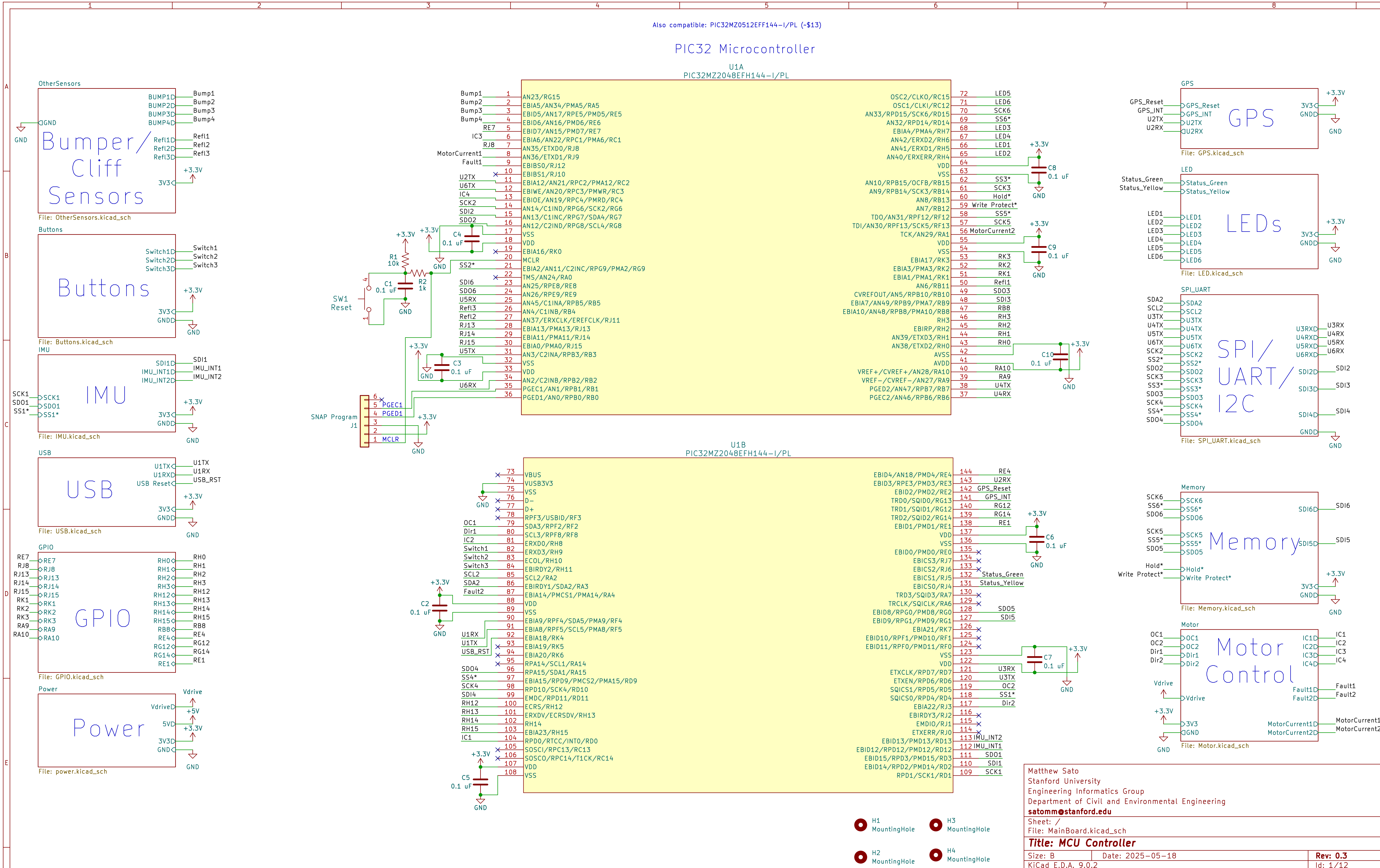

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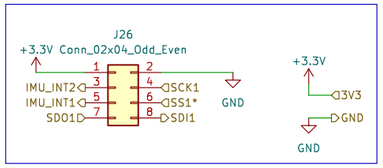
Sheet: /
File: MainBoard.kicad_sch

Title: MCU Controller

Size: B	Date: 2025-05-18	**Rev: 0.3**
KiCad E.D.A. 9.0.2		Id: 1/12

Provide SPI Pins for Connecting to IMU



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Sheet: /IMU/
File: IMU.kicad_sch

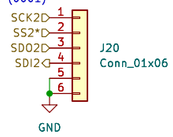
Title: MCU Controller

Size: B	Date:	**Rev: 0.3**
KiCad E.D.A. 9.0.2		Id: 3/12

Groups pins together for SPI/UART/I2C for Jetson communication and for future use.

