Mabot

百科

mabot.bellrobot.com

电器功能模块

A010001C00

主控球

Mabot的控制中心，可以存储和处理信息以及发送指令。

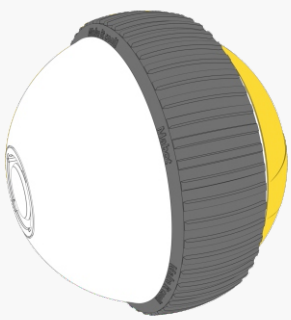
- 内含蓝牙连接模块和三轴陀螺仪模块。
- Micro-USB 端口具有传输程序功能，但无法进行充电。
- 具有1个具备信号传输和电流传输功能的接口。

工作状态说明：

- 系统启动：灯光闪烁后进入呼吸模式（亮到暗的逐渐变化），同时蜂鸣器发出提示音“Do Me”。
- 蓝牙连接成功：灯光闪烁两下，同时蜂鸣器发出提示音“Do Re Me”。
- 下载官方程序：程序下载成功后，灯罩显示绿色并闪三下，同时蜂鸣器发出提示音“Do Me”；程序下载失败，灯罩显示红色并闪三下。

按钮功能说明：

- 任意按键可以开始或结束主控里面的程序。



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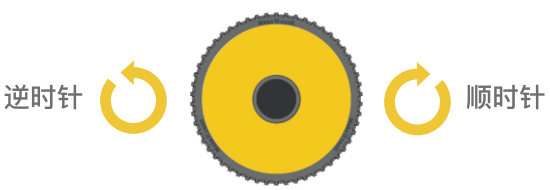
驱动球

Mabot的运动装置，可以当做轮子或带动其他部件转动使用。

- 注意转动方向，面朝黄色面识别顺时针及逆时针转动。
- 具有1个具备信号传输和电流传输功能的接口。
- 在没有主控球的情况下（电池球+驱动球），用手快速转动驱动球后，驱动球会沿着转动方向自传。

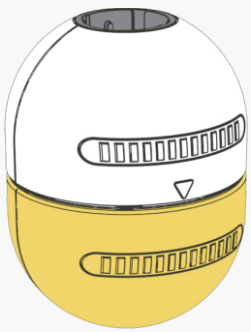


- 堵转力矩：1.2kg·cm
- 最大负载物体重量：0.25 kg

注意：

- 当驱动球负载超过扭力时，会停止转动，请及时进行减负，否则会对模块造成损伤。
- 定期检查传动缝隙中是否有异物并进行清理，保证驱动球工作良好。
- 请勿插入连接杆后转动，会损坏模块。
- 驱动球过载启动保护后，灯罩闪红色。

电器功能模块



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旋转关节球

Mabot的关节模块，可以水平旋转角度，如当做机器人的腰部使用。

- 旋转角度正负75°
- 负载转矩：0.55 kg·cm
- 负载物体重量限制：0.55kg
- 具有2个具备信号传输和电流传输功能的接口。

注意：

- 严禁强行掰动，会造成模块损坏。
- 负载物体有重量限制，如负载不能正常转动，需立即将物体拿下，否则会造成损坏。
- 两个半球之间不能有异物阻碍转动。
- 请勿插入连接杆后转动，会损坏模块。

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摇摆关节球

Mabot的关节模块，可以摇摆角度，如当做机器人的手臂使用。

- 摆动角度正负75°
- 负载转矩：0.55 kg·cm
- 负载物体重量限制：0.32kg
- 具有2个具备信号传输和电流传输功能的接口。

注意：

- 严禁强行掰动，会造成模块损坏。
- 负载物体有重量限制，如不能正常转动，需立即将物体拿下，否则会造成损坏。
- 两个半球之间不能有异物阻碍转动。
- 请勿插入连接杆后转动，会损坏模块。

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红外球

可以检测前方有无物体。

- 检测的角度：灯头与被测物体垂直。
- 通过红外线的反射强度来测量距离，可测范围为5~15cm，根据物体的大小和形状会有所不同。
- 具有1个具备信号传输和电流传输功能的接口。

