

mcr

# How to update Makelangelo firmware from Windows (pre 2021)

This guide will show you how to update the code in the brain of a Makelangelo robot

Written By: Dan Royer

```
firmware_rumba  MSerial  MServo.cpp  MServo.h  Vector3.h  Search

//-----
// Inverse Kinematics - turns XY coordinates into 1
void IK(float x, float y, long &l1, long &l2) {
#ifdef COREXY
    l1 = lround((x+y) / THREAD_PER_STEP);
    l2 = lround((x-y) / THREAD_PER_STEP);
#endif
#ifdef TRADITIONALXY
    l1 = lround((x) / THREAD_PER_STEP);
    l2 = lround((y) / THREAD_PER_STEP);
#endif
#ifdef POLARGRAPH2
    // find length to M1
    float dy = y - limit_top;
    float dx = x - limit_left;
    l1 = lround( sqrt(dx*dx+dy*dy) / THREAD_PER_STEP );
    // find length to M2
    dx = limit_right - x;
    l2 = lround( sqrt(dx*dx+dy*dy) / THREAD_PER_STEP );
#endif
}
```

## Makelangelo firmware (v6.17.1)

Suggested Price: **CAD \$10.00**

**SKU:** FIRM-0001

**Category:** Downloads

**Tags:** arduino code, driver, firmware, makelangelo

This project specifically deals with the firmware: the code in the brain of the robot that receives instructions and moves the motors. It pairs really well with Makelangelo, a project to give humans a pleasant GUI.

Please help support the development of this, and other projects by making a donation for the download.


*Thank you!*

Name Your Price ( CAD \$

10.00

Quantity

1

 Add to Cart

### Makelangelo firmware (v6.17.1)

Suggested Price: CAD \$10.00

**SKU:** FDM-0001  
**Category:** Downloads  
**Tags:** arduino, code, driver, firmware, makelangelo

This project specifically deals with the firmware: the code is the brain of the robot that receives instructions and moves the motors. It pairs really well with Makelangelo, a project to give humans a pleasant GUI.

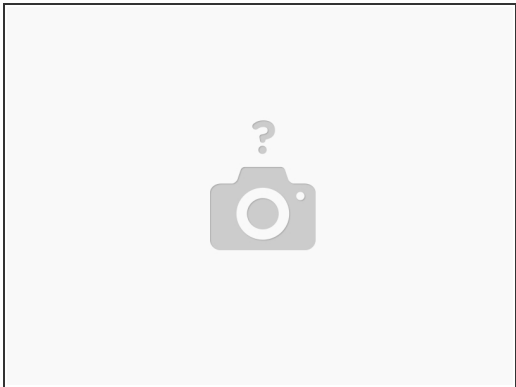
Please help support the development of this, and other projects by making a donation for the download.  
*Thank you!*

