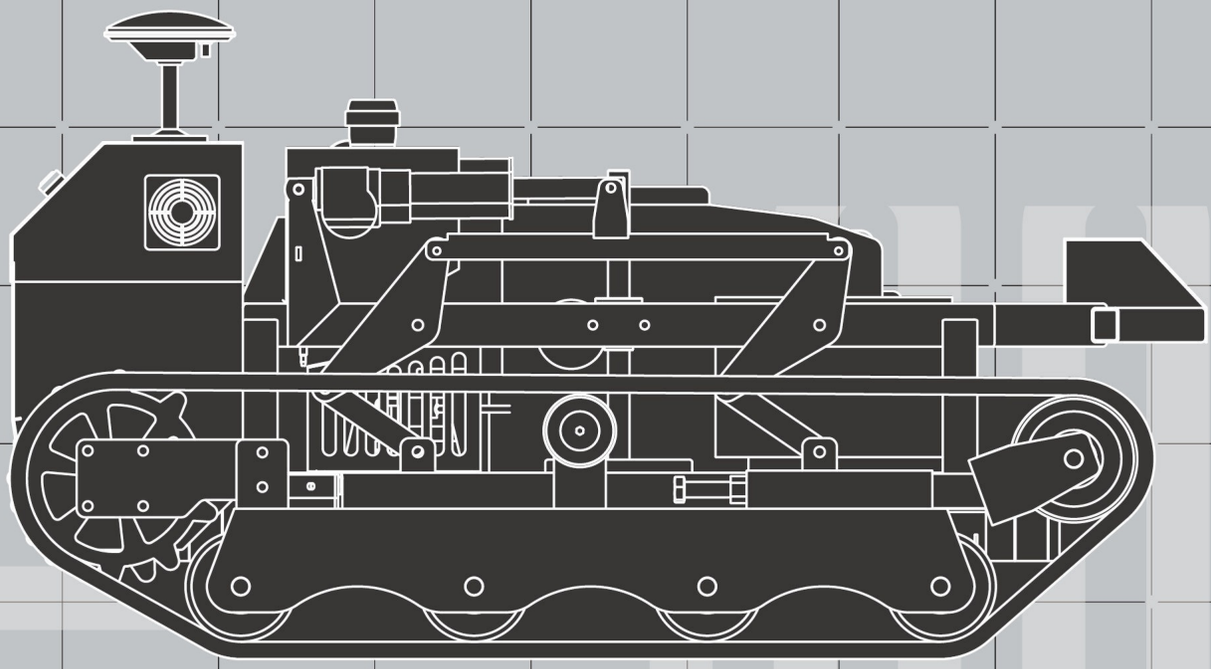
WANJI



WANJI Intelligence

Smart Hybrid-Powered Lawnmower User Manual

Unlock a New Intelligent Lawn Mowing Experience

Table of Contents

1. Overview ---- 3
    1.1 Product Introduction ---- 3
    1.2 Working Principle ---- 4
    1.3 Safety Warnings ---- 5
    1.4 Package Contents ---- 7
    1.5 Parts and Functions ---- 9
    1.6 Technical Parameters ---- 13
    1.7 Optional Accessories (Sold Separately) ---- 14
2. Installation and Mapping ---- 18
    2.1 Preparation Before Startup ---- 18
    2.2 Start the Lawn Mower ---- 19
    2.3 Install the Antenna ---- 20
    2.4 Location Selection ---- 24
    2.5 Plan the Working Area ---- 26
3. Daily Use ---- 28
    3.1 Lawn Mowing ---- 28
    3.2 SmartNavi App ---- 29
4. Maintenance ---- 30
    4.1 Routine Maintenance ---- 30
    4.2 Periodic Maintenance ---- 30
    4.3 Component Inspection Specifications ---- 30
    4.4 Blade Replacement ---- 32
    4.5 Transportation ---- 33
    4.6 Battery Maintenance ---- 33
    4.7 Power Supply ---- 33
    4.8 Storage ---- 34
    4.9 Recycling and Disposal ---- 34
5.Common Problems and Troubleshooting ---- 35
6.Three Guarantees Certificate ---- 37
7.Contact Us ---- 38

Welcome!

Thank you for choosing the **WANJI WJ-T-900A** Series Smart Lawnmower!

With the precise integration of the NAV-L3 (High-Precision MEMS Positioning and Navigation Control System) and excellent obstacle surmounting capability, the WANJI Intelligent lawn mower can easily handle various types of lawns.
Equipped with intelligent App connectivity and an intuitive control panel, the device requires no tedious boundary wire laying and is extremely easy to operate.

1. Overview

1.1 Product Introduction

WANJI WJ-T-900A Series

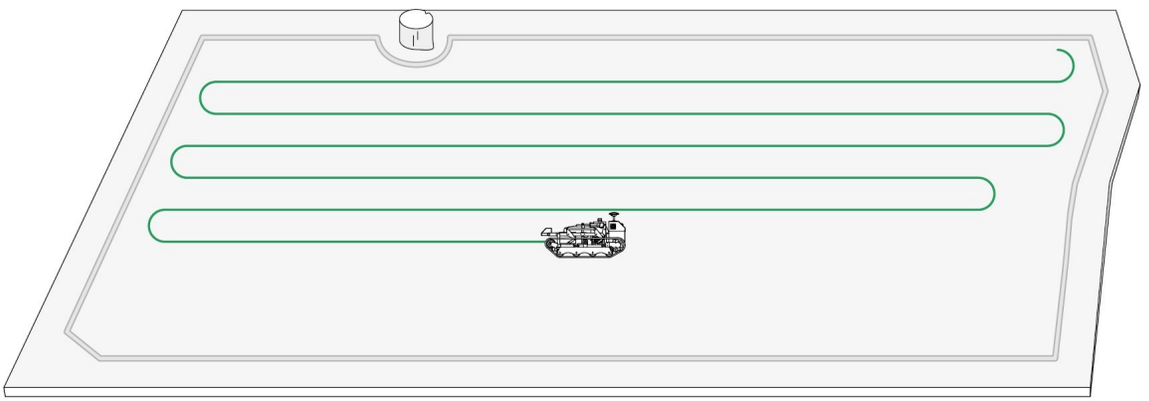
WANJI WJ-T-900A Series, an intelligent hybrid-powered lawn mower launched by Jining Wanji Intelligent Equipment Co.,Ltd
The WANJI WJ-T-900A Series is a new generation of commercial smart robotic mowers designed for agricultural weeding, orchards and groves maintenance, heavy-duty vegetation clearing, and landscaping. It supports camera integration for comprehensive path planning. Featuring a tracked chassis design, it adapts to all-terrain operating environments with a maximum climbing angle of 40° (84% slope) and travel speeds of 0–3.7 mph (0–6 km/h). It supports remote control and cellular/remote alerts. Its flat-blade configuration (2 swing blades + 1 fixed blade) combined with an adjustable mowing deck achieves a 35.4-inch (90cm) cutting width and 0.8-to-6-inch (2–15cm) cutting height adjustment, precisely meeting rigorous agricultural requirements. Powered by a next-generation hybrid system—The perfect combination of an engine available in an 810cc power rating and a high-performance electric motor—it covers approx. 0.74 to 1 acre(3000-4000 m²) per hour. This achieves eco-friendly, low-cost, and highly efficient operation, actively supporting sustainable agriculture.

The WANJI WJ-T-900A features an advanced intelligent mowing system utilizing virtual boundary technology, eliminating the need for cumbersome boundary wire installation. Its user-friendly operation and management free up your time, delivering a beautifully manicured lawn with every use.

The WANJI WJ-T-900A package includes: 1× smart mowing robot, 2× chargers, 1× remote controller, 2× Global Navigation Satellite System (GNSS) antennas, and the WANJI WJ-T-900A companion app. The mowing robot and GNSS antennas synchronously receive satellite positioning signals to precisely determine the device's location and the boundaries of the mowing area.

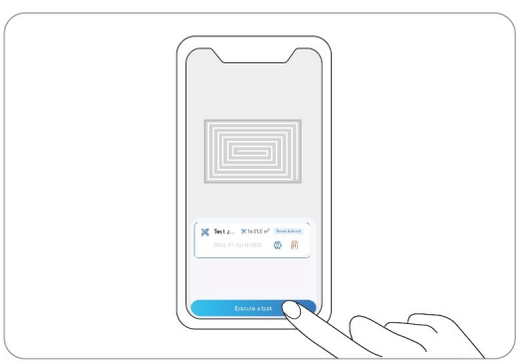
Lawn Mowing Robot

This hybrid lawn mower utilizes a gasoline engine for cutting power while featuring a rechargeable battery pack for propulsion. Simply define the mowing area boundaries via the smartphone app, and the machine will autonomously trim the lawn within those limits. Its cutting path is precisely planned by an algorithm based on the area's shape to achieve optimal mowing efficiency.



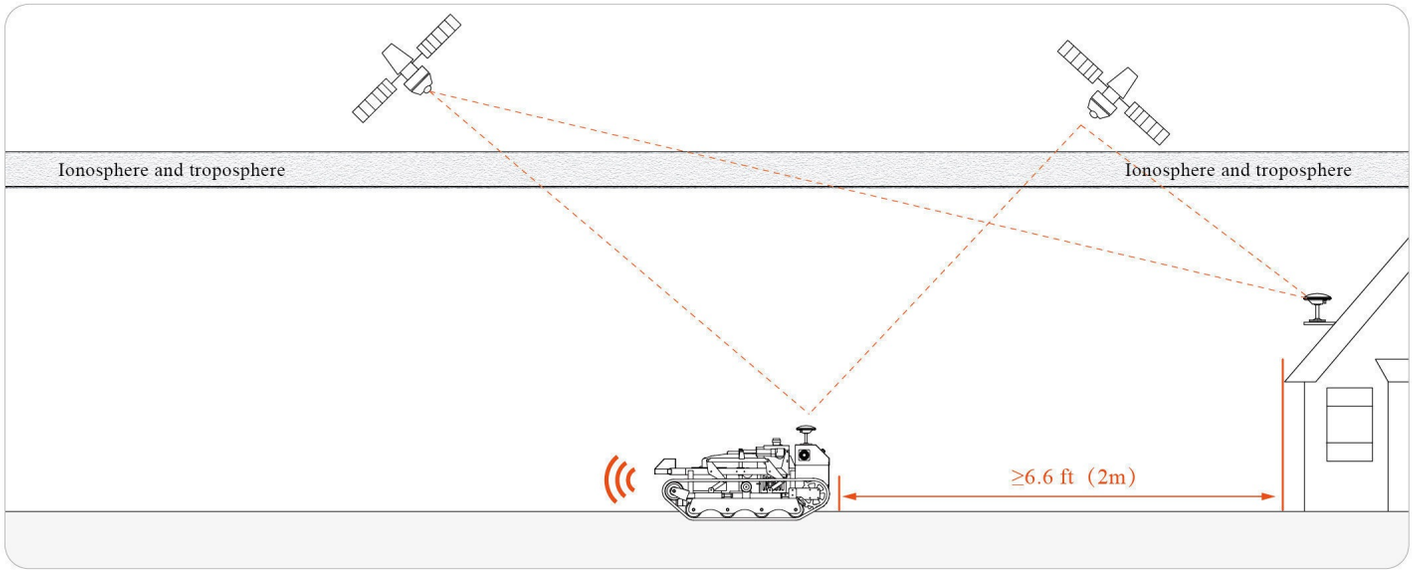
SmartNavi App

The application program is an important part of the WANJI WJ-T-900A system. You can complete system installation and working area settings according to the interactive guidance displayed in the application. At the same time, you can also adjust the lawn mower parameters, customize the working area, check the working status of the lawn mower, and remotely control the lawn mower through the App. In addition, you can obtain the latest and most comprehensive official help and support content through the application program.



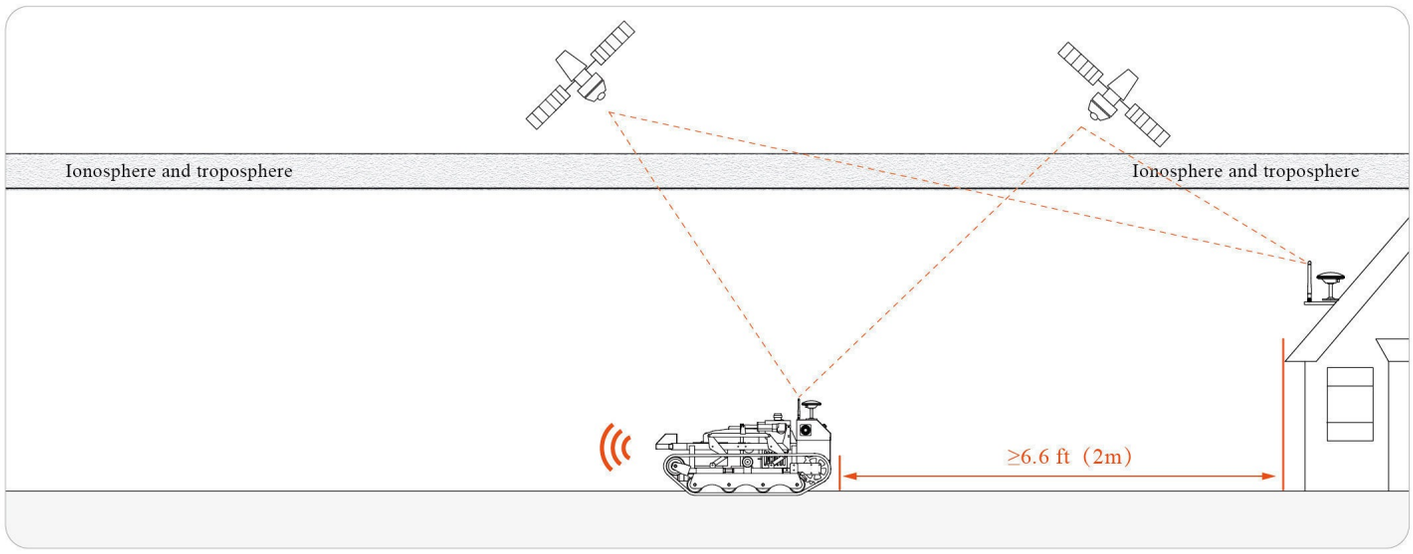
1.2 Working Principle of WANJI WJ-T-900A

Network Version



NAV-L3 (High-Precision MEMS Positioning, Navigation, and Control System) is the proprietary high-accuracy positioning technology of the WANJI WJ-T-900A mower. This technology leverages satellite positioning and integrates data from various sensors through algorithmic fusion to enhance positioning accuracy and fault tolerance. The mower achieves autonomous positioning via satellite signals, and its antenna also receives satellite signals. By comparing satellite signals received by the antenna and the mower, it minimizes transmission errors (such as shifts caused when signals traverse the ionosphere), elevating positioning accuracy to the centimeter level. Additionally, data from sensors like radar is integrated into this system via the WANJI WJ-T-900A's data fusion algorithm, further enhancing its adaptability across diverse environments. The NAV-L3 system enables precise operation zones without requiring boundary wires. Simultaneously, the system optimizes moving paths within the designated area through algorithmic planning, achieving a systematic moving effect that maximizes the mower's operational efficiency.

Radio Version



The autonomous operation system of the radio version mobile robot takes radio communication as the core of the data link and realizes environmental perception and motion control through multi-sensor information fusion. Its working process is as follows: the remote control console sends working area parameters and task instructions via radio, and after receiving them, the robot performs real-time positioning and constructs a local environmental model combined with predefined boundary information. The control unit runs path planning algorithms based on the fused data, generates speed closed-loop control signals to drive the actuator, and periodically transmits position coordinates and equipment status back via radio. The system adopts spread spectrum communication technology to ensure link stability, and suppresses positioning drift through sensor redundancy and filtering algorithms, ultimately achieving high-precision area coverage operations in network-free environments.

This architecture meets the autonomous mowing requirements for robotic lawn mowers on lawns ranging from 10,700 to 53,800 sq. ft. (approx. 0.25 to 1.2 acres) relative to the starting origin, while supporting breakpoint resume and remote emergency stop (e-stop) functions.

1.3 Safety Warnings

Important Notes

Please read carefully before use and keep it properly for future reference.

1) Always install and operate the WANJI WJ-T-900A (referred to as the “mower” in this manual) strictly according to the instructions. The complete user manual and latest operating materials are available at the official website: www.wanji-imp.com

2) Before use, thoroughly read the “Lawn Mower Safety Warnings,” “Lawn Mower Operating Procedures,” and “Engine Operating Procedures.” The manufacturer assumes no liability for personal injury or property damage resulting from failure to comply with these specifications.

3) Using the mower for purposes other than lawn trimming may cause serious injury. To avoid injury risks, carefully read and understand all warnings and precautions. Note that following the instructions and warnings in this manual reduces risks but does not eliminate all hazards. Operators or users remain responsible for accidents or dangers involving others within their operational area.

4)The WANJI WJ-T-900A incorporates multiple safety sensors, yet inherent risks remain. Mow only when the lawn is clear of people and pets, and inform neighbors of potential hazards. When operating on public lawns or areas bordering neighbors' properties/streets, establish protective barriers or fencing, or post warning signs around the work zone stating: WARNING! AUTOMATIC LAWN MOWER! Keep away from the device! Supervise children!