注意：

- 请勿在黑色壳上涂抹或用异物粘贴，否则会影响传感器的判断。
- 镜面和深色的物体也会影响传感器的识别。

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颜色球

可以检测到进入传感器表面小窗口的颜色或光强度。

- 可识别8种颜色
- 可识别光强度：0（极暗）到100（极亮）
- 检测角度：灯头与被测物体垂直
- 检测距离：1cm
- 具有1个具备信号传输和电流传输功能的接口

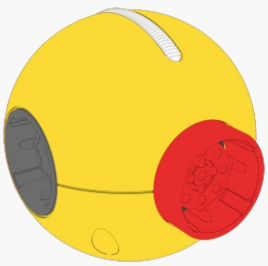
模式说明：

- 颜色模式：灯头显示白灯，可以识别平整物体颜色。
- 反射光强度模式：灯头显示红灯，可以在白色平面上识别到黑线位置 。
- 环境光强度模式：灯头熄灭，测量从周围环境进入到窗口的光强度，可以检测太阳光或手电筒灯光，能够通过光强度来触发程序。
- 当处于“颜色模式”或“反射光强度模式”时，为求最精确，颜色球必须角度正确、靠近但不接触到正在检测的物体表面（如套装中的“巡线机器人”）。

电器功能模块

触碰球

可以检测触碰球的红色按钮是否受到压力。



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- 触碰球上方为指示灯。
- 触碰球红色接口不具备信号传输和电流传输功能。
- 具有3个具备信号传输和电流传输功能的接口，接口夹角90°。

使用说明：

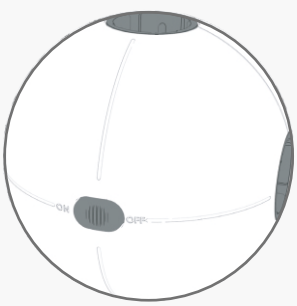
- 压力不要超过1 kg。
- 可以检测到2种状态，按压、松弛。

注意：

- 严禁人为破坏触碰按钮或强力拔出。
- 请勿插入连接杆后转动，会损坏模块。

电池球

Mabot的供电模块，为其他电器模块提供电能。



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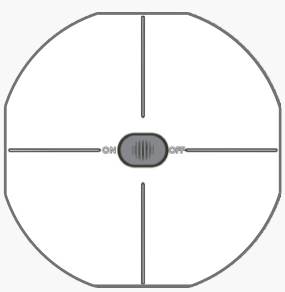


长按开关开启/关闭电源

- 支持Micro-USB 端口充电； 充电端口两侧为电池指示灯。
- 具有4个具备信号传输和电流传输功能的接口。
- 电池参数
  典型容量：640mAh
  标准电压：7.4V
  充电环境温度：10℃-45℃

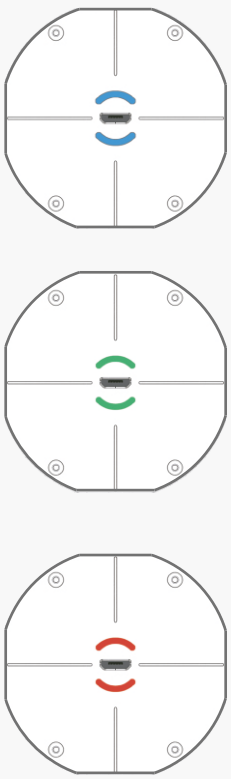
开关说明：

- 关闭状态下，长按2秒开启电源，电池球上的指示灯开启。
- 开启状态下，长按3秒关闭电源，电池球上的指示灯熄灭。

电池指示灯说明：

- 电池球在构型中电量充足，电池球指示灯显示绿色。
- 电池球在构型中电量不足，电池球指示灯显示红色。
- 电池球处于低电量状态下，Mabot可能会工作异常，请及时充电。
- 电池球在充电状态下，充电时指示灯显示蓝色，充满时显示绿色。