Name Your Price (CAD \$) 10.00

Quantity 1

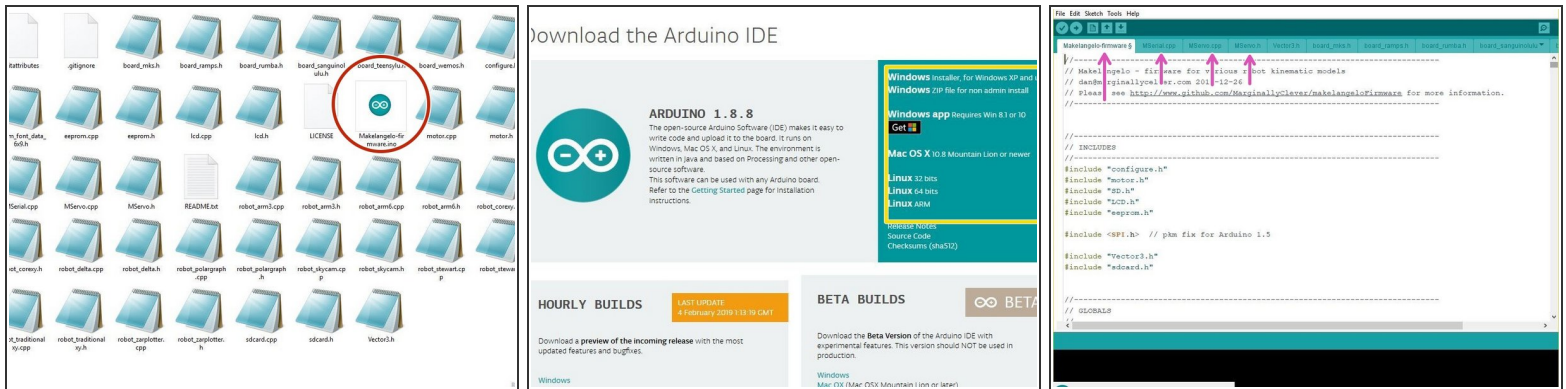
Add to Cart

- ## Step 2 — Install Windows Drivers



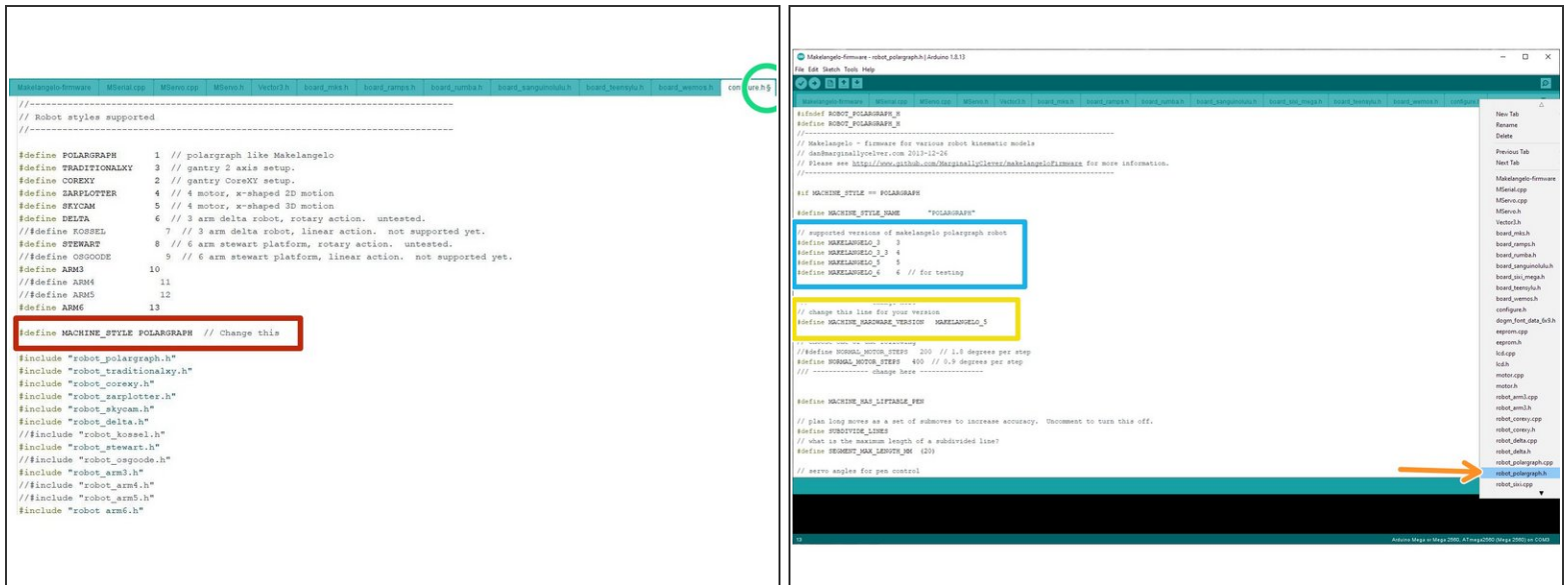
- This document was generated on 2022-06-16 09:03:50 AM (MST).
- 
- © 2022 [mcr.dozuki.com/](http://mcr.dozuki.com/) Page 2 of 10