5) Never attempt unauthorized repairs or manual adjustments to the mower. Any unauthorized modifications may impair device operation, cause serious injury or property damage, and void the limited warranty. Use only manufacturer-certified parts and accessories.

6) The manufacturer recommends users aged 18-70 years. Ensure you receive necessary operational training before operating the device.

⚠ Warnings

Do not allow children, persons with physical/sensory/mental impairments, persons lacking relevant experience and knowledge, or persons unfamiliar with the content of this manual to operate this lawn mower. Local regulations may impose restrictions on the age of the operator.

Preparation Before Mowing:

• Regularly inspect all components of the mower to ensure proper operation.

• For optimal mowing results, it is recommended to operate in dry weather. Mowing in rainy conditions may cause grass clippings to stick to the machine and may result in slipping. Never mow during severe weather such as heavy rain, thunderstorms, or snowfall.

• Regularly inspect the work area and remove stones, metal objects, thick branches, and other debris. Equipment damage caused by foreign objects left in the lawn is not covered under the limited warranty.

• To prevent equipment damage, maintain a minimum distance of 1 meter (3 feet) between the mower and sprinkler heads during operation. Never run the mower and sprinkler system simultaneously. Schedule their operation times appropriately to avoid overlapping.

• Keep children away from power units, blades, fuel tanks, tracks, and other components with gaps or openings.

⚠ Warnings

It is strictly prohibited to operate this equipment and its related peripheral accessories when the protective cover is damaged, the guard plate is missing, or the power cord is damaged or aging.

During Mowing Operations

• Keep away from rotating blades! Do not put hands or feet under or near the blades.

• Beware of flying foreign objects! Keep a safe distance from the lawn mower during operation.

• If it is known that there are pets, children, or other people near the working area, do not let the equipment operate unattended.

• When the mower encounters hard objects (such as stones, metal parts, or thick branches) during operation, immediately inspect the cutting blades, crankshaft, screws, and other components for looseness.

• When the operator works on slopes, be sure to ensure a stable footing. When operating this equipment and its peripheral accessories, walk slowly and do not run.

⚠ Warnings

• Children must not approach or tamper with this mower while it is in operation.

• Never lift the mower while it is running, and never ride on the mower.

• The generator becomes extremely hot during operation; do not touch it.

• Do not cut hard objects (stones, metal parts, thick branches, etc.) or allow the cutting deck to contact the ground! Doing so may cause blade breakage, engine damage, and direct safety hazards.

• The slope in the working area must not exceed 40°. Do not mow on slopes exceeding this angle.

• If the mower emits abnormal noises or alarm signals, immediately press the emergency stop button.

• If abnormal vibrations occur, shut off the mower, place it on level ground, and let it rest for approximately 30 seconds before restarting. If the issue persists, contact an authorized service center.

• Do not touch moving parts until they have completely stopped.

Safe Usage Specifications

• Never operate or charge the mower outside the temperature range of 0–40°C (32–104°F). Extreme temperatures not only degrade performance but may also cause safety incidents.

• Never place any objects on the mower.

• Regular maintenance should be performed by adults (see the “Maintenance” section in the user manual).

• Regularly inspect warning devices to ensure proper functionality. Relevant devices include the base station indicator lights.

• Before charging the mower, read the “Charging Methods” section in the user manual. Improper operation may cause electric shock, device overheating, or corrosive liquid leakage.

Use only the original battery pack or an officially designated battery pack for the WANJI WJ-T-900A. Battery replacement must be performed by professional technicians through the after-sales service center.

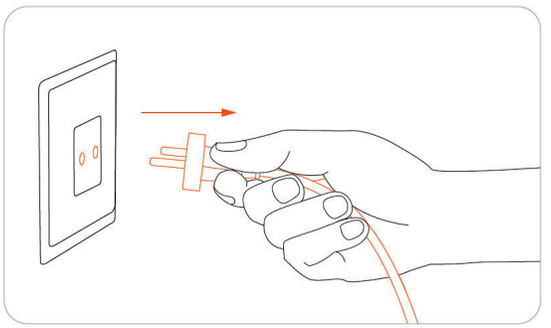
• Do not use non-rechargeable batteries. When charging, use only the detachable power adapter supplied with this device.

• Never disassemble or puncture the battery casing. Keep away from metal objects to prevent short circuits, and avoid exposure to fire, heat sources, or direct sunlight.

• For disposal of batteries and electrical waste, consult household waste management services, local/regional waste authorities, or the retailer where the device was purchased.

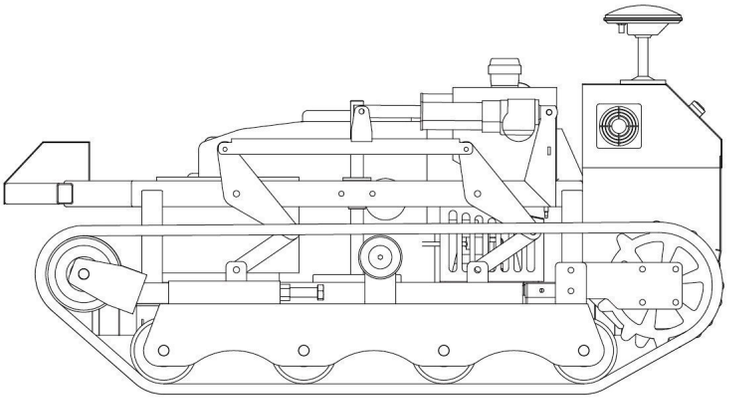
• Exercise extreme caution when replacing blades. Always wear protective gloves to prevent cuts.

• If the power adapter cable or extension cord becomes damaged or tangled during use, disconnect the power plug from the outlet before untangling. When unplugging, grasp the plug body directly—never pull on the cord to avoid hazards. Contact the after-sales service center for cable repair or replacement, to be handled by qualified technicians.



1.4 Package Contents

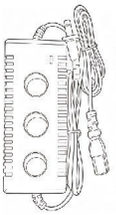
If any accessories are missing or have quality defects, please contact after-sales service in a timely manner. It is recommended to retain the packaging materials for future transportation.



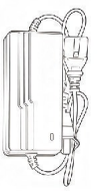
WANJI WJ-T-900A Lawn Mower



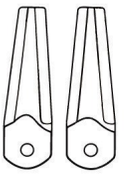
Remote control



24V Charger

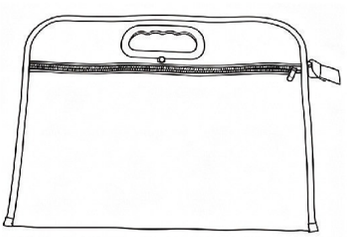


12V Charger

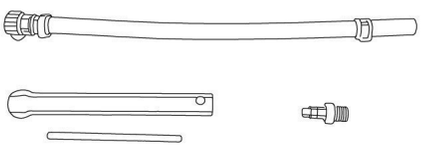


Blade

- Toolkit Suite



Toolkit

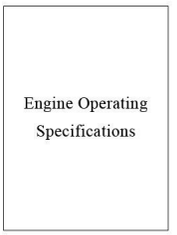


Engine Parts

- User materials



User manual



Engine Operating Manual

- Network version base station kit



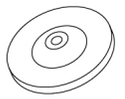
4G antenna



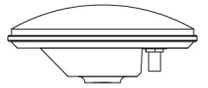
WiFi antenna



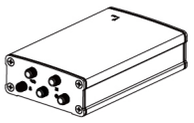
Connecting rod



Strong magnetic base



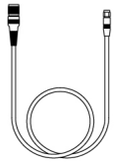
Base station mushroom head



Positioner



Remo connection line (one to two)



Base station connection cable

- Radio version base station kit



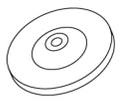
4G antenna



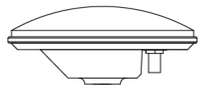
WiFi antenna



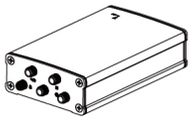
Connecting rod



Strong magnetic base



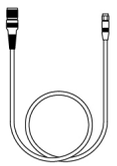
Base station mushroom head



Positioner



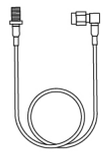
Remo connection line (one to two)



Base station connection cable



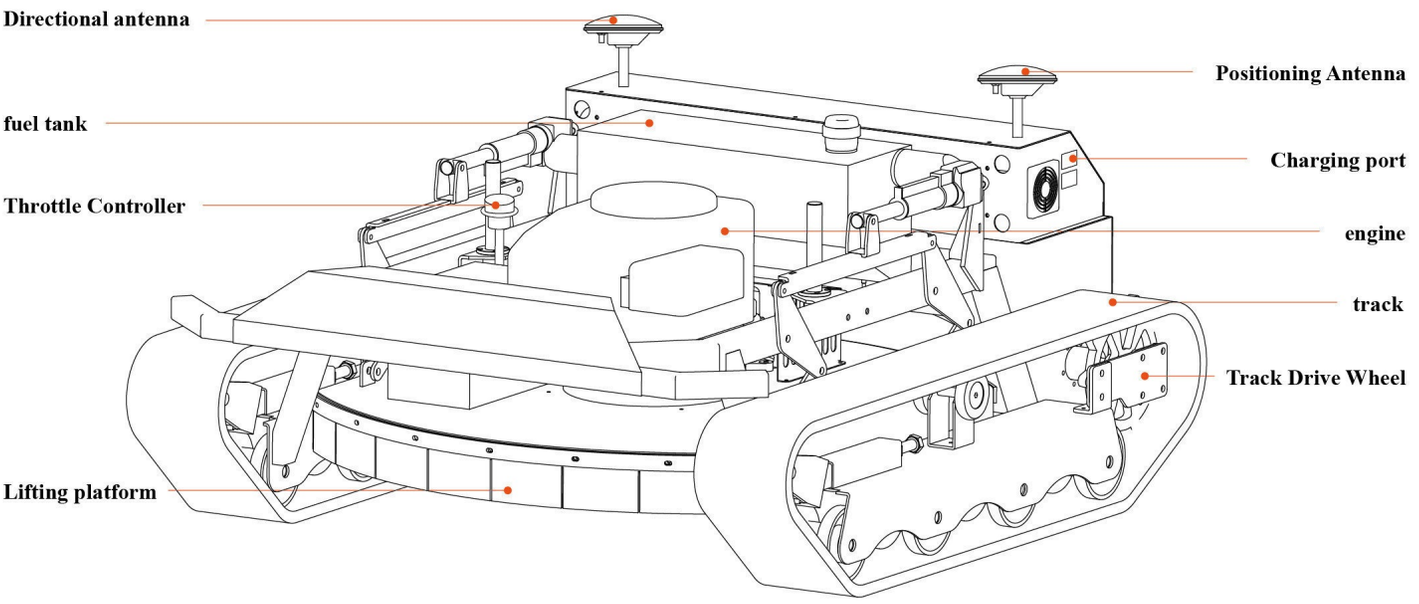
Radio antenna



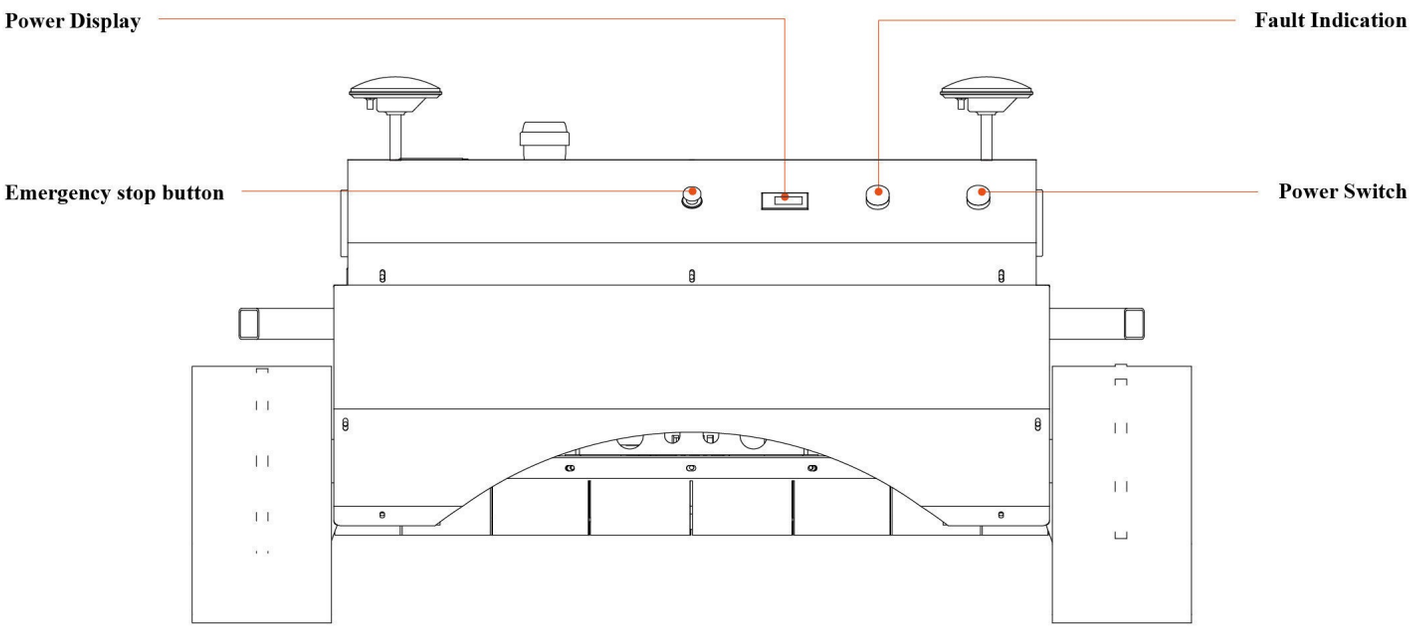
Radio connection cable

1.5 Parts and Functions

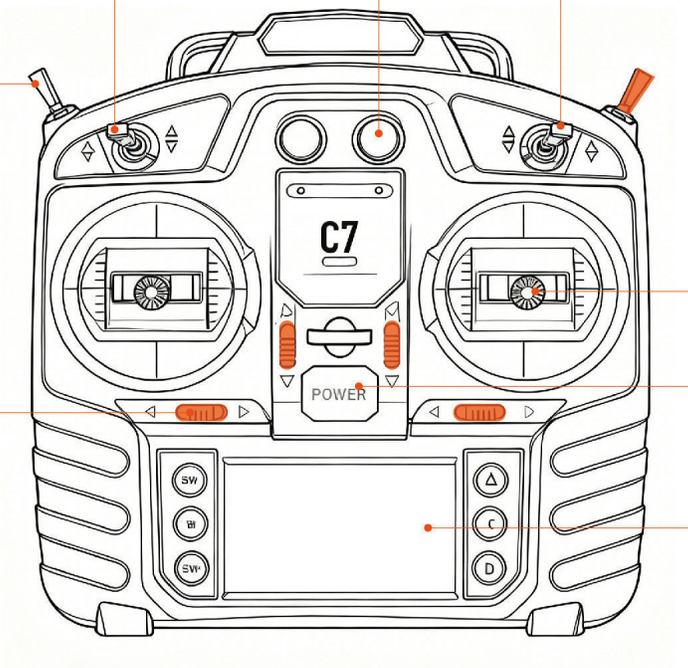
Lawn Mower



The buttons on the mower are used to perform basic operations. In addition to the GNSS antenna connected to the base station, the mower body is equipped with a GNSS positioning antenna and a GNSS orientation antenna to enhance positioning accuracy. See Section 1.2 for details on the WANJI T1's operating principles. Rotate the emergency stop button to the right. Briefly press the power switch to turn on the mower's power. Briefly press the power switch again, then briefly press the emergency stop button to turn off the mower's entire power system. Radar sensors detect obstacles to prevent collisions. Emergency Stop Button Pressing this button immediately halts the mower's operation and blade rotation.



