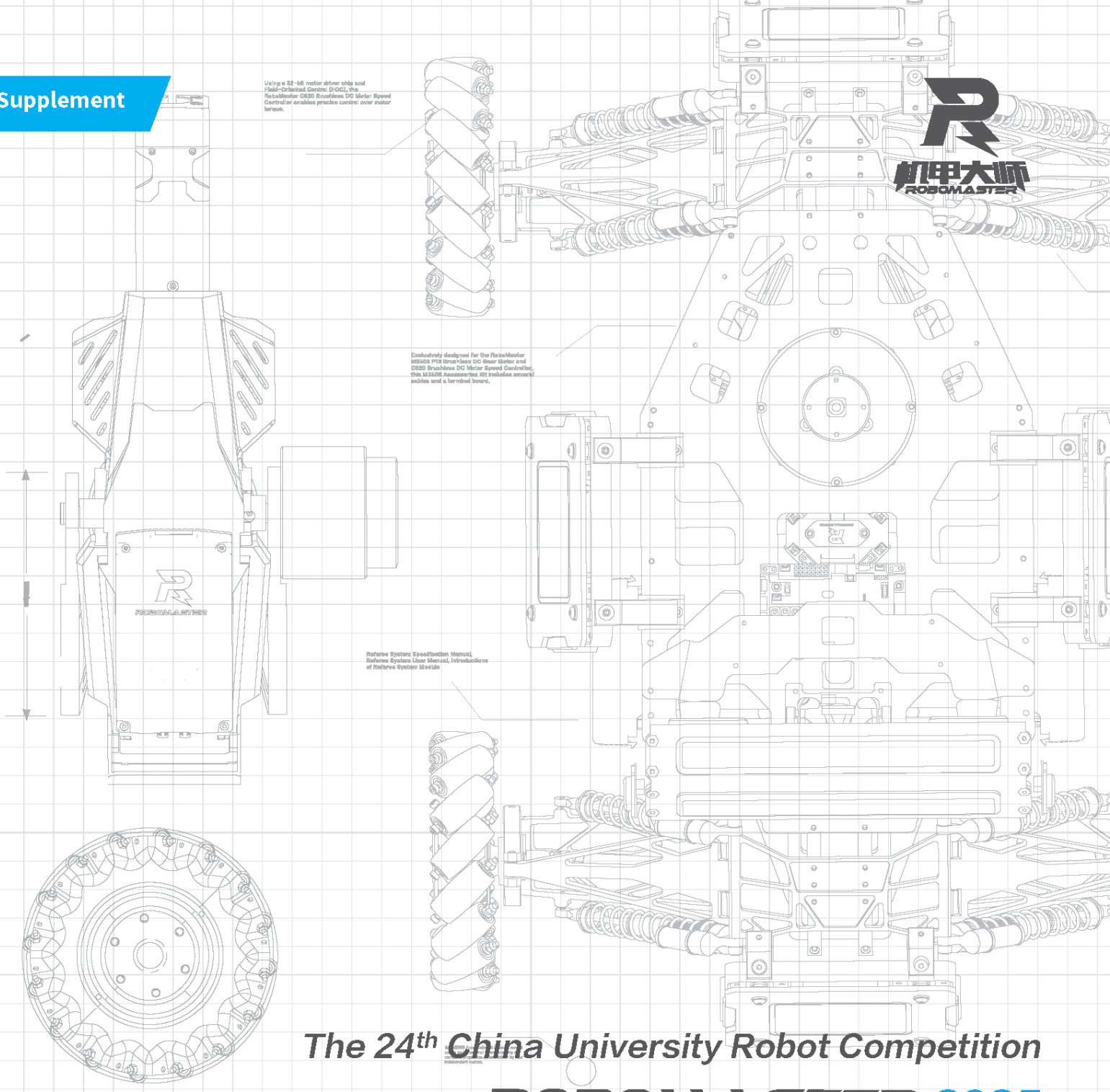
Supplement

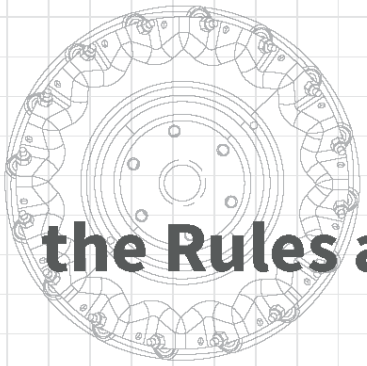


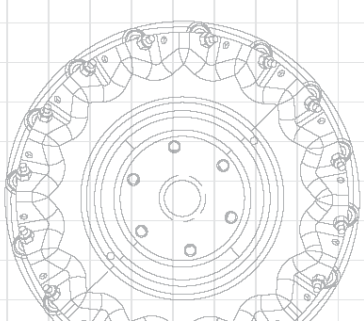
The 24th China University Robot Competition

