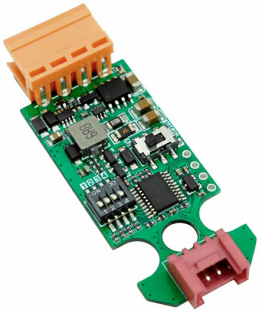
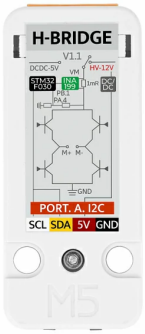
Unit HBridge v1.1

SKU:U160-V11





Description

Unit HBridge v1.1 is a DC motor driver module that uses **STM32F030** as the main controller and **RZ7899** as the driver to achieve motor driving functions. It communicates with the M5 host using **I2C** and controls functions such as **speed, forward, reverse, and braking** with (up to 16-bit data) **PWM** signals. The module features reliable **overcurrent, overvoltage, and overheating** protection functions. It has a built-in main power MOS switch circuit, supporting programmable dynamic control of motor release/lock. The built-in total current collection circuit can obtain total circuit parameters to ensure the safe operation of the motor. Additionally, the circuit includes a 6-12V and 5V switching circuit to accommodate different motor input power requirements. This product is suitable for fields such as **robotics, motor driving, industrial automation, and smart home**.

Features

- Overcurrent, overvoltage, and overheating protection
- Power switching
- i2c address: default 0x20
- Current detection
- PWM control
- Programming platforms: Arduino, UIFlow

Includes

- 1 × Unit HBridge v1.1
- 1 × VH3.96-4P
- 1 x HY2.0-4P Grove connection cable (20cm)
- 1 x Hex wrench L-shaped 1.5mm (for M2 screws)
- 1 x 470uF aluminum electrolytic capacitor

Applications

- Robotics
- Motor driving
- Industrial automation
- Smart home

Specifications

Specification	Parameter
MCU	STM32F030F4P6
DC Bidirectional Motor Driver Chip	RZ7899
Current Collection Chip	INA199A1DCKR
External DC Voltage Input	MAX 12V
Protocol	I2C @0x20 (can be modified via DIP switch)
Maximum Load Current	3A
Operating Temperature	0 ~ 40°C
Product Size	56.0 x 24.0 x 10.2mm
Product Weight	8.9g
Package Size	138.0 x 93.0 x 11.2mm
Gross Weight	20.0g

Learn

470uF Aluminum Electrolytic Capacitor

Connect the accompanying aluminum electrolytic capacitor to the positive and negative terminals of the power input to provide buffering protection to the circuit. Be careful not to connect it in reverse!

