

RoboMaster Referee System

Armor Modules AM02 & AM12

User Guide

使用说明

v1.0 2018.11

Disclaimer

Thank you for purchasing the ROBOMASTER™ Referee System Armor Module. Please read this disclaimer carefully before using this product. By using this product, you hereby signify that you have read and agree to all content herein. Please install and use this product properly and in strict accordance with the User Manual and product instructions, as well as any relevant laws, regulations, and policies. Users shall be responsible for the consequences resulting from their behavior while using this product. DJI™ will not bear any legal responsibilities for any damages due to improper use, installation or modification.

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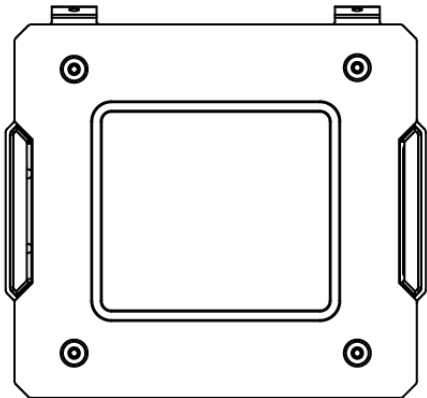
Product Usage Precautions

1. Make sure that the wiring connections are correct before use.
2. Make sure that the components are intact before use.
3. DO NOT use the module in excess of the measuring range, otherwise it may suffer permanent damage.
4. DO NOT let any customized armor come into contact with the Armor Module.
5. DO NOT modify or decorate the Armor Module.
6. The interfaces of the Armor Module are the same.
7. Before using the product, please download the RoboMaster 2019 Referee System User Manual from the official RoboMaster website to learn more about the product.

Introduction

The Armor Module of the RoboMaster Referee System belongs to the damage detection part of the Referee System, which can be installed on the exterior of your robot for detecting collisions and projectile attacks..

Inventory List



Armor Module (AM02) × 2/Armor Module (AM12) × 2*

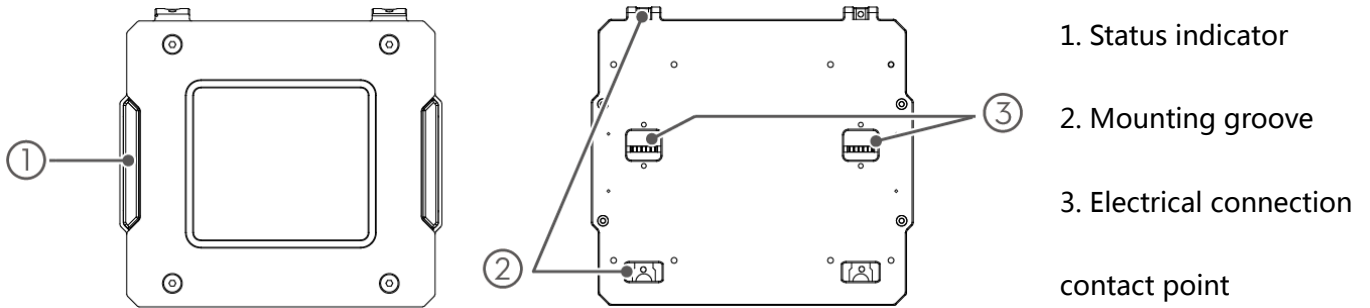
6-Pin Cable × 3**

*The RoboMaster Referee System Armor Module is available as two models: AM02 and AM12. The inventory list for AM02 is provided as an example.

