

# ROBOMASTER Referee System

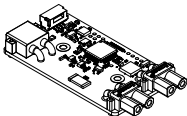
## Supercapacitor Management Module CM01

### 超级电容管理模块 CM01

User Guide

使用说明

v1.0 2020.07



ROBOMASTER

## Disclaimer

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## **Warning**

1. Before using the product, make sure that there are no short circuits and that all interfaces are correctly connected. Failure to do so may reduce the service life or even lead to permanent damage.
2. DO NOT damage the heat-shrink tubing. Otherwise, foreign objects may fall inside and cause the Capacitor Management Module to short circuit.

## **Introduction**

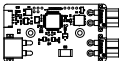
The RoboMaster Referee System Supercapacitor Management

Module CM01 monitors the status of the supercapacitor bank. Used with the Referee System Main Controller Module and Power Management Module, the Capacitor Management Module can detect the capacitance of the supercapacitor bank, and monitor its voltage and capacity in real time.

## In the Box

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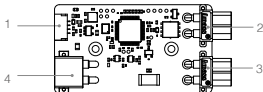
Capacitor Management  
Module × 1



4-Pin Cable × 1



## Overview



### 1. Capacitor Management Module Power Port (4-Pin)

Used to connect to the Power Management Module.

The port pin is shown below.

| ①  | ②   | ③    | ④    |
|----|-----|------|------|
| 5V | GND | CANH | CANL |



### 2. Capacitor Management Module RSVD Port (XT30PW-F)

A reserved port used for pre-match inspection. It is disabled by default and users cannot use it as an input or output port.

### 3. Capacitor Management Module PwrCtrl Port (XT30PW-F)

Used to connect to the power control board and has a rated current of 15 A. The power control board must be provided

by the user.

#### 4. Capacitor Management Module SuperCap Port (XT30PW-M)

Used to connect the supercapacitor bank and has a rated current of 15 A.

## Status LED Indicator

The status LED is used to indicate the operational status of the Capacitor Management Module and is defined below.

### Normal

|                                |                         |
|--------------------------------|-------------------------|
| Blinks green once every second | Communication is normal |
|--------------------------------|-------------------------|

|                                 |                            |
|---------------------------------|----------------------------|
| Blinks yellow once every second | Under pre-match inspection |
|---------------------------------|----------------------------|

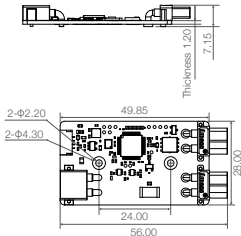
### Abnormal

|                              |                                       |
|------------------------------|---------------------------------------|
| Blinks red once every second | Exceeds the maximum detection current |
|------------------------------|---------------------------------------|

|                                    |                    |
|------------------------------------|--------------------|
| Blinks red five times every second | Under loader stage |
|------------------------------------|--------------------|

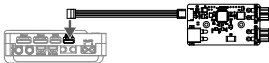
## Mounting the Capacitor Management Module

Refer to the dimensions in the illustration below when mounting the Capacitor Management Module.

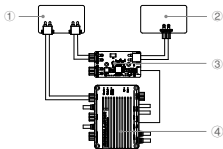


Unit: mm

1. Use the 4-pin cable to connect the power port of the Capacitor Management Module to the CAN1 communication port of the Power Management Module.



2. Connect the supercapacitor bank to the SuperCap port of the Capacitor Management Module, and then connect the power control board to the PwrCtrl port of the Capacitor Management Module.





