Unit RollerCAN

SKU:U188

Description

Unit RollerCAN is an integrated brushless DC motor motion control kit designed for efficient motion control. It features two power input methods, supporting 6-16V DC power input through the **CAN** (XT30) interface and 5V input through the Grove interface, with automatic adjustment of power coefficients to ensure optimal performance.

This kit includes a built-in FOC closed-loop drive system, equipped with a 3504 200KV brushless motor. Without forced cooling, the maximum continuous phase current is 0.5A, and the phase current can reach 1A for short periods. The driver uses a magnetic encoder feedback mechanism to achieve three-loop control of current, speed, and position, ensuring precise control. The device's axis features an optional electrical slip ring configuration, allowing the top Grove interface to remain connected to the bottom even during 360° rotation, enabling the expansion of additional modules on top while maintaining power and data transmission for the rotating part.

Additionally, the device's back is equipped with a 0.66-inch OLED display for real-time status monitoring. It also includes built-in RGB indicators and functional buttons for convenient human-machine interaction. The product's top and base designs include LEGO-compatible mounting holes and M3 screw holes for quick assembly and integration.

Unit RollerCAN is fully open-source in both hardware and software, supporting motion control and parameter adjustment via **CAN** or **I2C** buses. It also provides SWD and SWO debugging interfaces, further enhancing flexibility for developers. This product is used in various fields such as robotic joints, motion control, industrial automation, and visual demonstration projects.

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RollerCAN Unit

This tutorial will introduce you to the Unit RollerCAN usage guide

Features

- Brushless DC motor control
- CAN/I2C communication control
- Integrated OLED display
- RGB indicators
- FOC closed-loop drive system
- Slip ring

Includes

- 1 x Unit RollerCAN
- 1 x PwrCAN Cable (10cm)
- 2 x HY2.0-4P Grove cables (5cm)
- 6 x Friction pins
- 1 x Flange plate
- 1 x Bracket
- 1 x Hex key (2.5mm)
- 1 x Hex key (2mm)
- 6 x M3 nuts
- 2 x Hex socket head M3x14mm screws
- 4 x Hex socket countersunk M3x14mm screws
- 4 x Hex socket countersunk M3x12mm screws
- 1 x Single-ended terminal cable 5P debugging cable 1.25mm pitch 100mm length

Applications

- Robotic joint control
- Smart manufacturing equipment
- Visual demonstrations

Specifications

Specification	Parameters
MCU	STM32G431CBU6@Cortex-M4, 128KB-Flash, 32KB-SRAM, 170MHz
Motor Type	D3504 200KV brushless motor@Diameter: 41mm
Driver Chip	DRV8311HRRWR
Angle Sensor	TLI5012BE1000
Communication Interface	2x CAN (XT30 interface) @XT30 (2+2) PW-M 2x I2C (0x64)
Display	0.66-inch OLED display, resolution: 64 x 48, SPI communication
RGB LEDs	2x WS2812-2020
Motor Power Supply	CAN (XT30 interface) @6-16V power supply Grove port DC 5V power supply Slip ring_Grove port DC 5V power supply
Load	Load: 50g Motor speed: 2100rpm Current: DC 16V/225mA Load: 200g Motor speed: 1400rpm Current: DC 16V/601mA Load: 500g (**Maximum load**) Motor speed: 560rpm Current: DC 16V/918mA No load: DC 16V/78mA
Standby Current	Grove port DC 5V power supply@70mA CAN (XT30 interface) power supply DC 16V@32mA
Output Torque	Grove port DC 5V power supply: 0.021N.m/0.2kgf.cm@current 350mA CAN (XT30 interface) DC 16V power supply: 0.065N.m/0.66kgf.cm@current 927mA
Slip Ring (Grove port) Output Capacity	DC 5V/300mA
Noise	48dB
Operating Temperature	0 ~ 40°C
Product Size	40.0 x 40.0 x 40.0mm
Product Weight	84.6g
Package Size	105.0 x 76.0 x 54.0mm
Gross Weight	158.3g

