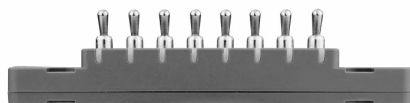
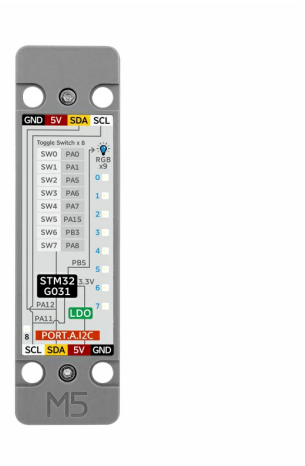
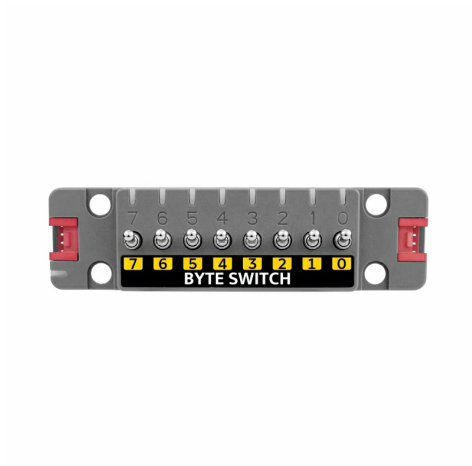


# Unit ByteSwitch

SKU:U191





## Description

**Unit ByteSwitch** is an 8-channel toggle switch input unit, equipped with 8 toggle switches and 9 WS2812C RGB LEDs. It adopts STM32 as the main controller, supports I2C communication, and has two onboard **Port A** I2C interfaces. Multiple Unit ByteSwitch units can be **cascaded** to meet the needs of complex systems. It can detect toggle switch inputs and provide dynamic light status feedback, suitable for smart home control, gaming entertainment devices, educational development platforms, industrial status displays, and interactive exhibitions.

## Features

- 8-channel toggle switch inputs
- 9 WS2812C RGB LEDs
- STM32 main controller
- I2C communication interface
- Development Platform
  - UiFlow1
  - UiFlow2
  - Arduino IDE