- ① . Power Control Board      ③ . Capacitor Management Module  
② . Supercapacitor Bank      ④ . Power Management Module

## Specifications

|   |                   |
|---|-------------------|
| Operating Voltage                             | 5 V               |
| Operating Current                             | 55 mA             |
| Max. Charge/Discharge Current<br>(Detectable) | 16 A              |
| Weight  | Approx. 9.8 g     |
| Dimensions                                    | 56 × 28 × 7.15 mm |

## 免责声明

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## 产品使用注意事项

1. 使用前请确保电路无短路、接口按照要求正确连接，否则可能会影响产品寿命或造成永久性损坏。
2. 使用时请不要损坏热缩管，避免由于异物造成电路板短路。

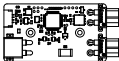
## 简介

RoboMaster 裁判系统超级电容管理模块 CM01 是用于监测超级电容模组状态的单元。电容管理模块搭配 RoboMaster 裁判系统主控模块和电源管理模块使用，可检测超级电容模组的容值，实时监控其电压和容量。

## 物品清单

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电容管理模块 × 1

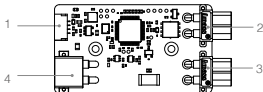


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4-pin 连接线 × 1



## 接口及线序说明



### 1. 电容管理模块电源接口（4-pin）

用于连接电源管理模块。

接口引脚线序如下所示：

| ①  | ②   | ③    | ④    |
|----|-----|------|------|
| 5V | GND | CANH | CANL |



### 2. 电容管理模块 RSVD 接口（XT30PW-F）

电容管理模块预留接口，仅用于赛前检录，不作为用户输入或输出接口，默认禁用。

### 3. 电容管理模块 PwrCtrl 接口（XT30PW-F）

用于连接功率控制板，额定电流 15A。功率控制板需自备。

### 4. 电容管理模块 SuperCap 接口（XT30PW-M）

用于连接超级电容模组，额定电流 15A。

## 状态指示灯

电容管理模块的 LED 灯可指示模块的工作状态，具体含义如下：

### 正常状态

绿灯每隔 1 秒闪 1 次      通信正常

黄灯每隔 1 秒闪 1 次      正在检录

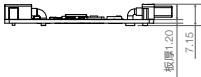
### 异常状态

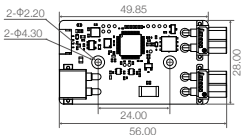
红灯每隔 1 秒闪 1 次      超过最大检测电流

红灯每隔 1 秒闪 5 次      持续处于启动（Loader）阶段

## 尺寸及安装说明

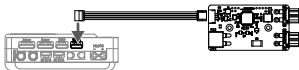
电容管理模块的结构尺寸如下所示：



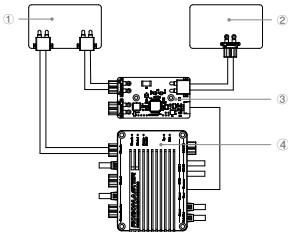


单位: mm

1. 使用 4-pin 连接线连接电容管理模块电源接口与电源管理模块的 CAN1 通信接口。



2. 连接超级电容模组与电容管理模块的 SuperCap 接口，然后连接功率控制板与电容管理模块的 PwrCtrl 接口。



① . 功率控制板

③ . 电容管理模块

② . 超级电容模组

④ . 电源管理模块

## 特征参数

|                |                   |
|----------------|-------------------|
| 工作电压           | 5 V               |
| 工作电流           | 55 mA             |
| 可检测最大充 / 放电电流  | 16 A              |
| 重量             | 约 9.8 g           |
| 尺寸 (长 × 宽 × 高) | 56 × 28 × 7.15 mm |



| 部件名称          | 有害物质      |           |           |                            |               |                 |
|---------------|-----------|-----------|-----------|----------------------------|---------------|-----------------|
|               | 铅<br>(Pb) | 汞<br>(Hg) | 镉<br>(Cd) | 六价铬<br>(Cr <sup>6+</sup> ) | 多溴联苯<br>(PBB) | 多溴二苯醚<br>(PBDE) |
| 线路板           | ×         | ○         | ○         | ○                          | ○             | ○               |
| 外壳            | ×         | ○         | ○         | ○                          | ○             | ○               |
| 金属部件<br>(铜合金) | ×         | ○         | ○         | ○                          | ○             | ○               |
| 内部线材          | ×         | ○         | ○         | ○                          | ○             | ○               |
| 其他配件          | ×         | ○         | ○         | ○                          | ○             | ○               |

本表格依据 SJ/T 11364 的规定编制。

○：表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。

×：表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。（产品符合欧盟 ROHS 指令环保要求）

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