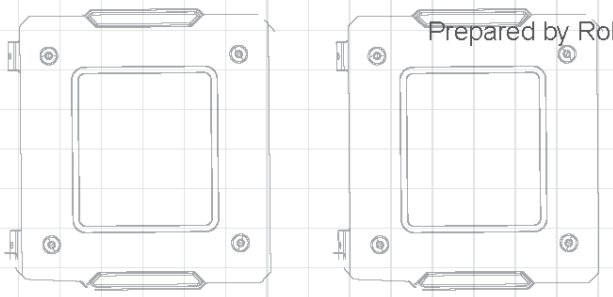
ROBOMASTER 2025

University Championship & University League

Supplement to the Rules and Robot Building Specifications

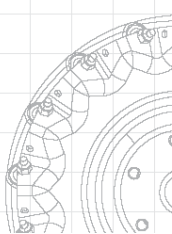






Prepared by RoboMaster Organizing Committee

Released in December, 2024



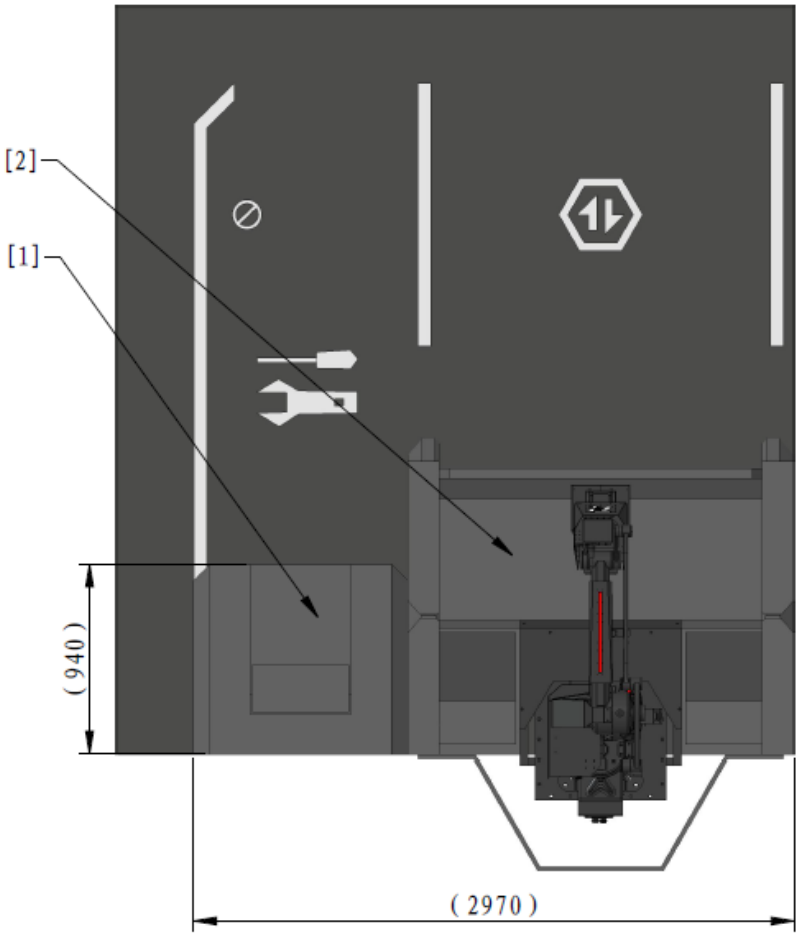
1. RMUC Rules

Based on the “RoboMaster 2025 University Championship Rules Manual V1.0.0”, the RMOC announces the following changes:

1) Added a Wireless Charger and Related Mechanisms

- The following new content is added to Section 4.2.6 Resupply Zone:

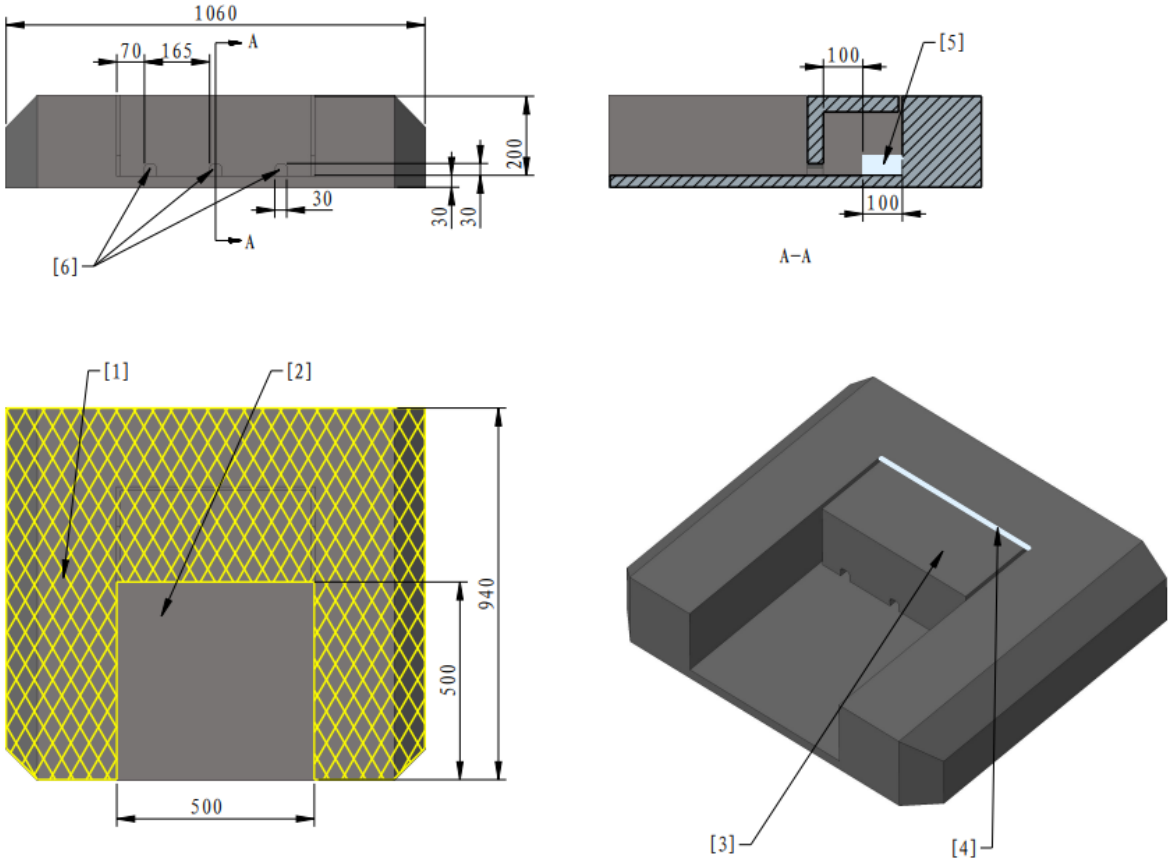
A wireless charger is added to the Resupply Zone of each side. Participating teams may install their wireless chargers (transmitters) in the designated area during the Three-Minute Setup Period, as illustrated in the figure below:



[1] Wireless charger installastion area [2] Exchange Station

Figure 4-21 Wireless Charger Installation Area

The RMOC provides 220 V mains supply and one fixed 5-hole socket compliant with China’s national standard GB/T 2099.7-2015 in wireless charger installation area to power the wireless charger.



[1]	Wireless charger penalty area	[2]	Wireless charger installation area	[3]	Cable management flip cover
[4]	Rotating shaft of flip cover	[5]	Power strip	[6]	Cable pass-through hole

Figure 4-22 Wireless charger

- The following new content is added to Section 5.7.2 Special Mechanism of Engineer:

The wireless charger (transmitter) mounted on Engineer has a maximum output power of 160 W. If the output power of the wireless charger (transmitter) exceeds this limit, the power supply to the device for the current round will be cut off.

