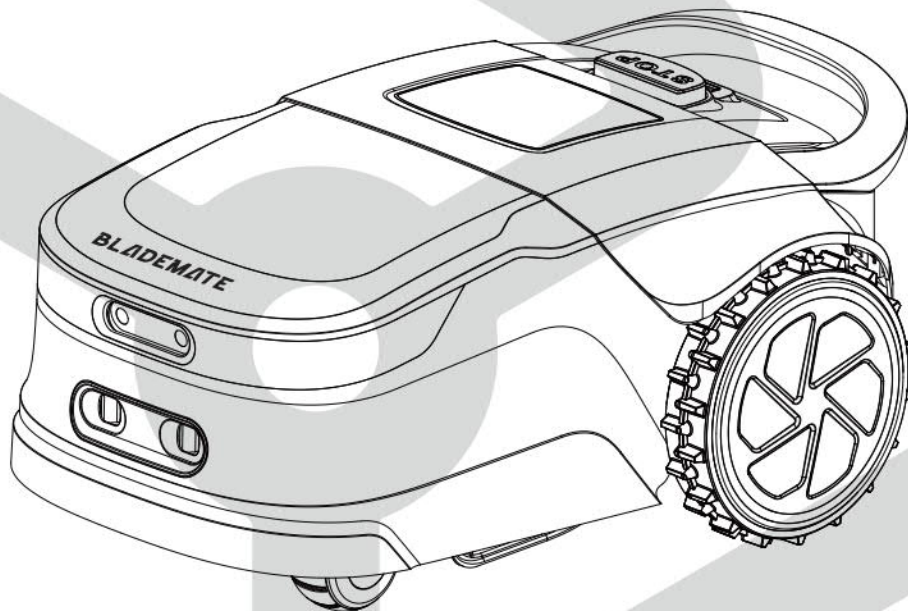


BladeMate

Intelligent lawn mowing robot

S1 Pro / S1 Ultra

User Manual



BLADEMATE

Blades free forever!

Contents

1 Safety.....	3
1.1 General Safety Instructions	3
1.2 Safety Instructions for Installation	3
1.3 Safety Instructions for Operation	4
1.4 Safety Instructions for Maintenance	4
1.5 Battery Safety	4
1.6 Residual Risks	5
1.7 Disposal.....	5
2 Introduction.....	6
2.1 About BladeMate S1 Ultra	6
2.2 What's in the box	6
2.3 Symbols on the Product.....	7
2.4 Product Overview	8
2.5 BMRTK Introduction.....	12
3 Installation.....	13
3.1 Preparation	13
3.2 Choosing a Location for RTK Reference Station.....	13
3.3 Choosing a Location for Charging Station	14
3.4 Install.....	15
4 Operation.....	18
4.1 Preparation.....	18
4.2 Prepare the lawn.....	18
4.3 Download BladeMate APP.....	18
4.4 Add Device.....	19
4.5 Setup Wi-Fi.....	19
4.6 Activate 4G Card.....	20
4.7 Update Firmware.....	20
4.8 Create a Map.....	20
4.9 Edit Your Map	25
4.10 Mow.....	27
4.11 Task Schedule	29
4.12 Manual Mowing	30

4.13 Share Your Device.....	31
4.14 User feedback.....	33
5 Maintenance.....	34
5.1 Cleaning.....	34
5.2 Replacing Blades.....	35
5.3 Battery Maintenance.....	35
5.4 Transportation.....	35
5.5 Winter Storage.....	36
5.6 Spring Reinstall	36
6 Troubleshooting.....	37
7 Technical Data.....	41
8 Warranty.....	42
9 Compliance.....	43
9.1 EC Declaration of Conformity.....	43
9.2 FCC Compliance Statement.....	44

1 Safety

1.1 General Safety Instructions

- Read this User Manual carefully and confirm comprehension of all operational and safety protocols prior to usage. Keep the manual for future reference.
- Prevent unsupervised access to the product by children.
- Prohibit operation by individuals with physical, cognitive, or sensory impairments, insufficient experience, or unfamiliarity with these guidelines. Adhere to regional age restrictions for operators.
- Use exclusively original components and accessories. Unauthorized modifications void compliance guarantees.
- Do not touch moving hazardous parts, such as the blade disc, until it has stopped entirely.
- In the event of injury, prioritize immediate medical intervention.
- Disconnect all power sources and peripheral wiring, if there is a risk of thunderstorm, to avoid component damage. Re-establish connections only after hazardous weather subsides, ensuring proper connection.
- The operator is responsible for accidents or dangers that occur to other persons or property.
- Restrict operation, maintenance, and repairs to qualified personnel trained in device-specific safety practices.
- It is not permitted to modify the original design of the product. If there are any modifications made at your own risk, manufacturer's warranty will expire immediately in due course.
- Adhere to jurisdictional electrical safety regulations for installation and operation.
- Operate and charge within 0°C to 45°C. Storage temperature range is -20°C to 50°C.
- During manual control via the app, maintain deliberate movement, avoid running. Prioritize stability on inclines and secure footing at all times.

03/

1.2 Safety Instructions for Installation

- Maintain a minimum clearance of 60cm between the charging station, including any accessory, and flammable substances to mitigate fire hazards caused by equipment malfunction or overheating.
- Never plug in a power supply with compromised plugs or frayed cords. Damaged wiring significantly elevates electrocution risks.
- Avoid placing the power supply in flood-prone areas or directly on soil/ground surfaces. Ensure installation at elevated, dry locations.
- Ensure adequate ventilation around the power supply. Sealed enclosures may trap condensation, risking equipment failure or electrical hazards.
- Route power cords away from mowing paths and operational zones.
- Install the charging station in low-traffic areas to eliminate tripping risks.

- Stop use immediately if cables show wear or damage, and do not touch damaged cables. If a cable is damaged during operation, unplug it from the power outlet, qualified technicians must replace faulty components.

1.3 Safety Instructions for Operation

- Avoid proximity to rotating blades during operation. Never put limbs near or below the mower when it is powered on.
- Stop or turn off the mower immediately if unauthorized individuals or animals enter the work area. Prioritize daytime operation for enhanced visibility and wildlife protection.
- Routinely inspect the lawn for objects (e.g., stones, branches, tools, toys, water pipes) that may obstruct operation or damage the mower. Remove hazards before resuming tasks.
- Do not lift the mower or carry it around when powered ON.
- Refrain from placing metallic items on the mower or charging station, as these may interfere with satellite signal.
- Immediately stop operation if STOP button malfunction.
- Powered OFF the mower, if it is in non-use for a longer period.
- Avoid concurrent operation with sprinklers. Use scheduling features to alternate between mowing and irrigation cycles, adjusting rain sensors via app controls if simultaneous tasks are necessary.
- Replace worn blades promptly. Never operate the mower with compromised components.

04

1.4 Safety Instructions for Maintenance

- Powered OFF the mower before addressing blockages, performing maintenance, or conducting inspections. If unusual vibrations occur during operation, immediately cease use and thoroughly inspect components for damage. Do not resume operation until defects are resolved.
- Avoid using high-pressure water jets or chemical solvents for cleaning. After cleaning, ensure the mower is placed upright on a stable, level surface.
- Prior to servicing the charging station, disconnect it from the electrical supply.
- Regularly check the blades, blade screws, and related mechanisms for wear or damage. Replace worn or damaged blades and their screws as a set to ensure operational stability.

1.5 Battery Safety

- Lithium-ion batteries pose fire or explosion risks if mishandled, physically damaged, or exposed to liquids, extreme heat, or electrical faults. Avoid unauthorized disassembly, electrical/mechanical abuse, or storage in direct sunlight.
- Recharge exclusively with the original charger included with your device. Third-party adapters may compromise safety and performance.

- Improper usage can lead to overheating, electrical hazards, or leakage of corrosive substances. If battery fluid contacts skin, rinse thoroughly with water. For eye exposure, flush immediately and seek emergency medical care.
- Fully charge the battery before storage to avoid over-discharge and damage to the electrical components. Charge the mower every 90 days for long-term storage. Battery damage caused by over-discharge will not be covered by the Limited Warranty.
- Battery replacement must be conducted by certified technicians. User attempts to repair or modify internal components invalidate warranty protections.
- Never expose battery to temperature exceeding 45°C or below -20°C.

1.6 Residual Risks

- For hand protection during blade replacement, wearing durable gloves is essential to prevent cuts or abrasions.

1.7 Disposal

- Proper disposal of this device must adhere to regional electronic waste management laws. It is prohibited to discard this product with general household trash. To minimize environmental impact, transport it exclusively to government-approved recycling facilities or designated collection sites. These locations specialize in safely processing electrical components and preventing hazardous material leakage.

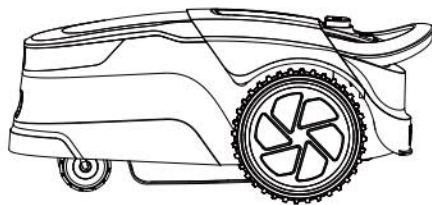
2 Introduction

2.1 About BladeMate S1 Ultra

The BladeMate S1 Ultra is an intelligent lawn mowing product. The product is equipped with RTK + 3D Vision fusion positioning system, which allow users to setup a virtual boundary of the lawn, eliminating the hassle of complicated perimeter wiring. The product includes a robotic lawn mower, a charging station, a RTK reference station, and BladeMate APP. The product is your best choice for lawn maintenance with hands-free and perfect lawn experience.

2.2 What's in the box

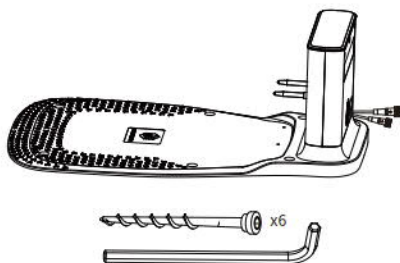
If there are missing or damaged parts, please contact your local retailer or our after-sales service. We recommend keeping the package materials for future transportation or storage.



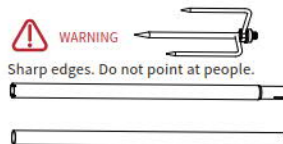
S1 Ultra



Quick Start Guide



Charging Station



Antenna kit



GNSS antenna



Extension cable for the power supply



Power supply



Extension cable for the GNSS antenna



x6 x6
Spare blades and bolts



x10
Pegs to secure the extension cable

2.3 Symbols on the Product

Please study the symbols on the product and labels, a key step to safe operation and extend product lifespan.



WARNING- Read the operator instructions before you operate the product.



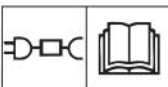
WARNING-Disable the product before maintenance or before you lift the product.



WARNING-Keep a safe distance from the product when it is in operation. Keep your hands and feet away from the rotating blades of the product.



WARNING-Do not sit on the product. Do not put your hands or feet near or below the product.



Use a detachable power supply as specified on the rating plate adjacent to the symbol.