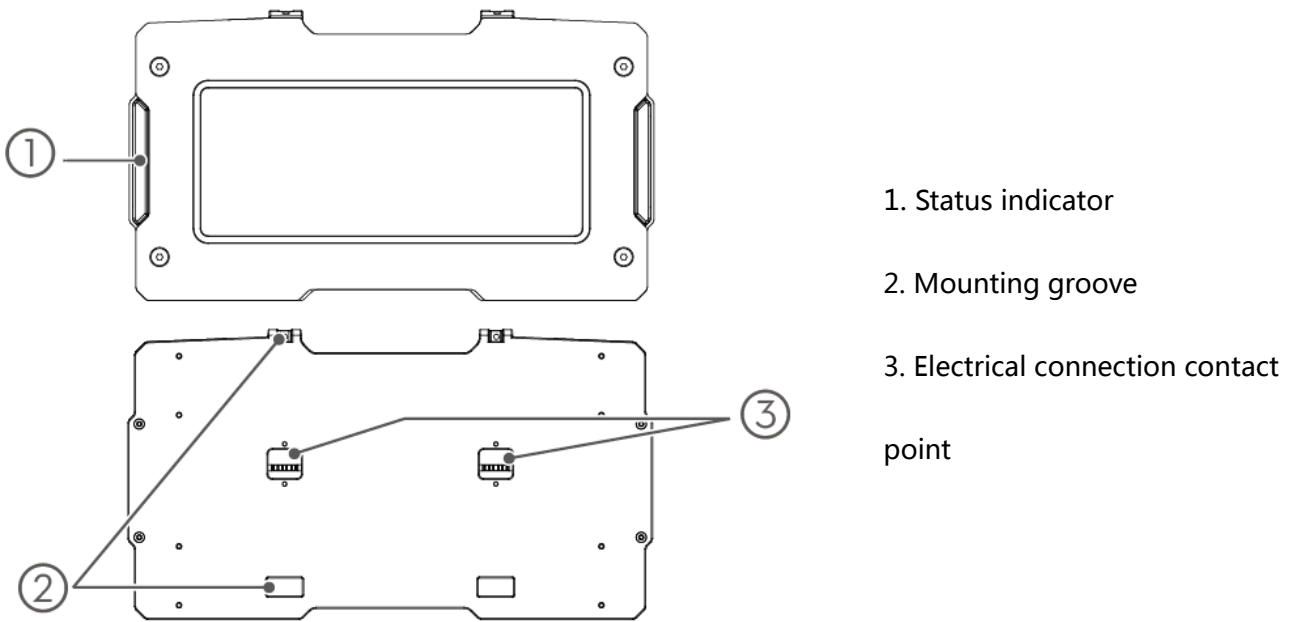
**The 6-pin cable is available in two lengths. The 6-pin cable that comes with AM02 is 400 mm long, and the 6-pin cable that comes with AM12 is 800 mm long.

Component Name

AM02 (small armor):



AM12 (large armor):

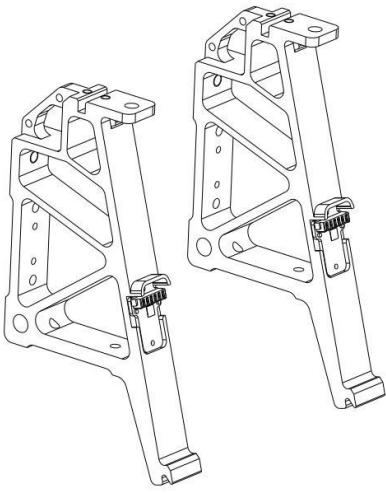


The electrical connection contact point needs to be connected to the armor support frame (available separately) to supply power to the Armor Module and enable communication between the Armor Module and the Main Control Module.

