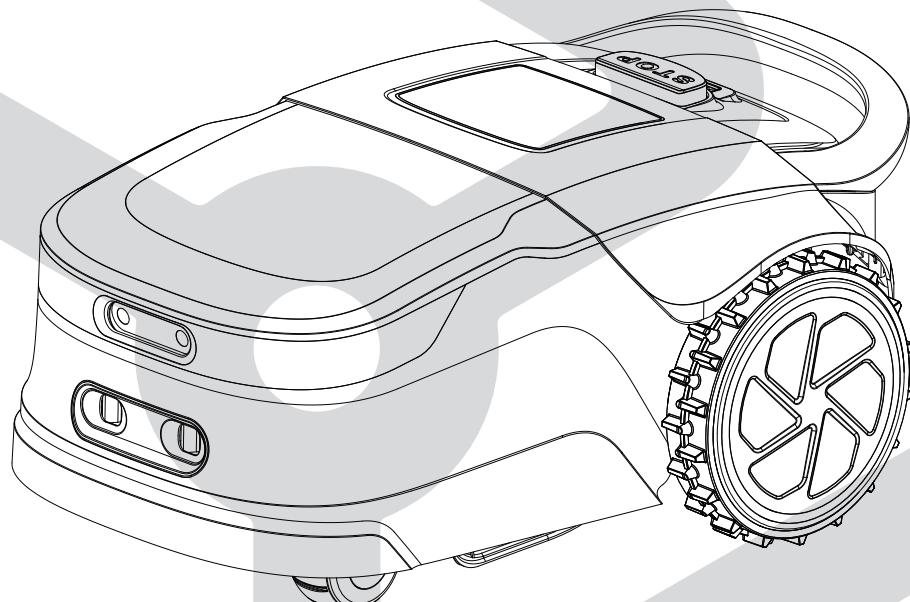


# ABAX SENSING

## Intelligent lawn mowing robot

### S1 Pro / S1 Ultra

## User Manual



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# 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

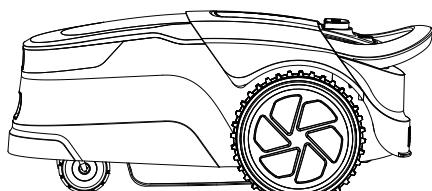
### 2.1 About ABAX S1 Ultra

The ABAX 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 APP. The product is your best choice for lawn maintenance with hands-free and perfect lawn experience.

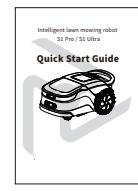
### 2.2 What's in the box

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.

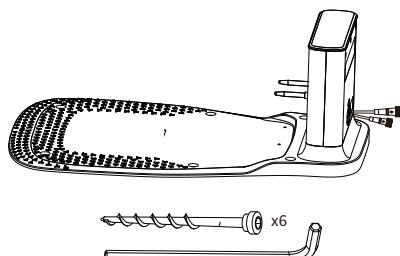
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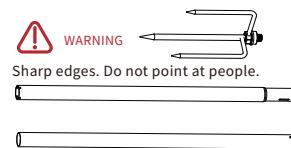
S1 Ultra



Quick Start Guide



Charging Station



Antenna kit



GNSS antenna



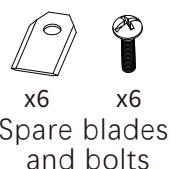
Extension cable for the power supply



Power supply



Extension cable for the GNSS antenna



Spare blades and bolts



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.

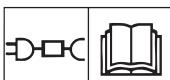


WARNING-Keep a safe distance from the product when it is in operation. Keep your hands and feet away from the rotating blades of the product.



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

07



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



This product complies with the applicable EU Directives.

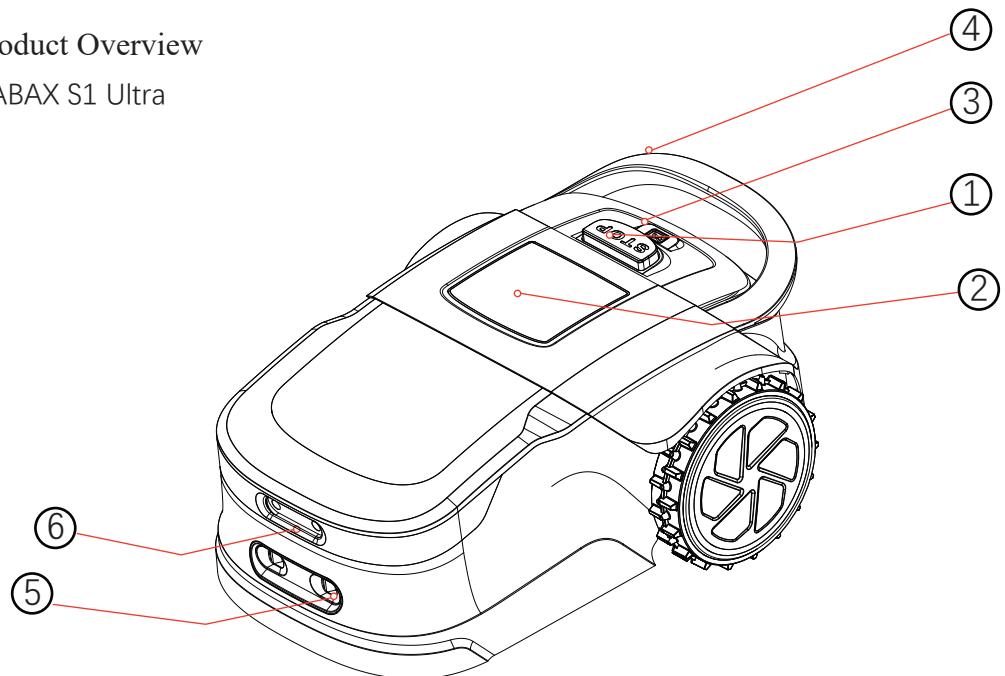


It is not permitted to dispose the product as usual domestic waste. Obey national regulations and use the local recycling system.



## 2.4 Product Overview

### 2.4.1 ABAX S1 Ultra



1. Emergency Stop Button

2. Control Panel

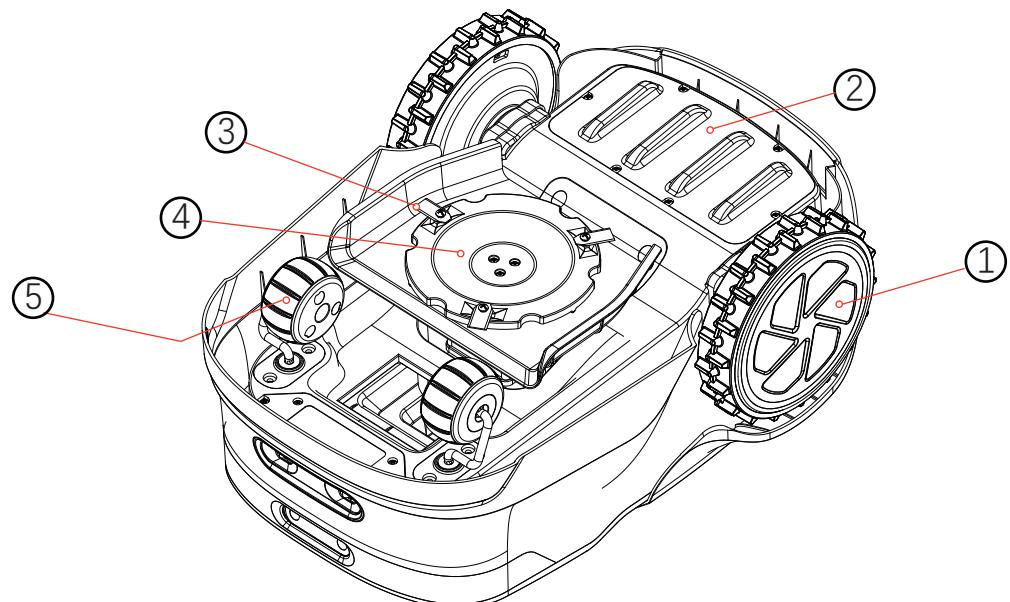
3. Rain Sensor

4. Handle

5. Mower Battery Charging Contacts

6. Stereo Camera

08



1. Rear Wheel

2. Battery Compartment Cover

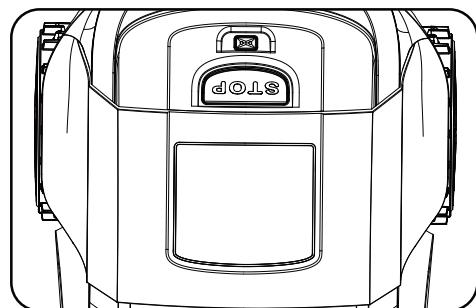
3. Cutting Blade

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

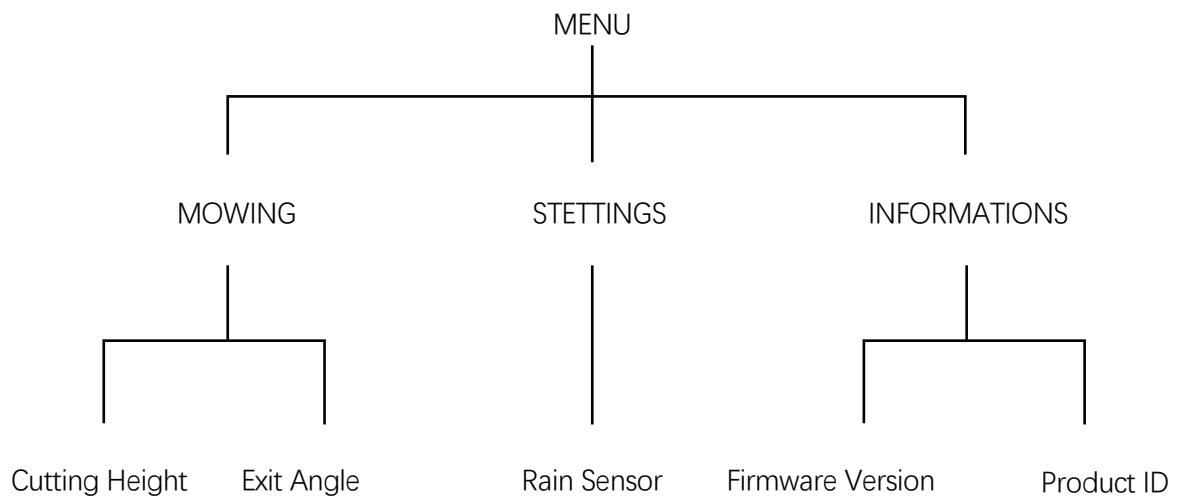


#### 2.4.3 Control Panel (Keys & LC Display)

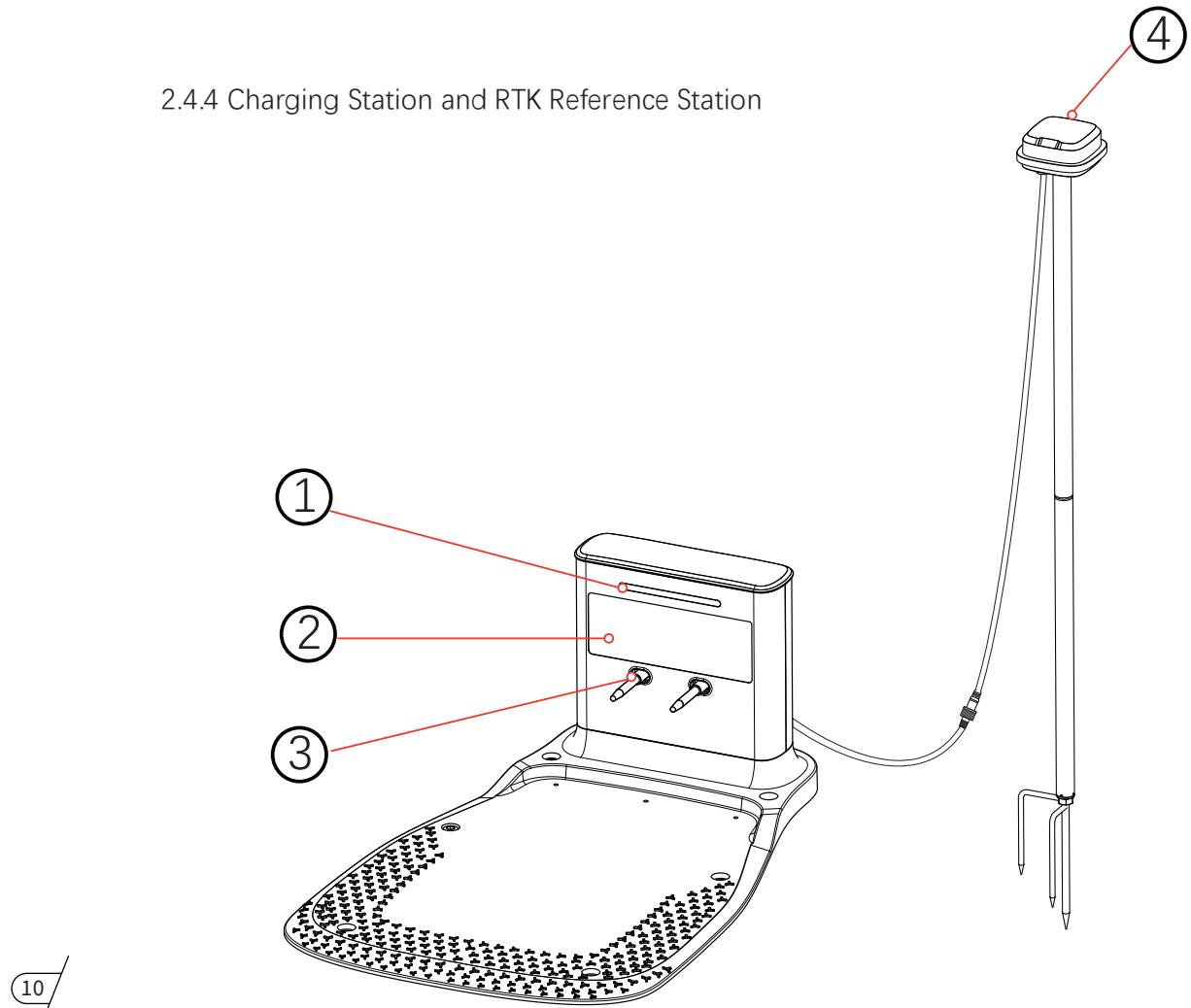


1. Press and hold the “**POWER**” button for over 5 seconds to turn the mower ON/OFF.
2. Use the “**▲**”, “**▼**”, “**◀**”, “**▶**” arrow buttons to navigate in the menu or enter digits PIN code, the default PIN code is “**0000**”.
3. Press the “**OK**” button to quick access the setting menu or to confirm 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