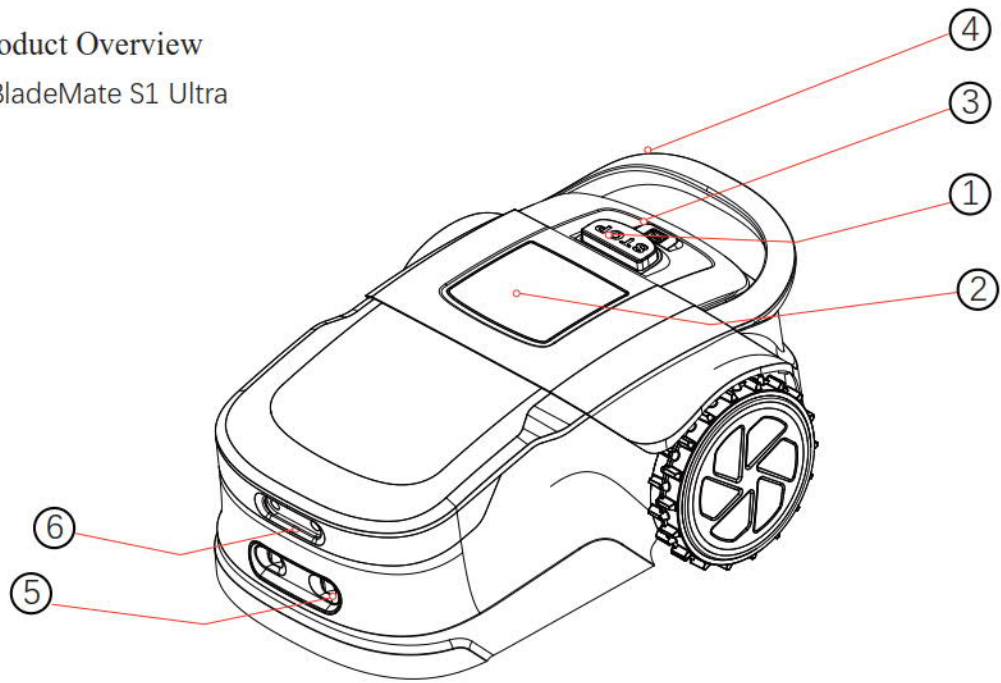
This product complies with the applicable EU Directives.



It is not permitted to dispose the product as usual domestic waste. Obey national regulations and use the local recycling system.

2.4 Product Overview

2.4.1 BladeMate S1 Ultra



1. Emergency Stop Button

2. Control Panel

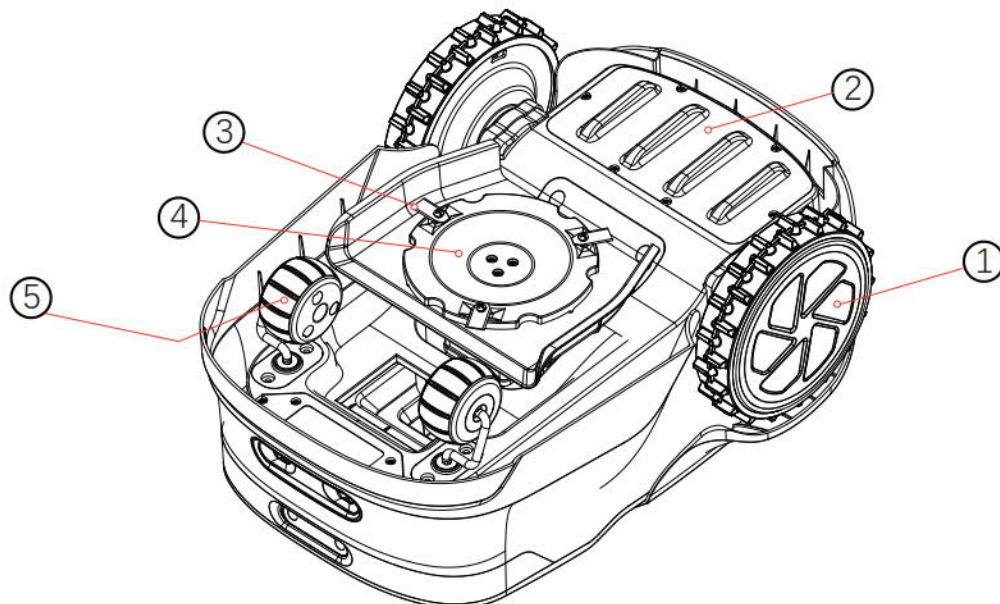
3. Rain Sensor

4. Handle

5. Mower Battery Charging Contacts

6. Stereo Camera

08



1. Rear Wheel

2. Battery Compartment Cover

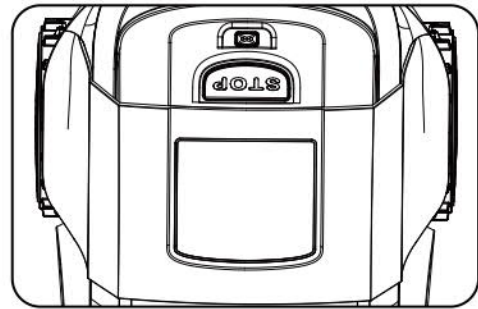
3. Cutting Blade

4. Cutting Disc

5. Front Wheel

2.4.2 LED Indicator of the Mower

Solid Yellow	The user is operating the control panel
Breathing Yellow	The mower is Trimming or Mowing
Breathing Red	The mower is Parking or error
No indication	The mower is Standby

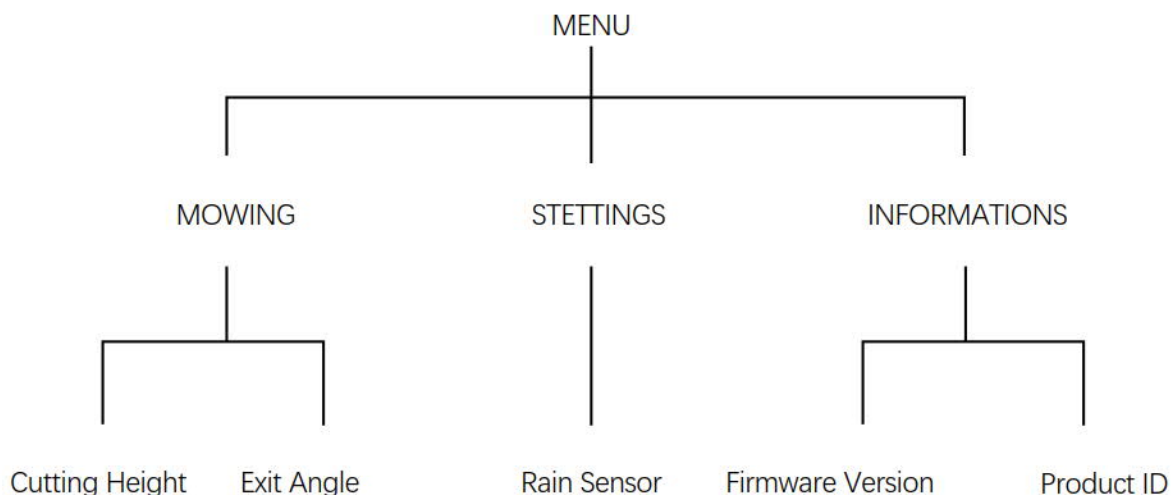


2.4.3 Control Panel (Keys & LC Display)

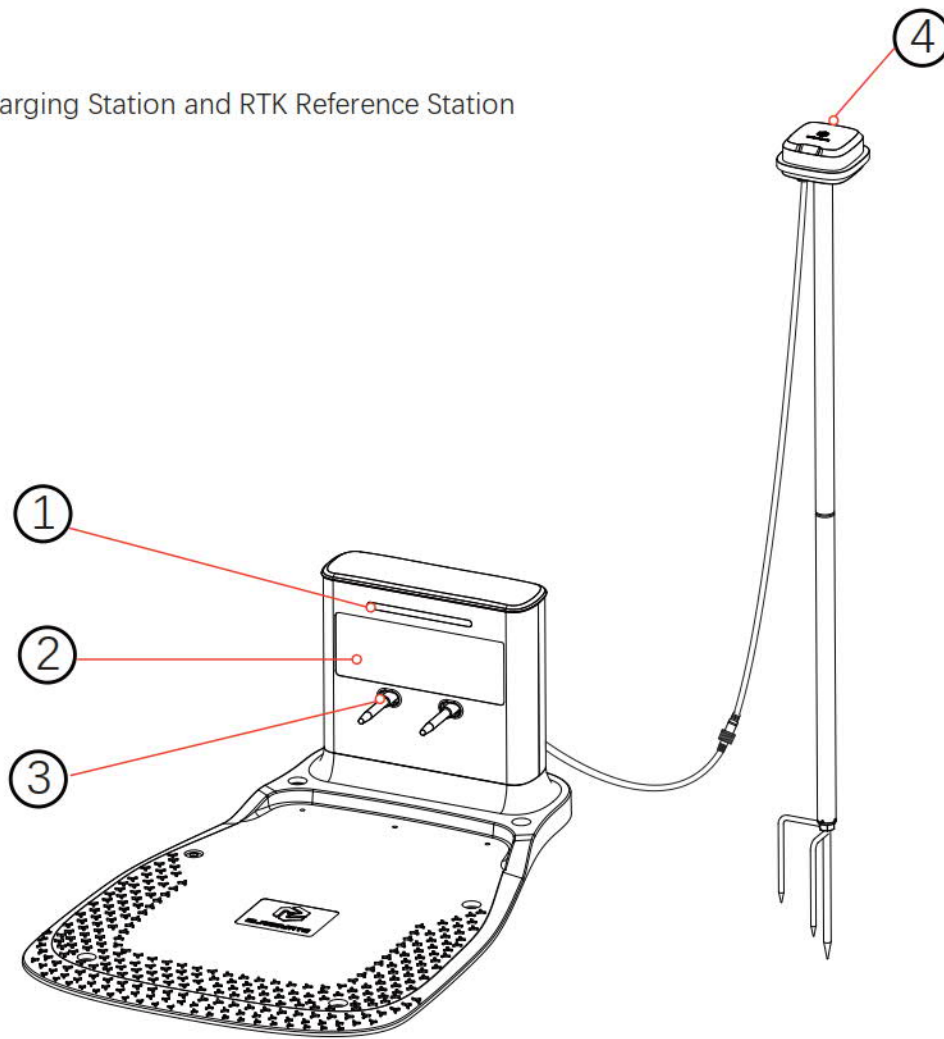


1. Press and hold the **"POWER"** button for over 5 seconds to turn the mower ON/OFF.
2. Use the **"▲"**, **"▼"**, **"◀"**, **"▶"** arrow buttons to navigate in the menu or enter digits PIN code, the default PIN code is **"0000"**.
3. Press the **"OK"** button to quick access the setting menu or to confirm the choose settings in the menu.
4. Press the **"BACK"** button to quick confirm the choose settings in the menu or return to previous menu.
5. Press the **"START"** button to trigger quick start mowing.
6. Press **"PARK > OK"** buttons to return the mower back to charging station.