Mounting and Connection

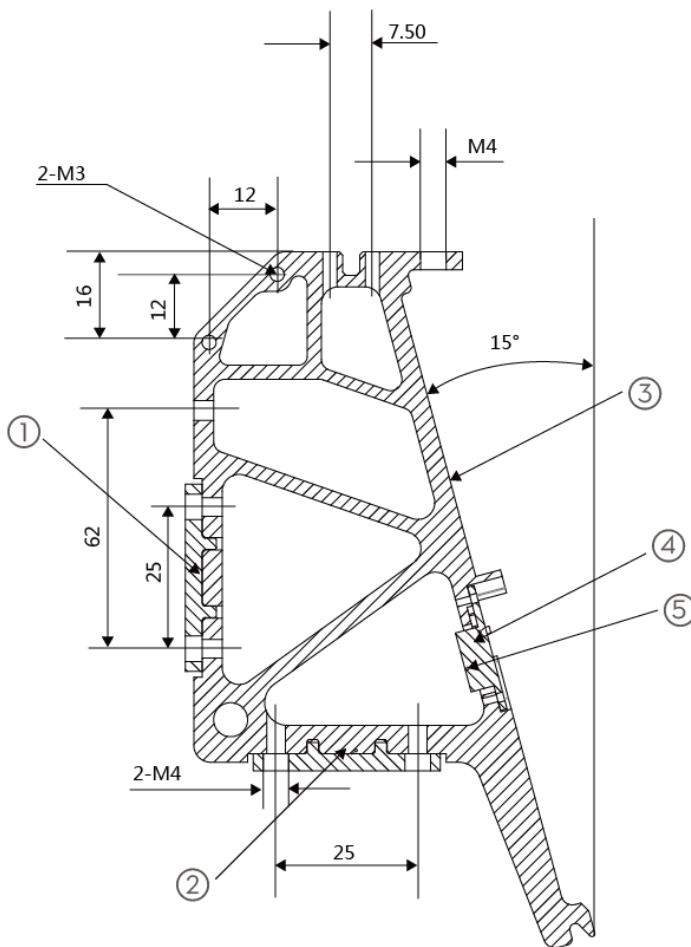
The mounting and connection methods for AM02 and AM12 are the same. Below follows an explanation of how to mount and connect AM02.

The Armor Module needs to be mounted using armor support frames (as shown in the figure below).



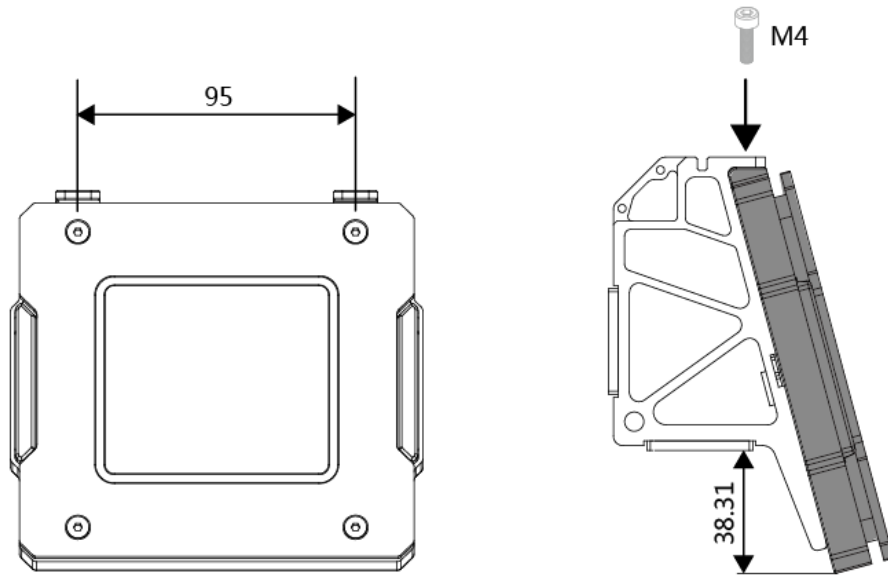
* An Armor Module needs to be mounted using two armor support frames. Please purchase the required armor support frames from the official RoboMaster website.

