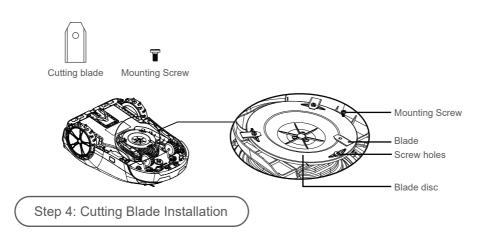
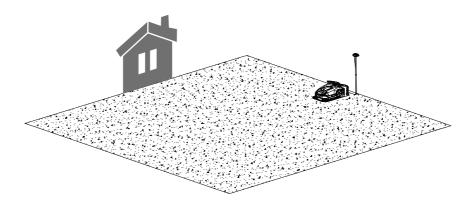
### **Quick Start Installation**



Make sure that power is off before installing the blades.

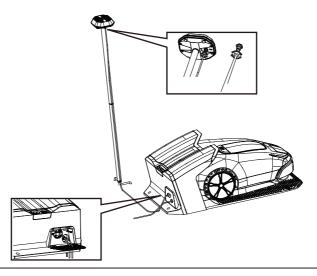
3 blades are required for one machine. Secure the blades with screws.



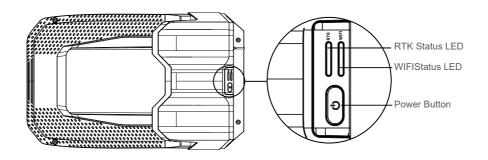
Step 5: Charging Base Station And RTK Antenna Installation

Place lawn mower on the docking pad. Connect power cord and RTK antenna.

## **Quick Start Installation**



Connect RTK antenna to the charging base station with an RTK cable. Connect charging base station to power supply. Both RTK antenna and power cord goes through the threading hole and then connect to the charging base station.



Status 6: Power On

A.Power on charging base station: Long push the power button on top of base station.

Wifi status LED: On if working properly, flashes otherwise, RTK status LED: On if working properly, flashes otherwise

## **Quick Start Installation**



B.Power on the lawn mower Push the "START" button on the mower. The battery of a newly purchased lawn mower may be drained too much due to long storage time. Place the mower on base station and it will charge automatically.

#### Caution:

Do not charge when the lawn mower, power supply, or base station are wet or damaged.

When abnormal smell, sound, or light appears, cut off power immediately and contact after-sales service.

## 5. Operation Instruction

### 5.1 Control Panel





WiFi icon

Dark: not connected to AP;

Flashes: connected to AP but not connected to network;

On: network connected, The more the number of bright grids, the stronger the signal.



Satellite (RTK) icon

Dark: no signal;

Flashes: weak signal;

On: good signal.



Lock icon

On: no correct password is entered;

Off: correct password is entered.



Blade disc status icon

On: blade disc is working;

Off: otherwise.



Warning icon: On: error occurs; Off: normal.

Battery icon: Each grid represents 25% of the battery. Four grids have a power level of 75%-100%; three grids 50%-75%; two grids 25%-50%; one grid 5%-25%.

Digital display : password setting, input, error code.
After powering on, light circles , then displays "0000"
Auto Automatic mode light
Edge mode light
Start: on, off, mode confirmation key; +:Number increases
Home: home key; -: Number decreases
Code : change password  → : right shift digit
Mode: working mode: automatic mode, edge mode OK: confirmation key
Emergency stop key: When pressed, the lawn mower stops all actions and enters a locked state. The dome cover is opened.



### **Password Operation**

Unlocking the machine: Default password is 1000.

In the beginning, the first digit flashes, push "+" "-" key to change the digit, push "→" key to move the digit. Once 4 digits are all in, push "OK" key. If password is wrong, all four digits quickly flash three times. Otherwise, 0000 is shown.

Reset password: After unlocking the lawn mower, long push"CODE"key for 3 seconds to start password resetting process. Input all 4 digits, push "OK" key to confirm the new password.