Motor Power Selection

Motor Power Selection

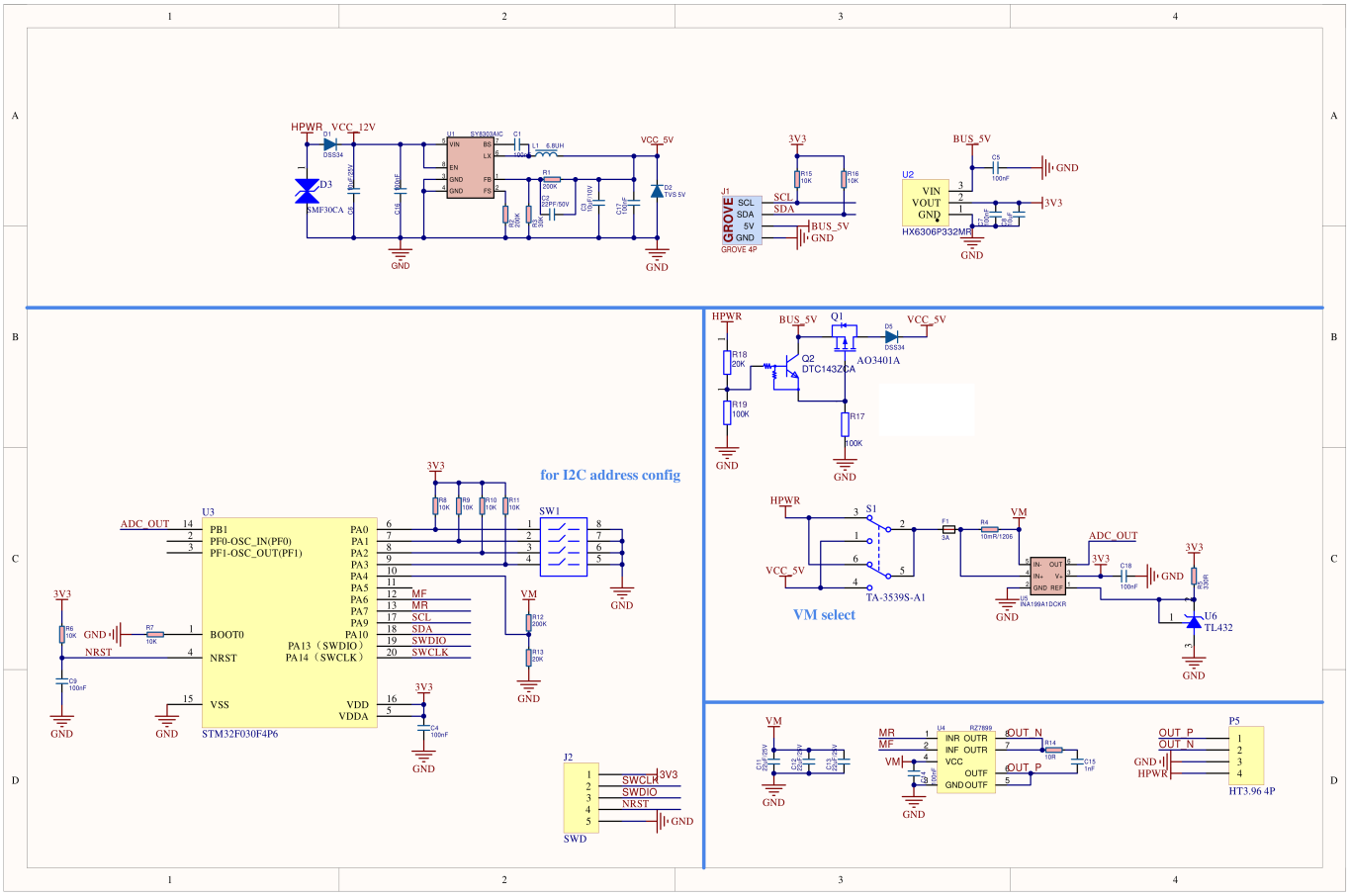
The Unit HBridge v1.1 integrates a DC/DC step-down circuit that can reduce the 6 ~ 12V input from the external 3.96 terminal to 5V to adapt to different motor power requirements. It also provides a power switch to select whether the motor power uses the external input of 6 ~ 12V or the 5V after DC/DC step-down. Please choose the appropriate driving voltage according to the motor specifications during actual use.

