8EnCoder 🛒

Description

UNIT 8EnCoder is a set of 8 rotary encoders as one of the input unit, the internal use of STM32 single-chip microcomputer as the acquisition and communication processor, and the host computer using I2C communication interface, each rotary encoder corresponds to 1 RGB LED light, encoder in addition to left and right rotation, but also radially pressed, in addition to a physical toggle switch and its corresponding RGB LED light, including 5V->3V3 DCDC circuit. The unit can be used for the input of multi-channel relative control values, the corresponding RGB lamp can display different statuses, and the toggle switch can be used for the input of multi-channel switching quantities. It can be used as a multi-degree-of-freedom robot or music equalization application.

Features

- 8-channel Rotary encoder
- 8 channels correspond to RGB lights
- I2C communication
- Toggle switches can be used for multi-channel switching inputs
- Radial press function
- HY2.0-4P interface
- 2x LEGO compatible holes

Includes

- 1x 8Encoder Unit
- 1x HY2.0-4P Cable(20cm)

Applications

- Multi-degree-of-freedom robot joint control
- Music equalization control aspects
- Multi-channel light control

Specification

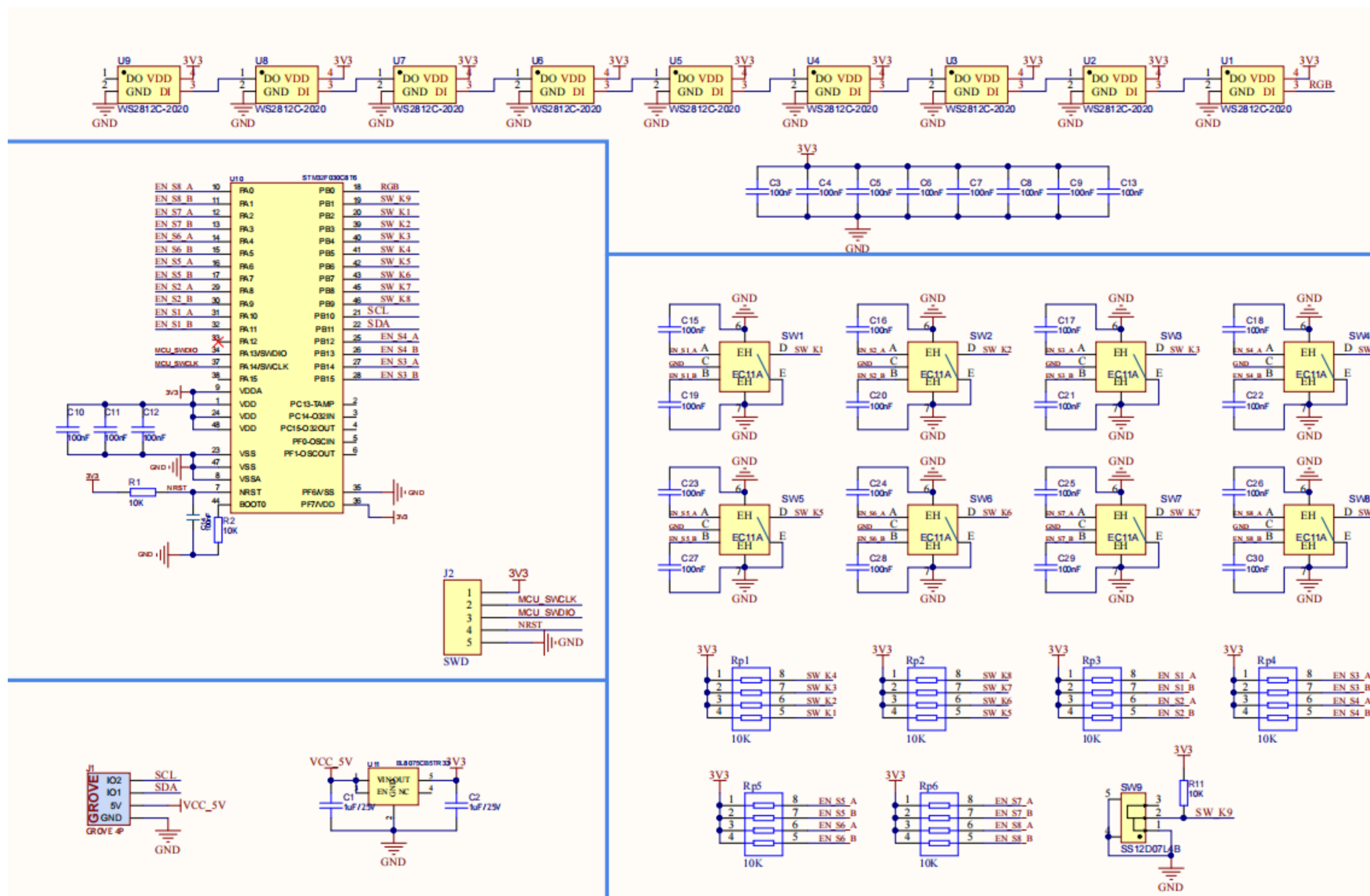| Resources	Parameters
MCU	STM32F030C8T6
RGB	WS2812C-2020
Input voltage	5v
I2C communication address	0x41
Product Size	128mm × 24mm ×22.7mm
Package Size	130mm × 27.7mm ×27.7mm
Product Weight	42.8g
Package Weight	52.4g
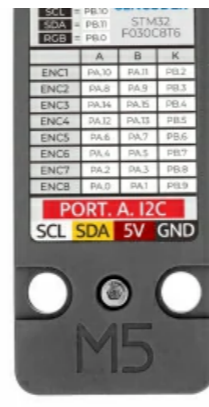
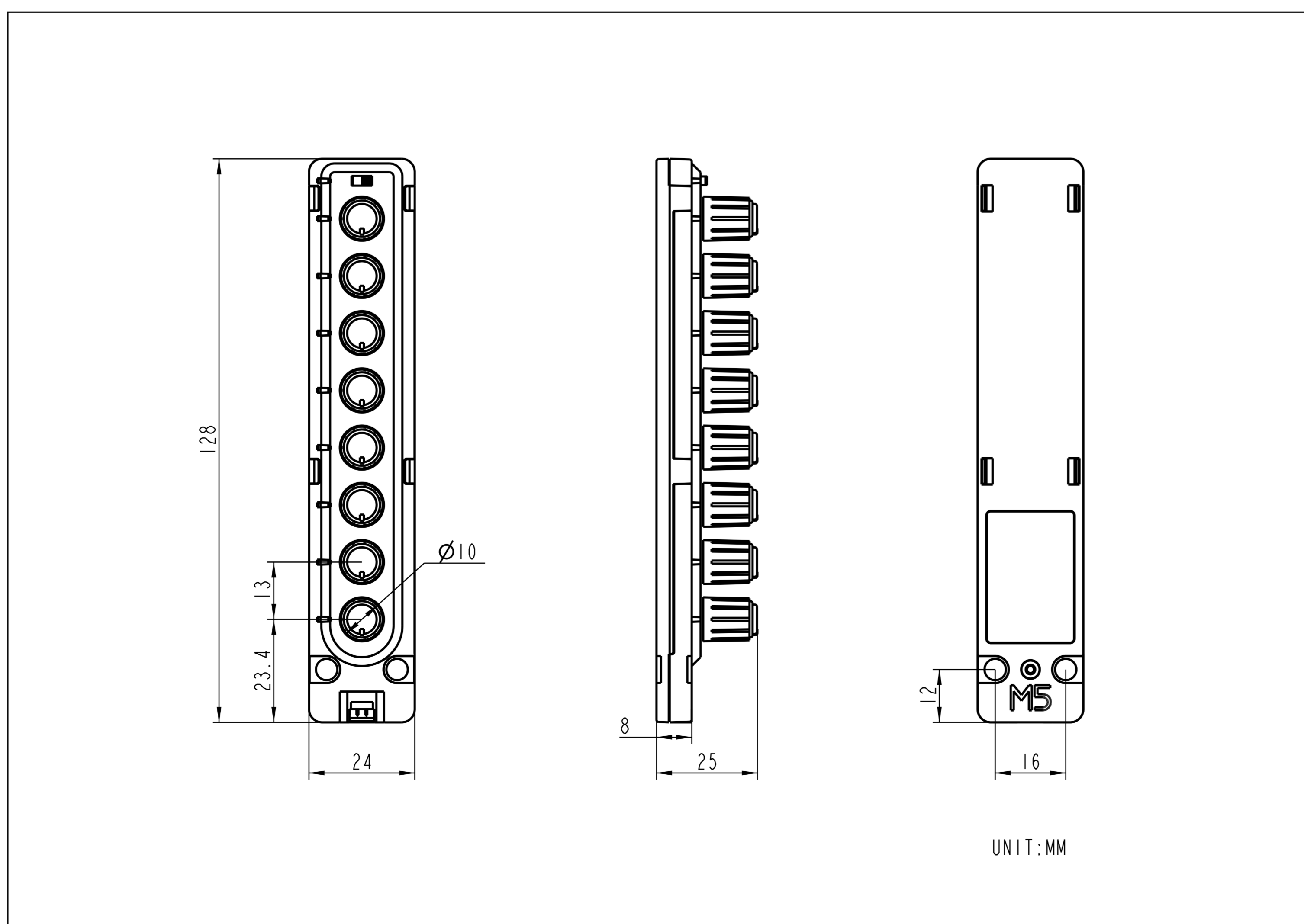# Related Link