Please mount the armor support frames and Armor Modules to your robot according to the dimensions shown in the figure below:



1. Back installation surface
2. Bottom installation surface
3. Armor module mounting surface
4. Electrical connection contact point
5. JST 6-pin port

Dimensions and mounting holes of the armor support frame (unit: mm)

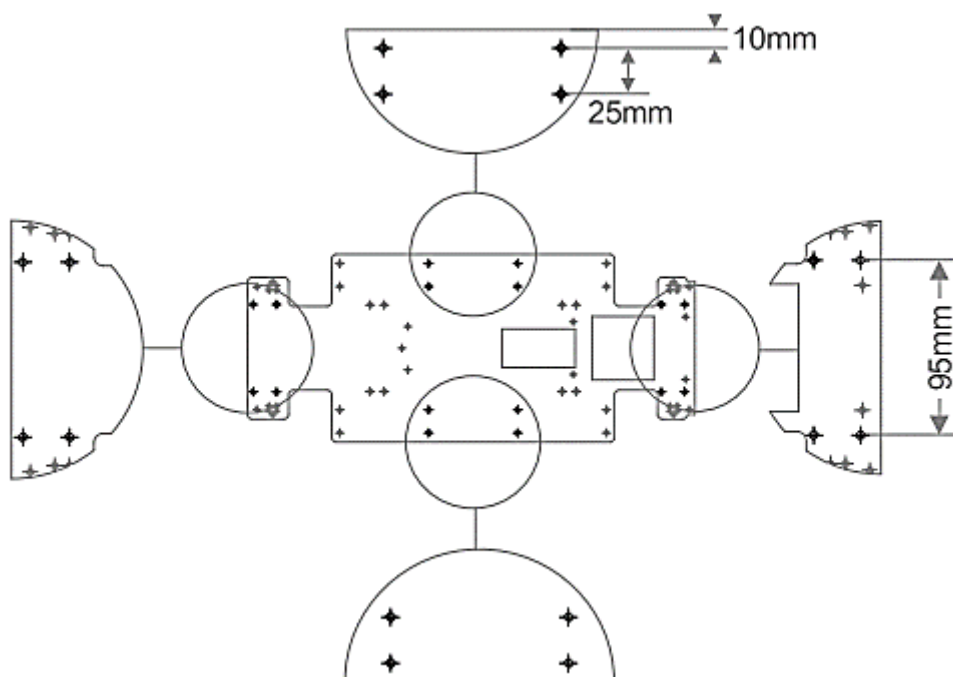


Distance between the mounting holes of the Armor Module and the method for securing it to the armor support frames (unit: mm)

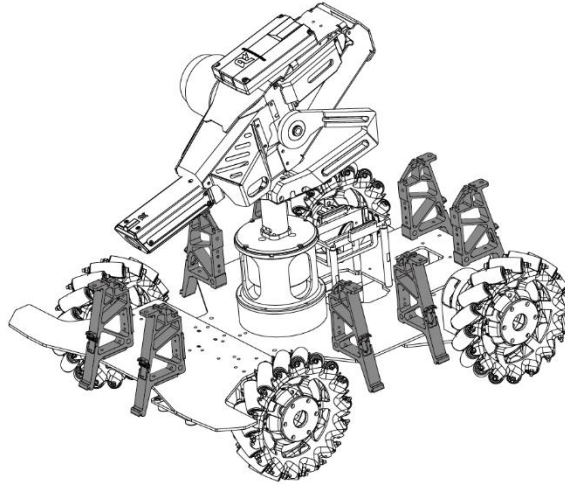
AM02 and AM12 differ in dimensions and structure, but the way the armor support frames are connected and secure are the same. The diagram provides an explanation of how to connect and secure AM02 to the armor support frames.

Example of installation

1. Reserve mounting holes on the chassis of your robot according to the dimensions shown in the figure below, ensuring that the sizes and relative positions of the four mounting holes are the same.



2. Secure Armor Support Frames A to the chassis using M4 screws.



3. Connect in series the 6-pin cables included in the package of the Armor Modules to the 6-pin ports of the armor support frames (see the Mounting and Connection section) and to the Armor interface of the Power Management Module of the Referee System.

4. Mount the Armor Modules to the armor support frames and secure them using M4 screws (see the Mounting and Connection section).