When entering working mode, the display switches to P000 (Percent), the last three digits are the percentage of the lawn area that has been cut. P100 means 100%.

## LED light status:

	LED	status	description	
	Front light	Light blue	standby	
		blue	working	
Lawn mower		Green flashes/on	Charging , turns off after 30 secs ; Finished charging, turns off after 30 secs	
		Red flash	Error occurs	
		Yellow flash	Lawn mower enters APP binding process. Once done, turns into light blue	
	Tail light	Red flash	Lawn mower errs	
Charging base station	RTK	flash	RTK signal is bad , check whether RTK antenna is installed correctly, or move RTK antenna to open space.	
		on	RTK signal is OK.	
	WIFI	Flash	Network is not connected. Check wheth the router is connected, or the charging base station is connected.	
		on	Network is connected.	

## 5.2 APP Installation And Binding

Scan the QR code in Figure 1 to download and install "JOY LIFE" APP, or search for "JOY LIFE" in App Store and Android app stores directly - Download and install.



Figure 1

Launch "JOY LIFE" App to register and log in.



After logged in, click "+" at the upper right corner of Figure 3 to add equipment. On the add equipment page, select "Lawn Mower". Follow the prompts on the page to connect.



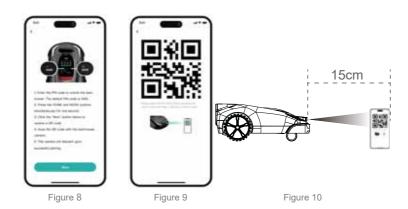
Unlock the lawn mower after turning it on and ensure that it is connected to the internet: check WiFi icon on the control panel.

Off: Lawn mower is not connected to the AP. Check if the AP is turned on. Flashes: Lawn mower is connected to AP, but not connected to the network. Check if the AP network cable is normal.

On: Lawn mower is connected to the network.

The number of WiFi bars represents the signal strength

Press "Home/+" and "Mode/-" keys simultaneously for 1 second, the lawn mower broadcasts "start network configuration", lawn mower camera is turned on, front light flashes yellow. Display the QR code corresponding to the device model in "JOY LIFE" APP directly in front of the camera. After the device broadcasts "network configuration is successful", the camera is turned off, front light turns solid white, APP jumps to device naming page, you may rename the lawn mower.



Update to the latest firmware to fully experience the mower:

After activating the lawn mower, maintain network connection, follow the guidance in the pop-up window, and wait for 20 min for the update to complete. You may start using the lawn mower after the app prompts that the update is successful.

Caution: Before the update, make sure the following

- 1.Lawn mower is docked in the charging base station.
- 2.Lawn mower is connected to the internet, there are 3 or more signal bars.
- 3. There is no scheduled mowing task in the next one hour.



## 5.3 Lawn Mower Operation

## Control page



Figure 15

- 1.Battery Level 4.WiFi Signal/RTK Status
- 7.Lock Status
- 2.Mowed Area
- 5.BT Switch
- 8.Recharge
- 3.Mowing Time 6.TOF Switch
- 9.Start



Figure 16

1.Edit Map

4. Mowing Mode

- 2. Remote Control
- 3. Mowing Strength
- 3. Locate Lawn Mower
- 6. Mowing Height

## Map creation page



- 1.Return To Up Level 2.RTK Signal Status
  - 2.RTK Signal Status 3. Mower Icon
- 4.Base Station 5.Help 6.Mower Roll Back (when creating map)
- 7. Manual Control Forward/Backward 8.Start 9.Manual Control Left/Right

Create the map(s)

1.Place the lawn mower on the charging base station and click on the lawn mower icon that has been bound on the APP device page.



Figure 18

2.Click "new map"

A security check window pops up, confirms that each item passes ( $\sqrt{}$  means passed). Click Next.

Caution: Remove lawn obstacles (such as sticks, branches, stones, wires, toys, etc.) beforehand; ensure slopes in the lawn do not exceed 24 (45%) degrees and the grass height does not exceed

100mm



Figure 19



Figure 20

3. The lawn mower comes out of the charging base station and stops.



Figure21

4.A "Lawn + Path" window pops up on APP, click on "Lawn".