- STM32F030C8T6

Schematic

Module Size

UNIT:MM

Examples

Arduino

- [Arduino Example](#)

M5Stack Unit 8Encoder I2C Protocol																		V1 (FW Version) 2022/11/8
REG MAP (Addr:0x41)		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note
Counter Value	0x00 R/W	Cnt0-byte0	Cnt0-byte1	Cnt0-byte2	Cnt0-byte3	Cnt1-byte0	Cnt1-byte1	Cnt1-byte2	Cnt1-byte3	Cnt2-byte0	Cnt2-byte1	Cnt2-byte2	Cnt2-byte3	Cnt3-byte0	Cnt3-byte1	Cnt3-byte2	Cnt3-byte3	Cnt: -2147483648-2147483647 (will be reset after set reg 0x40)
	0x10 R/W	Cnt4-byte0	Cnt4-byte1	Cnt4-byte2	Cnt4-byte3	Cnt5-byte0	Cnt5-byte1	Cnt5-byte2	Cnt5-byte3	Cnt6-byte0	Cnt6-byte1	Cnt6-byte2	Cnt6-byte3	Cnt7-byte0	Cnt7-byte1	Cnt7-byte2	Cnt7-byte3	
Increment Value	0x20 R	Inc0-byte0	Inc0-byte1	Inc0-byte2	Inc0-byte3	Inc1-byte0	Inc1-byte1	Inc1-byte2	Inc1-byte3	Inc2-byte0	Inc2-byte1	Inc2-byte2	Inc2-byte3	Inc3-byte0	Inc3-byte1	Inc3-byte2	Inc3-byte3	Inc: -2147483648-2147483647 (will be reset after get)
	0x30 R	Inc4-byte0	Inc4-byte1	Inc4-byte2	Inc4-byte3	Inc5-byte0	Inc5-byte1	Inc5-byte2	Inc5-byte3	Inc6-byte0	Inc6-byte1	Inc6-byte2	Inc6-byte3	Inc7-byte0	Inc7-byte1	Inc7-byte2	Inc7-byte3	
Counter Reset	0x40 W	Cnt0-RST	Cnt1-RST	Cnt2-RST	Cnt3-RST	Cnt4-RST	Cnt5-RST	Cnt6-RST	Cnt7-RST									RST: write 1 to reset counter
Button Value	0x50 R	BNT0	BNT1	BNT2	BNT3	BNT4	BNT5	BNT6	BNT7									BNT: 0~1
Switch	0x60 R	SW value																SW Value: 0~1
RGB	0x70 R/W	LED0-R	LED0-G	LED0-B	LED1-R	LED1-G	LED1-B	LED2-R	LED2-G	LED2-B	LED3-R	LED3-G	LED3-B	LED4-R	LED4-G	LED4-B	LED5-R	R/G/B: 0~255
	0x80 R/W	LED5-G	LED5-B	LED6-R	LED6-G	LED6-B	LED7-R	LED7-G	LED7-B	LED8-R	LED8-G	LED8-B						
Firmware Version	0xF0 R															Version		Version: firmware version number
I2C Address	0xF0 R/W															Address		Address: 1~127