09



2.4.4 Charging Station and RTK Reference Station



1. Charging Station LED indicator

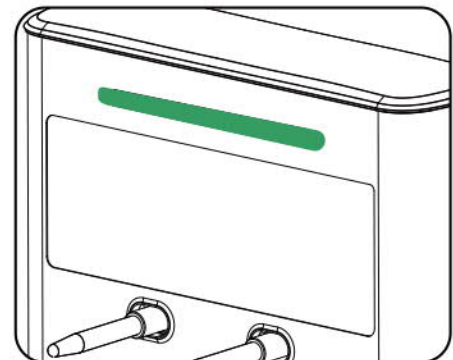
2. QR Code

3. Charging Pin

3. RTK Reference Station

2.4.5 LED Indicator of the Charging Station

Solid Blue	No RTK reference station signal
Breathing Blue	The RTK reference station signal is not good
Solid Green	The RTK reference station signal is good
Breathing Green	The mower is Charging
Solid Red	Malfunction of charging station



2.5 BMRTK Introduction

RTK Introduction

RTK stands for Real Time Kinematic, which is a high-precision positioning technology based on the Global Navigation Satellite System (GNSS). It can provide centimeter level or even sub centimeter level three-dimensional positioning results in real time, greatly revolutionizing the operation mode of traditional measurement and other fields. The following is a detailed introduction:

core components

Reference station: usually located in a fixed position with known coordinates, continuously receives GNSS satellite signals, calculates real-time error correction, and sends it to the mobile station through a communication link. It is generally unmanned and has capabilities such as data storage, power outage endurance, lightning protection, etc., which can ensure long-term stable operation.

Mobile station: a mobile receiver device commonly found on measuring instruments, autonomous vehicles, drones, and other carriers. It receives both satellite signals and correction data from reference stations, and calculates its precise position in real-time.

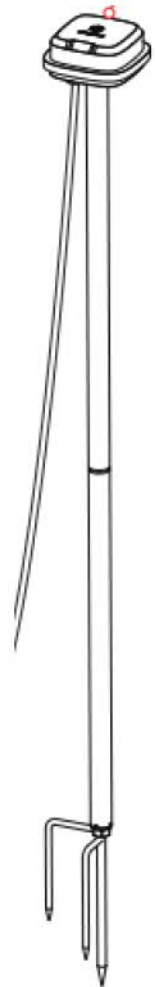
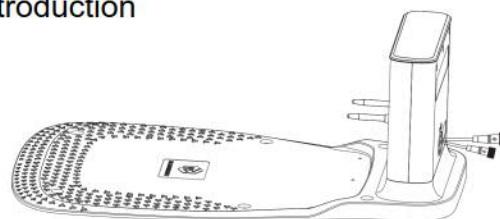
Data communication link: responsible for data transmission between the reference station and the mobile station.

The LoRa radio in RTK is a key wireless communication device that connects the reference station and the mobile station. Its core function is to establish a stable data transmission link for both, ensuring real-time transmission of differential data required for RTK high-precision positioning, and adapting to the operational needs of various complex scenarios. Its specific functions are as follows:

1. Real time transmission of differential core data.
2. Breaking through the homework restrictions in areas without public networks.
3. Ensure the stability of transmission in complex environments.
4. Suitable for long-term low-power outdoor operations
5. Reduce homework and deployment costs.

Electrical parameters of charging-station Introduction

1. Rated voltage: $26.3V \pm 0.3V$
2. Rated current: $3A \pm 0.3A$
3. Working temperature: $-10^{\circ}C - 75^{\circ}C$
4. Storage temperature: $-20^{\circ}C - 85^{\circ}C$



SRTK

3 Installation

3.1 Preparation

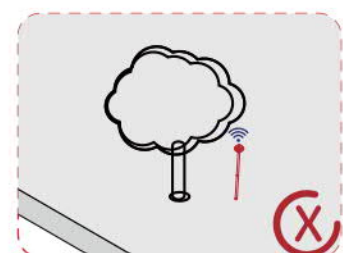
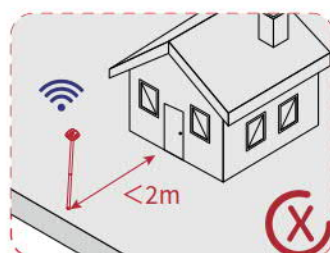
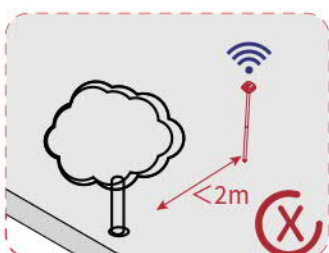
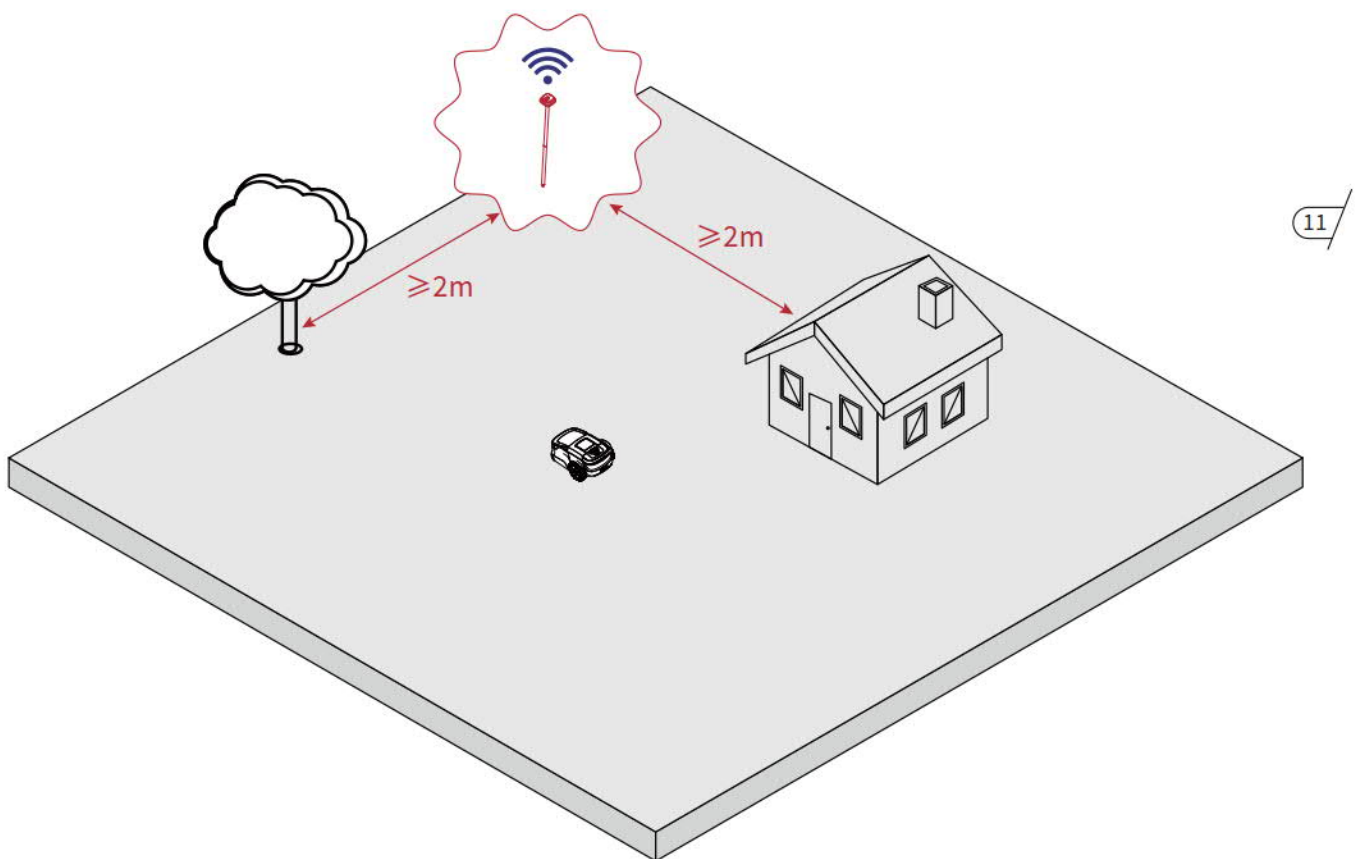
- 1) Read and understand the safety instructions prior to installation.
- 2) Remove debris, piles of leaves, toys, wires, stones and other obstacles.
- 3) Cut your lawn to required maximum height of 10cm.

3.2 Choosing a Location for RTK Reference Station

For best positioning accuracy and mowing performance, the RTK reference station must be in an open area to receive satellite signals.

The guidelines for finding a proper location are:

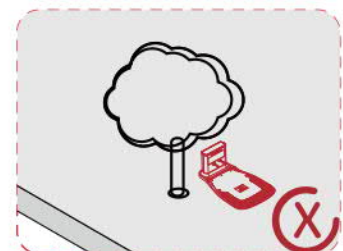
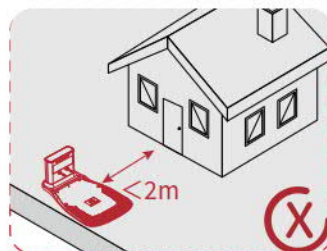
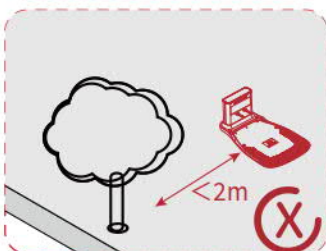
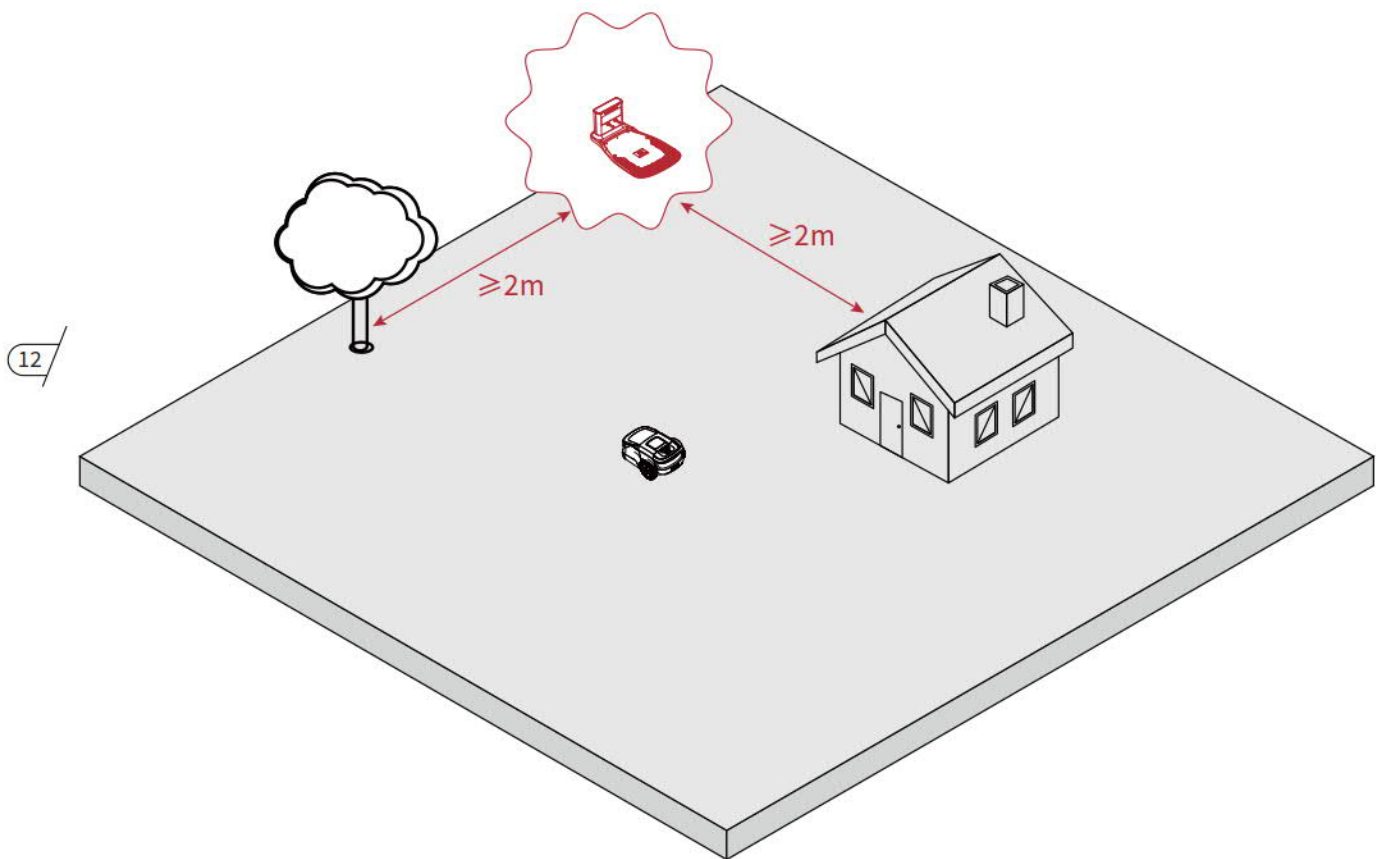
- Choose an open area with no trees or buildings that may obstruct the satellite signals.
- The RTK reference station should be oriented vertically.
- Maintain a distance of at least 2 meters between the RTK reference station and any trees or buildings.



