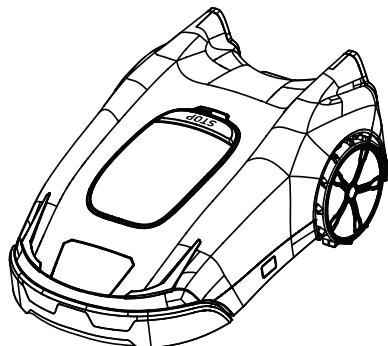


Robotic Lawn Mowers
HVIN: K2
Models: K2-1, K2-2, K2-3, K2-4, K2-5, K2 EVO



User Manual

(Note: Please read this manual carefully before use to avoid danger or damage to the product)

original instruction

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Product Description

1. Product Description

This product is an intelligent lawn mowing robot equipped with RTK and AI vision, which allow it to adapt to most mowing scenarios. The product features an RTK global navigation satellite system and AI vision recognition dual positioning system. This enables the mower to operate normally even under the influence of RTK disturbances. The user-friendly control panel and the smart app provide a more intelligent lawn care solution, truly freeing users from manual labor and saving time.

This product is a rear-wheel drive lawn mower, suitable for home garden lawn maintenance. The grass height of the current lawn must be less than 10cm. If the grass is higher, cut the grass first before using this product; keep the ground flat, and fill in the pits or set up no-go zones on APP. Do not let the lawn mower go up slopes of more than 45% to prevent accidents.

Intended Use

This garden product is only intended for lawn mowing, automatically cutting garden grass at any time of day and night. Any usage beyond the intended purpose may pose hazards, potentially causing harm to individuals and/or damage to property. Improper use encompasses, but is not limited to, transporting people, children, or animals on the machine; being transported by the machine; using the machine to pull or push loads; and employing the machine for cutting non-grass vegetation. It is imperative to adhere strictly to the specified guidelines to ensure safety and prevent accidents.

Not Intended Use

By persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Residual risks- In order to prevent injuries, wear protective gloves and eye goggles when conducting maintenance or replacing the blades.

Hereby, [Shenzhen Hua Xin Information Technology Co.,Ltd.] declares that the radio equipment type [K2] is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address:
<http://www.joybeerobot.com/>

Product Description

Hereby, [Shenzhen Hua Xin Information Technology Co.,Ltd.] declares that the radio equipment type [K2] is in compliance with Radio Equipment Regulations 2017. The full text of the UK declaration of conformity is available at the following internet address: <http://www.joybeerobot.com/>

Safety Instruction

2.Safety Instruction

FCC Compliance Statements

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Caution: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

ISED Compliance Statements

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment.

Safety Instruction

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- (1) L'appareil ne doit pas produire de brouillage;
- (2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet équipement est conforme aux limites d'exposition aux radiations IC CNR-102 établies pour un environnement non contrôlé.

RF Exposure Compliance

This equipment complies with FCC/IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

Cet équipement est conforme aux limites d'exposition aux radiations IC CNR-102 établies pour un environnement non contrôlé. Cet émetteur ne doit pas être colocalisé ou fonctionner en conjonction avec une autre antenne ou un autre émetteur. Cet équipement doit être installé et utilisé avec une distance minimale de 20cm entre le radiateur et votre corps.

Safety sign illustrating



Safety sign illustrating – "WARNING – Read user instructions before operating the machine"



Safety sign illustrating – "WARNING – Keep a safe distance from the machine when operating"



Safety sign illustrating – "WARNING – Operate the disabling device before working on or lifting the machine"

Safety Instruction



Safety sign illustrating – "WARNING – Do not ride on the machine"

Safe operating practices Training

- a) Read the instructions carefully. Be familiar with the controls and the proper use of the machine.
- b) Never allow people unfamiliar with these instructions or children to use the machine. Local regulations may restrict the age of the operator.
- c) The operator or user is responsible for accidents or hazards occurring to other people or their property.

Preparation

- a) Ensure the correct installation of the automatic perimeter delineation system as instructed.
- b) Periodically inspect the area where the machine is to be used and remove all stones, sticks, wires, bones, and other foreign objects.
- c) Periodically visually inspect to see that the blades, blade bolts and cutter assembly are not worn or damaged. Replace worn or damaged blades and bolts in sets to preserve balance.
- d) On multi-spindle machines, take care as rotating one blade can cause other blades to rotate.