2) Revised the "Small Power Rune When Activating" Figure

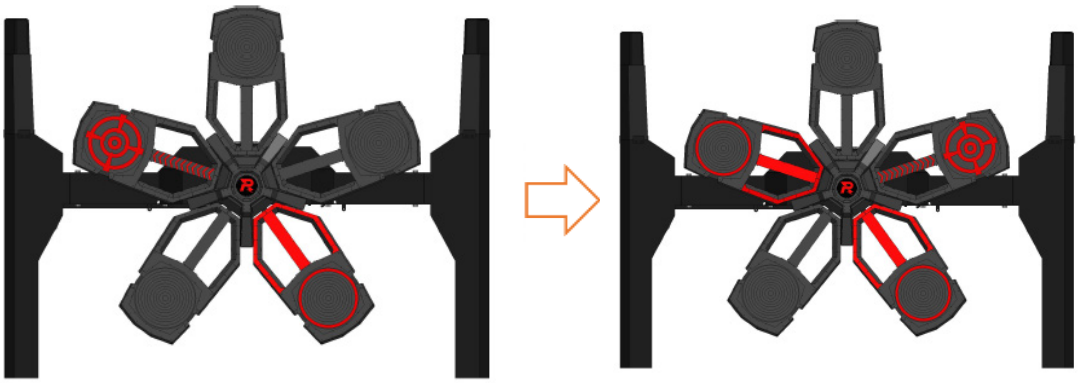
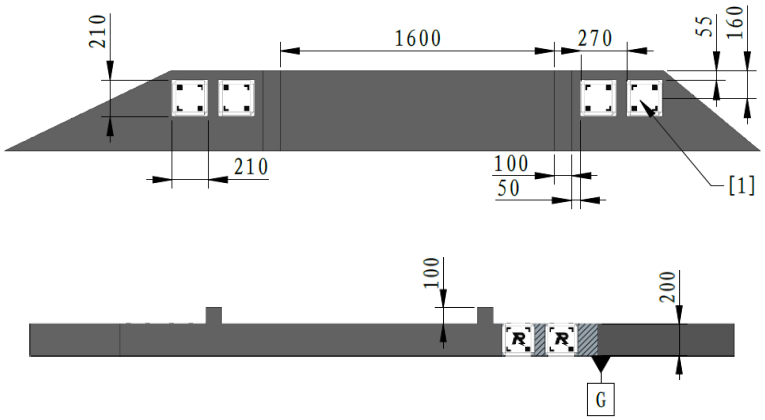


Figure 5-1 Small Power Rune When Activating

3) Revised the "Small Resource Island" Figure



[1] Silver Ore

Figure 4-2 Small Resource Island

2. RMUL Rules

Based on the "RoboMaster 2025 University League Rules Manual V1.0.0", the RMOC announces the following changes:

1) Added the Engineer Challenge Battlefield Drawings and Revised the Pose Ranges of Ore Receptacles

The core Battlefield for the Engineer Challenge is a 5 m * 5 m (L * W) area, consisting mainly of the Starting Zone, Resource Island, and Exchange Station.

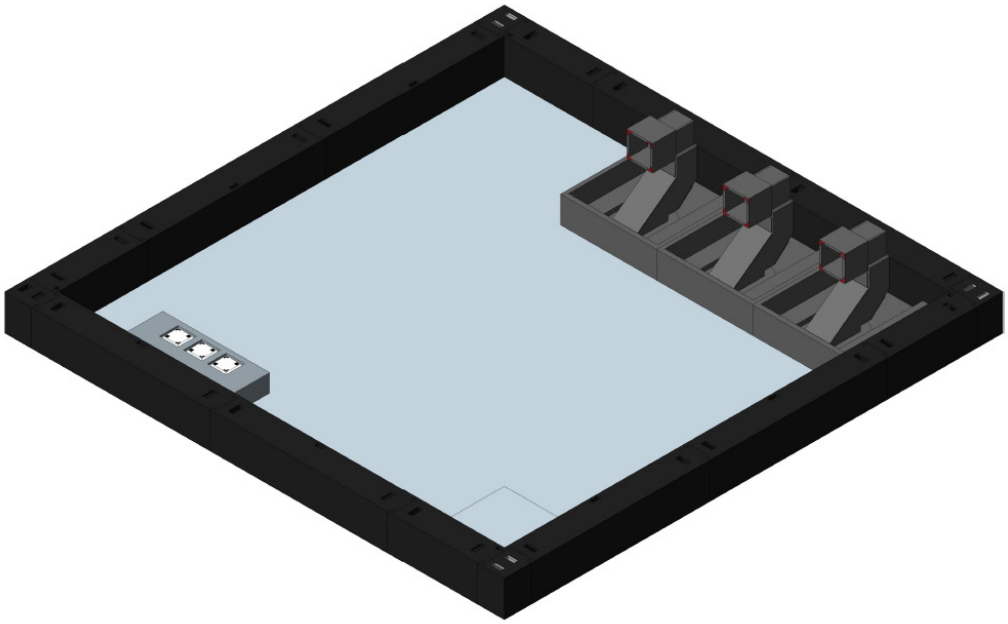
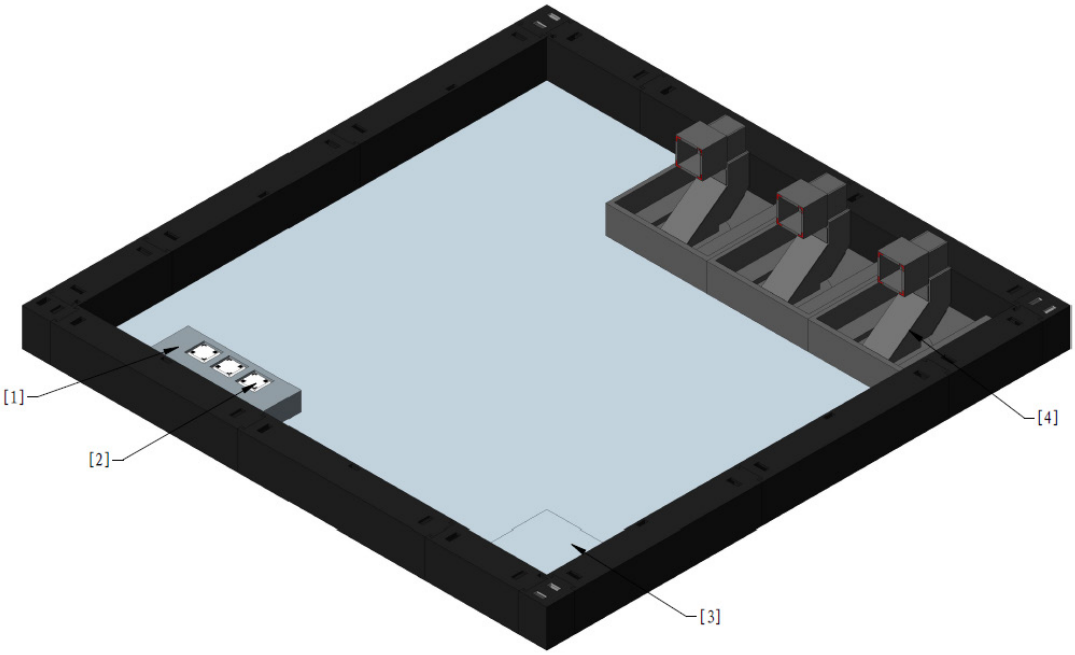