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Power Supply Voltage

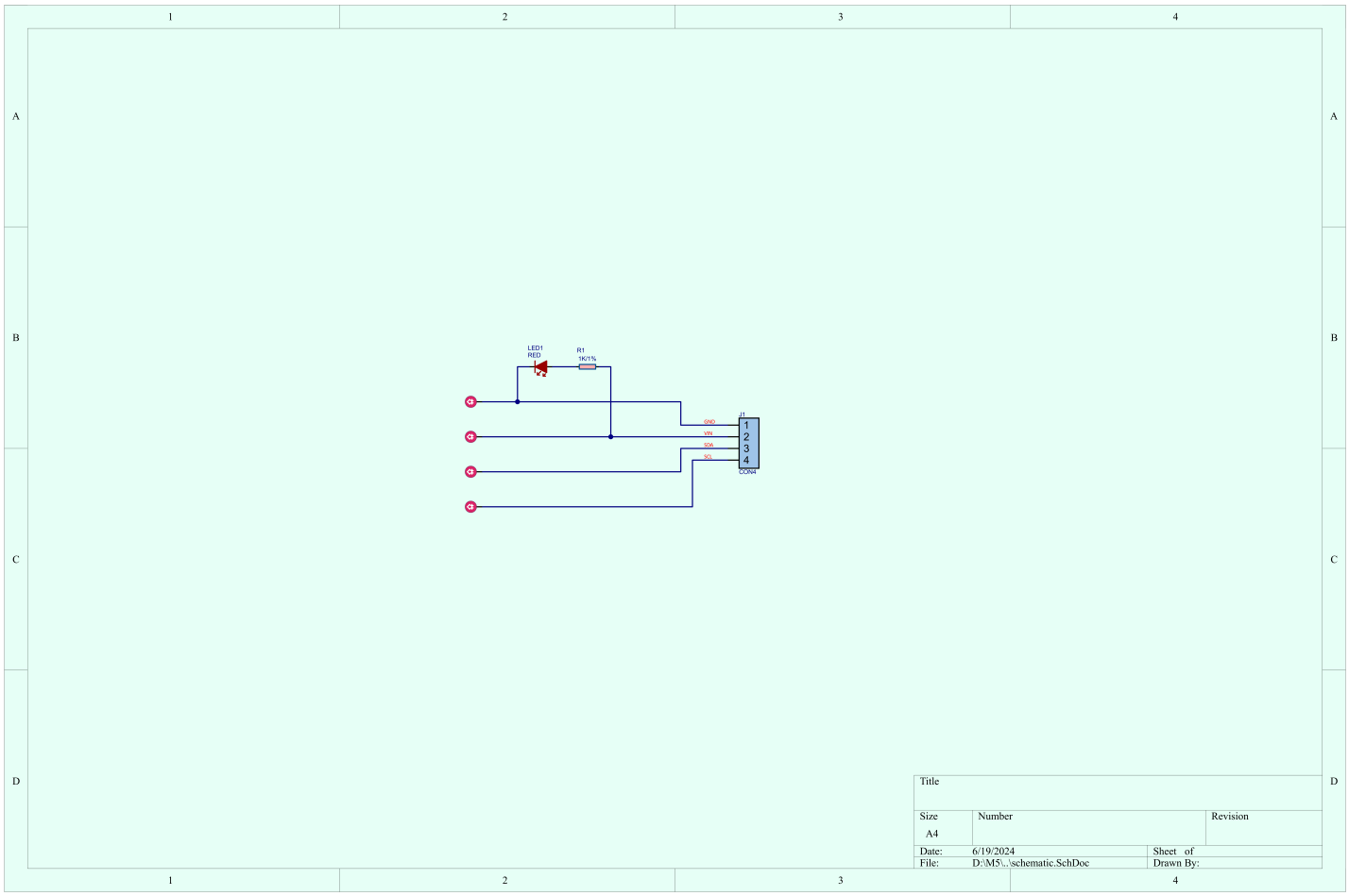
The power supply should not exceed 16V. If the voltage exceeds 18V, the motor fault code E:1 will be displayed, the motor will not work, and "Over Voltage" will be displayed, with the LED lighting up blue.