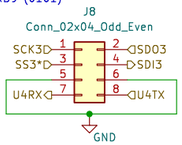
SPI2 (Jetson Communications)

SPI2 (PIC32 PPS Mapping)
SS*: RG9 (0110 ouput, 0001 input)
SCK: RG6
SDO: RG8 (0110)
SDI: RG7 (0001)



SPI3/UART4 (General Purpose Use)

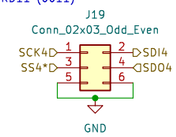
SPI3 (PIC32 PPS Mapping)
SS*: RB15 (0111 ouput, 0011 input)
SCK: RB14
SDO: RB10 (0111)
SDI: RB9 (0101)



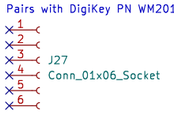
UART4 (PIC32 PPS Mapping)
TX: RB7 (0010)
RX: RB6 (0101)

SPI4 (General Purpose Use)

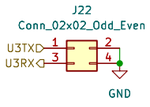
SPI4 (PIC32 PPS Mapping)
SS*: RD9 (0111 ouput, 0000 input)
SCK: RD10
SDO: RA15 (1000)
SDI: RD11 (0011)



Pairs with DigiKey PN WM2015-ND

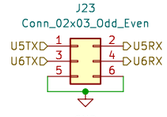


UART3 (PIC32 PPS Mapping)
TX: RD6 (0001)
RX: RD7 (1110)



UART3 (General Purpose Use)

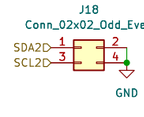
UART5 (PIC32 PPS Mapping)
TX: RB3 (0011)
RX: RB5 (1000)



UART6 (PIC32 PPS Mapping)
TX: RC3 (0100)
RX: RB2 (0111)

UART5/UART6 (General Purpose Use)

I2C2
SDA: RA3
SCL: RA2



I2C2 (General Purpose Use)

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Sheet: /SPI_UART/
File: SPI_UART.kicad_sch

Title: MCU Controller

Size: B	Date: 2025-05-18	**Rev: 0.3**
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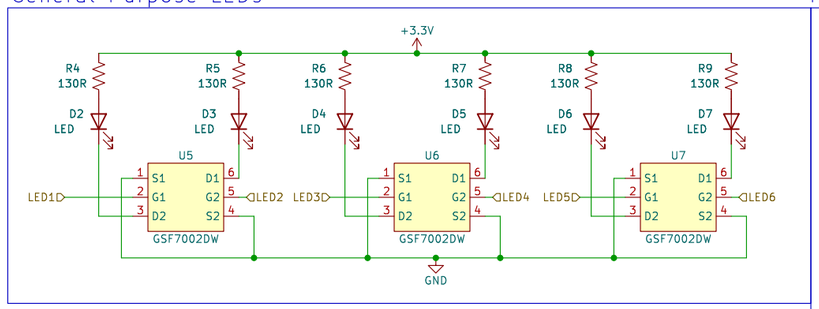
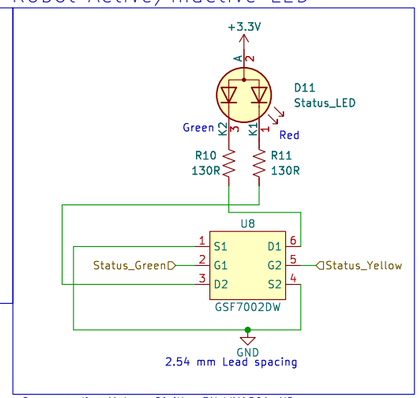
General Purpose LEDs



Robot Active/Inactive LED



Corresponding Male : DigiKey PN WM4201-ND
Corresponding Female: DigiKey PN 900-0022013037-ND
Corresponding Crimp : DigiKey PN WM2756CT-ND

GND
GND
+3.3V
3V3

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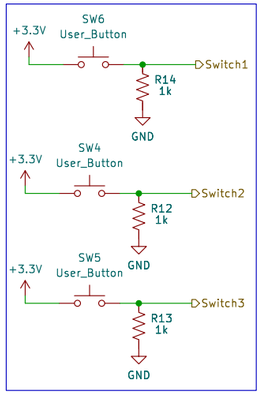
Sheet: /LED/
File: LED.kicad_sch

