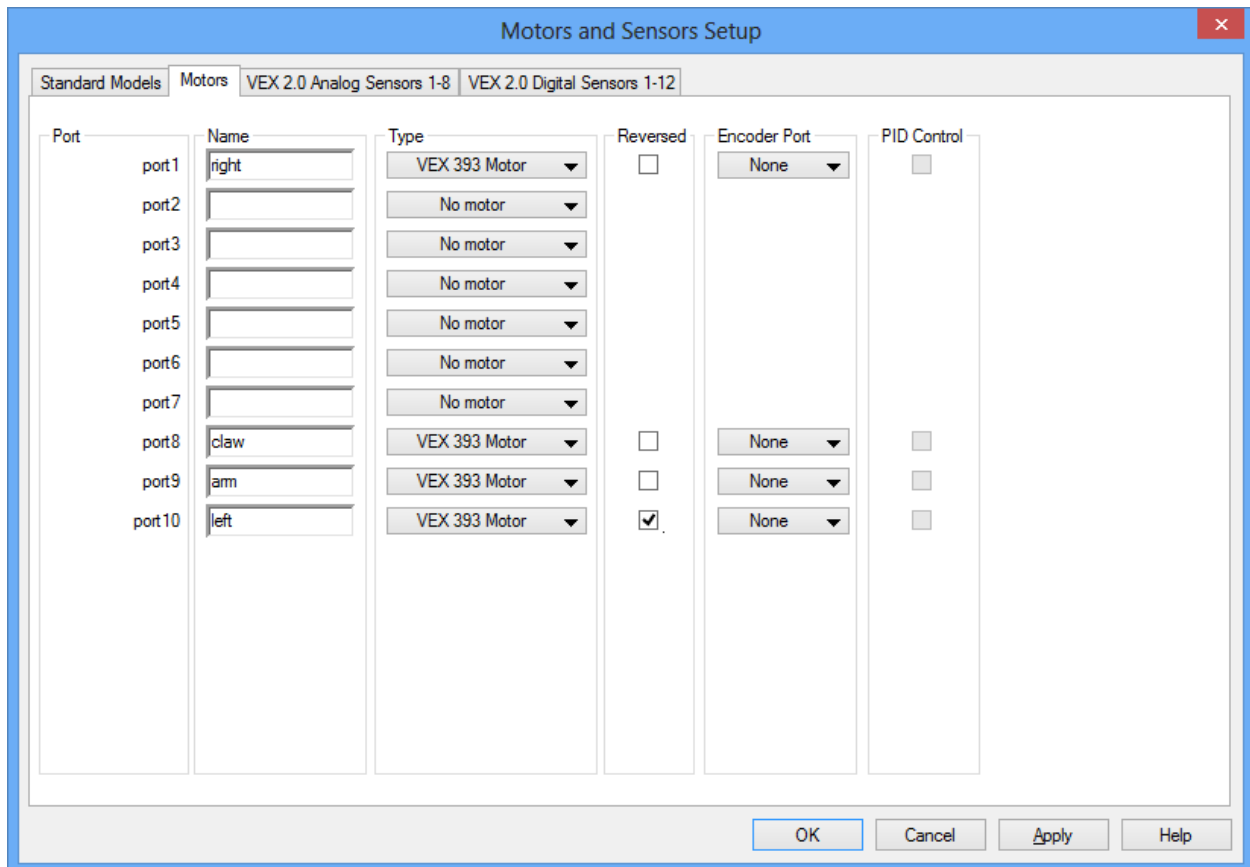
2. Select "File – New - NewFile" from the Menu Bar. This creates a new RobotC program.



