

## Procedure for installing WormBot firmware into the microcontroller

1. From a terminal window, install the arduino IDE with the following command:

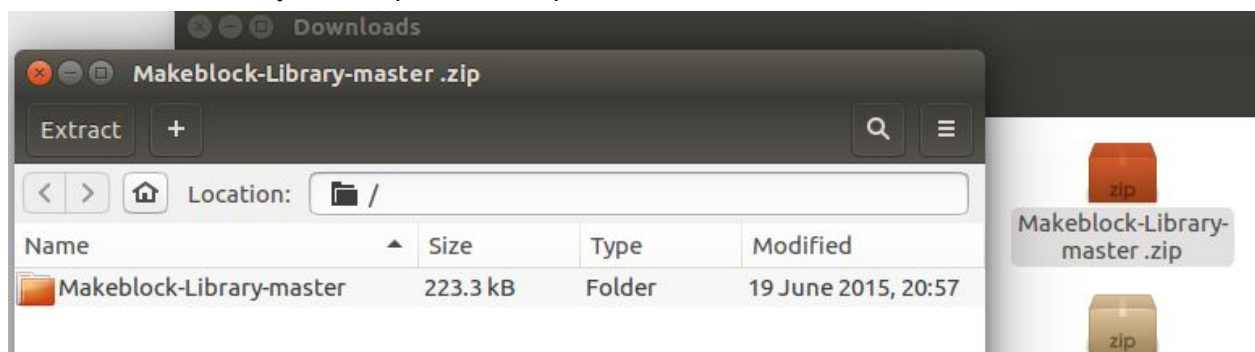
```
sudo apt-get install arduino
```

2. After installation the software will ask for your password to add the user to the dial-out group to access the serial connection to the arduino board, please enter your password then reboot the system.

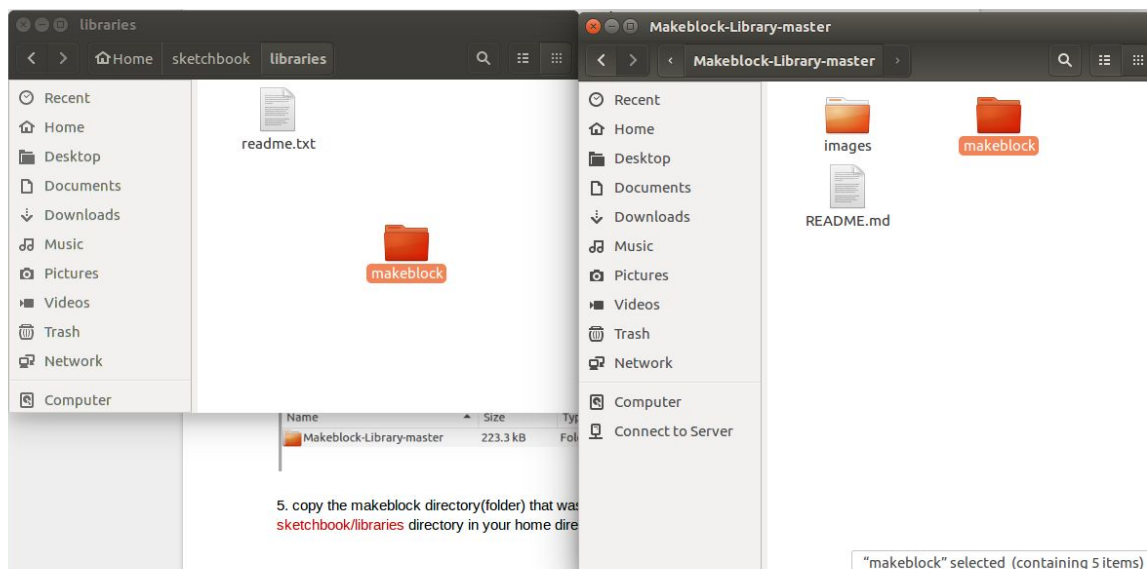
3. Download the MakeBlock arduino libraries v2.1.0916 from github

[https://github.com/evilxsystems/wormbot/blob/master/wormbot\\_firmware/Makeblock.zip](https://github.com/evilxsystems/wormbot/blob/master/wormbot_firmware/Makeblock.zip) **NOTE this is NOT the most recent release of the library, if you do not use this legacy library the firmware will fail to compile.**

