F_Interface_AL v0.01 presentation

Global interfacing view

Mounting holes

OR

Wiring 1

Wiring 2

PADDLE TOP

PADDLE SHIFTER

CLUTCH

JST ZH 1.5mm
6 Pins
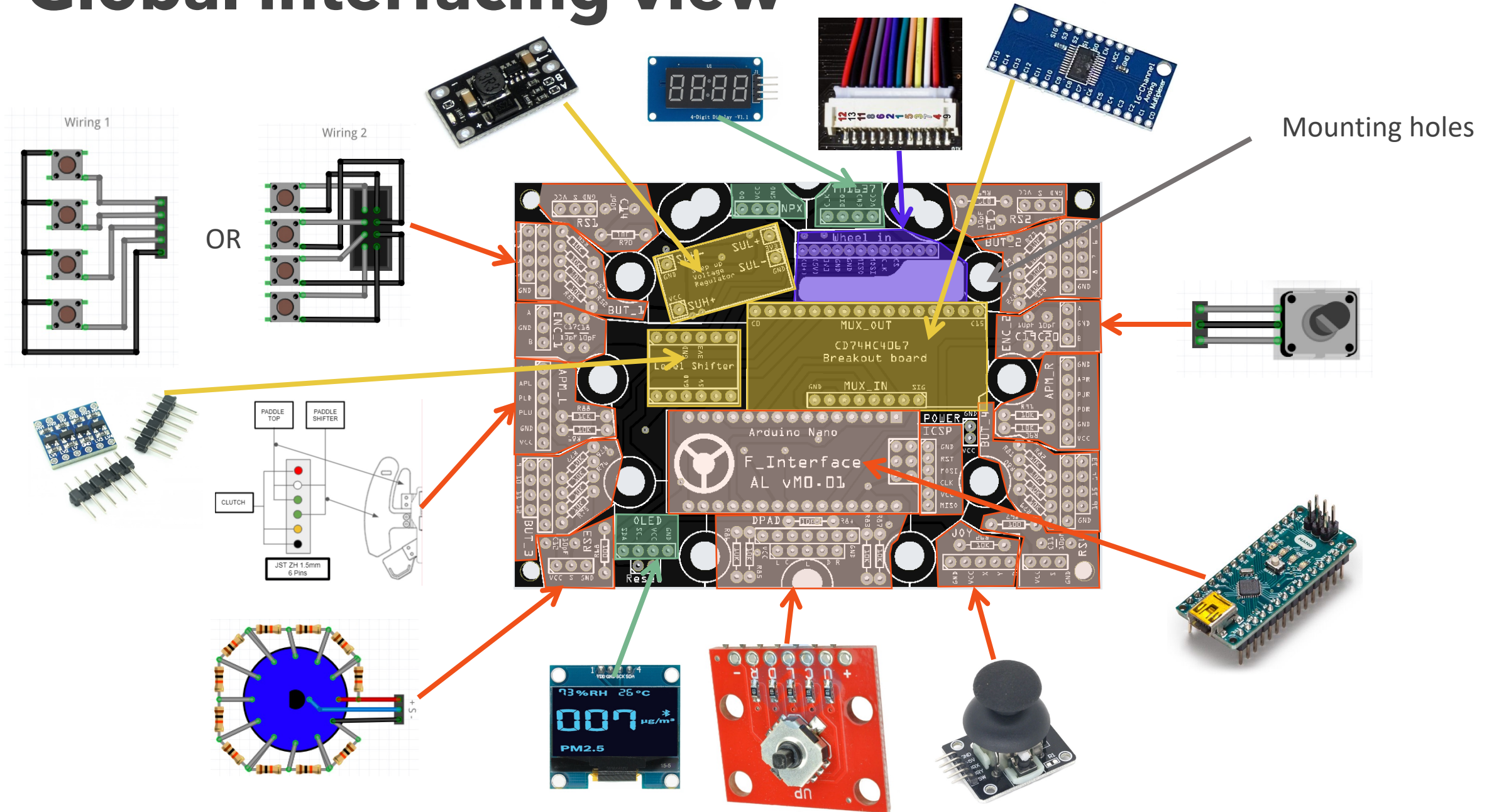
Dimensions

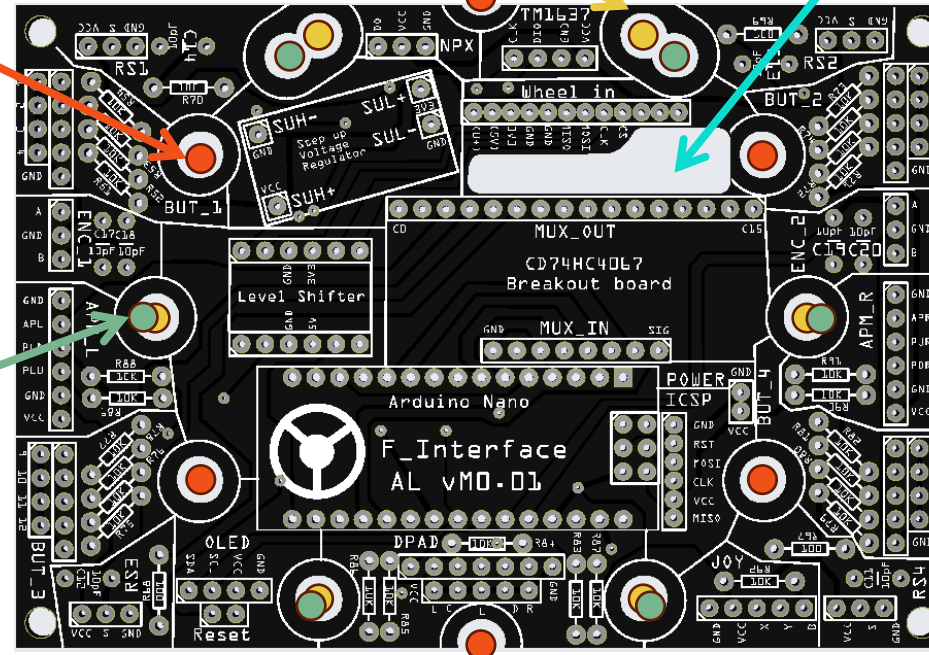6x70mm mounting holes
30° tilted

Fanatec base ribbon cablle passthrough hole

6x70mm mounting holes

Fanatec QR mounting holes
71mm diameter

69 mm

100mm

Abbreviations

Abbreviations are used on the PCB and in the software to refer to input types :

APM   Advance Paddle Module
RS   Rotary switch
BUT   Button group
ENC   Encoder
JOY   Joystick
DPAD   Group of 5 buttons that make a direction pad – up / down / left / right / center

General schematic

General schematic will help you understand the PCB wiring and link with the code.

