

STAMP IO

SKU:S002



Description

STAMP IO is an **IO expansion board** based on STM32F030 main controller, using I2C communication interface, providing 8 IO expansion. Each IO supports independent configuration of **digital input/output**, **ADC**, **SERVO control**, **RGB LED control** modes. Suitable for multi-channel digital/analog signal acquisition, and lighting/servo control applications.

Product Features

- 8-channel input and output expansion.
 - Digital input/output
 - ADC input
 - SERVO control (PWM)
 - RGB LED control
- I2C communication interface:
 - Supports configuration of I2C address
- Multiple soldering options
 - Three types soldering options are available (SMT, DIP, Jumper wire),
 - With high-temperature resistant plastic enclosure, Peak temperature = 230°C

Included

- 1x STAMP IO
- 1x HY2.0-4P female connector (red)
- 1x Hex key 1.5mm

Applications

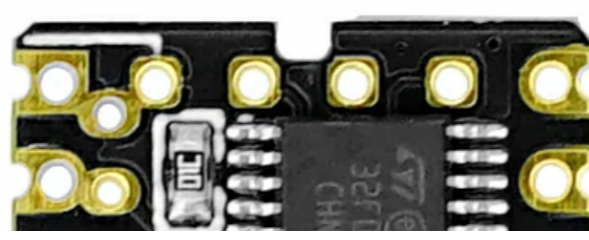
- IO Expansion
- Servo control
- Multiple lighting control
- Multiple analog signal acquisition

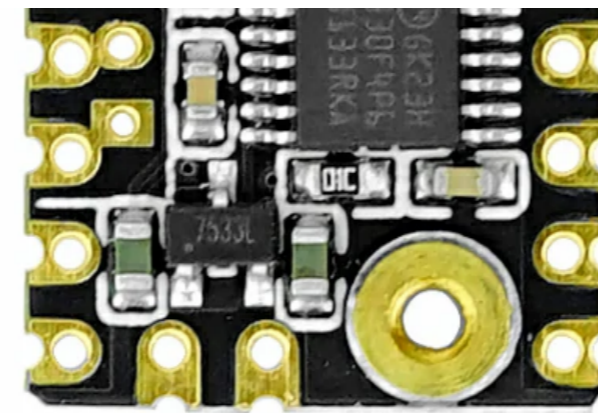
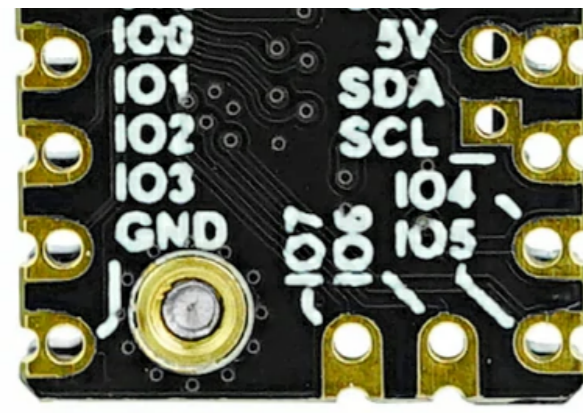
Applications

