

# Module Fan v1.1

SKU:M013-V11

MODULE  
**FAN**  
V1.1

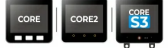
M5STACK

OUTFLOW

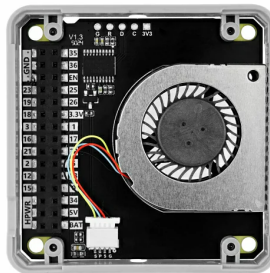
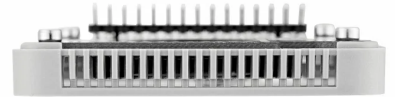
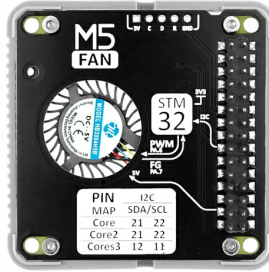
AIR  
INLET

I2C  
INTERFACE

COMPATIBLE & NOT INCLUDE



STM32  
PWM 100%:  
FAN DC5V@125mA





## Description

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**Module Fan v1.1** is a cooling module designed for the M5Stack stacking system. It features an STM32 microcontroller and uses the **I2C** protocol for control. It supports **reading and controlling** the fan speed and includes a **stall protection** function. This module is primarily used for cooling in stacking systems, effectively improving the system's thermal performance. It is suitable for embedded devices, smart hardware, and other applications requiring thermal management.

## Features

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- M5Stack stacking system
- STM32 microcontroller
- I2C protocol control
- Fan speed reading and control
- Stall protection function
- Development platforms
  - UiFlow1
  - UiFlow2
  - Arduino IDE

## Includes

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- 1 x Module Fan v1.1

## Applications

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- Cooling for M5Stack devices

## Specifications

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| Specification                     | Parameters   |
|-----------------------------------|--|
| MCU                               | STM32F030F4P6  |
| Communication                     | I2C(0x18)  |
| Operating Voltage                 | 5V   |
| Noise Test (Ambient Noise 40.8dB) | PWM20%:48.6dB<br>PWM60%:64.5dB<br>PWM100%:70.6dB                       |
| Operating Power                   | PWM20%:DC 5V@13.52mA<br>PWM60%:DC 5V@56.19mA<br>PWM100%:DC 5V@125.14mA |
| Standby Power                     | DC 5V@503.49uA   |
| Fan Speed                         | 11500RPM±10%   |
| Maximum Airflow                   | 1.23 CFM   |
| Fan Speed Control                 | Supports reading fan speed and PWM speed control                       |
| Stall Protection                  | Supports stall protection function                                     |
| Operating Temperature             | 0~40°C   |
| Product Size                      | 54.0 x 54.0 x 13.1mm   |
| Product Weight                    | 14.7g  |
| Package Size                      | 95 x 184 x 15.7mm  |
| Package Weight                    | 28.3g  |

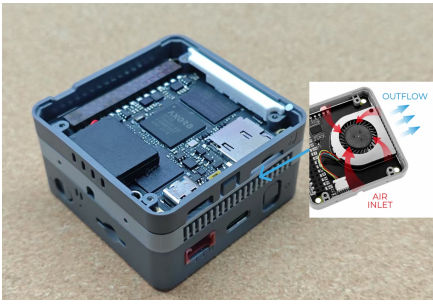
## Learn

### Stall Protection Note

If the fan is stalled due to foreign objects, it will automatically resume operation after the obstruction is removed. However, prolonged stalling may damage the fan or even cause it to burn out. Therefore, please promptly clear any blockages and ensure the fan operates normally.