It can be found in the Fritzing file
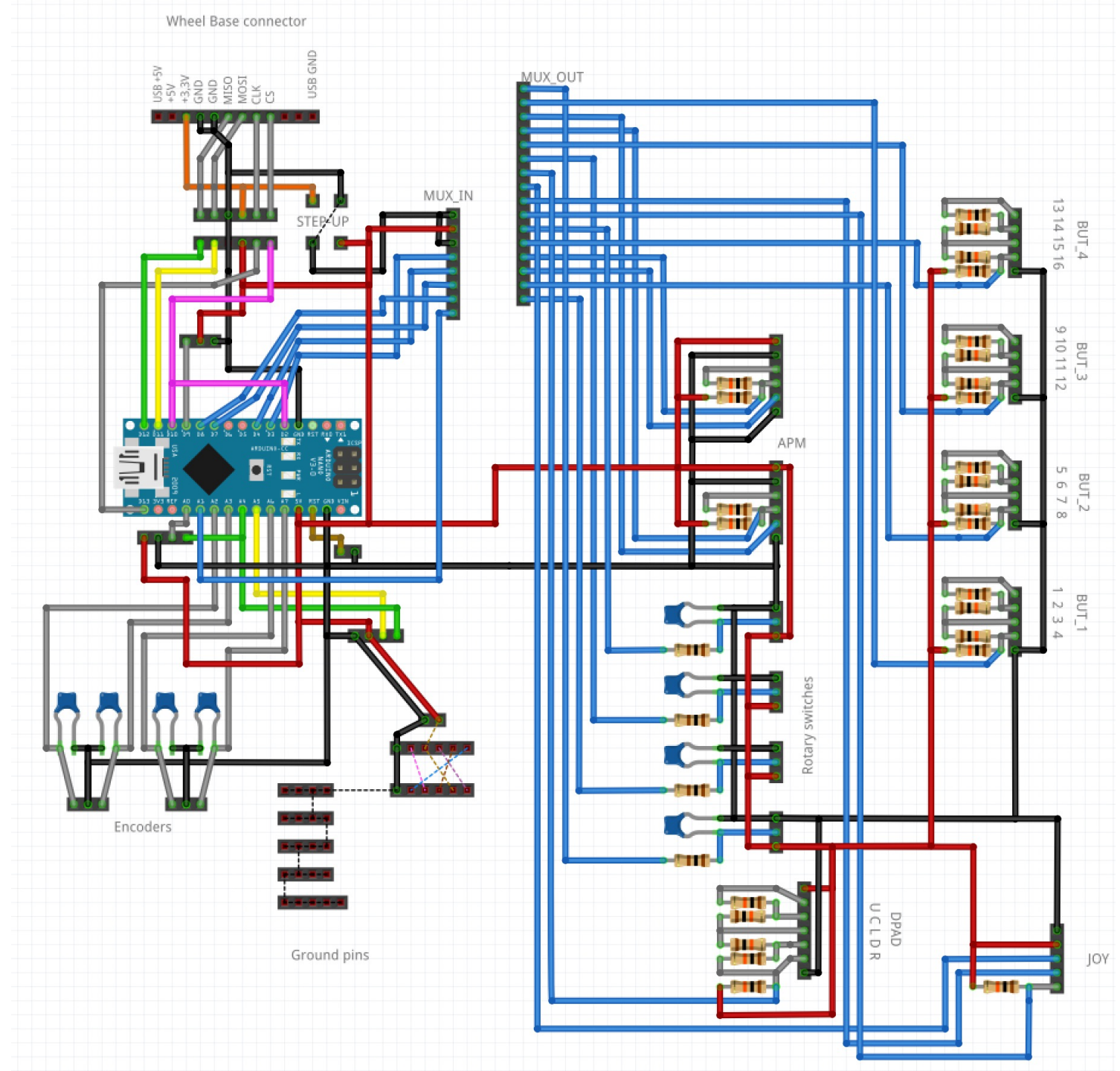
Arduino nano

The setup uses a classic arduino nano, original or clone.
As the wheels run on 3,3v for SPI communication while arduino runs at 5V, some adaptations are necessary like a level shifter and a step up voltage regulator.