Remote Control



Turn left: **Navigation**
In the middle: **Safe**
Turn right: **Manual**

Cutting table height adjustment
Upward: Rise
Middle: Stop
Downward: Descend

Engine switch (Cutter switch)
Move up: Start
Move down: Stop

Upward: Manual high gear
Downward: Manual low gear

Walking Joystick

Power On/Off

Do not press the highlighted button

Display screen

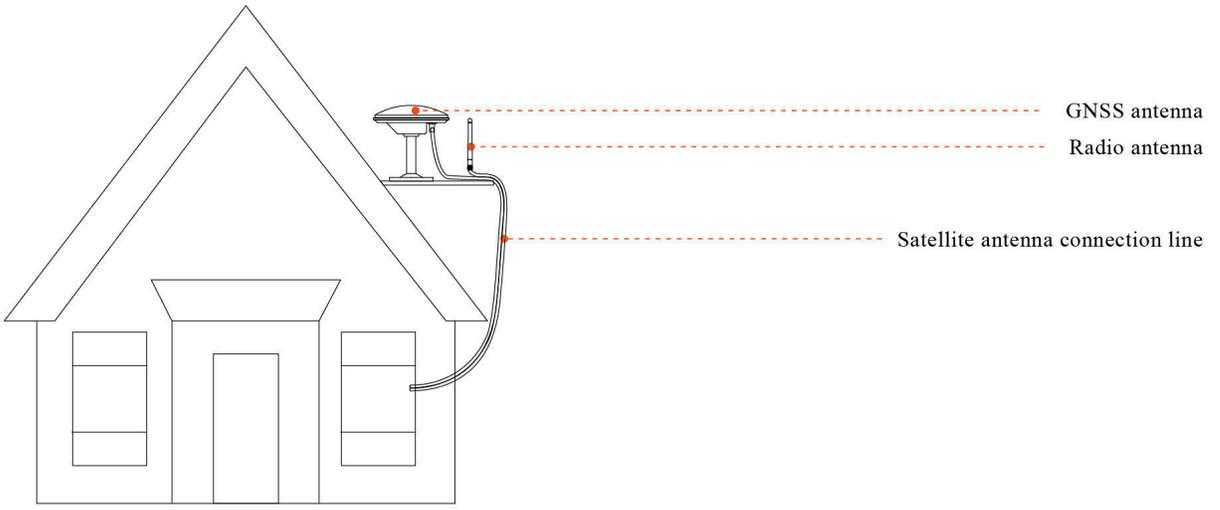
Display

	Meaning
Power Display	Display battery voltage

Control

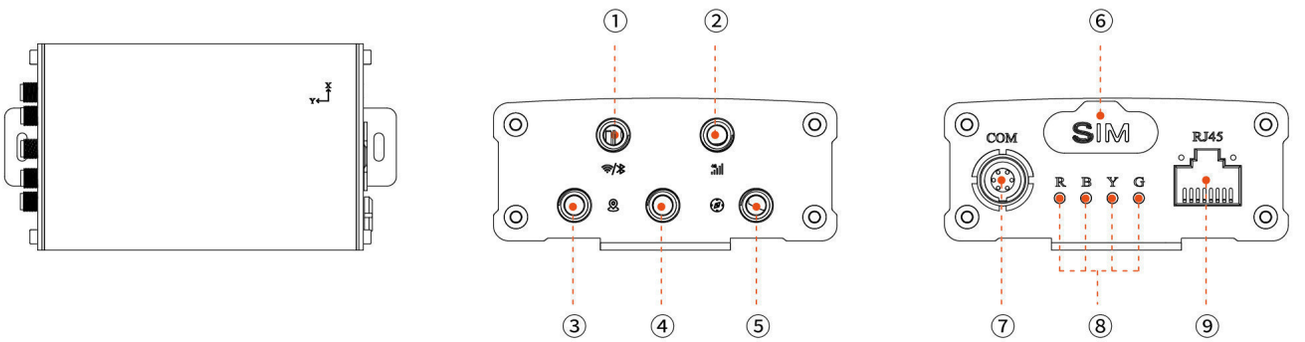
Operation	Description
Power On	Turn the emergency stop button to the right. Briefly press the power switch to turn on the mower. Let the mower idle for 1 minute.
Power Off	Briefly press the power switch, then briefly press the emergency stop button to turn off the mower.
Remote Operation	Press and hold the remote control's power button for 2 seconds to turn on. Move the joystick to control the mower's direction.
Throttle Control	To start, push the throttle controller forward to low speed or to the middle for medium speed. To stop the engine, push the throttle controller forward to slow speed. Refer to sections 5.2-5.6 of the engine manual for details.
Header Height Adjustment	Adjusting cutting deck height: Lifting the cutting deck moves it upward, pauses at the middle position, and lowers downward.
Start Mowing	Pushing the blade switch upward starts the engine and begins mowing. Pushing the blade switch downward stops the engine and halts mowing.

GNSS Antenna and Radio Antenna



• GNSS antenna: Receives satellite signals to improve the positioning accuracy of the lawn mower.

• Radio antenna: Enhances the strength of radio signals between base stations and mobile stations.

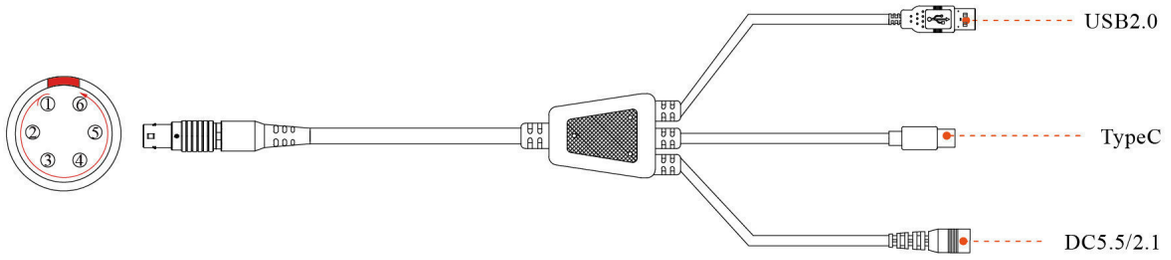


Serial Number	Interface Name	Meaning
①	Wireless/Bluetooth	External network data
②	4G antenna	Obtains 4G network signals
③	GNSS antenna interface (positioning)	GNSS position source
④	Radio antenna interface (not available for network version)	Increases radio signal strength
⑤	GNSS antenna interface (directional)	Directional point for GNSS direction data
⑥	MICRO SIM card (4G full network)	Inserts operator SIM card to obtain network
⑦	I/O	Serial port and USB communication
⑧	Indicator light	Displays various working statuses through different colors
⑨	Network port	External network data

Indicator Color	Status	Meaning
Red (R)	Flashes once per second	Effective positioning
Blue (B)	Steady on	Enter RTK fixed positioning
Orange (Y)	Steady on	Registered to LTE network
	Flashing	Not registered to the network
Green (G)	On for 0.2 seconds, off for 1.8 seconds	Normal connection status
	On for 1.8 seconds, off for 0.2 seconds	Standby
	On for 0.125 seconds, off for 0.125 seconds	Data transmission status

Lemo Connection Cable (One-to-Three)

① Communication port
② Communication port
③ GND
④ USB-DP
⑤ USB-DM
⑥ VCC

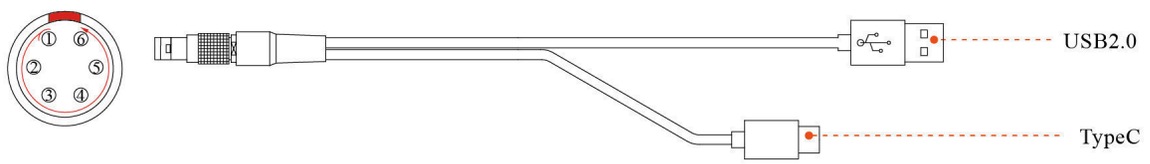


1.Equipped with Lemo to Type-A (USB) and Type-C cables. The USB interface adopts the standard USB2.0 protocol, which is used for the use and testing of systems such as Linux and Windows. The USB2.0 has a built-in USB-to-serial chip; please install the corresponding CH340 driver for the system before use. The Linux kernel has a built-in driver and can be used by direct plug-in.
2. The Type-C interface adopts the TTL serial protocol (3.3V level), which is used for embedded devices such as single-chip microcomputers. For wiring definition, please refer to the Type-C definition below for wiring.

		Function	Remarks
USB2.0	D-	USB2.0	Internal wire color: White
	D+	USB2.0	Internal wire color: Green
	-	Power negative pole	GND
TypeC	RX	Serial version (RX)	Internal wire color: White
	TX	Serial version (TX)	Internal wire color: Green
	-	Power negative pole	GND
DC5.5/2.1	+	Power positive pole	Supports 12~24V input
	-	Power negative pole	GND

Lemo Connection Cable (One-to-Two)

① Communication port
② Communication port
③ GND
④ USB-DP
⑤ USB-DM
⑥ VCC



1.Equipped with Lemo to Type-A (USB) and Type-C cables. The USB interface adopts the standard USB2.0 protocol, which is used for the use and testing of systems such as Linux and Windows. The USB2.0 has a built-in USB-to-serial chip; please install the corresponding CH340 driver for the system before use. The Linux kernel has a built-in driver and can be used by direct plug-in.
2. The Type-C interface adopts the TTL serial protocol (3.3V level), which is used for embedded devices such as single-chip microcomputers. For wiring definition, please refer to the Type-C definition below for wiring.

		Function	Remarks
USB2.0	D-	USB2.0	Internal wire color: White
	D+	USB2.0	Internal wire color: Green
	-	Power negative pole	GND
TypeC	S	Shell shielding layer	Can be left unconnected, connected to -
	+	Power positive pole	Supports 5V input
	D-	Serial version (RX)	Internal wire color: White
	D+	Serial version (TX)	Internal wire color: Green
	-	Power negative pole	GND

1.6 Technical Parameters

Model		WANJI WJ-T-900A
Basic Information	Product Name	WANJI WJ-T Series Smart Lawnmower
	Energy Type	Hybrid (Gas-Electric)
	Length*Width*Height	1500*1370*670mm (59.1 × 53.9 × 26.4 in)
	Net Weight	339kg (747.4 lb)
Lawn Mower Specifications	Protection Rating	IP54
	Operating Speed	0–6km/h (0–3.7 mph)
	Gradeability	≤40°
	Working Efficiency (Peak)	3000m²–4000m²/h (0.74–1 acre/h)
	Cutting Width	90cm (35.4 in)
	Cutting height adjustment	2~15cm (0.8–5.9 in)
	Blade Rotation Speed	3000 rpm
	Number of Blades	2-blade, 1-straight
	Engine	Briggs & Stratton (USA)
	Horsepower	810 cc, 27 HP
	Number of Cylinders	Twin-cylinder
	Starting Method	Electric Start
	Fuel Consumption	2L–4L/h (0.44–0.88 imp gal/h)
	Fuel Tank Capacity	10L-15L (2.2–3.3 imp gal)
	Fuel Type	92 and above(Regular unleaded (87 octane or higher))
	Control System	Remote Control (C7)
	Charger	Slow Charge

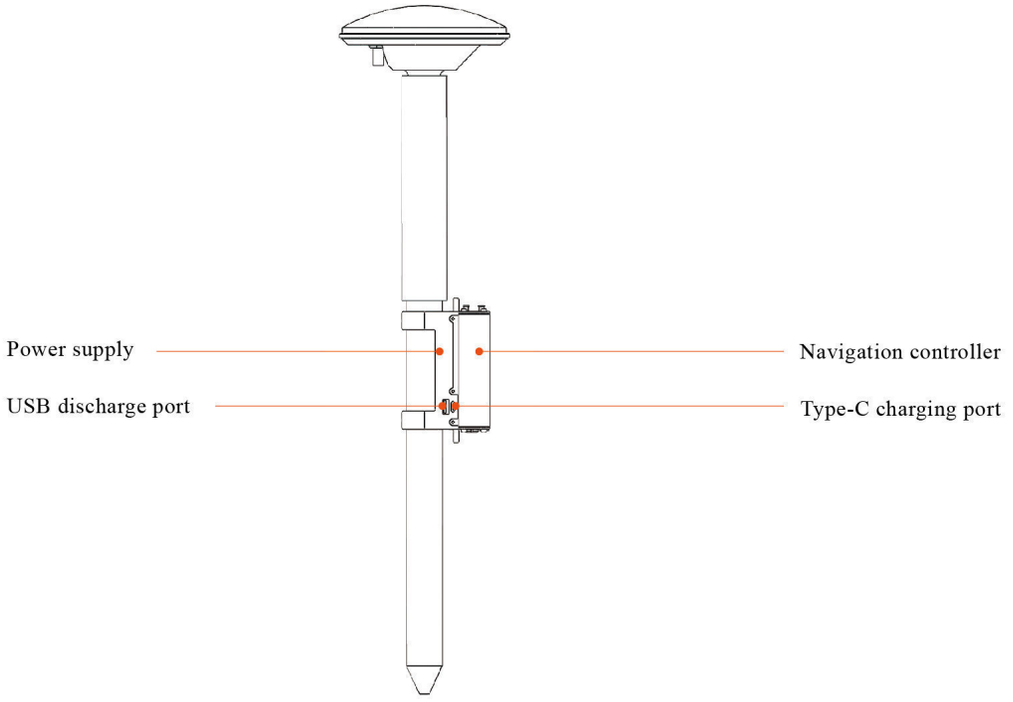
Optional		Online Edition	Radio Edition
Navigation Controller	Single-point positioning accuracy	1.5m (4.9 ft)	
	RTK positioning accuracy	2cm (0.79 in) + 1 ppm	
	Orientation accuracy	0.2° (GNSS signal good, baseline length ≥3.3 ft)	
	Data update frequency	2~20Hz	
	Initialization time	Cold Start Time ≤25s	
	Network access method	4G/WIFI	
	Dimensions	125.6x66.2x29.3mm (4.94x2.61x1.15 in)	
	Weight	185g (6.5 oz)	
	Material	Aluminum Alloy	
	Power consumption	3.5W (Typical Value)	
	Operating temperature	-40°F - 176°F	
	Storage temperature	-40°F - 176°F	
	Operating voltage	5V / 12V	
	Travel speed	Supports speeds of up to 2 m/s (6.6 ft/s)	

Tested on a newly mowed lawn at full power in an ambient temperature of 25°C (77°F) at standard cutting speed. The product mows more per hour in open areas than divided small lawns. Working efficiency will decrease when the lawn is wet or the grass is long. The flatter the lawn surface, the higher the working efficiency.

1.7 Optional Accessories (Sold Separately)

Handheld Point Marker

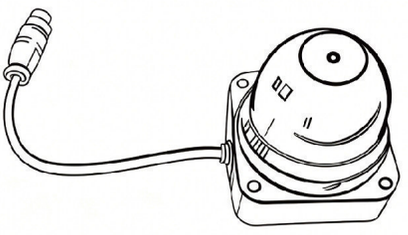
Through "on-site marking + data synchronization", the handheld point marker solves the detail problems that are difficult to cover by automatic mapping, allowing users to customize mowing plans more flexibly. It is a practical tool to improve mowing accuracy and personalization.

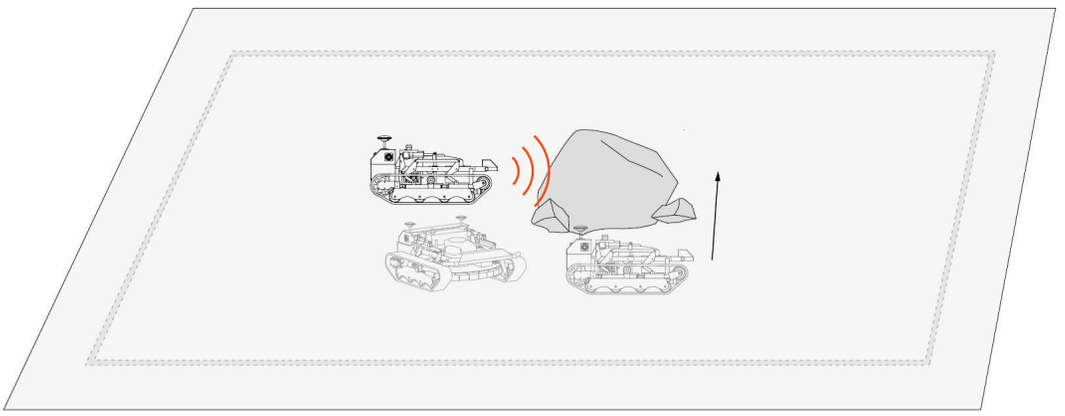


LiDAR

LiDAR precisely measures the distance between vehicles and obstacles by emitting laser beams into the surrounding environment and receiving reflected signals, generating high-precision 3D point cloud maps of the surroundings in real time.

The NAV-L3 system, integrated with LiDAR, clearly perceives the precise contours, size, and position of obstacles. Based on this information, it enables functions to stop or navigate around obstacles.