Encoder Value and Rotation Angle

In absolute position mode, the encoder value of 36000 pos corresponds to 360°. Due to the fact that the mechanical installation angle and the encoder angle are not strictly aligned, there may be an error of approximately 2°.

Schematics

- Unit RollerCAN Main Board Schematics PDF
- Unit RollerCAN Top Ring Board Schematics PDF



PinMap

Unit RollerCAN

HY2.0-4P	Black	Red	Yellow	White
PORT.A	GND	5V	SDA	SCL

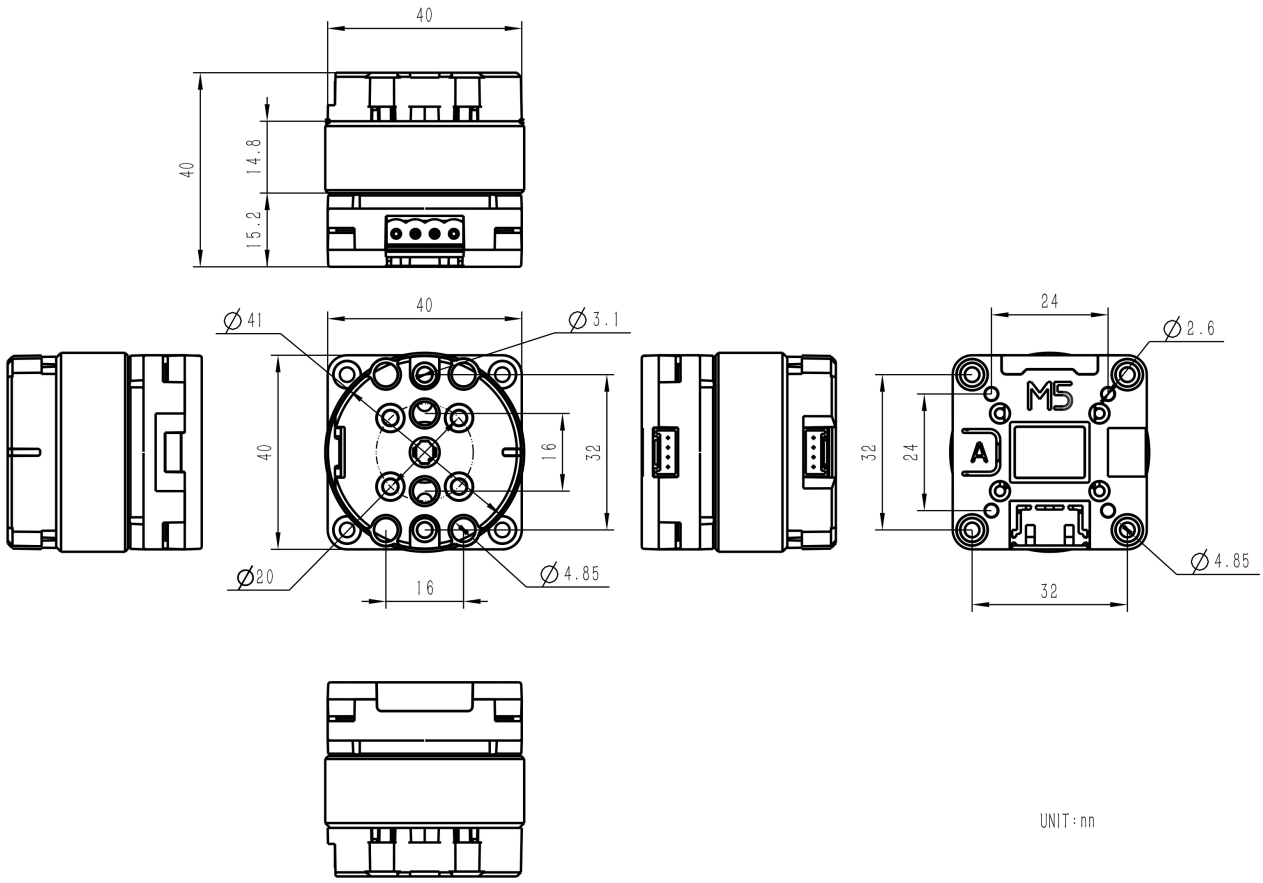
I2C, CAN, RGB, Button

STM32G431CBU6	PA15	PB7	PA11	PA12	PB4	PB5	PC6
I2C	SYS_I2C_SCL	SYS_I2C_SDA					
CAN			FDCAN_RX	FDCAN_TX	CAN_STB		
WS2812C						LED_DAT	
Button A							SYS_SW