Figure 5-1 Axonometric View of the Engineer Challenge Battlefield



[1]	Resource Island	[2]	Ore
[3]	Starting Zone	[4]	Exchange Station

Figure 5-2 Engineer Challenge Battlefield Modules

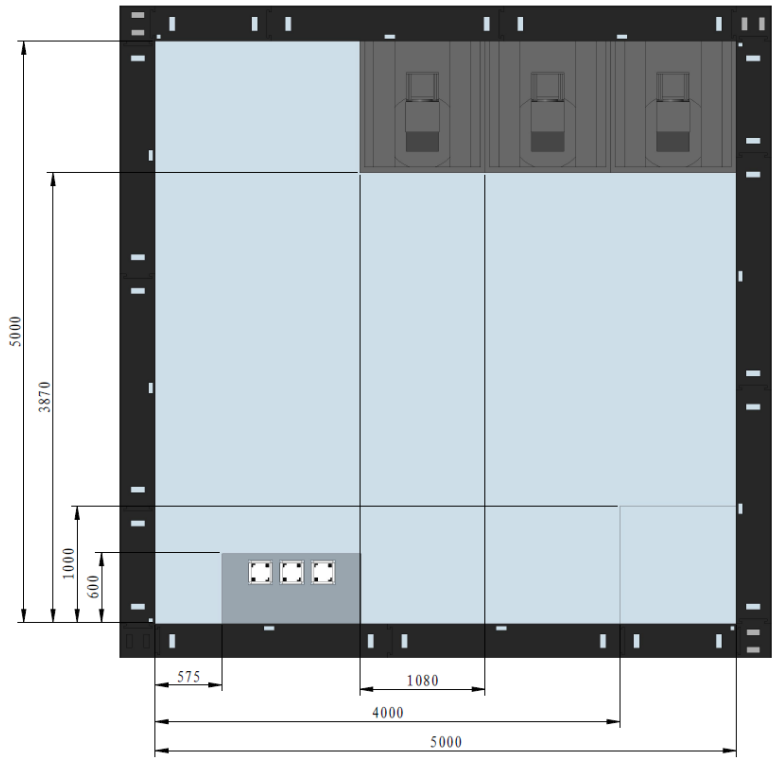


Figure 5-3 Engineer Challenge Battlefield Dimensions

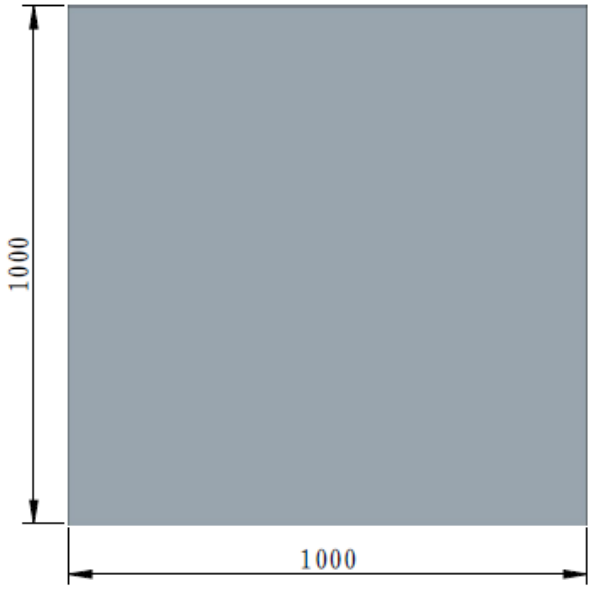


Figure 5-4 Starting Zone

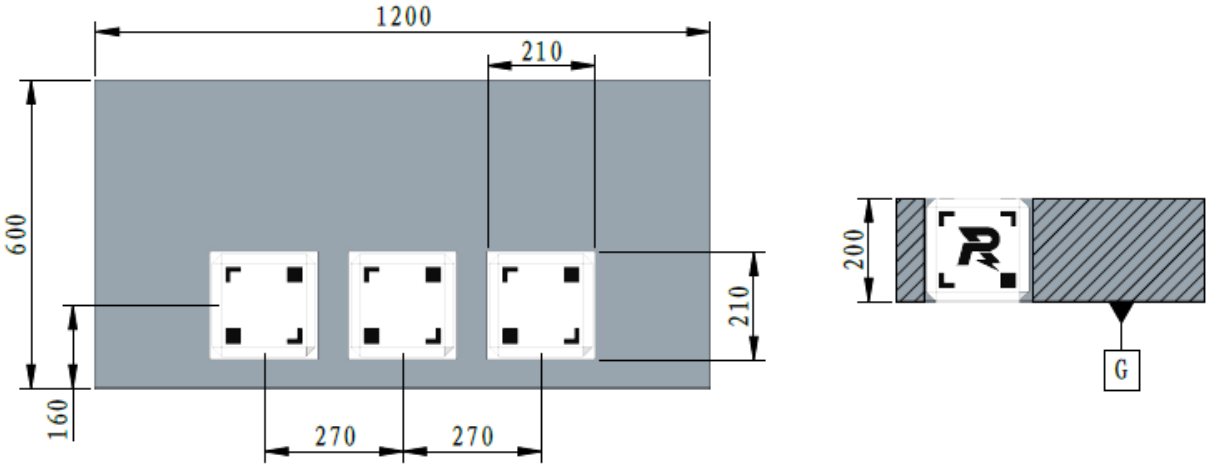