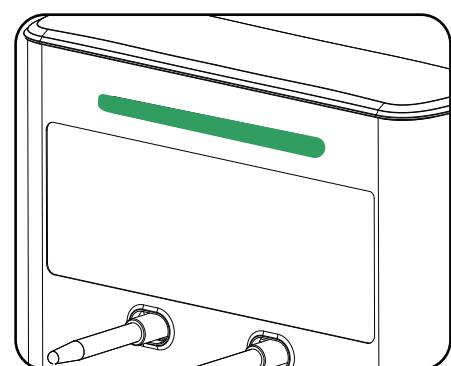
#### 2.4.4 Charging Station and RTK Reference Station



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



## 3 Installation

### 3.1 Preparation

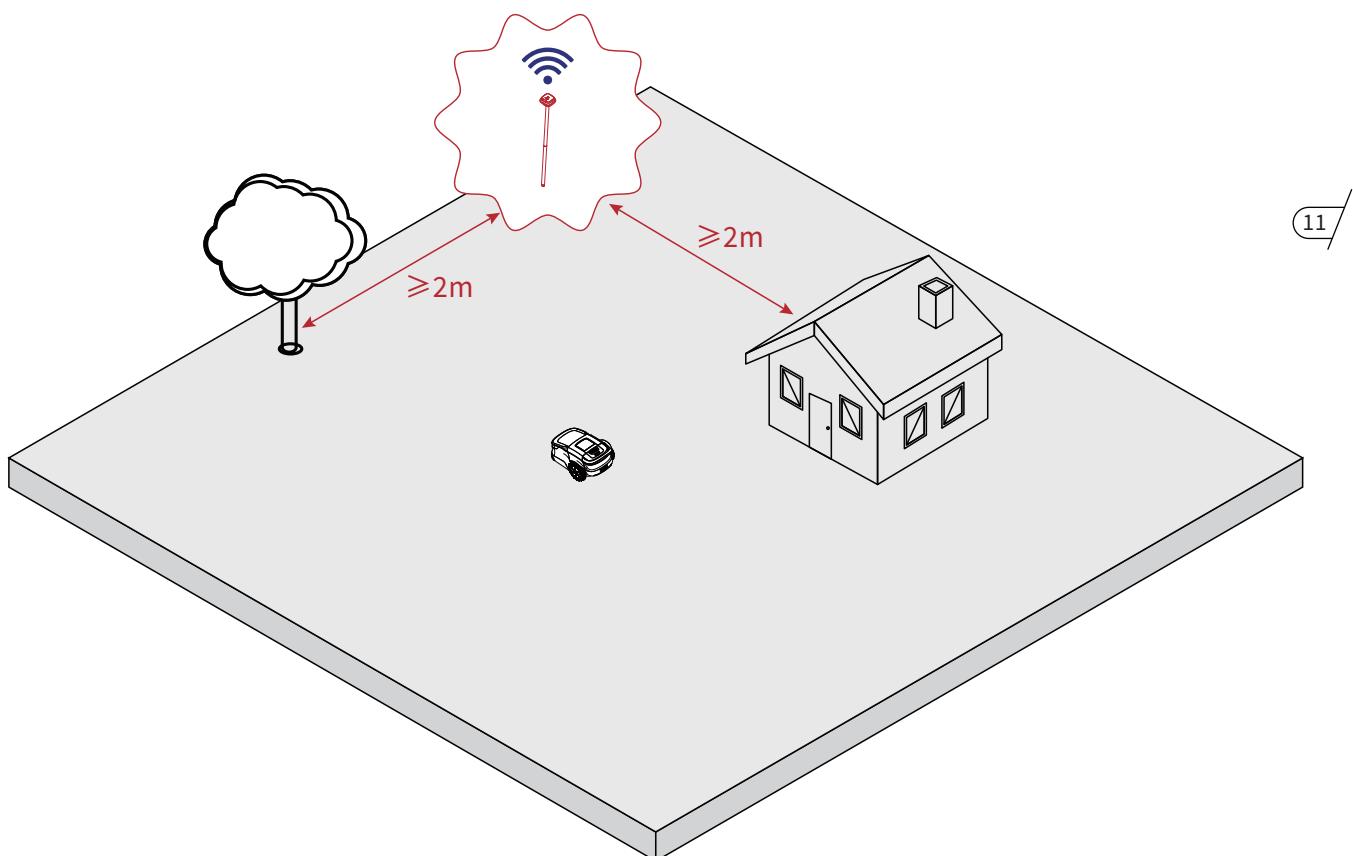
- 1) Read and understand the safety instructions prior to installation.
- 2) Remove debris, piles of leaves, toys, wires, stones and other obstacles.
- 3) Cut your lawn to required maximum height of 10cm.

### 3.2 Choosing a Location for RTK Reference Station

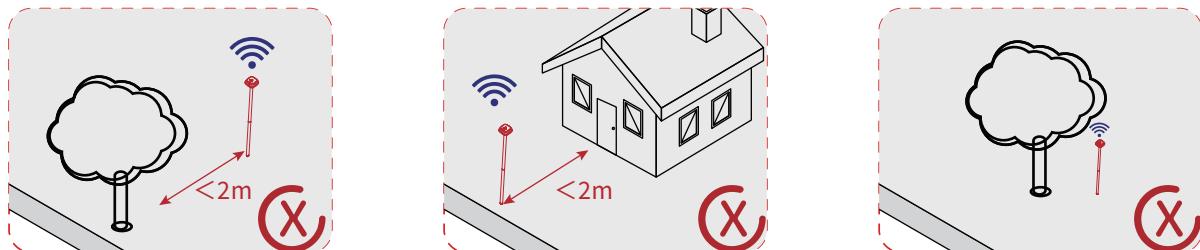
For best positioning accuracy and mowing performance, the RTK reference station must be in an open area to receive satellite signals.

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.



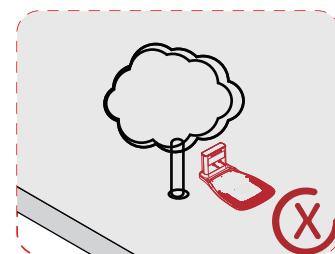
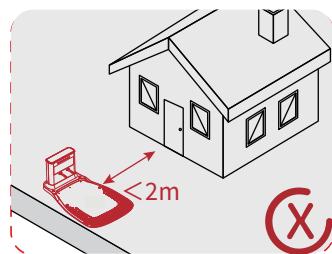
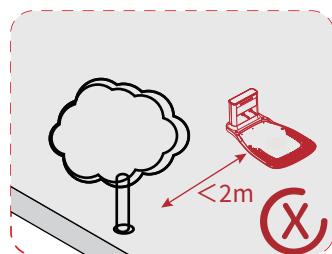
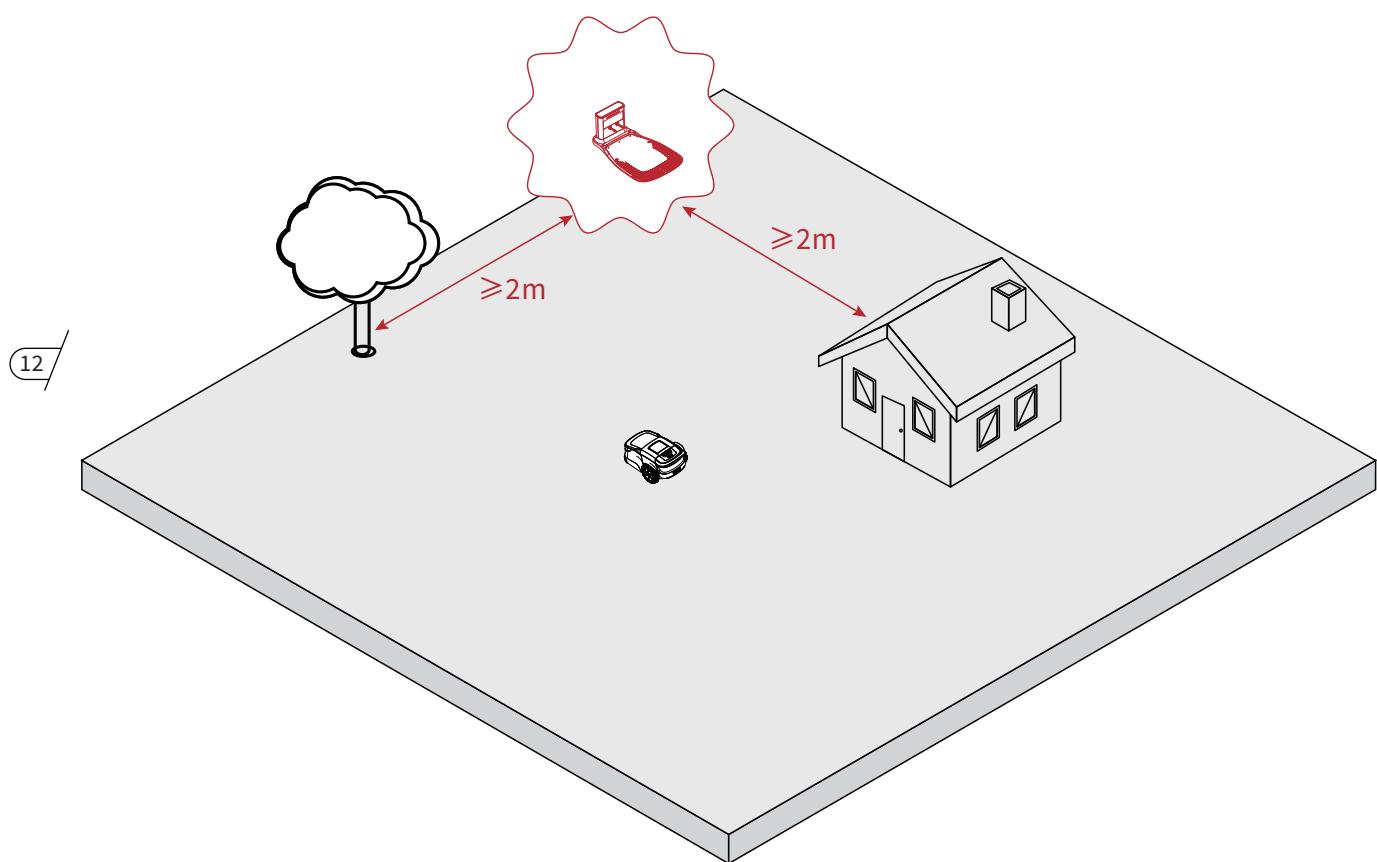
(11)



