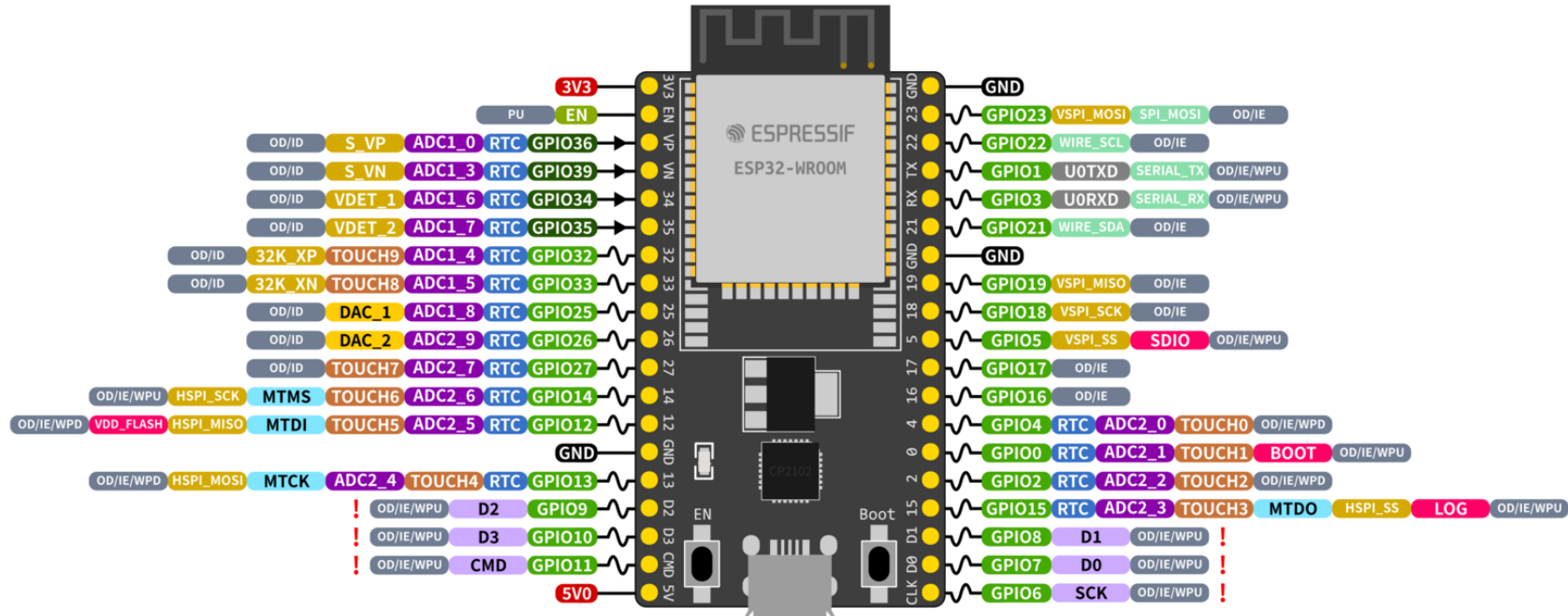


OBC Interfaces					
Interface / Protocol	Usage / Interfaced subsystem	Harness ID	GPIO Function	GPIO Used	Cable Color
UART0	Flashing / Serial Traces		TXD0	GPIO1	
			RXD0	GPIO3	
UART2	Neo-6M GPS Module		TXD2	GPIO17	
			RXD2	GPIO16	
I2C	MPU-6050 IMU		SCL	GPIO22	
			SDA	GPIO21	
	HMC5883 Magnetometer		SCL	GPIO22	
			SDA	GPIO21	
	ADS1115 16-Bit ADC		SCL	GPIO22	
			SDA	GPIO21	
	-				
SPI	SD Card Module		MISO	GPIO19	
			MOSI	GPIO23	
			SCK	GPIO18	
			SS / CS	GPIO5	
PWM	MOTOR 1 / Left - Front		PWM0A / IN1	GPIO32	
			PWM0B / IN2	GPIO33	
	MOTOR 2 / Left - Rear		PWM1A / IN3	GPIO25	
			PWM1B / IN4	GPIO26	
	MOTOR 3 / Right - Front		PWM0A / IN1	GPIO27	
			PWM0B / IN2	GPIO14	
	MOTOR 4 / Right - Rear		PWM1A / IN3	GPIO12	
			PWM1B / IN4	GPIO13	