电器功能模块



电量说明：

- 电池电量：当连接摇摆关节球、旋转关节球、驱动球等高耗电模块时，数量越多，则使用时间越短。

注意：

- 切勿使用已损坏的电池球。
- 切勿将尖锐的金属物体插入连接口内，会造成电池球短路或永久性损坏。
- 不使用时，请将电池球关闭。长时间不使用时，为保证电池的正常使用，请每隔三个月对其进行充电维护。
- 关闭电池球后再进行充电，以延长电池寿命。
- 禁止暴力砸摔模块。
- 请勿插入连接杆后转动，会损坏模块。

电器连接模块

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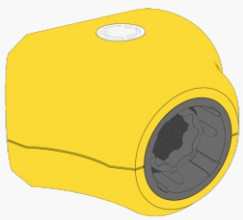
可以拓展连接端口数量以及配合其他部件进行结构加固。
具有6个信号传输和电流传输功能的接口。

注意：请勿插入连接杆后转动，会损坏模块。



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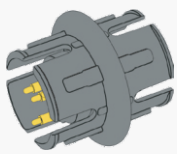
可以扩展连接端口数量，拓展方向更灵活。
具有3个信号传输和电流传输功能的接口， 接口夹角120°。

注意：请勿插入连接杆后转动，会损坏模块。



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可以进行结构连接、电流传输以及信号传输。

电器连接模块

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可以进行电流传输以及信号传输。

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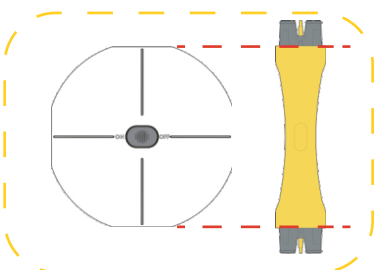
可以进行信号传输，但无法传输电流。
可以将电池分组，如1号电池给四个驱动球供电，2号电池给两个关节球供电，用该部件连接后，可以保证电量持久的同时进行整体编程控制。

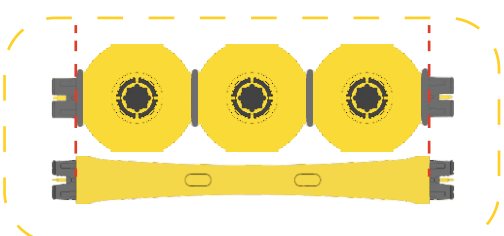
B010005A00

可以进行结构连接、电流传输以及信号传输。
尺寸单位和一个电池球的尺寸相同。

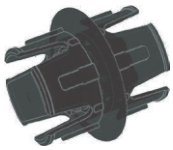


B010006A00

可以进行结构连接、电流传输以及信号传输。
尺寸单位和三个连接在一起的连接球相同。



结构连接零件



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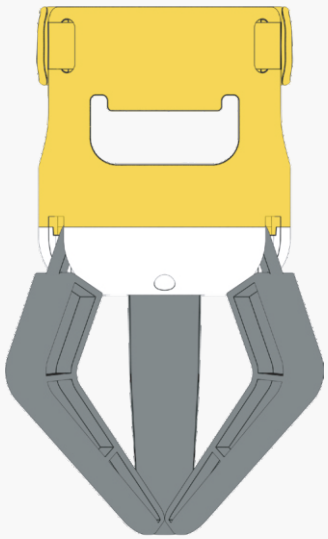
配件



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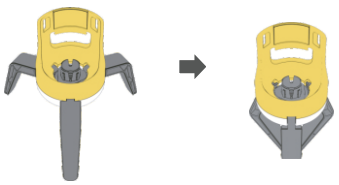
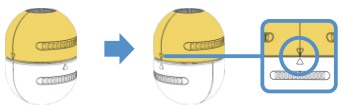
配合A020002C00可以抓取物体。