4. To install the library, decompress the .zip file



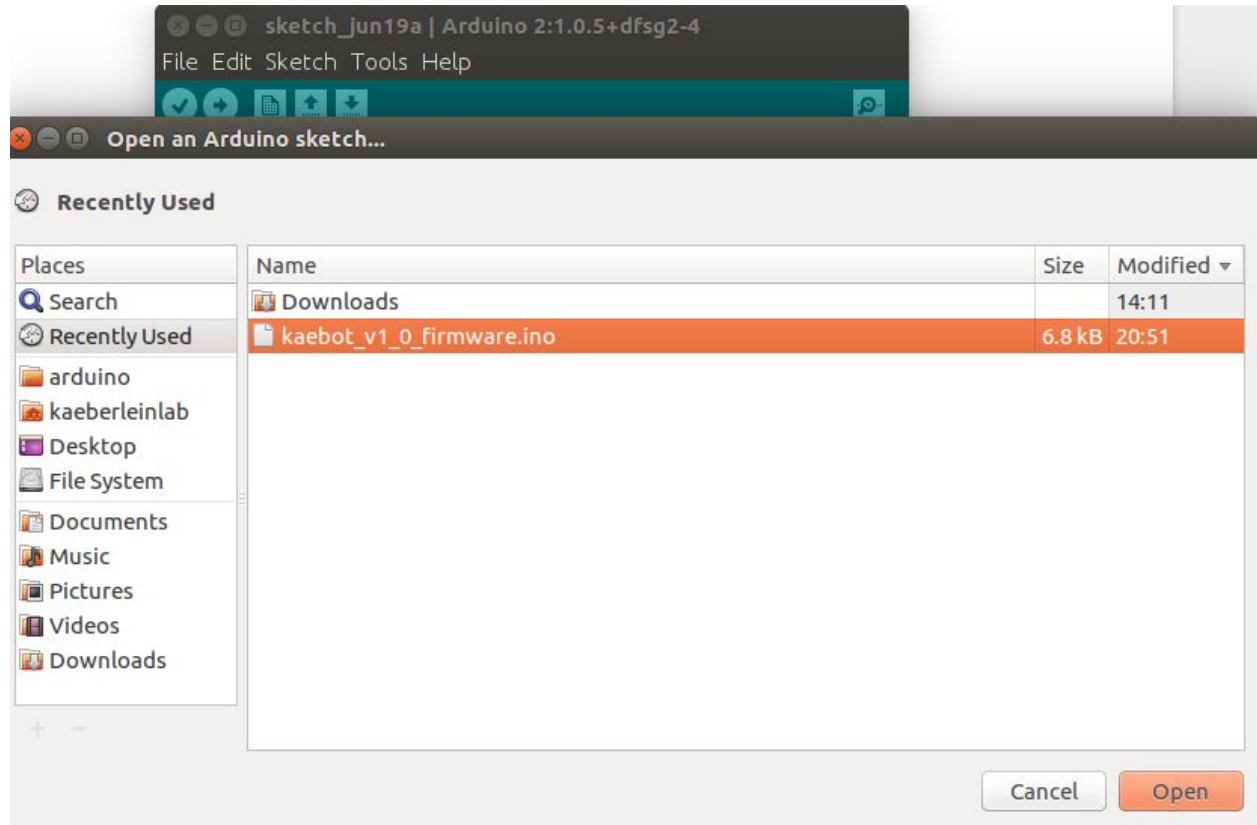
5. copy the **makeblock** directory(folder) that was compressed in the zip file into the **sketchbook/libraries** directory in your home directory