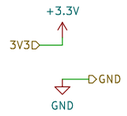
Title: MCU Controller

Size: B	Date:	**Rev: 0.3**
KiCad E.D.A. 9.0.2		Id: 5/12

User Interaction Buttons



Corresponding Female: DigiKey PN 900-0022013027-ND
Corresponding Crimp : DigiKey PN WM2756CT-ND
Button : DigiKey PN EG2025-ND



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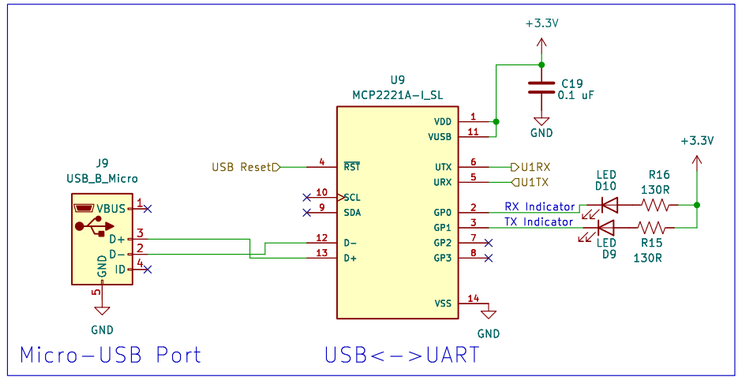
Sheet: /Buttons/
File: Buttons.kicad_sch

Title: MCU Controller

Size: B	Date:	**Rev: 0.3**
KiCad E.D.A. 9.0.2		Id: 6/12

Allow Serial Communication Via USB



+3.3V

3V3

GND

GND

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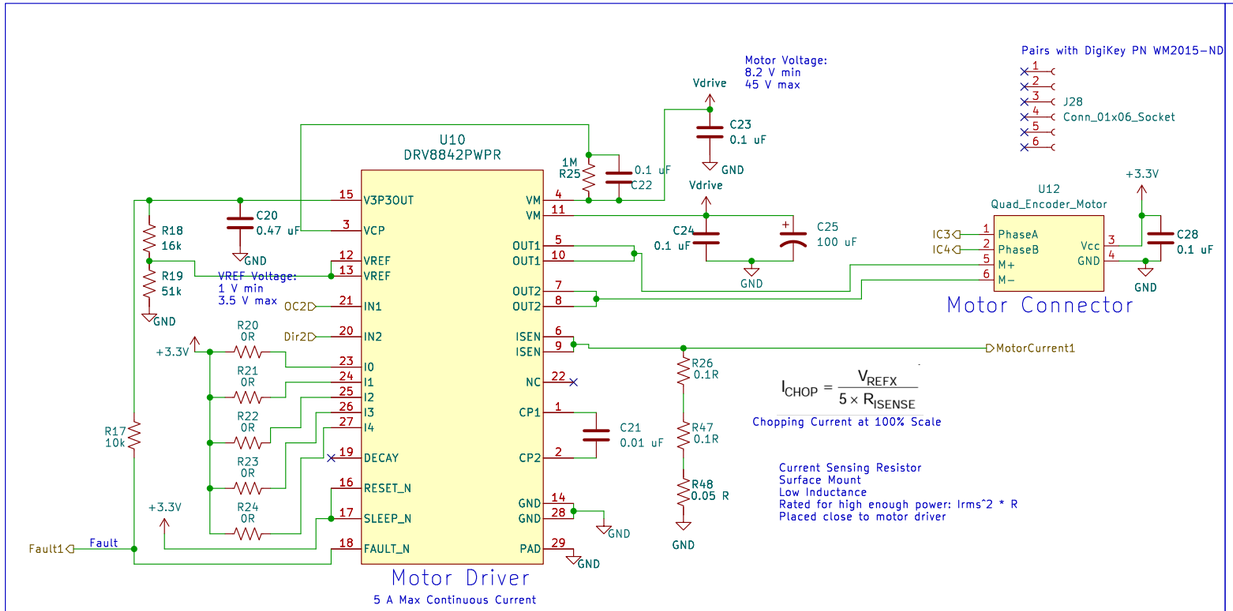
Sheet: /USB/
File: USB.kicad_sch