Operation General

- a) Never operate the machine with defective guards, or without safety devices, for example deflectors and/or grass catchers, in place.
 - b) Do not put hands or feet near or under rotating parts. Keep clear of the discharge opening at all times.
 - c) Never pick up or carry a machine while the motor is running.
 - d) Remove (or Operate) the disabling device from the machine
 - before clearing a blockage;
 - before checking, cleaning or working on the machine.
- Additionally when the machine is operating automatically
Do not leave the machine to operate unattended if you know that there are pets, children or people in the vicinity.

Maintenance and storage

- a) Keep all nuts, bolts, and screws tight to be sure the machine is in safe working condition.

Safety Instruction

- b) Check the grass catcher frequently for wear or deterioration.
- c) Replace worn or damaged parts for safety.
- d) Ensure that only replacement cutting means of the right type are used.
- e) Ensure that batteries are charged using the correct charger recommended by the manufacturer. Incorrect use may result in electric shock, overheating or leakage of corrosive liquid from the battery.
- f) In the event of leakage of electrolyte flush with water/neutralizing agent, seek medical help if it comes into contact with the eyes, etc.
- g) Servicing of the machine should be according to manufacturers' instructions.

Additional safety instruction

- To operate this robot safely and effectively, training and practice are required.
- Read the instructions carefully before operating it in your garden.
- Do not use a third-party charger to charge your lawn mower. Do not turn the mower over while it is running.
- Do not put your feet/hands under the mower while it is running. Do not push/pull the mower while it is running.
- Do not disassemble any parts while power is on.
- Do not touch or replace running blades with your hands. Do not touch the charging port with your hands.
- Do not drive the mower through flooded areas of your lawn.
- Do not operate the lawnmower on the ground or lawn where there is debris such as rocks or branches.
- Before working on your lawn, remove any clutters from your lawn.
- Keep the charging port clean and dry.
- When the machine is working, the user should try not to get close to the machine.
- Non-professional technicians are prohibited from disassembling and assembling the machine.
- If the machine is not used for a long time, it is necessary to recharge the battery to 80% before storing it.
- It is prohibited to use the machine during thunderstorms.
- When temperature falls below 0°C, this lawn mower won't recharge.
- Twice a week mowing frequency is recommended.
- Indoor recharge is strictly prohibited.
- If the mower, power source, charge plug, or power outlet are damaged, do not recharge. When temperature goes above 45°C or falls below 0°C, do not recharge the mower. The battery has built in over-heat protection, if its temperature goes beyond the limit, it won't charge.
- Warning! Automatic lawn mower! Keep away from the machine! Children must be supervised!

Safety Instruction

- This machine can only be used and maintained by people over 12 years old with normal physical, sensory and mental health.
- When abnormal sound, light appears, stop charge immediately, and contact after-sale service. Stay away from combustible materials when charging.
- Before the product is scrapped, please remove the battery from the robot. When you remove the battery, please ensure that the product is not connected to a power supply. Put the recycled batteries in the recycling bins set up by the community, hotels, schools, large shopping malls, supermarkets, etc or the hazardous trash can collected by professional recycling agencies. Discarded product batteries must be removed and discarded in accordance with local laws and regulations.

How to remove the battery

Remove the 12 screws at the positions indicated by the arrows.

Lift open upper body module to reveal the screws (note: the upper body module cannot be removed yet)

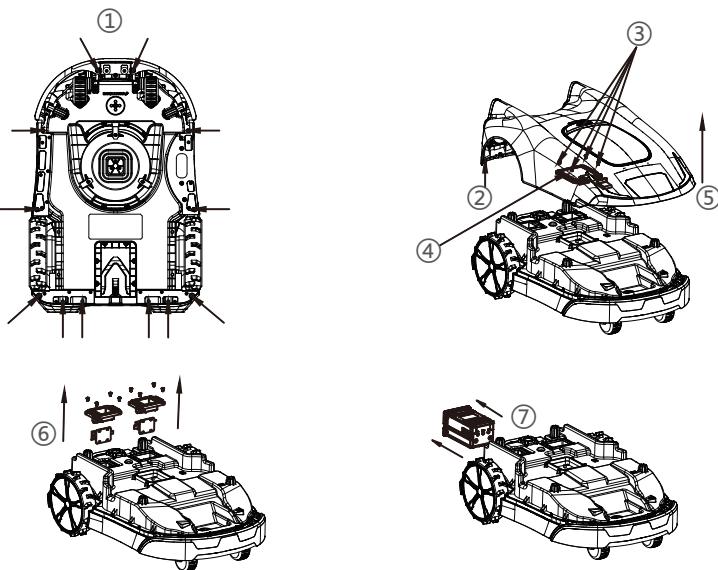
Take out 4 screws.