Industrial remote control

Emergency stop switch

Turn to the right

Engine switch (Cutter switch)

Turn up to start the engine

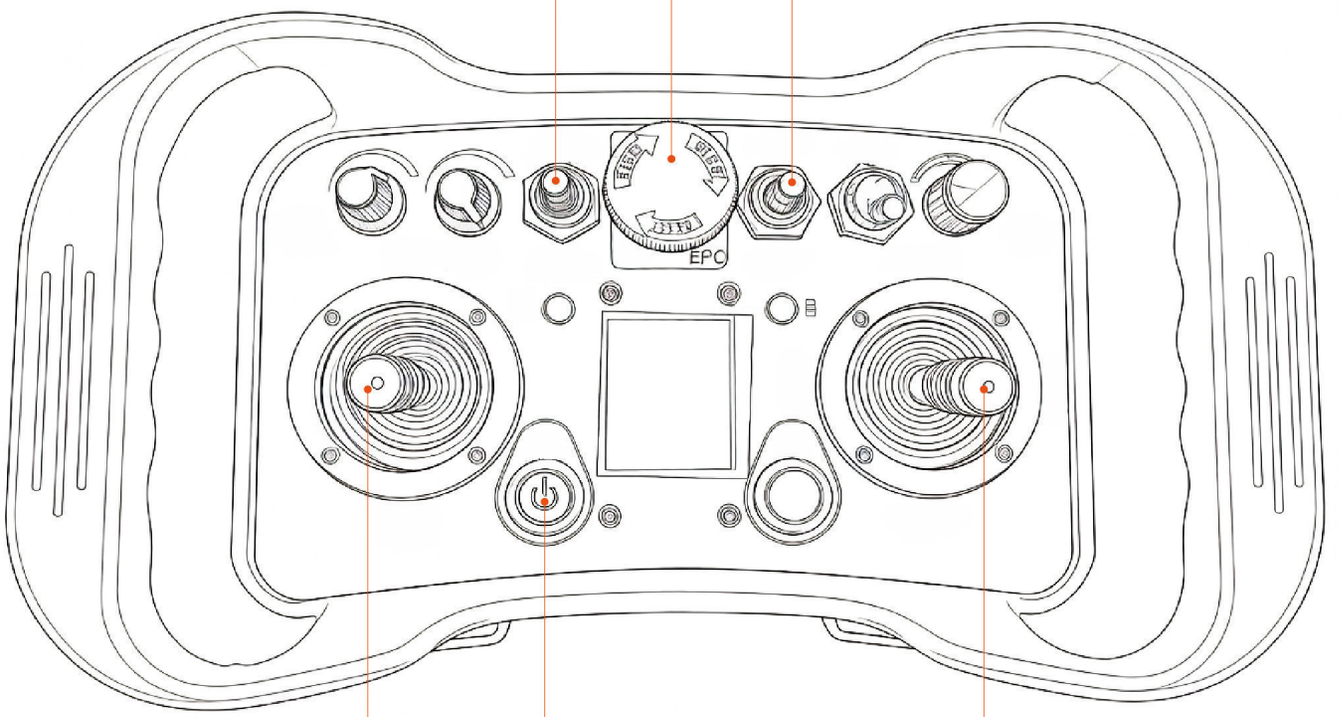
Turn down to switch off the engine

Cutting table height adjustment

Up: Raise

Middle: Stop

Down: Lower



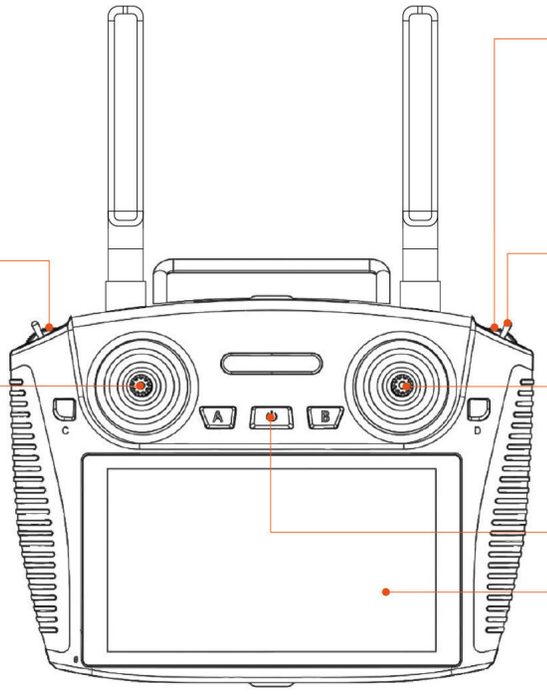
Front and rear walking joystick

Long press the power on/off button

Left and right movement joystick

YunZhuo G12 Remote Control

Equipped with a large-size display screen, it is mainly used to intuitively and conveniently remotely control the lawn mower and check the working status in real-time.



Cutting table height adjustment
Upward: Rise
Middle: Stop
Downward: Descend
(2-second pause)

(Dial) Engine switch (Cutter switch)
Push right: **Start engine**
Push left: **Stop engine**

Turn left：**Navigation**
In the middle: **Safe**
Turn right: **Manual**

Front and rear walking joystick

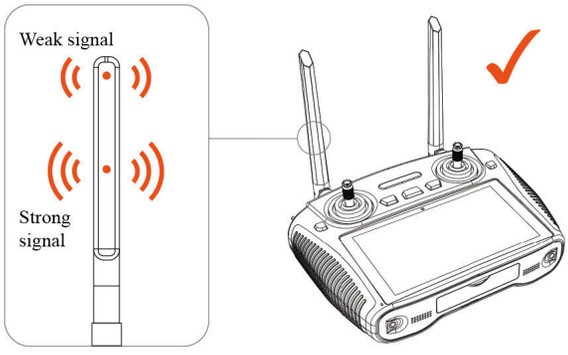
Left and right movement joystick

Long press the power on/off button

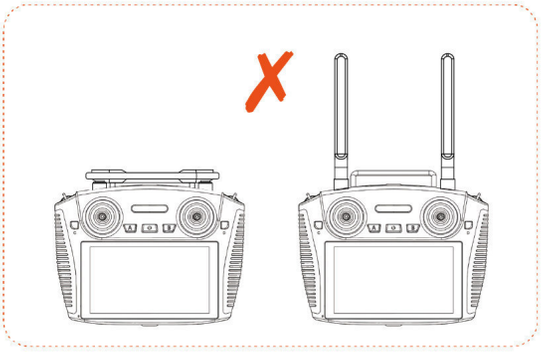
Display screen

How to Use

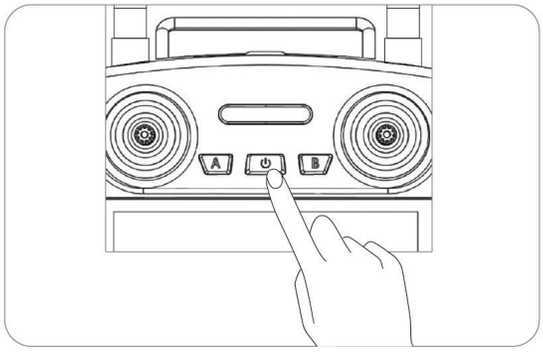
1 Unfold the antenna and point it vertically upward. As shown in the figure, the middle and lower part of the antenna is where the signal is strong, and it should face the direction of the lawn mower.



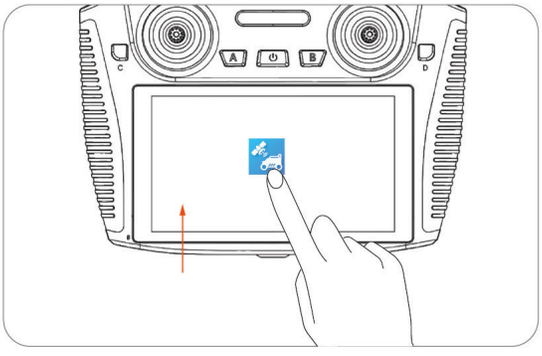
• Do not cross the antennas; folding and crossing will cause mutual interference between the two antennas, leading to signal abnormalities.
• Do not place it parallel to the remote control, as it will prevent the antenna signal from maximizing performance.



2 Long press the power button to turn on the remote control.

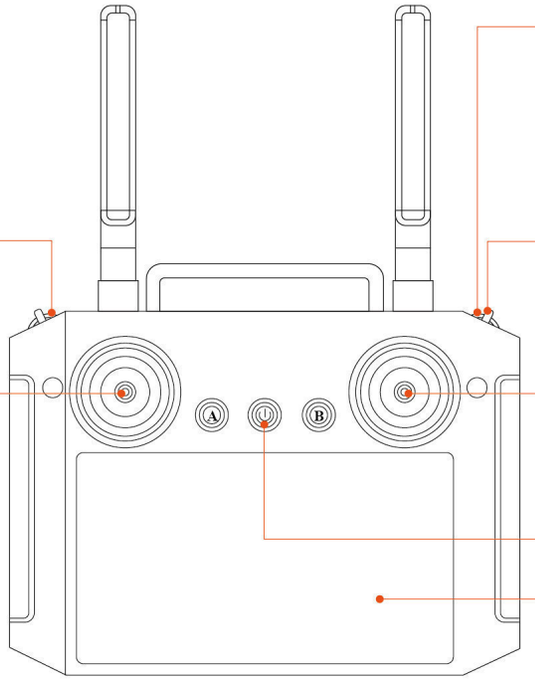


3 After power on, slide up from the bottom of the screen to the menu page, and click the "SmartNavi" App.



YunZhuo H12 Remote Control

Equipped with a large-size display screen, it is mainly used to intuitively and conveniently remotely control the lawn mower and check the working status in real-time.



Cutting table height adjustment
Upward: Rise
Middle: Stop
Downward: Descend
(2-second pause)

(Dial) Engine switch (Cutter switch)
Push right: **Start engine**
Push left: **Stop engine**

Turn left：**Navigation**
In the middle: **Safe**
Turn right: **Manual**

Front and rear walking joystick

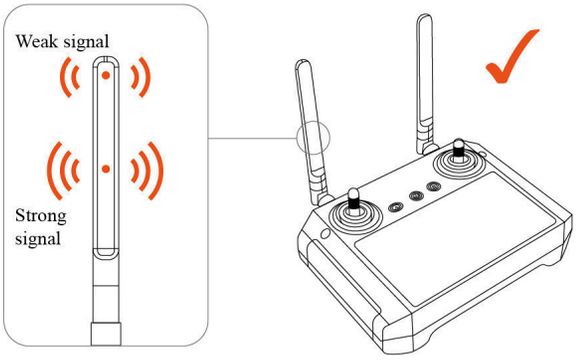
Left and right movement joystick

Long press the power on/off button

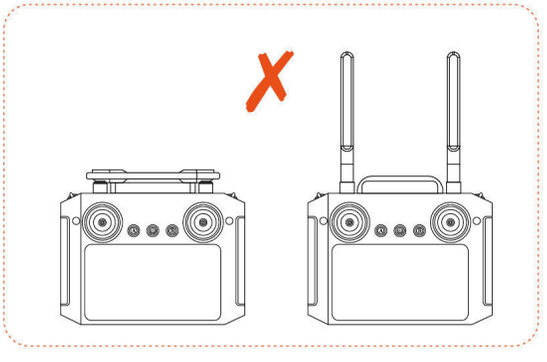
Display screen

How to Use

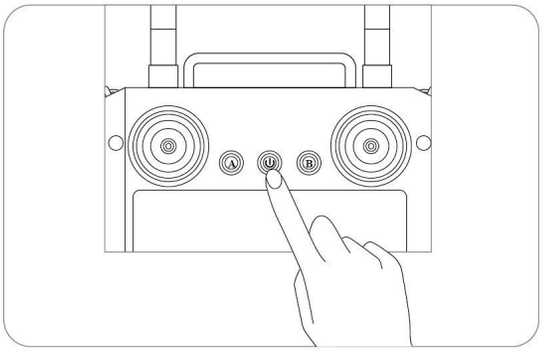
1. Unfold the antenna and point it vertically upward. As shown in the figure, the middle and lower part of the antenna is where the signal is strong, and it should face the direction of the lawn mower.



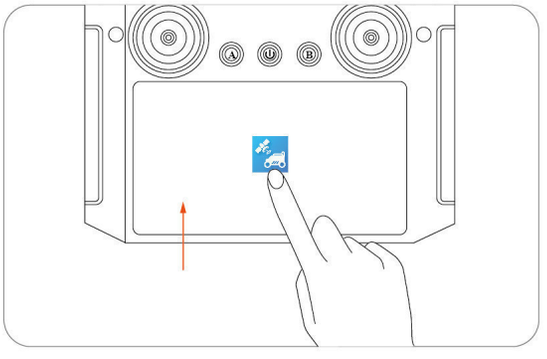
• Do not cross the antennas; folding and crossing will cause mutual interference between the two antennas, leading to signal abnormalities.
• Do not place it parallel to the remote control, as it will prevent the antenna signal from maximizing performance.



2. Long press the power button to turn on the remote control.



3. After power on, slide up from the bottom of the screen to the menu page, and click the "SmartNavi" App.



2. Installation and Mapping

2.1 Preparation Before Startup

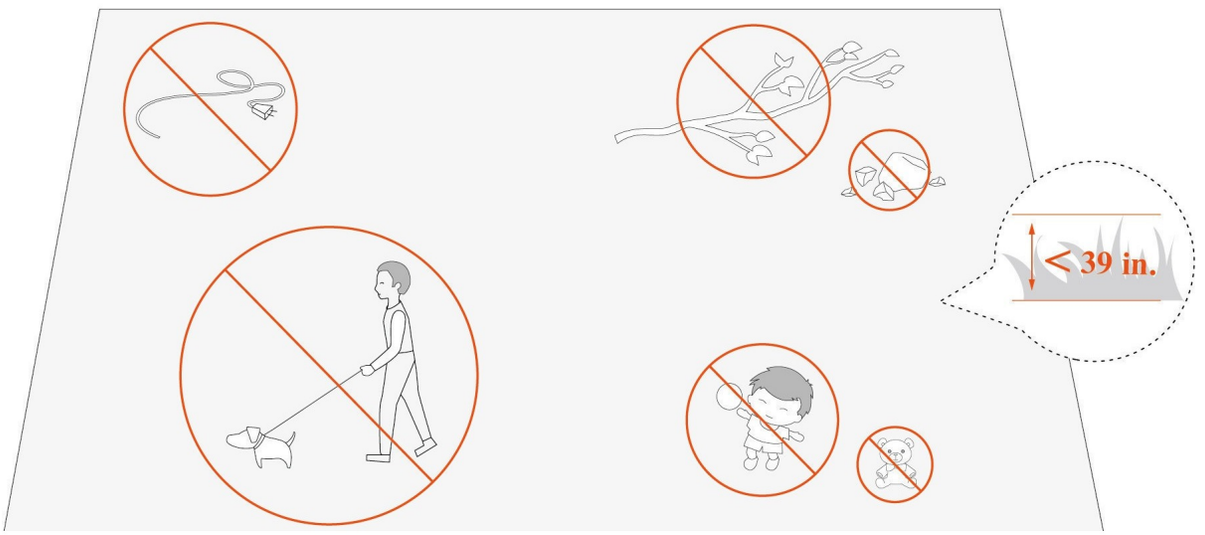
Prepare the Application Program (Network Version)

To ensure successful setup, please download and install the "SmartNavi" application program. You can also go to the Apple App Store (iOS system) to search for "SmartNavi". For Android systems, search for "SmartNavi" in Google Play. After installing the application program, please complete registration and login.

[ote: During use, the application program will request Bluetooth, GPS positioning, and Wi-Fi network access perm se, it is recommended that you enable the above permissions.

Prepare the Lawn

Before using the lawn mower, ensure the grass height does not exceed approximately 39 inches (100 cm). Clear the lawn of stones, metal objects, thick branches, and other hard materials to prevent blade damage or hazards. Additionally, keep children and pets away from the work area during operation to ensure safety.

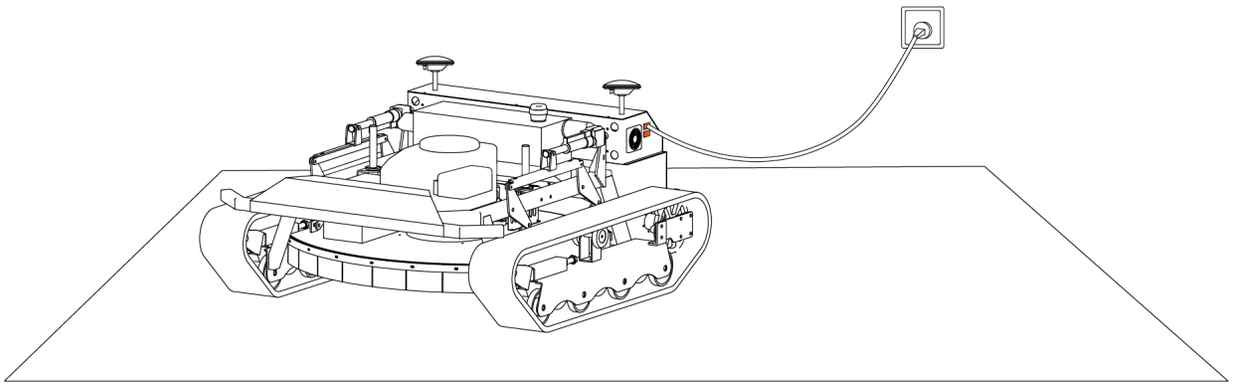


First Charging of the Lawn Mower

The battery may be low after long-term storage of the new lawn mower. Please fully charge the mower's battery before first use.

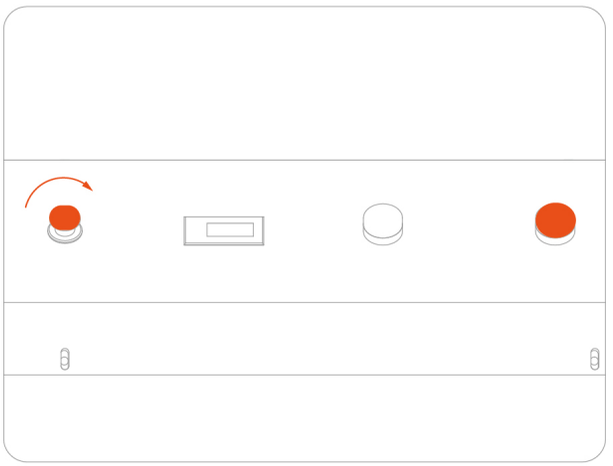
How to Charge

Open the mower's charging port (top for 24V drive power, bottom for 12V starter power). Insert the plug into the charging port and tighten the locking tab to prevent it from coming loose. Plug the other end into an outlet to begin charging.

