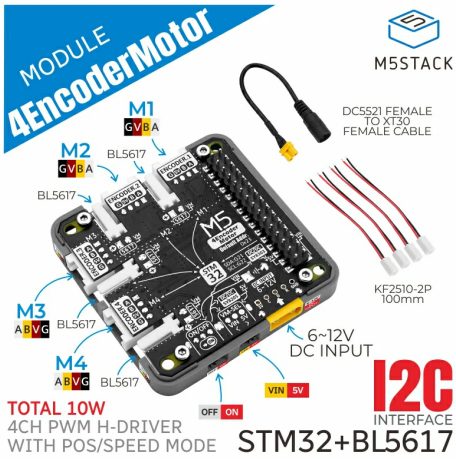
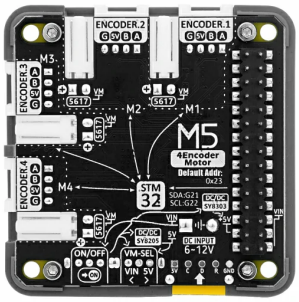
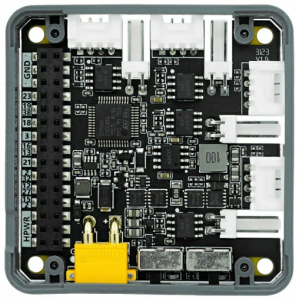
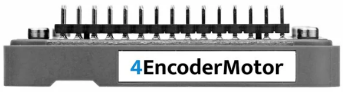
Module 4EncoderMotor

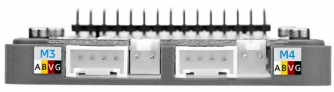
SKU:M138











Description

Module 4EncoderMotor is a 4-channel encoder motor driver module adopting **STM32 + BL5617 H-Bridge driver IC** solution. Communicating via I2C, it supports slave address modification, providing flexible control options. Through AB pulse encoder signal input, it enables precise motor motion status and position detection. It supports modes such as duty cycle control, absolute position positioning, and speed adjustment, achieving motor forward rotation, reverse rotation, stop, and brake functions. It integrates INA199 power monitoring to monitor voltage and current status in real time. Onboard power input switch allows for DC 5V or external DC 6 ~ 12V power input selection. It is suitable for applications in robotic motion control, automation equipment, intelligent vehicles, laboratory equipment, and industrial automation systems.

Features

- 4-channel encoder motor driver
- AB pulse signal input
- Duty cycle, absolute position positioning, speed adjustment control modes
- I2C communication
- Power current and voltage monitoring

Includes

- 1 x Module 4EncoderMotor
- 1 x DC5521 Female To XT30 Female Cable
- 4 x KF2510-2P 100mm