### 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.

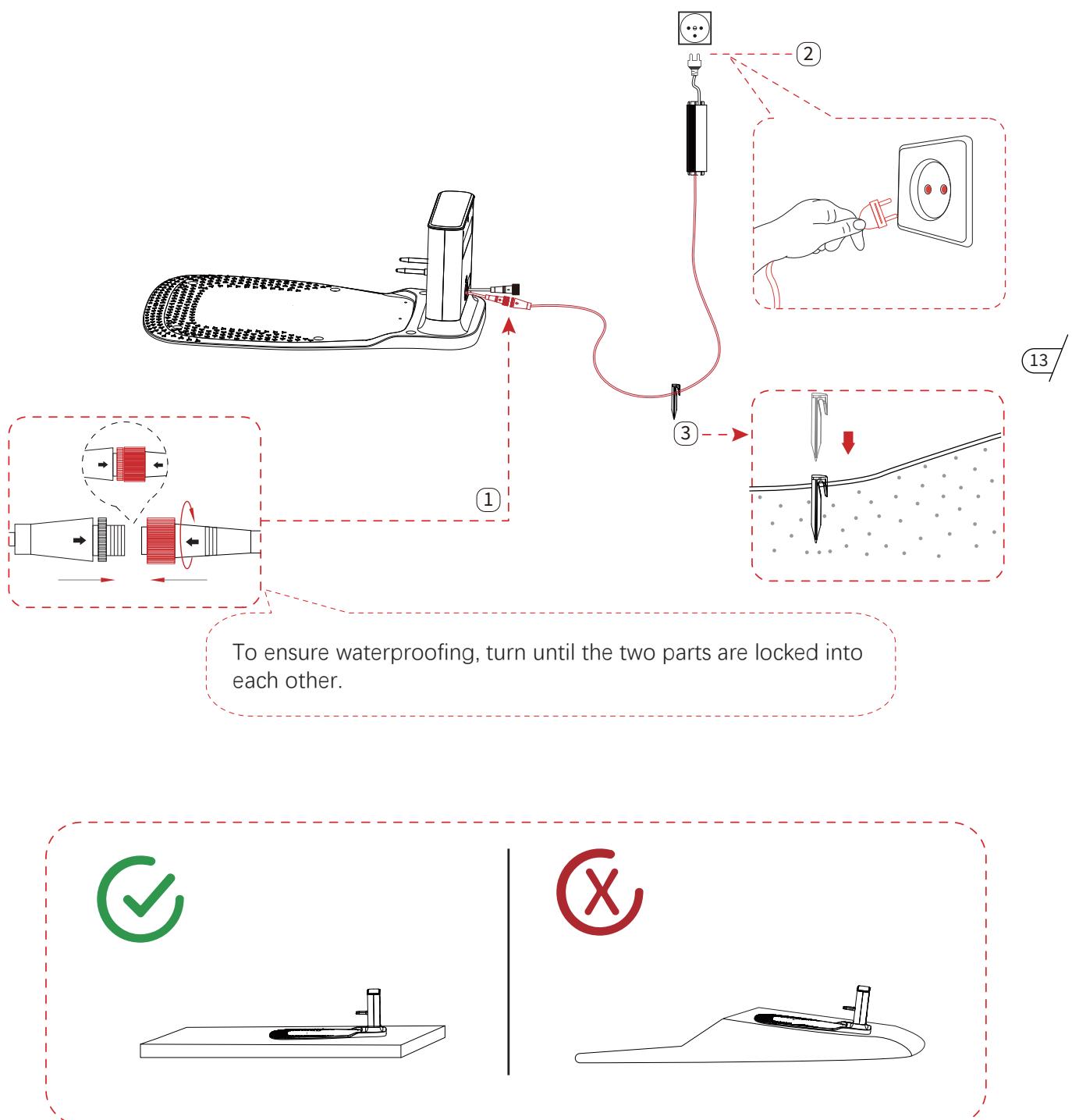
- Choose an open area with no trees or buildings that may obstruct the satellite signals.
- Place the charging station on a flat ground.
- Maintain a distance of at least 2 meters between the charging station and any trees or buildings.
- Position the charging station to face the lawn.
- Avoid placing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



### 3.4 Install

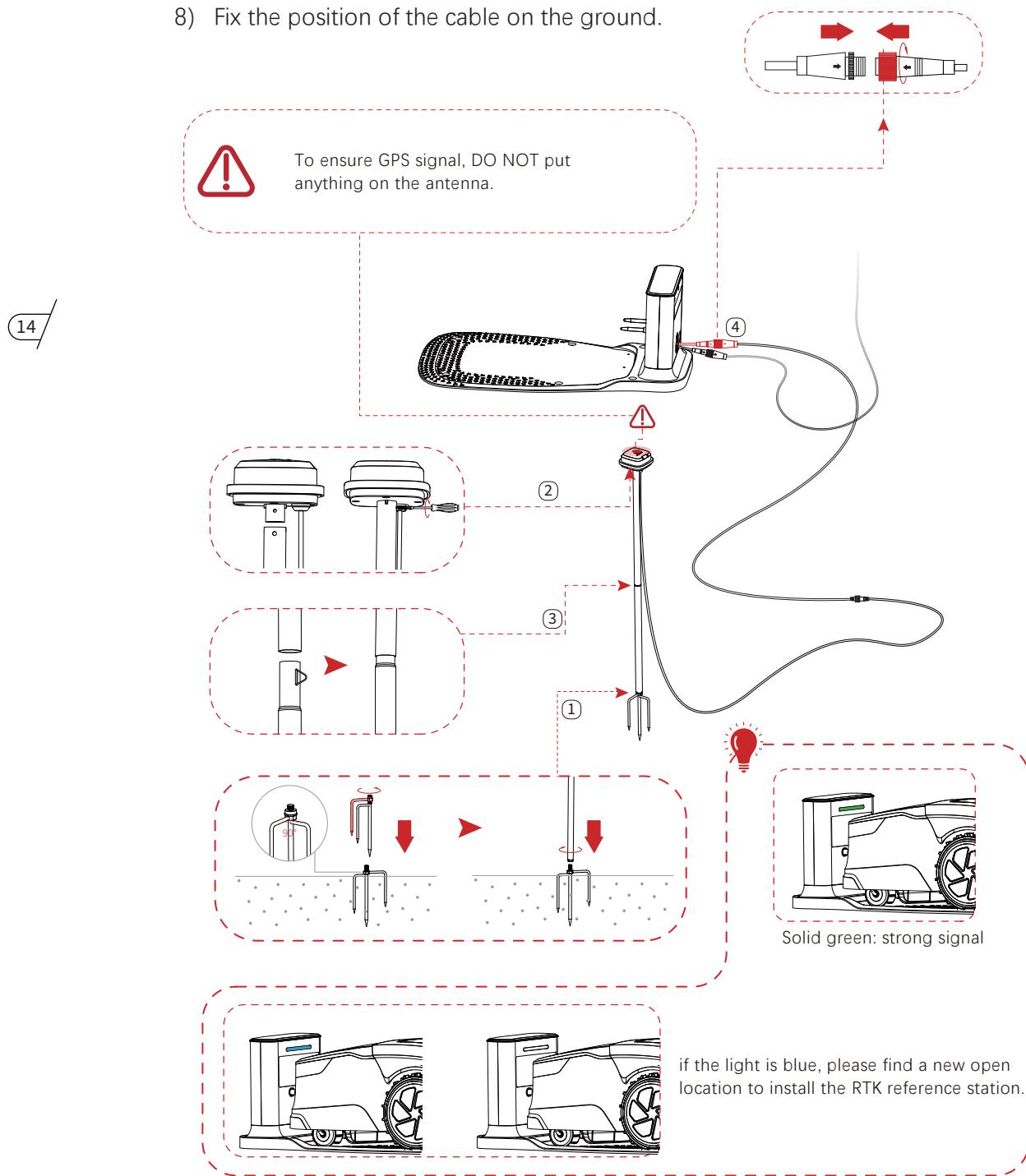
#### 3.4.1 Install the Charging Station

- 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.



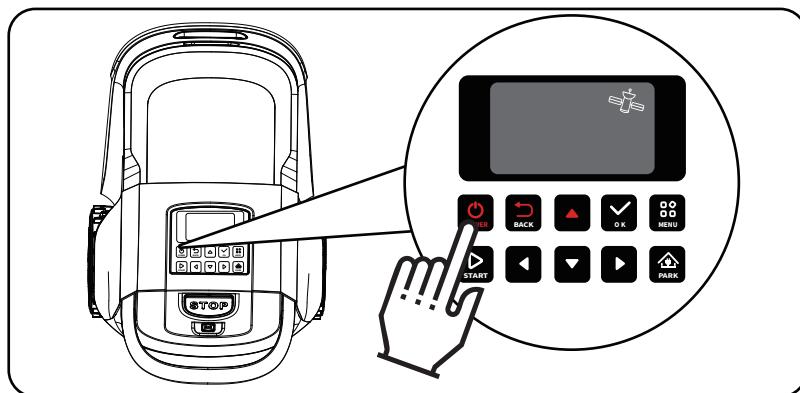
### 3.4.2 Install the RTK Reference Station

- 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.



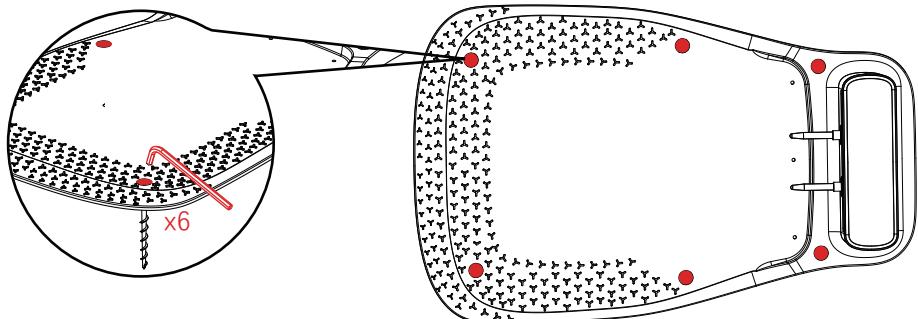
### 3.4.3 Charge and Activate the Mower

- 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.

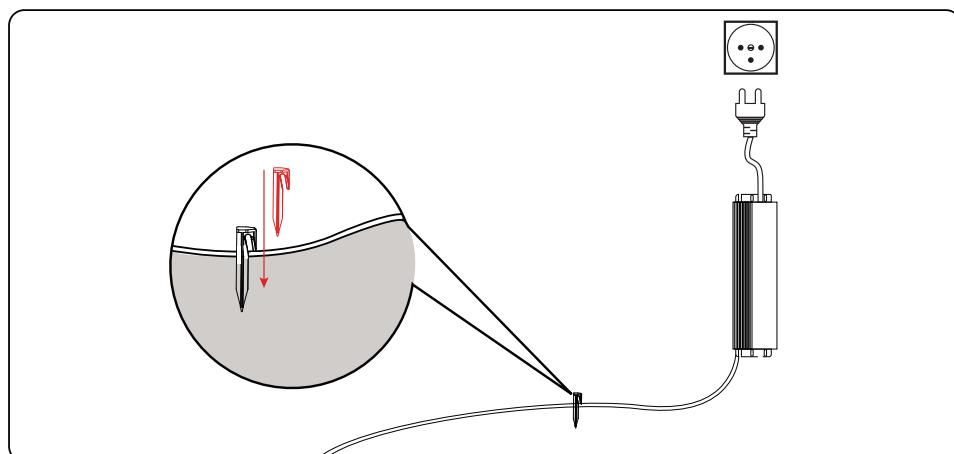


### 3.4.4 Secure the Location of Charging Station

- 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

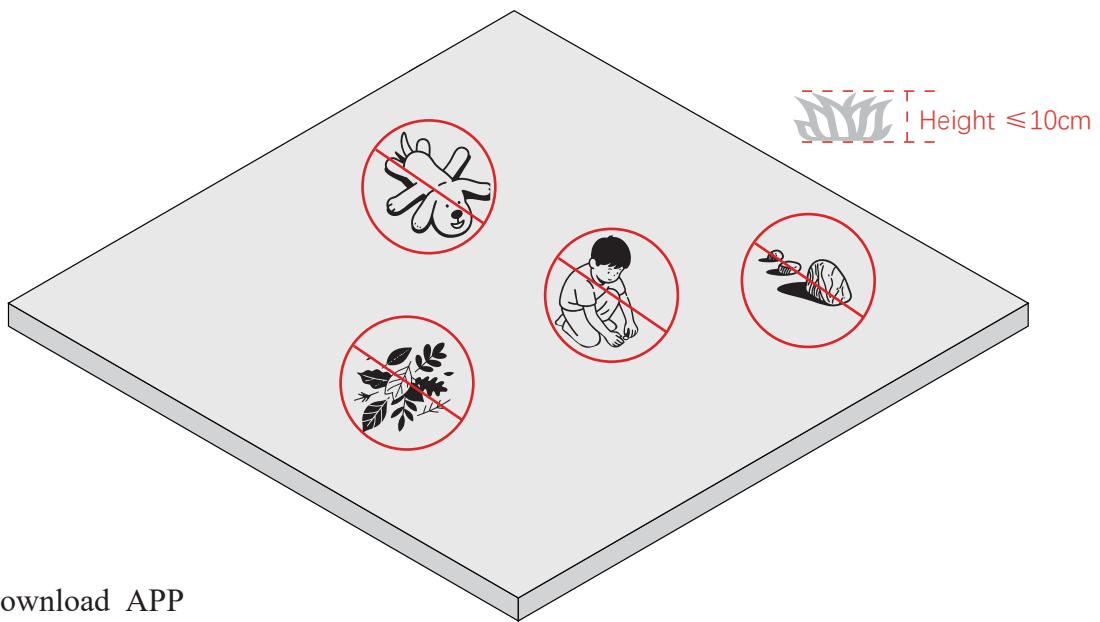
### 4.1 Preparation

- 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.

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### 4.3 Download APP

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



App Store



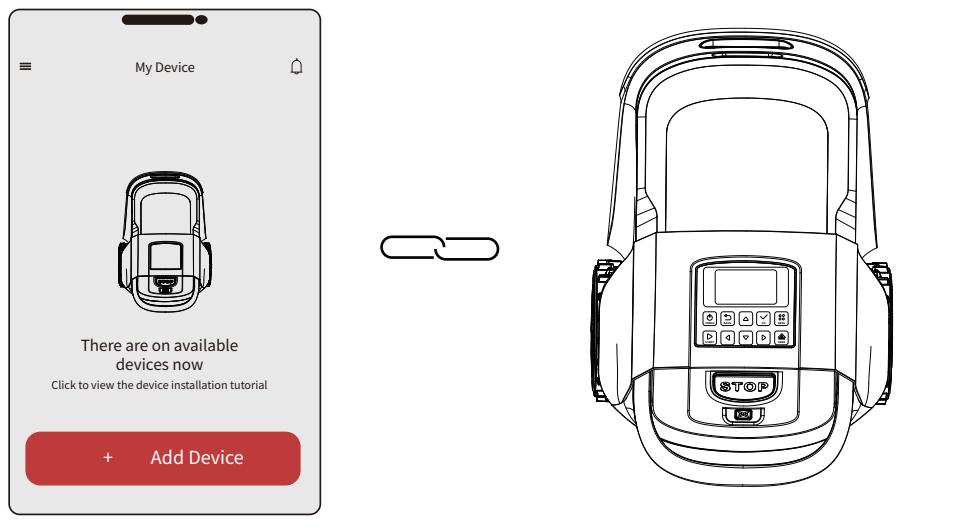
Google Play

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.