As the base requires a fast response from arduino on SPI communication port at startup, the arduino bootloader has to be removed. Arduino will then be programmed via ICSP port. See this page for further details
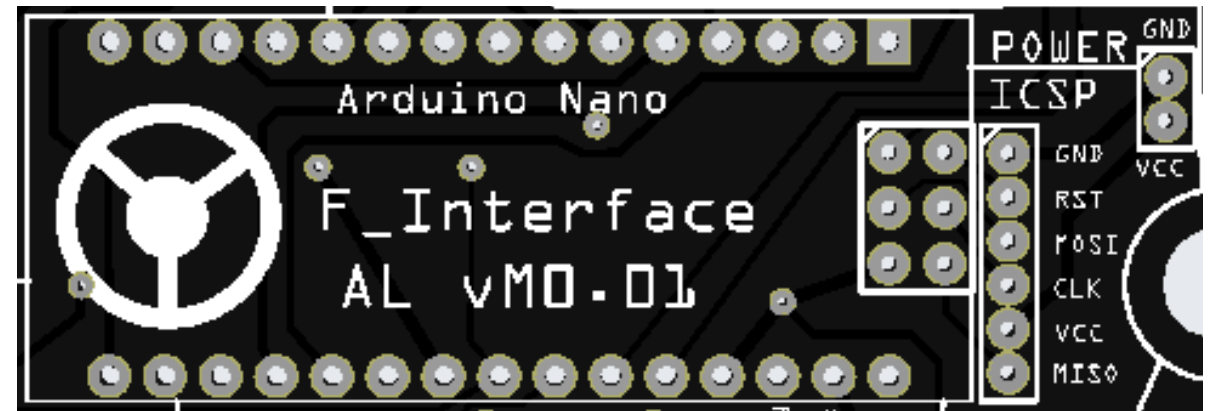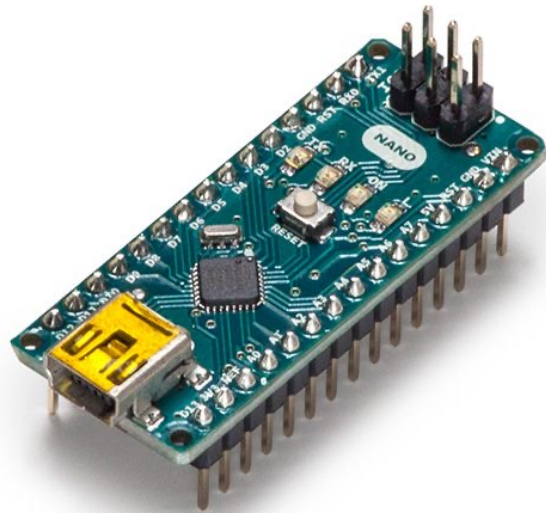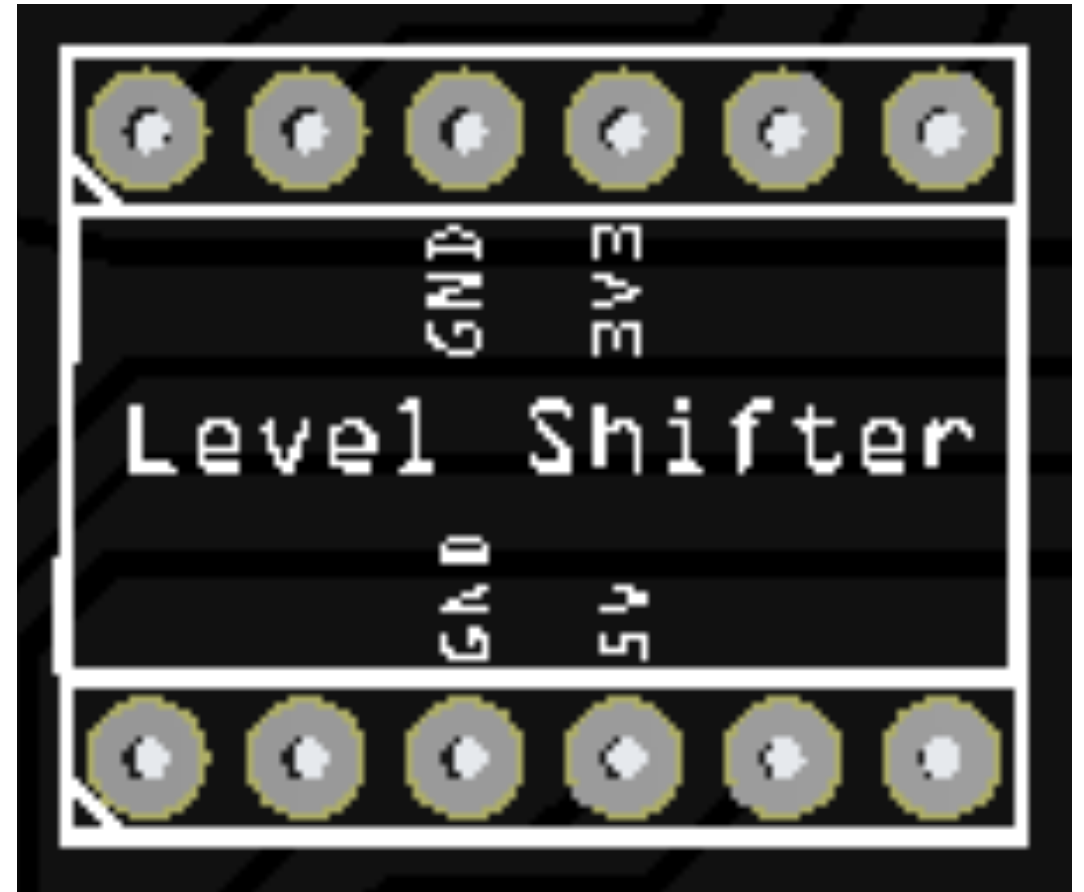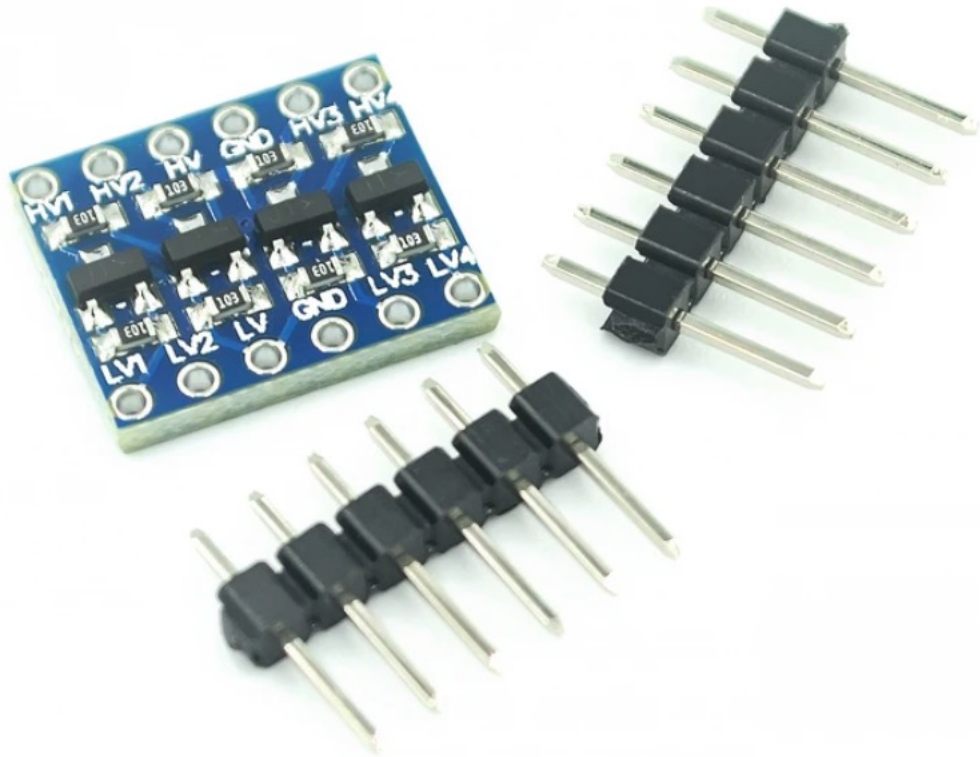
Step up voltage regulator

