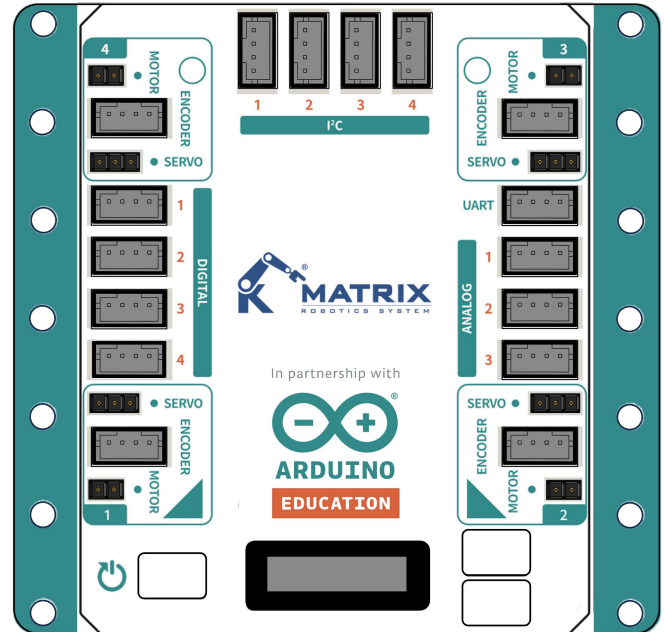


1. Feature

- Support 4 channel RC Servo control.
- Support 4 channel DC Motor with encoder.
- Support 4 channel I2C Interface.
- Support 8 channel GPIO.
- Arduino UNO R4 WiFi built-in.
- OLED, Buttons, RGB LED, Buzzer built-in.
- Co-processor for motor control and IMU.

2. Application

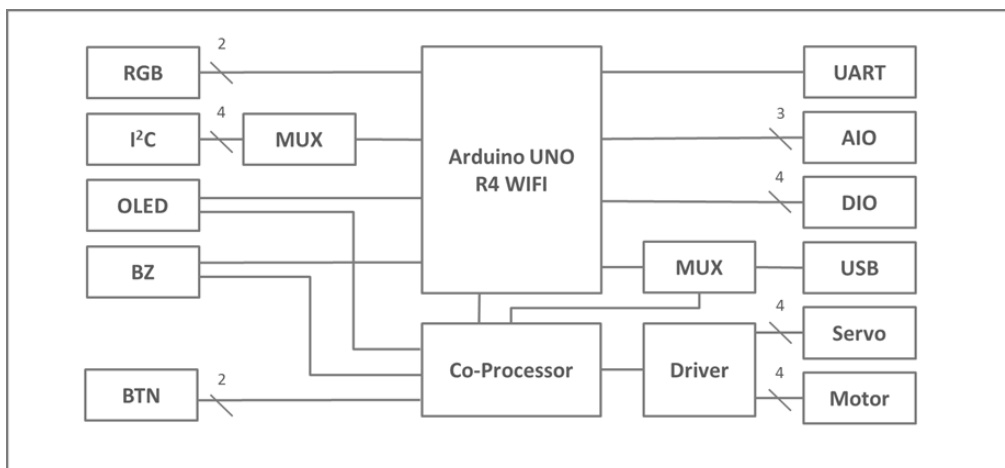
- Autonomous/TelOp Robotics
- IoT Projects Gateway
- Automatic Device



3. Introduction

MATRIX Mini R4 is an Arduino UNO R4 WiFi based robot controller. With the MATRIX building system, you can make tons of projects. From basic tracking car to omni-directional mobile platform, you can make any ideas comes out of your mind.