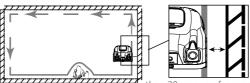


Figure 22

5.Remote control lawn mower to reach the boundary of the lawn, click "START", walk along the lawn boundary to create a map (the lawn mower needs to be more than 20cm away from any cliffs)







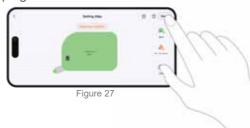
6.In the process of mapping, if there is a need to adjust the path due to inappropriate control, hold down the "Back" button at the upper right corner. The lawn mower will go back. Release the button and the lawn mower will stop. You can continue mapping



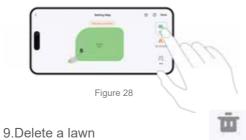
7. Control the lawn mower to return to the starting point of the map, a "CLOSE" button will appear. Click it to finish mapping.



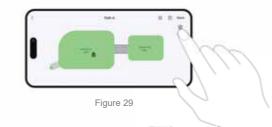
Figure 26



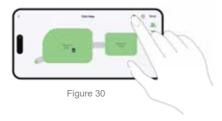
8.If multiple lawns need to be built, click on the second lawn icon at the upper right corner to add a lawn.



Select a lawn, click the delete icon delete to delete the lawn. The paths connected to the deleted lawn will also be automatically deleted. After clicking save, if there are lawns that are not connected, create path according to the instructions to connect isolated lawns.



Click the top delete icon it to delete the whole map.



#### Create NO-GO ZONE

If there is an area in the lawn not suitable for mowing, ponds, trees, roots, big rocks, etc, a No-Go Zone can be set up on the APP.

When the lawnmower encounters a hard obstacle exceeding 5 centimeters tall, such as a large stone or tree trunk, it automatically reverses and changes direction to avoid collision. However, to protect specific objects or prevent the lawnmower from entering certain areas, such as flowerbeds, small trees, lawn ornaments, ponds, sprinklers, or exposed tree roots, you need to establish boundaries for them. Additionally, if you have recently added equipment such as a trampoline or barbecue grill to your lawn, you can also set up no-go zones to protect them, ensuring that the lawnmower does not enter these areas mistakenly. No-Go Zone can not overlap. Please refer to app tutorial for details.



As shown in Figure 31, click "No go Zone", 3 different ways of creating No go Zone pops up as shown in Figure 32.

Manually control the lawn mower to move to the side of obstacles,

1.Click on No-Go Zoom, control the lawn mower to move around the obstacles, as shown in Figure 33, to create a "No go Zone", as shown in Figure 34.

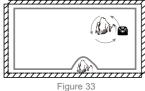
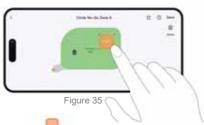




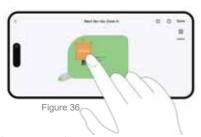


Figure 34

2.Click on corresponding to the lawn mower icon as the No-Go zone. You can adjust the size of the No-Go zone by dragging the icon; click save to save the No-Go zone, as shown in Figure 35

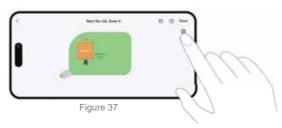


3. Click on drag the square icon on the APP and place it at the obstacle position corresponding to the lawn mower icon as the No-Go zone. You can adjust the size of the square by dragging the icon; click save to save the No-Go zone, as shown in Figure 36



#### 5. Delete operation

Please follow the guided steps in the app. If you need to delete a No-Go zone, for example, when you remove a barbecue grill from the lawn, you can simply delete that zone through the app.



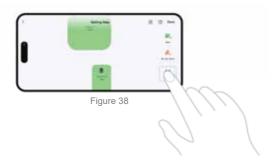
## Create Path(s)

Paths need to be setup to connect charging station and lawn(s).