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- Servo control
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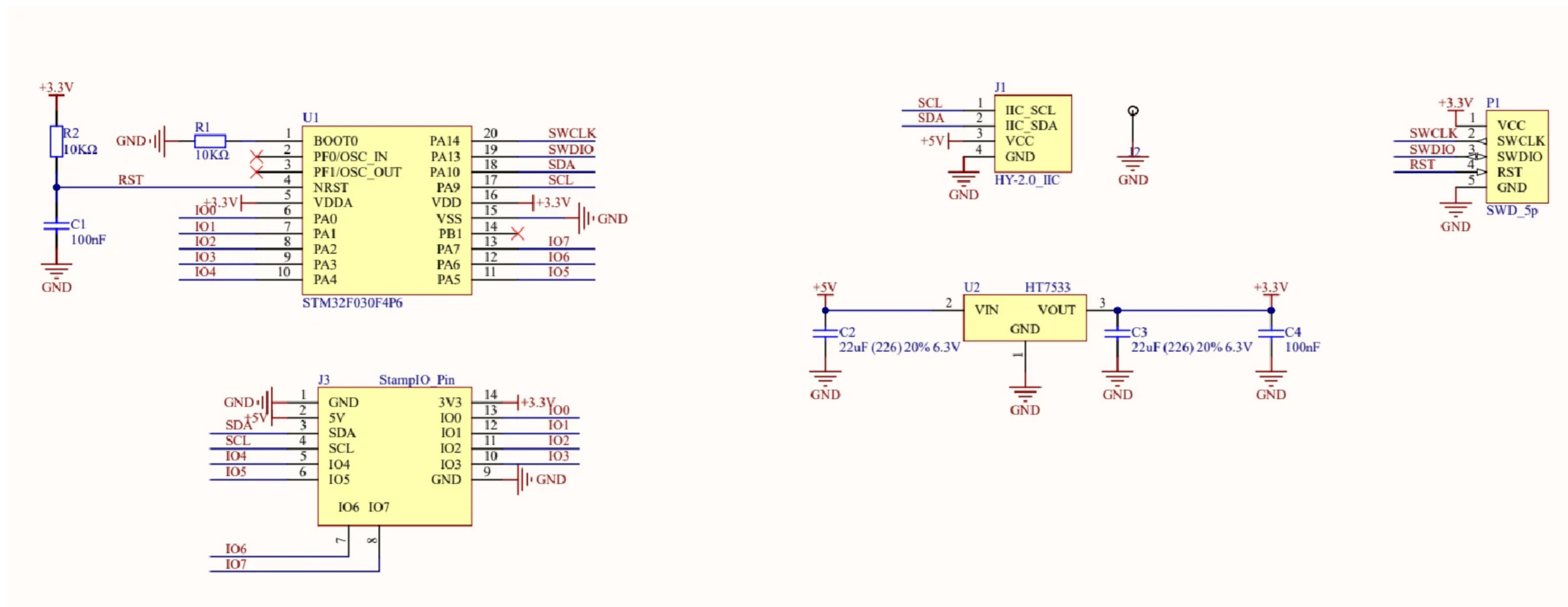
Specifications

| Specification | Parameters |
|--------------------------------|--|
| MCU | STM32F030 |
| I2C Address | 0x45(default) |
| Number of IO expansions | 8 |
| IO Support Mode | Digital I/O, ADC, SERVO control, RGB LED control |
| IO Support Input/Output Levels | 3.3V |
| Net Weight | 2.5g |
| Gross Weight | 4.3g |
| Product Size | 15*4.7*16mm |
| Package Size | 93*138mm |