OLED

STM32G431CBU6	PB15	PB13	PB14	PB11	PB12
OLED	OLED_MOSI	OLED_SCK	OLED_DC	OLED_RST	OLED_CS

Model Size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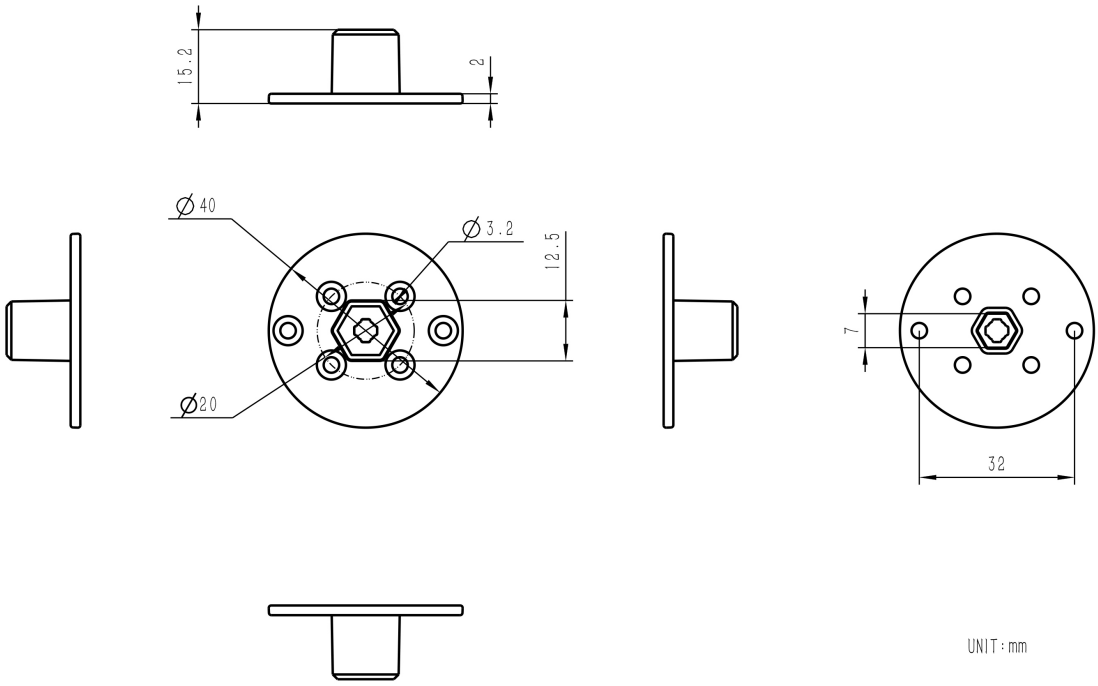
40
14.8
15.2
Ø41
40
Ø3.1
40
16
32
Ø20
16
Ø4.85