## Step 3 — Open the firmware in Arduino



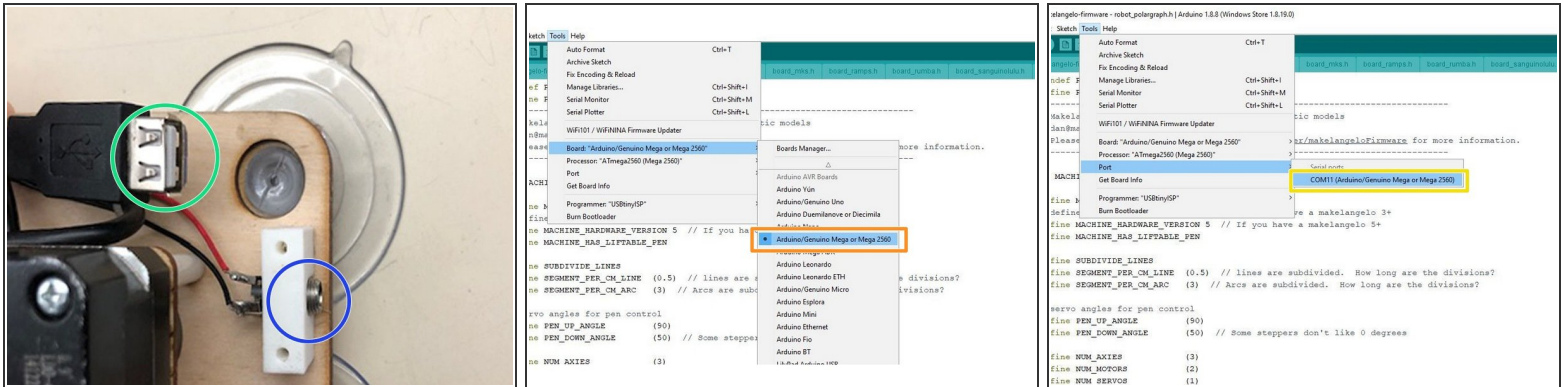
- Extract the zip file downloaded from the link into a folder called **Makelangelo-firmware**. Double check the *exact spelling*, including the hyphen -.
- Go into the folder and open **Makelangelo-firmware.ino** with the Arduino app.
- The Arduino app is available from <https://www.arduino.cc/en/Main/Software>
- You may be asked to update some features of Arduino. Please follow the prompts and get up to date.
- You should see **many tabs** at the top of the app. If you have only one tab then Arduino has created that folder and moved the ino file into the folder. Quit Arduino, move the rest of the files into the new folder, and re-open the file.

## Step 4 — Confirm code settings




- Confirm that in the tab *configure.h*, the line reads **#define MACHINE\_STYLE POLARGRAPH**. This firmware runs on many styles of robots and this sets the correct style.
- You can find more tabs in the drop down on the right
- Confirm that in the *robot\_polargraph.h* tab your machine hardware version is selected. For example,
  - **#define MACHINE\_HARDWARE\_VERSION MAKELANGELO\_5** for version 5.
  - **#define MACHINE\_HARDWARE\_VERSION MAKELANGELO\_3** for version 3.
  - etc. The list of available options appears immediately above it in the same file.


## Step 5 — Connect your robot to the app




- Connect the USB from your computer to your robot.
  - Connect the 12v2a power supply to your robot.
  - In Arduino, set *Tools* > *Board* to **Mega 2560**
  - set *Tools* > *Port* to the port that says **Mega 2560**. This name is slightly different for OSX and Linux users.
- ❗ If you do not see any com port, **don't panic**. Read the next step.

## Step 6 — If you don't see any Windows COM port


**Safety Tip**  
 **Caution**  
Once you start putting electricity into your RepRap - even at just 12 volts - you have to take basic, common sense precautions to avoid injury. Just in case these fail, test your workshop smoke detector. Got no smoke detector? Get one!