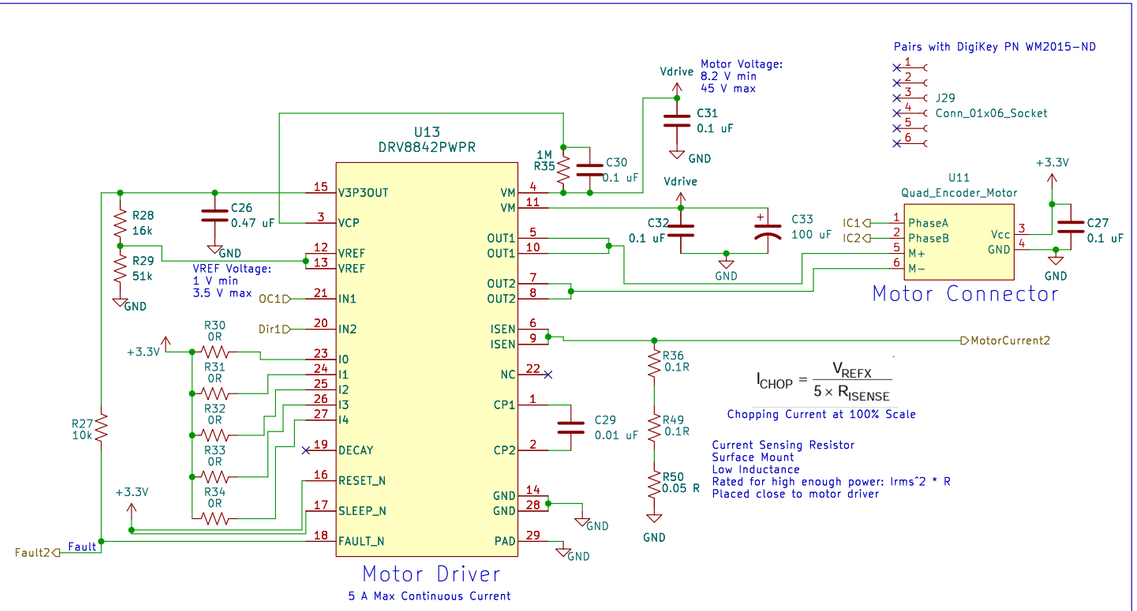
Title: MCU Controller

Size: B	Date:	**Rev: 0.3**
KiCad E.D.A. 9.0.2		Id: 7/12

Left Motor Driver



Right Motor Driver



Corresponding Molex for Motor Connector:
Corresponding Female: DigiKey PN WM2002-ND
Corresponding Crimp : DigiKey PN WM2756CT-ND

xIN1	xIN2	xOUT1	xOUT2
0	0	L	L
0	1	L	H
1	0	H	L
1	1	H	H

PWM Frequency:
100 kHz max

Slow Decay: Logic low
Mixed Decay: Open
Fast Decay: Logic high

I0 – I4 Function

I[4..0]	RELATIVE CURRENT (% FULL-SCALE CHOPPING CURRENT)
0x00h	0%
0x01h	5%
0x02h	10%
0x03h	15%
0x04h	20%
0x05h	24%
0x06h	29%
0x07h	34%
0x08h	38%
0x09h	43%
0x0Ah	47%
0x0Bh	51%
0x0Ch	56%
0x0Dh	60%
0x0Eh	63%
0x0Fh	67%
0x10h	71%
0x11h	74%
0x12h	77%
0x13h	80%
0x14h	83%
0x15h	86%
0x16h	88%
0x17h	90%
0x18h	92%
0x19h	94%
0x1Ah	96%
0x1Bh	97%
0x1Ch	98%
0x1Dh	99%
0x1Eh	100%
0x1Fh	100%

+3.3V
3V3
Vdrive
Vdrive
GND
GND

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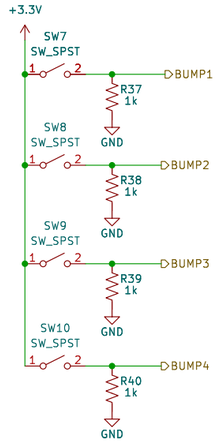
Sheet: /Motor/
File: Motor.kicad_sch