4. Block Diagram



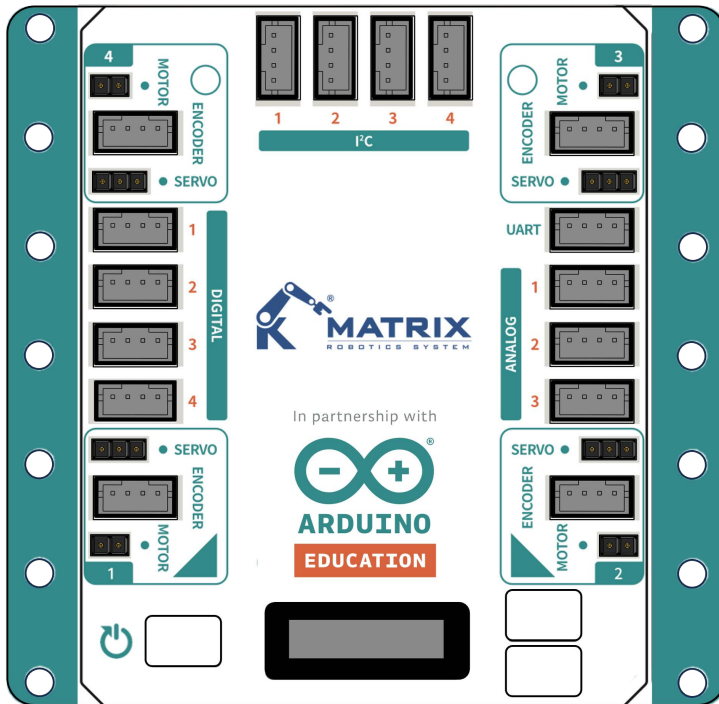
5. Pinout 5.1. Matrix Mini R4 Pinout



Pinout-I2C			
NO.	Name	I/O	Description
1	SDA	I/O	Serial data line.
2	SCL	I	Serial clock line.
3	VCC	O	Supply voltage.
4	GND	-	Supply ground.



Pinout-UART			
NO.	Name	I/O	Description
1	TX	O	Serial transmit line.
2	RX	I	Serial receive line.
3	VCC	O	Supply voltage.
4	GND	-	Supply ground.



Pinout-Analog In			
NO.	Name	I/O	Description
1	AINA	I	Analog input A.
2	AINB	I	Analog input B.
3	A5V	O	Supply voltage.
4	GND	-	Supply ground.



Pinout-Servo Out			
NO.	Name	I/O	Description
1	GND	-	Supply ground.
2	5V	O	Supply voltage.
3	PWM	O	PWM out for RC servo.



Pinout-Digital I/O			
NO.	Name	I/O	Description
1	DIOA	I/O	GPIO A.
2	DIOB	I/O	GPIO B.
3	VCC	O	Supply voltage.
4	GND	-	Supply ground.



Pinout-Motor Out			
NO.	Name	I/O	Description
1	M-	O	H-bridge out M-.
2	M+	O	H-bridge out M+.



Pinout-Encoder			
NO.	Name	I/O	Description
1	CHA	I	CH input A.
2	CHB	I	CH input B.
3	M5V	O	Supply voltage.
4	GND	-	Supply ground.