**RUMBA USB Driver for Windows**  
 [Download RUMBA USB Driver for Windows \(Windows 7/XP 32 and 64 bit\)](#)  
File:RRD RUMBA TAURINO DriverSetup.zip

 **CLASSIC: (can cause problems with Windows 8 and Vista/7 64bit, use the easy method from above instead)**  
When you attach RUMBA for the first time to a Windows computer you might need to provide a driver (INF file).  
File:RRD-RUMBA USB DRIVER.zip


**Features**

- compact size: 135mm x 75mm
- fully integrated all in one solution:
  - Arduino 2560-R3 compatible (works with Sprinter, Repetier-Firmware, Marlin out of the box)
  - ATmega16U2 (with enhanced firmware) for high speed USB serial connection (up to 2MBit)
- UNIVERSAL POWER:
  - can be used with 12V-35V for motors / heated bed
  - integrated high precision power regulators (DC/DC) for:
    - 12V / 5A and 5V / 1A

 If you already see the COM port, you can ignore this step.

- You may be missing the drivers, which can be downloaded from [https://reprap.org/wiki/RUMBA#RUMBA\\_USB\\_...](https://reprap.org/wiki/RUMBA#RUMBA_USB_...). The recommended method is the *Easy driver setup for Windows 8/7/Vista/XP 32 and 64 bit*

- After driver installation if you still don't see the COM port, try rebooting your PC.

 Suddenly disconnecting power while your PC is talking to your robot scares Windows. It will hide the COM port until after a reboot as a precaution.

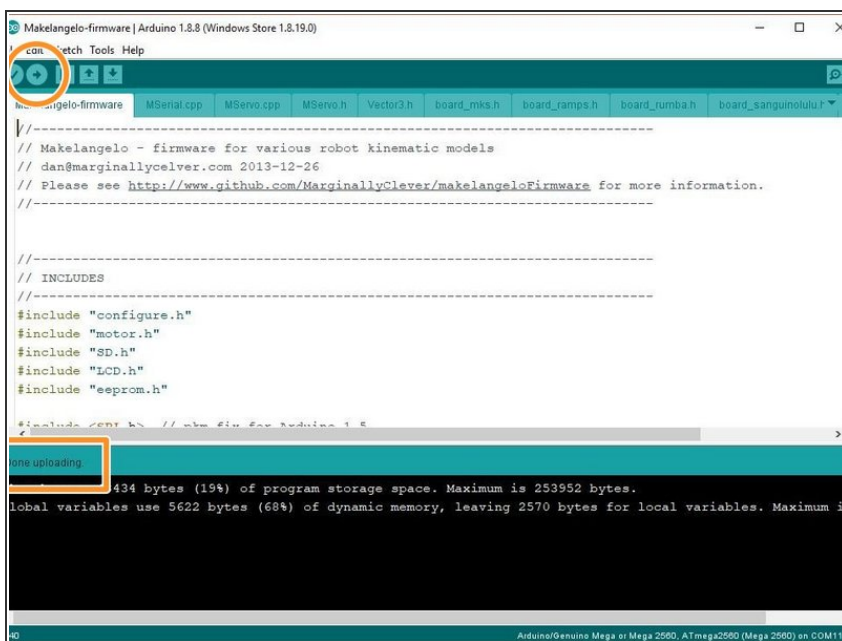


## Step 7 — If you don't see a Linux/OSX COM port



- Connect your robot when power is on and open a terminal in your computer.
- Type "`ls /dev/tty*`" without quotes and hit enter. you should see at least one device, typically `/dev/ttyACM0`.
- Often, the command to use is "`sudo chmod 666 /dev/ttyACM0`". You will need to know the root password to perform this command.
- restart your java app and try to connect again.