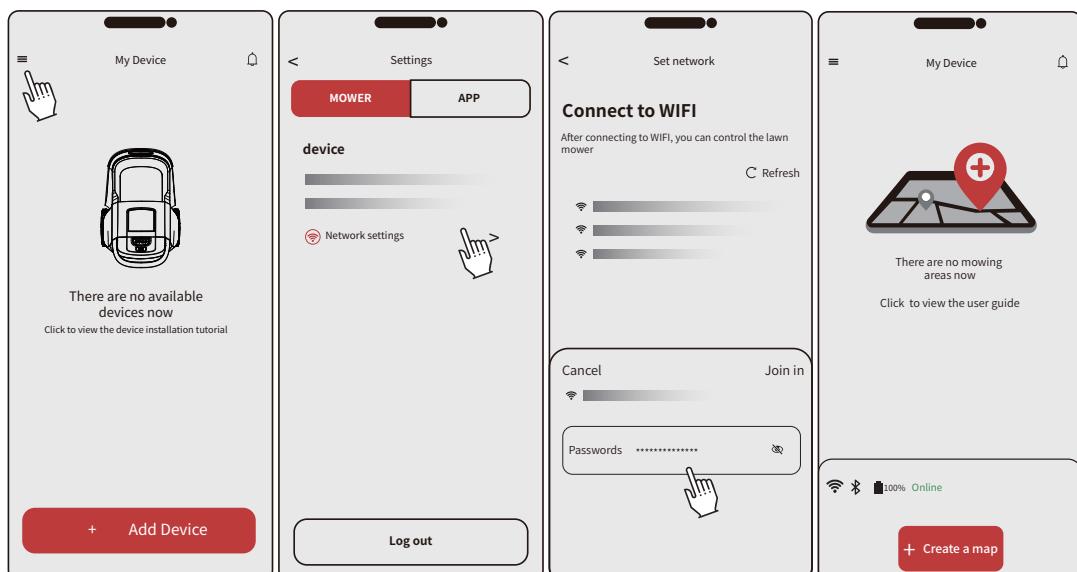


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#### 4.5 Setup Wi-Fi

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.

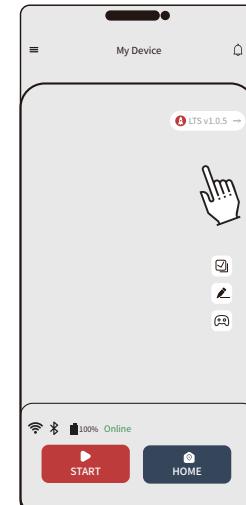
- 1) Go to **Settings > MOWER > Device management** to find your device.
- 2) Tap ":" to show popup menu.
- 3) Tap Activate 4G to activate your 4G card.



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## 4.7 Update Firmware

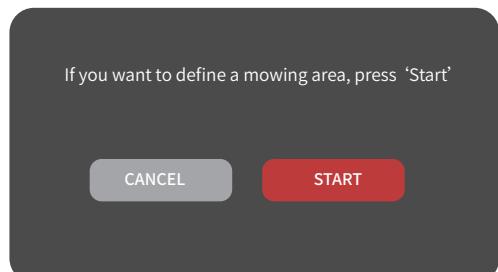
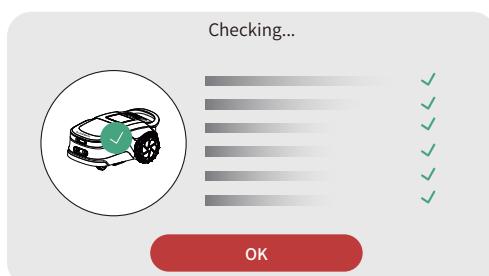
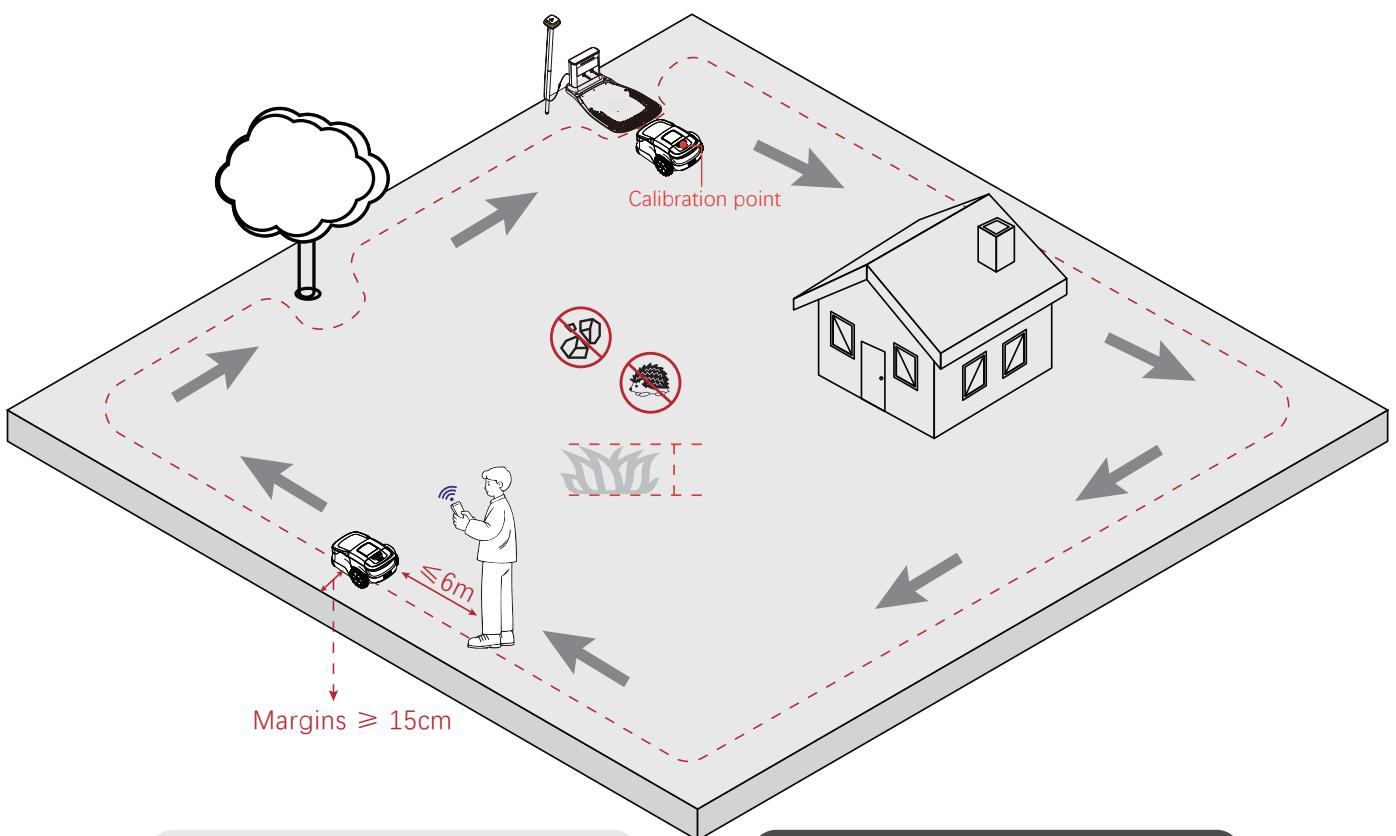
For best experience, please update to the latest firmware. During the update, you can not power off or perform other operations. The mower will reboot if the update is successful.



## 4.8 Create a Map

### 4.8.1 Map out the Task Area

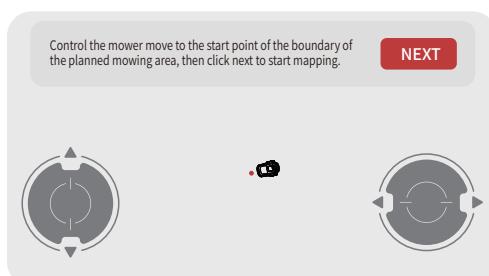
- 1) Push the mower into the charging station.
- 2) Keep within 6 m from the mower during the mapping process to maintain a stable Bluetooth connection and for safety.
- 3) If the height difference is more than 4cm, please keep the mower at least 15cm from the edge of the lawn.
- 4) Select "+ Create 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.



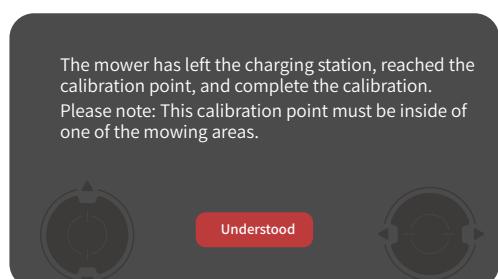
01 Confirm that the connection between the mobile app and the lawn mower is complete.



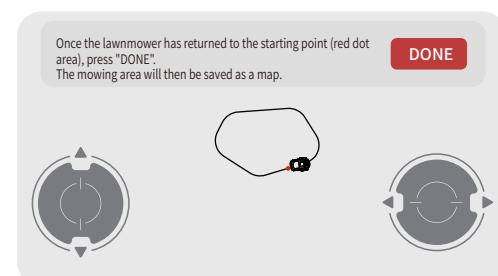
03 The lawn mower will slowly move away from the charging station.



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



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



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.

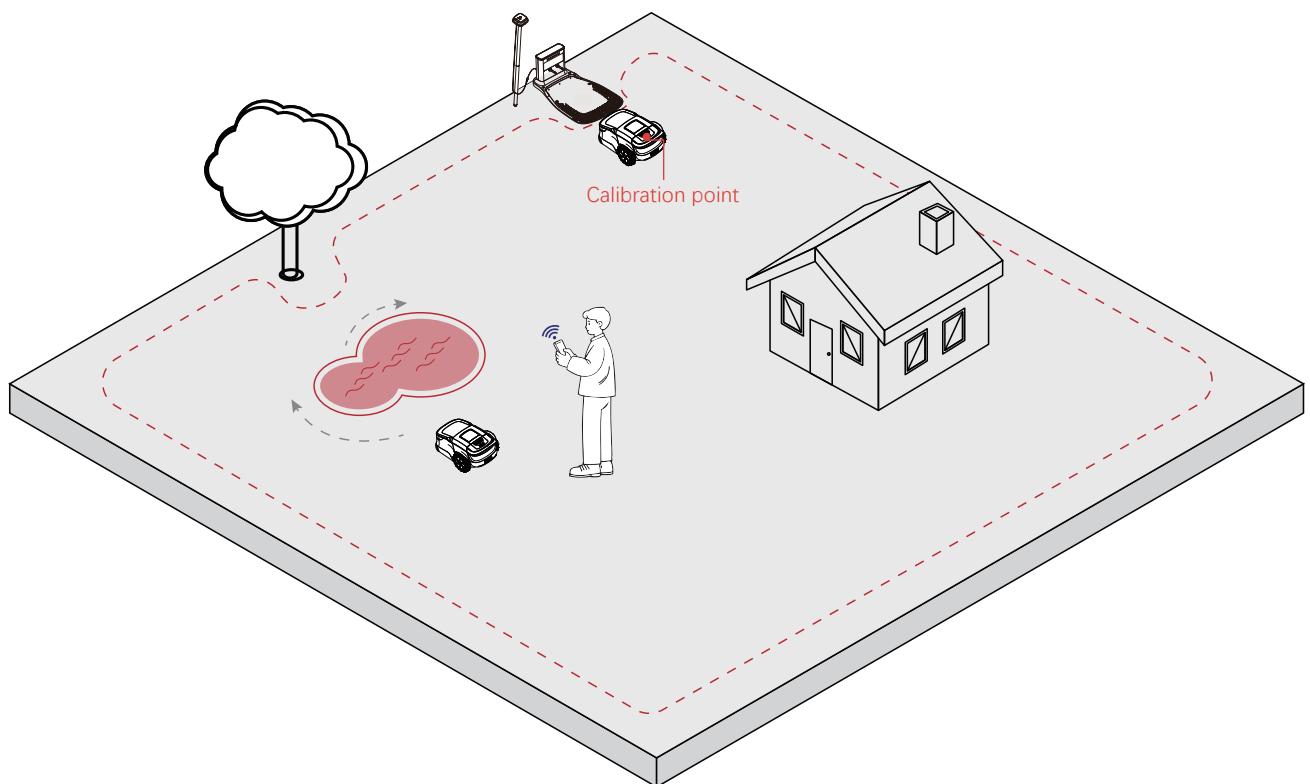
For the efficiency of mowing, we recommend that fixed objects with a diameter of more than 2 meters be map as protected areas.

- 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.