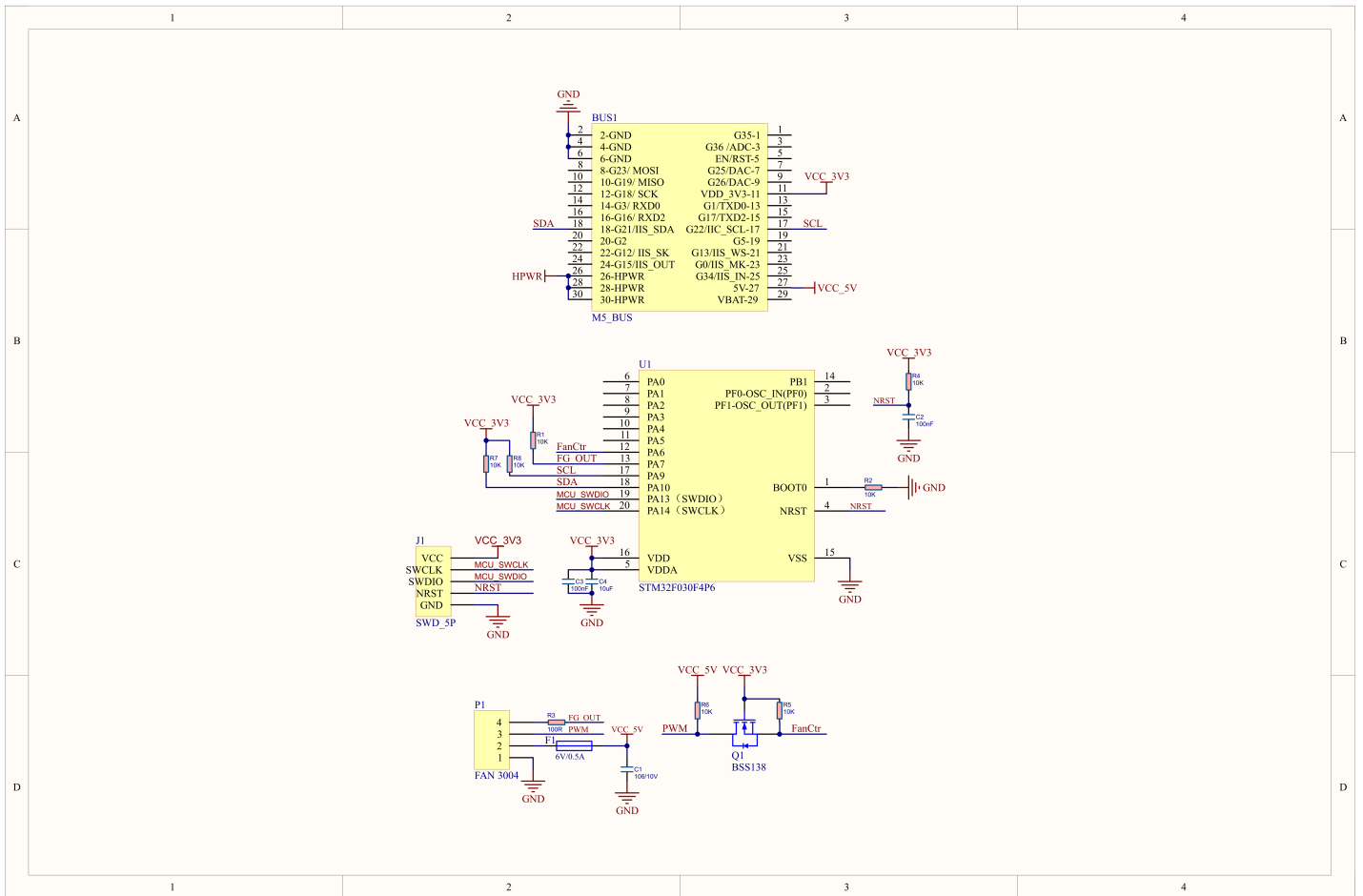
### Cooling Module Installation

The air intake of Module Fan v1.1 is located at the bottom of the module. For optimal cooling performance, it is recommended to stack it on top of the module that requires cooling, as shown in the image below.



## Schematics

- Module Fan v1.1 Schematics PDF



## PinMap

### Fan

| Fan   | VCC | GND   | FG_OUT | PWM  |
|-------|-----|-------|--------|------|
| Color | Red | Black | Yellow | Blue |

FG\_OUT is the fan speed waveform output pin, and PWM is the fan speed control pin.