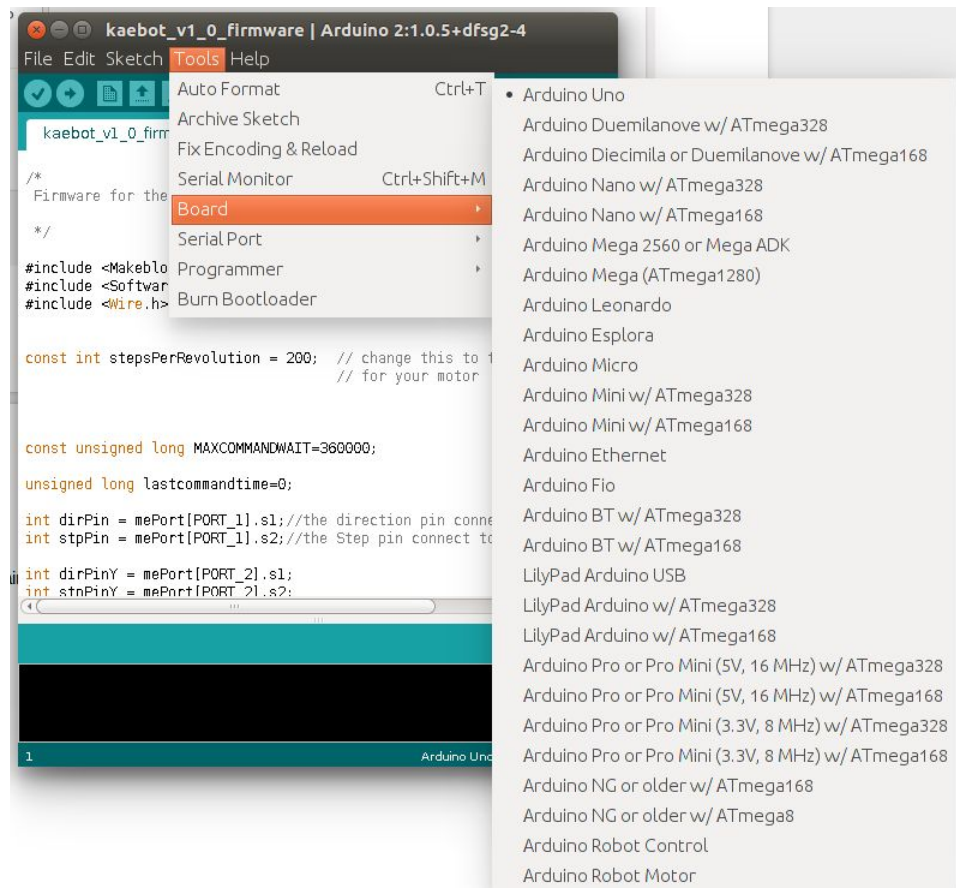
6. Download the Wormbot firmware from github  
([https://github.com/evilxsystems/wormbot/wormbot\\_firmware.ino](https://github.com/evilxsystems/wormbot/wormbot_firmware.ino))
7. Make certain that the included micro USB cable from the XY plotter robot kit is plugged into the Makeblock Orion board and plugged into to the linux server.
8. Launch the arduino IDE by opening a terminal and entering the command:

arduino

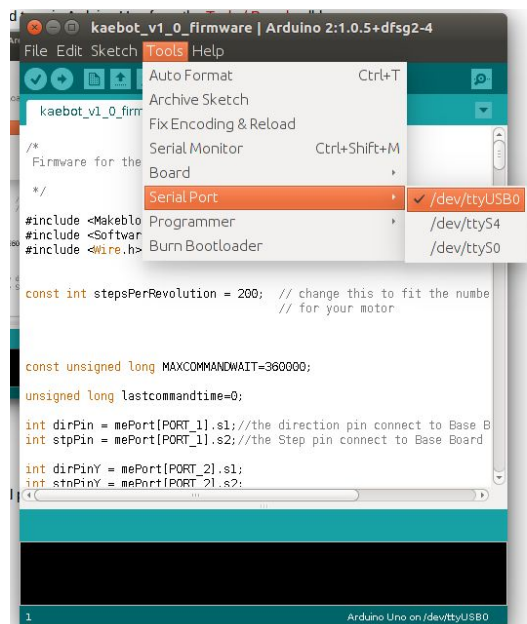
9. From the Arduino **File** menu select **Open**, and select the wormbot\_firmware.ino file downloaded from github in the arduino IDE



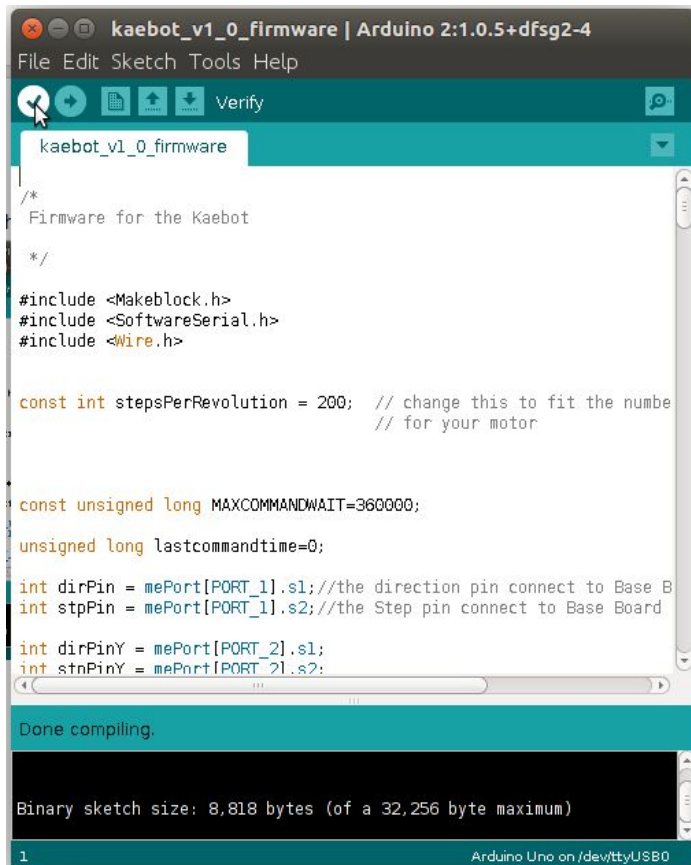
10. Make certain the board type is Arduino Uno from the **Tools / Board** pulldown menu