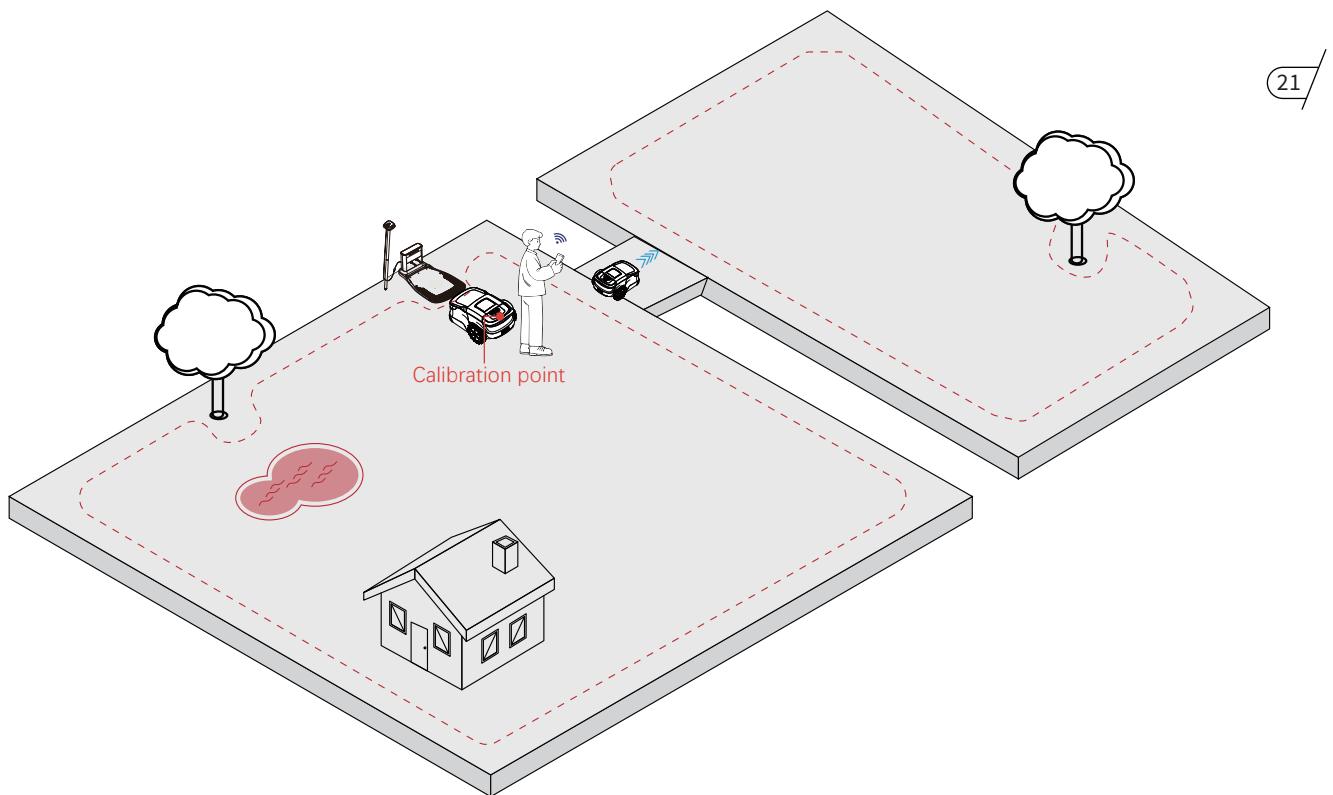
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#### 4.8.3 Map out a Passage

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.

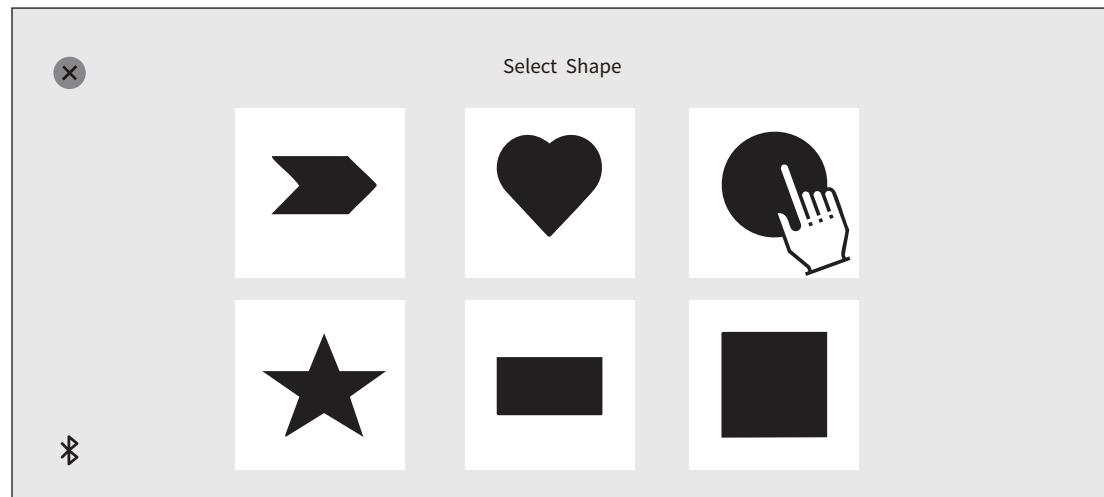
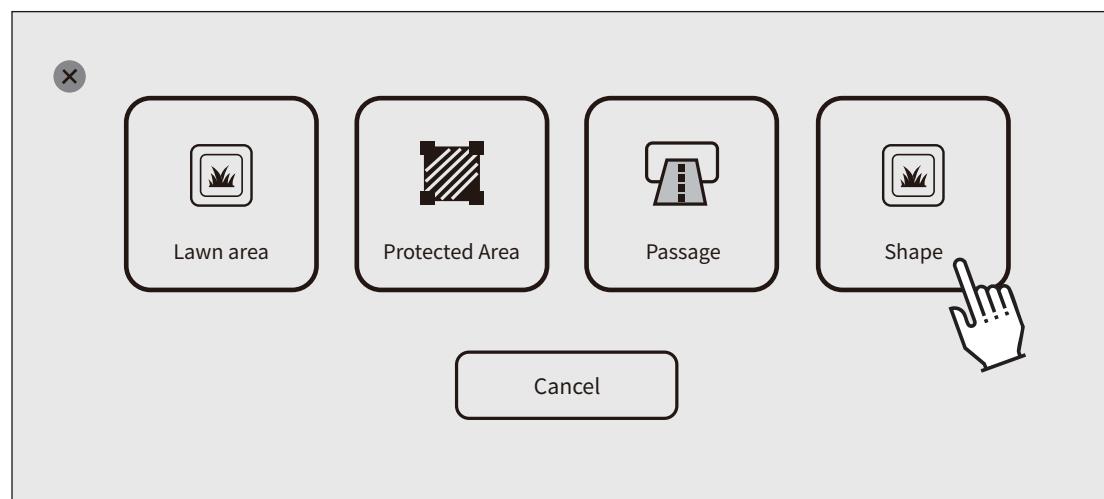
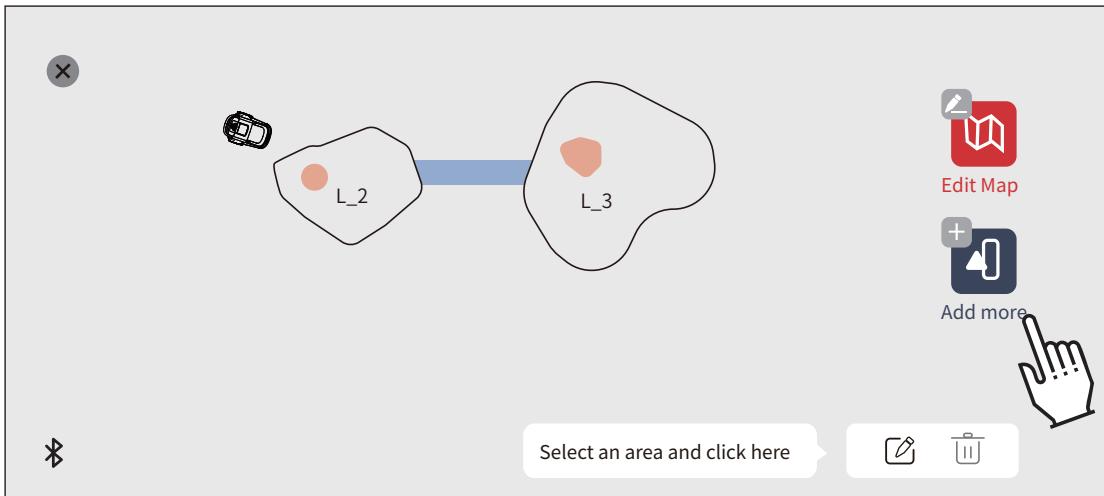
Tap **Add more > Passage** on the Map management page.



#### 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.

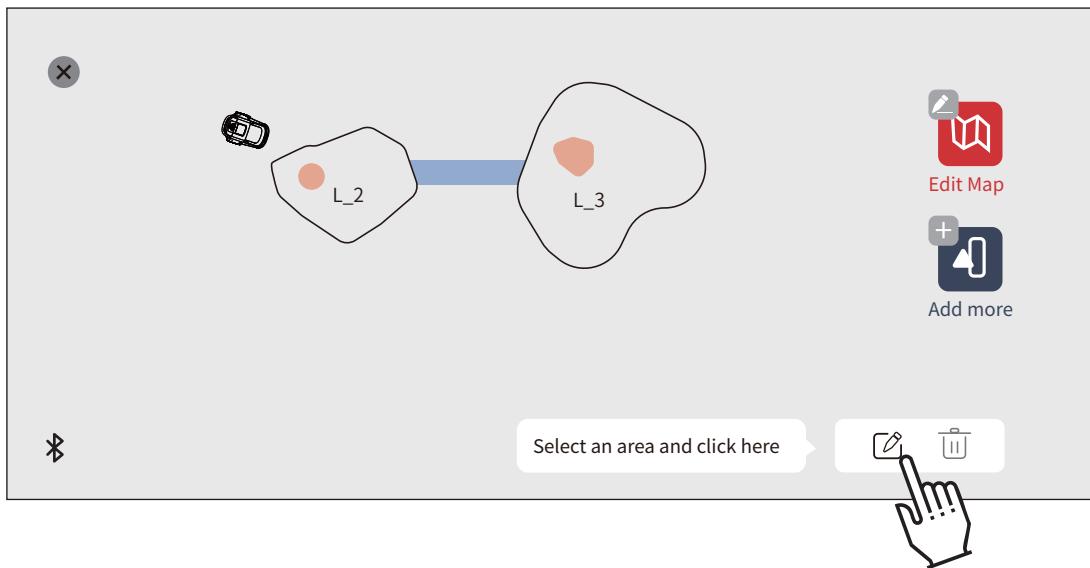
Tap **Add more > Shape** on the Map management page.



## 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.

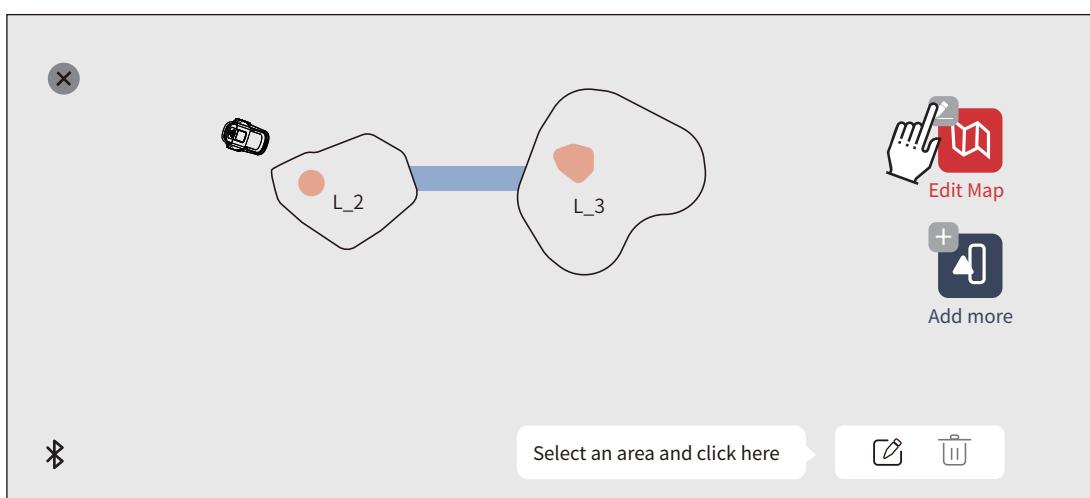


(23)

### 4.9.2 Modify the Task Area

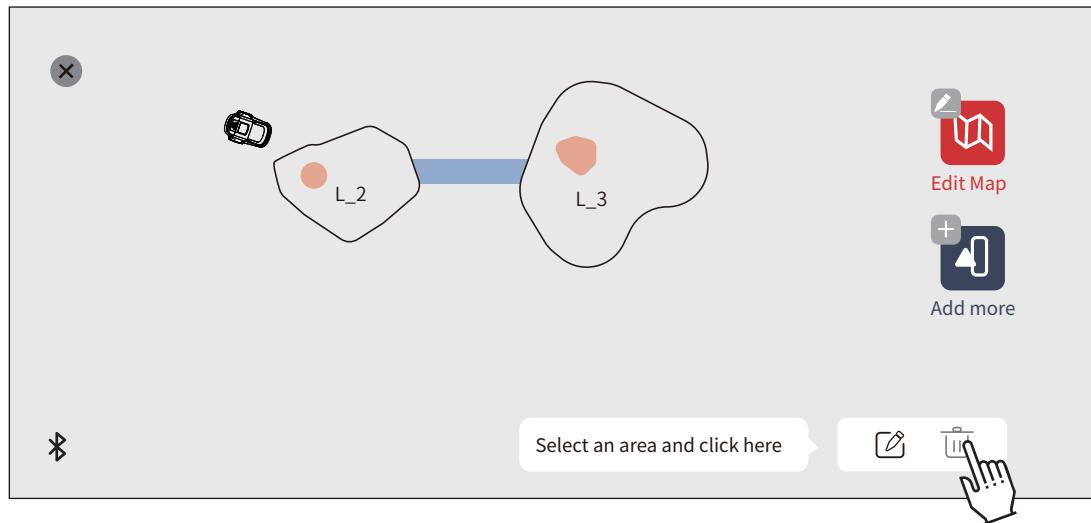
If post-mapping modifications occur in your lawn, such as new perimeter plantings, soil depressions, or unstable RTK signal, you can modify the task area without requiring to delete it entirely.