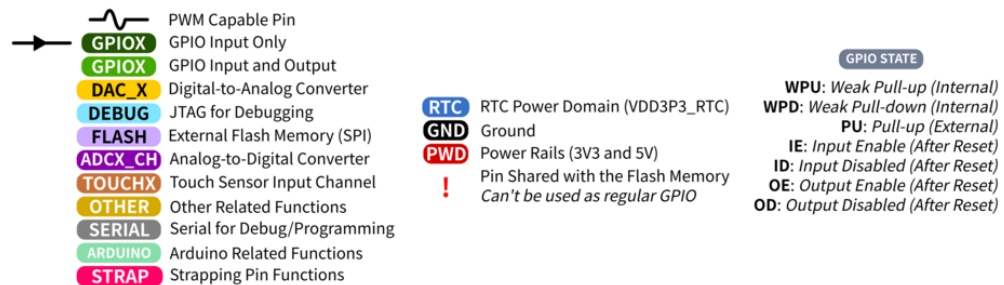
JTAG	Debugging		MTDO	GPIO15	DISABLED
			MTMS	GPIO14	
			MTDI	GPIO12	
			MTCK	GPIO13	
OneWire	DS18B20 Temperature Sensor			GPIO4	
RGB LED	WS2812B RGB LED			GPIO2	
ADS1115 ADC Interfaces					
Interface / Protocol	Usage / Interfaced subsystem	Harness ID	GPIO Function	GPIO Used	Cable Color
A0	ACS712 Hall effect Current sensor				
A1	Voltage sensor				
A2	-				
A3	-				
External Serial Debug and FW Update Interface					
M12 5-pin Male BulkHead Connector (External)		USB Micro B (Connected to ESP32 Internally)			
Pin	Wire Color	Wire Color	Pin/Function		
1	Brown	Red	Vcc		
2	White	Black	GND		
3	Blue	Green	D+		
4	Black	White	D-		