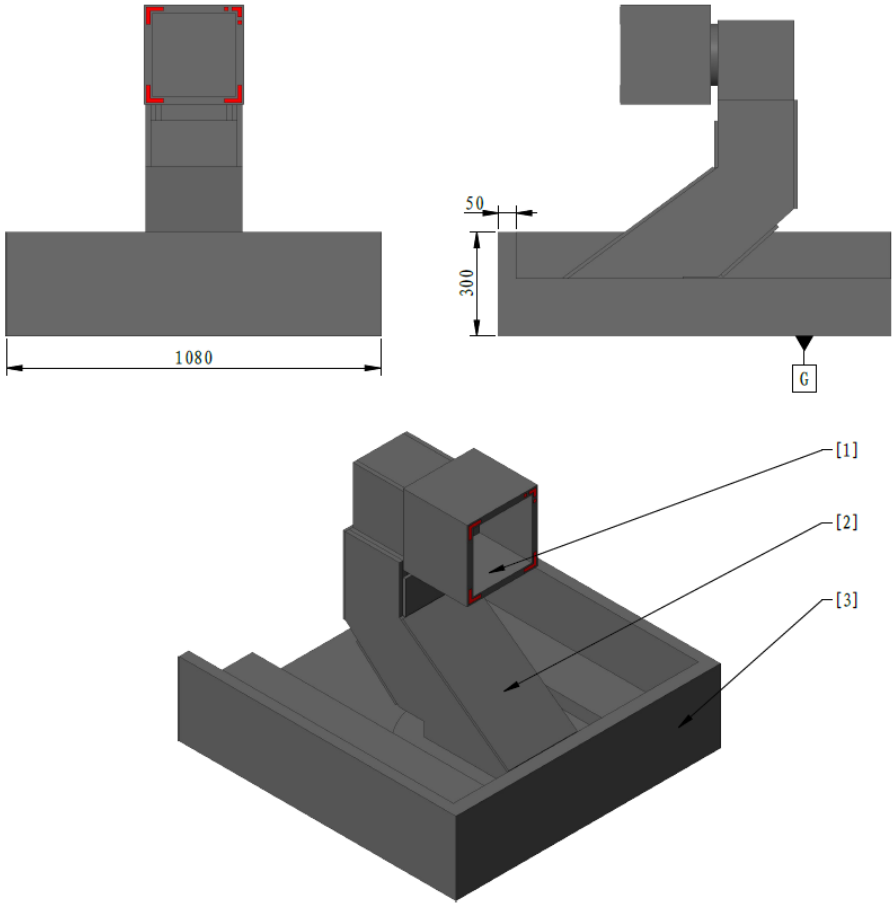


Figure 5-5 Resource Island



[1] Ore Receptacle [2] Main body of Exchange Station [3] Guard

Figure 5-6 Exchange Station

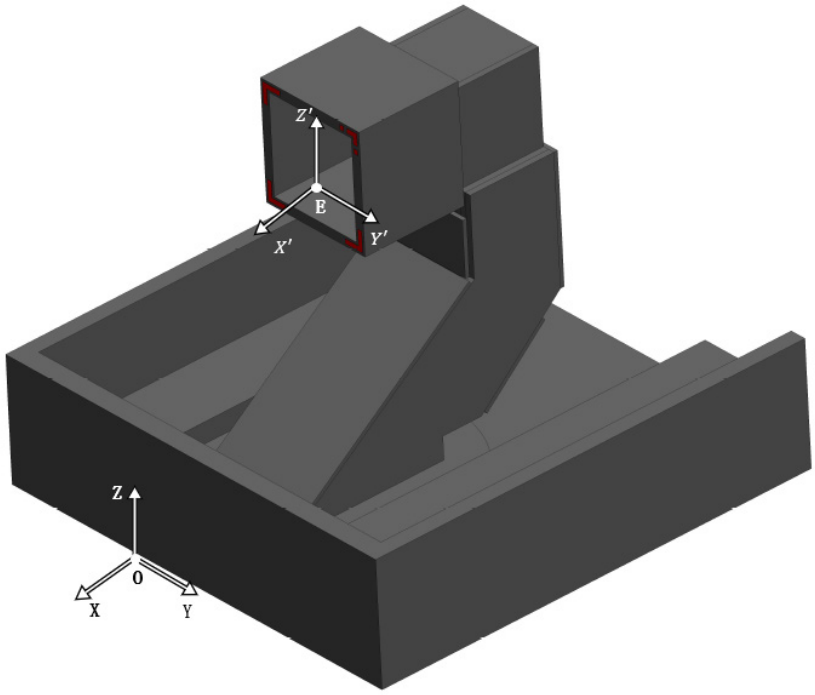


Figure 5-7 Coordinate System of the Exchange Station

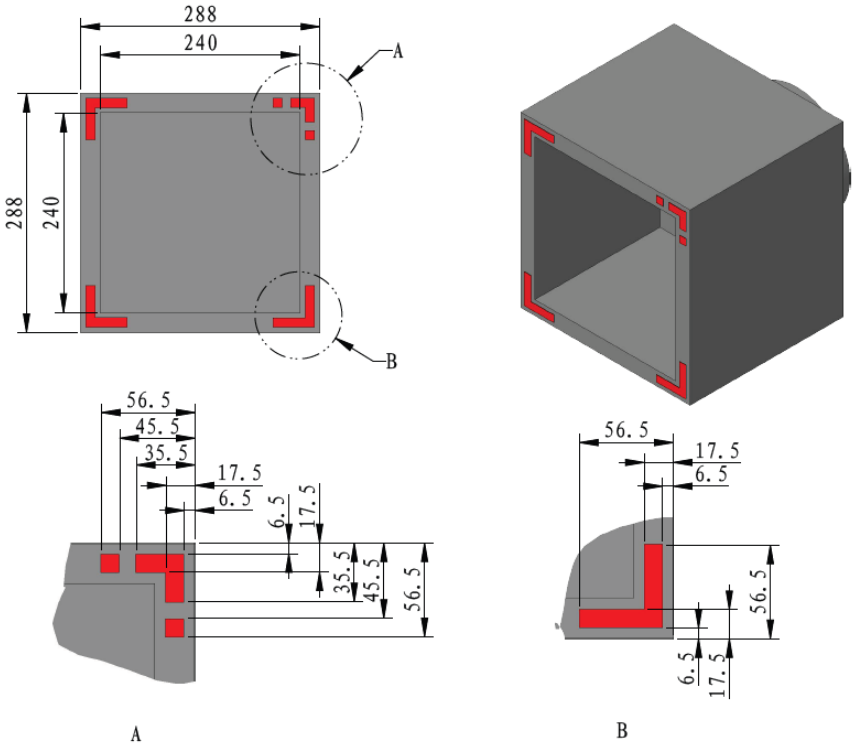


Figure 5-8 Ore Receptacle

The red parts in the figures represent decorative stickers, not light effects.