Applications

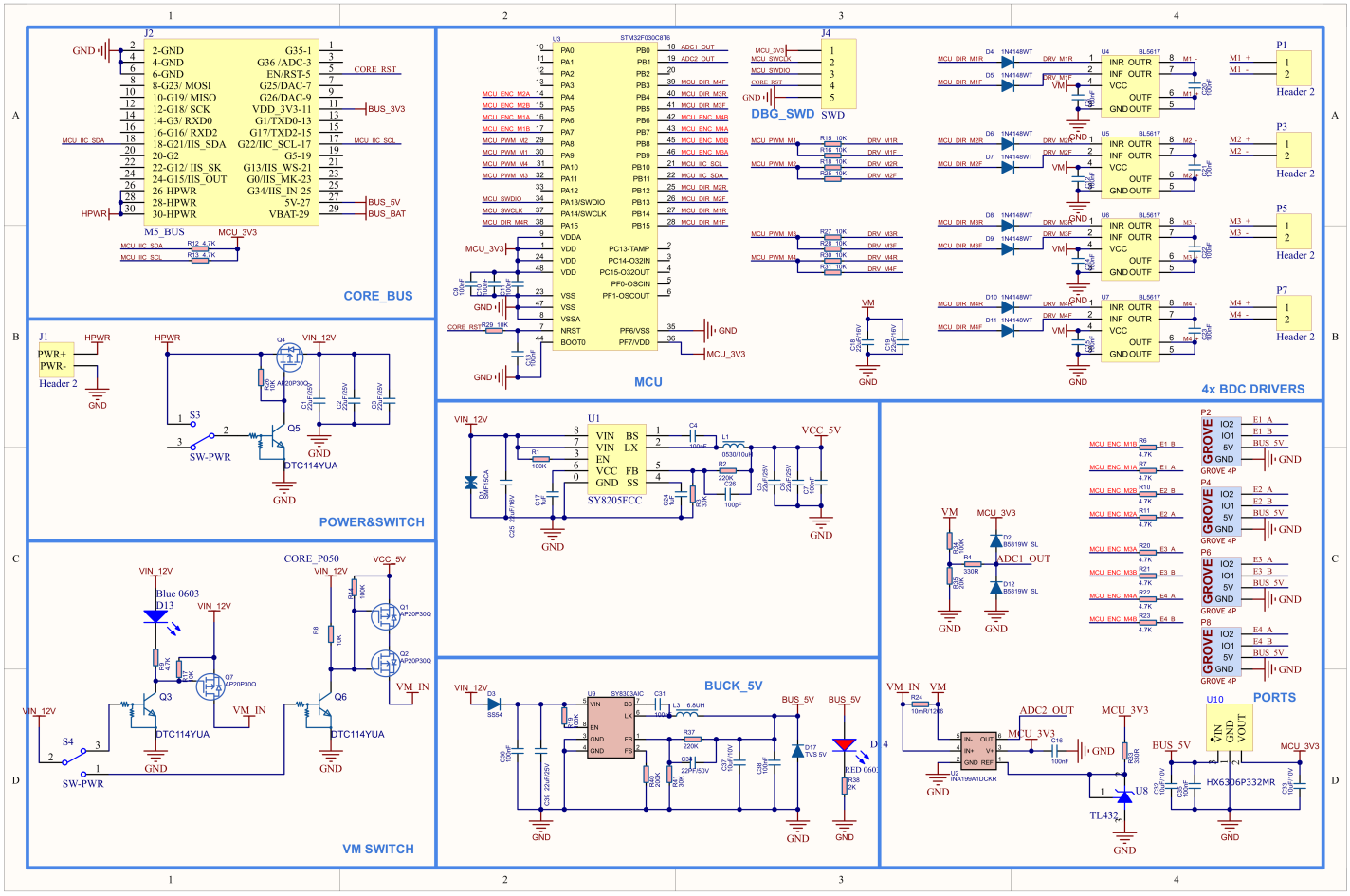
- Robotic motion control
- Automation equipment
- Intelligent vehicles
- Industrial automation systems

Specifications

Specification	Parameter
MCU	STM32F030C8T6
Encoder Motor Driver IC	BL5617
Maximum Supported Current	3.0A
Power	Max 10W
External DC Power	6 ~ 12V
Communication Port	I2C @0x24
Operating Temperature	0°C ~ 40°C
Product Size	54.0 x 54.0 x 13.1mm
Product Weight	15.8g
Package Size	95.0 x 66.0 x 26.0mm
Gross Weight	45.7g

Schematics

- Module 4EncoderMotor Schematics PDF



PinMap

Current & Voltage Detection Pins

STM32	PB0	PB1
Motor Voltage Detect	ADC1_OUT	
Current Detect		ADC2_OUT

Motor Direction Control Pins

STM32	PB14/PB15	PB12/PB13	PB4/PB5	PA15/PB3
BL5617	MCU_DIR_M1R/MCU_DIR_	MCU_DIR_M2R/MCU_DIR_	MCU_DIR_M3R/MCU_DIR_	MCU_DIR_M4R/MCU_DIR_
(Direction)	M1F	M2F	M3F	M4F