Status Indicator

| Normal Status | |
|---|---|
| Solid red/blue | The Armor Modules are functioning properly, showing the color of the identity of your robot |
| Flashing red/blue quickly | The Armor Module detects an attack (collision or projectile) |
| Flashing red/blue slowly | The Armor Modules are in Set ID mode |
| Warnings and Errors | |
| Flashing red and blue alternately | A sensor is damaged |
| Flashing purple | Failed to successfully communicate with the Referee System after the armor is powered on |
| Flashing red, blue and purple alternately | Module ID conflict |

Product Parameters

| Product Model | AM02 | AM12 |
|-----------------------------|---------------|---------------|
| Maximum Detection Frequency | 20 Hz | 20 Hz |
| Minimum Test Pressure | 19 N | 19 N |
| Maximum Bearing Pressure | 490 N | 490 N |
| Power Supply | 12 V | 12 V |
| Dimensions | 140 x 125 mm | 235 x 127 mm |
| Weight | Approx. 359 g | Approx. 546 g |

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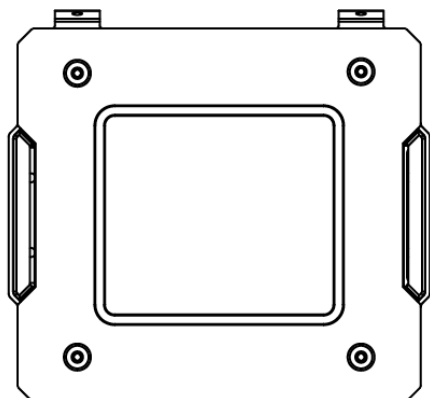
产品使用注意事项

1. 使用前请确保连线正确。
2. 使用前请检查零部件是否完好。
3. 请不要超量程使用，否则可能造成模块永久性损坏。
4. 自行设计的保护装甲，不要与装甲模块有任何接触，以免影响正常使用。
5. 请勿对装甲模块进行任何修改与装饰，以免影响使用。
6. 装甲模块接口均为等效接口。
7. 使用前，请前往 RoboMaster 官网下载《RoboMaster 2019 裁判系统用户手册》了解产品更为详细的使用功能。

简介

RoboMaster 装甲模块属于机器人裁判系统的伤害感知部分，可安装于机器人周围外侧，用于检测机器人被弹丸攻击及碰撞的情况。

物品清单



装甲模块 (AM02) X2/装甲模块 (AM12) ×2*

6-Pin 连接线 X 3**

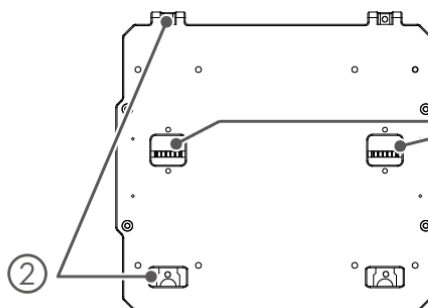
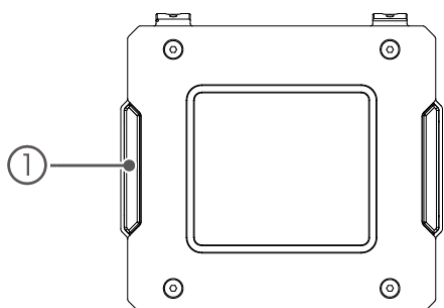
*RoboMaster 裁判系统装甲模块共有两个型号 :AM02 及 AM12 ,物品清单以 AM02 为例。具体实物以您购买时为准。