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

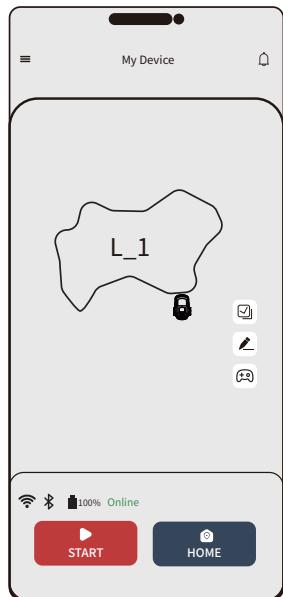
To delete a task area, protected area, passage, shape, select the element, then tap “” to delete.



## 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**.

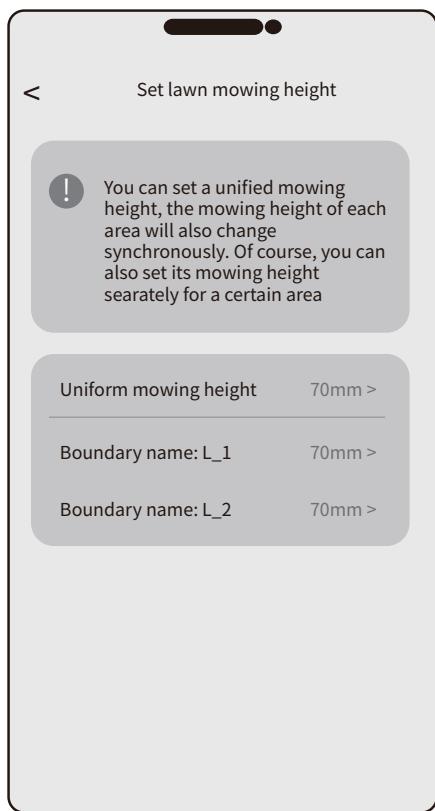


On the mower, you can tap **START > OK** to mow all task areas.

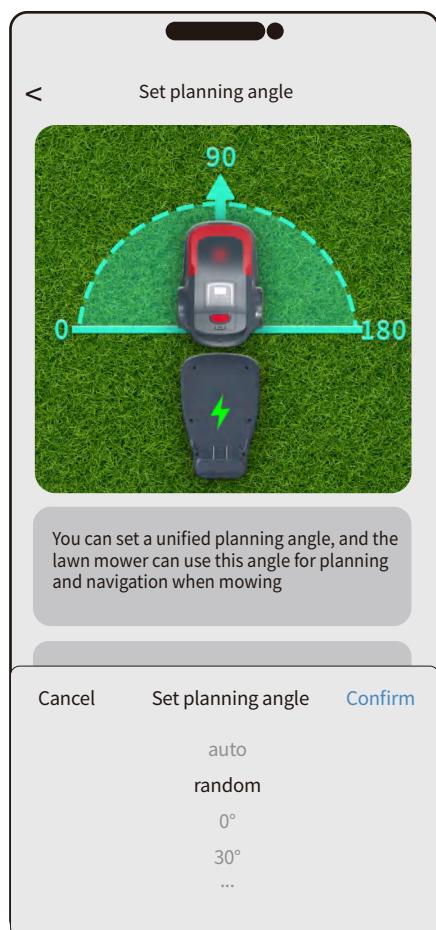


#### 4.10.2 Task settings

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

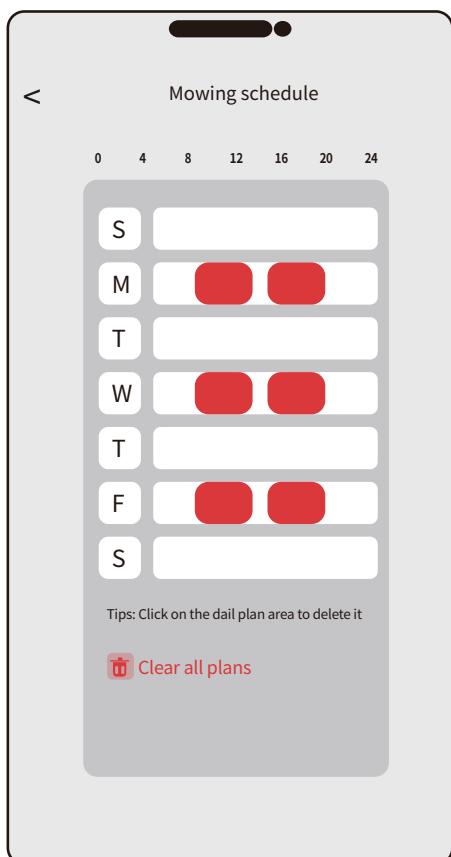


You can set the mowing direction via the APP.



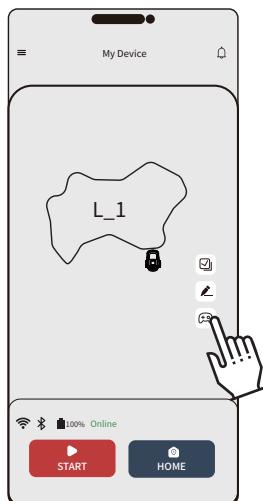
#### 4.11 Task Schedule

- 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.

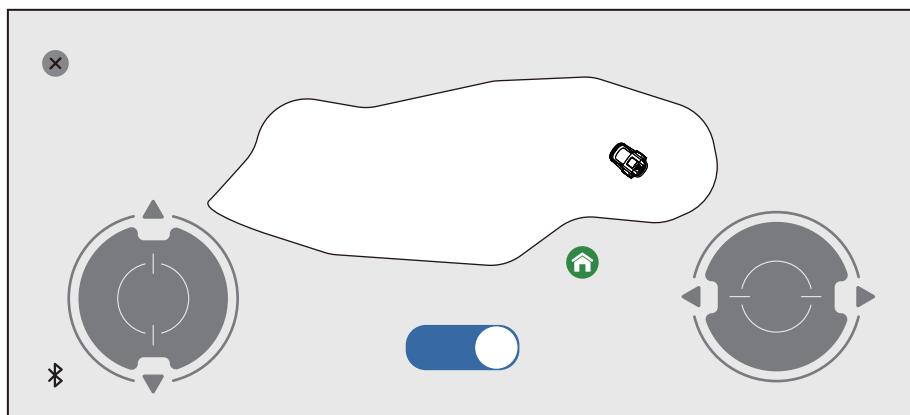


#### 4.12 Manual Mowing

- 1) Select manual Mow from the home page



- 2) Control the mower to the place you want to start manual mowing, tap the icon to start the cutting disc.

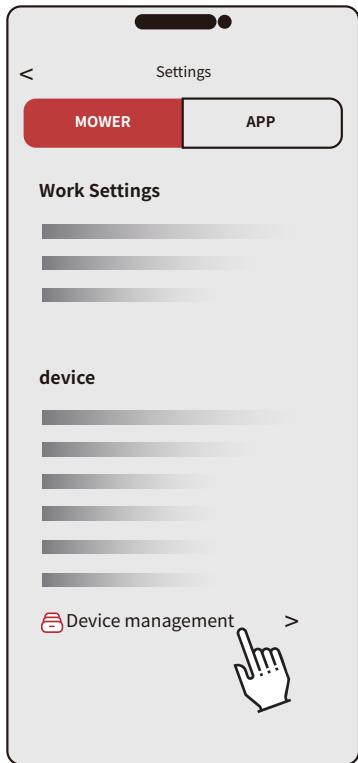


- 4) Maneuver forwards/backward or turn left/right to start manual mowing. If you stop maneuver, the cutting disc will turn off for safety, you can tap again to turn on the cutting disc.

#### 4.13 Share Your Device

Sharing your device permits the recipient to manage settings and access device information.

- 1) Go to Settings and tap **Device management**.

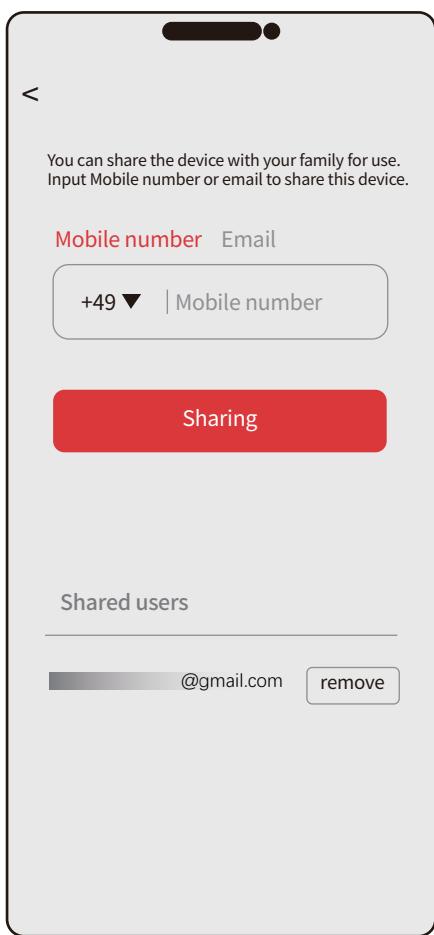


29

- 2) Select one of your own devices to share, tap ":" select **Device sharing management**.

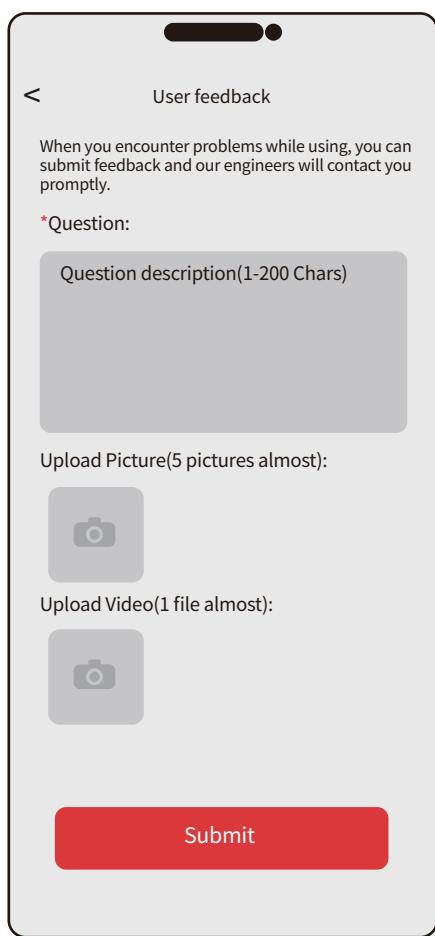


3) Enter the account you want to share.



#### 4.14 User feedback

Contact us for support.



## 5 Maintenance

To achieve optimal mowing results and extend the service life, we recommend:

- 1) Weekly system checks focusing on blade integrity and debris removal.
- 2) Prompt replacement of compromised components.
- 3) Mandatory use of protective apparel (trousers + work shoes) during maintenance.
- 4) Complete avoidance of open-toed footwear during maintenance.

### 5.1 Cleaning

Warning:

- Before cleaning, ensure the mower is powered off.
- Always power off the mower before turning it upside down.

#### 5.1.1 Camera

Use a soft cloth to remove any stains on the camera lens. A clean sight is crucial for the camera to work normally, check camera weekly.

#### 5.1.2 Housing

Use a soft brush or cloth to clean the housing of the mower. Avoid using alcohol, gasoline, acetone, or other corrosive or volatile solvents, they may damage the appearance and internal components of the mower.

#### 5.1.3 Wheels

Regularly clean the wheels with a brush or water hose, keep wheels clean to ensure strong grip.

#### 5.1.4 Blade Disc

Mandatory wear protective gloves while cleaning the blade disc, use a brush or water hose to clean. Check the damage of blades, and ensure the blades and cutting disc rotate freely.

#### 5.1.5 Charging port

Check if grass clippings, dirt, or other objects are stuck inside the charging station, clean them in time.

#### 5.1.6 Rain Sensor

Check rain sensor weekly, ensure it is not covered by mud, grass or other objects.

#### 5.1.7 Charging Station

Use a brush or cloth to clean the charging pin.

#### 5.1.8 RTK Reference Station

Use a brush or cloth to clean any dirt on the RTK reference station.

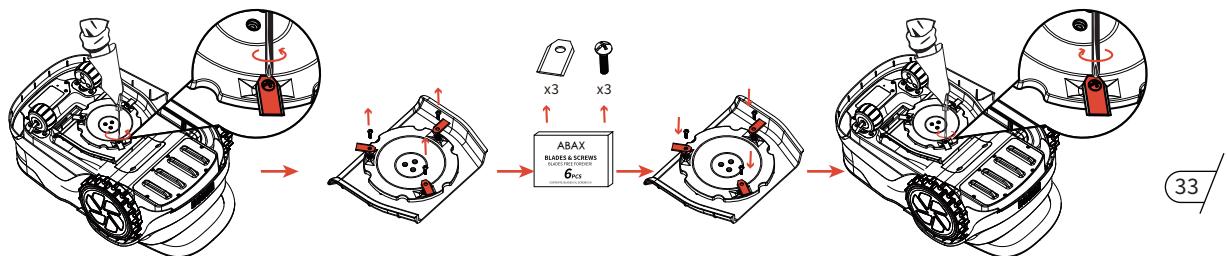
## 5.2 Replacing Blades

### Warning

- Mandatory power off the mower before operation.
- Mandatory wear protective gloves when replacing the blades.
- Do not use an electrical screwdriver to install or loosen the blade.
- Use only the blades manufactured by A B A X and new screws when assembling the blades.