## STM32

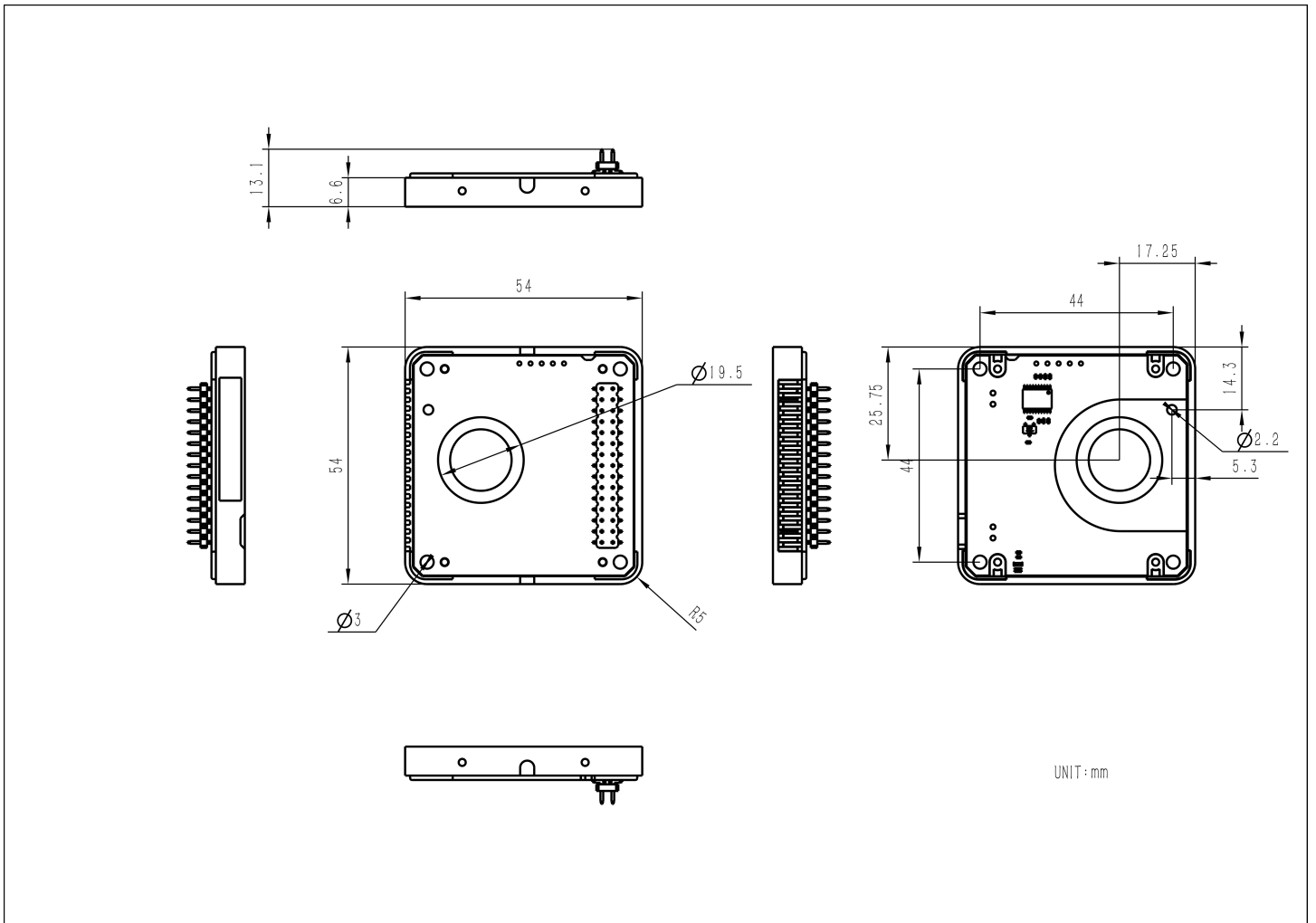
| STM32F030F4P6 | PA6    | PA7    | PA9 | PA10 |
|---------------|--------|--------|-----|------|
| Fan           | FanCtr | FG_OUT | SCL | SDA  |

## M5-Bus

| PIN  | LEFT | RIGHT | PIN |
|------|------|-------|-----|
| GND  | 1    | 2     |     |
| GND  | 3    | 4     |     |
| GND  | 5    | 6     |     |
|      | 7    | 8     |     |
|      | 9    | 10    |     |
|      | 11   | 12    | 3V3 |
|      | 13   | 14    |     |
|      | 15   | 16    |     |
| SDA  | 17   | 18    | SCL |
|      | 19   | 20    |     |
|      | 21   | 22    |     |
|      | 23   | 24    |     |
| HPWR | 25   | 26    |     |
| HPWR | 27   | 28    | 5V  |
| HPWR | 29   | 30    |     |

## Model Size

- [Module Fan v1.1 Model Dimensions PDF](#)



## Datasheets

- [Fan Datasheet](#)

## Softwares

### Arduino

- [Module Fan v1.1 Arduino Guide](#)
- [Module Fan v1.1 Arduino Library](#)

### UiFlow1

- Coming soon...