**6-Pin 连接线共有两种长度 搭配 AM02 的 6-Pin 连接线长度为 400mm 搭配 AM12 的 6-Pin 连接线长度为 800mm。

根据购买的装甲模块型号不同，有所区别。

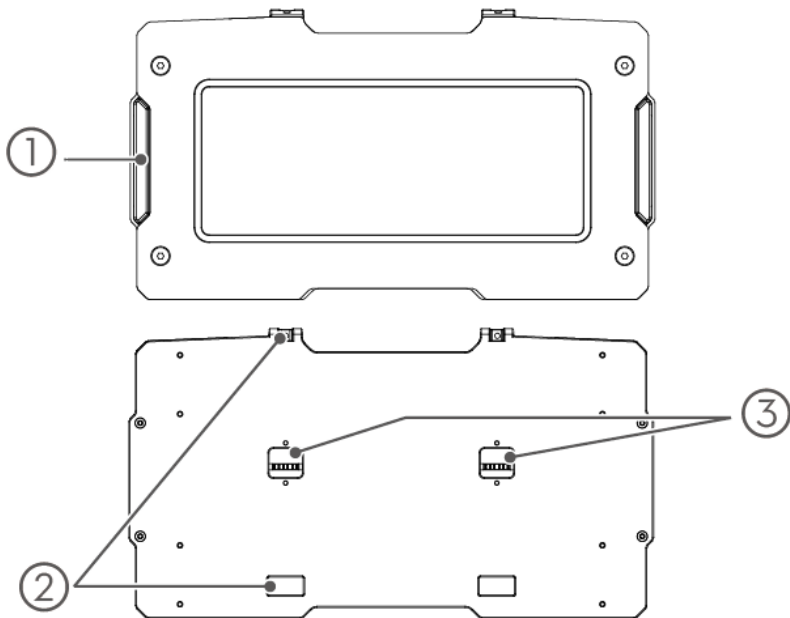
部件名称

AM02 (小装甲) :



1. 状态指示灯
2. 安装槽
3. 触点连接器

AM12 (大装甲) :



