Hardware and software

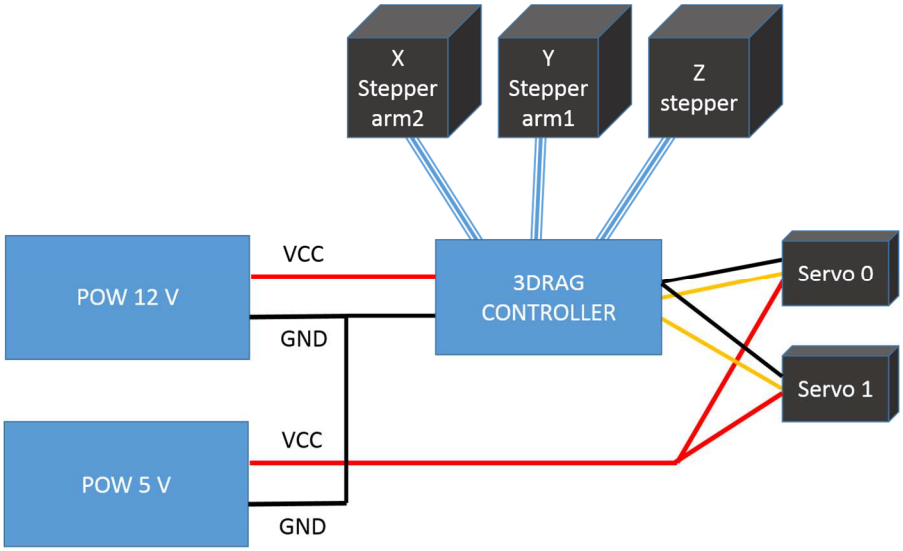
The motherboard (MB) used for the robot control is the 3DRAG controller. If you use the same controller, a working version of Marlin is ready in file list. If you choose another hardware, you should modify your Marlin accordingly. The critical step could be controlling servos if your MB does not have dedicated pins like in this case. In the uploaded version of Marlin, the pins for servos belong to the LCD and manual control interface (that was commented).

My suggestion is to use a dedicated power supply for servos. In fact, the MB could not be able to supply the requested servo current.