When creating a lawnmower path, ensure the following conditions:

1. Avoid uneven, muddy, or wet surfaces as they may affect the performance and

stability of the lawnmower.Click on the icon to create the path.



2.Ensure the width of the path is at least 1 meter or more. This provides sufficient space for the lawnmower to move without colliding with obstacles. Make sure the lawn mower is inside the lawn, click "start" to create the path. Manually control the lawn mower to move forward.



Figure 39

3. When setting up the path, it is recommended to follow the center line of the navigable area. This helps maintain a smooth ride for the lawnmower and reduces the risk of scratching the machine. Being too close to the edges may cause friction between the lawnmower and the edges during turns or adjustments, potentially scratching the body.

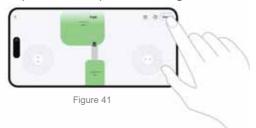
By following these recommendations, you will be able to create and manage the lawnmower path more effectively, ensuring smooth and safe operation of the lawnmower.

After reaching another lawn area, click "END" to end creating the path.



Figure 40

4.After completing the above operations, click "save" in the upper right corner to save the full map. If there are any abnormalities in the map, the APP will prompt that the mapping is abnormal and a new map needs to be created. If there are no abnormalities, the lawn mower enters edge path detection mode. In this mode, the lawn mower walks one full circle along all boundaries of the map to check if it can pass. If yes, the mapping is successful. If there is an abnormal interruption, the map at the wrong location needs to be rebuilt.



#### Introduction to obstacle avoidance

The obstacle avoidance function of the lawn mower includes bumper collision avoidance and TOF camera non-contact obstacle avoidance. If obstacles appear on the path, the path will be automatically re planned. Therefore, to improve the performance of the lawn mower, please regularly wipe the front camera to prevent dirt from covering the lens and causing false detection of obstacles.

### Marker Setup

If the created lawn map have orange or red colored boundary line segments(RTK signal is not good), after mapping is completed, setup sunflower marker plates at those locations. Each marker needs to face the lawn, stand upright along the lawn edge, and spaced 2 meters apart, as shown in below figure.

Each lawn mower is packed with 6 sunflower markers.

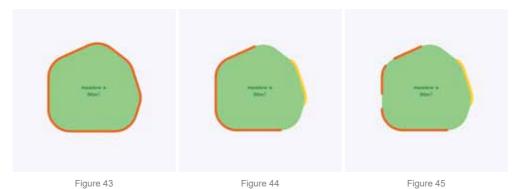
If there are multiple red or orange line segments, pick the brighter and longer ones first, and put the marker at the center of the segment.



Figure 42

If the red or yellow line segments are too long or too many, as shown in below figures, the charging base station needs to be moved to an unobstructed area, and rebuilt the map;

Seek help from professional personnel if necessary. Or contact the nearest dealer to resolve the issue.



After the above steps, a complete lawn map is completed.

Lawn mower operation instruction

#### 1.Mowing mode

#### Automatic mode

Click on "start mowing", lawn mower moves out of charging base station, moves to the edge of a lawn, and starts mowing following a zigzag pattern. When the whole lawn is cut, or battery runs low, the lawn mower goes back to the charging base station to recharge.



Figure 46

Mowing trajectory of a lawnmower on irregular grass.



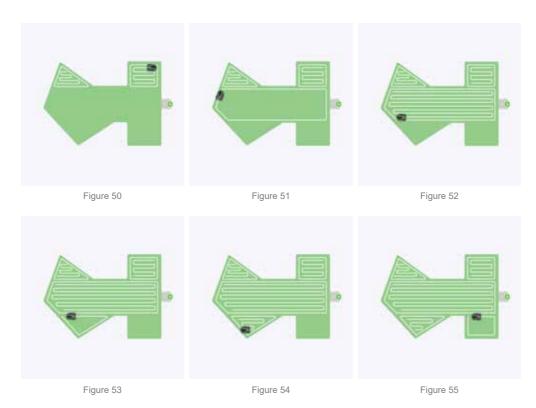




Figure 56

#### Edge mode

In edge mode, the lawn mower will move along the edges of the lawns, once finished, it goes back to the charging base station to recharge.