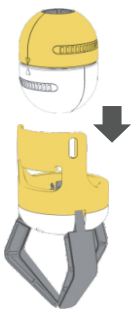
❶ 按箭头方向旋转接口将爪子收拢



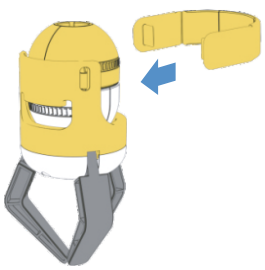
❷ 转动旋转关节球，将两个箭头对在一起

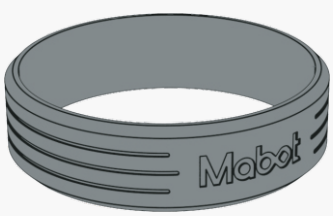


❸ 旋转关节球垂直插入



❹ 扣上锁扣





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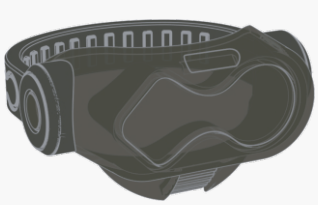
起到在构型中稳固A020002C00的作用。



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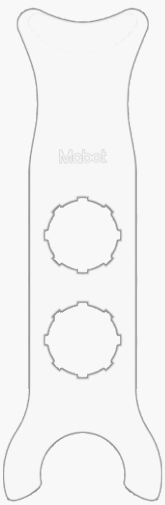
安装时请确认C070003A03两侧与主控球组合时仍可按动按钮

配件



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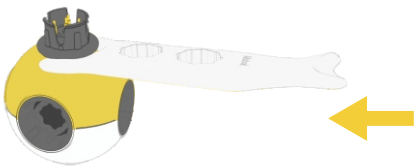
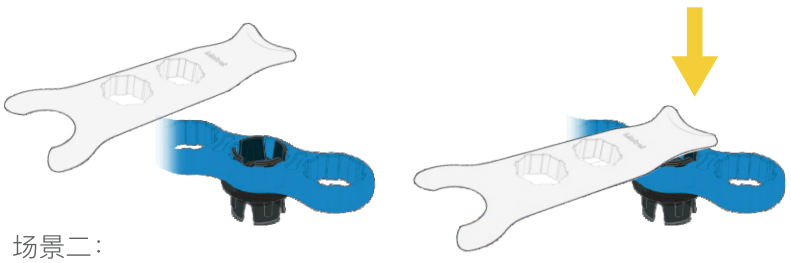
拆卸工具使用说明：



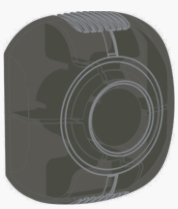
场景一：

- 将拆卸工具插入连接杆与连接球间隙之间；
- 向箭头指示方向用力，即可把连接杆拆出。



场景二：

- 将拆卸工具的手柄压在梁上S结构连接杆的凸起位置；
- 用力向下按压手柄，即可推出连接杆。



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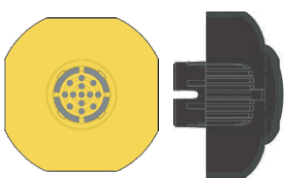
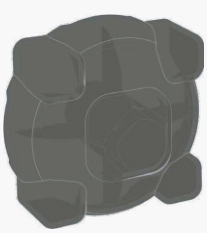


C070004A03可安装到不同模块的接口上。



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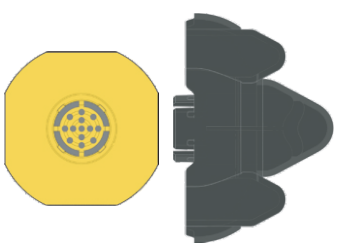
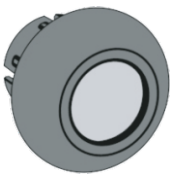


C070005A03可安装到不同模块的接口上。

配件



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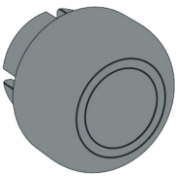

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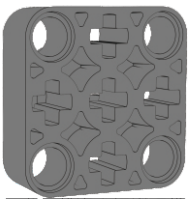

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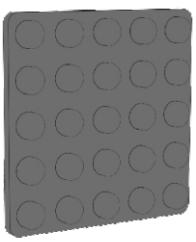