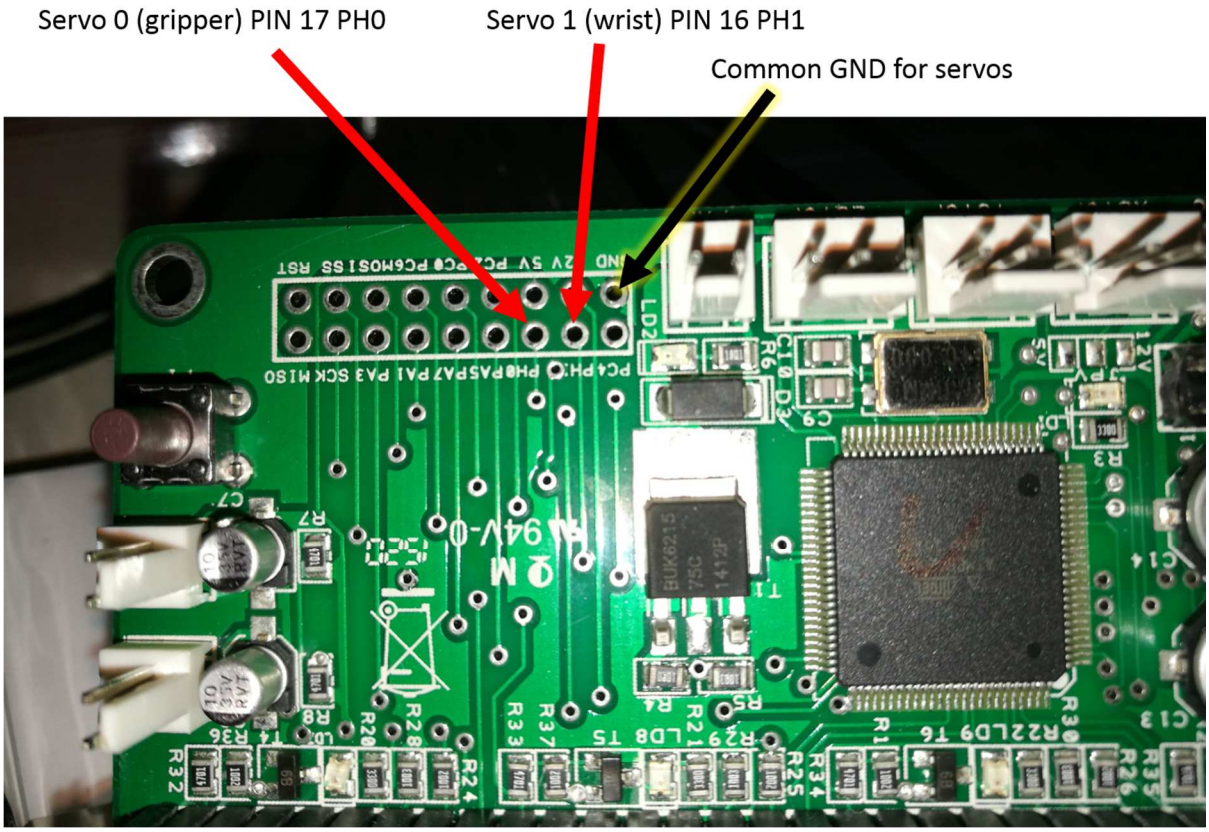
Marlin was set up with angle (degrees) unit for X and Y and mm for Z axis. You can find the formula in configurations.h, line containing #define DEFAULT_AXIS_STEPS_PER_UNIT (//N=uSTEPS/DEGREES_PER_STEP*MOTOR_PULLEY_TEETH/ARM_TEETH

//27.56=16/1.8*20/62 CHANGE IF YOU CHANGE ARM_TEETH).

Connections



Below a zoom on servo connections



Software

The following software was installed onto raspberry P3 for programming and control.

Marlin version 1.0.0 (modified version, check on thing files)

Arduino IDE version 1.6.9 (linux/ARM) [NOTE: Marlin v. 1 runs only on old Arduino IDE]

PRINTRUN (pronterface) ver 2015.03.10

Example script

```
M280 P0 S90      ;OPEN GRIPPER
M280 P1 S15      ;ROTATE WRIST HOME POSITION
G04 P1000        ;PAUSE
G1 X180 Y90 Z0   ;GO TO POSITION 2 (DOWN)
G04 P200         ;PAUSE SHORT
M280 P0 S10      ;CLOSE GRIPPER
G04 P1000        ;PAUSE
G1 Z50           ;GO UP
G1 X90 Y0        ;GO TO POSITION 1
G04 P200         ;PAUSE SHORT
M280 P1 S90      ;ROTATE WRIST 90 DEG
G04 P1000        ;PAUSE
M280 P0 S90      ;OPEN GRIPPER
G04 P1000        ;PAUSE
M280 P1 S15      ;ROTATE WRIST HOME POSITION
G04 P1000        ;PAUSE
M280 P0 S10      ;CLOSE GRIPPER
G04 P1000        ;PAUSE
G1 X180 Y90      ;GO TO POSITION 2
G1 Z0            ;GO DOWN
G04 P200         ;PAUSE SHORT
M280 P0 S90      ;OPEN GRIPPER
G04 P1000        ;PAUSE
```

Notes for gcode scripting: Please add pauses before and after servo controls (G04 command, see above).

NOTE 2: Since the current version does not have endstops, you should NOT home axes with the program (arms and Z axis will hit the minimum position allowable soliciting the hardware).

NOTE 3: For the reason shown above, the zero position is considered the starting position when you power up the robot. With this Marlin version, only positive movements are allowed.