Unplug the cable.

Remove the entire upper body module from the chassis.

Remove the 8 screws at the position shown in the diagram, then remove the cover and take out the built-in electromagnetic lock.

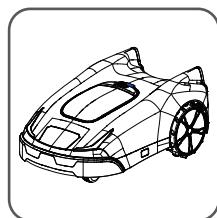
Take out the battery pack at the tail of the robot.



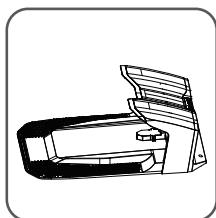
Parts and Functions

3. Parts And Functions

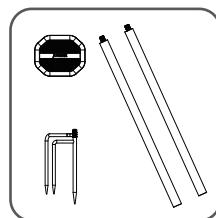
3.1 Parts Name



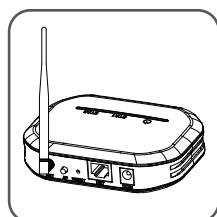
Lawn Mower



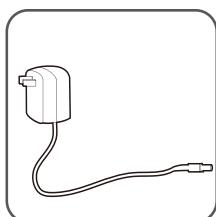
Charging Base Station



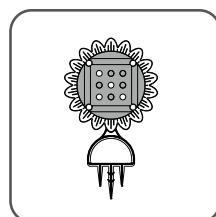
RTK Antenna



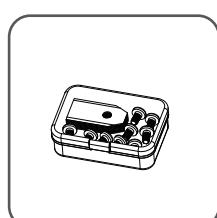
AH Wireless Router Kit



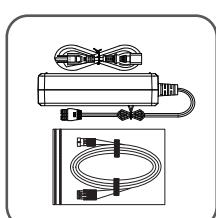
Router Adapter



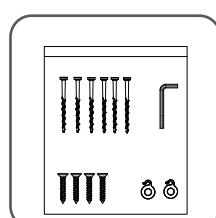
Marker Plate x6



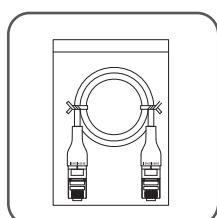
Blades



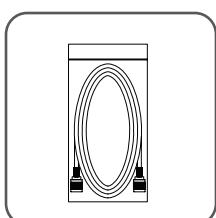
Mower Adapter



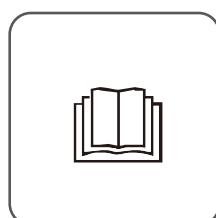
Accessory kit



Ethernet Cable



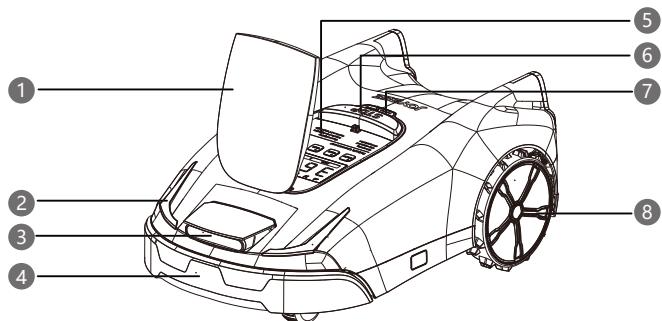
RTK Cable



User Manual

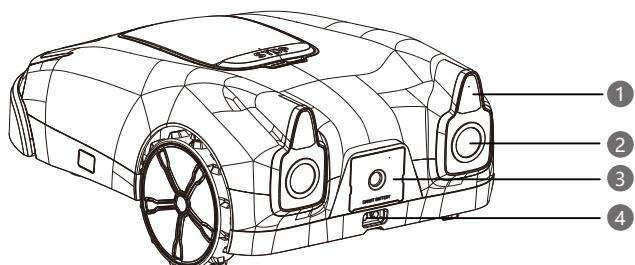
The accessories are slightly different. Please refer to the actual product received