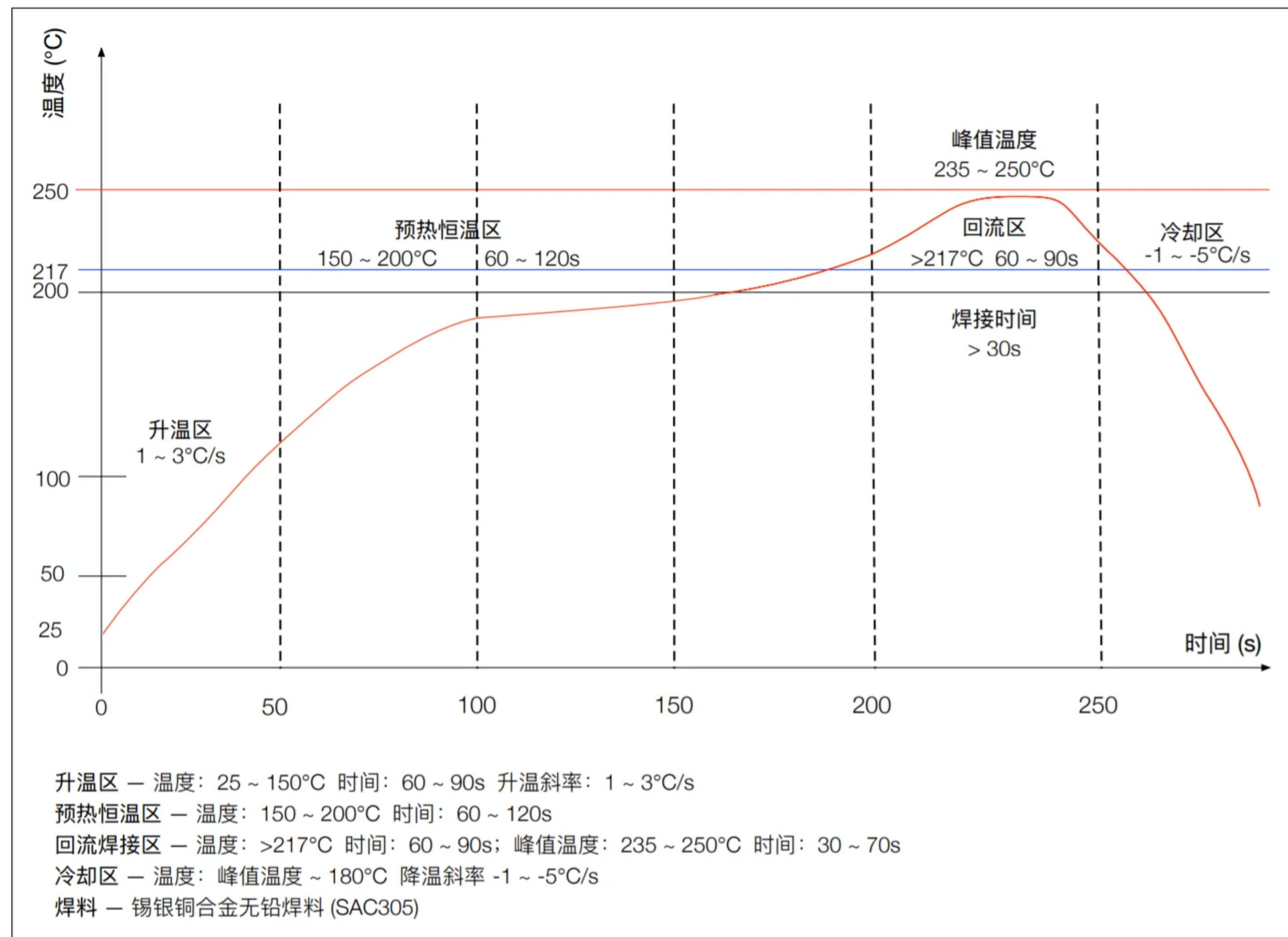




Schematics



The housing support reflow soldering



Example

Arduino

- ADC Input

- [Digital Input/Output](#)
- [RGB LED Control](#)
- [Servo Control](#)

Firmware

- [M5Unit-EXTIO2-Internal-FW](#)

Communication protocols

MODE CONFING

| REG | DESC | LEN | R/W |
|------|-----------|--------|-----|
| 0x00 | MODE_CH_1 | 1 BYTE | R/W |
| 0x01 | MODE_CH_2 | 1 BYTE | R/W |
| 0x02 | MODE_CH_3 | 1 BYTE | R/W |
| 0x03 | MODE_CH_4 | 1 BYTE | R/W |
| 0x04 | MODE_CH_5 | 1 BYTE | R/W |
| 0x05 | MODE_CH_6 | 1 BYTE | R/W |
| 0x06 | MODE_CH_7 | 1 BYTE | R/W |
| 0x07 | MODE_CH_8 | 1 BYTE | R/W |