5.2. Arduino Pin Mapping

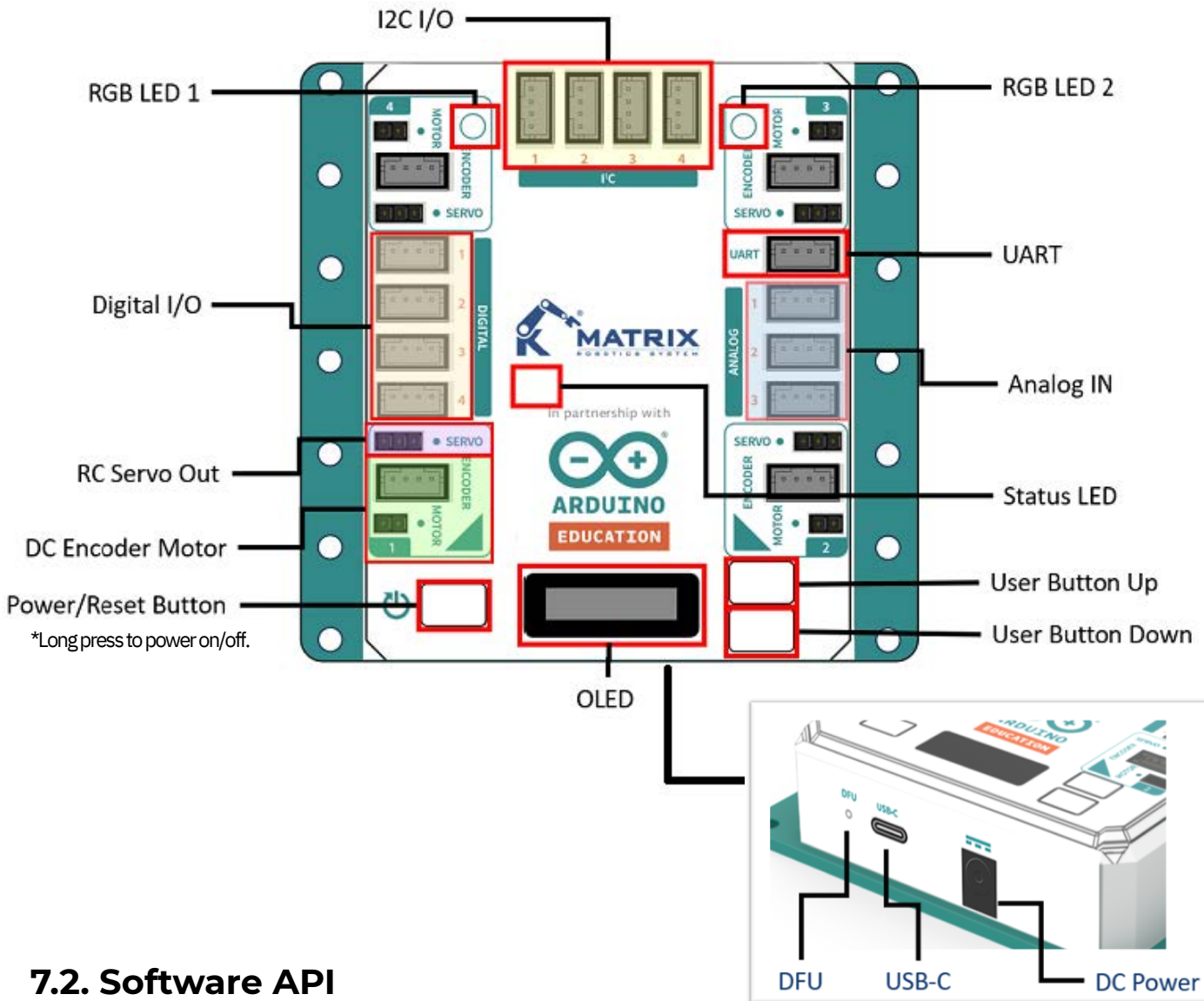
Matrix Mini R4		Arduino Uno R4 WiFi	Peripheral
D1	D1A	3	-
	D1B	2	-
D2	D2A	5	-
	D2B	4	-
D3	D3A	12	-
	D3B	11	-
D4	D4A	13	-
	D4B	10	-
A1	A1A	A1	-
	A1B	A0	-
A2	A2A	A3	-
	A2B	A2	-
A3	A3A	A4	-
	A3B	A5	-
UART	TX	1	-
	RX	0	-
I2C	SDA	-	PCA9548-SDA(0-3)
	SCL	-	PCA9548-SCL(0-3)
Looks	Buzzer	6	-
	RGB LED	7	-
RC		-	Co-Processor
DC		-	Co-Processor
BTN		-	Co-Processor

6. Electrical Characteristics

Parameter	Min	Typ	Max	Units
Input Voltage	6	-	24	V
I/O Voltage	-0.3	5	6.5	V
Digital I/O Pin Current	-	-	8	mA
Analog In Pin Current	-	-	8	mA
RC Servo Output Voltage	-	5	-	V
DC Motor Output Voltage	-	5	-	V
RC Servo Output Current	-	-	1	A
DC Motor Output Current	-	1.5	2	A
UART Baud	300	9600	115200	bit/s
I2C operating speed	100	-	400	KHz
I2C Low-Level Input Voltage	-0.5V	-	0.33*VCC	-
I2C High-Level Input Voltage	0.7*VCC	-	VCC	-
LED R Wavelength	620	-	625	nm
LED G Wavelength	522	-	525	nm
LED B Wavelength	465	-	467	nm
Operating Temperature	-40	25	85	°C