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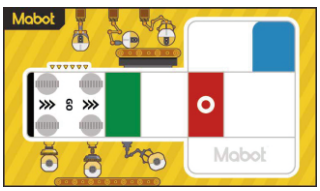

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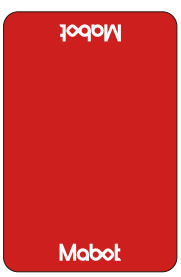

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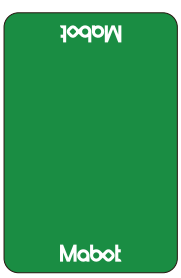

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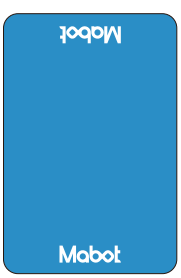


D030003A00

Mabot

Encyclopedia

mabot.bellrobot.com

Electric Modules

A010001C00

Control Ball

Operating and Controlling center of Mabot.
Storage, Processing information and Sending instructions.

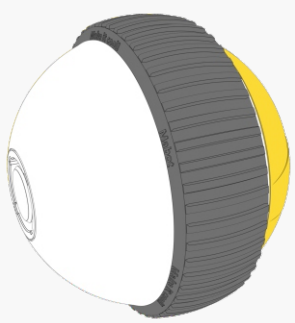
- Integrated blue-tooth and gyroscope.
- The Micro-USB port is for firmware upgrades only.
- Each control ball has only one port.

Working Status:

- After the shining light, it enters the breathing mode (from bright to dark) with the tones of 'Do Mi' from the buzzer.
- Blue-tooth connected: The light shining twice with the tones of 'Do Re Mi' from the buzzer.
- Downloading official programs: After successfully downloading, the lampshade will flash green three times, playing a 'Do Mi' progression from the buzzer; if downloading fails, the lampshade will flash red three times.

Operating Instruction:

- Any buttons can start or stop the programs in the Control Ball.



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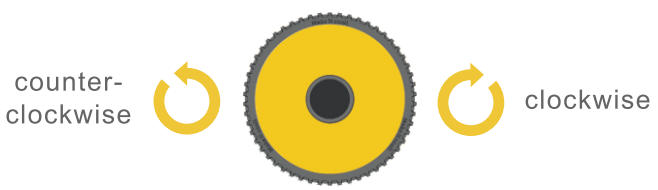
Drive Ball

Exercise device, such as wheels or transmission with other components.

- It can rotate clockwise and counter-clockwise.
- Each drive ball has one connector.



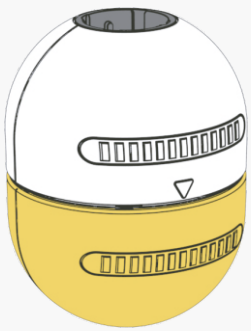
Operation parameters:

- Stalling torque: 1.2kg.cm
- Load limit:0.25kg

Attention:

- Please do not exceed the maximum load weight when using the drive ball. Overloaded may damage the drive ball.
- Please clean the drive ball regularly to assure the well function.
- Please do not rotate when connected with connector.

Electric Modules



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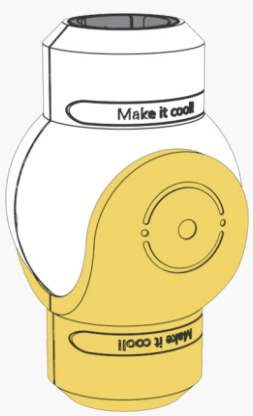
Rotating Joint

It can rotate objects horizontally.

- The rotary angle is ±75°
- Load torque:0.55kg.cm
- Load limit:0.55kg
- Every rotate joint ball has two connection points.

Attention:

- Please do not forcibly break the module when it is energized.
- Please do not exceed the load limit.
- Please do not rotate when connected with connector.
- Please keep space clean between the two hemispheres.



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Swinging Joint

This module can swing objects to left and right.