Parts and Functions



Mower

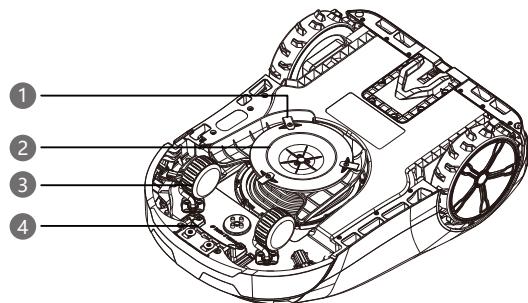
- | | | | |
|-----------------|---|----------|----------|
| 1.Dome Cover | 2.Headlight | 3.Camera | 4.Bumper |
| 5.Control Panel | 6.Emergency Stop Button/Dome Cover Button | | |
| 7.Rain Sensor | 8.Driving Wheel/Rear Wheel | | |



Mower

- | | | | |
|-------------------|--------------|-----------------|-----------------------|
| 1.Infrared Sensor | 2.Tail Light | 3. Battery Pack | 4. Charging Electrode |
|-------------------|--------------|-----------------|-----------------------|

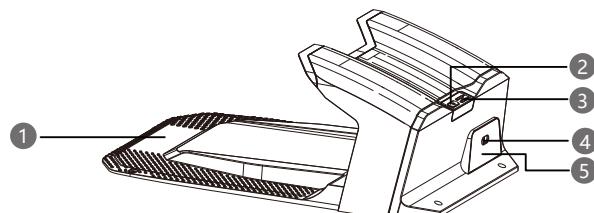
Parts and Functions



Mower

Note: Blades are not installed when the product leaves the factory. Users are required to install the blades before use.

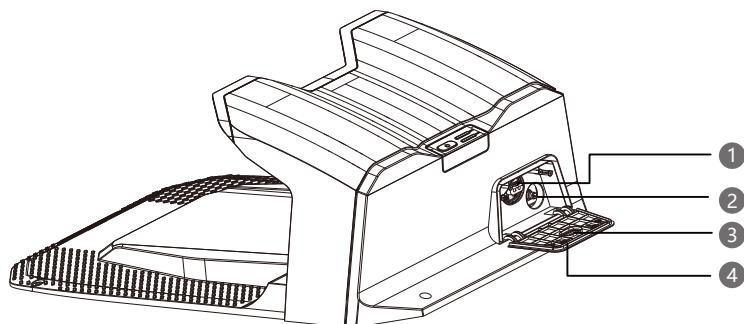
- | | |
|------------------|---|
| 1.Cutting Blades | 2.Blade Disc/Obstacle Detection Sensor |
| 3.Handle | 4.Universal Wheel/lift Detection Sensor |



Charging Base Station

- | | | |
|-----------------------|-----------------|------------------------|
| 1.Docking Pad | 2. Power Button | 3. RTK/WIFI Status LED |
| 4.Adaptor Access Port | | 5. Rear Door |