7. Usage

7.1. Hardware Guide

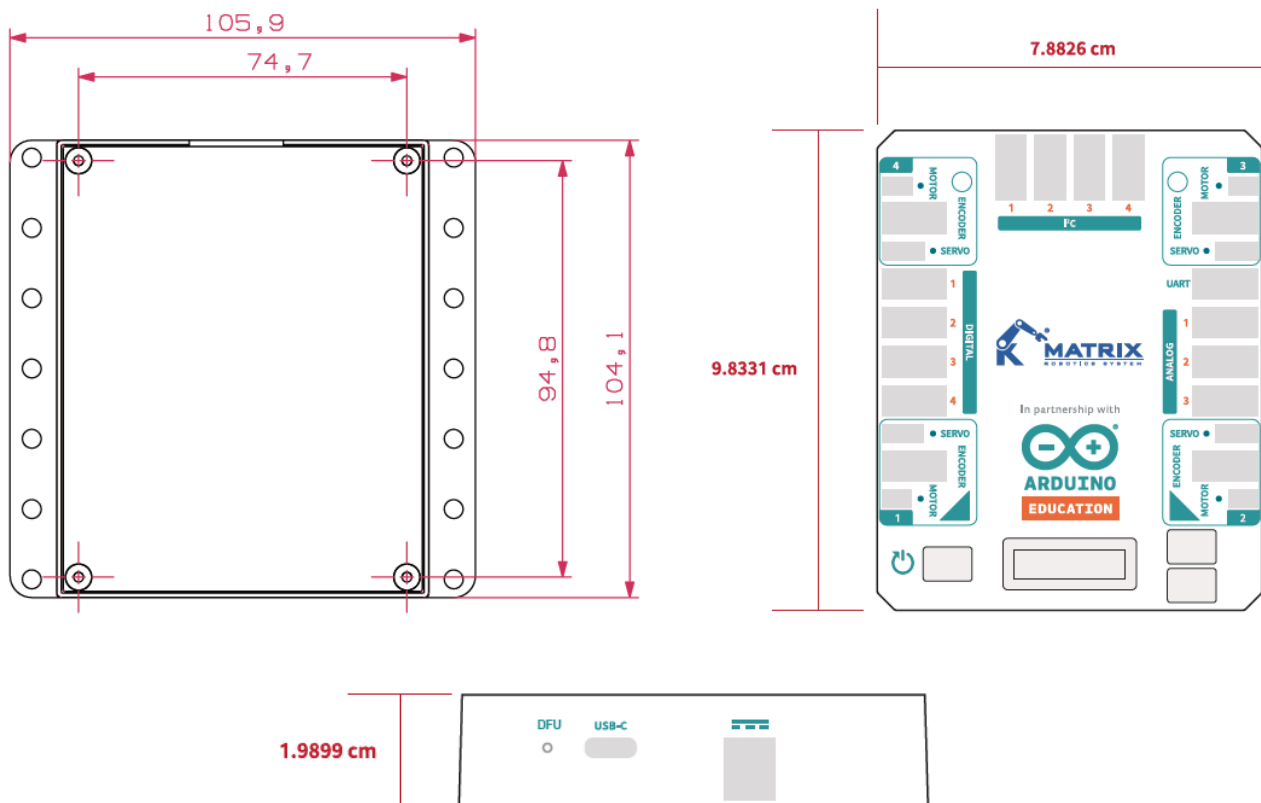


7.2. Software API

- Open Arduino IDE (At least v2.0)
- Open the Boards Manager from the Tools -> Board menu and select "Arduino Uno R4 WiFi"
- Open the Library Manager from the Sketch-> Include Library -> Manage Libraries and search "MatrixMiniR4"
- For Scratch style programming and Firmware Updating, please download "MATRIXblock" software from our website.

For further information and example code please checkout our github page <https://github.com/Matrix-Robotics/MatrixMiniR4>

8. Dimensions



9. Disclaimer

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