Title: MCU Controller

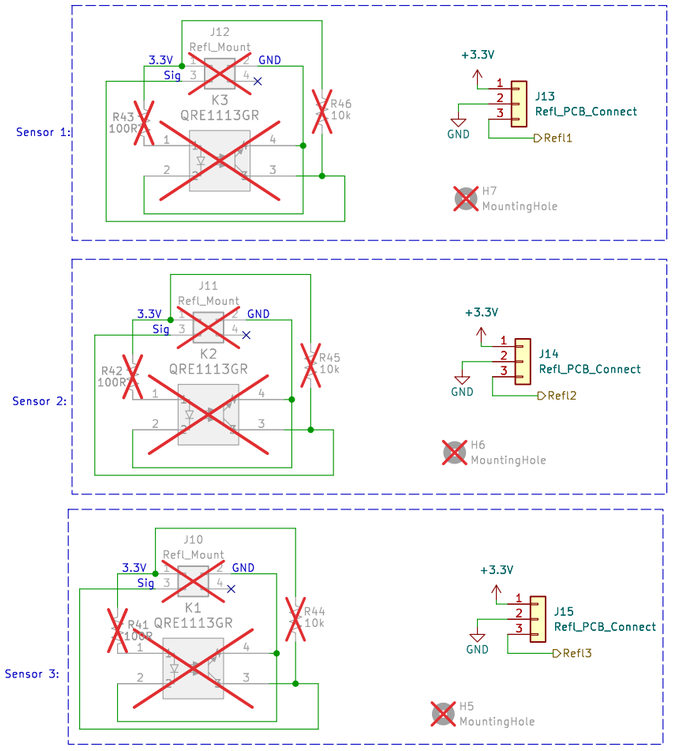
Size: B	Date:	**Rev: 0.3**
KiCad E.D.A. 9.0.2		Id: 8/12

Bumper Sensors



Corresponding Female: DigiKey PN 900-0022013027-ND
Corresponding Crimp : DigiKey PN WM2756CT-ND
Limit Switch : DigiKey PN _____

Reflective Optical Sensors (Cliff Sensor)



Corresponding Female: DigiKey PN 900-0022013037-ND
Corresponding Crimp : DigiKey PN WM2756CT-ND

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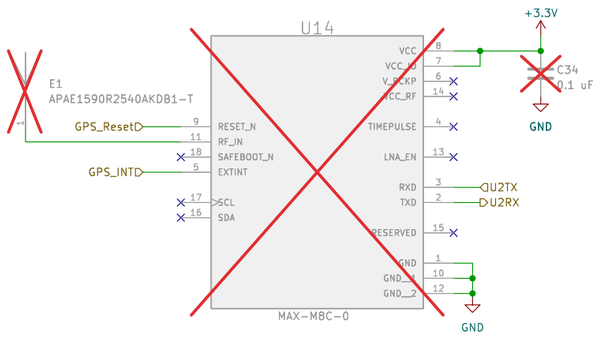
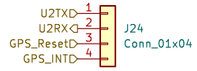
Sheet: /OtherSensors/
File: OtherSensors.kicad_sch

Title: MCU Controller

Size: B	Date:	**Rev: 0.3**
KiCad E.D.A. 9.0.2		Id: 9/12





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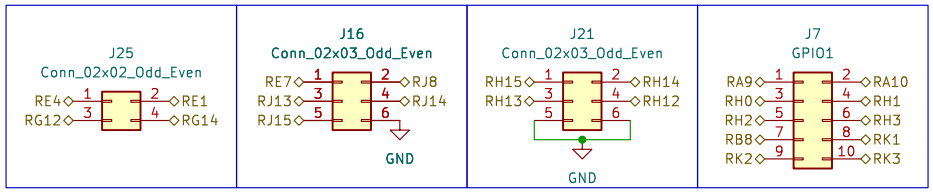
Sheet: /GPS/
File: GPS.kicad_sch

Title: MCU Controller

Size: B	Date:	**Rev: 0.3**
KiCad E.D.A. 9.0.2		Id: 10/12

Provide Access to Unused Pins



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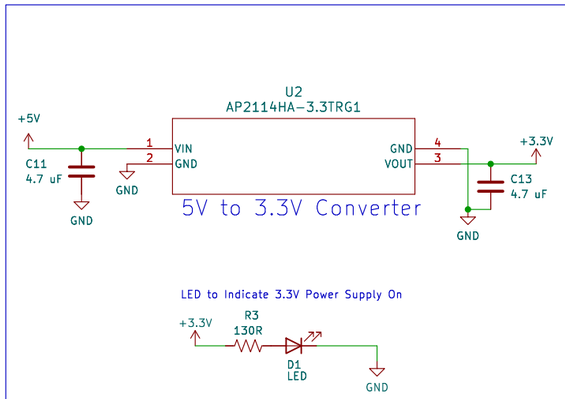
Sheet: /GPIO/
File: GPIO.kicad_sch