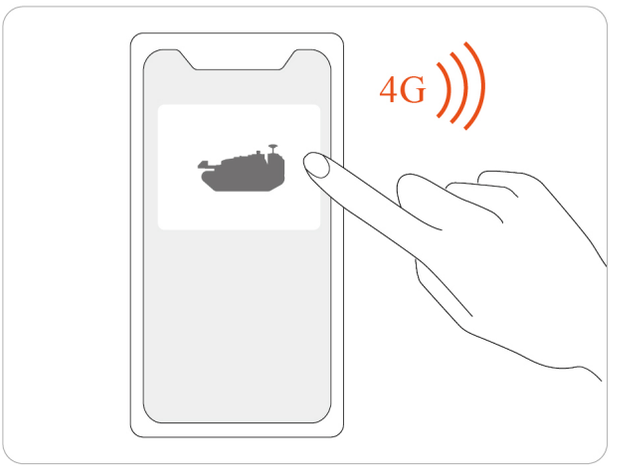


2.2 Start the Lawn Mower

1. To start the power, rotate the emergency stop button on the lawn mower to the right, then briefly press the power switch.



2. Connect the lawn mower via 4G network/radio network.



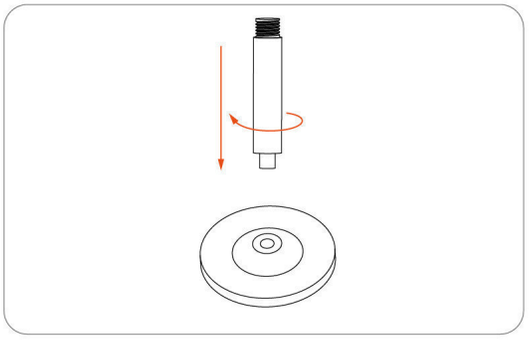
2.3 Install the Antenna

2.3.1 Base Station Installation

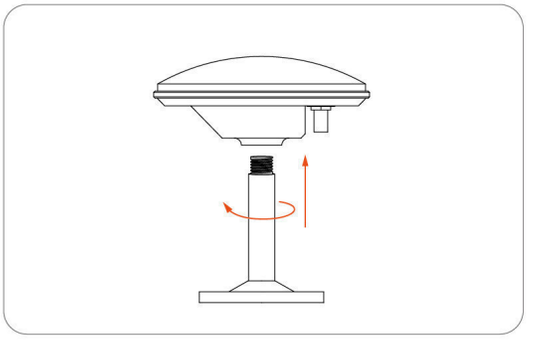
Base stations are primarily categorized into two types: network version and radio version. You may select the appropriate version based on your actual usage requirements.

Network Version Installation

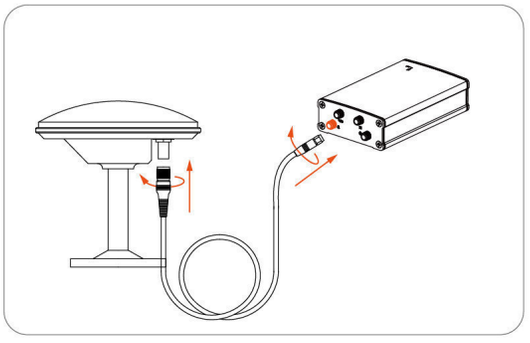
1. Screw the small end of the mushroom head connecting rod into the magnetic base.



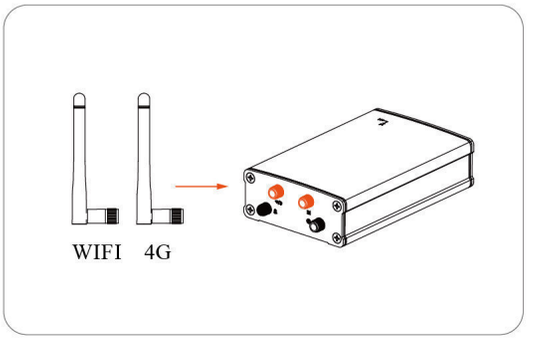
2. Screw the mushroom head into the connecting rod to complete the assembly of the antenna main body.



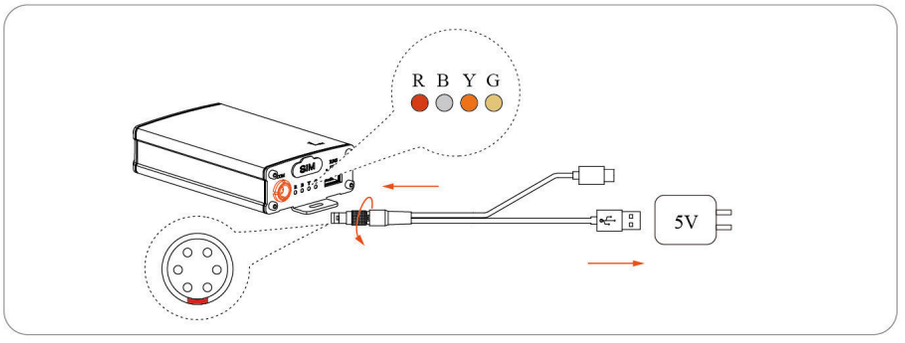
3. Insert the connecting cable plug into the mushroom head antenna. Insert the other end of the connecting cable into the locator interface.



4. Connect the 4G antenna and WIFI antenna to the locator.

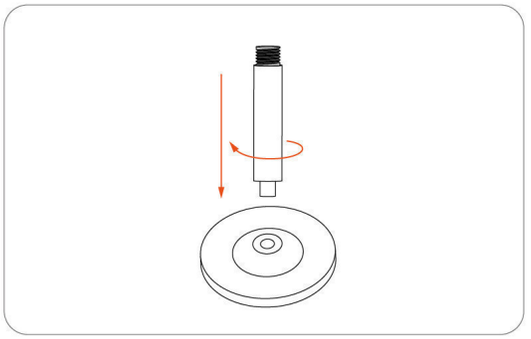


5. Connect the Lemo port of the power supply cable (red dot downward) to the locator. For the 4G version, insert the SIM card here. Insert the other end of the power supply cable into a 5V power supply. Wait for the Y light to be steady on, the G light to flash quickly, and the R light to flash, indicating that the signal is normal.

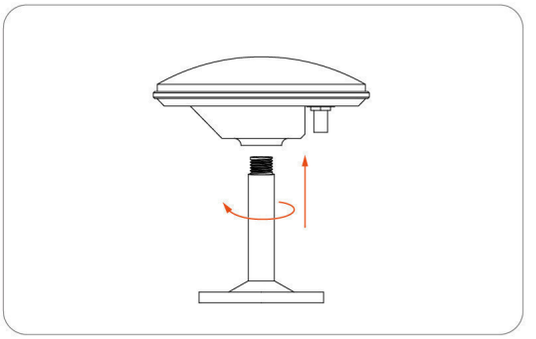


Radio Version Installation

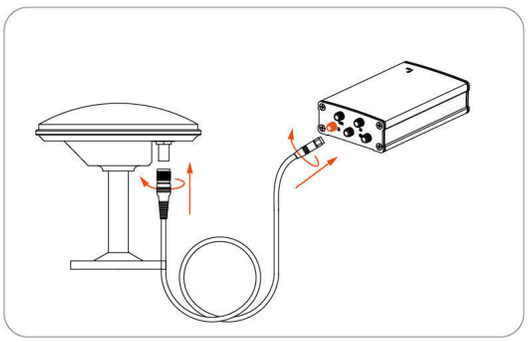
1 Screw the small end of the mushroom head connecting rod into the magnetic base.



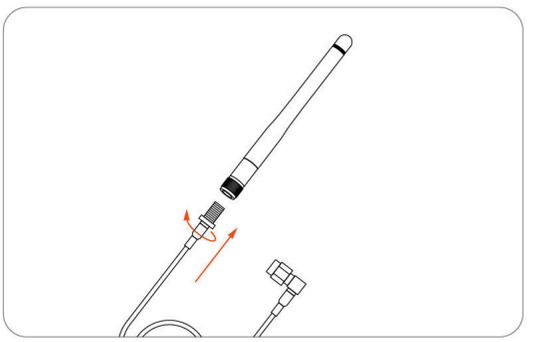
2 Screw the mushroom head into the connecting rod.



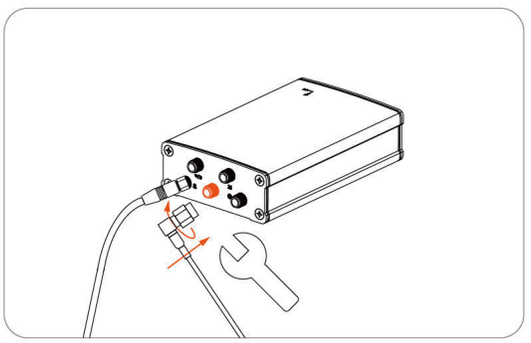
3 Insert the connecting cable plug into the mushroom head antenna. Insert the other end of the connecting cable into the locator interface.



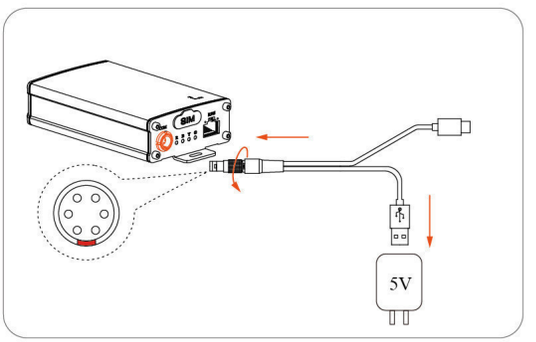
4 Connect the straight end of the radio connecting cable to the radio antenna.



5 Use a wrench to gently screw the right-angle end of the other end of the radio connecting cable into the locator interface.

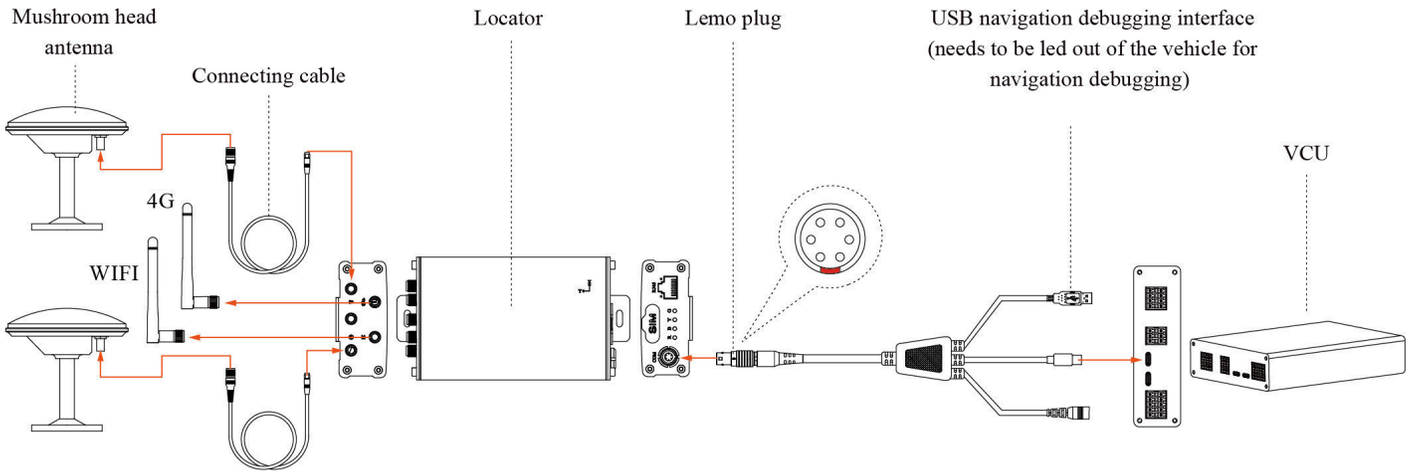


6 Connect the Lemo port of the power supply cable (red dot downward) to the locator, and insert the USB port of the other end into a 5V power supply.

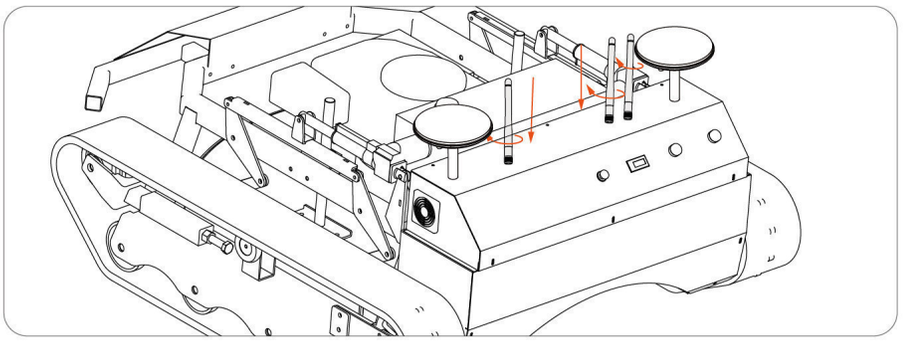


2.3.2 Mobile Base Station Installation

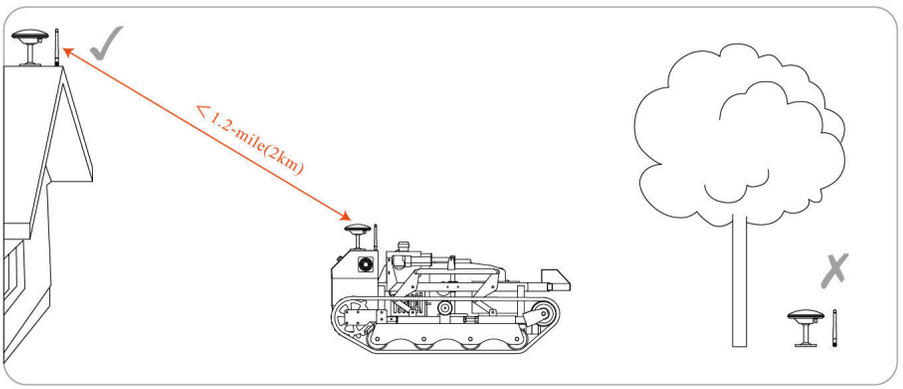
1 As shown in the figure, connect the mushroom head antenna, 4G antenna, WIFI antenna to the locator, and connect the locator to the VCU. (Installed before the lawn mower leaves the factory)



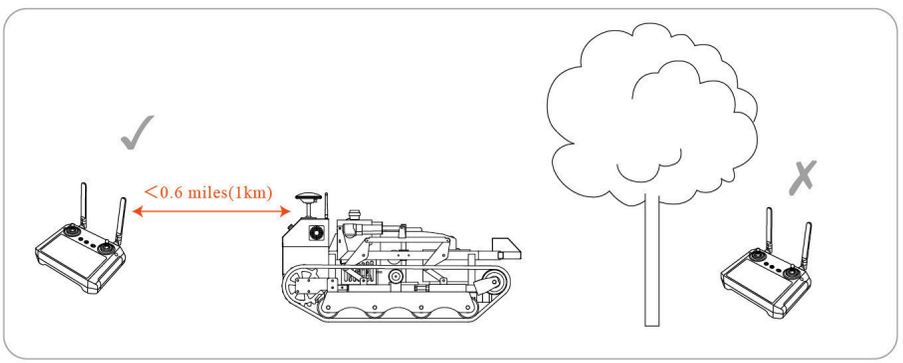
2 Insert the radio antenna and remote control antenna into the top of the lawn mower.



⚠ Ensure that the radio antenna on the mower maintains a direct line of sight with the base station's radio antenna, with no obstructions, and remains within a 1.2-mile(2km) distance.



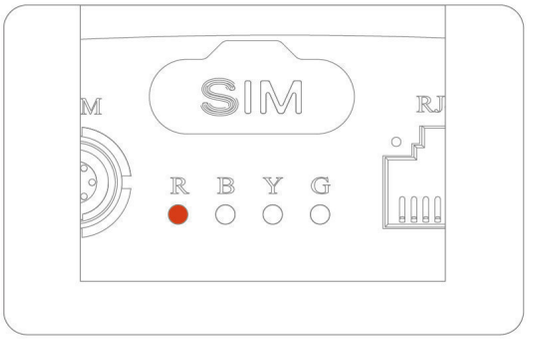
⚠ Ensure a clear line of sight between the receiver antenna on the mower and the remote control antenna, and keep the distance within 0.6 miles(1km).



