RP2040 ZERO

+5V +3V3

5V 3V3

	GP0	GP29	20
SDA0 — 1 GP0   GP29 20
SCL0 — 2 GP1   GP28 19
3 GP2   GP27 18
IN1_1 — 4 GP3 GP26 17 — TX
IN2_1 — 5 GP4 GP15 16 — RX
IN3_1 — 6 GP5 GP14 15 — SCLK
7 GP6   GP13 14 — CS_2
8 GP7   GP12 13 — MISO
IN3_2 — 9 GP8 GP11 12 — CS_1
IN2_2 — 10 GP9 GP10 11 — IN1_2

GND 23

RZ1
RP2040-Zero

GND

ELRS RECEIVER

ELRS_Receiver

+3V3   TX   R
       RX   T
             V
             G

GND

IMU BNO055

+3V3

        VIN
        GND
SCL0   SCL
SDA0   SDA
GND   ADC
        INT
        BOOT
        REST

BNO055

SIMPLEFOC MINI DRIVERS

                GND
        IN1_1   IN1
        IN2_1   IN2
+3V3   IN3_1   IN3
    GND   EN

SimpleFOC_Mini_1

                GND
        IN1_2   IN1
        IN2_2   IN2
+3V3   IN3_2   IN3
    GND   EN

SimpleFOC_Mini_2

MOTOR ENCODERS

+3V3
                GND
                VCC
        SCLK   SCLK/SCL
    GND MISO   MISO/SDA
        CS_1   CS

MT6701_1

+3V3
                GND
                VCC
        SCLK   SCLK/SCL
    GND MISO   MISO/SDA
        CS_2   CS

MT6701_2

Figure 1: Pin Configuration for SOP-8 Package

Sensing Center at Geometry Center

Pin List

Name	#	Type	Description
VDD	1	Power Supply	3.3~5.0V Supply
MODE	2	Digital Input with Build in 200KΩ Pull-up Resistor	ABZ or I²C/SSI Selection
OUT	3	Analog/Digital Output	Analog or PWM Output
GND	4	Power Supply	Ground
PUSH	5	Digital Output	Push Button Function Output
A	6	Digital Input/output	Incremental Signal A/U or I²C Data 'SDA', or SSI Data 'DO'
B	7	Digital Input/output	Incremental Signal B/V or I²C Clock 'SCL', or SSI Clock 'CLK'
Z	8	Digital Input/output with Build in 200KΩ Pull-up Resistor	Incremental Signal Z/W or SSI 'CSN'

5V			
GND			
3V3			
ADC3	GP29		
ADC2	GP28		
I2C1 SCL	ADC1	GP27	
I2C1 SDA	ADC0	GP26	
I2C1 SCL	SPI1 TX	GP15	
I2C1 SDA	SPI1 SCK	GP14	

RP2040-Zero
BOOT   RESET

GP0	SPI0 RX	I2C0 SDA	UART0 TX
GP1	SPI0 CSn	I2C0 SCL	UART0 RX
GP2	SPI0 SCK	I2C1 SDA	
GP3	SPI0 TX	I2C1 SCL	
GP4	SPI0 RX	I2C0 SDA	UART1 TX
GP5	SPI0 CSn	I2C0 SCL	UART1 RX
GP6	SPI0 SCK	I2C1 SDA	
GP7	SPI0 TX	I2C1 SCL	
GP8	SPI1 RX	I2C0 SDA	UART1 TX
GP9	SPI1 CSn	I2C0 SCL	UART1 RX
GP10	SPI1 SCK	I2C1 SDA	
GP11	SPI1 TX	I2C1 SCL	
GP12	SPI1 RX	I2C0 SDA	UART0 TX
GP13	SPI1 CSn	I2C0 SCL	UART0 RX

GND			
GP25			
GP24			
GP23			
GP22			
GP21		I2C0 SCL	
GP20		I2C0 SDA	
GP19	SPI0 TX	I2C1 SCL	
GP18	SPI0 SCK	I2C1 SDA	
GP17	SPI0 CSn	I2C0 SCL	UART0 RX

WS2812 RGB LED
used pin

GP16	DIN

Balancer Robot Mk1

Alberto Mugavero

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Title: Balancer Robot Mk1

Size: A4   Date: 21/11/2025   Rev:

KiCad E.D.A. 9.0.6   Id: 1/1