



Instruction Manual

Nicholas Grant, Andrew Lois, SirDarius Lomack, Nicholas Haynes, Jacob Ray, Christian Perez

FAMU-FSU College of Engineering

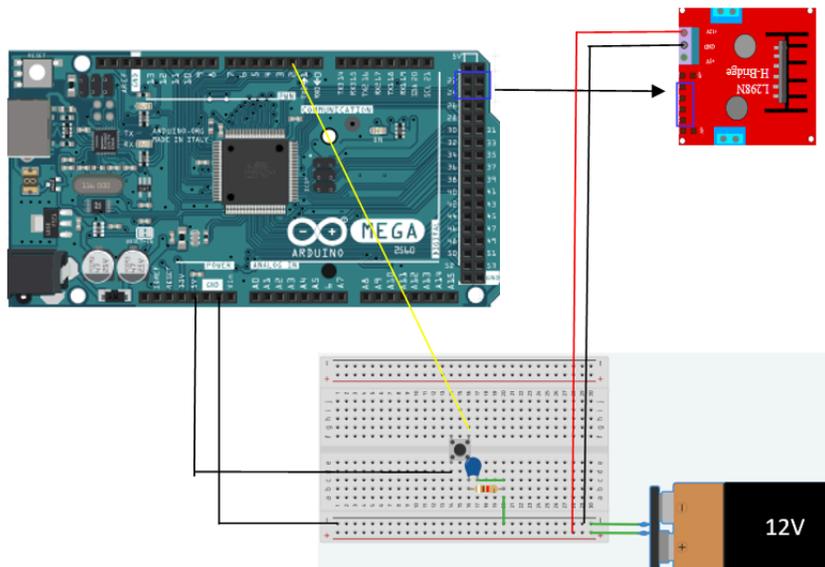
EML 4911: Senior Design

Jerris Hooker & Shayne McConomy

April 19th, 2024

Instruction Manual

1. Connect the following circuit



Use a 12 volt power supply to connect to the breadboard. The 5V supply in the arduino goes to the bottom left leg of the button. The top right leg of the arduino is connected to pin 2 of the arduino. The bottom right leg of the button is connected to a 10Kohm resistor and 1uF capacitor, which are both connected to ground. The ground of the arduino is connected to the negative rail of the breadboard. Digital pins 22-25 of the arduino are connected to the L298N motor driver in that order. Connect the 12V and ground ports of the L298N driver to the positive and negative rails of the arduino respectively. Connect the motor driver to the motor, With the top right port having A, the top left having A-, the bottom right having B-, and the bottom left having B. A phase is black, A- is green, B phase is red, and B- is blue.

2. Upload the following code:
 - a. Open the Arduino IDE
 - b. Include the AccelStepper library
 - c. Use the following code:

```
#include <AccelStepper.h>
#include <MultiStepper.h>
```

```
//initialize variables
```

```
int currentPosition = 0;
int desiredPosition = 0;
```

```

int counter = 1;
int state = 0;
int buttonState = 0;           //sets up state of the putton to
0
const int buttonPin = 2;      //sets the button pin to 2
const int ledPin = 13;        //sets LED pin to pin 13

//declare step order
int fullSteps[4] = {0b1, 0b1000, 0b10, 0b100};

void setup() {
  DDRA = 0xFF; //using port A as output
  pinMode(buttonPin, INPUT); //takes input from the button
pin
  pinMode(ledPin, OUTPUT);    //sets ledpin to output
}

void loop() {
  buttonState = digitalRead(buttonPin);
  switch(state) {
    case 0:
      if((buttonState == HIGH) && ((counter % 3) != 0)){ //if
button is pressed and counter is not divisible by 3, enter
loop
        currentPosition = 0;
        desiredPosition = 67;           //set desired position
to 67 to drive motor
        digitalWrite(ledPin, HIGH);    //checks to see if
button input is read
        counter++;                      //iterate counter
        state = 1;                      //move to state 1
      }
      else if((buttonState == HIGH) && ((counter % 3) == 0))
{ //if button counter is divisible by 3, rotate 66 steps
        currentPosition = 0;
        desiredPosition = 66;           //set desired position
to 66 to drive motor

```

```

        digitalWrite(ledPin, HIGH);    //checks to see if
button input is read
        counter++;                      //iterate counter
        state = 2;                      //move to state 2

    }
    else {
// turn LED off:
        digitalWrite(ledPin, LOW);
    }

    break;

    case 1:
        if(currentPosition == 67){ //reset state to inert (0)
after rotating 67 steps
            state = 0;
        }
        break;

    case 2:
        if(currentPosition == 66){ //reset state to inert (0)
after rotating 66 steps
            state = 0;
        }
        break;

    }

if(currentPosition < desiredPosition){ //drive motor to
desired postion
    currentPosition++;                //if motor is not at
the desired position, move forward
    PORTA = fullSteps[currentPosition % 4];
    delay(30);
    state=0;
}
else if(currentPosition = desiredPosition){

```

```
    state=0;  
  }  
  else{  
  
    state=0;  
  }  
}
```

3. Turn on the power supply, set it to 12V, and press the button. The motor will turn about 120 degrees.