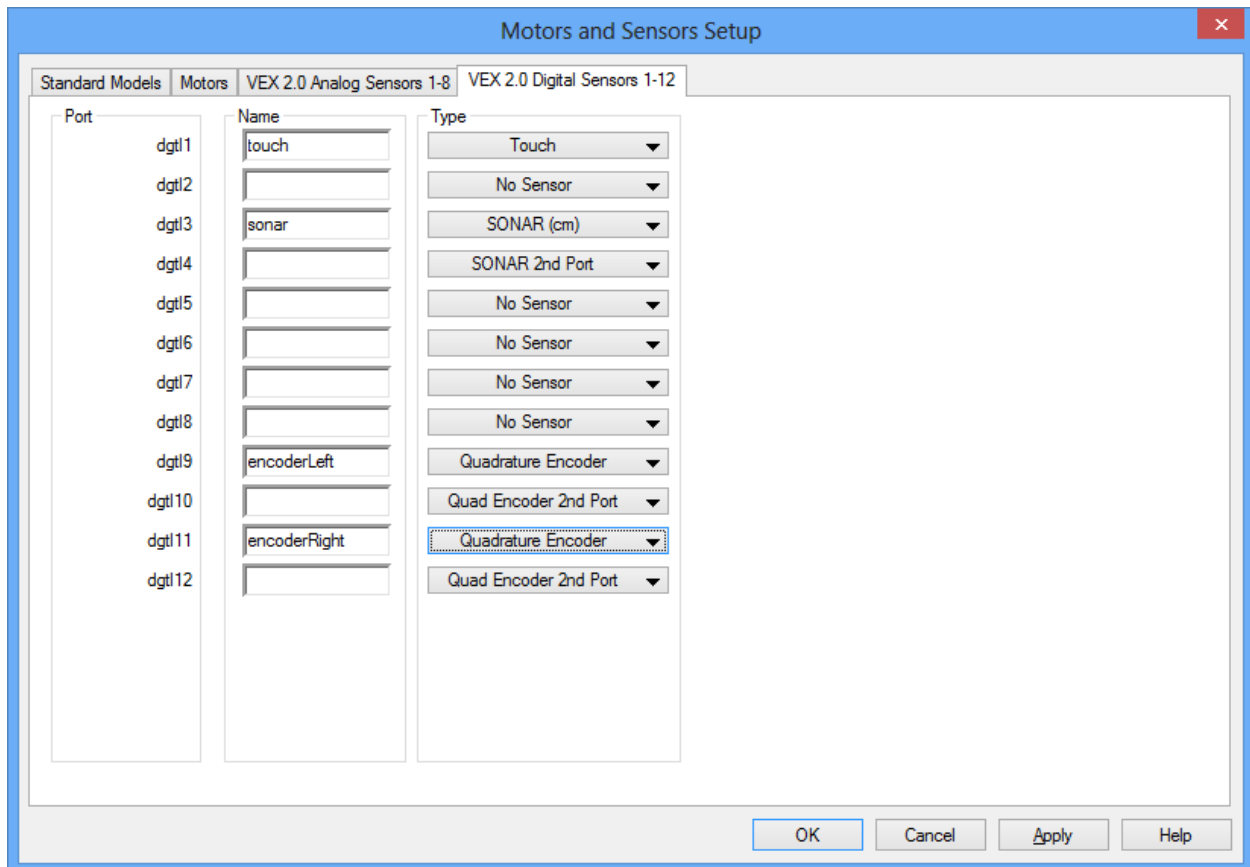
3. We now need to set up the Motors and Sensors for the Robot. We will use the “Motors and Sensors” setup to set the Pragma Code for the program. Select “Robot – Motors and Sensors Setup” from the Menubar.