Used to step the voltage received from the base from 3,3 to 5V. Can be found on Aliexpress. Be sure to check the A and B jumpers on the board to have it 5V delivered and not 9 or 12V.
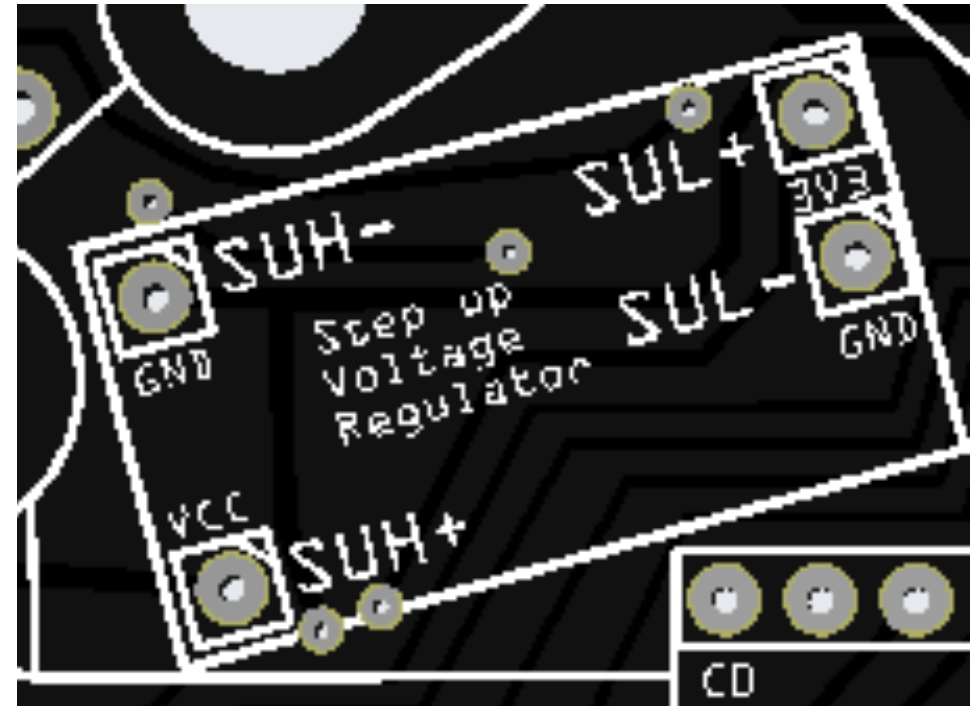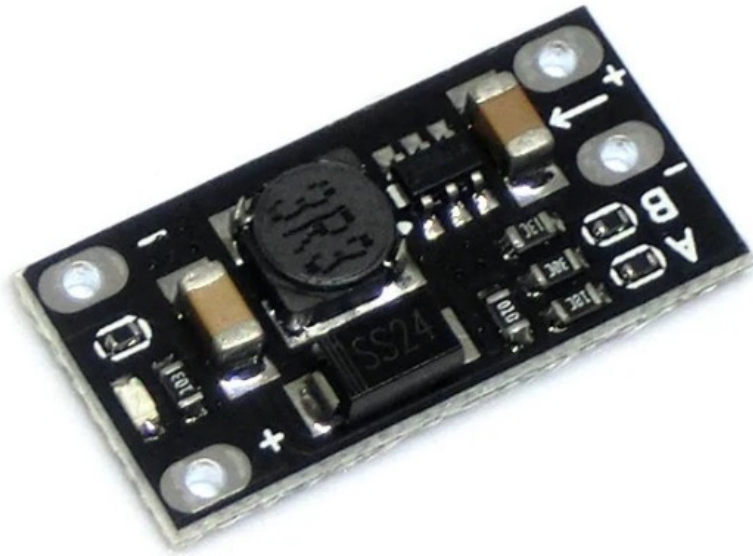
Level shifter

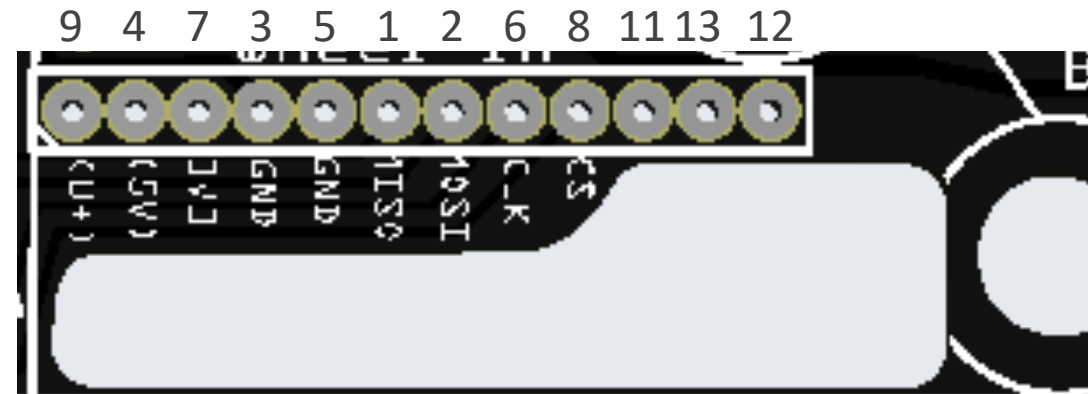Classic component that shift voltage between 2 circuits. Easily found on Aliexpress

Wheel in

This connector is used to plug the base ribbon. It respects the pinout standard described by Darknao :

1. MISO
2. MOSI
3. GND
4. 5v
5. GND
6. SCK
7. 3v3
8. CS
9. USB charge 5v*
10. DataPort1*
11. USB charge GND*
12. DataPort2*