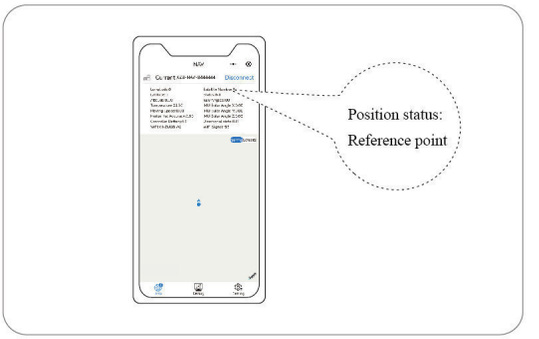
2.3.3 Antenna Inspection

Base Station Inspection

1. Power on the device and wait for the base station locator's red (R) indicator to flash (approximately 2 to 3 minutes).

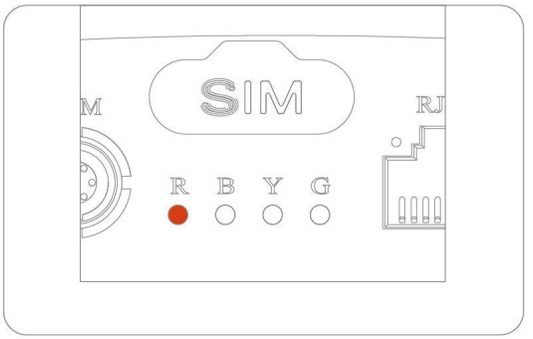


2. Check whether the positioning status of the mini-program base station is at the reference point(approximately 2 minutes after the red light flashes).

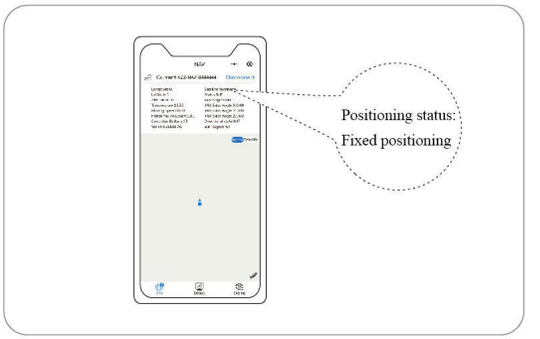


Mobile Base Station Inspection

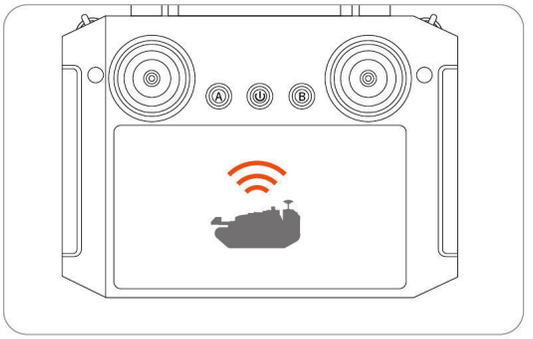
1. Power on the device and wait for the locator's red (R) light to flash (approximately 2 to 3 minutes).



2. Check whether the positioning status of the mini-program mobile site is fixed positioning(approximately 2 minutes after the red light flashes).



3. Check whether the devices are online in the remote control or the "SmartNavi" application on your mobile phone.



2.4 Location Selection

The basic principles for antenna placement are as follows:

1. Maintain a distance from buildings, trees, and walls (greater than 2 meters/6.6 feet).
2. Position the antenna in an open area to ensure unobstructed signal reception (e.g., clear of tree canopies or umbrellas).
3. Place the antenna on flat, non-paved ground and keep it vertical. Never install it on a slope.

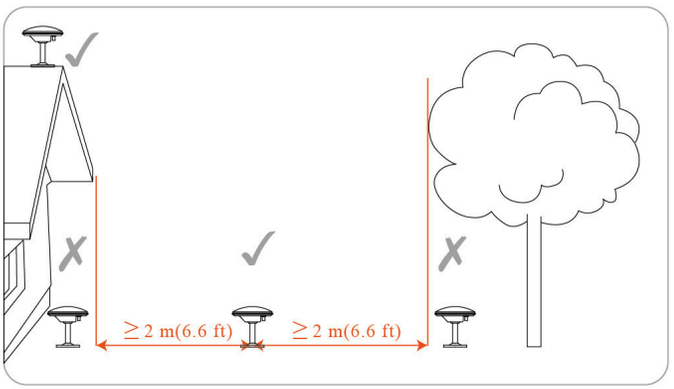
2.4.1 Antenna Location

Choosing the antenna location is one of the most important steps during setup. The antenna needs to be installed in a place where it can share as many visible satellites as possible with the device at any position. Otherwise, the device will be difficult to locate accurately during operation. For more information about visible satellites, please refer to Section 2.4.2 "Verifying location using satellite signal analysis software".

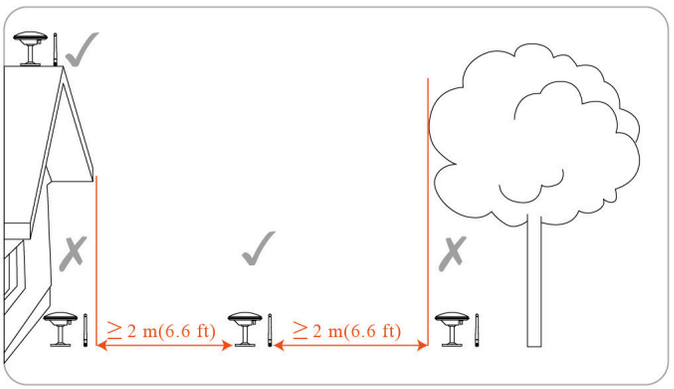
Guidelines for finding a suitable location:

• Try to choose an open area with no walls blocking the view around. Ensure that the sky directly above the antenna is not blocked by trees or roofs.

• If it is impossible to have a completely open area around, at least keep the southern sky unobstructed in the northern hemisphere and the northern sky unobstructed in the southern hemisphere. (If possible, try to keep the east and west sides free of obstacles.)

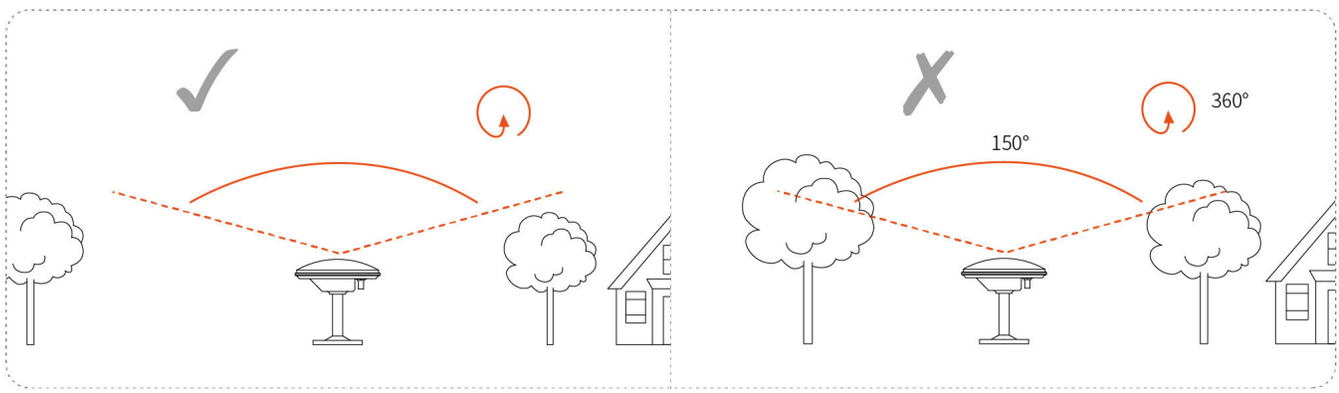


Web version

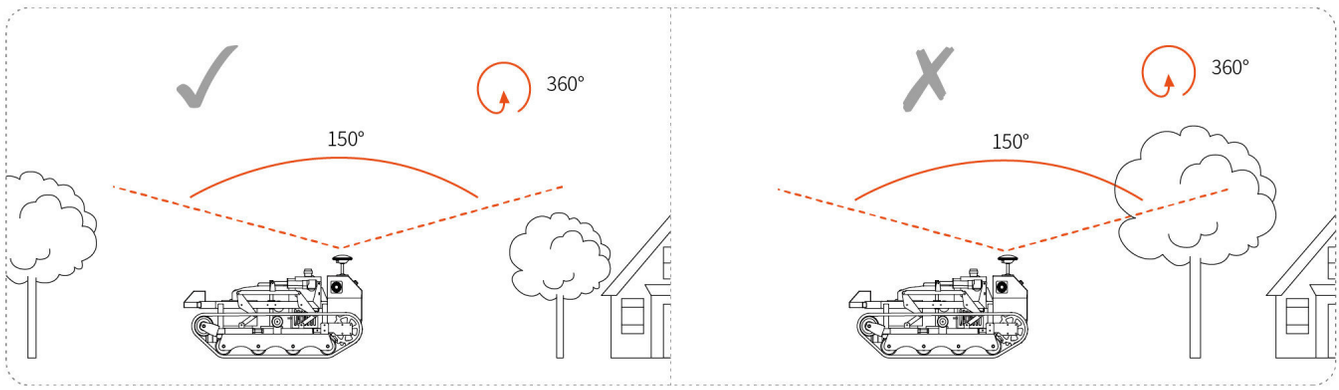


Radio version

Note: Ensure there are no obstructions within the 150° angle above the base station.



Note: Ensure there are no obstructions within the 150° angle above the rover station.

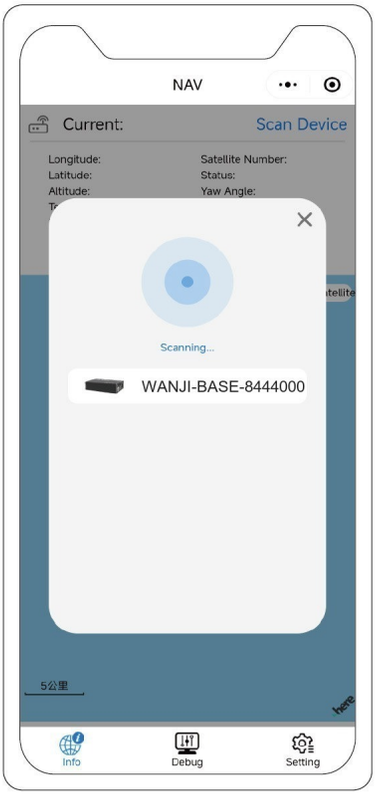


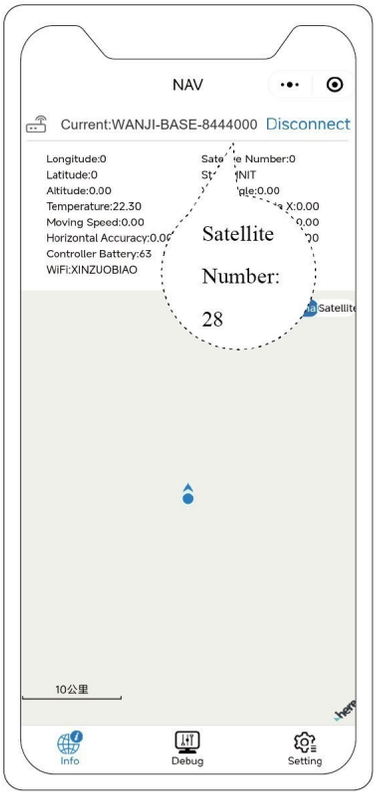
2.4.2 Verifying location using satellite signal analysis software

The satellite signal analyzer helps you verify whether the antenna and charging station are installed in the correct positions.

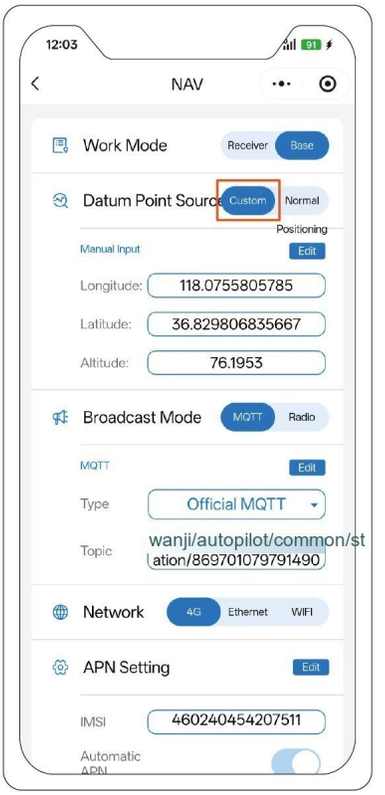
If the results indicate an adequate number of satellites, this confirms the antenna is properly positioned. If fewer than 22 satellites are detected, this means you need to relocate the antenna to a different spot. After relocation, check the satellite count again.

1. Click "Scan Device" to connect to the base station (starting with WANJI-BASE). After successful connection, the pop-up window will disappear, and you can view the number of satellites.





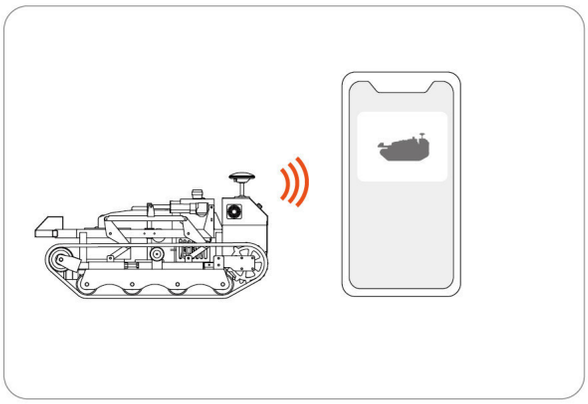
2. After completing base station testing and securing a fixed position, wait for the base station to enter the reference point. You can then switch to custom mode via the mini-program. This prevents map offset caused by base station power cycling. However, if the base station's position changes afterward, it will be unable to re-enter the reference point state.



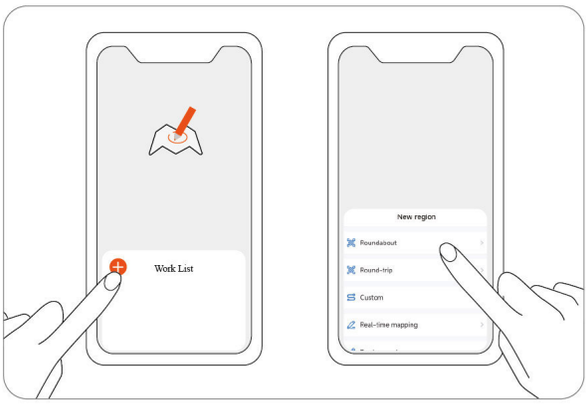
⚠ Please choose locations carefully. Once the map is saved, if the base station is reactivated or the GNSS antenna position is altered, you will need to create a new map or recalibrate the entire area based on the actual location of the return point.

2.5 Plan the Working Area

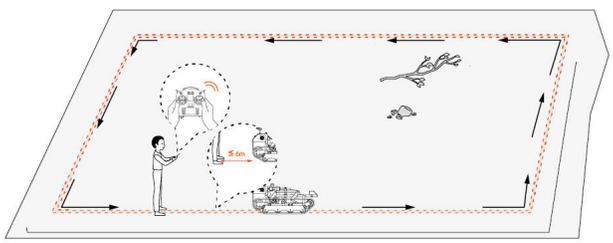
1. Turn on the lawn mower and the remote control. Your mobile phone and remote control will automatically establish a connection with the lawn mower via 4G network/radio. (For initial pairing, Bluetooth must be enabled and the device must be within 2 metres.)



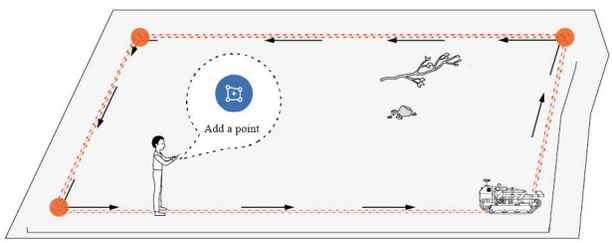
2. Enter the "Device Details" page, click the "+" icon in the operation list, select the corresponding route type (such as zigzag), and enter the new area page. For other route operations, please refer to the "Application Program Manual".



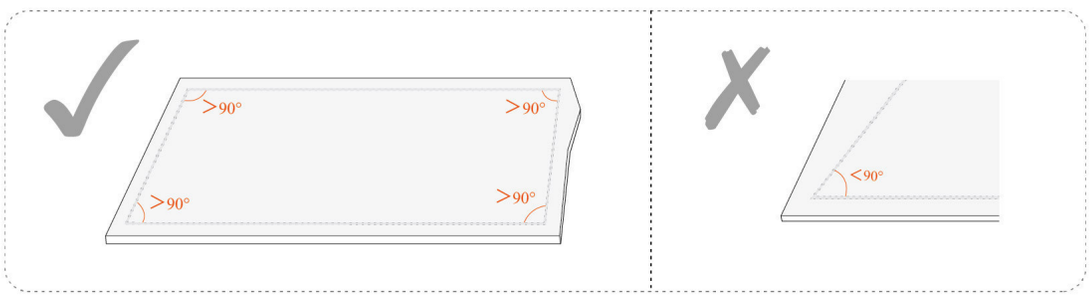
3. Find a suitable starting point at the edge of the lawn. Keep the mobile phone active and avoid switching to other applications. During mapping, keep the lawn mower within 6 meters (19.7 feet). If the device behaves abnormally, you can stop controlling the device at any time.