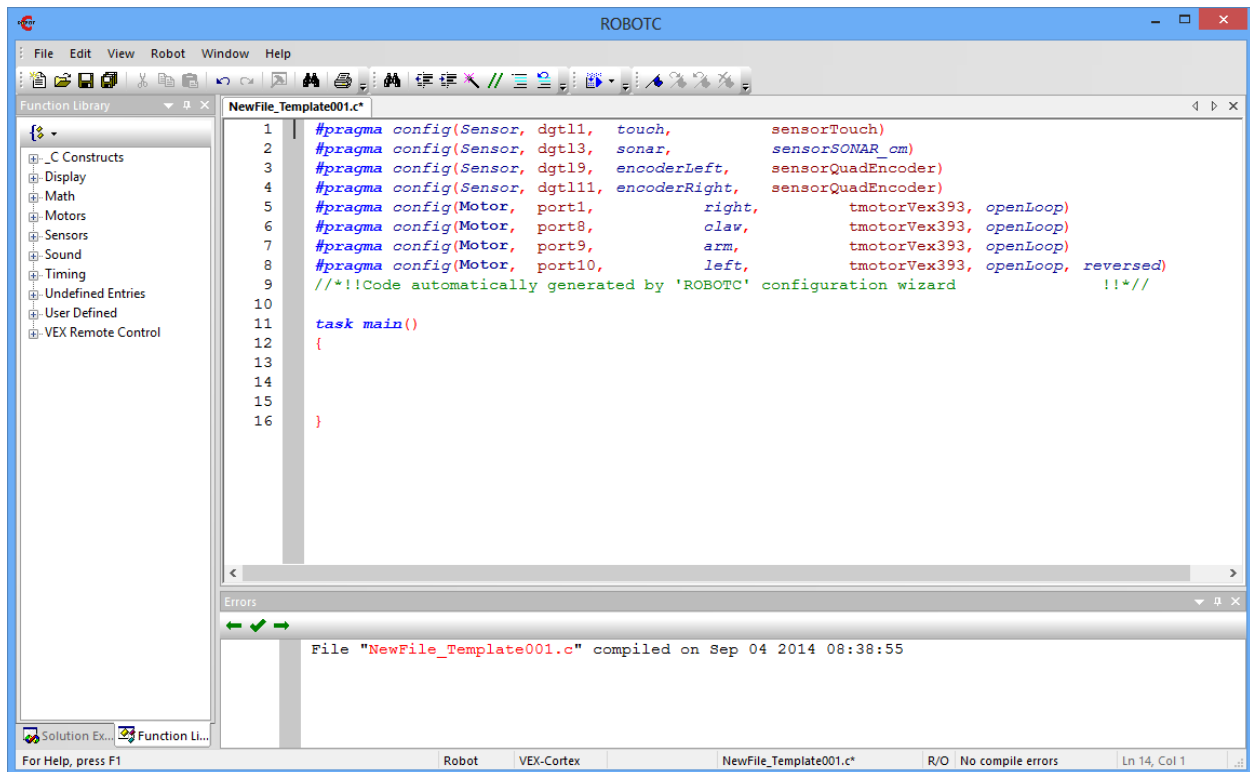
4. Click on the “Motors” tab and label the motors for the following:
- port1: right: 393
 - port8: claw: 393
 - port9: arm: 393
 - port 10: left: 393: reversed