Credit :
https://github.com/darknao/btClubSportWheel
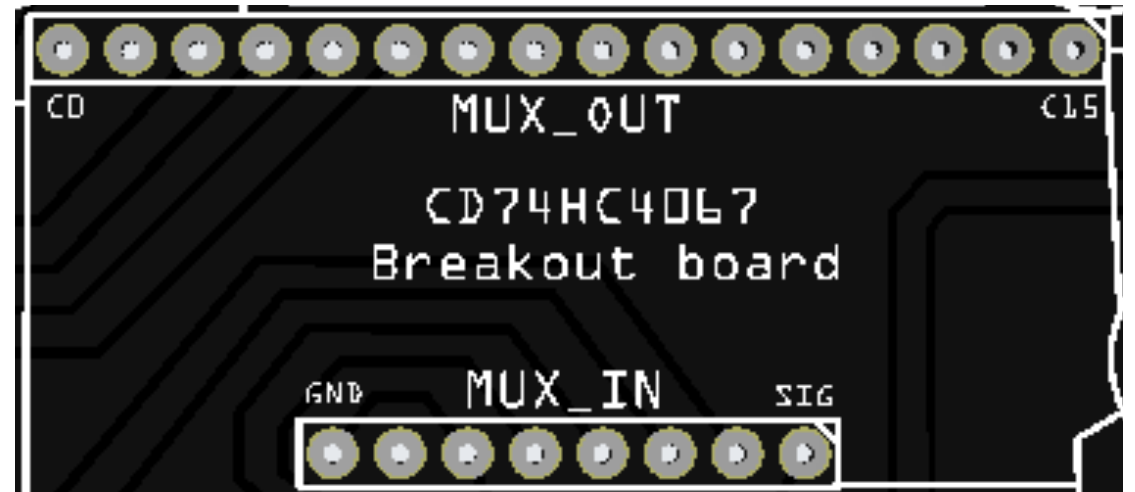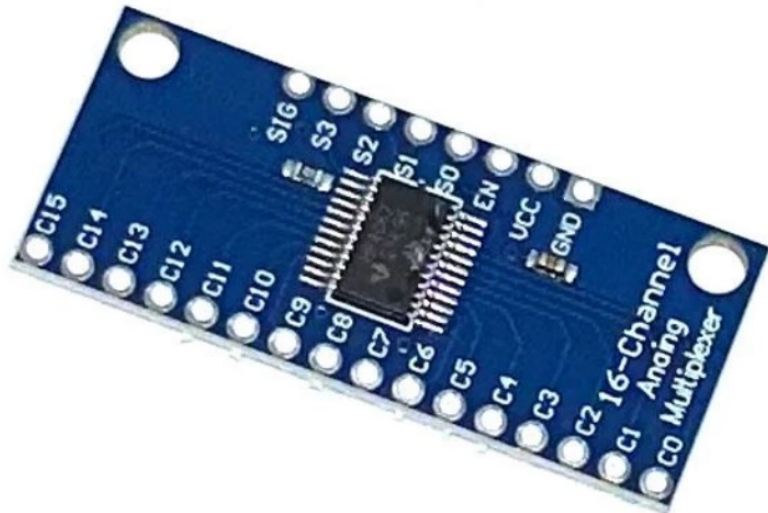
CD74HC4067 multiplexer

This component is used to multiplexed the analog reading from buttons / rotary switches / ... to the arduino.
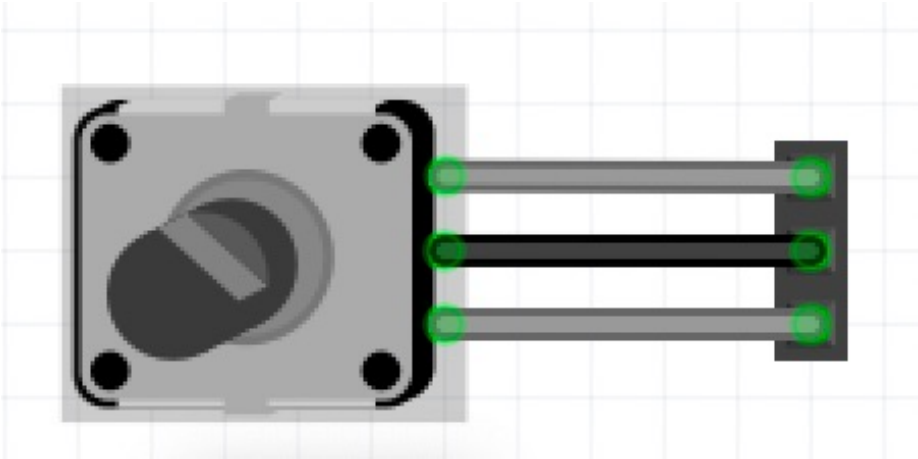
Rotary switch

You can use any rotary switch. You just need to solder 10K resistors between each connector according to the below presented schematic. RS16 – 1pole from Aliexpress is a good option