The Exchange Station is where robots exchange Ores. The Exchange Station comprises three separate Ore Receptacles with different poses, the ranges of which are shown below:

Table 5-1 Pose Ranges of Different Ore Receptacles

Ore Receptacle	x	y	z	θ	φ	α
A	0	0	0	0	90	0
B	0	[-100,100]	[710,910]	0	90	[-45,45]
C	0	[-100,100]	[710,910]	[0,90]	90	[-45,45]

3. RMU Robot Building Specifications

Based on the "RoboMaster 2025 University Series Robot Building Specifications Manual V1.0.0", the RMOC announces the following changes:

1) Revised the Definition of Chassis Power

Chassis Power: The power of propulsion system that enables a robot to conduct translational and rotational motions in the horizontal direction, not including the power used for special tasks (e.g., power consumption for functional movements such as moving the upper mechanical structure, legged robot's joint motor, climbing steps, or overcoming obstacles). Therefore, the power generated during the power consumption by the propulsion system actuator of mechanical structures related to chassis horizontal movements counts as chassis power. For example, the motors, steering gears, electromagnetic switches, and other components for regulating the direction of chassis motors or other energy storage mechanical structures (including but not limited to springs, pneumatic systems, rubber bands, and tension springs).

2) Revised the Maximum Total Power Capacity of Robots

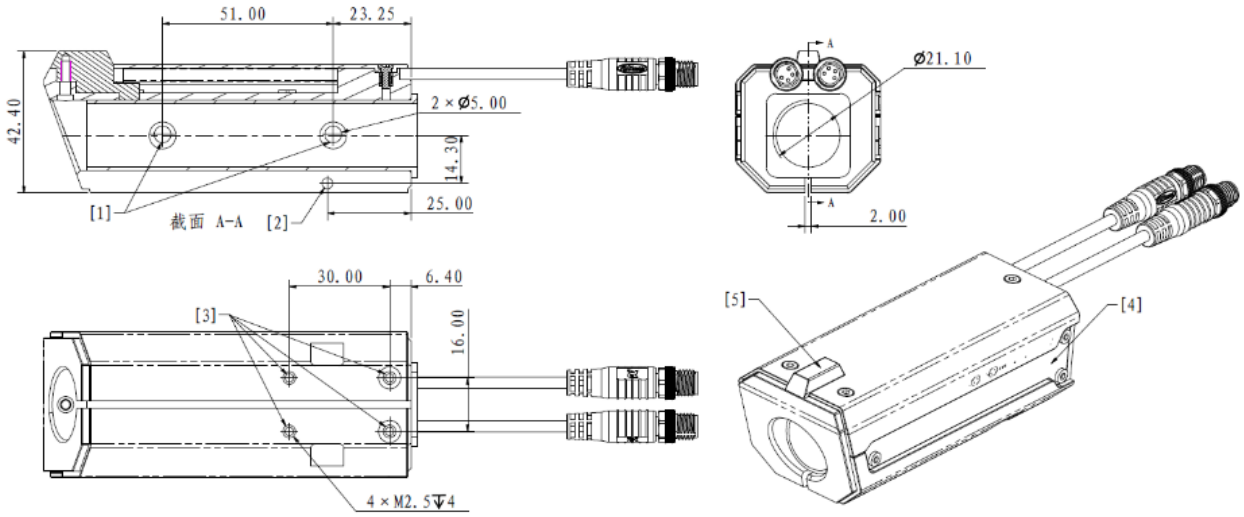
The Maximum Power Capacity for Hero, Engineer, Infantry, and Sentry, as well as Dart Launcher, is adjusted to 300 Wh, while that for the Drone is adjusted to 900 Wh.

3) Revised Specifications for Removing and Modifying Referee System Onboard Modules

S102: Except for the installation methods mentioned in this manual, any removal or modification of Referee System Onboard Modules is prohibited.

4) Revised the Specifications Related to the Speed Monitor Module

There are two types of Speed Monitor Modules: Speed Monitor Module (17 mm Projectile) and Speed Monitor Module (42 mm Projectile).



[1] Phototube

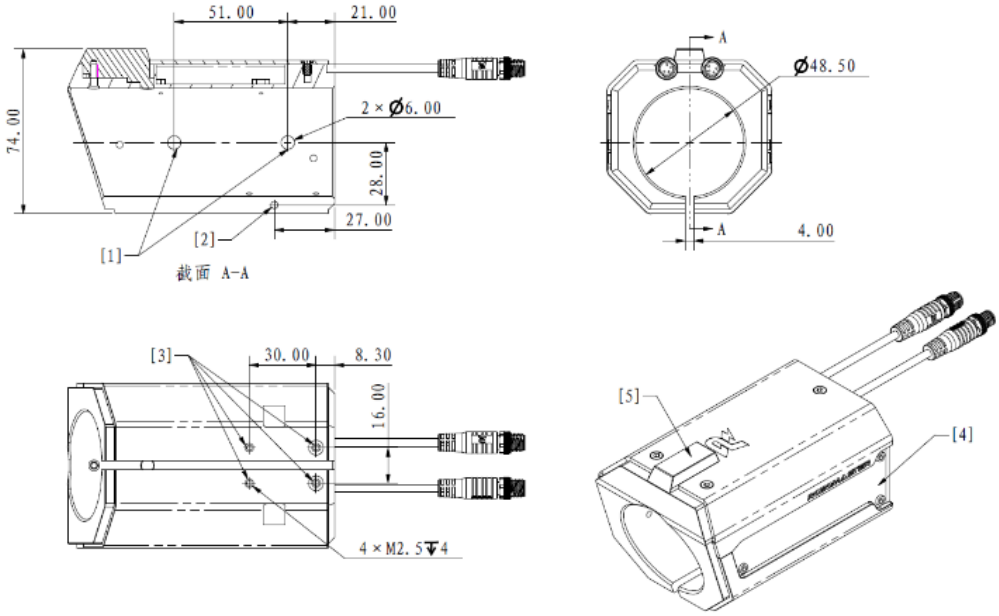
[2] Speed Monitor Module’s clamping screw hole