## Includes

- 1 x Unit ByteSwitch
- 1 x HY2.0-4P Grove Cable (20cm)
- 1 x DIY Sticker

## Applications

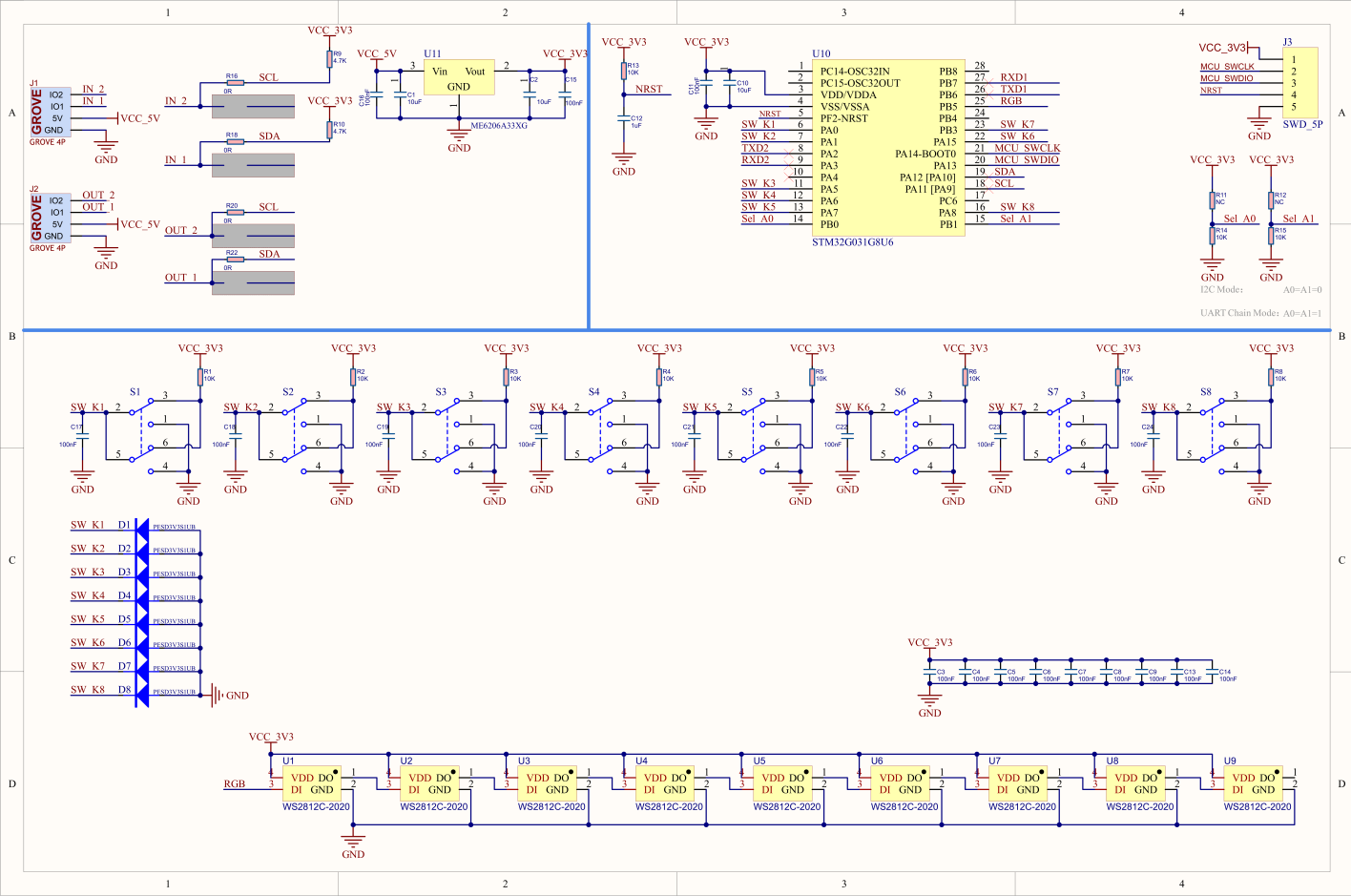
- Smart home control panel
- Game or entertainment device controller
- Educational and laboratory development platform
- Status control and feedback devices
- Portable device debugging tools
- Interactive exhibitions or scene control
- User interface for small instruments

# Specifications

| Specification  | Parameter                                         |
|----------------|---------------------------------------------------|
| MCU            | STM32G031G8U6, 32-bit ARM Cortex-M0+ core, 64 MHz |
| Toggle Switch  | 8 independent toggle switches (DPDT)              |
| RGB LED        | WS2812C-2020 (9 pcs)                              |
| Interface      | I2C @0x46                                         |
| Grove Port     | 2 (I2C bus cascading expansion)                   |
| Standby Power  | DC 5V@9.03mA                                      |
| Operating Temp | 0 ~ 40°C                                          |
| Product Size   | 88.0 x 24.0 x 19.6mm                              |
| Product Weight | 22.6g                                             |
| Package Size   | 170.0 x 120.0 x 20.6mm                            |
| Gross Weight   | 29.3g                                             |

# Schematics

- [Unit ByteSwitich Schematics PDF](#)



## PinMap

## Unit ByteSwitch

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

## STM32

| STM32 | PA0   | PA1   | PA5   | PA6   | PA7   | PA15  | PB3   | PA8   | PB5 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|
| KEY   | SW_K0 | SW_K1 | SW_K2 | SW_K3 | SW_K4 | SW_K5 | SW_K6 | SW_K7 | RGB |