3.3 Choosing a Location for Charging Station

The mower calibrates its position in the charging station. If the charging station is not properly located, the mower may fail to start mowing due to weak RTK signal, or fail to return to charging station.

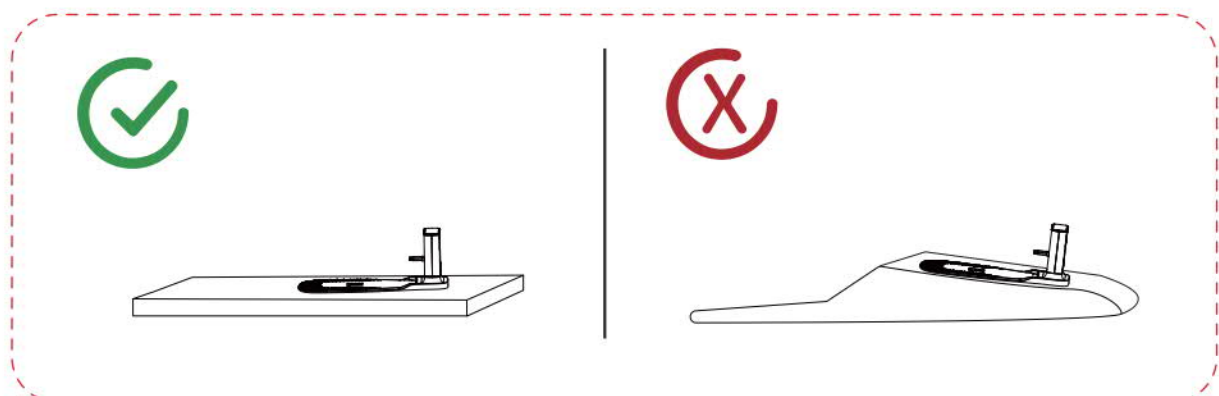
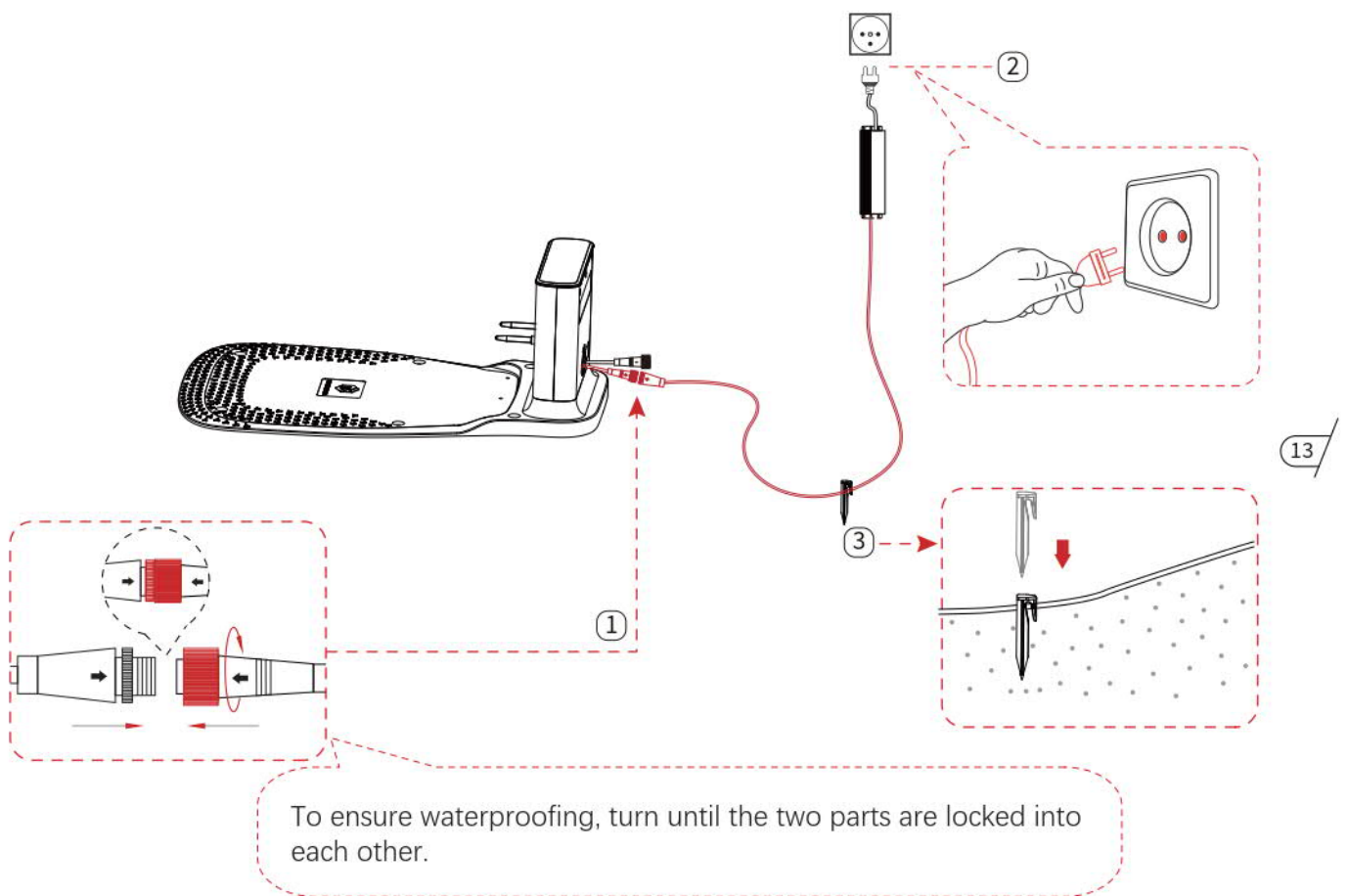
- Choose an open area with no trees or buildings that may obstruct the satellite signals.
- Place the charging station on a flat ground.
- Maintain a distance of at least 2 meters between the charging station and any trees or buildings.
- Position the charging station to face the lawn.
- Avoid placing the charging station in flood-prone areas.



3.4 Install

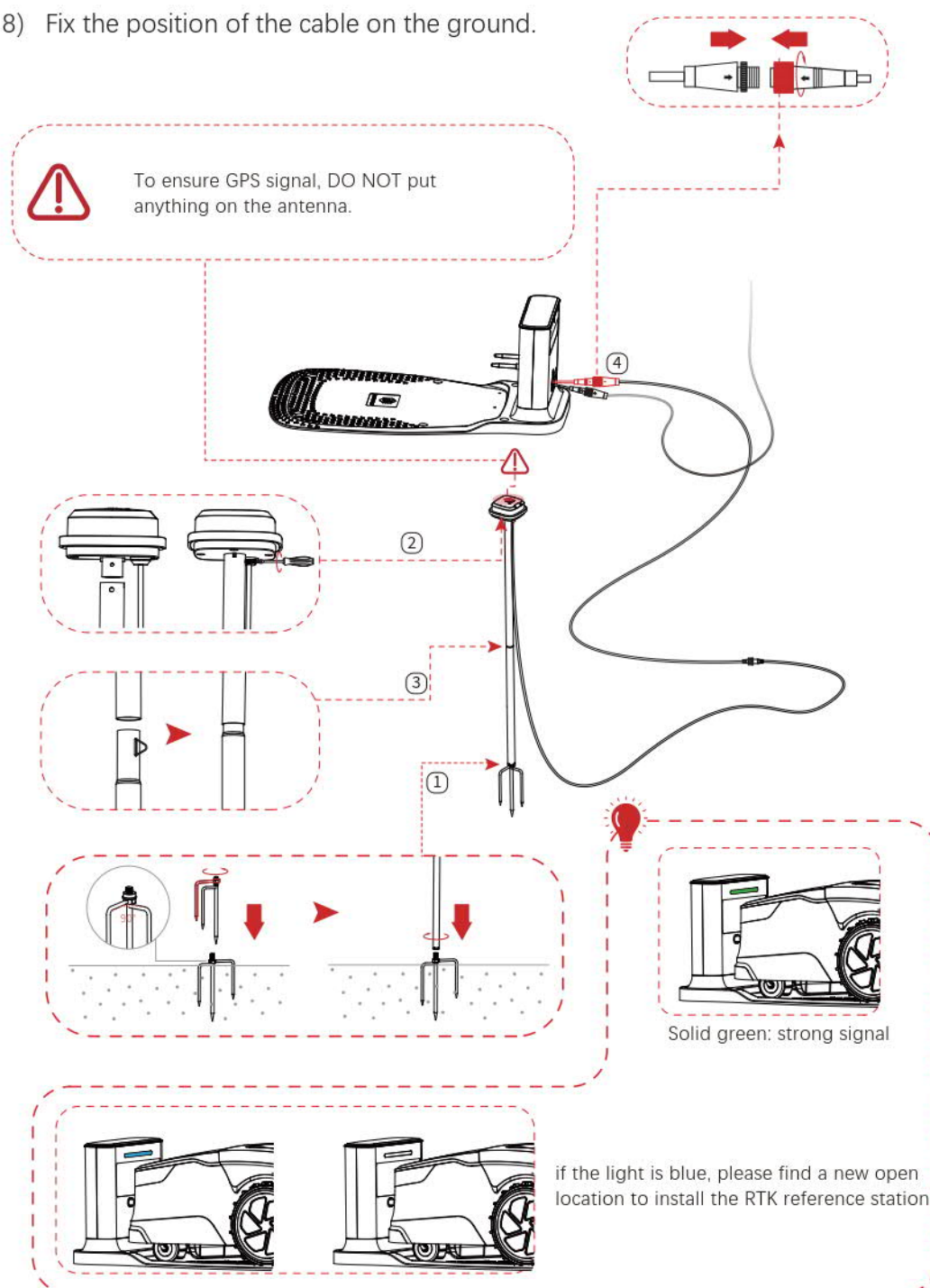
3.4.1 Install the Charging Station

- 1) Select an open location to install the charging station.
- 2) Connect the power supply adapter to the power interface of charging station.
Align the notch on the cable, turn the nuts until they are locked into each other.
If you need, please use the power supply extension cable to extend the cable.
- 3) Plug the power supply into a suitable socket.