[3] Laser Sight’s mounting screw hole

[4] LED indicator

[5] Decorative block

Figure 3-1 Speed Monitor Module (17 mm Projectile)



[1] Phototube

[2] Speed Monitor Module’s clamping screw hole

[3] Laser Sight’s mounting screw hole

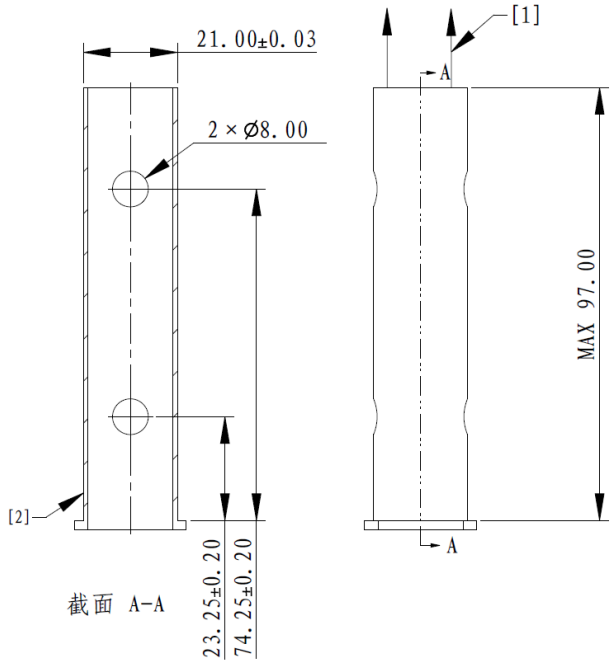
[4] LED indicator

[5] Decorative block

Figure 3-2 Speed Monitor Module (42 mm Projectile)

S124: Don’t remove the decorative blocks from Speed Monitor Modules.

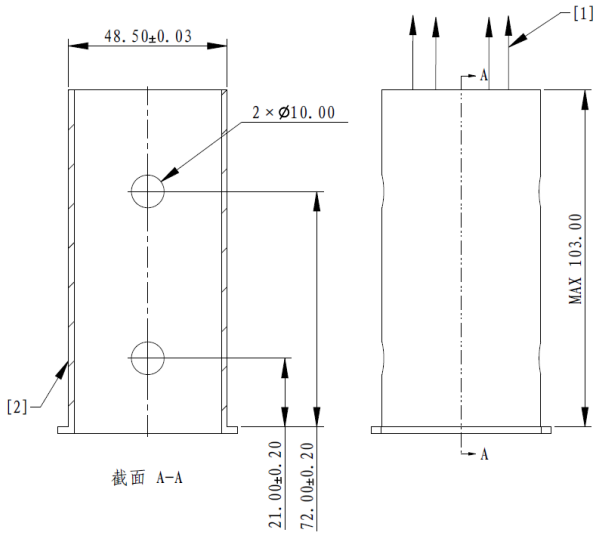
17 mm barrel size restrictions:



[1] Facing the Launching Mechanism [2] Recommended wall thickness: no less than 1 mm

Figure 3-3 17 mm Barrel

42 mm barrel size restrictions:



[1] Facing the Launching Mechanism [2] Recommended wall thickness: no less than 1 mm

Figure 3-4 42 mm Barrel

Installation Steps for Securing Method 1:

1. Place the Speed Monitor Module on the barrel and ensure that the U-shaped step of barrel is stuck in the cylindrical positioning boss within the module inner diameter.
2. Insert M3 screws through the clamping screw holes on the Speed Monitor Module to clamp the barrel.
3. Use an aviation cable to connect the aviation connector port of the Speed Monitor Module to the aviation connector port of the Power Management Module.

After installation, avoid any rotation or misalignment of the barrel that could block the phototube at any time.

Installation Steps for Securing Method 2:

1. Remove the M2.5 screws on both the left and right of the Speed Monitor Module for securing the LED indicator. The position of one side is shown in [1] in the figure below. Do not remove any other screws securing the LED indicator on the Speed Monitor Module.
2. Use two M2.5×14 screws to secure the adapter block to the Speed Monitor Module, through the fixing holes on both left and right sides (the position of one side is as shown in [4] in the figure below).
3. Use two M3 screws to secure the robot's original board part 1 to the top of the Speed Monitor Module.
4. Use two M3 screws and four M2.5 screws to secure the robot's original board part 2 to the bottom of the Speed Monitor Module.
5. Use an aviation cable to connect the aviation connector port of the Speed Monitor Module to the aviation connector port of the Power Management Module.

5) Added Wireless chargers and Related Specifications

2.1.10 Wireless charger

Wireless charging is a non-beam near-field power transmission technology that utilizes mechanisms such as magnetic coupling (magnetic induction, magnetic resonance) and capacitive coupling to transfer power from a power source to an electrical load. Participating teams may choose to build wireless chargers that only include the power transmitter (the "Transmitter") or only the power receiver (the "Receiver").

S57: Wireless chargers are only applicable to RMUC.

S58: The maximum transmission power between the Transmitter and the Receiver is 80 W.

S59: Charging is only available when the protocol used by the Transmitter matches that used by the Receiver. If protocol matching fails, the Transmitter is prohibited from releasing power to any object.

S60: The wireless charger must not interfere with the normal functioning of the Referee System Module. Any issues arising from such interference are the responsibility of participating teams.

S61: The wireless charger must comply with the Interim Regulations on Radio Management of Wireless Charging (Power Transmission) Devices.

S62: The power interaction surface of wireless chargers is limited to 100 mm * 100 mm in size.

Wireless charger (Transmitter):

S63: The operating frequency is limited to 100-148.5 kHz.

S64: The wireless charger can only be installed on the Engineer or in the Resupply Zone (or installed on both the Engineer and the Resupply Zone simultaneously). Up to one such device can be installed per location.

S65: When the Transmitter isn't charging (in idle state), its output power must be lower than 10 W.