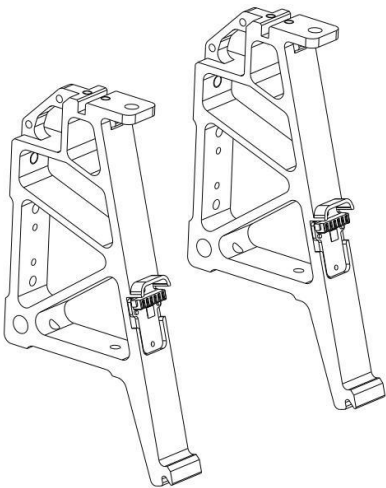
1. 状态指示灯
2. 安装槽
3. 触点连接器

装甲模块中触点连接器需要与装甲支撑架（需另购）连接，为装甲模块供电并实现装甲模块与主控模块之间的通信。

安装与连线

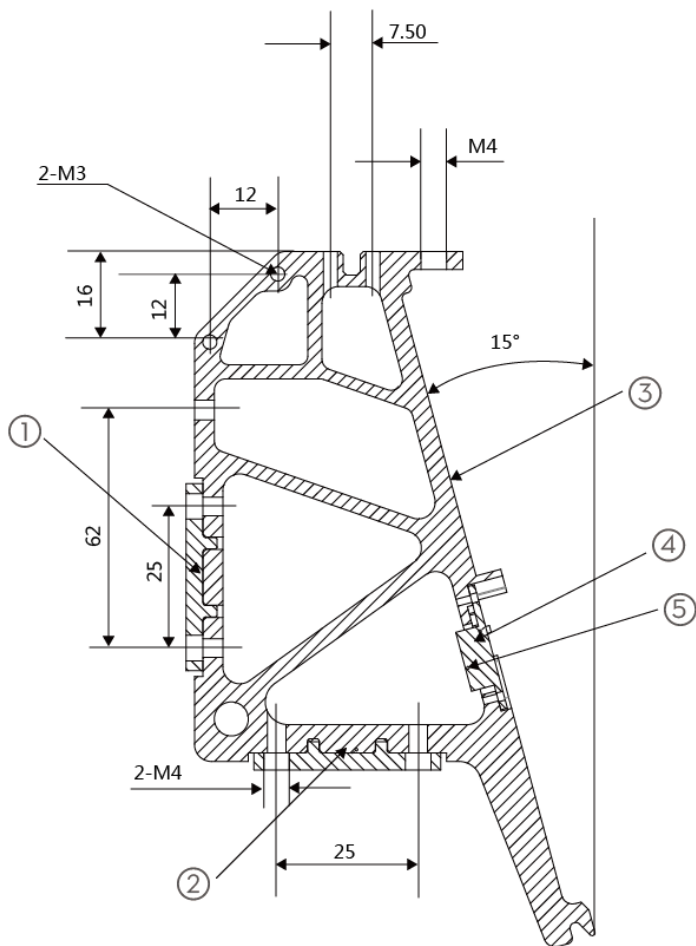
AM02 与 AM12 的安装与连线方式一致，下面以 AM02 为例进行说明。

装甲模块需要使用装甲支撑架（如下图）进行安装。



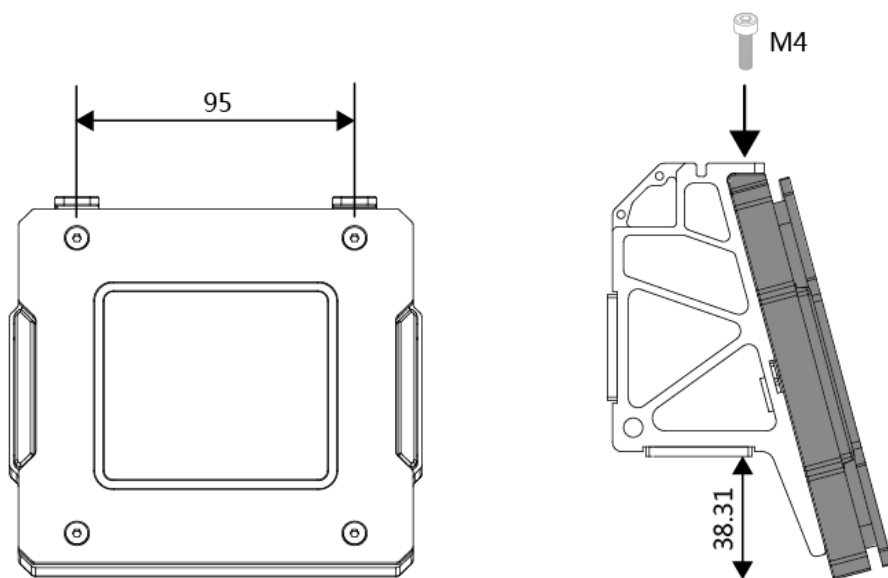
*安装一个装甲模块需要使用两个装甲支撑架，请根据需求于 RoboMaster 官网选购所需数量的装甲支撑架。