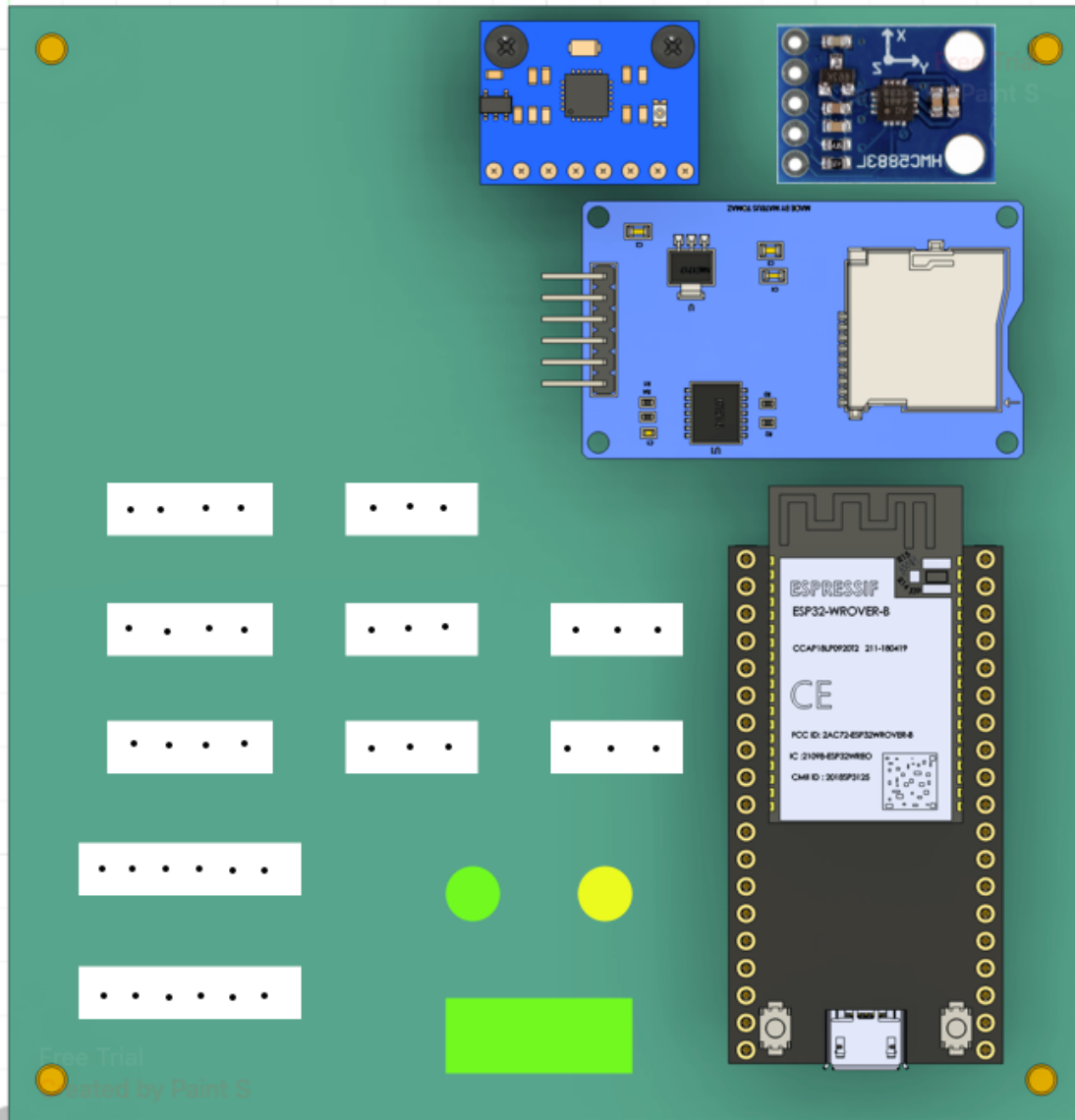
ESP32-DevKitC



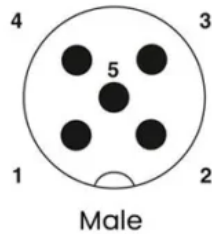
ESP32 Specs

32-bit Xtensa® dual-core @240MHz
 Wi-Fi IEEE 802.11 b/g/n 2.4GHz
 Bluetooth 4.2 BR/EDR and BLE
 520 KB SRAM (16 KB for cache)
 448 KB ROM
 34 GPIOs, 4x SPI, 3x UART, 2x I2C,
 2x I2S, RMT, LED PWM, 1 host SD/eMMC/SDIO,
 1 slave SDIO/SPI, TWAI®, 12-bit ADC, Ethernet

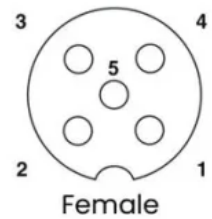




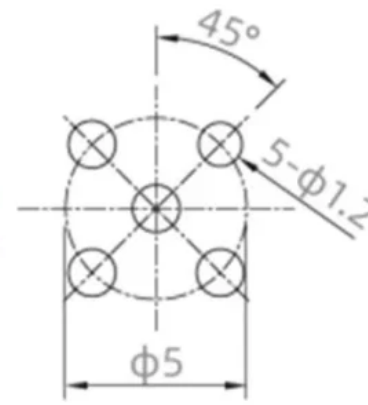
M12 A-Coded 5 Pin Connector Pinout and Color Code



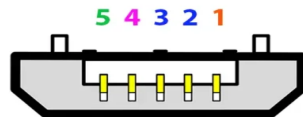
	X	Y	Wire Color
1	2.5	0	Brown
2	0	2.5	White
3	-2.5	0	Blue
4	0	-2.5	Black
5	0	0	Grey



	X	Y	Wire Color
1	-2.5	0	Brown
2	0	2.5	White
3	2.5	0	Blue
4	0	-2.5	Black
5	0	0	Grey



Pin Arrangement



Micro-B

Pin 1 **VCC** (+5 V) Power supply

Pin 2 **D-** Data line (negative)

Pin 3 **D+** Data line (positive)

Pin 4 **ID** Identification (OTG use only)

Pin 5 **GND** (Ground)

CTU Interfaces						
Interface / Protocol	Usage / Interfaced subsystem	Harness ID	GPIO Function	GPIO Used	Cable Color	
UART0	Flashing / Serial Traces		TXD2	GPIO17		
			RXD2	GPIO16		
UART2	Neo-6M GPS Module		TXD2	GPIO17		
			RXD2	GPIO16		
I2C	LCD 20 x 4		SCL	GPIO22		
			SDA	GPIO21		
	ADS1115 16-Bit ADC		SCL	GPIO22		
			SDA	GPIO21		
SPI	SD Card Module		MISO	GPIO19		
			MOSI	GPIO23		
			SCK	GPIO18		
			SS / CS	GPIO5		
Analog In	Joystick		X-axis	GPIO39	A3 / SVN	Left / Right
			Y-axis	GPIO36	A0 / SVP	Forward / Reverse
			SWITCH	GPIO25		
Digital In / Interrupts	Rotary Encoder / Selector		CLK	GPIO32		
			DT	GPIO33		
			SW	GPIO23		
Digital In	Control Switches		ARM	GPIO4		

			HEADLIGHTS	GPIO19		
			E-STOP	GPIO14		
			AUX			
Digital Out	LED Indicators		ARM			
			HEADLIGHTS			
			E-STOP			
WS2812B RGB LED	RGB LED Strip		DATA	GPIO2		
JTAG	Debugging		MTDO	GPIO15		
			MTMS	GPIO14		
			MTDI	GPIO12		
			MTCK	GPIO13		
Hall Effect Joystick Pinout	5-Pin JST Connector					
1	Black	GND	Circuit 1 Mark			
2	Red	VCC				
3	White	Vertical / Y-axis	GPIO36			
4	Yellow	Horizontal / X-axis	GPIO39			
5	Orange	Switch	GPIO25			