- Value:

```

DIGITAL_INPUT_MODE=0
DIGITAL_OUTPUT_MODE=1
ADC_INPUT_MODE=2
SERVO_CTL_MODE=3
RGB_LED_MODE=4

```

DIGITAL INPUT/OUTPUT

| REG | DESC | LEN | R/W |
|------|------------------------|--------|-----|
| 0x10 | OUTPUT_CTL_REG_CH_1 | 1 BYTE | W |
| 0x11 | OUTPUT_CTL_REG_CH_2 | 1 BYTE | W |
| 0x12 | OUTPUT_CTL_REG_CH_3 | 1 BYTE | W |
| 0x13 | OUTPUT_CTL_REG_CH_4 | 1 BYTE | W |
| 0x14 | OUTPUT_CTL_REG_CH_5 | 1 BYTE | W |
| 0x15 | OUTPUT_CTL_REG_CH_6 | 1 BYTE | W |
| 0x16 | OUTPUT_CTL_REG_CH_7 | 1 BYTE | W |
| 0x17 | OUTPUT_CTL_REG_CH_8 | 1 BYTE | W |
| 0x20 | DIGITAL_INPUT_REG_CH_1 | 1 BYTE | R |
| 0x21 | DIGITAL_INPUT_REG_CH_2 | 1 BYTE | R |
| 0x22 | DIGITAL_INPUT_REG_CH_3 | 1 BYTE | R |
| 0x23 | DIGITAL_INPUT_REG_CH_4 | 1 BYTE | R |
| 0x24 | DIGITAL_INPUT_REG_CH_5 | 1 BYTE | R |
| 0x25 | DIGITAL_INPUT_REG_CH_6 | 1 BYTE | R |
| 0x26 | DIGITAL_INPUT_REG_CH_7 | 1 BYTE | R |
| 0x27 | DIGITAL_INPUT_REG_CH_8 | 1 BYTE | R |

o Value:

HIGH:1 / LOW:0

8B ANALOG INPUT

| REG | DESC | LEN | R/W |
|------|--|--------|-----|
| 0x30 | ANALOG_INPUT_8B_REG_CH_1 Value: 0-255 | 1 BYTE | R |

| | | | |
|-------------|--|---------------|----------|
| REG 0x31 | ANALOG_INPUT_8B_REG_CH_2 Value: 0-255 | LEN 1 BYTE | R/W R |
| 0x32 | ANALOG_INPUT_8B_REG_CH_3 Value: 0-255 | 1 BYTE | R |
| 0x33 | ANALOG_INPUT_8B_REG_CH_4 Value: 0-255 | 1 BYTE | R |
| 0x34 | ANALOG_INPUT_8B_REG_CH_5 Value: 0-255 | 1 BYTE | R |
| 0x35 | ANALOG_INPUT_8B_REG_CH_6 Value: 0-255 | 1 BYTE | R |
| 0x36 | ANALOG_INPUT_8B_REG_CH_7 Value: 0-255 | 1 BYTE | R |
| 0x37 | ANALOG_INPUT_8B_REG_CH_8 Value: 0-255 | 1 BYTE | R |

12B ANALOG INPUT

| REG | DESC | LEN | R/W |
|------|--|--------|-----|
| 0x40 | ANALOG_INPUT_12B_REG_CH_1 Value: 0-4095 | 2 BYTE | R |
| 0x42 | ANALOG_INPUT_12B_REG_CH_2 Value: 0-4095 | 2 BYTE | R |
| 0x44 | ANALOG_INPUT_12B_REG_CH_3 Value: 0-4095 | 2 BYTE | R |
| 0x46 | ANALOG_INPUT_12B_REG_CH_4 Value: 0-4095 | 2 BYTE | R |
| 0x48 | ANALOG_INPUT_12B_REG_CH_5 | 2 BYTE | R |

| REG | DESC | LEN | R/W |
|------|--|--------|-----|
| 0x4A | ANALOG_INPUT_12B_REG_CH_6 Value: 0-4095 | 2 BYTE | R |
| 0x4C | ANALOG_INPUT_12B_REG_CH_7 Value: 0-4095 | 2 BYTE | R |
| 0x4E | ANALOG_INPUT_12B_REG_CH_8 Value: 0-4095 | 2 BYTE | R |