24
Ø2.6
M5
A
32
24
Ø4.85
32
UNIT:nn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Ø40
Ø3.2
12.5
Ø20
7
32
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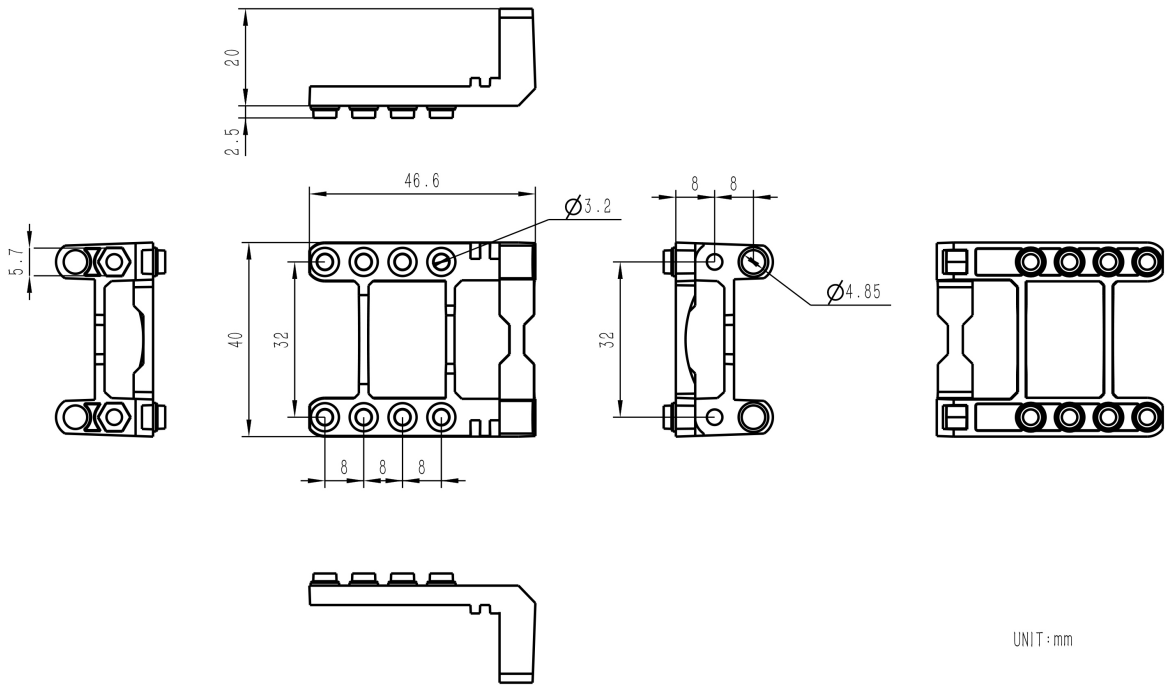
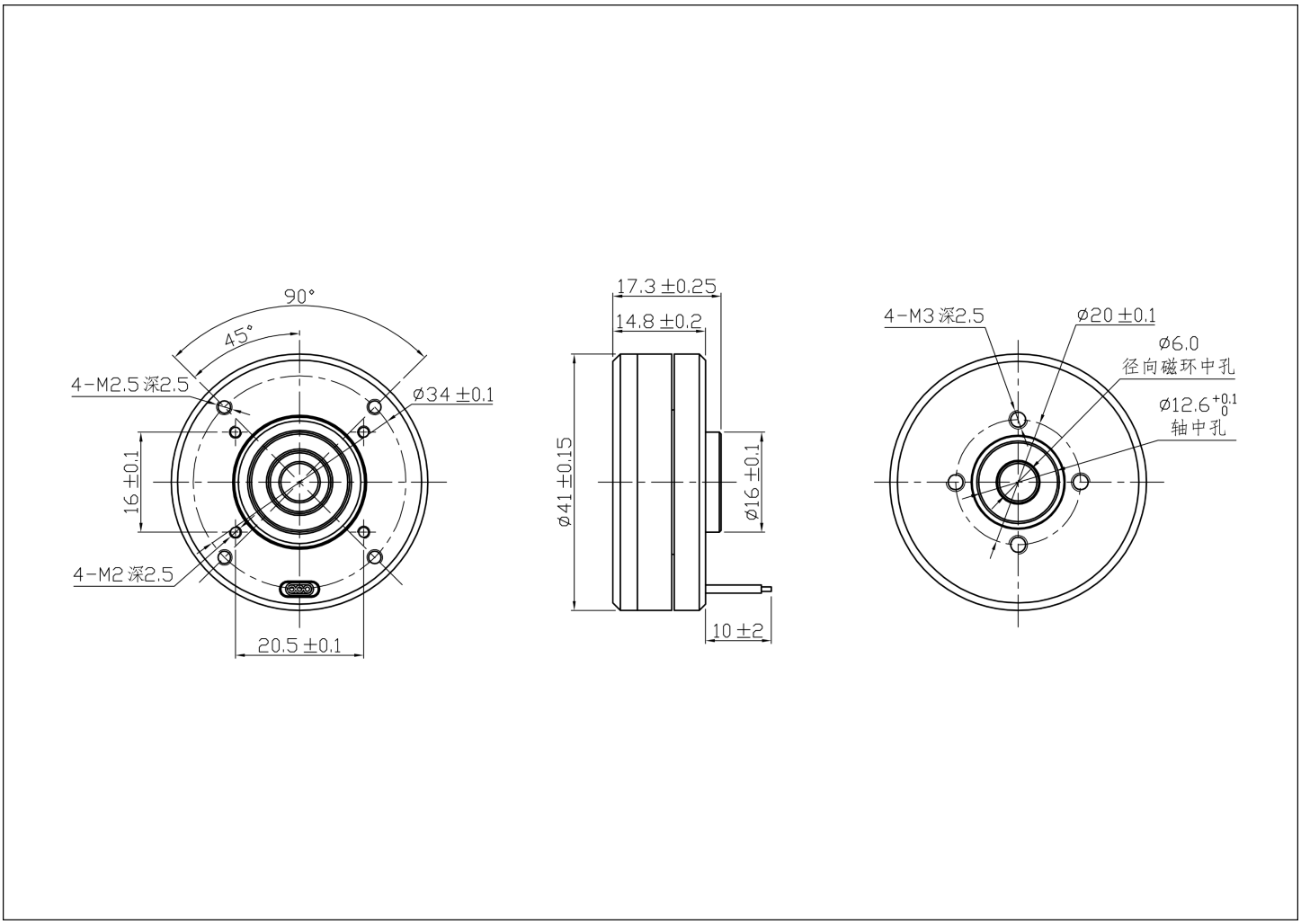