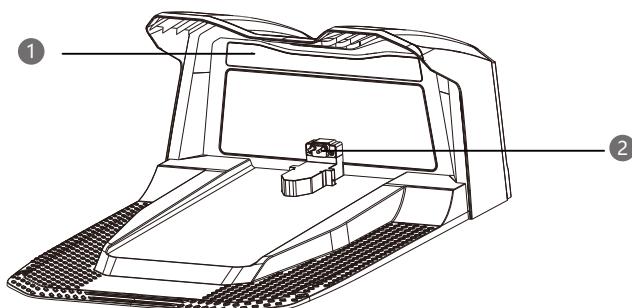
Parts and Functions



Charging Base Station

1. DC Power Jack
3. Threading Hole

2. RTK Cable Port
4. Rear Door Panel

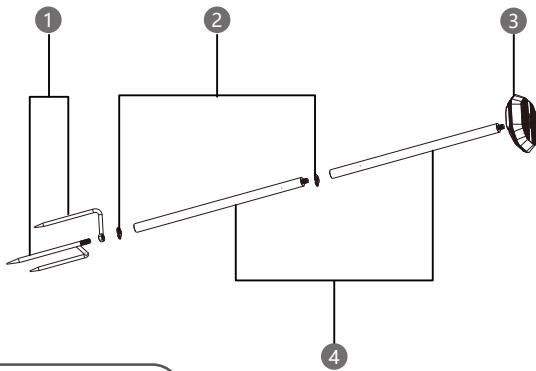


Charging Base Station

1. Infrared Emission Panel

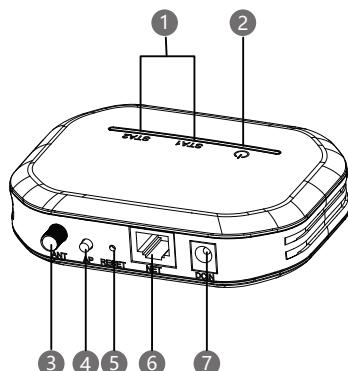
2. Charging Port

Parts and Functions



RTK Antenna Components

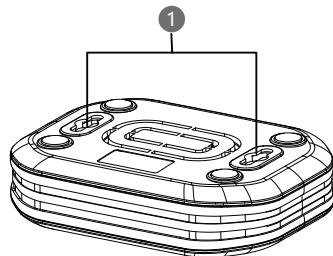
- 1. Ground fork
- 2. RTK Cable Buckle
- 3. RTK Antenna
- 4. Link Rod



AH WiFi Router

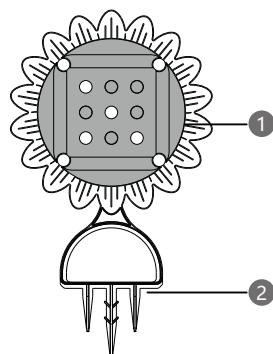
- 1.Status LEDs
- 2.Power LED
- 3.Antenna Connector
- 4.AP Pairing Button
- 5.Reset Switch
- 6.Ethernet Port
- 7.Power Connector

Parts and Functions



AH WiFi Router

1.Screw Hanging Holes



Marker plate

1.Marker Front

2.Pin

Parts and Functions

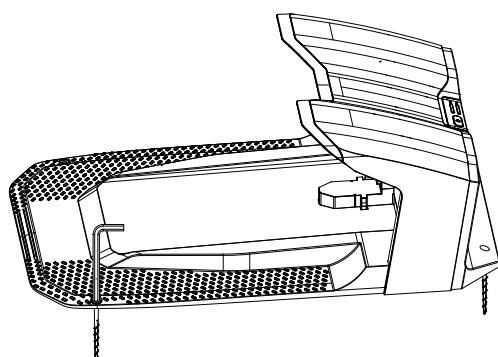
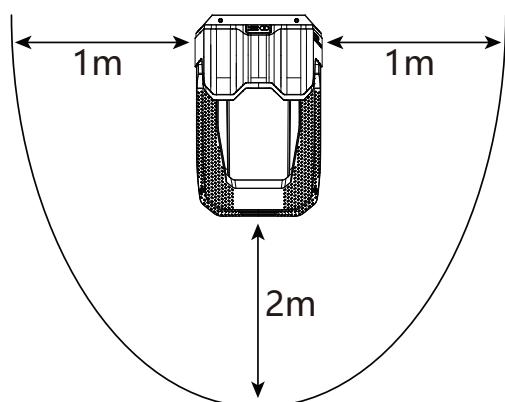
3.2 Product Specifications

Specifications	Joybee Model K2
Mowing Capability	2000m ²
Slope	45%
Maximum Obstacle Height	30mm
Mowing Height	25-60mm
Mowing Width	220mm
Mowing Area Per Charge	350m ²
Battery Capacity	3900mAH
Charging Time	150min
Battery life	90min
Charging Method	Automatic
Battery Type	LiFePO4
Virtual Boundary	Yes
Autonomous Mowing	Yes
Maximum Mowing Zones	10
Obstacle Detection And Avoidance	Yes
No-go Aone Setting	Yes
Rain Sensor	Yes
Connectivity	Bluetooth,Wi-Fi
WIFI Coverage	300 meters
User Interface	Joy Life APP
Scheduled Mowing	Yes
Firmware Update	OTA
Anti-theft	Yes
Whole Weight	15.4kg