### Steps to Replace the Blades

- 1) Power off the mower.
- 2) Gently turn the mower upside down on a soft surface.
- 3) Loosen the screws with a screwdriver.
- 4) Remove the screws and the blades.
- 5) Tighten the new blades with the new screws.
- 6) Make sure that the blades can spin freely.

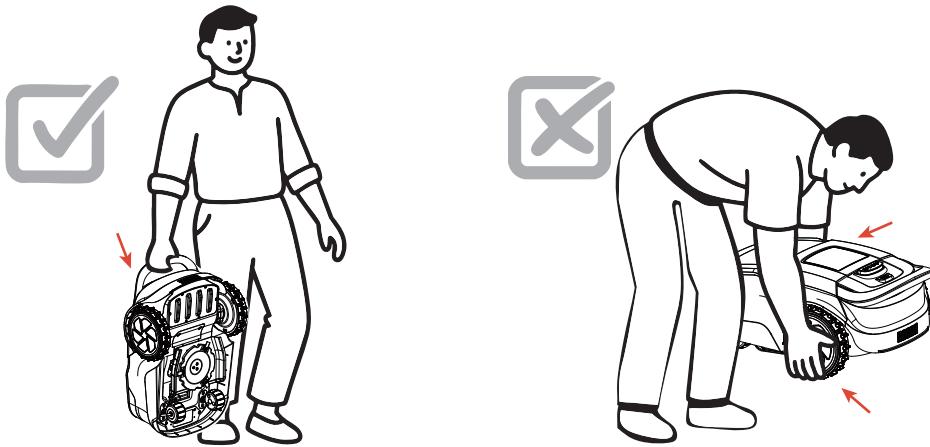


## 5.3 Battery Maintenance

- Maintain the battery fully charged before storage to avoid over-discharge.
- Power off the mower before storage long-term.
- Charge the battery fully every 120 days, even if it is not in use.

## 5.4 Transportation

- For optimal protection during long-distance transportation, always use the original packaging.
- Power off the mower before lifting, moving, or transporting the mower.
- Carry the mower by the big handle, position the blade disc to face outward, opposite your torso and limbs.



## 5.5 Winter Storage

To ensure the product is in optimal performance and extend its lifespan, store the mower, charging station, and RTK reference station properly during winter.

Please mark the location of charging station, if you don't install the charging station at same place of next spring, you must delete the old map and remap your lawn.

### 5.5.1 Store the Mower

- Fully charge the mower.
- Power off the mower.
- Clean the mower.
- Store the mower in a cool and dry place indoor.

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### 5.5.2 Store the Charging Station

- Disconnect the power supply and RTK reference station.
- Unscrew the ground screws off the charging station.
- Clean the charging station.
- Store the mower in a cool and dry place indoor.

### 5.5.3 Store the RTK Reference Station

- Disconnect the cable of RTK reference station.
- Remove the RTK reference station mounting pole from the base fork.
- Clean the RTK reference station.
- Store the RTK reference station in a cool and dry place indoor.

## 5.6 Spring Reinstall

- Reinstall the RTK reference station.
- Reinstall the charging station.
- If you don't install the charging station at same place, you must delete the old map and remap your lawn.

## 6 Troubleshooting

Fault Codes	Causes	Solutions
0x10	Power on self-test failed	Shut down and restart the robot
0x11	Overcharged battery pack	Shut down robot. Take it to the after-sales store for repair or replacement.
0x12	Over-discharge battery pack	The battery has automatically stopped discharging. Shut down and restart the robot.
0x13	Battery pack overload	The battery has automatically stopped discharging. Shut down and restart the robot.
0x14	Battery pack undervoltage	The battery has automatically stopped discharging. Shut down and restart the robot.
0x15	Battery charge overheat protection	The battery has automatically stopped charging. It will resume charging when the temperature drops.
0x16	Battery discharge overheat protection	The battery has automatically stopped discharging. It will resume charging when the temperature drops.
0x17	Battery pack Internal communication abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x21	Battery pack external communication abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x22	Left/right walking, mowing/height adjustment motor controller undervoltage	The robot stops for self-protection and recovers after 2 seconds
0x23	Left/right walking, mowing/raising motor controller overvoltage	The robot stops for self-protection and recovers after 2 seconds
0x30	Power on self-test failed	Shut down and restart the robot.
0x31	Left walking motor controller overcurrent	The robot stops for self-protection and recovers after 2 seconds
0x32	Left walking motor controller short circuit	Shut down robot. Take it to the after-sales store for repair or replacement.
0x33	Left walking motor controller is locked	The robot stops for self-protection and recovers after 2 seconds
0x34	Left walking motor controller MOS temperature too high protection	The robot stops for self-protection and recovers after 30 seconds
0x35	Left walking motor controller MOS abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x36	Left walking motor controller Hall abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x37	Left walking motor controller phase loss	Shut down robot. Take it to the after-sales store for repair or replacement.
0x38	Left walking motor controller communication abnormality	Shut down and restart the robot.

0x39	Left walking controller bias abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x3A	Left walking controller IPD position abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x3B	Left walking controller out of step abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x3C	Left walking controller other abnormalities	Shut down robot. Take it to the after-sales store for repair or replacement.
0x40	Power on self-test failed	Shut down and restart the robot.
0x41	Right walking motor controller overcurrent	The robot stops for self-protection and recovers after 2 seconds
0x42	Right walking motor controller short circuit	Shut down robot. Take it to the after-sales store for repair or replacement.
0x43	Right walking motor controller is locked	The robot stops for self-protection and recovers after 2 seconds
0x44	Right walking motor controller MOS temperature too high protection	The robot stops for self-protection and recovers after 30 seconds
0x45	Right walking motor controller MOS abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x46	Right walking motor controller hall abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x47	Right walking motor controller phase loss	Shut down robot. Take it to the after-sales store for repair or replacement.
0x48	Right walking motor controller communication abnormality	Shut down and restart the robot.
0x49	Right walking controller bias abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x4A	Right walking controller IPD position abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x4B	Right walking controller out of step abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x4C	Right walking controller other abnormalities	Shut down robot. Take it to the after-sales store for repair or replacement.
0x50	Power on self-test failed	Shut down and restart the robot.
0x51	Mowing motor controller overcurrent	The robot stops for self-protection and recovers after 2 seconds
0x52	Mowing motor controller short circuit	Shut down robot. Take it to the after-sales store for repair or replacement.
0x53	Mowing motor controller is locked	The robot stops for self-protection and recovers after 2 seconds
0x54	Mowing motor controller MOS temperature too high protection	The robot stops for self-protection and recovers after 30 seconds
0x55	Mowing motor controller MOS abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.

0x57	Mowing motor controller phase loss	Shut down robot. Take it to the after-sales store for repair or replacement.
0x58	Mowing/Lift motor controller communication abnormality	Shut down and restart the robot.
0x59	Mowing/Lift motor controller bias abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x5A	Mowing/Lift motor controller IPD position abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x5B	Mowing/Lift motor controller out of step abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x5C	Mowing/Lift motor controller other abnormalities	Shut down robot. Take it to the after-sales store for repair or replacement.
0x61	Lift motor controller overcurrent	The robot stops for self-protection and recovers after 2 seconds
0x62	Lift motor controller short circuit	Shut down robot. Take it to the after-sales store for repair or replacement.
0x63	Lift motor controller is locked	The robot stops for self-protection and recovers after 2 seconds
0x64	Lift motor controller MOS temperature too high protection	The robot stops for self-protection and recovers after 30 seconds
0x65	Lift motor controller MOS abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x66	Lift motor controller hall abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x67	Lift motor controller phase loss	Shut down robot. Take it to the after-sales store for repair or replacement.
0x68	Lift motor controller communication abnormality	Shut down and restart the robot.
0x69	Lift motor controller bias abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x6A	Lift motor controller IPD position abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x6B	Lift motor controller out of step abnormality	Shut down robot. Take it to the after-sales store for repair or replacement.
0x6C	Lift motor controller other abnormalities	Shut down robot. Take it to the after-sales store for repair or replacement.
0x80	Lift Up	Press OK + Start to restart.
0x81	Collision	Press OK + Start to restart.
0x82	Tilted	Press OK + Start to restart.
0x83	Upside Down	Press OK + Start to restart.
0x90	Trapped	Press OK + Start to restart.
0x91	Task timeout	Shut down and restart the robot.
0x92	RTK malfunction	Press STOP. Shut down and restart the robot.

0x93	Visual sensor malfunction	Press STOP. Shut down and restart the robot.
0x94	Self-test failed	Shut down and restart the robot.
0x95	Insufficient Light	Shut down and return to the charging-station.
0x96	Outside Boundary	The robot has stopped. Shut down and restart the robot.
0x97	Upper computer and HMI communication malfunction	Shut down and restart the robot.
0x98	Out of operational area	Press STOP. Shut down and restart the robot.
0xb0	Control software malfunction	Press STOP. Shut down and restart the robot.
0xc0	A software malfunction	Press STOP. Shut down and restart the robot.
0xa1	Power on self-test failed	Press STOP. Shut down and restart the robot.
0xa2	Driver software and upper computer communication abnormality	Press STOP. Shut down and restart the robot.
0xa3	Driver software and Lower computer communication abnormality	Press STOP. Shut down and restart the robot.

## 7 Technical Data

Specifications	ABAX S1 Pro	ABAX S1 Ultra
<b>Recommended Mowing Area</b>	1000m <sup>2</sup>	1600m <sup>2</sup>
<b>Mowing Area Per Hour</b>	100 - 150m <sup>2</sup>	
<b>Positioning System</b>	RTK + 3D Vision	
<b>Obstacle Avoidance</b>	3D AI Vision	
<b>Cutting Width</b>	21 cm	
<b>Cutting Height</b>	30-70 mm	
<b>Cutting Height Adjustment</b>	APP	
<b>Battery</b>	10 Ah	15 Ah
<b>Working Voltage</b>	21.6 V DC	
<b>Mowing Time per Charge</b>	180 min	270 min
<b>Charging Time</b>	120 min	180 min
<b>Max. Slope</b>	45%	
<b>Noise</b>	<60 dB(A)	
<b>Waterproof</b>	IPX6	
<b>Net Weight</b>	12.5 kg	13 kg
<b>IoT Connectivity</b>	Bluetooth & Wi-Fi	Bluetooth & Wi-Fi & 4G
<b>Virtual Boundary</b>	●	
<b>Systematic Mowing Pattern</b>	●	
<b>Pause &amp; Resume</b>	●	
<b>Automatic Charging</b>	●	
<b>APP Control</b>	●	
<b>Multi-zone Management</b>	●	
<b>Rain Detection</b>	●	
<b>OTA Updates</b>	●	
<b>Battery Charger</b>	Input: 100-240Vac Output: 26Vdc, 3A, 78.9W	
<b>Robotic Mower Dimensions</b>	655 × 447 ×285 mm	
<b>Charging Station Dimensions</b>	780 × 494 ×291 mm	

## 8 Warranty

Ningbo ABAX Sensing Electronic Technology Co., Ltd. strives to deliver exceptional service to customers. ABAX warrants that the product will be free from material and workmanship defects under normal use in accordance with the product materials published by ABAX during the warranty period.

- If the product does not work as warranted during the warranty period, please contact the dealer for customer service.
- Users must present a valid proof of purchase, receipt, or invoice.
- The warranty period for the product starts from the original date of purchase indicated on the sales receipt or invoice.
- Lifetime-long Blades Free-of-Charge: The product is for personal user. Requested once a year, and the product has been used.

Warranty period:

Main Body	3 Years
RTK Reference Station	
Charging Station	
Battery	
Power Supply	
Blades	Lifetime-long Blades Free-of-Charge
Other Accessories	No Warranty

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**Meet but not limited to the following conditions, you can apply for free warranty service:**

- The product is within the warranty period.
- The product only be used in compliance with the instructions in this user manual.
- The product has no signs of man-made or external of damage.

**Meet but not limited to the following conditions, Lantuo reserves the right to refuse a free warranty:**

- Misuse or non-compliance with the user manual.
- The failure is caused by accident, abuse, misuse, flood, fire, earthquake, food or liquid spills, incorrect electrical charge, or other external causes.
- The damage is caused by operating the product outside the permitted or intended uses described by Lantuo.
- The product or part that has been modified to significantly alter functionality or capability without the written permission of Lantuo.
- Defects caused by normal wear or aging.

## 9 Compliance

### 9.1 EC Declaration of Conformity

Manufacturer Name: Ningbo ABAX Sensing Electronic Technology Co., Ltd.