- Angles:±75°
- Load torque:0.55kg.cm.
- Load limit:0.32kg.
- Each swing joint ball has two connections.

Attention:

- Please do not forcibly break the module when it is energized.
- Please do not exceed the load limit.
- Please do not rotate when connected with connector.
- Please keep space clean between the two hemispheres.

A030001C00

Infrared Sensor

It can detect if there is any obstacle ahead.

- Angle of detection: The lamp head and object are perpendicular.
- It can measure distances using infrared light, measuring between 5–15cm (the parameter is based in the test results done on a white A4 piece of paper).
- Each infrared sensing ball has one input.

Attention:

- Please do not smear or paste things onto the black cover or it will compromise the detector's sensitivity.
- Mirror and dark colored objects will influence the detector's ability to operate.

A030002C00

Color Sensor

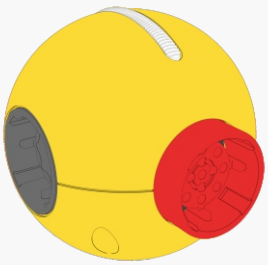
It can detect the color and intensity of light.

- 8 Colors detection.
- Levels of light: 0 (extremely dark) to 100 (extremely bright).
- Detection angle: the lamp head is perpendicularto the object.
- Detection distance: 1 cm.
- Each color sensing ball has one port.

Mode instructions: Three status of color sensing ball:

- Color mode: When lamp base is white, it catches the color detected by the color sensing ball sensor.
- Reflected light intensity mode: When lamp base turns red ,it measures reflected light's intensity from the obects exposed to it.
- Environmentallight intensity mode: When lamp base turns off,it can measure the 1ight intensity of environmental 1ight through the sensor.
- When in color mode or reflected light intensity mode, make sure the color sensing ball is at a right angle and is not touching the surface of the object being detected.
  (e.g.: a line–tracking robot from the package).

Electric Modules



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Touch Sensor

It can check whether the red button of the touch sensing ball is under pressure.

- The indicator light is above the touch button.
- The touch button does not transmit signals or electrical current.
- Every color sensi ng ball has three ports, on each side of the ball.

Instructions:

- When the button is pressed past 2.2mm. the light will flash green.
- Pressure on the button should less than 1kg.

Attention:

- Manually damaging or pulling the button by force is strictly prohibited.

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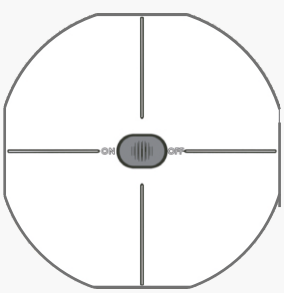


长按开关开启/关闭电源

Battery Ball

The power supply module of Mabot.

- The micro-USB supports a device charging function.
- Every battery ball has four ports, on each side of the ball.
- Battery parameters:
  Typical capacity: 640mAh
  Standard voltage: 7.4V
  Recommended charge temperature: 10℃—45℃

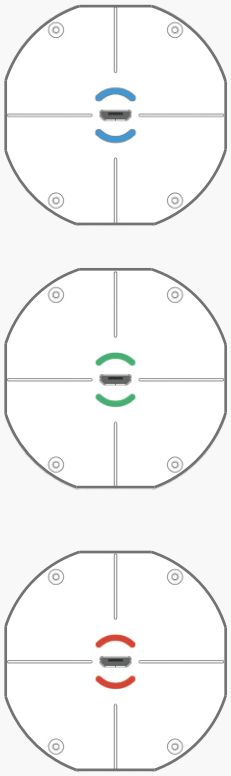
Instruction to the switch:

- When the Mabot is off,press and hold the button for 2 seconds to boot up, the indicator light of the battery ball will turn on.
- When the Mabot is on, press and hold the button for 3 seconds to shut it down; the indicator light of the battery ball will turn off.

Instructions for the indicator lights of the battery ball:

- Green light means fully charged.
- Red light means low battery.
- When the battery ball is low on power, certain modules of the Mabot may become unresponsive.
- Blue light means under charging.