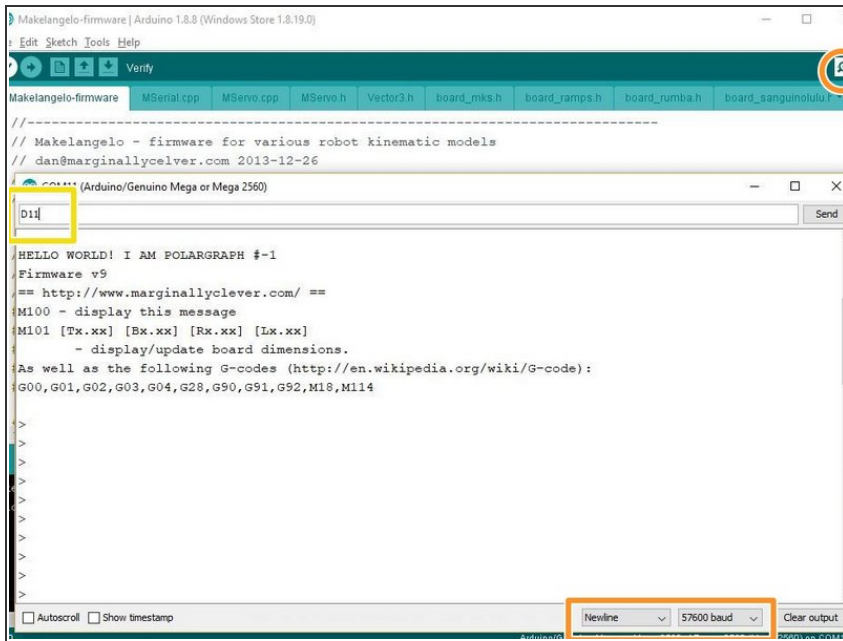
## Step 8 — Upload the firmware to the robot



- Click the upload button. The app will say "Compiling..." and then "Uploading..."
- When finished OK, it will say **Done uploading.**

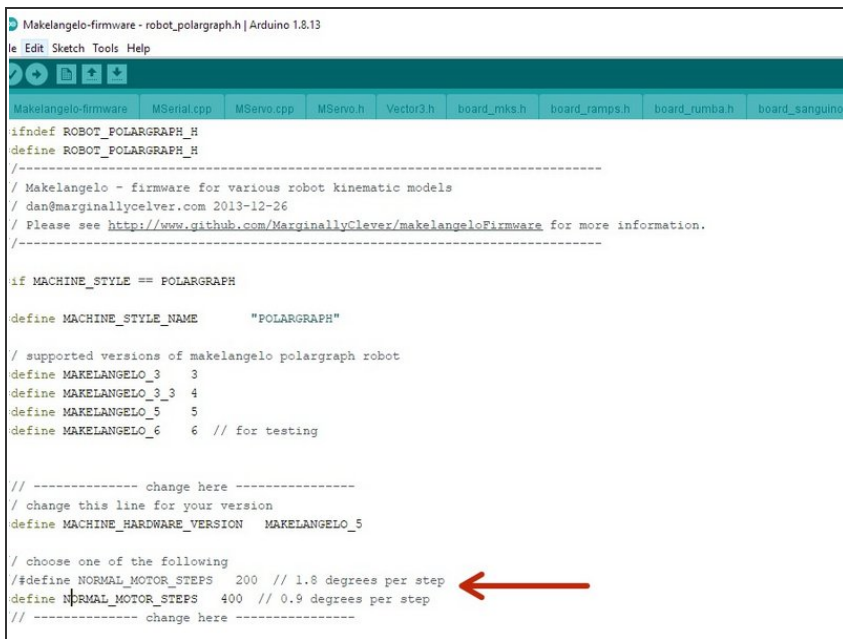
⚠ For all other results, please copy all the text in the orange text in the fail message and post it to our support forums at <https://www.marginallyclever.com/forums/>

## Step 9 — If this is a brand new Makelangelo 5



- Click the *Serial Window* icon in the top right (looks like a magnifying glass)
- Confirm the dropdowns says **newline** and **57600 baud**. **HELLO WORLD!** text should appear in the window.
- In the text field at the top type **D11** (uppercase) and hit enter or click **Send**. The status window should say *Saving dimensions. Saving calibration. Saving home.*

## Step 10 — Does your machine move wrong after update?



- **i** Some older Makelangelos had motors with 400 steps per turn (0.9deg/step). Newer machines have 200 step per turn.
- in robot\_polargraph.h, look for the lines that define **NORMAL\_MOTOR\_STEPS**. the double slash (//) blocks one line, and so the machine thinks it has 400 step motors when it doesn't. Move the // to the other line and upload again.



- You may also find your machine moves half the distance it should. then you have a 400 machine and

---

the firmware is set to 200. Do the reverse.

---

Congratulations! You are done. The robot is now up to date and should talk to the latest Makelangelo Software.