Datasheets

- STM32F030F4P6
- RZ7899
- INA199A1DCKR

Schematics

- Unit HBridge v1.1 Schematics PDF

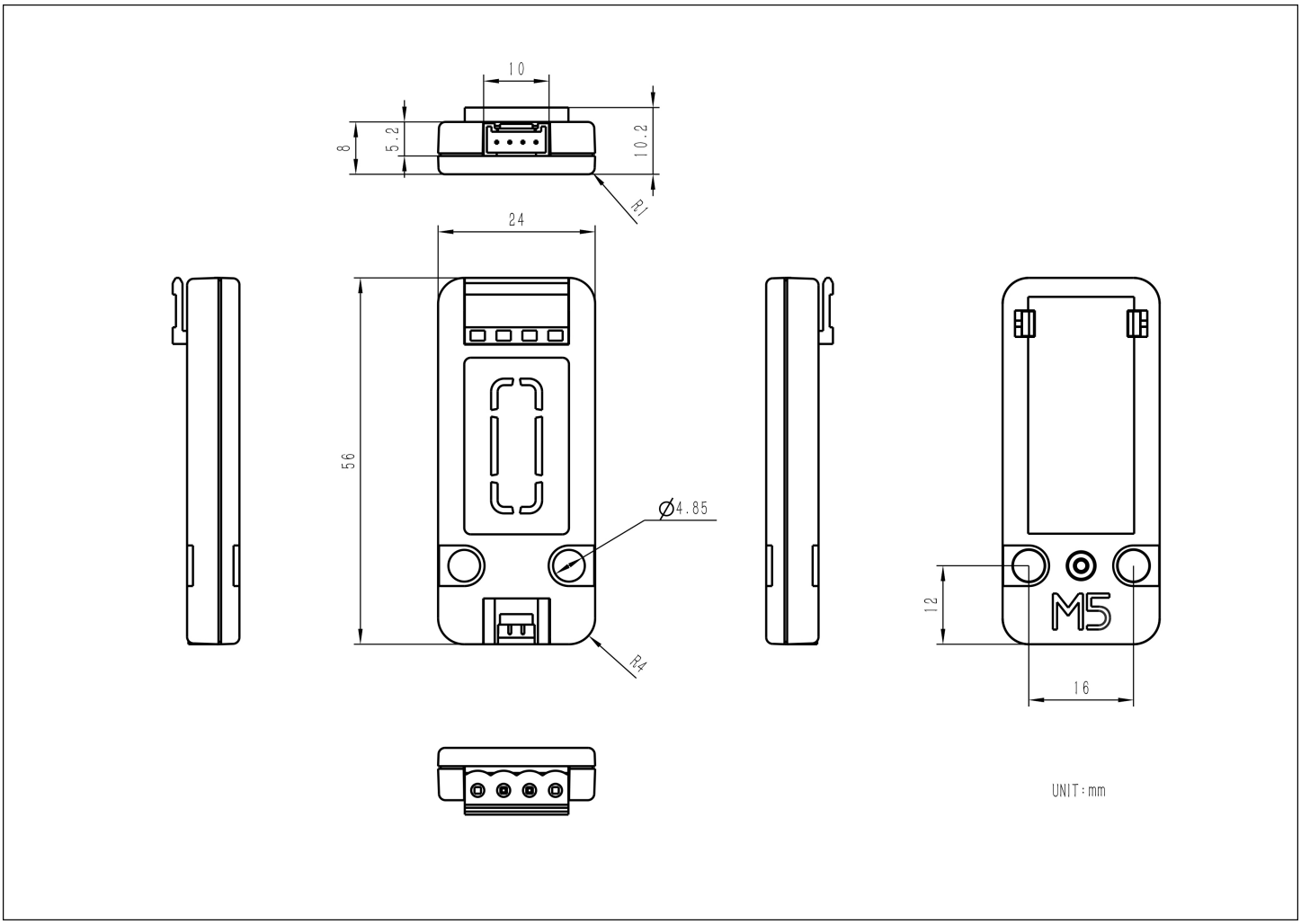


PinMap

Unit HBridge v1.1

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

Model Size



Softwares

Arduino

- Unit HBridge v1.1 Test Example

UiFlow1

- Unit HBridge v1.1 UiFlow1 Docs

Internal Firmware

- Unit HBridge v1.1 Internal Firmware

Protocol

M5Stack Unit Hbridge I2C Protocol

V2 (FW Version)
2023/4/27

REG		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note
Driver config	0x00 W/R	Direction	8Bits PWM duty	16Bits PWM duty-L	16Bits PWM duty-H	PWM Freq-L	PWM Freq-H											**Direction:** 0, Stop(default); 1, Forward; 2, Rverse **8Bits PWM duty:** 0~255 **16Bits PWM duty:** 0~65535 **PWM Freq:** 100~10000Hz(default 1000Hz)
VIN ADC 8bits	0x10 R	ADC Value																**Vaule:** 0~255
VIN ADC 12bits	0x20	ADC Value-L	ADC Value-H															**Vaule:** 0~4095
VIN Current	0x30	current-byte0	current-byte1	current-byte2	current-byte3													**float**
Firmware Version	0xF0 R															FW Version		**Value:** firmware version
I2C Addr	0xF0 R																I2C Addr	**Value:** I2C Address

I2C ADDR SW	0	1	2	3
0x20	OFF	OFF	OFF	OFF
0x21	ON	OFF	OFF	OFF
0x22	OFF	ON	OFF	OFF
0x23	ON	ON	OFF	OFF
0x24	OFF	OFF	ON	OFF
0x25	ON	OFF	ON	OFF
0x26	OFF	ON	ON	OFF
0x27	ON	ON	ON	OFF
0x28	OFF	OFF	OFF	ON
0x29	ON	OFF	OFF	ON
0x2A	OFF	ON	OFF	ON
0x2B	ON	ON	OFF	ON
0x2C	OFF	OFF	ON	ON
0x2D	ON	OFF	ON	ON
0x2E	OFF	ON	ON	ON
0x2F	ON	ON	ON	ON

Video

- Unit HBridge V1.1 controlling a servo

U160-V11 HBridge v1.1 Unit.mp4

Version Change

SKU	Version	Change Details	Release Date	Notes
U160	Unit HBridge	/	/	/
U160-V11	Unit HBridge v1.1	Optimized circuit and added current detection function	2023.8	/