### UiFlow2

- [Module Fan v1.1 UiFlow2 Docs](#)

### Internal Firmware

- [Module Fan v1.1 Internal Firmware](#)

### Protocol

o Module Fan v1.1 I2C Protocol

| M5Stack Module-FAN I2C Protocol |             |                |             |   |   |   |   |   |   |   |   |   |   |   |   |         | V1 (FW Version)   |   |      |
|---------------------------------|-------------|----------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---------|---|---|------|
| REG MAP (Addr: 0x18)            |             | 0              | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E       | F   | 2024/11/28                              | note |
| Fan control                     | 0x00<br>R/W | Control status |             |   |   |   |   |   |   |   |   |   |   |   |   |         | Control status: 风扇工作状态<br>0: 不工作<br>1: 工作<br>default: 1                       |   |      |
| PWM frequency                   | 0x10<br>R/W | Frequency      |             |   |   |   |   |   |   |   |   |   |   |   |   |         | Frequency: PWM频率<br>0: 1KHz<br>1: 12KHz<br>2: 24KHz<br>3: 48KHz<br>default: 2 |   |      |
| PWM duty cycle                  | 0x20<br>R/W | Duty cycle     |             |   |   |   |   |   |   |   |   |   |   |   |   |         | Duty cycle: 占空比<br>value: 0-100<br>default: 0                                 |   |      |
| Fan RPM                         | 0x30<br>R   | Speed-L        | Speed-H     |   |   |   |   |   |   |   |   |   |   |   |   |         |   | Speed: 风扇每分钟的转速<br>value: 0-(11500±10%) |      |
| Fan signal frequency            | 0x40<br>R   | Frequency-L    | Frequency-H |   |   |   |   |   |   |   |   |   |   |   |   |         |   | Frequency: 风扇输出引脚频率                     |      |
| Flash write back                | 0xF0W       | Write back     |             |   |   |   |   |   |   |   |   |   |   |   |   |         | write 1, write back   |   |      |
| Firmware Version                | 0xF0<br>R   |                |             |   |   |   |   |   |   |   |   |   |   |   |   | Version | Version: 软件版本号  |   |      |
| I2C Address                     | 0xF0<br>R/W |                |             |   |   |   |   |   |   |   |   |   |   |   |   | Address | Address: I2C设备地址<br>value: 0x08-0x77<br>default: 0x18                         |   |      |

寄存器说明

- Fan control: 配置风扇的工作状态，默认状态为打开。
- PWM frequency: 配置 PWM 信号输出的频率，默认值为 24kHz。
- PWM duty cycle: 配置 PWM 信号输出的占空比，用于调节风扇转速。
- Fan RPM: 读取风扇转速 (RPM，即每分钟旋转次数)。  
公式:  $Fan\ RPM = 60 \times (Fan\ signal\ frequency / Pulse\ count)$ 。  
注:  
Fan RPM 表示风扇每分钟的转速。  
Fan signal frequency 是风扇输出引脚的信号频率。  
Pulse count 表示风扇每转一圈产生的脉冲数 (此处每圈产生 2 个脉冲)。
- Fan signal frequency: 读取风扇输出引脚的信号频率。
- Flash write back: 向该寄存器写入 1，将配置信息保存到内部 Flash 中。  
配置内容包括:  
Fan control  
PWM frequency  
PWM duty cycle
- I2C Address: 设置 I2C 地址，地址设置成功后会立即生效，并保存到内部 Flash 中，掉电后不丢失。

注意事项

写入 Flash 时需先擦除内部 Flash，操作耗时较长，约 20ms。  
为延长 Flash 使用寿命，请避免频繁写入。  
如果要写入的值与内部 Flash 当前存储的值相同，则不会执行实际的写操作，从而减少不必要的 Flash 擦写，进一步延长其使用寿命。

## Video

o Module Fan v1.1 Product Introduction and Case Demonstration

[M013\\_V11\\_Module\\_Fan\\_v11\\_video.mp4](#)

## Product Comparison

### Product Comparison



Module Fan v1.1



Module Fan

|               |                              |               |
|---------------|------------------------------|---------------|
| Communication | I2C (0x18)                   | /             |
| Speed         | 11500RPM ±10%                | 7500RPM ±10%  |
| Speed Control | Supported (via I2C protocol) | Not Supported |