PWM Control Pins

STM32	PA9	PA8	PA11	PA10
BL5617 (PWM)	MCU_PWM_M1	MCU_PWM_M2	MCU_PWM_M3	MCU_PWM_M4

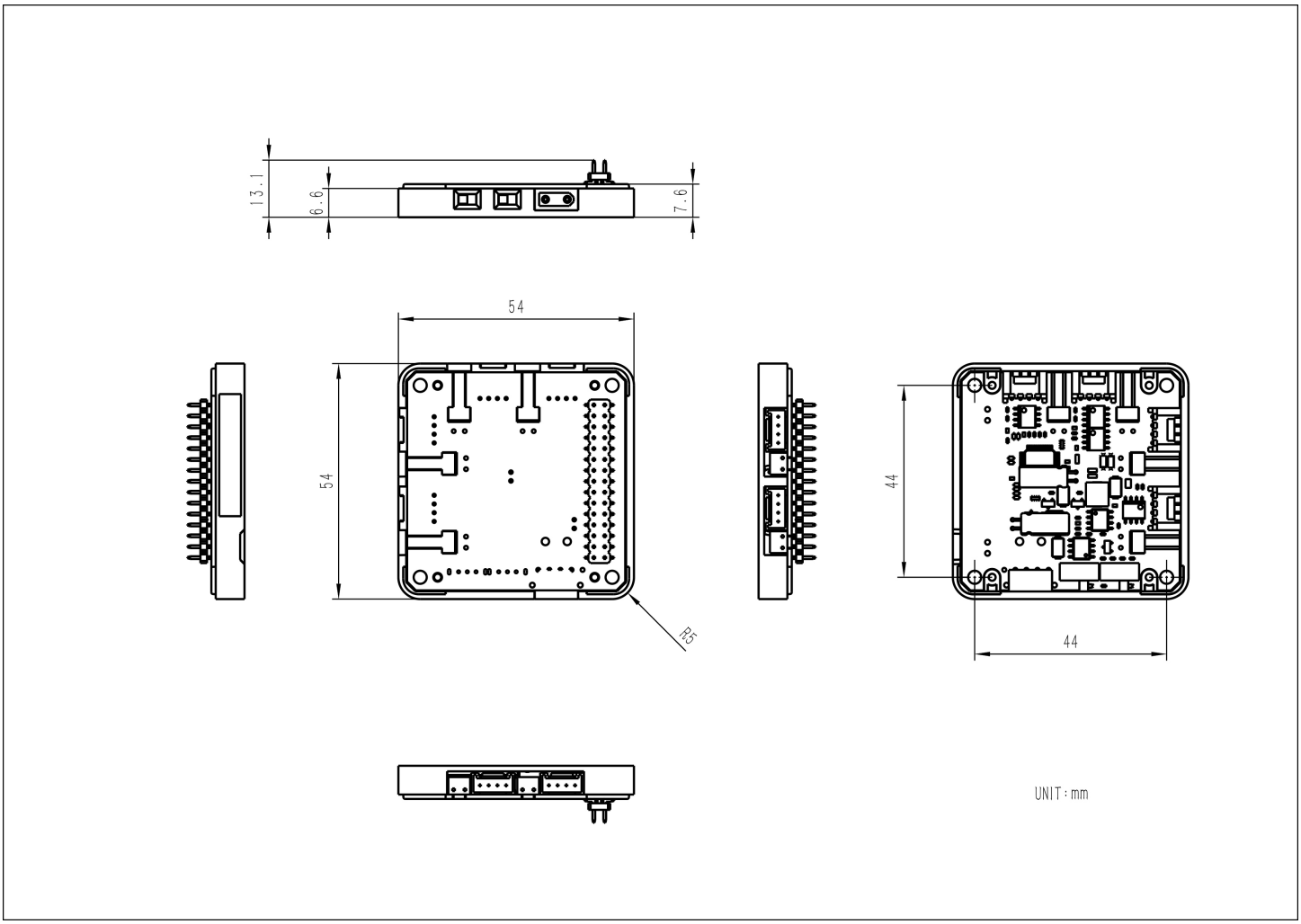
A/B Signal Detection Pins

STM32	PA6/PA7	PA4/PA5	PB9/PB8	PB7/PB6
Encodering motors	E1_A/E1_B	E2_A/E2_B	E3_A/E3_B	E4_A/E4_B

M5-Bus

PIN	LEFT	RIGHT	PIN
GND	1	2	
GND	3	4	
GND	5	6	RST
	7	8	
	9	10	
	11	12	
	13	14	
	15	16	
SDA	17	18	SCL
	19	20	
	21	22	
	23	24	
HPWR	25	26	
HPWR	27	28	5V
HPWR	29	30	BAT

Model Size



Datasheets

- BL5617 Datasheet

Softwares

Arduino

- Module 4EncoderMotor Arduino Library
- Module 4EncoderMotor Example with Basic
- Module 4EncoderMotor Example with Core2
- Module 4EncoderMotor Example with CoreS3