Electric Modules



General instructions:

- Service time - the more power-hungy devices connected to a single battery ball (such as rotate joint ball , swing joint ball, drive ball), the shorter of time it will operate.

Attention:

- Never use a damaged battery ball.
- Never insert any sharp metal into the connectors, as it may cause short circuiting or permanent damage.
- Keep the battery ball offwhen not in use. Please charge and check the battery ball every fourth months to keep in working condition.
- Please use under adult supervision. Remove the charger immediately after charging has completed.
- The battery ball can be turned on while charging. Shutting the device down before charging is suggested for extended times.

Electric Modules

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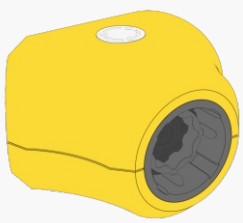
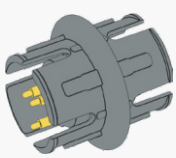
6-port connection ball is used to connect other balls, to secure the structure, to connect electrical currents, and to transmit signals.



B010002C00

3-port connection ball is used for connecting other module balls, to secure the structure, to connect electrical current, and to transmit signals.



B010003A04

Small connector is used to connect all the module balls, to secure the structure, to connect electrical current, and to transmit signals.

Electric Modules

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Power cord is for transmission of both electrical current and signal.

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Data cord is for signal transmission between modules only,
not for electric current transmission.

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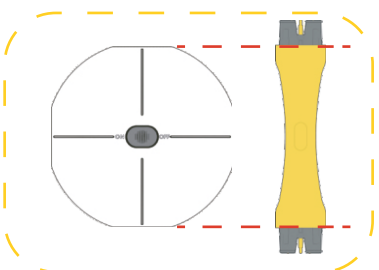
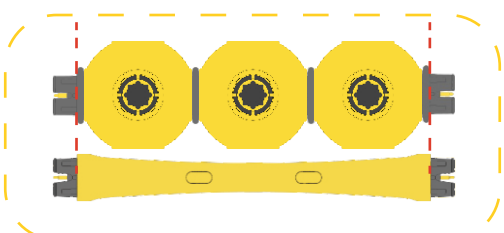
Length: equal length to one battery ball.

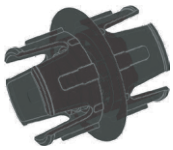


B010006A00

Length: three unit lengths of one port .



Connectors



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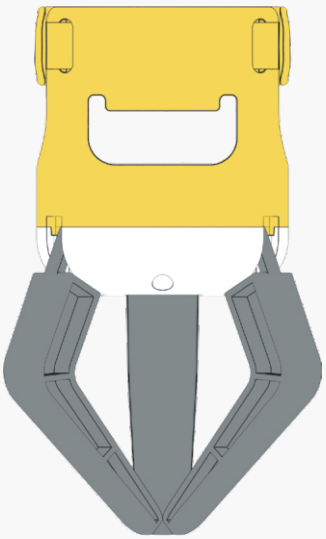
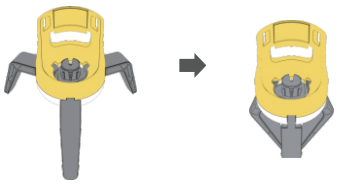
Accessories



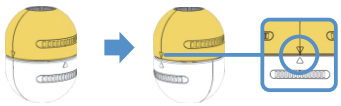
C070007A00

It can draw objects in by controlling rotate joint balls.

1. turn as illustrated position to tuck the clippers.

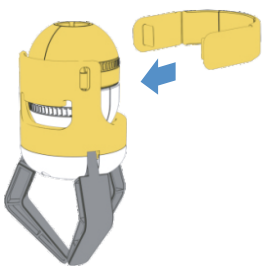


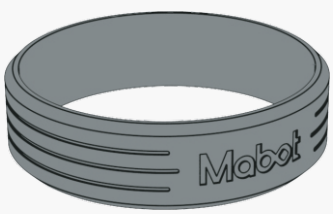
2. turn the rotata joint balls to make the two arrows touch.