Address: TusPark (Room102, Building #11), Jiangkou Street, Fenghua District, Ningbo City, Zhejiang Province, P.R.China

Object of the declaration

Description: Intelligent Lawan

Mower Brand: ABAX

Models: S1 Pro; S1 Ultra

The object of the declaration is comply with the following EU Directives:

Directive	Description
2006/42/EC	Relating to machinery
2014/53/EU	Relating to radio equipment

Conformity with EU Directives has been assessed for the product by demonstrating compliance to following standards and/or technical specifications:

EN 60335-1:2012/A15:2021	EN 301 489-1 V2.2.3:2019
EN 50636-2-107:2015/A3:2021	EN 301 489-3 V2.3.2:2023
EN IEC 55014-1:2021	EN 301 489-17 V3.3.1:2024
EN IEC 55014-2:2021	EN 301 489-19 V2.2.1:2022
EN IEC 61000-3-2:2019/A1:2021	EN 301 489-52 V1.2.1:2021
EN 61000-3-3:2013/A2:2021	EN 300 328 V2.2.2:2019
EN 62311:2008	EN 300 220-2 V3.1.1:2017
EN 50665:2017	EN 303 413 V1.2.1:2021
EN 62479:2010	EN 301 908-1 V15.2.1:2023
EN 50663:2017	EN 301 908-13 V13.2.1:2022
EN 62233:2008	

Signed for and on behalf of: Ningbo ABAX Sensing Electronic Technology Co., Ltd.

Signed: Andy Liu

Date: April 15, 2025

Position: General Manager

# EG-Konformitätserklärung

## EC Declaration of Conformity

Hiermit erklären wir,  
We herewith declare,

Ningbo ABAX Sensing Electronic Technology Co., Ltd.  
TusPark (Room102, Building #11), Jiangkou Street, Fenghua District,  
Ningbo City, Zhejiang Province, P.R.China

daß die nachfolgend bezeichnete Maschine aufgrund ihrer Konzipierung und Bauart sowie in der von uns in Verkehr gebrachten Ausführung den einschlägigen grundlegenden Sicherheits- und Gesundheitsanforderungen der EG-Richtlinien entspricht.

that the following machine complies with the appropriate basic safety and health requirements of the EC Directive based on its design and type, as brought into circulation by us.

Bei einer nicht mit uns abgestimmten Änderung der Maschine verliert diese Erklärung ihre Gültigkeit.

In case of alteration of the machine, not agreed upon by us, this declaration will lose its validity

**Bezeichnung der Maschine:** Battery-powered robotic mower for household use only.  
*Machine Description:*

**Maschinentyp:** S1 Pro; S1 Ultra  
*Machine Type:*

**Handelsmarke:** N/A  
*Trade name*

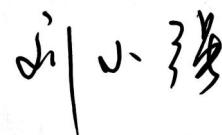
**Maschinen-Nr.:** N/A  
*Serial Number*

**Die Maschine erfüllt die  
EG-Richtlinien:** EU Directive EMC: 2014/30/EU  
*The machinery fulfils these EC  
Directives:* EU Directive Machinery Directive: 2006/42/EC  
EU Directive WEEE: 2012/19/EC  
EU Directive RoHS directive: 2011/65/EU

**Angewandte harmonisierte  
Normen:** EN 60335-1:2012/A15:2021  
*Applicable Harmonized Standards:* EN 50636-2-107:2015/A3:2021  
EN 62233:2008

**Herstellerunterschrift/ Platz  
/Datum:** ..... Ningbo CHINA 2025-02-25.....  
*Authorized Signature/Place/Date:*

**Angaben zum Unterzeichner:** .....  
*Title of Signatory:*



**Name und Anschrift der Person,  
die Erstellung der technischen  
Unterlagen** Ningbo CHINA 2025-02-25  
*Name and address of the person  
compiling the technical file:*

## Declaration Letter

We, Ningbo ABAX Sensing Electronic Technology Co., Ltd.

TusPark (Room102, Building #11), Jiangkou Street, Fenghua District,  
Ningbo City, Zhejiang Province, P.R.China

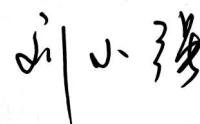
Herewith declare that the user manual/instruction for below product,

Product: Intelligent Lawn Mower

Product model no.:  
S1 Pro; S1 Ultra

The user manual/instruction shall also be available in an alternative format like below:

- Website
- Repair/Maintenance centre
- Sales centre (supermarket, vendor place etc.)
- Others, pls. specify \_\_\_\_\_



Seal and signature:



TÜV SÜD Certification and Testing (China) Co., Ltd.– Floor 1-4, Building B, No.37, Tuanjie Road(Middle), Xishan Economic and Technological Development Zone, Wuxi, Jiangsu, China

Competence.  
Certainty.  
Quality.

To: Ningbo ABAX Sensing Electronic Technology Co., Ltd.

Attention: CC:

From: TÜV SÜD Certification and Testing (China) Co., Ltd.

**Message:**

Your Reference	Our Reference./Name	Telephone no./E-Mail	Fax no.	Date	Total Page
	Dingpeng Xia	+86 510 8185 1267 Dingpeng.Xia@tuv sud.com	+86 510 8820 3636	11 July 2025	4

贵公司在我公司测试的以下样品：

The EUT certificated:

样品名(name) : Intelligent Lawn Mower

型号名(model) : S1 Pro, S1 Ultra

依据 Directive 2014/53/EU 要求, 在说明书或者铭牌或者随产品的包装内需加上以下信息:

According to Directive 2014/53/EU, the following information need to be included in the user manual or name plate or packing:

- (a) frequency band(s) in which the radio equipment operates; 产品使用的无线频率范围;
- (b) maximum radio-frequency power transmitted in the frequency band(s) in which the radio equipment operates; 产品在使用的无线范围内的最大发射功率;
- (c) A copy of the DoC or a simplified declaration of conformity has to accompany each radio equipment;  
随产品附带一份完整自我申明或者简易自我申明;

客户声明 (client's declaration) : 按以上执行(execute as above)

签名 (signed) :



## 附录 1：完整自我声明

### Appendix 1: EU Declaration of Conformity

We Ningbo ABAX Sensing Electronic Technology Co., Ltd.  
Address TusPark (Room102, Building #11), Jiangkou Street, Fenghua District,  
Ningbo City, Zhejiang Province, P.R.China  
declare under our sole responsibility that the product

<b>Product Name:</b>	<u>Lawn mowers Intelligent Lawn Mower</u>	
<b>Model name:</b>	<u>S1 Pro, S1 Ultra</u>	
<b>Software:</b>	<u>LTS V1.0.0</u>	
<b>Accessories:</b>	<u>WEC-65WEAD-26300300BA ,</u>	
Rated voltage:		00-240V
Rated frequency:		50/60Hz
Rated current:		1.5A Max
Rated output:		DC26.3V, 3A

comply with the following directives and regulations:

#### **2014/53/EU (The Radio Equipment Directive)**

For the evaluation of the compliance with these Directives and Regulations, the following standards/requirements were applied:



<b>Safety Article3.1(a)</b>	EN 60335-1:2012/A15:2021 EN 50636-2-107:2015/A3:2021
<b>EMC Article3.1(b)</b>	EN IEC 55014-1:2021 EN IEC 55014-2:2021 EN IEC 61000-3-2:2019/A1:2021 EN 61000-3-3:2013/A2:2021 EN 301 489-1 V2.2.3:2019 EN 301 489-17 V3.3.1:2024 EN 301 489-19 V2.2.1:2022 EN 301 489-52 V1.2.1:2021
<b>Radio Article3.2</b>	EN 300 328 V2.2.2:2019 EN 300 220-2 V3.1.1:2017 EN 303 413 V1.2.1:2021 EN 301 908-1 V15.2.1:2023 EN 301 908-13 V13.2.1:2022
<b>Health Article3.1(a)</b>	EN 50663:2017 EN 62311:2008 EN 50665:2017 EN 62233:2008

Responsible for making this declaration is the:

Manufacturer  Authorised representative established within the EU

Person responsible for making this declaration

Print name/Title: \_\_\_\_\_

\_\_\_\_\_  
(Place)

\_\_\_\_\_  
(Date)

\_\_\_\_\_  
(Signature)

A handwritten signature consisting of stylized characters, possibly 'Ji Jia', written over a faint background of the declaration text.



## 附录 2：简易自我声明

## Appendix 2: simplified declaration

Hereby, Ningbo ABAX Sensing Electronic Technology Co., Ltd. declares that the radio equipment type [designation of type of radio equipment] is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address:

<https://www.xxxx.com>



Product Service

# Attestation of Conformity

No. T8A 127967 0004 Rev. 00

**Holder of Attestation: Ningbo ABAX Sensing  
Electronic Technology Co., Ltd.**

Key&Core Technology Enterprises  
Community (Building #7), No.3000, Biyuan  
Road II, Chang'an District, Xi'an,  
Shaanxi, P.R.China

**Product: Lawn mowers  
Intelligent Lawn Mower**

This Attestation of Conformity is issued on a voluntary basis in support of the Conformity Assessment Module A of Radio Equipment Directive 2014/53/EU. On the basis of the referenced test reports, the samples of the listed product were found to comply with the essential requirements of the above mentioned directive as implemented in the standards used valid at the time the tests were carried out. For the requirements of the Article(s) 3(2) and 3(3) only harmonized standards valid at the moment of issuing where used. The used standards cover the essential requirements of the Radio Equipment Directive as applicable to this product. The manufacturer must ensure compliance of the manufactured products with the technical documentation and other requirements of the Radio Equipment Directive that apply to them. National legal requirements have to be considered before bringing the product to the market. For details see: [www.tuvsud.com/ps-cert](http://www.tuvsud.com/ps-cert)

**Test report no.:** 4840324374500

**Date:** 2025-04-10

  
( Ming Gu )

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This Attestation does not replace the regulatory EU Declaration of Conformity (DoC) and does not allow for CE marking. After preparation of the necessary documentation and establishing compliance to requirements of all applicable directives, the manufacturer may sign a DoC and apply the CE marking. The DoC is issued under the sole responsibility of the manufacturer.



Product Service

# Attestation of Conformity

No. T8A 127967 0004 Rev. 00

**Model(s):** S1 Pro, S1 Ultra

**Parameters:**

Ratings: 21.6Vd.c. for lawn mower; 100-240V~, 50/60Hz for charger  
Test report no.: 4840324374500A (EN IEC 55014-1, EN IEC 55014-2, EN IEC 61000-3-2, EN 61000-3-3, EN 301 489-1, EN 301 489-3, EN 301 489-17, EN 301 489-19, EN 301 489-52) 4840324374500B (EN 300 328, EN 62311, EN 50665) 4840324374500C (EN 300 328, EN 62479, EN 50663) 4840324374500D (EN 300 328, EN 62479, EN 50663) 4840324374500E (EN 300 220-2, EN 62479, EN 50663) 4840324374500F (EN 303 413, EN 62479, EN 50663) 4840324374500G (EN 301 908-1, EN 301 908-13) 4840324374500H (EN 62311, EN 50665) 4840324619300 (EN 60335-1, EN 50636-2-107, EN 62233)

**Tested according to:**

EN IEC 55014-1:2021  
EN IEC 55014-2:2021  
EN IEC 61000-3-2:2019/A1:2021  
EN 61000-3-3:2013/A2:2021  
EN 301 489-1 V2.2.3:2019  
EN 301 489-3 V2.3.2:2023  
EN 301 489-17 V3.3.1:2024  
EN 301 489-19 V2.2.1:2022  
EN 301 489-52 V1.2.1:2021  
EN 300 328 V2.2.2:2019  
EN 300 220-2 V3.1.1:2017  
EN 303 413 V1.2.1:2021  
EN 301 908-1 V15.2.1:2023  
EN 301 908-13 V13.2.1:2022  
EN 62311:2008  
EN 50665:2017  
EN 62479:2010  
EN 50663:2017  
EN 60335-1:2012/A15:2021  
EN 50636-2-107:2015/A3:2021  
EN 62233:2008

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TÜV®



Product Service

# Attestation of Conformity

No. M8A 127967 0003 Rev. 00

**Holder of  
Attestation:**

**Ningbo ABAX Sensing  
Electronic Technology Co., Ltd.**

Key&Core Technology Enterprises  
Community (Building #7), No.3000, Biyuan  
Road II, Chang'an District, Xi'an,  
Shaanxi, P.R.China

**Product:**

**Lawn mowers  
Intelligent Lawn Mower**

**Model(s):**

**S1 Pro; S1 Ultra**

**Parameters:**

Rated voltage:	21.6V d.c.
Cutting width:	210mm
Protection class:	III
Degree of protection:	IPX6(machine)

**Tested  
according to:**

EN 60335-1:2012/A15:2021  
EN 50636-2-107:2015/A3:2021  
EN 62233:2008

This Attestation of Conformity is issued on a voluntary basis according to Council Directive 2006/42/EC relating to machinery. It confirms that the listed equipment (not Annex IV equipment) complies with the principal protection requirements of the directive and is based on the technical specifications applicable at the time of issuance. It refers only to the particular sample submitted for conformity assessment. For details see: [www.tuvsud.com/ps-cert](http://www.tuvsud.com/ps-cert)

**Test report no.:** 4840324619300

**Date:** 2025-04-07

( Qifeng Gu )

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This Attestation does not replace the regulatory EU Declaration of Conformity (DoC) and does not allow for CE marking. After preparation of the necessary documentation and establishing compliance to requirements of all applicable directives, the manufacturer may sign a DoC and apply the CE marking. The DoC is issued under the sole responsibility of the manufacturer.



The manufacturer reserves the right to make changes to the product, release firmware updates, and update this manual at any time. Illustrations of the product, accessories, and app interface in the User Manual are for reference purposes only. Actual product and functions may vary.