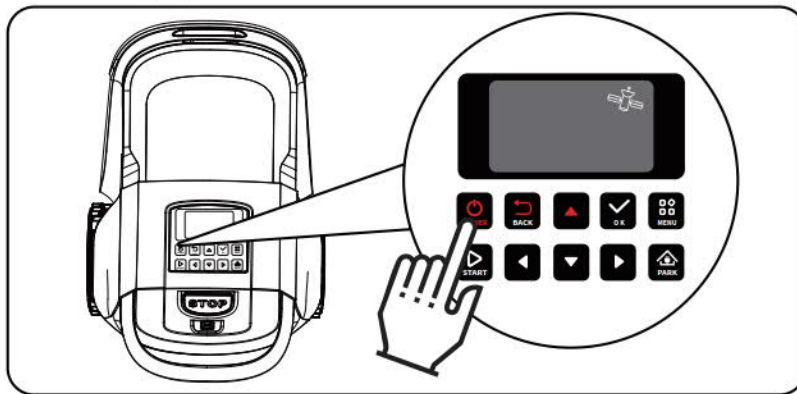
3.4.2 Install the RTK Reference Station

- 1) Select an open location to install the RTK reference station.
- 2) Fix the RTK reference station on the tube slot with a screw.
- 3) Unfold the base fork of RTK reference station installation kit and insert it into the ground.
- 4) Rotate another tube with nut onto the base fork.
- 5) Assemble the two tubes.
- 6) Connect the RTK reference station cable to the signal interface of charging station. Align the notch on the cable, turn the nuts until they are locked into each other. If you need, please use the RTK reference extension cable to extend the cable.
- 7) Check the LED indicator of the charging station is green, if it is not, you need to select an alternative location to install RTK reference station.
- 8) Fix the position of the cable on the ground.



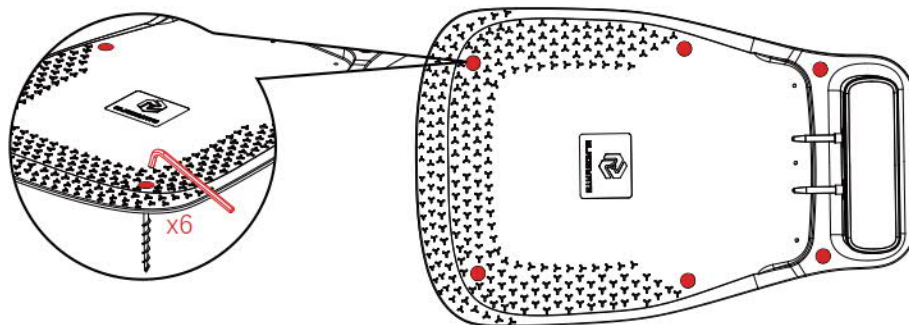
3.4.3 Charge and Activate the Mower

- 1) Push the mower into the charging station.
- 2) Press and hold the **"Power"** button for over 5 seconds to start the mower.
- 3) Use the **"▲"**, **"▼"**, **"◀"**, **"▶"** arrow buttons to enter digits PIN code, the default PIN code is **"0000"**.
- 4) Reset the PIN of your mower, it can't be "0000".
- 5) The screen on the mower should show the "Charging" status.
- 6) Wait patiently for 2 minutes to allow the mower to search RTK signal, the mower will prompt "📶", when completing search.
- 7) If the mower doesn't prompt "📶", please find an alternative location to install charging station.

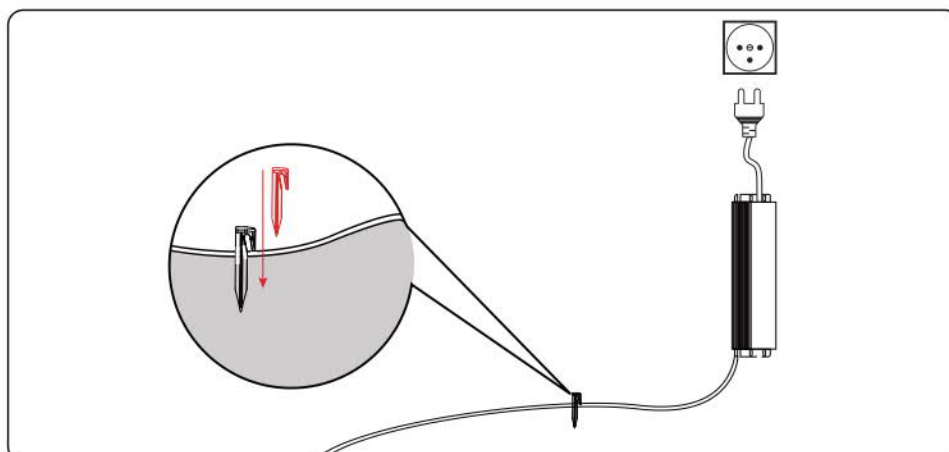


3.4.4 Secure the Location of Charging Station

- 1) Secure the charging station in place using the 6 stakes and the Allen key.



- 2) Fix the position of the cable on the ground.



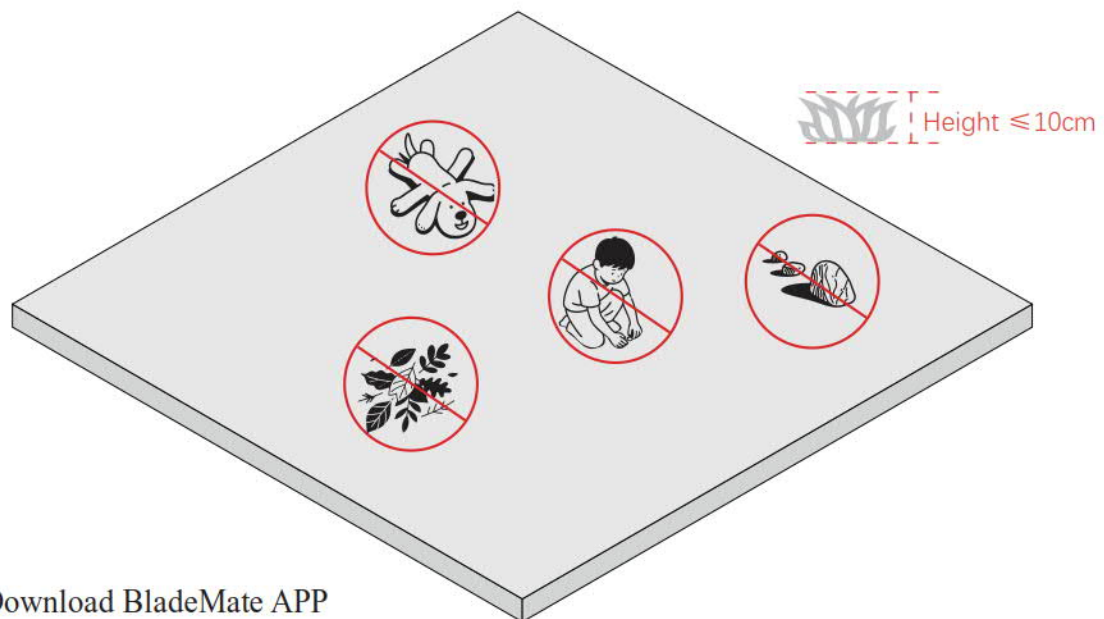
4 Operation

4.1 Preparation

- 1) Read and comply safety instructions before operation.
- 2) Confirm proper installation of the charging station and RTK reference.
- 3) Confirm the mower has already pushed into the charging station.
- 4) Confirm the battery state of charge is above 40%.

4.2 Prepare the lawn

- 1) Before using the mower, please cut your lawn to a height below 10cm.
- 2) Remove debris, piles of leaves, toys, wires, stones and other obstacles.
- 3) Confirm no children or animals are on the lawn.



4.3 Download BladeMate APP

The mower is designed to work with the free BladeMate APP, please scan the QR code to download the BladeMate APP. Alternatively, go to the Google Play Store or the Apple App Store and search "BladeMate". After installing the app, please register and log in.



App Store



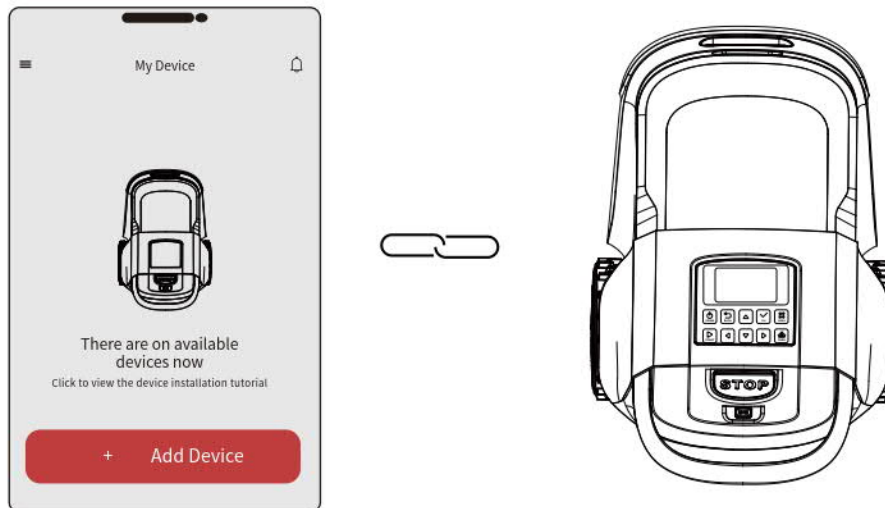
Google Play

To ensure normal use, the app will ask you for Bluetooth, Location, and Wi-Fi networking accesses when necessary, please enable above accesses. For more information, please refer to our Privacy Agreement.

Mobile system requirement, Android 9.0 and above or IOS 12 and above.

4.4 Add Device

- 1) Tap “+ Add Device ” to add your mower.
- 2) Tap “Start searching ” to search any available mower by Bluetooth.
- 3) Select the right mower to bind. If bind success, on the app and the screen on the mower should show the Bluetooth symbol .
- 4) Follow the displayed instructions to connect the mower with Wi-Fi network.
- 5) Follow the displayed instructions to activate the 4G connection.