Figure 57

#### 2. Work area management

When there are multiple lawns, or work areas, select one or a few of them, click "start mowing". The lawn mower will only work in the selected areas and return to the base station after completion. If you do not select any area and click "start mowing", all lawns will be worked on.



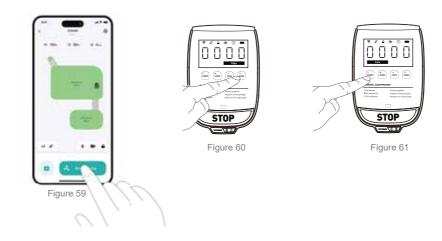
#### 3.Start mowing

If the height of the grass exceeds 6cm, it is recommended to increase the cutting height to at least 4cm. Only one-third of the grass height should be trimmed each time. For example, if the initial grass height is 6cm, the cutting height of the lawn mower should be set to 4cm or 4.5cm. If the grass is higher than 10cm, the cutting height of the lawn mower should be set to 6cm, and the TOF obstacle avoidance function should be turned off.

After setting the cutting height,

A.click on "start mowing" on APP, or

B.select"MODE->auto" on the lawn mower control panel, push "START" button, press down the dome cover, the mowing begins.

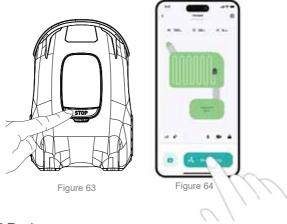




### 4.Pause mowing

If anything unexpected happens, press "STOP" button on the lawn mower to pause mowing.

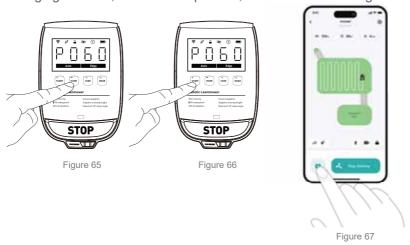
You can also use APP to stop the work.



#### 5.Recharge

During mowing, if battery falls below 20%, the lawn mower will automatically return to the charging base station. After being fully charged, it returns to previous stop spot to continue the work;

You can also manually control lawn mower return to the charging station via APP or control panel. In this mode, the lawn mower will not resume previous work after charging. Instead, it enters sleep mode, as shown in below figure:



#### 5.4 Lawn Mower Parameter Setting

#### 1. Mowing strength

There are three levels of mowing strength that the user can set on APP: normal, strong, and max. If the grass is taller than 6cm, set the cutter head height to 6cm, which is the maximum allowed, and set mowing strength to strong or max. Afterwards, it is recommended to set mowing strength back to normal, which improves mowing efficiency.

#### Max level:

when the height of the grass exceeds 6cm, especially for lawns that have not been trimmed for a long time, this mode is recommended. Set the cutting height to 6cm on the APP. Due to the possibility of high grass being higher than the height of the TOF camera, the TOF obstacle avoidance function needs to be turned off, so that the lawn mower only relies on the bumper to detect obstacles.

#### Strong Level

At this level, the lawn mower moves at a higher speed, and it is suitable for grass that is thicker and below 6cm long. Set the mowing height to 4cm on the APP. At this level, the TOF obstacle avoidance function can be activated, and the bumper and TOF will work simultaneously to detect obstacles.

#### Normal level:

This level focuses on the efficiency of lawn mowing. The lawn mower moves at the fastest speed. The mowing height can be set between 2.5cm and 6cm, which can be used for daily maintenance.

According to actual lawn conditions and needs, users can choose the corresponding level for lawn mowing operations.



Figure 68

### 2.Scheduled mowing

In the lawn mower setting pages on the APP, set time table for mowing. The lawn mower will work according to the settings.

Click on the switch to turn on/off scheduled mowing, as shown in below figure.