11. From the **Tools / Serial** port pulldown menu select **/dev/ttyUSB0**



12. Compile the firmware by clicking the **Verify** check button. If the makeblock library is installed correctly the firmware should compile and the IDE will report “Done compiling”



The screenshot shows the Arduino IDE interface. The title bar reads 'kaebot\_v1\_0\_firmware | Arduino 2:1.0.5+dfsg2-4'. The menu bar includes 'File', 'Edit', 'Sketch', 'Tools', and 'Help'. The toolbar contains icons for opening, saving, and verifying, with the 'Verify' button highlighted. Below the toolbar, the sketch name 'kaebot\_v1\_0\_firmware' is displayed. The main text area contains the following code:

```
/*
Firmware for the Kaebot
*/

#include <Makeblock.h>
#include <SoftwareSerial.h>
#include <Wire.h>

const int stepsPerRevolution = 200; // change this to fit the number
// for your motor

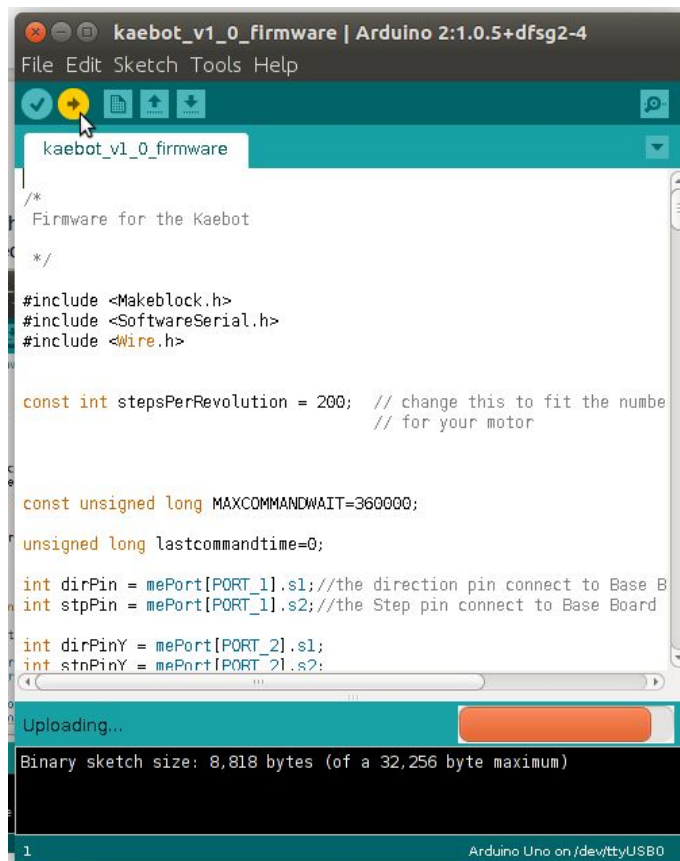
const unsigned long MAXCOMMANDWAIT=3600000;
unsigned long lastcommandtime=0;

int dirPin = mePort[PORT_1].s1; //the direction pin connect to Base Board
int stpPin = mePort[PORT_1].s2; //the Step pin connect to Base Board

int dirPinY = mePort[PORT_2].s1;
int stnPinY = mePort[PORT_2].s2;
```

Below the code editor, a status bar indicates 'Done compiling.' and 'Binary sketch size: 8,818 bytes (of a 32,256 byte maximum)'. The bottom status bar shows '1' and 'Arduino Uno on /dev/ttyUSB0'.

13. Upload the firmware to the robot by clicking the **Upload** button



14. If successful the robot should immediately home the X and Y axes and then return to the origin. **If the robot shakes violently when it reaches one of the extremes, a limit switch has been wired incorrectly. Immediately turn off the power switch on the Makeblock Orion board and check the limit switch connections before powering up again.**