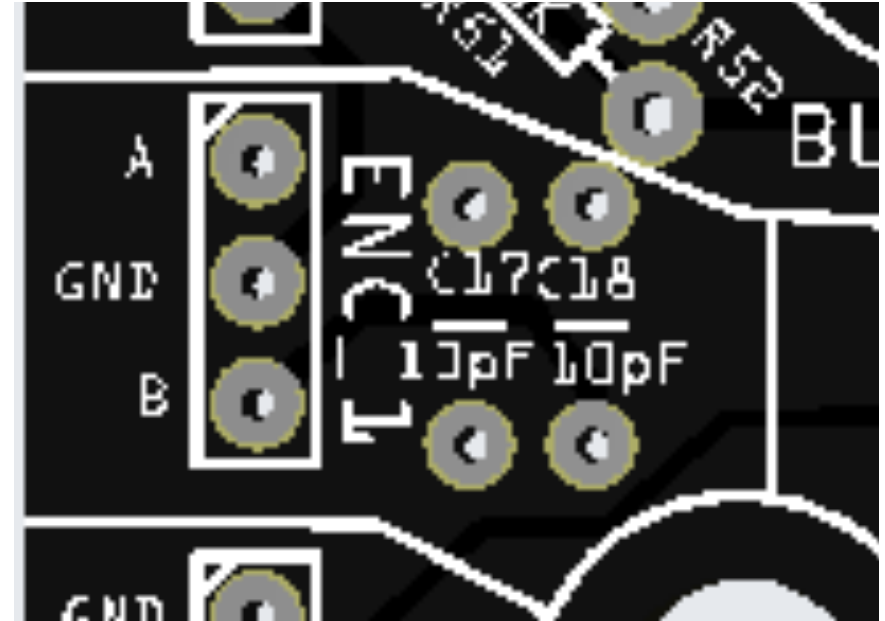On the PCB side, you will need 1x 100k resistor + 1x 10pF capacitor for debounce.
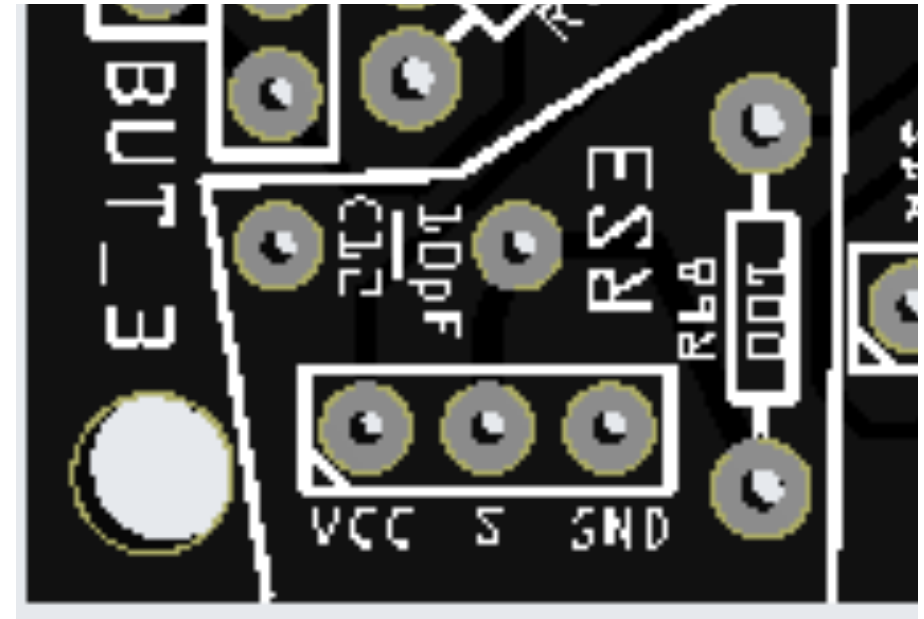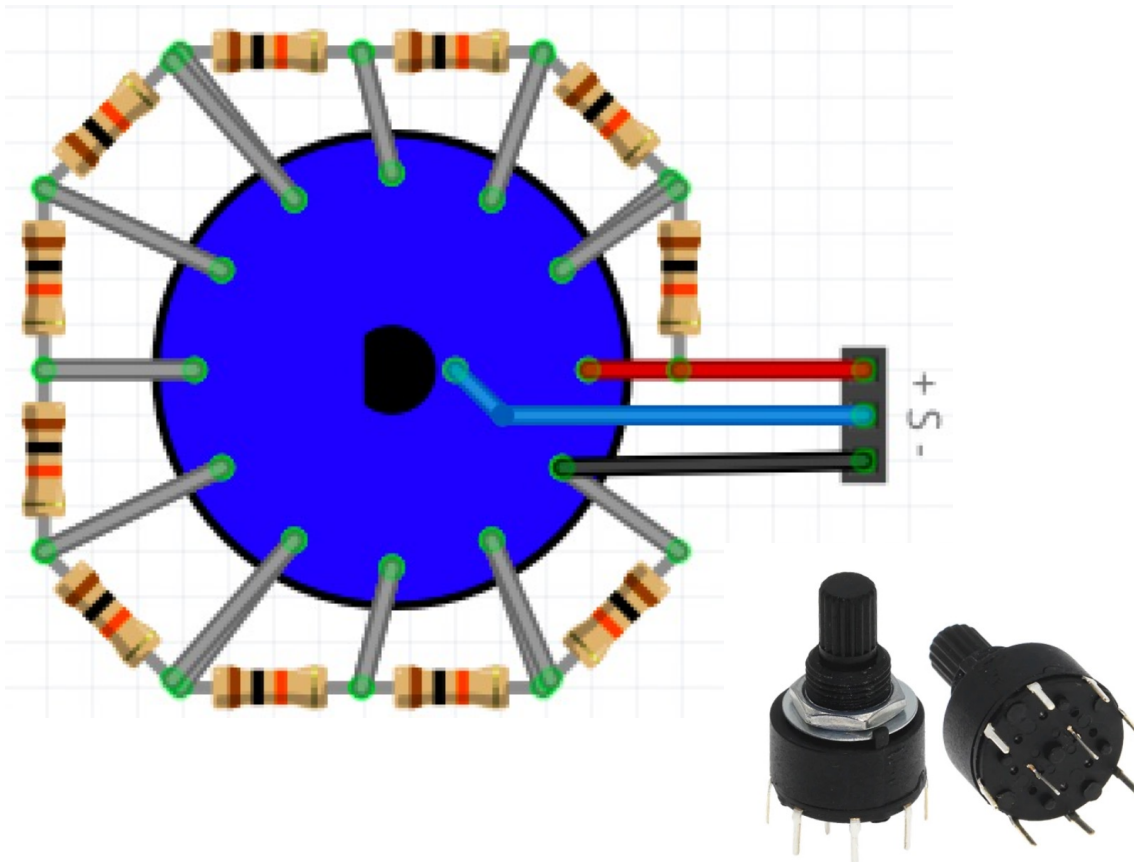
Encoder

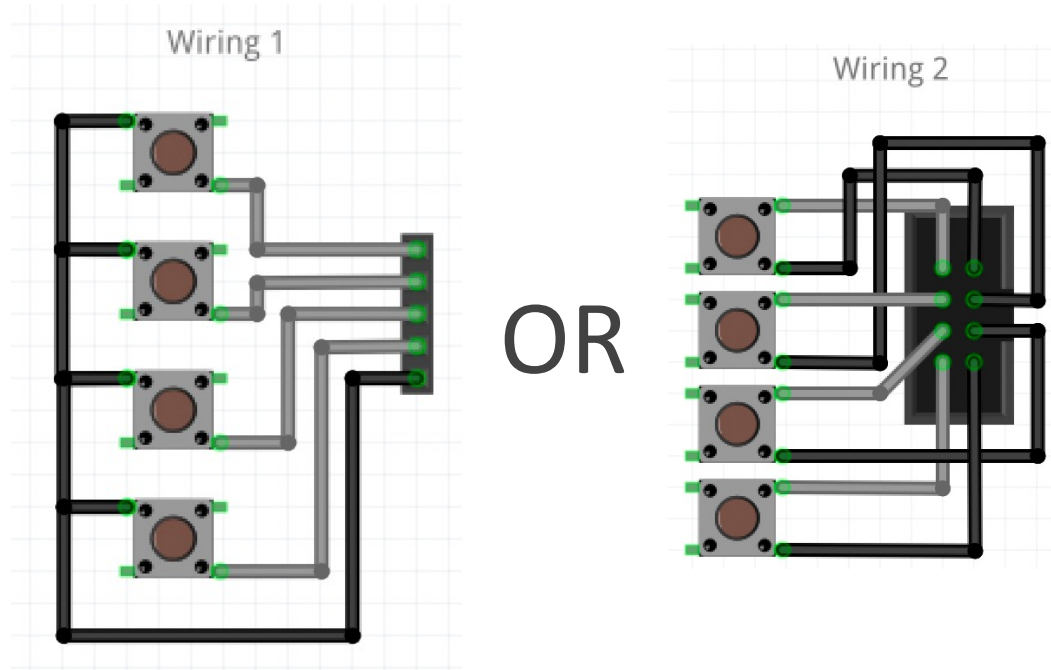Everything needed for the encoder is placed on the PCB.