## Model Size



| M5Stack Unit Byte Switch I2C Protocol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                       |          |                      |                 |                 |                 |                 |                 |                 |                 |                 |                                         |            |            |            |   |         |                                                                                                                                                          | V1 (FW Version)<br>6/19/2024                         |                                                                                   |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|----------|----------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------------------------------|------------|------------|------------|---|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------------|--|--|
| REG MAP (Addr:0X46)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                       |          | 0                    | 1               | 2               | 3               | 4               | 5               | 6               | 7               | 8               | 9                                       | A          | B          | C          | D | E       | F                                                                                                                                                        | note                                                 |                                                                                   |  |  |
| Read                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Byte of Switch Value<br>(Each switch value is combined into one byte) | 0x00 R   | Byte of Switch Value |                 |                 |                 |                 |                 |                 |                 |                 |                                         |            |            |            |   |         | Byte of Switch Value:<br>bit0: switch 0; bit1: switch 1; bit2: switch 2; bit3: switch 3; bit4: switch 4; bit5: switch 5; bit6: switch 6; bit7: switch 7; |                                                      |                                                                                   |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Switch Value<br>(Each switch value is a separate byte)                | 0x60 R   | Switch0              | Switch1         | Switch2         | Switch3         | Switch4         | Switch5         | Switch6         | Switch7         |                 |                                         |            |            |            |   |         | SwitchX:<br>0~1                                                                                                                                          |                                                      |                                                                                   |  |  |
| LED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | LED Brightness & LED Show Mode                                        | 0x10 W/R | LED0 Brightness      | LED1 Brightness | LED2 Brightness | LED3 Brightness | LED4 Brightness | LED5 Brightness | LED6 Brightness | LED7 Brightness | LED8 Brightness | LED Show Mode<br>(Can be save to flash) |            |            |            |   |         |                                                                                                                                                          |                                                      | LED Brightness:<br>0~255<br><br>LED Show Mode:<br>0: Self define<br>1: Sys define |  |  |
| LED Self define                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | RGB888 (Self define)                                                  | 0x20 W/R | LED0_RGB-B           | LED0_RGB-G      | LED0_RGB-R      |                 |                 | LED1_RGB-B      | LED1_RGB-G      | LED1_RGB-R      |                 |                                         | LED2_RGB-B | LED2_RGB-G | LED2_RGB-R |   |         | LED3_RGB-B                                                                                                                                               | LED3_RGB-G                                           | LED3_RGB-R                                                                        |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                       | 0x30 W/R | LED4_RGB-B           | LED4_RGB-G      | LED4_RGB-R      |                 |                 | LED5_RGB-B      | LED5_RGB-G      | LED5_RGB-R      |                 |                                         | LED6_RGB-B | LED6_RGB-G | LED6_RGB-R |   |         | LED7_RGB-B                                                                                                                                               | LED7_RGB-G                                           | LED7_RGB-R                                                                        |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                       | 0x40 W/R | LED8_RGB-B           | LED8_RGB-G      | LED8_RGB-R      |                 |                 |                 |                 |                 |                 |                                         |            |            |            |   |         |                                                                                                                                                          |                                                      |                                                                                   |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | RGB233 <sup>[1]</sup> (Self define)                                   | 0x50 W/R | LED0                 | LED1            | LED2            | LED3            | LED4            | LED5            | LED6            | LED7            | LED8            |                                         |            |            |            |   |         |                                                                                                                                                          | RGB233:<br>bit6-bit7:R<br>bit3-bit5:G<br>bit0-bit2:B |                                                                                   |  |  |