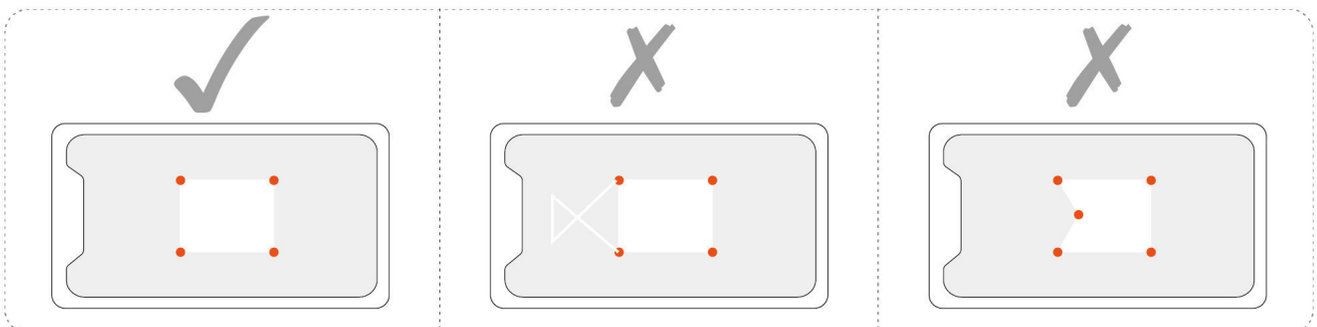
4. Use the remote control to move the machine to the inflection point of the area to be operated, and click the "Add Point" button. Add the endpoints of the working area in clockwise or counterclockwise order until all endpoints of the working area are completed. During the point marking process, you can undo the last recorded endpoint by clicking the undo button.



Angle: Ensure to drive in a straight line, with gentle turning angles not less than 90°.

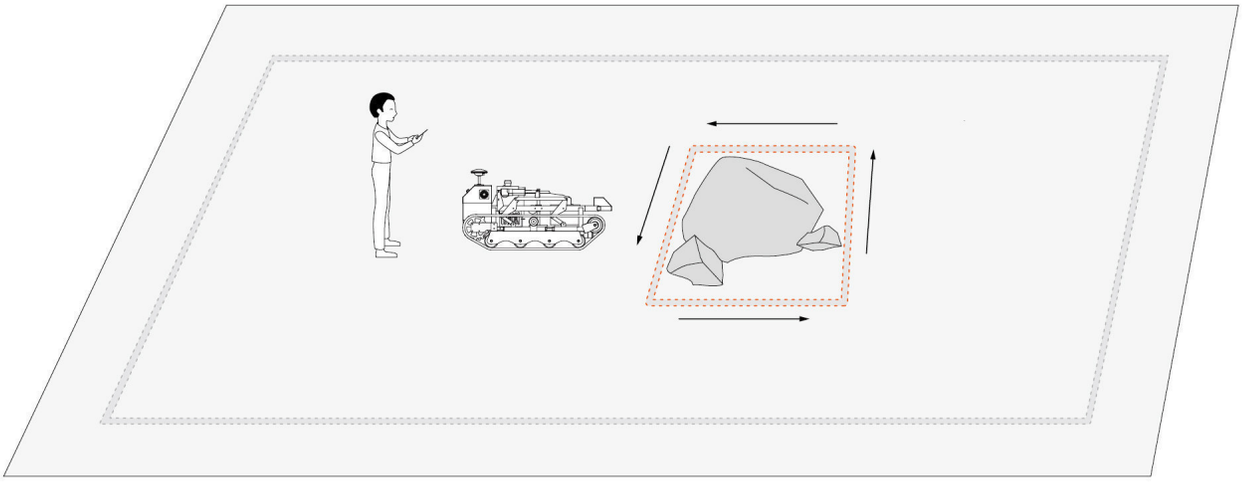


Note: Check the route to see if it exceeds the working area (the working area is the white area). If it exceeds the working area, please re-plan the working area. To ensure the operation effect, the working area should be as quadrilateral as possible, without large protruding and concave areas. If necessary, it can be divided into multiple areas.



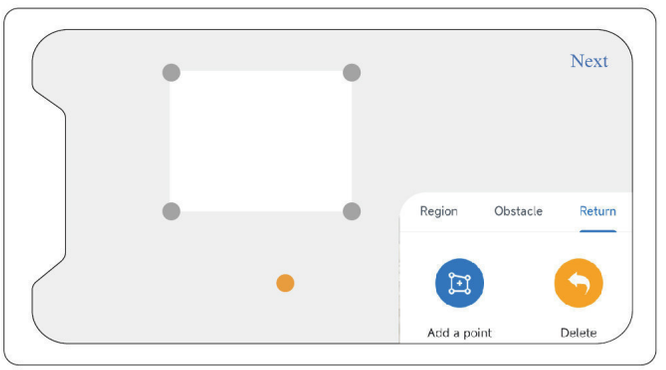
5 If there are hard obstacles in the lawn, such as large rocks or trees, you can set up no-go zones for the mower. (This setting is also required for obstacles after installing the LiDAR sensor on the device.)

Click “Obstacle Point,” use the remote control to move the machine to the obstacle's location, click “Add Point” to mark multiple corners of the obstacle one by one, then click “Done.”

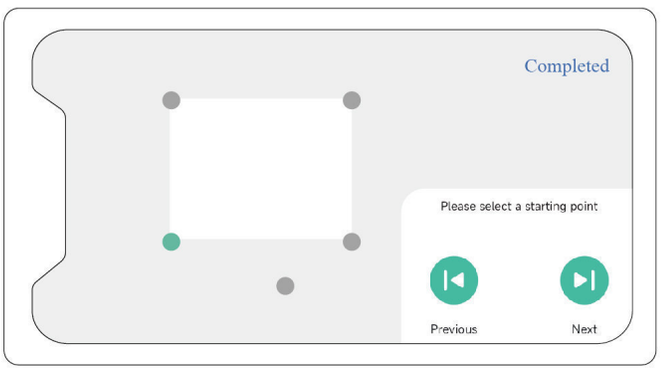


Note: When setting obstacles, keep the turning angle smooth, and the angle shall not be less than 90°. When setting islands, you also need to walk along the edge.

6 Click "Return Point", use the remote control to move the machine to the return position, click "Add Point", and click "Next" in the upper right corner.



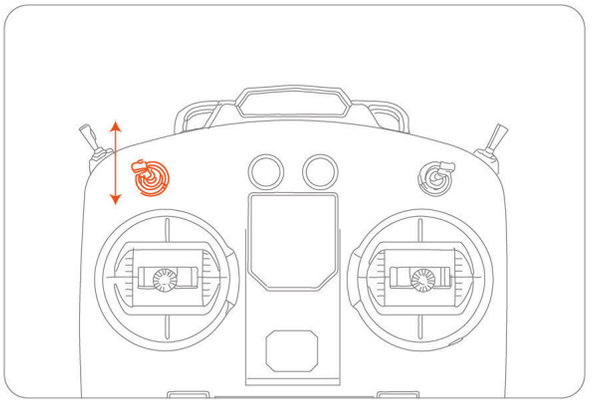
7 Set the starting point of the current working area. You can switch by clicking the white record point in the map or clicking the "Previous" and "Next" buttons below. Click the "Next" button in the upper right corner. Enter the operation name and click "Complete".



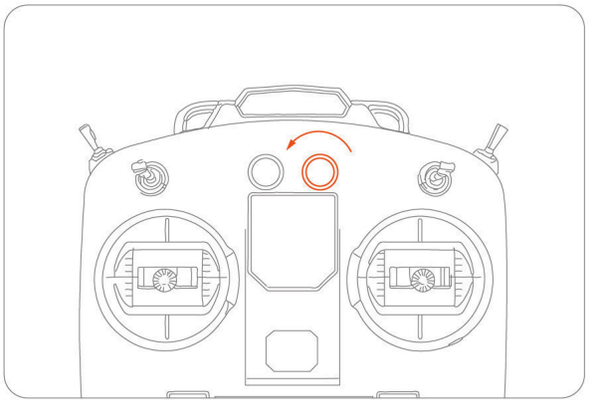
3. Daily Use

3.1 Lawn Mowing

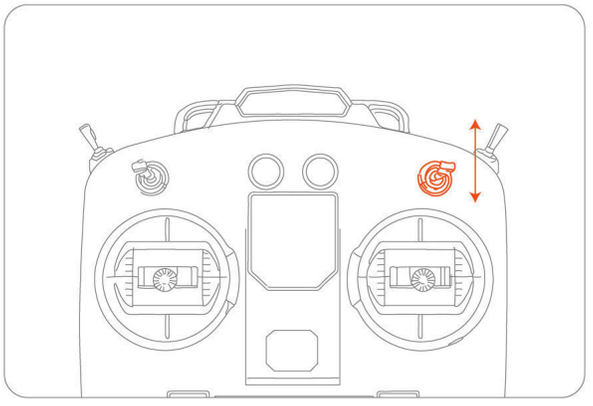
1. Adjust the cutting height: Use the remote control to activate the cutting deck lift mechanism. Pressing up raises the deck, the middle position stops it, and pressing down lowers the deck.



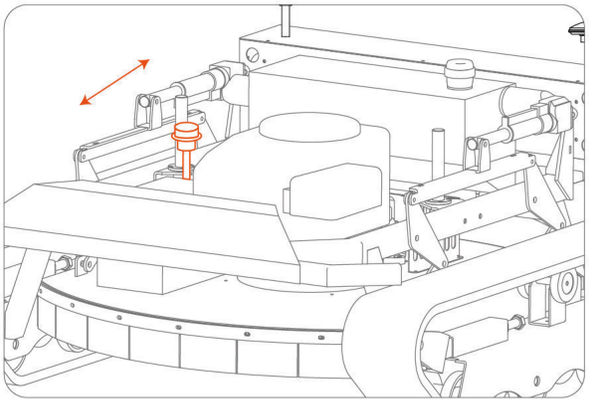
2. Remote control operation mode: Turn left to navigate operations.



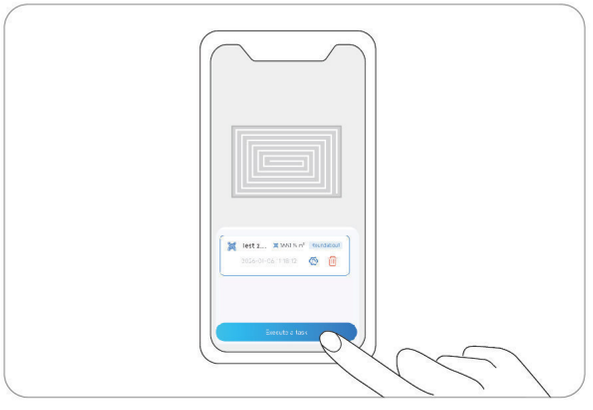
3. Remote control switch: Toggle upward to start the engine.



4. Throttle control for the lawn mower: To start, adjust the throttle control forward to low speed or to the middle position for medium speed.



5. Select the pre-created mowing zone in the mobile app, tap Start Mowing, and the mower will begin automatically cutting the grass.



3.2 SmartNavi App

3.2.1 Introduction

The SmartNavi App is an important part of the lawn mower. Through this App, you can:

1.Bind and activate the lawn mower.

2.Create a map (working area) containing multiple mowing areas.

3.Check the status and operation progress of the lawn mower, and remotely control the lawn mower to start, stop, etc.

4.View and modify the mowing operation settings (map management).

5.Unbind and retain or clear user data.

3.2.2 Download, Registration, and Login

1.Search for "SmartNavi" in the Apple App Store (iOS system) and download it. (For Android systems, please scan the QR code to download)

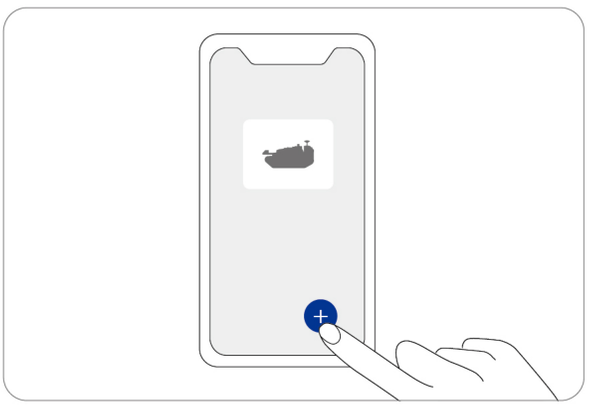
2.Register and log in to your account.

3.Turn on the Bluetooth function of the mobile phone and ensure that the mobile phone is within the network signal coverage.

3.2.3 Basic Operations

Bind the Lawn Mower

After registration and login, click "+" to add a device and bind the lawn mower to your account. For more information, refer to 2.2 Activate the Lawn Mower.



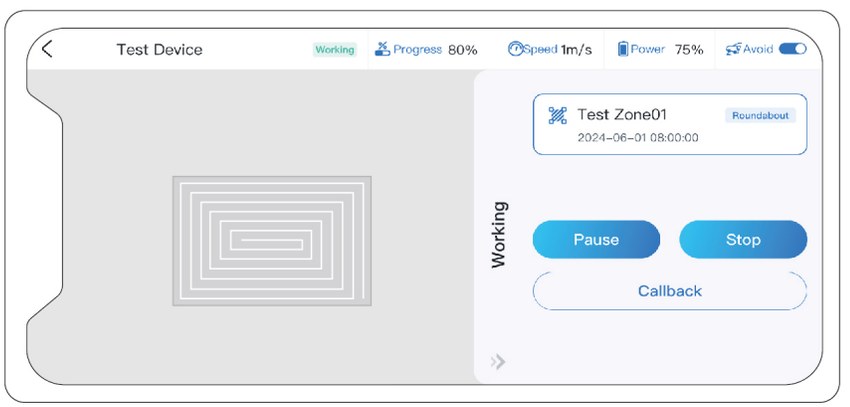
Create a Map

Before using the lawn mower to mow the lawn, you need to create a working area (map) through the intelligent operation App. Click "+" to add a new operation and follow the guidance in the App. For detailed steps and skills, refer to Section 2.5 "Plan the Working Area".

The map can also be edited or deleted on the device details page. For more information, refer to the "Application Program Manual".

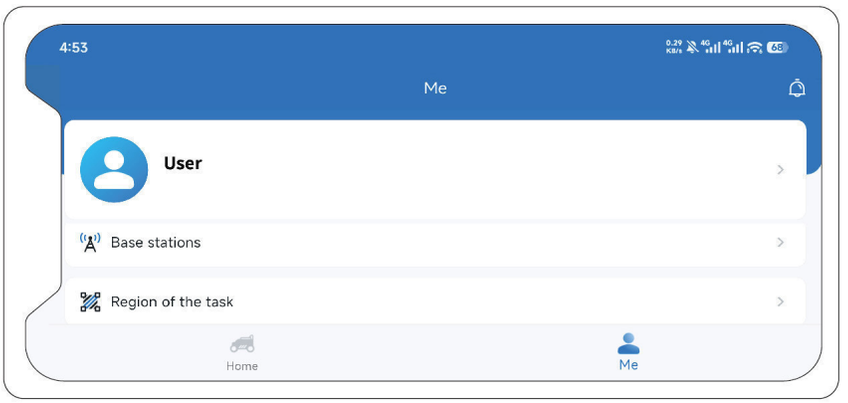
Check Device Status

The device details page displays the status, operation progress, and mowing tasks of the lawn mower. You can choose to view the working range of all areas or selected areas, and start/pause mowing tasks.



3.2.4 Personal Information

Click "My" to enter the personal page, browse and adjust the settings related to the intelligent operation App.



Account and Security

You can view the bound email address or mobile phone number, modify the password, and log out of the current account.

Language

Click "Settings" to enter the settings page. The default language is the same as the mobile phone system language. To modify the language, click "Language" and set it to Chinese/English.

4. Maintenance

To achieve optimal mowing results and extend the mower's lifespan, always keep the mower clean and maintain the blades in good condition. Weekly inspections and maintenance should be performed by an adult, with any damaged or worn parts replaced. Never perform maintenance while wearing open-toed sandals or barefoot. Always wear long pants and work shoes when servicing the mower.

4.1 Daily Maintenance (Performed Daily)

Control Box Cleaning

• Frequency: At least once per week;
• Method: After opening the panel, use compressed air to remove dust. Do not wash with water (to prevent electrical malfunctions).

Battery Check (After Daily Work)

• Inspection Method: With the engine off, check the remaining charge level using the voltage indicator.
• Charging Standard: If the remaining charge falls below 80%, immediately connect an external charger to recharge.
• Full Charge Indicator: When the charger indicator light turns green, it indicates the battery is fully charged.