SERVO ANGLE CTL

| REG | DESC | LEN | R/W |
|------|--|--------|-----|
| 0x50 | SERVO_ANGLE_8B_REG_CH_1 Value: 0-180deg | 1 BYTE | R/W |
| 0x51 | SERVO_ANGLE_8B_REG_CH_2 Value: 0-180deg | 1 BYTE | R/W |
| 0x52 | SERVO_ANGLE_8B_REG_CH_3 Value: 0-180deg | 1 BYTE | R/W |
| 0x53 | SERVO_ANGLE_8B_REG_CH_4 Value: 0-180deg | 1 BYTE | R/W |
| 0x54 | SERVO_ANGLE_8B_REG_CH_5 Value: 0-180deg | 1 BYTE | R/W |
| 0x55 | SERVO_ANGLE_8B_REG_CH_6 Value: 0-180deg | 1 BYTE | R/W |
| 0x56 | SERVO_ANGLE_8B_REG_CH_7 Value: 0-180deg | 1 BYTE | R/W |
| 0x57 | SERVO_ANGLE_8B_REG_CH_8 Value: 0-180deg | 1 BYTE | R/W |

SERVO PULSE CTL

| REG | DESC | LEN | R/W |
|------|---|--------|-----|
| 0x60 | SERVO_PULSE_16B_REG_CH_1 Value: 500-2500us | 2 BYTE | R/W |
| 0x62 | SERVO_PULSE_16B_REG_CH_2 Value: 500-2500us | 2 BYTE | R/W |
| 0x64 | SERVO_PULSE_16B_REG_CH_3 Value: 500-2500us | 2 BYTE | R/W |
| 0x66 | SERVO_PULSE_16B_REG_CH_4 Value: 500-2500us | 2 BYTE | R/W |
| 0x68 | SERVO_PULSE_16B_REG_CH_5 Value: 500-2500us | 2 BYTE | R/W |
| 0x6A | SERVO_PULSE_16B_REG_CH_6 Value: 500-2500us | 2 BYTE | R/W |
| 0x6C | SERVO_PULSE_16B_REG_CH_7 Value: 500-2500us | 2 BYTE | R/W |
| 0x6E | SERVO_PULSE_16B_REG_CH_8 Value: 500-2500us | 2 BYTE | R/W |

RGB LED CTL

| REG | DESC | LEN | R/W |
|------|---------------------------|--------|-----|
| 0x70 | RGB_24B_REG_CH_1: RGB 888 | 3 BYTE | R/W |
| 0x73 | RGB_24B_REG_CH_2: RGB 888 | 3 BYTE | R/W |
| 0x76 | RGB_24B_REG_CH_3: RGB 888 | 3 BYTE | R/W |
| 0x79 | RGB_24B_REG_CH_4: RGB 888 | 3 BYTE | R/W |

| | | | |
|------|---------------------------|--------|-----|
| 0x79 | RGB_24B_REG_CH_4: RGB 888 | 3 BYTE | R/W |
| 0x7C | RGB_24B_REG_CH_5: RGB 888 | 3 BYTE | R/W |
| 0x7F | RGB_24B_REG_CH_6: RGB 888 | 3 BYTE | R/W |
| 0x82 | RGB_24B_REG_CH_7: RGB 888 | 3 BYTE | R/W |
| 0x85 | RGB_24B_REG_CH_8: RGB 888 | 3 BYTE | R/W |

Note: Do not write to the I2C address configuration register repeatedly at high frequency.

CONFIG

| REG | DESC | LEN | R/W |
|------|---|--------|-----|
| 0xFE | FW VERSION | 1 BYTE | R |
| 0xFF | I2C ADDR CONFIG (warn: Repeated writing may cause partition damage) | 1 BYTE | R/W |

FAQ