UiFlow1

- Module 4EncoderMotor UiFlow1 Docs

UiFlow2

- Module 4EncoderMotor UiFlow2 Docs

Internal Firmware

- Module 4EncoderMotor Internal Firmware

Protocol

- Module 4EncoderMotor I2C Protocol

M5Stack Module 4EncodeMotor V1.1 I2C Protocol																		V3 (FW Version) 2024/3/1
REG MAP (Addr:0x24)		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note
Motor PWM Duty INT8	0x20 R/W	Motor1_PWM_Duty	Motor2_PWM_Duty	Motor3_PWM_Duty	Motor4_PWM_Duty													-127 ~ 127
Motor Encoder INT32	0x30 R/W	Motor1_Encoder-byte0	Motor1_Encoder-byte1	Motor1_Encoder-byte2	Motor1_Encoder--byte3	Motor2_Encoder-byte0	Motor2_Encoder-byte1	Motor2_Encoder-byte2	Motor2_Encoder--byte3	Motor3_Encoder-byte0	Motor3_Encoder-byte1	Motor3_Encoder-byte2	Motor3_Encoder--byte3	Motor4_Encoder-byte0	Motor4_Encoder-byte1	Motor4_Encoder-byte2	Motor4_Encoder--byte3	Motor Encoder = Motor Encoder-byte0 + Motor Encoder-byte1 * 256 + Motor Encoder-byte2 * 65536 + Motor Encoder-byte3 * 16777216
Motor Speed INT8	0x40 R	Motor1_Speed	Motor2_Speed	Motor3_Speed	Motor3_Speed													-127 ~ 127 Motor encoder increments every 20 ms
Motor1 Mode[1]	0x50 R/W	Motor1_Mode	Motor1_Position_P	Motor1_Position_I	Motor1_Position_D	Motor1_Position_Point-Byte0	Motor1_Position_Point-Byte1	Motor1_Position_Point-Byte2	Motor1_Position_Point-Byte3	Motor1_Position-MAX-Speed	Motor1_Speed_P	Motor1_Speed_I	Motor1_Speed_D	Motor1_Speed_Point				
Motor2 Mode[1]	0x60 R/W	Motor2_Mode	Motor2_Position_P	Motor2_Position_I	Motor2_Position_D	Motor2_Position_Point-Byte0	Motor2_Position_Point-Byte1	Motor2_Position_Point-Byte2	Motor2_Position_Point-Byte3	Motor2_Position-MAX-Speed	Motor2_Speed_P	Motor2_Speed_I	Motor2_Speed_D	Motor2_Speed_Point				
Motor3 Mode[1]	0x70 R/W	Motor3_Mode	Motor3_Position_P	Motor3_Position_I	Motor3_Position_D	Motor3_Position_Point-Byte0	Motor3_Position_Point-Byte1	Motor3_Position_Point-Byte2	Motor3_Position_Point-Byte3	Motor3_Position-MAX-Speed	Motor3_Speed_P	Motor3_Speed_I	Motor3_Speed_D	Motor3_Speed_Point				
Motor4 Mode[1]	0x80 R/W	Motor4_Mode	Motor4_Position_P	Motor4_Position_I	Motor4_Position_D	Motor4_Position_Point-Byte0	Motor4_Position_Point-Byte1	Motor4_Position_Point-Byte2	Motor4_Position_Point-Byte3	Motor4_Position-MAX-Speed	Motor4_Speed_P	Motor4_Speed_I	Motor4_Speed_D	Motor4_Speed_Point				
VIN Current Float (A)	0x90 R	current-byte0	current-byte1	current-byte2	current-byte3													float
VIN Current X100 Int (A)	0xC0 R	VIN Current X100-byte0	VIN Current X100-byte1	VIN Current X100-byte2	VIN Current X100-byte3													VIN Current X100 Int = VIN Current X100-byte0 + VIN Current X100-byte1 * 256 + VIN Current X100-byte2 * 65536 + VIN Current X100-byte3 * 16777216
VIN ADC 8bits[2]	0xA0 R	ADC Value 8bits																Vaule: 0~255
VIN ADC 12bits[3]	0xB0 R	ADC Value 12bits-L	ADC Value 12bits-H															Vaule: 0~4095
Encoder AB or BA	0xD0 R/W	Encoder AB or BA																Vaule: 0~1 0: AB(Default) 1: BA * Need to restart module to affect * Writing to this register will save the value to flash. Please do not write to this register frequently to prevent flash damage.
Soft start and stop	0xD0 R/W		Soft start and stop															Soft start and stop(0:disable, 1:enable): bit0: Motor1 bit1: Motor2 bit2: Motor3 bit3: Motor4
Firmware Version	0xF0 R															Version		Version: firmware version number
I2C Address	0xF0 R/W																Address	Address: 1~127 Writing to this register will save the value to flash. Please do not write to this register frequently to prevent flash damage.

[1] (1)Mode:
0:Normal(Open loop)
1: Position Lock
2: Speed Lock
(2)P/I/D: 0~255
(3)Motor_Position_Point = Motor_Position_Point-byte0 + Motor_Position_Point-byte1 * 256 + Motor_Position_Point-byte * 65536 + Motor_Position_Point-byte3 * 16777216
(4)Motor_Position-MAX-Speed: -127 ~ 127
(5)Motor_Speed_Point: -127 ~ 127

[2] Voltage = ADC Value 8bits/255*3.3/0.16

[3] Voltage = ((ADC Value 12bits-L) + (ADC Value 12bits-H)*256)/255*3.3/0.16

Easyloader

Module 4EncoderMotor Internal Firmware Upgrade Easyloader.

Easyloader	Download	Note
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Video

- Module 4EncoderMotor Function Introduction

M138 4EncoderMotor Module 视频.mp4