4.2 Regular Maintenance (Core Parameters and Intervals)

Engine Oil Maintenance

• Initial oil change: After 5 hours of operation for new units; Subsequent changes: Every 100 hours (adjustable based on actual operating conditions).
• Oil grade: Use SAE 5W-30/10W-30, matched to ambient operating temperatures (refer to Section 8.1 of the Engine Operation Manual for details).

Key Component Inspection Cycle

• Engine oil level: Check once every 5 hours or daily;
• Air filter: Inspect and clean every 5 hours; replace promptly if it remains dirty after multiple cleanings;
• Spark plugs: Inspect every 50 hours or quarterly; inspect or replace every 100 hours;
• Fuel filter: Inspect or replace every 100 hours;
• (Detailed maintenance intervals can be supplemented by referring to Section 6.2 of the Engine Operation Manual).

Maintenance of Drive Motor Reducers

Perform maintenance at least twice annually: Remove the drive wheel → Disassemble the inner gearbox housing of the drive wheel → Thoroughly clean with diesel fuel → Reapply lithium-based grease.

Generator Belt Inspection

• Standard tension: 0.39 in (10mm) (reasonable deformation range when pressing the belt);
• Troubleshooting: If the machine displays “low generator voltage” or “belt slippage with abnormal noise,” immediately adjust the tension or replace the belt.

4.3 Component Inspection Specifications (Pre-Safety Assurance)

Cutter Blade Inspection (Mandatory Before Each Startup)

• Inspect whether the cutter disc mounting screws are loose and whether the cutting blades have missing teeth;
• Risk Warning: Missing teeth on cutting blades can cause dynamic imbalance and excessive machine vibration, leading to loosening of the spacers. Ensure all components are securely fastened to prevent potential safety incidents.

Track Tension Inspection (Performed Periodically)

• Inspection Method: Pull the track up and down between the drive wheel and the front steering wheel;
• Standard Range: Distance from the highest arc point to the lowest concave point: 1.18 in to 1.97 in(30mm to 50mm);
• Risk Warning: Excessively loose tracks may detach. Continuing operation after detachment will directly damage the track.

Harvester Platform Elevation Mechanism Inspection (Performed Periodically)

Check whether the lifting mechanism bolts are loose. Maintain proper clearance to ensure smooth cutting platform elevation.

4.4 Blade Replacement

If the lawn mower is used frequently, it is recommended to replace the blades and screws every 1-2 months to ensure safety and better mowing results. To ensure the safety of the cutting system, please replace both blades and their screws at the same time.

Wet grass is more likely to adhere to the blades and the bottom of the lawn mower, which may affect equipment performance and increase the frequency of cleaning. For the best results and to keep the lawn healthy, avoid mowing during heavy rain or when the lawn is excessively wet.

It is normal for grass clippings to accumulate on the blades during mowing. The blade design ensures smooth rotation even with minor debris buildup. Occasional accumulation does not impair the mower's efficiency, as it is engineered to maintain performance even with long-term minor debris buildup on the blades.

Debris can be removed when replacing the blades, but it is not necessary to handle it immediately unless excessive debris adheres to the blades.

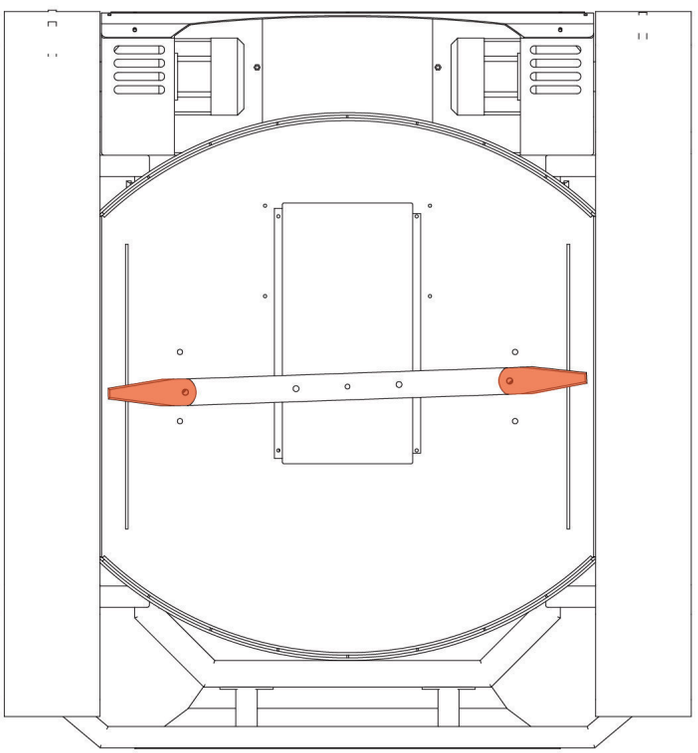
⚠ Warning

- Wear protective gloves when inspecting or maintaining the blades.
- Do not use an electric screwdriver to install or loosen the cutterhead. Only use the correct type of screws and original blades certified by the manufacturer.
- Do not reuse screws. This may cause serious injury.

How to Replace the Blades

1. Turn off the lawn mower.
2. Lift the lawn mower.
3. Use an Allen wrench to loosen the screws.
4. Remove the screws and blades.
5. Tighten the new blades and screws. Ensure that the blades can rotate freely.

Note: Be sure to tighten the screws to prevent the screws from loosening and falling off when the cutterhead rotates and hits hard objects.
During mowing, the rotating cutterhead will generate centrifugal force, causing the blades to tilt outward. This outward tilt angle allows the blades to cut the lawn effectively.

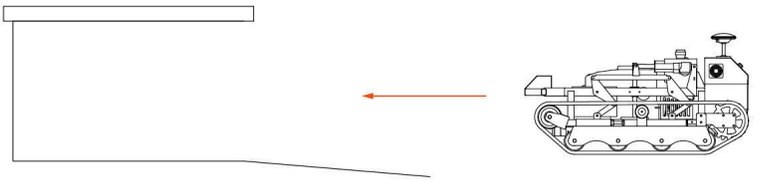


4.5 Transportation

To protect the lawn mower, use the original packaging for long-distance transportation. Before carrying, moving, or transporting the product, please turn off the power first. Handle with care during operation to avoid violent operations (such as heavy pressure).

Correct Moving and Transportation Method

Use the remote control to move the lawn mower into the original packaging.



4.6 Battery Maintenance

• After the lawn mower is out of use, charge the battery to 85% or higher before storage to avoid damage to electronic components due to over-discharging. For long-term storage, charge the lawn mower every 120 days.

• Battery damage caused by over-discharging is not covered by the limited warranty.

• Do not use or store the battery under extreme temperature conditions, i.e., higher than 50°C (122°F) or lower than -20°C (-4°F).

• When the temperature reaches 0°C (32°F)/53°C (127°F), the temperature protection mechanism will be activated. At this time, the battery cannot be charged, and charging can only be resumed when the temperature rises above 3°C (37°F)/drops below 49°C (120°F).

• When the battery temperature is too high or too low, the lawn mower will stop working.

Note: Battery life depends on the frequency of product use and total working time. When the running time per charge is significantly shorter than the normal level, or the lawn mowing effect is poor, please consider contacting after-sales service to replace the battery.

4.7 Power Supply

• Cut off the power supply:

- Before removing blockages;

- Before inspecting, cleaning, or operating the machine;

- After hitting foreign objects, check if the machine is damaged.

• Regularly inspect the power cord, plug, shell, and other parts. If any signs of damage or aging are found, stop using it immediately.

⚠ Warning

• Do not use a damaged power adapter. If the power cord is damaged, it must be replaced by the manufacturer, its service agent, or a person with equivalent qualifications to avoid danger.

• Do not connect a damaged power cord to the power adapter, or touch the damaged power cord or extension cord before the power cord is unplugged from the socket. A damaged power cord may cause contact with live parts.

• Do not use the power adapter for other products or batteries, otherwise, it may cause personal injury, fire, or electric shock risks. Non-original batteries cannot guarantee product safety.

• Do not charge the battery if it leaks.

• Keep the power cord away from moving dangerous parts to avoid damage to the power cord leading to contact with live parts.

4.8 Storage

• Before storage, turn off the mower's power and charge the battery to 85% capacity or higher to prevent permanent damage from deep discharge. Drain gasoline from the fuel tank and run the engine until it stops (to prevent carburetor clogging).

• Store in a cool, dry indoor location. Direct sunlight and extreme weather (high or low temperatures) accelerate component aging and may cause permanent battery damage.

• Keep the mower and power supply away from heat sources (such as stoves, radiators, etc.) or chemicals. The power supply must be protected from moisture and placed in a well-ventilated area.

⚠ Warning

When there is a risk of thunderstorms, unplug the power cord from the power outlet. Disconnect all power cords connected to antennas. Reconnect only after the risk of thunderstorms has passed.

4.8.1 Winter Storage

To ensure optimal performance and service life, it is recommended to properly store your lawn mower during the winter inactivity period. Correct storage can protect the equipment from harsh winter environments and ensure that it functions properly when activated in spring. Low-temperature environments (including freezing temperatures and snowfall) may damage the precision parts of the lawn mower. Please follow the steps below:

Prepare Required Tools

Lawn mower packaging boxes and packaging materials.

Storing the Lawn Mower

1. Ensure the lawn mower has at least 85% battery charge remaining.
2. Turn off the lawn mower's power.
3. Disconnect the power cord and antenna.
4. Wear protective gloves, thoroughly clean the body with a brush, and allow it to air dry.

Antenna Storage Guide

If the antenna is mounted on a wall or roof, cover it with a plastic bag or protective cover.

4.8.2 Spring Reactivation

To restore your lawn mower and all its installation configurations, follow the steps below in spring:

1. Remove all covers from the mower.
2. Reconnect cables disconnected during winter storage. Inspect cables for damage or breaks and repair as needed.
3. Check blade sharpness and replace if necessary. Inspect and clean the camera lens to ensure proper operation.
4. Finally, turn on the mower's power to verify the device is paired with the app and functioning correctly.

4.9 Recycling and Disposal

Do not dispose of this product as household waste. For recycling information, please contact your household waste disposal service agency, municipal department, or point of sale.

⚠ Warning

Do not dispose of this product in landfills, incinerate it, or mix it with household waste. Due to the electronic components contained in the product, it may cause danger or serious injury.

5. Common Problems and Troubleshooting

<table>
<tr><th colspan="2">Problem Type</th><th colspan="3">Troubleshooting Methods</th></tr>
<tr><td rowspan="15">Positioning Deviation</td><td rowspan="4">Base Station Inspection</td><td rowspan="3">Is the red indicator light flashing?</td><td colspan="2">Is the mushroom head connected and pointing to the unobstructed sky?</td></tr>
<tr><td colspan="2">Are both ends of the mushroom head connecting cable loose?</td></tr>
<tr><td colspan="2">Is the base station positioning connector damaged (excessive shaking)?</td></tr>
<tr><td>Check the base station positioning status in the WeChat mini program.</td><td colspan="2">Enter the "Working Mode" page under "Settings" in the WeChat mini program. Check if the reference point source is customized and the mushroom head has been moved.</td></tr>
<tr><td rowspan="11">Receiver Inspection</td><td colspan="3">Is the power supply of the receiver normal?</td></tr>
<tr><td rowspan="10">Check the positioning status in the WeChat mini program.</td><td rowspan="3">Init</td><td>Is the positioning and directional mushroom head connected and pointing to the unobstructed sky?</td></tr>
<tr><td>Are both ends of the positioning and directional mushroom head connecting cable loose?</td></tr>
<tr><td>Is the positioning and directional connector damaged (excessive shaking)?</td></tr>
<tr><td rowspan="3">point positioning</td><td>Are the base station and receiver radio antennas installed, and are there no obstructions directly above both antennas?</td></tr>
<tr><td>Is the radio antenna and connector damaged?</td></tr>
<tr><td>Enter the "Working Mode" page under "Settings" in the WeChat mini program to check if the frequency of the base station and receiver is consistent.</td></tr>
<tr><td rowspan="4">Differential positioning / Floating-point positioning</td><td>Is there only one base station supplying power currently?</td></tr>
<tr><td>The sky above the positioning and directional mushroom head is obstructed and not in an open area.</td></tr>
<tr><td>Check whether the number of satellites visible to the base station is less than 22.</td></tr>
<tr><td>The distance between the radio base station and the receiver exceeds 1.2 miles(2 km).
The distance between the network base station and the receiver exceeds 18.6 miles(30 km).</td></tr>
<tr><td colspan="2" rowspan="2">Unable to Power On</td><td colspan="3">Insufficient battery power, Replace with a fully charged battery and try again.</td></tr>
<tr><td colspan="3">Battery temperature is too low or too high: Use in an environment of 0-40°C.</td></tr>
<tr><td colspan="2" rowspan="2">Unable to Charge</td><td colspan="3">Poor contact, Clean the battery charging contacts.</td></tr>
<tr><td colspan="3">Check if the battery indicator light is on.</td></tr>
<tr><td colspan="2" rowspan="2">The gasoline engine won't start.</td><td colspan="3">When starting the engine, adjust the choke lever;</td></tr>
<tr><td colspan="3">Check if fuel is present in the fuel line; if not, open the fuel valve.</td></tr>
<tr><td colspan="2">During normal operation, the remote-controlled walking function suddenly fails, though the lifting function remains operational.</td><td colspan="3">Check whether the circuit breaker in the electrical panel has tripped.</td></tr>
<tr><td colspan="2" rowspan="2">The C7 remote control cannot operate all functions of the lawn mower.</td><td colspan="3">Check if the small white light on the VR2 remote control is flashing. If flashing, turn off the cruise control function.</td></tr>
<tr><td colspan="3">Check if the remote control receiver in the electrical box is not illuminated.</td></tr>
<tr><td colspan="2" rowspan="2">Remote Alarm</td><td colspan="3">High temperature and overheating, Move the machine to a cool and ventilated place to dissipate heat.</td></tr>
<tr><td colspan="3">Low battery, Charge or replace with a fully charged battery.</td></tr>
<tr><td colspan="2">weak signal</td><td colspan="3">Move the machine to an open environment to connect.</td></tr>
</table>

Problem Type	Troubleshooting Methods
Radio Version Remote Control Shows Offline	Is the antenna of the remote control receiver installed?
	Is the distance between the remote control receiver and the remote control greater than 2,600 feet(800m)?
	Is there an object obstruction in the straight line between the antenna of the remote control receiver and the remote control?
	Open the H12Pro assistant software, click the frequency pairing button to check if the remote control is connected to the device. You can repeat the operation of turning on/off the remote control and the device. If the problem still cannot be solved, please contact after-sales service. Note: Under no circumstances should you click the "Start Frequency Pairing" button.

6. Three Guarantees Certificate

Return and Exchange Policy

1. 7-Day Return Policy

Within 7 days from the date you receive the purchased product, if the product has non-human-induced faults and is confirmed as product performance faults by the Jining Wanji Intelligence after-sales service center through inspection, you can enjoy free return service.

2. 15-Day Exchange Policy for Quality Issues

Within 15 days from the date you receive the purchased product, if the product has non-human-induced faults and is confirmed as product performance faults by the Jining Wanji Intelligent after-sales service center through inspection, you can enjoy free exchange service.

Warranty Policy

Within the warranty period, if the product has non-human-induced faults and is confirmed as product performance faults by the Jining Wanji Intelligent after-sales service center through inspection, you can enjoy free repair service.

Notes

• This after-sales policy only applies to mainland China (excluding Hong Kong, Macau, and Taiwan regions).

• Returns, exchanges, or repairs shall be handled with valid invoices and Three Guarantees certificates. Please keep the purchase documents properly.

• For returns and exchanges, please ensure that the product, gifts, original packaging, and purchase documents are intact and complete.

• Before sending for repair, please confirm the fault and repair requirements with online customer service or the seller.

Warranty Period for the Whole Machine and Various Components

Type	Warranty Content	Warranty Period
Whole Machine	Lawn mower; Remote control; Power cord	1 Year

Circumstances Not Covered by Free Warranty

1.The product has been repaired, inspected, disassembled, etc., by institutions or personnel not authorized by Jining Wanji Intelligent.

2.Misuse, collision, negligence, liquid ingress, accidents, modifications, incorrect use of non-original accessories, or artificial operational errors or faults such as tearing or altering labels caused by failure to use the product in accordance with this manual.

3.Normal wear and tear, as well as wear parts (such as track wear, scratches on the outer casing, etc.);

4.Damage caused by force majeure.

5.Damage caused by improper storage (such as cockroach infestation, animal bites, etc.).

6.The warranty period has expired (accessories purchased separately are covered by free warranty for three months from the date of receipt).

7.Product performance faults of this product and its accessories caused by human factors.

The three-guarantee card can be cut along this line.

Product Warranty Card

User Name	Product Name and Model
Contact Phone	Product Serial Number
Mailing Address	Date of Purchase

Maintenance Record

	Maintenance Date	Fault Description and Replaced Accessories	Maintenance Center	Maintenance Engineer
1				
2				

7. Contact Us

Manufacturer: **Jining Wanji Intelligent Technology Co., Ltd**

Jining City, Shandong Province, China

Service Website: **www.wanji-imp.com**

Technical Support Email: **info@wanji-imp.com**