- [I2C timing diagram](#)
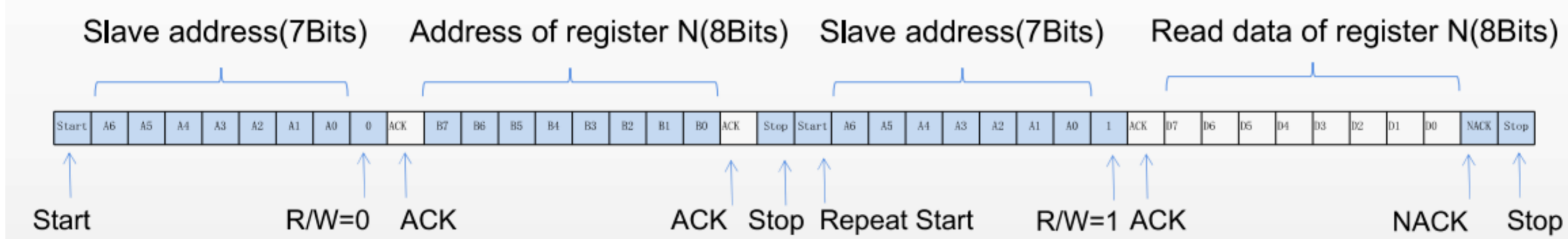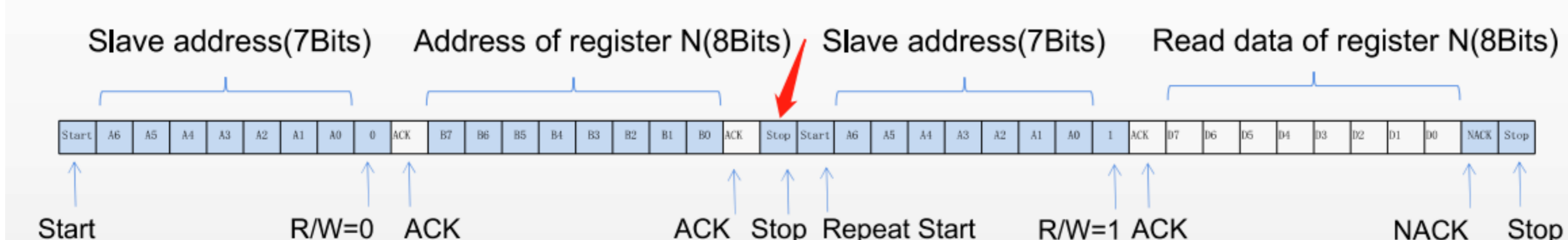

- Compared to the standard I2C's ReStart, 8EnCoder has an additional stop bit, which is identified as shown in the following figure:

Timing diagram:
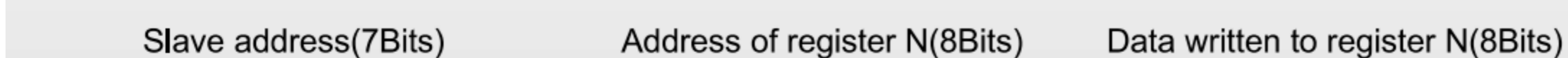

Data: 10101010(0xAAH)

Data: 10101101(0xADH)

- Firmware

UIFlow

- Uiflow Example

| UIFlow Blocks

- Init I2C address

- Get counter value

encoder8_0 ▾ Get counter value **channel** 0

○ Get increment value

encoder8_0 ▾ Get increment value **channel** 0

○ Get button status

encoder8_0 ▾ Get button status **channel** 0

○ Get switch status

encoder8_0 ▾ Get switch status

○ Get device FW version or I2C address

encoder8_0 ▾ Get device **status** FW_VERSION ▾

○ Set counter value

encoder8_0 ▾ Set counter **value** 1000 **channel** 0

○ Reset counter value

encoder8_0 ▾ Reset counter value **channel** 0

○ Set single RGB LED color

encoder8_0 ▾ Set RGB LED **channel** 0 R 50 G 50 B 50

○ Set multiple RBG LED color

encoder8_0 ▾ Set RGB LED **channel from** 0 **to** 0 R 50 G 50 B 50

○ Set I2C address

encoder8_0 ▾ Set device I2C **address** 0x41