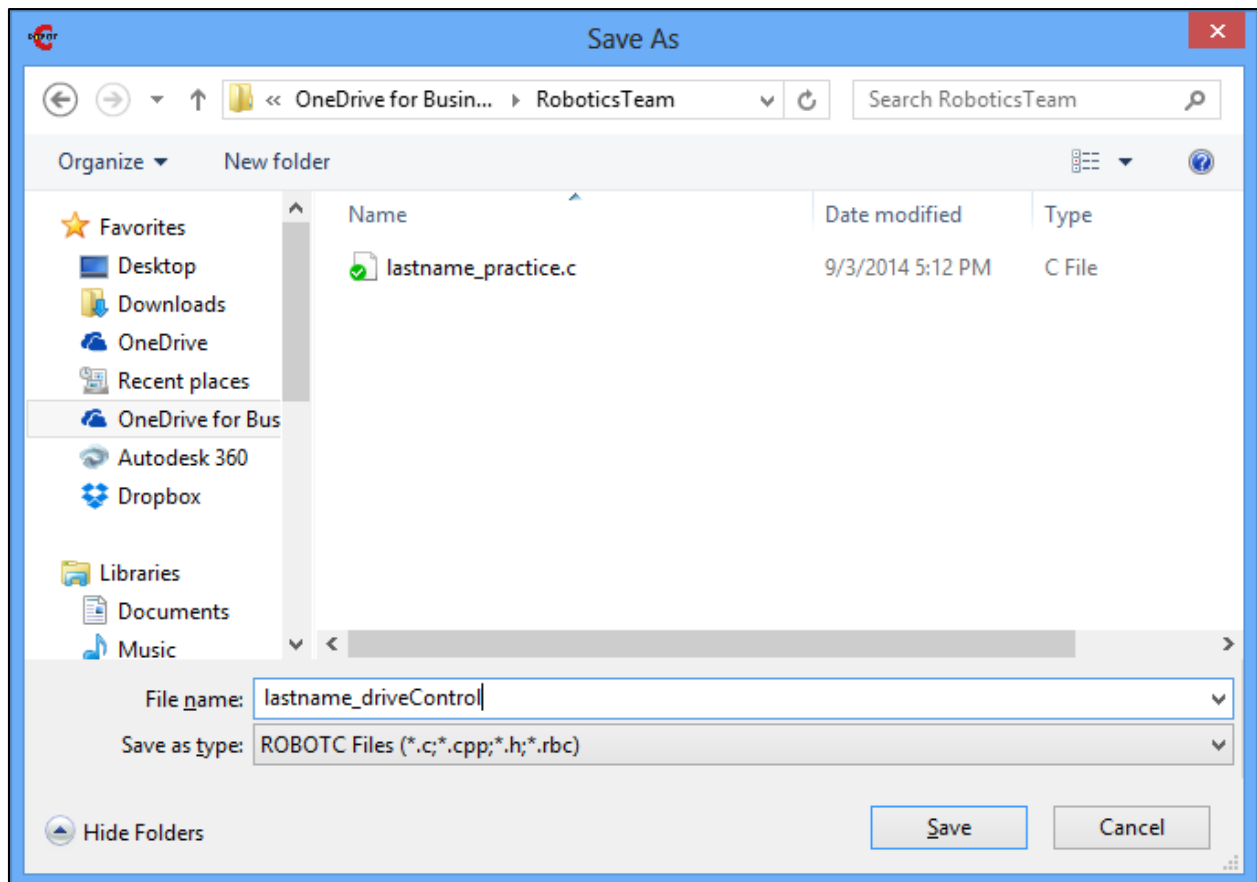
5. Click on the VEX 2.0 Digital Sensors 1-12 tab and set up the sensors:
- dgtl1: touch: Touch
 - dgtl3: sonar: SONAR (cm)
 - dgtl9: encoderLeft: Quadrature Encoder
 - dgtl11: encoderRight: Quadrature Encoder



6. Click 'Apply' and 'OK'. Your code should look like this:



7. Select “File – Save” and save your program to your OneDrive for Business as “lastname_driveControl”



8. We now need to define functions to 'listen' to the Vex Remote. Add the following comment and function to your code:

```
10
11 // Functions for driver control
12
13 void driveControl() {
14     motor[left] = vexRT[Ch3]; // Left motor to Ch3
15     motor[right] = vexRT[Ch2]; // Right motor to Ch2
16 }
17
18 task main()
19 {
20
21
22
23 }
24
```

9. Now add functions to control Arm of the robot with the 5U and 5D buttons:

```
17
18 void armControl() {
19     if (vexRT[Btn5U] == 1) {
20         motor[arm] = 100;
21     }
22     if (vexRT[Btn5D] == 1) {
23         motor[arm] = -100;
24     }
25     if (vexRT[Btn5U] == 0 && vexRT[Btn5D] == 0) {
26         motor[arm] = 0;
27     }
28 }
29
```