Figure 69

### 3. Mowing height setting

Cutting height can be set in "mowing height" page, the adjustment range is between 2.5cm  $\sim$  6cm  $_{\circ}$ 



### 4. Volume setting

Set the lawn mower speaker volume.



Figure 71

#### 5.Tof setting

Since high grass frequently triggers TOF obstacle detection, tof sensor needs to be turned off under certain conditions.

Caution: turn off TOF, the lawn mower lost its no-contact obstacle avoidance capability. The lawn mower can only rely on bumper for obstacle avoidance.



#### 6.Product Maintenance

For better mowing results and longer service life, be sure to keep your lawn mower clean and the blades in good condition. Inspection and maintenance should be performed weekly by an adult. Any damaged or worn parts should be replaced. Do not perform maintenance on the lawn mower while wearing open sandals or bare feet.

Always wear long pants and work shoes when servicing the lawn mower.

#### 6.1 Clean

Use a soft brush or cloth to clean the exterior of the lawnmower thoroughly. Do not use alcohol, gasoline, acetone or other corrosive/volatile solvents to clean. These substances may damage the exterior and interior structure of the lawn mower. In order for the robot to recharge properly, please regularly check and clean the charging base station. Make sure all connections to the charging station, extension cords and power supplies are not blocked. Before cleaning, make sure the lawn mower is turned off. The mower must be turned off when it is turned upside down.

#### A.Chassis and blade disc

If the base plate and blade disc are dirty, use a brush or water hose to clean them. Do not use high pressure water. At the same time, make sure that the blade disk rotates freely and the blades rotate freely.

NOTE: High-pressure water may penetrate seals and damage electronic and mechanical components.

#### **B.Wheel**

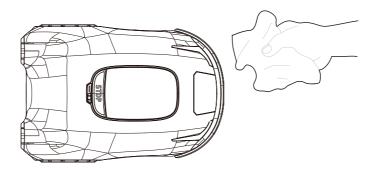
Grass on the wheels can affect the performance of your lawn mower when climbing hills. Clean any mud or other items stuck in between to ensure a strong grip.

#### **C.Rain Sensor**

Check once a week to make sure the rain sensor is not covered with mud, grass or other objects. You can wash it or use a soft brush to clean it.

## D.Camera glass

Check once a week to make sure the camera glass is not covered with mud, grass or other objects.



## 6.2 Replace Blade

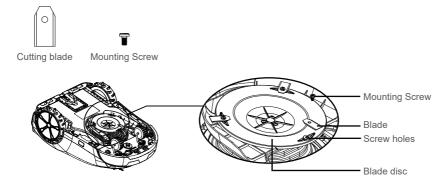
If you use your lawn mower regularly, it is recommended to replace the blades and screws every 1-2 months to ensure safety and better mowing results. Replace all three blades and their screws at the same time to ensure safety and stability.

#### warning

Wear heavy-duty gloves when inspecting or servicing the blade. Please use the screws and blades provided with this machine. Do not reuse screws. Doing so may result in serious injury.

#### How to replace the blade:

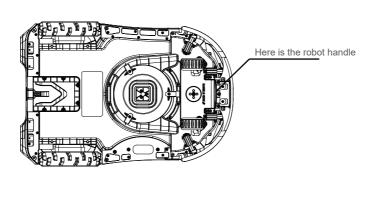
- 1 Turn off the lawn mower.
- 2 Place the mower upside down on a soft, clean surface.
- 3 Use a Phillips screwdriver loosen the three screws.
- 4 Remove the screws and blade.
- 5 Secure the new blade and screws (torque: 1  $N \cdot m$ ). Make sure the blade can rotate freely.