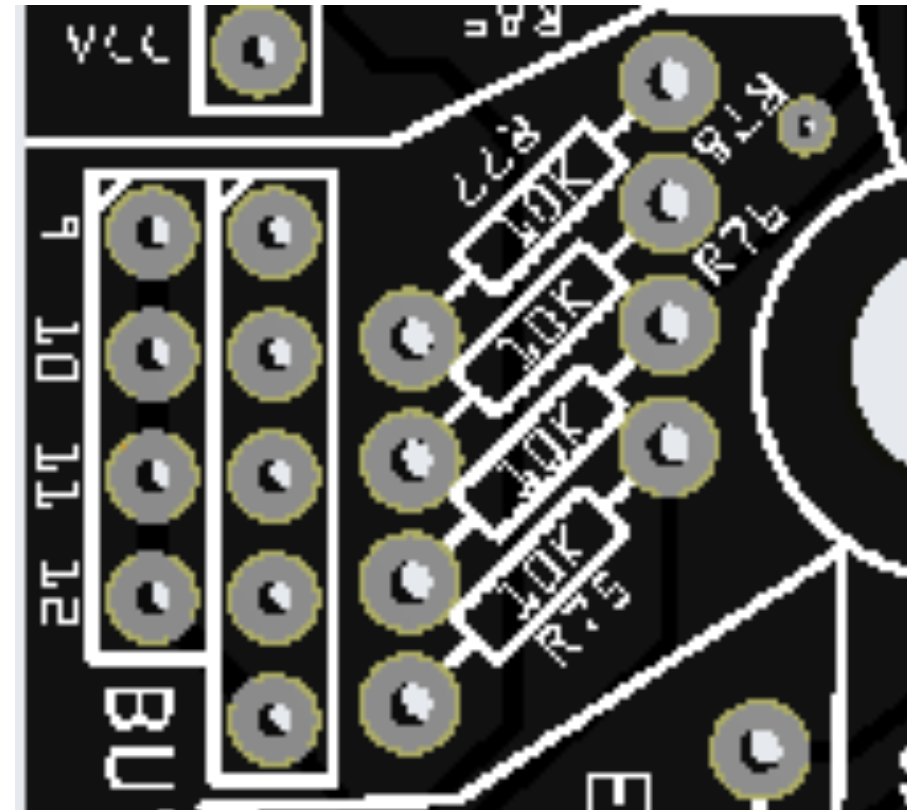On the PCB side, you will need 2x 10pF capacitors for debounce.

Button groups

You have 4 groups of buttons. They are multiplexed to save I/Os on the microcontroller.

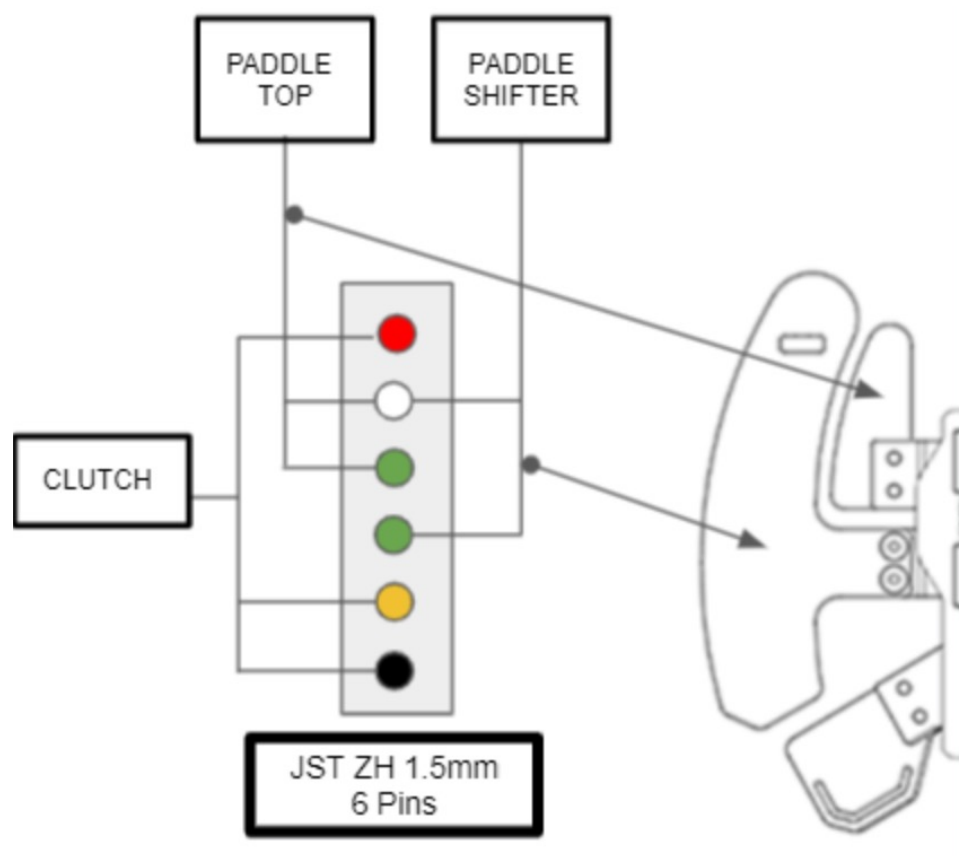You can wire them by 4 or individually as shown below