10. Finally, add a function to control the claw with buttons 6U and 6D:

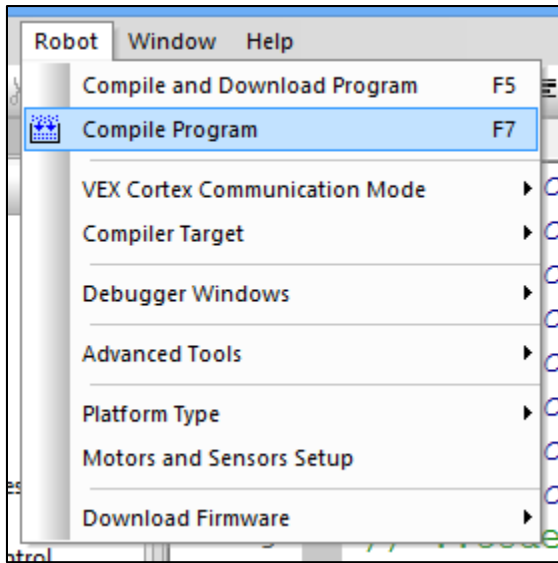
```
29
30 void clawControl() {
31     if (vexRT[Btn6U] == 1) {
32         motor[claw] = 100;
33     }
34     if (vexRT[Btn6D] == 1) {
35         motor[claw] = -100;
36     }
37     if (vexRT[Btn6U] == 0 && vexRT[Btn6D] == 0) {
38         motor[claw] = 0;
39     }
40
41 }
42
```

11. In the 'task main()' we need to tell the Robot to continuously listen to the driveControl(), armControl() and clawControl() functions. To do this we will use a 'whileLoop'. Inside the 'task main()' write the following code:

```
42
43 task main()
44 {
45     while(true) {
46         driveControl();
47         armControl();
48         clawControl();
49     }
50
51 }
52
```

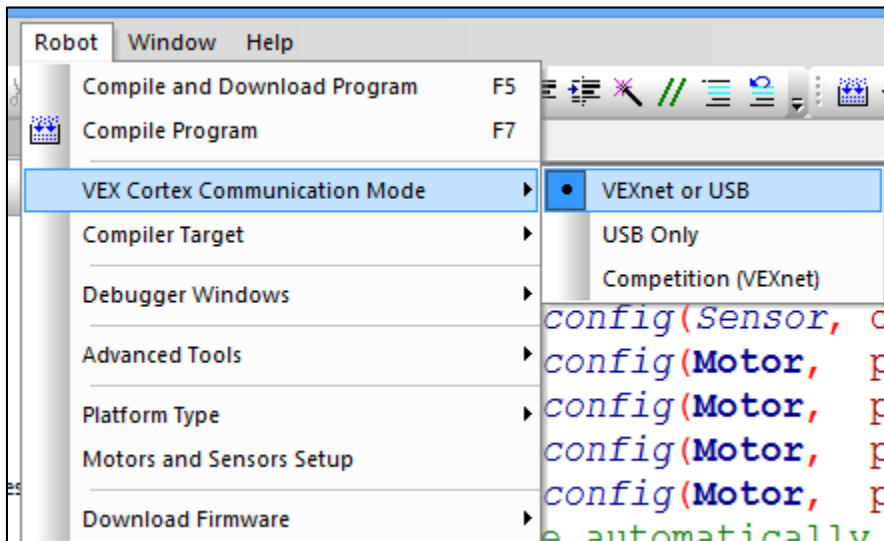
12. Select "File – Save" to save your program.

13. To check for errors, select “Robot-Compile Program” from the Menu Bar.

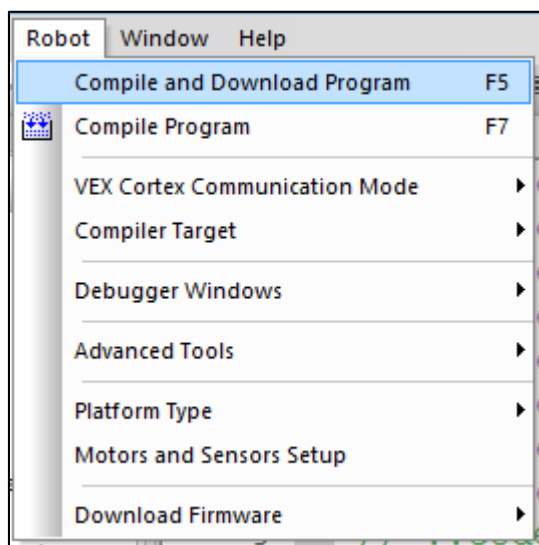


14. If the program compiles – you will not have errors (red x marks next the numbers). Now it is time to load the program in the Robot.