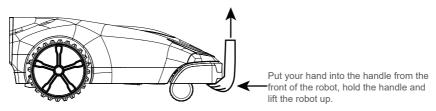


## 6.3 Transportation

Please use the original package for long-distance shipping. Turn off the machine before lifting, moving, or any other ways of transporting the product. Handle with care and avoid careless handling. Never pick up or carry the lawnmower while the motor is running

How to move or lift the robot correctly:





## **Common Errors**

# 7.Common Errors

# 7.1 Error Description

Error code	Error name	Description and solution				
0000	No alarm					
E111	Left wheel overload alarm	Robot left wheel overload alarm. Check whether the left rear driving wheel is entangled with foreign objects.				
E112	Right wheel overload alarm	Robot right wheel overload alarm. Check whether the left rear driving wheel is entangled with foreign objects.				
E113	Docking alarm	The machine can't dock, no docking code is received.				
E121	Battery temperature alarm	Battery temperature is too high. Pause mowing and wait for half an hour or longer before working again. If this happens again, please replace the battery				
E122	Body temperature alarm	Body temperature is too high. If air temperature is too high, suspend mowing;				
E132	Cutter head motor current is too large	Cutterhead overload alarm. Check whether the cutterhead is entangled with foreign objects.				
E141	Right collision alarm					
E142	Right middle collision alarm	Check whether the front bumper is stuck with foreign objects or damaged.				
E143	Left middle collision alarm	If damaged, please contact after-sales service for repair.				
E144	Left collision alarm					
E145	Cutter head collision alarm	Cutter head collides with a hard object. Check for foreign objects in the grass. If there are objects that cannot be cleaned up, you may set up a restricted area to prevent future alarm				
E161	Camera alarm	Camera malfunctions. Reboot the lawn mower to see whether the conditions go away.				
E162	TOF sensor alarm	Tof sensor malfunctions. Reboot the lawn mower to see whether the conditions go away.				
E1A1	Rain alarm	Rain detection sensor triggers. When the robot detects rain, it returns to the charging station to take shelter; If the rain alarm stays on, check whether the leakage hole of the rain sensor is blocked.				
E1B1	Front left lifting alarm	Front left wheel is suspended. Check whether someone has lifted it.				
E1B2	Front right lifting alarm	Front right wheel is suspended. Check whether someone has lifted it.				
E1D1	Out of boundary alarm	Exceeds lawn boundary. The lawn mower either lost its positioning, or is moved by someone.				
E1D2	Out of boundary alarm	The lawn mower has left work area by mistake, please check the scene.				
E1F1	RTK alarm	Check status lights(LED) on the base station: WIFI status light: Off : no WIFI signal. Flashes at a frequency of 1sec: WIFI signal is poor. On: WIFI signal is good. RTK status light: Off:no RTK signal Flashes at a frequency of 1sec: RTK signal is poor. On: RTK signal is good. When the status is abnormal, reboot base station, and check the status again				

### **Common Errors**

Error code	Error name	Description and solution			
E211	Network alarm	AH wifi router is not working properly. Check the indicator lights on AH router. sta1 LED light is on if connected, off if not sta2 LED light is on if connected, off if not If the status is abnormal, reboot the router; If it still does not work properly, check network cable;			
E221	APP alarm	Not connected to APP. Follow instruction manual to bind the APP to the machine.			
E231	No route alarm	No navigation path. The machine has either entered restricted areas or strayed beyond the lawn			
E232	No recharge route alarm	boundaries. Place the machine back in working area.			
E233	No map alarm	No lawn map. The machine has not built a map. Follow instruction manual to complete map building process.			
E235	Rollover alarm	The robot rolled over. Check the machine and correct the conditions that caused the problem. Or, set up a restricted area to prevent the machine from entering this area again;			
E236	No route for edge mowing	Check lawn boundaries and see whether there are obstacles blocking the way.			
E241	Mower stuck alarm	Mower is stuck. Check the machine and correct the conditions that caused the problem. Or, set up a restricted area to prevent the machine from entering this area again;			
EFFF	Unknown				

When the cutter disc or blade of the machine is stuck in the alarm, or makes a "click" noise, or the machine vibrates; please press the STOP button to turn off the machine, then turn the machine over 180 degrees to check whether the blade and cutter disc are stuck or damaged by foreign objects. Please clean up the foreign objects or replace the damaged parts before starting the work.

### **Common Errors**

## 7.2 Replacible Module