Product Name	Module	Frequency Range (MHz)	Max E.I.R.P (dBm)
Robotic Lawn Mowers	WIFI module (TX-AH-R900PNR-860M)	859-894	20
Robotic Lawn Mowers	BT-(UAE076-A0)	2400-2480	10
Charging Station	WIFI module (TX-AH-R900PNR-860M)	859-894	20
AH Wireless Router	WIFI module (TX-AH-R900PNR-860M)	859-894	20

Quick Start Installation

4. Quick Start Installation



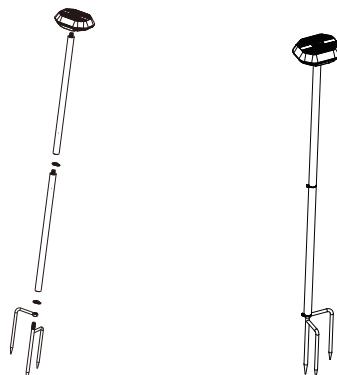
Step 1: Charging Base Station Installation

Pick a solid, flat spot to put the charging base station, keep the space 2 meters in front and 1 meter on both sides empty. The charging base station needs to be level with the lawn.

Use a screwdriver drive down ground nails at the 4 corners to secure the charging base station.

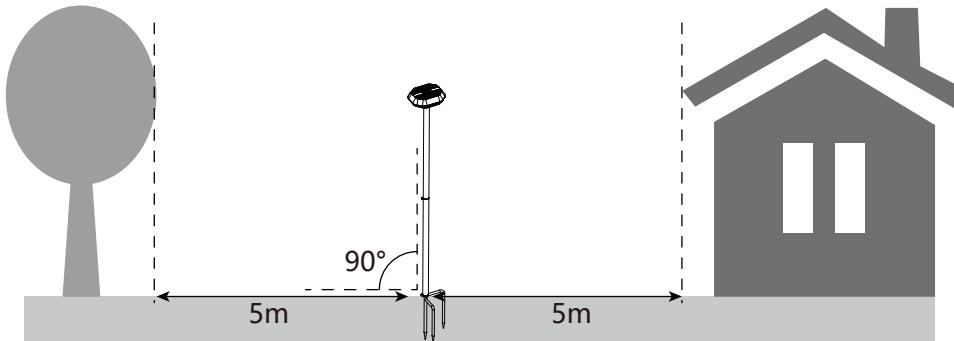
Stay away from irrigation system (sprinklers, etc).

Quick Start Installation



Step 2: RTK Antenna Installation

Assemble RTK antenna: connect ground fork, cable buckle, RTK antenna, and rotate them onto the link rod.



RTK antenna needs to be away from walls, trees, tall big glass panels, etc. The minimum distance should be $\geq 5\text{m}$ away from the edge of houses and trees. It cannot be placed under trees or roofs. RTK antenna must be installed vertically, 90° perpendicular to the ground.
Step down the ground fork firmly into the soil to secure RTK antenna.

Quick Start Installation

RTK positioning system uses multiple satellite systems, such as GPS, BD, GLONASS, Galileo, etc. It could achieve accuracy of about 2 cm.

The actual achieved accuracy depends on following conditions.

Signal blocking

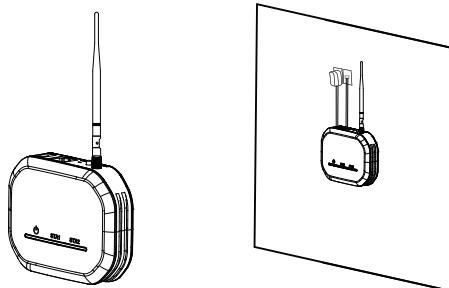
If the RTK antenna are close to tall obstacles such as walls or trees, the signal will be weakened or blocked.

Solution: Do not install RTK antenna (along with the base station) next to house, under trees, or anything that may block the signal.

Signal interference

If the signals from satellites are transmitted to the antenna after being reflected off the walls, rather than directly from the air to the antenna, it is called the multi-path effect. Multi-path effect is the main form of signal interference.

Solution: Mount the antenna away from big, shining surfaces.



Step 3: AH WiFi Router Installation

The AH WiFi router can be wall mounted using the provided screws.

Connect pen antenna, connect power supply and network cable.

The data rate of WIFI communication channel decreases as distance increases.