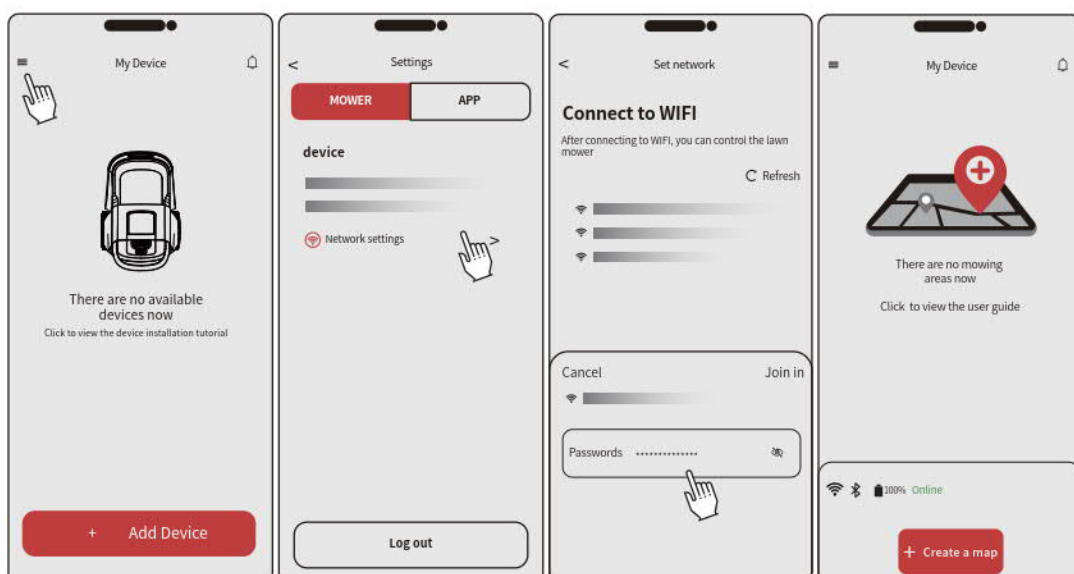


17

4.5 Setup Wi-Fi

You also can setup Wi-Fi by follow below instructions.

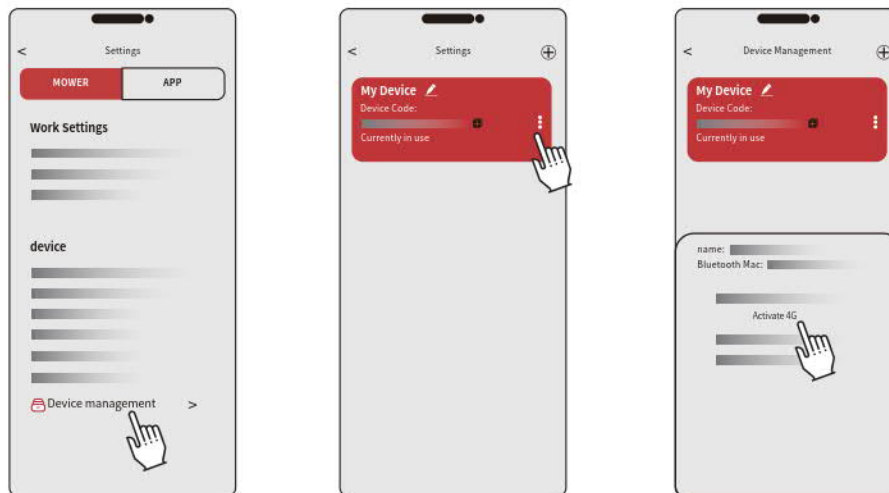
- 1) Tap the MENU button on the Home page.
- 2) Tap the MOWER button, then select Network settings.
- 3) Select a Wi-Fi to connect.



4.6 Activate 4G Card

You also can activate 4G card by follow below instructions.

- 1) Go to **Settings > MOWER > Device management** to find your device.
- 2) Tap “⋮” to show popup menu.
- 3) Tap Activate 4G to activate your 4G card.



18

4.7 Update Firmware

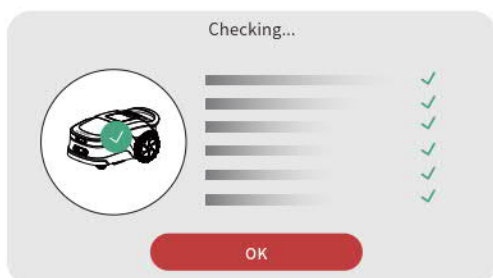
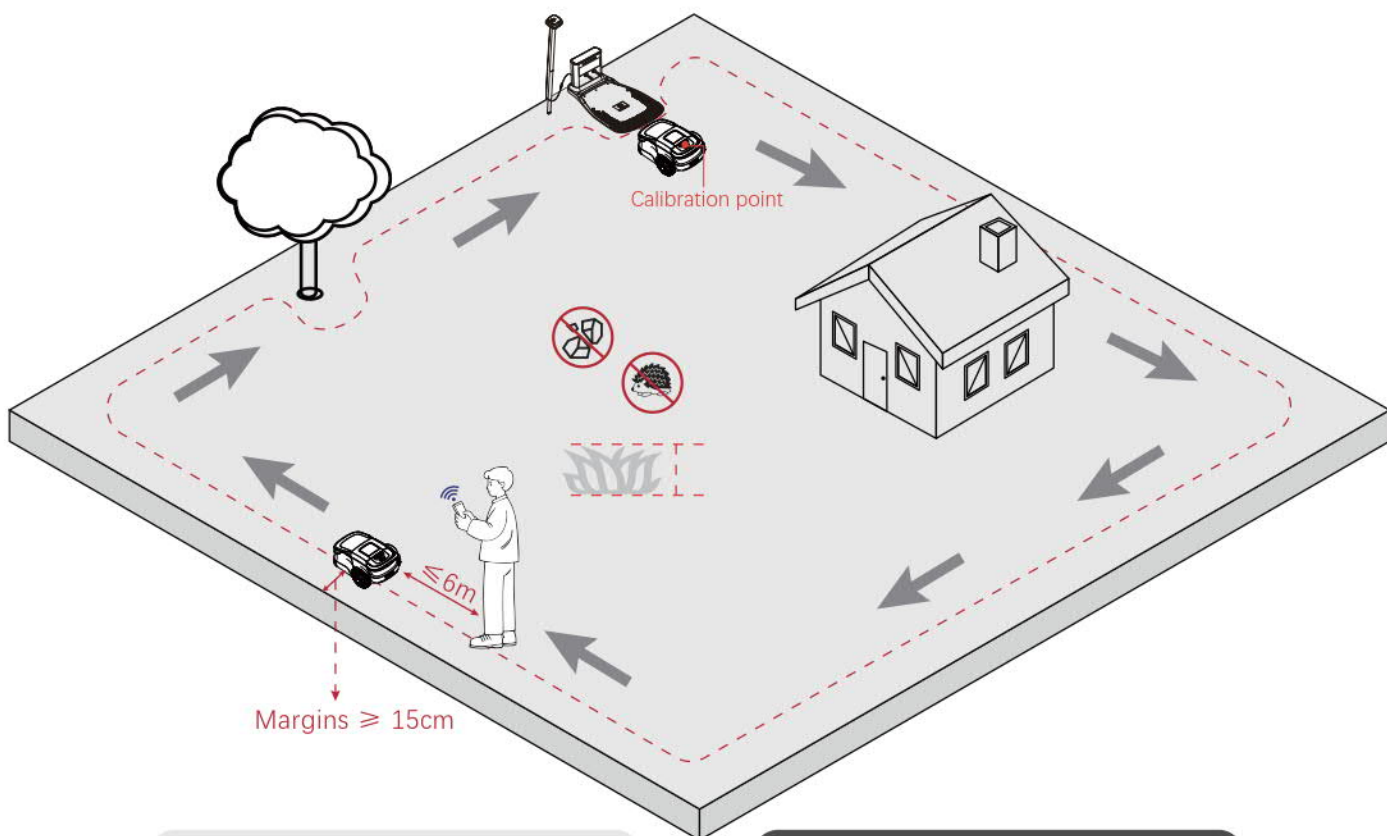
For best experience, please update to the latest firmware. During the update, you can not power off or perform other operations. The mower will reboot if the update is successful.



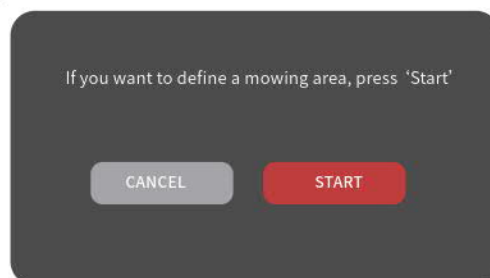
4.8 Create a Map

4.8.1 Map out the Task Area

- 1) Push the mower into the charging station.
- 2) Keep within 6 m from the mower during the mapping process to maintain a stable Bluetooth connection and for safety.
- 3) If the height difference is more than 4cm, please keep the mower at least 15cm from the edge of the lawn.
- 4) Select “+ **Create a map**” on the APP, follow the instructions to control the mower to move along the edges to create virtual map of a task area.
- 5) When the mow leaves the charging station, it will stop in the front of charging station, the middle point of rear wheels is calibration point, it must be in the work area.



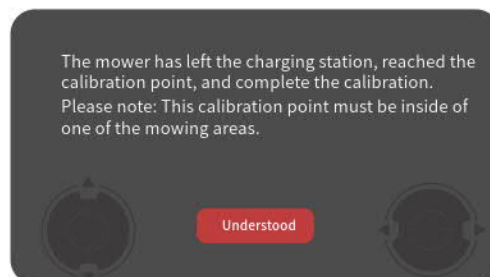
- 01** Confirm that the connection between the mobile app and the lawn mower is complete.



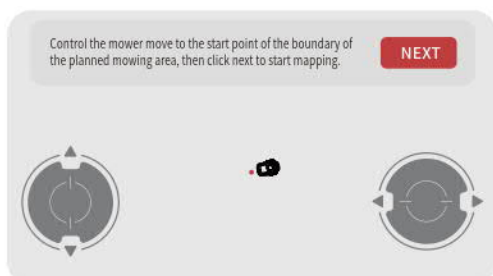
- 02** Click "Start" to create Lawn.



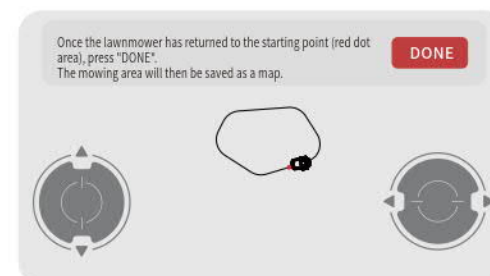
- 03** The lawn mower will slowly move away from the charging station.



- 04** The calibration point must be inside of one of the mowing areas.



- 05** Control the of the planned mower to the start point of the boundary mowing area, then click "NEXT" to start mapping.



- 06** Once the lawnmower has returned to the starting point (red dot area), press "DONE". The mowing area will then be saved as a map.