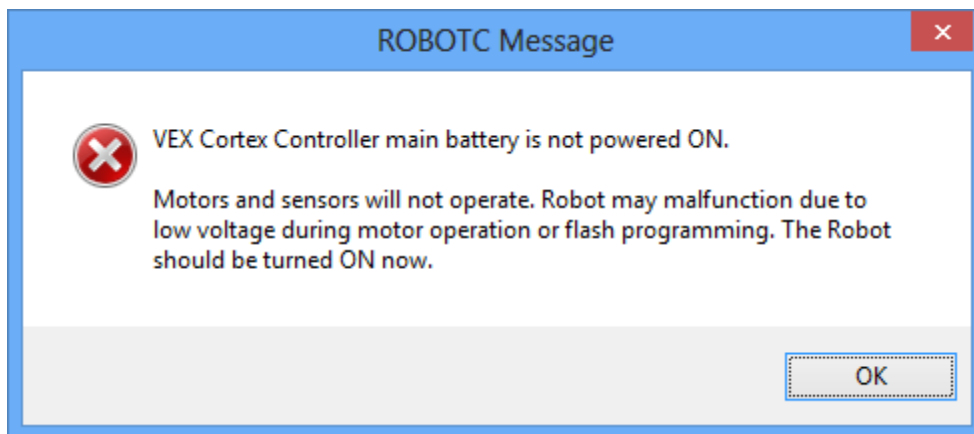
15. First, set the communication mode for the Robot to be “VEXnet or USB” by going to ‘Robot – VEX Cortex Communication Mode – VEXnet or USB’ on the Menu bar.



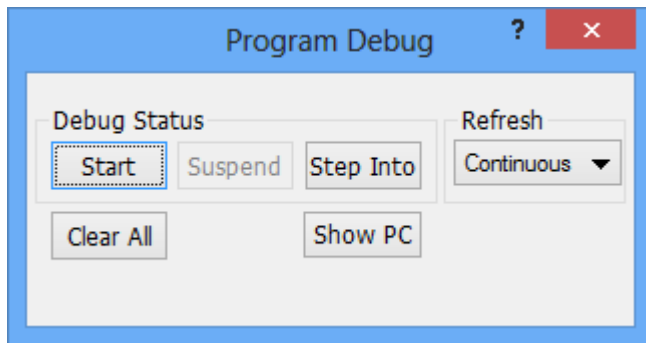
16. Take your ClawBot and make sure you have the following:
 - ClawBot
 - Remote with Batteries
 - Orange USB Cable
 - Blue Battery Pack (7.2 Volts, 3000 mAH)
17. Battery into the VEX Cortex brick but do not turn on.
18. Plug the orange USB cable into the Cortex and into your computer.
19. Select “Robot – Compile and Download Program” from the Menu Bar.



20. You might get a message about the Robot not being switched on. Click OK at this message:



21. The Program Debug window will open. Close this window to exit the Debugger mode.



22. Unplug the robot from the computer and plug into the VEX Remote. (Remote connected to Robot via the orange USB cable.)

Note: In order to use the VEX wireless keys, the remote must first connect to the VEX Cortex via the orange USB cable. This pairs the remote and the cortex. If you have communication problems with the keys, use the orange cable to pair the remote/Cortex.

23. Turn the Remote on.

24. Turn the robot on.

25. The remote should control the robot. Test the Chassis, Arm, and Claw.

26. Turn off the robot and remote. Place the USB VEX keys in the remote and robot to control wirelessly.