3. vertically insert the rotata joint balls and lock.

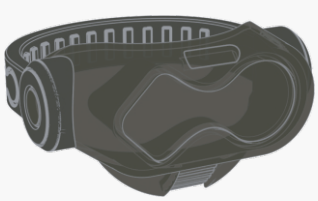
4. make sure the clippers are tuckes up when finished.





C070006A04

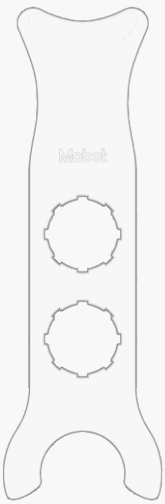
This rubber ring is used for rotate joint ball to help secure objects.



C070003A03

Make sure the button is still clickable when both sides of YJ-001 and the control ball are connected.

Accessories



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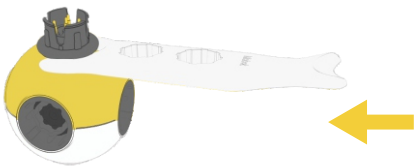
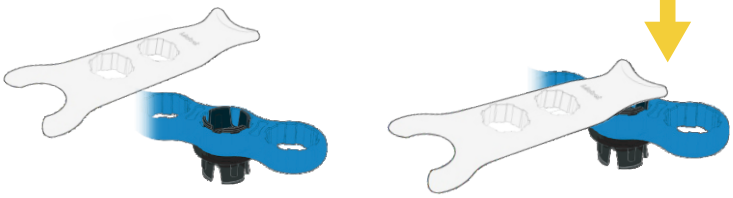
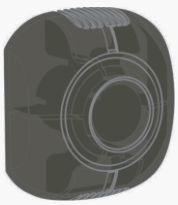
Instructions of disassembly tool:



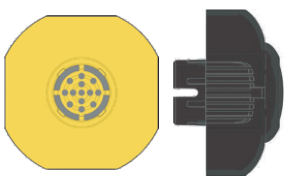
Scenario 1:
- Insert the disassembly tool into the gap between the connecting rod and connecting ball.
- Push inward to detach the connecting rod.



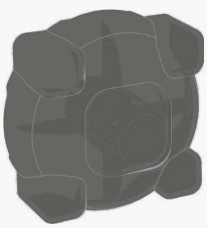
Scenario 2:
- Place and press the handle of the disassembling rod onto the protruding section of connecting rod S on the bridge.
- Push down on the handle to detach the connecting rod.



C070004A03



Connection Ball Accessory 001



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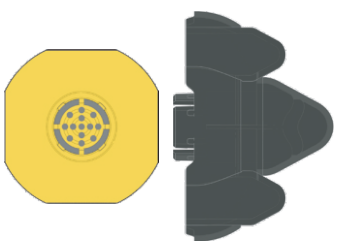
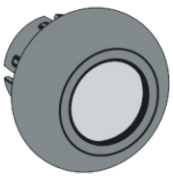


Drive Ball Accesory 002

Accessories



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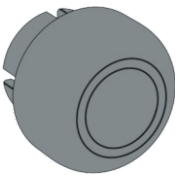
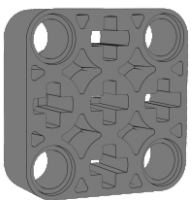


C070002A04



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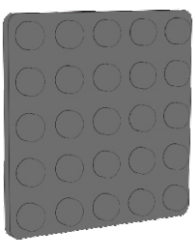

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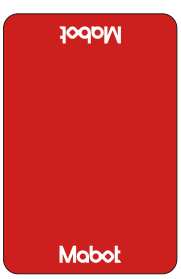

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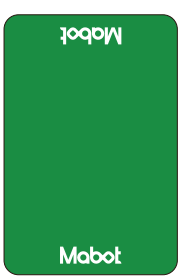

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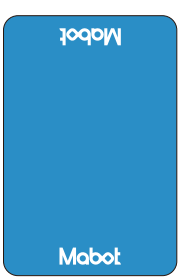

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