4.8.2 Map out a Protected Area

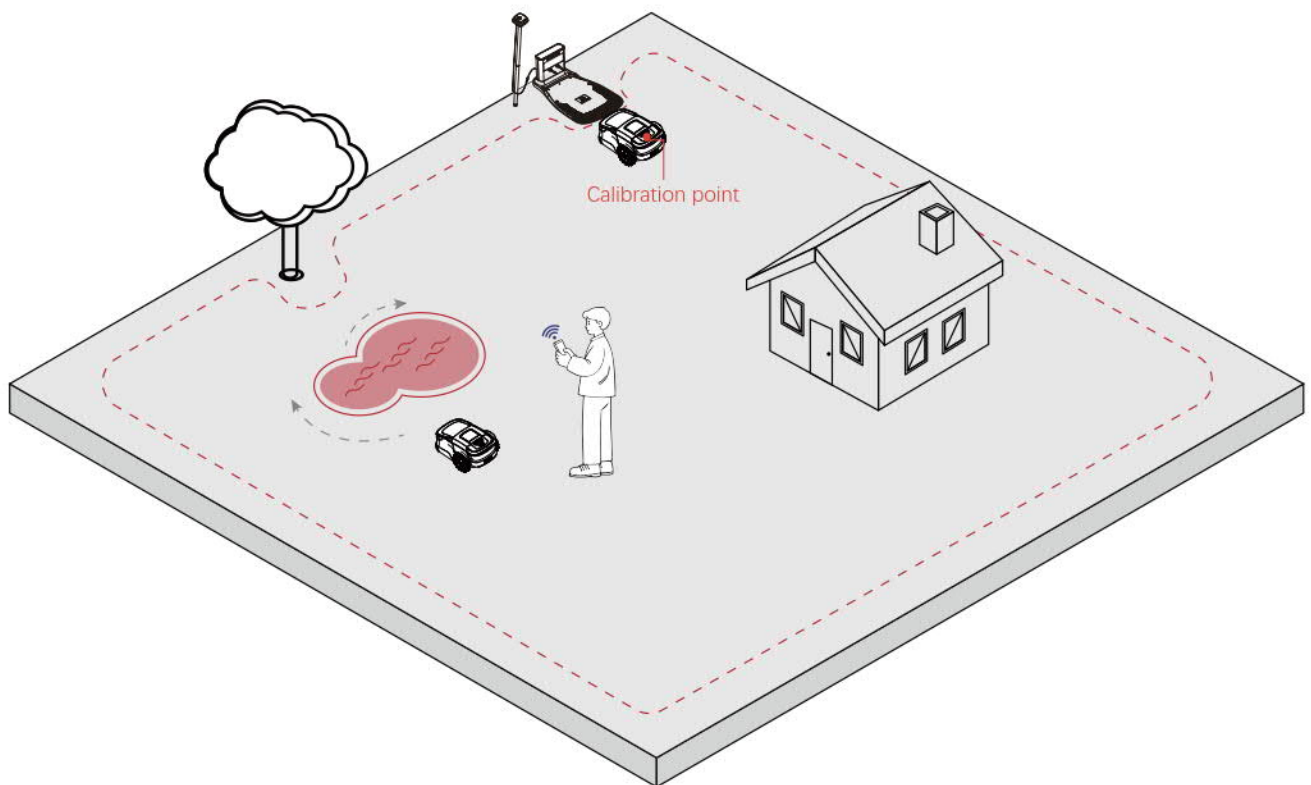
Protected areas can be created to protect flower beds, small trees, lawn decorations, pools, roots, ditches, slides, swings, etc. The mower's navigation programming prevents mowing with these predefined exclusion spaces.

For the efficiency of mowing, we recommend that fixed objects with a diameter of more than 2 meters be map as protected areas.

- 1) Tap **Add more > Protected Area** on the Map management page.



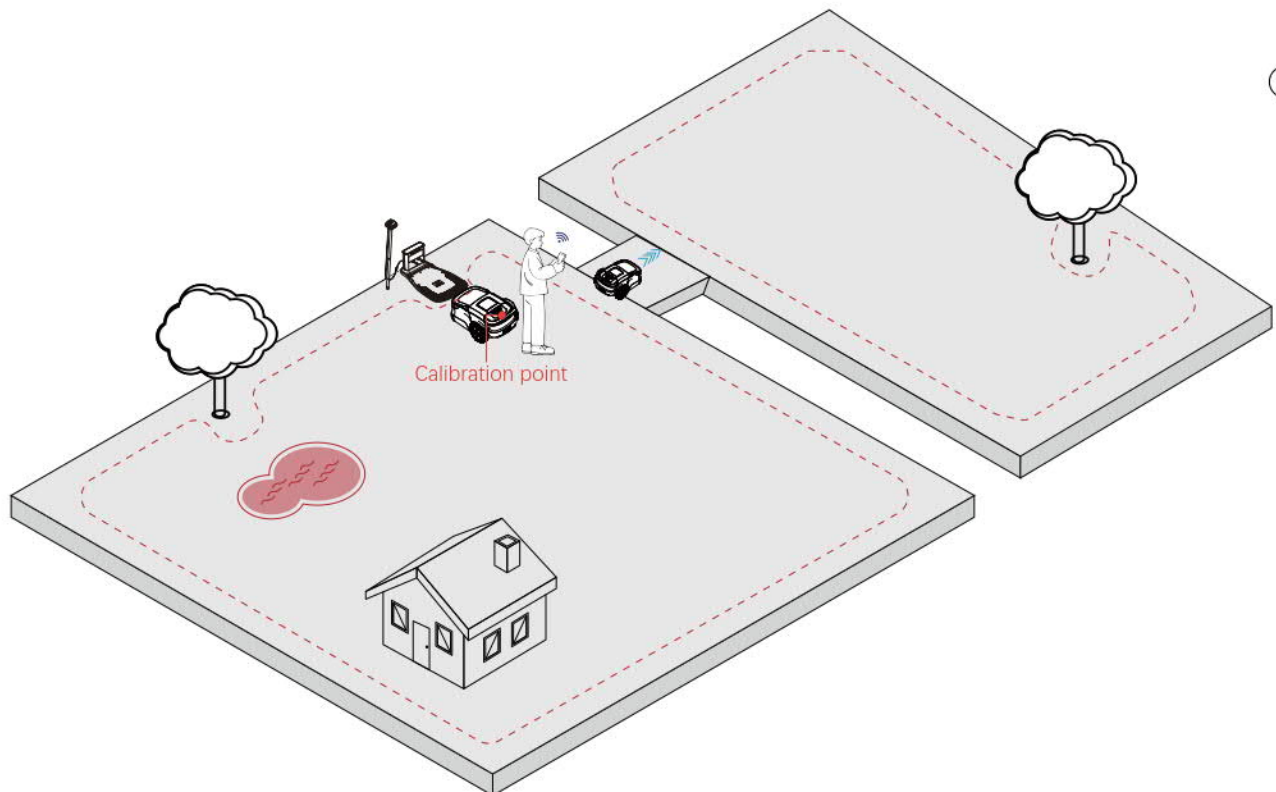
- 2) Follow the instructions to control the mower to move along the edges of exclusion spaces to create a protected area.



4.8.3 Map out a Passage

A passage can be created to connect two separate task areas. The width of the passage is required to be more than 1 m, while there should be no potholes or steps in the passage exceeding 4 cm.

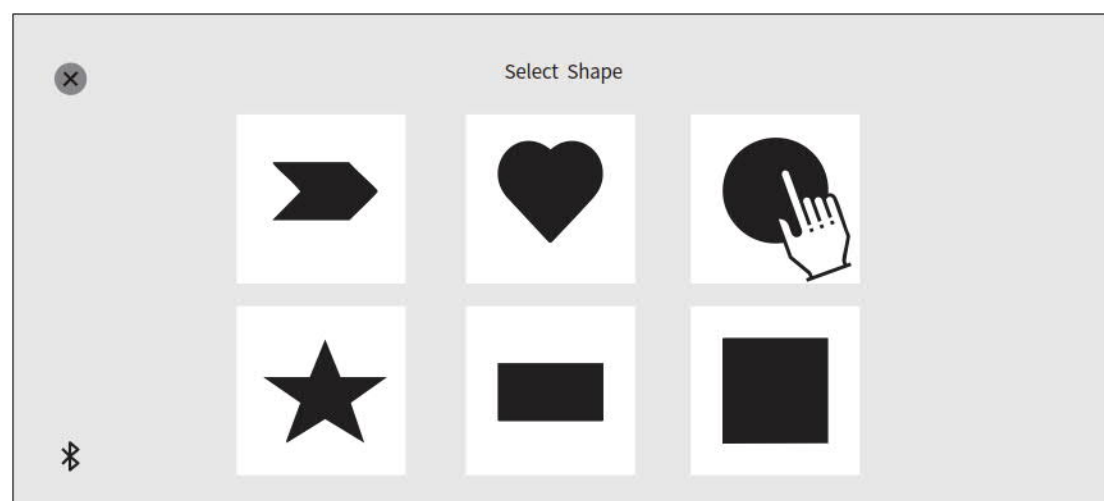
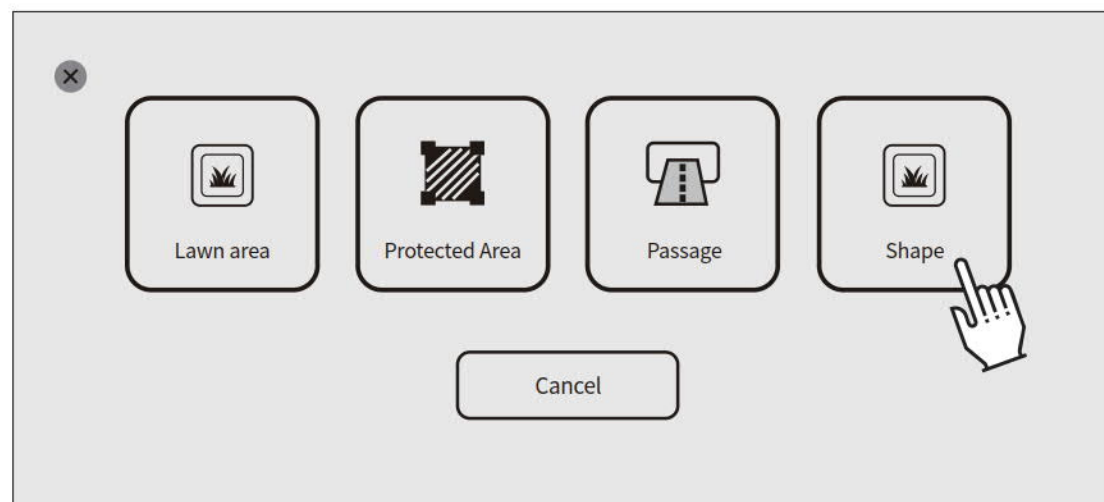
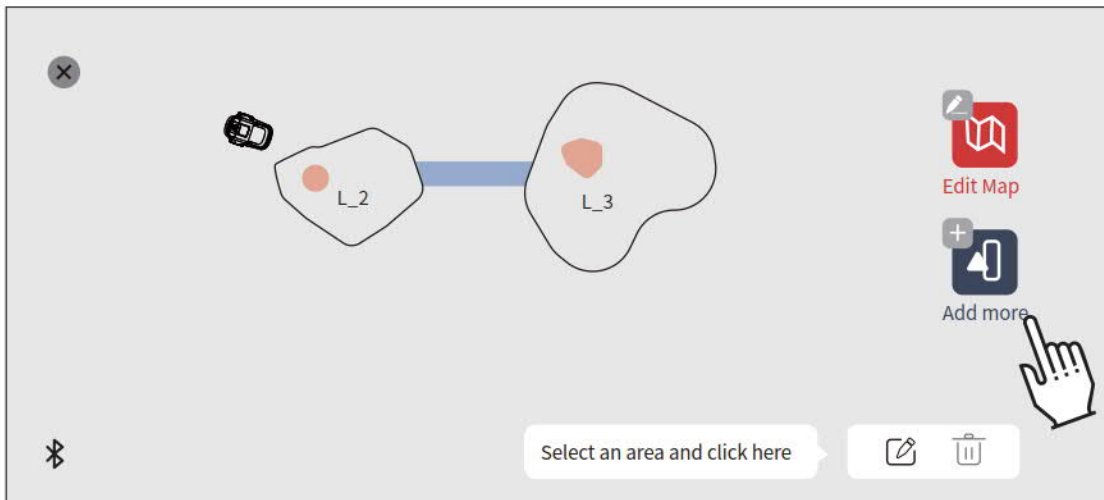
Tap **Add more > Passage** on the Map management page.