请按照下图装甲支撑架及装甲模块的尺寸说明将装甲支撑架和装甲模块安装至您的机器人上：



1. 后部安装面
2. 底部安装面
3. 装甲模块安装面
4. 电器触点安装面
5. JST-6-Pin 连接线端口

装甲支撑架尺寸及安装孔（单位：mm）

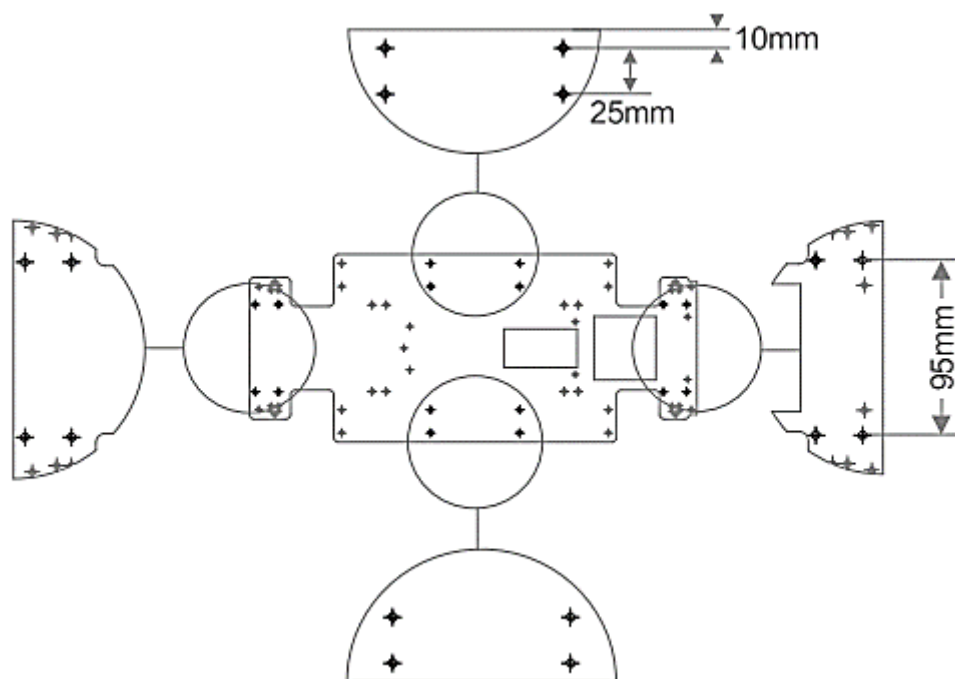


装甲模块安装孔距离及固定至装甲支撑架方法（单位：mm）

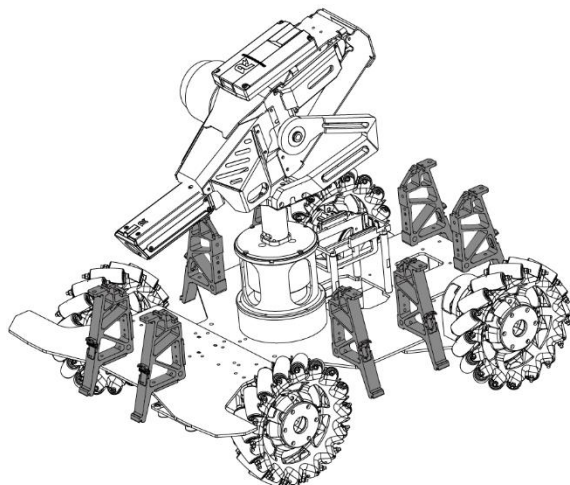
AM02 和 AM12 尺寸外形结构不同，但与装甲支撑架连接固定位置一致，图示以 AM02 为例进行说明。

安装举例

5. 按照下图尺寸，在机器人底盘上板预留安装孔位，四个安装孔位尺寸和相对位置保持一致。



6. 使用 M4 螺丝固定各个面的装甲支撑架 A 型至底盘上板。



7. 使用装甲模块包装内附带的 6-Pin 连接线以串联方式连接至各装甲支撑架的 6-Pin 端口（见安装与连线章节）并连接至裁判系统电源管理模块 Armor 接口。

8. 安装装甲模块至装甲支撑架，并使用 M4 螺丝固定（见安装与连线章节）。

状态指示灯

| 正常状态 | |
|---------|--------------------|
| 红灯/蓝灯常亮 | 装甲模块工作正常，显示机器人身份颜色 |
| 红灯/蓝灯快闪 | 装甲模块检测攻击（弹丸射击、撞击） |
| 红灯/蓝灯慢闪 | 装甲模块处于设置 ID 模式 |

| 警告与异常 | |
|----------|--------------------|
| 红蓝灯交替闪烁 | 装甲模块传感器损坏 |
| 紫灯持续闪烁 | 装甲上电之后，未能与裁判系统通信成功 |
| 红蓝紫灯交替闪烁 | 模块 ID 冲突 |

产品参数

| 产品型号 | AM02 | AM12 |
|--------|--------------|--------------|
| 最大检测频率 | 20 Hz | 20 Hz |
| 最小检测压力 | 19 N | 19 N |
| 最大承受压力 | 490 N | 490 N |
| 供电 | 12 V | 12 V |
| 尺寸 | 140 x 125 mm | 235 x 127 mm |
| 重量 | 约 359 g | 约 546 g |

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