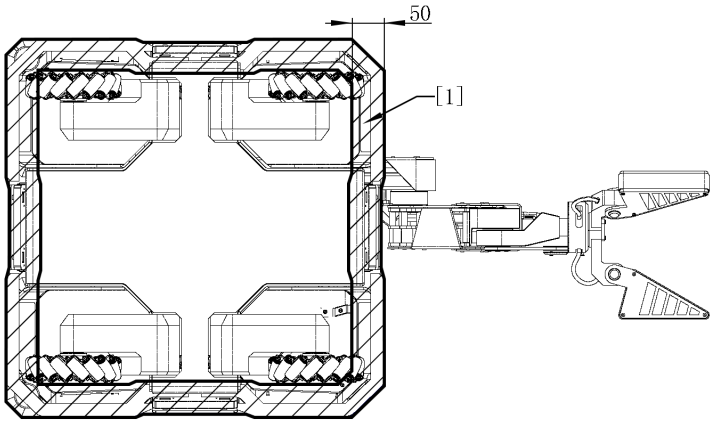
S66: The maximum detection distance of the Transmitter must be less than or equal to 30 mm.

Teams are advised to equip their Transmitters with power management, voltage and current adjustment, over current protection, over voltage protection, over temperature protection, and other safety features.

When installed on Engineer:

S67: The Transmitter installed on Engineer must be electromagnetically shielded in all directions, except for the power interaction surface, to avoid interfering with the normal functioning of the Referee System.

S68: The Transmitter installed on Engineer must not exceed the outermost edge of the chassis' horizontal plane, and the Transmitter must be at least 50 mm from the outermost edge horizontally, as shown in the figure below.



[1] Prohibited area for Transmitter installation

S69: The power interaction surface of the Transmitter installed on Engineer must face upwards vertically.

When installed in the Resupply Zone:

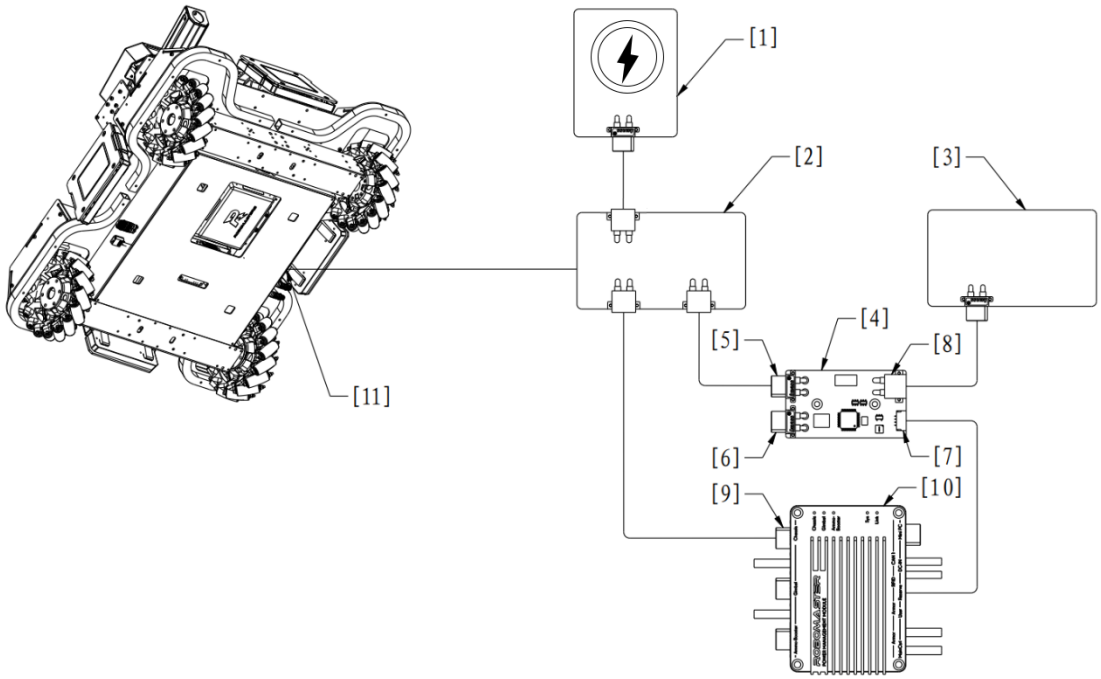
S70: The maximum size of the Transmitter installed in the Resupply Zone is 500 mm * 500 mm * 300 mm.

S71: The Transmitter installed in the Resupply Zone must be connected to AC power (maximum output power: 200 W) provided by the RMOC.

For safety reasons, the RMOC has set up a power protection device for the AC power supply. If the operating power of the Transmitter exceeds 200 W, the power supply for the round will be cut off.

Wireless charger (Receiver):

S72: The wireless charger (Receiver) can only be connected to the Power Control Board and must not be connected to other circuits, as shown in the figure below:



[1] Wireless charger (Receiver)

[2] Power Control Board

[3] Supercapacitor Module

[4] Capacitor Management Module

[5] Capacitor Management Module connector (output, XT30 receptacle) – connecting to Power Control Board

[6] Inspection port of Capacitor Management Module (output, XT30 receptacle) – for Pre-Match Inspection only

[7] Communication port of Capacitor Management Module (CAN, SM04B-GHS-TB connector) – connecting to Power Management Module

[8] Capacitor Management Module connector (input, XT30 plug) – connecting to Supercapacitor Module

[9] Chassis output port of Power Management Module

[10] Power Management Module

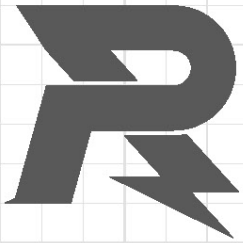
[11] Robot chassis power port

S73: The wireless charger (Receiver) can only be installed on Hero, Infantry, and Sentry, with a maximum of one device (Receiver) per robot.

6) Revised Specifications for Ports of the Power Management Module

Table 3-1 Power Management Module Port Instruction

Power Supply / Robot Type	Chassis Power Supply	Gimbal Power Supply	Launching Mechanism (17 mm) Power Supply	Launching Mechanism (42 mm) Power Supply	Mini PC Power Supply	Wireless charger (Transmitter)
Hero	Chassis	Gimbal	-	Ammo-Booster	Mini PC	-
Engineer	Gimbal	Gimbal	-	-	Mini PC	Chassis
Infantry	Chassis	Gimbal	Ammo-Booster	-	Mini PC	-
Drone	-	Gimbal	Ammo-Booster	-	Mini PC	-
Sentry	Chassis	Gimbal	Ammo-Booster	-	Mini PC	-
Dart Launcher	-	-	-	-	-	-
Radar	-	-	-	-	-	-



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