4.8.4 Create a Shape

This feature allows customized lawn designs by keeping selected shapes uncut. Pre-programmed templates in the app let you define artistic or functional zones where grass growth remains untouched to sustain your chosen layout.

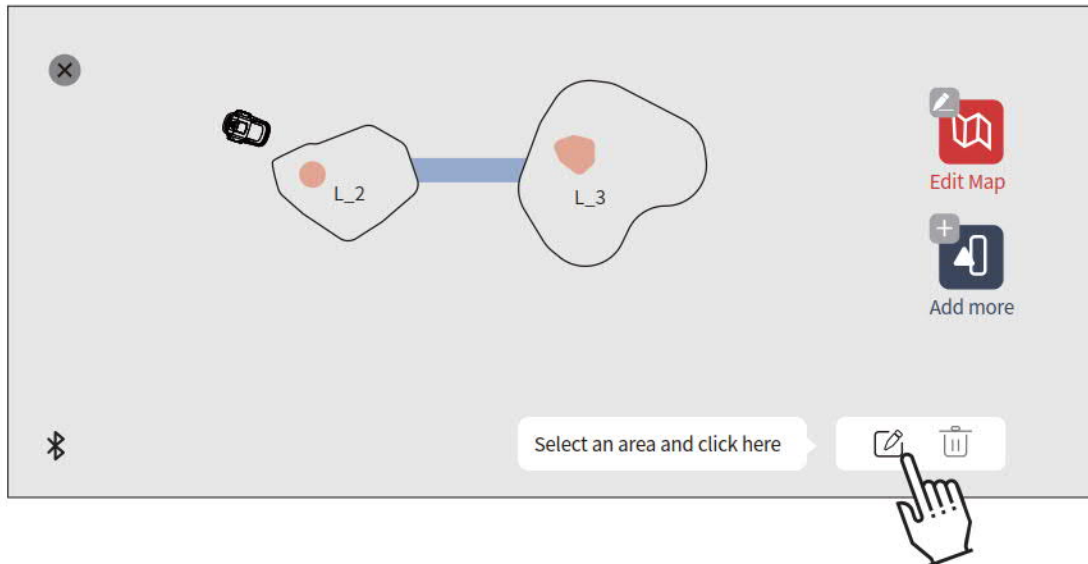
Tap **Add more > Shape** on the Map management page.



4.9 Edit Your Map

4.9.1 Rename the Task Area

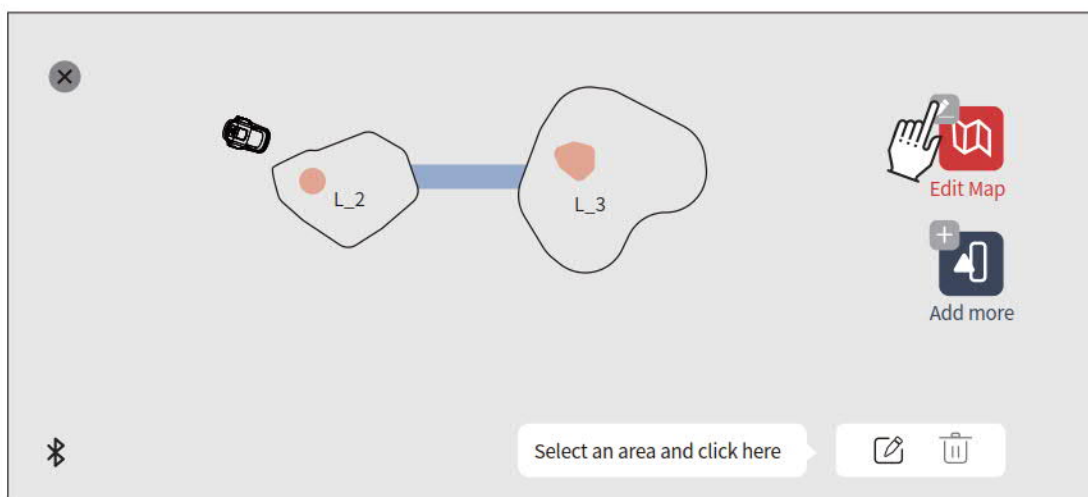
Select the task area you want to rename, tap the icon to rename.



4.9.2 Modify the Task Area

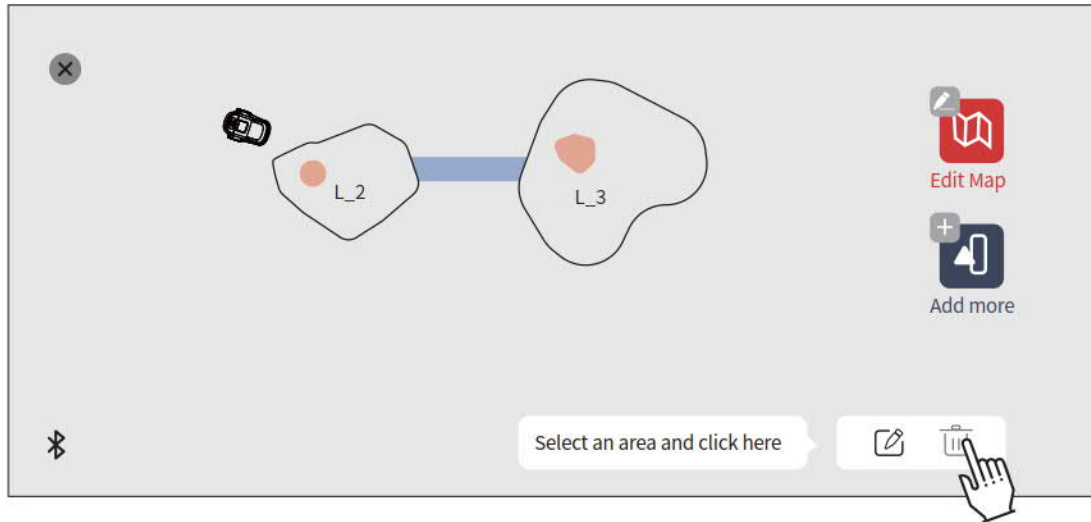
If post-mapping modifications occur in your lawn, such as new perimeter plantings, soil depressions, or unstable RTK signal, you can modify the task area without requiring to delete it entirely.

Select the map element you want to modify, tap **Edit Map**, and follow the instructions to modify the map.



4.9.3 Delete the map element

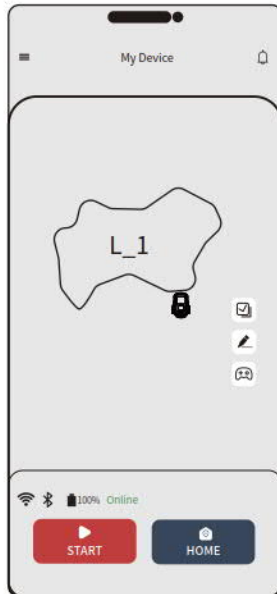
To delete a task area, protected area, passage, shape, select the element, then tap “” to delete.



4.10 Mow

4.10.1 Start mowing

On the APP, you can simply tap **Start** from the home page to mow all task areas, if you just want to mow one area, select it and then tap **Start**.

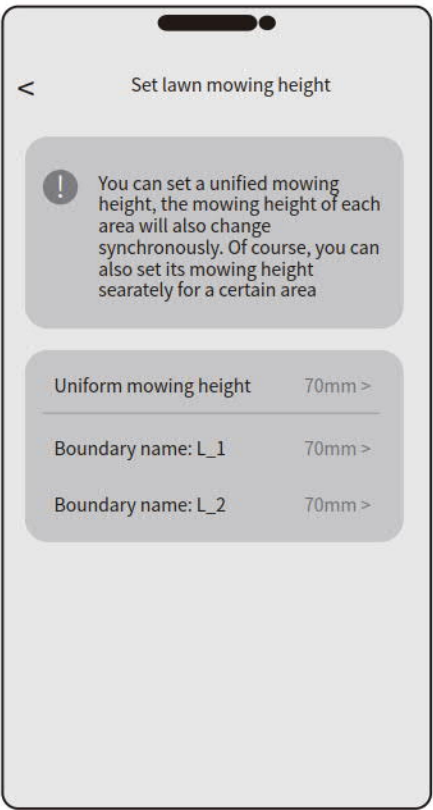


On the mower, you can tap **START** > **OK** to mow all task areas.



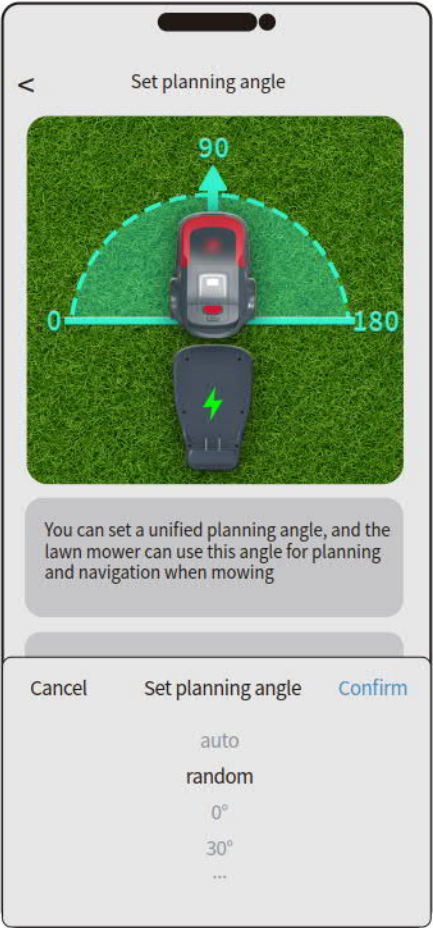
4.10.2 Task settings

You can set the mowing height via the APP for all task area or a certain area.



26

You can set the mowing direction via the APP.



4.11 Task Schedule

- 1) Go to **Settings > MOWER > Mowing Plan.**
- 2) Select a day to set up a schedule.
- 3) Set the start time and end time of the schedule.