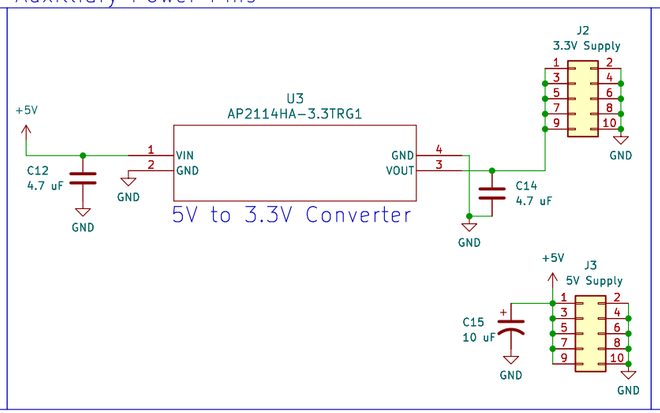
Title: MCU Controller

Size: A4	Date: 2025-05-18	**Rev: 0.3**
KiCad E.D.A. 9.0.2		Id: 11/12

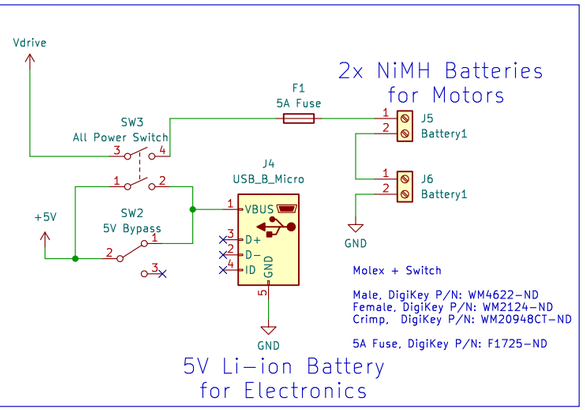
3.3V Converter for ICs



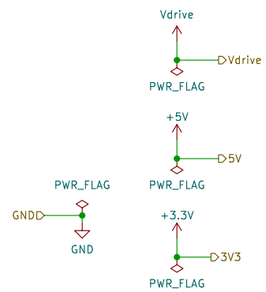
Auxilliary Power Pins



Power Switches



Inputs:
1) Motor Battery: 2x NiMH Battery, 7.2 V Each
2) Battery for MCU: 5 V



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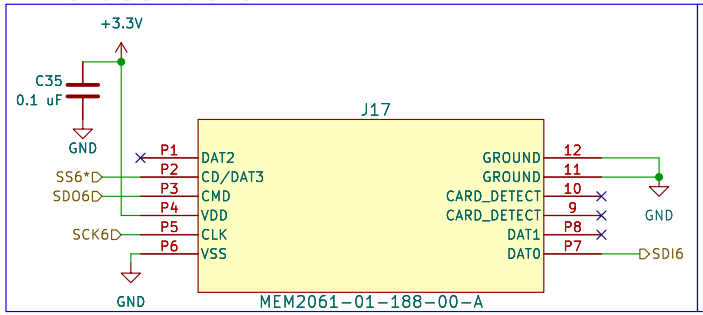
Sheet: /Power/
File: power.kicad_sch

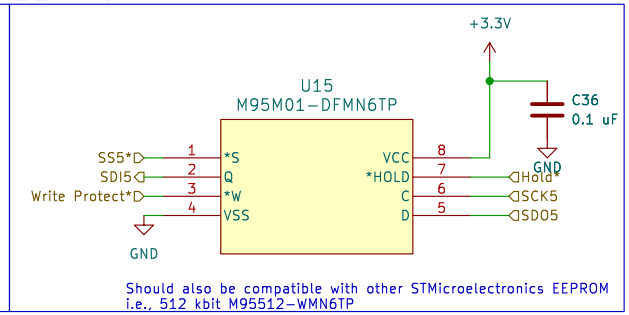
Title: MCU Controller

Size: B	Date:	**Rev: 0.3**
KiCad E.D.A. 9.0.2		Id: 12/12

MicroSD Card



EEPROM



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Sheet: /Memory/
File: Memory.kicad_sch

Title: MCU Controller

Size: A4	Date:	**Rev: 0.3**
KiCad E.D.A. 9.0.2		Id: 12/12