| LED Sys define                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | RGB888 Switch=0 define<br>(Can be save to flash)                      | 0x70 W/R | LED0_RGB-B           | LED0_RGB-G      | LED0_RGB-R      |                 |                 | LED1_RGB-B      | LED1_RGB-G      | LED1_RGB-R      |                 |                                         | LED2_RGB-B | LED2_RGB-G | LED2_RGB-R |   |         | LED3_RGB-B                                                                                                                                               | LED3_RGB-G                                           | LED3_RGB-R                                                                        |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                       | 0x80 W/R | LED4_RGB-B           | LED4_RGB-G      | LED4_RGB-R      |                 |                 | LED5_RGB-B      | LED5_RGB-G      | LED5_RGB-R      |                 |                                         | LED6_RGB-B | LED6_RGB-G | LED6_RGB-R |   |         | LED7_RGB-B                                                                                                                                               | LED7_RGB-G                                           | LED7_RGB-R                                                                        |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | RGB888 Switch=1 define<br>(Can be save to flash)                      | 0x90 W/R | LED0_RGB-B           | LED0_RGB-G      | LED0_RGB-R      |                 |                 | LED1_RGB-B      | LED1_RGB-G      | LED1_RGB-R      |                 |                                         | LED2_RGB-B | LED2_RGB-G | LED2_RGB-R |   |         | LED3_RGB-B                                                                                                                                               | LED3_RGB-G                                           | LED3_RGB-R                                                                        |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                       | 0xA0 W/R | LED4_RGB-B           | LED4_RGB-G      | LED4_RGB-R      |                 |                 | LED5_RGB-B      | LED5_RGB-G      | LED5_RGB-R      |                 |                                         | LED6_RGB-B | LED6_RGB-G | LED6_RGB-R |   |         | LED7_RGB-B                                                                                                                                               | LED7_RGB-G                                           | LED7_RGB-R                                                                        |  |  |
| System                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Flash write back                                                      | 0xF0 W   | Flash write back     |                 |                 |                 |                 |                 |                 |                 |                 |                                         |            |            |            |   |         | write 1 save to flash                                                                                                                                    |                                                      |                                                                                   |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | IRQ Setup <sup>[2]</sup><br>(Can be save to flash)                    | 0xF0 R/W |                      | IRQ Setup       |                 |                 |                 |                 |                 |                 |                 |                                         |            |            |            |   |         |                                                                                                                                                          | 0: Disable; 1: Enable<br>need to restart             |                                                                                   |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Firmware Version                                                      | 0xF0 R   |                      |                 |                 |                 |                 |                 |                 |                 |                 |                                         |            |            |            |   | Version | Version: firmware version number                                                                                                                         |                                                      |                                                                                   |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | I2C Address<br>(Can be save to flash)                                 | 0xF0 R/W |                      |                 |                 |                 |                 |                 |                 |                 |                 |                                         |            |            |            |   | Address | Address: 1~127                                                                                                                                           |                                                      |                                                                                   |  |  |
| <div><div>[1] RGB888-&gt;RGB233<br/>uint8_t rgb888_to_rgb233(uint32_t color)<br/>{<br/>    uint8_t r_led, g_led, b_led, rgb_233;<br/><br/>    r_led = ((color &gt;&gt; 16) &amp; 0xFF);<br/>    g_led = ((color &gt;&gt; 8) &amp; 0xFF);<br/>    b_led = (color &amp; 0xFF);<br/><br/>    rgb_233 = ((r_led &amp; 0xC0)   (g_led &amp; 0xE0) &gt;&gt; 2)   (b_led &amp; 0xE0) &gt;&gt; 5);<br/><br/>    return rgb_233;<br/>}</div><div>[2] IRQ Setup = 1, SWDIO(PA13) will become IRQ pin. When the switch state changes, the IRQ pin is pulled low. After reading register 0F, IRQ will be pulled high again (high level when idle)<br/>IRQ Setup = 0, IRQ Disable.</div></div> |                                                                       |          |                      |                 |                 |                 |                 |                 |                 |                 |                 |                                         |            |            |            |   |         |                                                                                                                                                          |                                                      |                                                                                   |  |  |

# | Video

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- Unit ByteSwitch product introduction and case demonstration

[U191 BYTESWITCH UNIT Video.mp4](#)