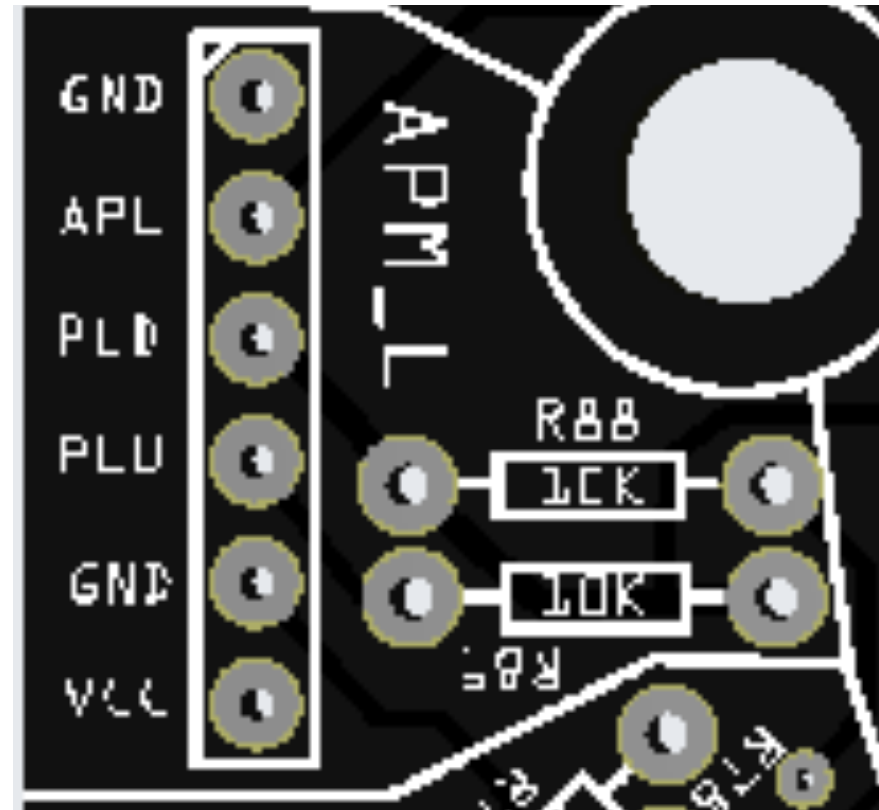On the PCB side, you will need 4x 10k resistors per button group

APM

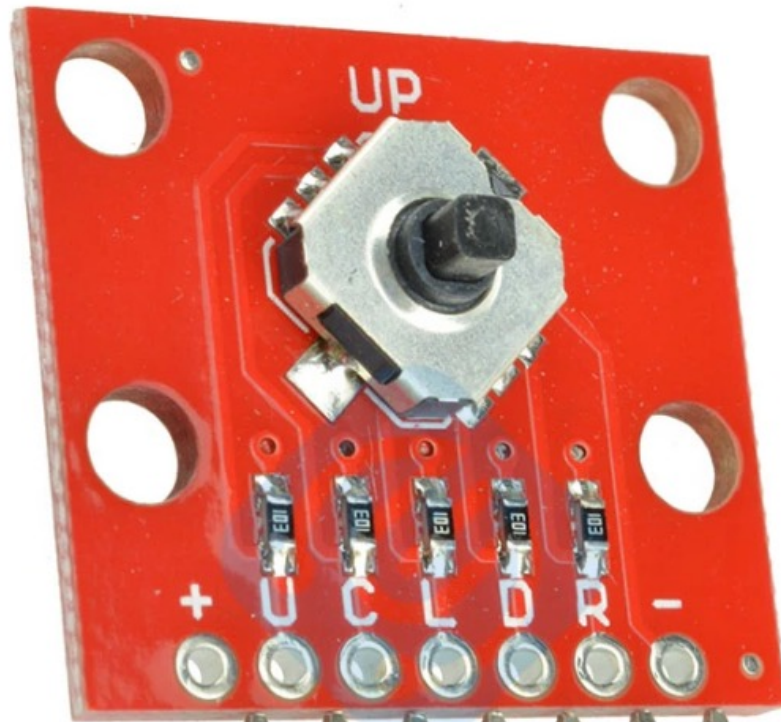You can plug Advance paddle modules to the board that have the following pinout :

On the PCB side, you will need 2x 10k resistors

DPAD

You can plug a DPAD module to the board that has the following pinout. You can also use 5 seperate pressbuttons.
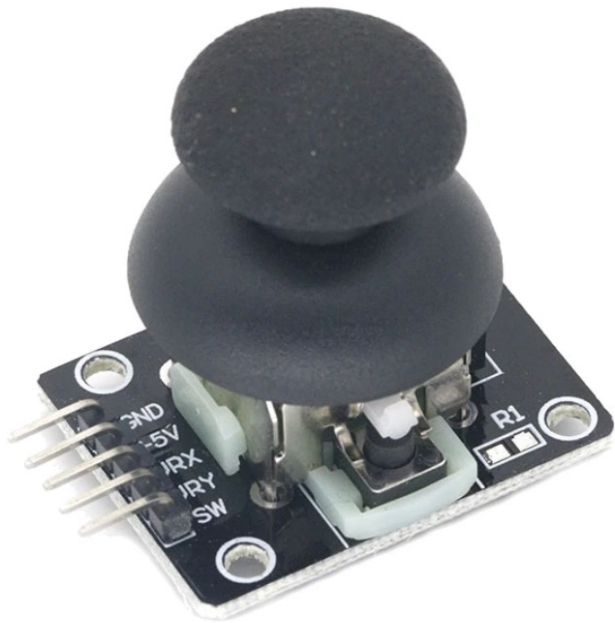
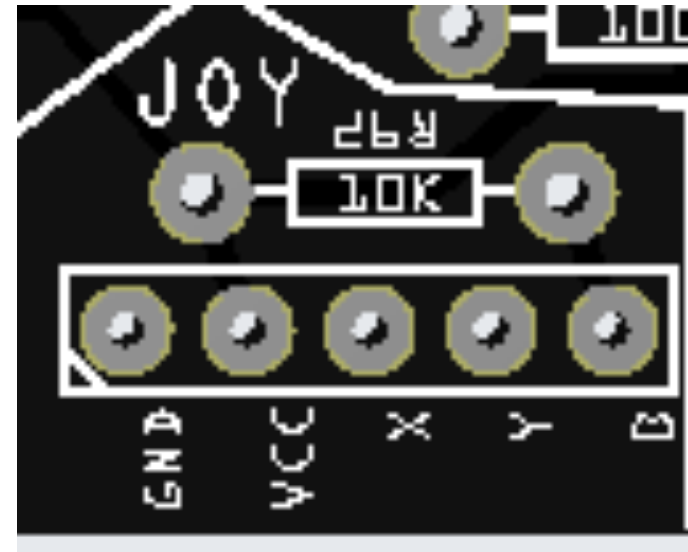On the PCB side, you will need 5x 10k resistors

Joystick

You can plug a joystick module to the board, a standard one or custom 1.

On the PCB side, you will need 1x 10k resistors to manage the button press

TM1637

You can hook up a 7 segments display based on TM1637 driver. Nothing special here to connect it

OLED display

You can hook up an OLED display. Nothing special here to connect it