2.0
2.5
46.6
Ø3.2
8
8
5.7
40
32
32
Ø4.85
8
8
8
UNIT:mm



Datasheets

- Angle Sensor TLI5012BE1000
- Motor Driver DRV8311HRRWR

Softwares

Arduino

- Unit RollerCAN Arduino Library

Internal Firmware

- Unit RollerCAN Internal Firmware

Communication Protocols

- I2C Protocol
- Unit RollerCAN-I2C Protocol
- Unit RollerCAN-I2C User Manual
- CAN Protocol
- Unit RollerCAN-CAN Protocol

- Unit RollerCAN-CAN User Manual

UiFlow2

- Unit RollerCAN UiFlow2 Docs

Video

- Unit RollerCAN Product Introduction and Case Demonstration

RollerCAN RollerCAN Lite product intro video.mp4

Product Comparison

Product Comparison				
	Unit RollerCAN	**Unit RollerCAN Lite**	**Unit Roller485**	**Unit Roller485 Lite**
Driver Chip	DRV8311	DRV8311	DRV8311	DRV8311
Communication Method	CAN/I2C	CAN/I2C	RS485/I2C	RS485/I2C
Slip Ring	With slip ring	Without slip ring	With slip ring	Without slip ring
Power Indicator LED Color	Blue	None	Green	None
Product Color	Black	Black	Gray	Gray