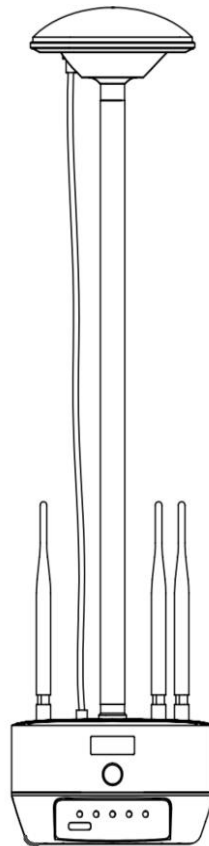




Eavision RTK Basise Station

User Mannual

V2. 0/2022. 08



EA-BAS20

SUZHOU EAVISION ROBOTIC TECHNOLOGIES CO., LTD

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FCC STATEMENT:

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.

Warning: 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.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

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Disclaimer

Thanks for choosing the EA-20XA (global offline version) developed and manufactured by Suzhou EAVISION Robotic Technologies Co., Ltd. (hereinafter referred to as "EAVISION"). Please read and abide by the relevant requirements of this manual carefully, operate in strict accordance with the instructions in actual operation process and maintain in a timely and detailed manner. The use of this product shall be deemed as the approval and acceptance of the entire contents of this manual. This product is not suitable for people under 18. Before using this product, please accept the formal training of EAVISION and obtain the qualification certificate. While using the product, the user promises to be responsible for his/her actions and all consequences arising therefrom. EAVISION shall not be borne by all losses caused by the user's failure to use the product in accordance with this document and user manual, and shall not be liable for any indirect, consequential, punitive, incidental, special or punitive damages.

EAVISION shall not be borne by any loss or injury caused by non-use, modification or disassembly of the original parts.

EAVISION shall not be liable for any consequences arising from the use of this product in violation of laws and regulations.

EAVISION reserves the right to update this disclaimer.

Precaution

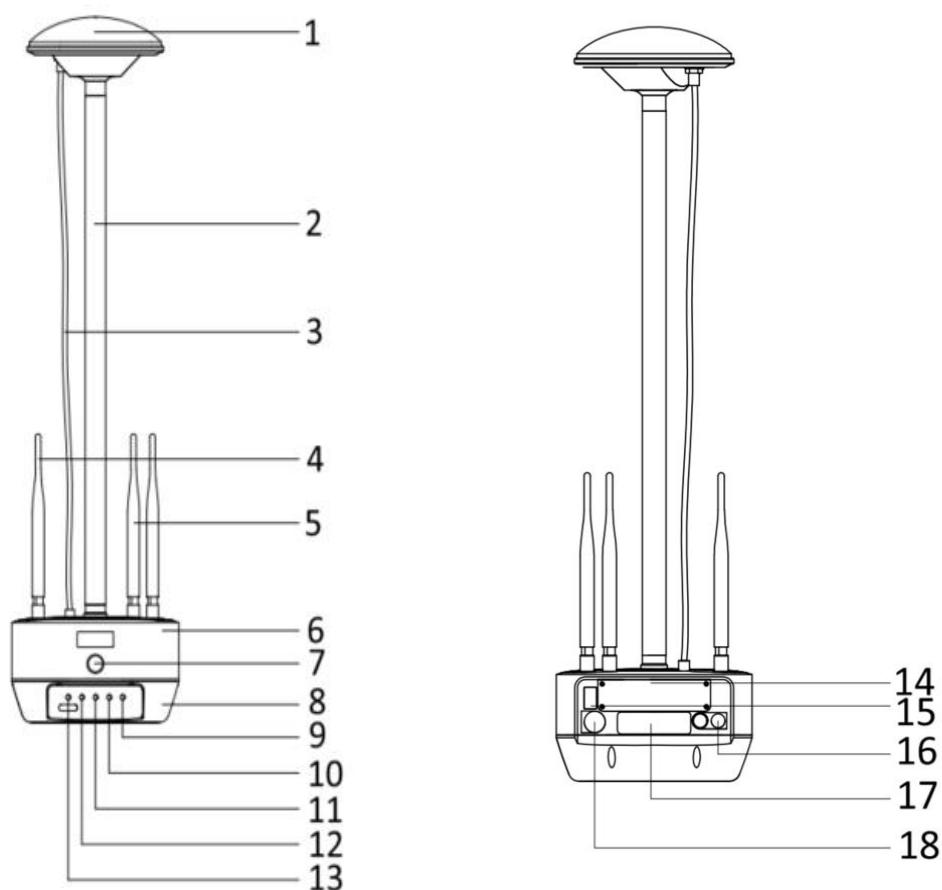
- It is strictly forbidden to use this product in thunderstorms and thunderstorms.
- In strong winds, please ensure that the base station is firmly installed and cannot be knocked down by the wind.
- Built-in lithium battery, do not put the base station in fire
- Do not spill acid-base liquid on the surface of the base station
- Please put the base station in the box when transporting
- When replacing the GPS antenna,
- please prevent the base station from falling down, so as to prevent the antenna from being damaged by falling off your hands

Product Overview

Brief Introduction

EA-20X realizes the data transmission between the UAV and the ground station through the 4G signals. In some areas with the weak or no 4G signals, the UAV fails to receive mission data from the ground station and cannot operate autonomously. EA-20XA-global offline version connects all the devices in the system to realize the autonomous operation in offline state via the mobile base station and surveying tool.

Introduction to module



1. GPS antenna	2. Antenna support rod	3. GPS antenna feeder	4. 2.4G antenna
5. 4G mobile phone	6. Upper case	7. Power switch	8. Lower case

antenna			
9. Alarm red indicator	10.Positioning/differential indicator	11. Wifi/Bluetooth indicator	12. Ground wire
13. Power indicator	14. Debugging back cover	17.Base station back cover	18.Base station charging port
15.Charging instruction nameplate	16.Fixing screw		

Operation instruction

Base station erection instructions

- Place the base station on a tripod with its own screws and place it in an open space outdoors.
- Press the power button, the system self-checks whether all the indicators can work normally. The power indicator, communication indicator, positioning/differential indicator, and alarm red indicator light up at the same time. After two seconds, the positioning/differential indicator changes. It is yellow, and the other indicators remain unchanged; after two seconds, all the indicators are off.
- After another two seconds, enter the initialization state: the power indicator, communication indicator, positioning/differential indicator and marquee lights are on. If a module fails, the alarm red indicator and the faulty module indicator flash synchronously.
- The indicator light repeats the above process. When the pending positioning/differential indicator flashes yellow, it means that the base station has entered the positioning state. When the positioning/differential indicator flashes blue, it means that the base station has entered the normal differential working state.
- The base station erection is completed.

Base station charging instructions

- If the battery is low, please use a dedicated charger to charge the base station.
- The charging indicator is blue, indicating that the base station is charging. Real-time power can be viewed at any time during charging
- The charging indicator is red, indicating abnormal charging
- The charging indicator is off (and the battery indicator is greater than or equal to 3), indicating that the battery is fully charged
- In order to prolong the battery life, the base station battery is designed for shallow charging. After the battery is fully charged, if only three green lights are on, it is a normal phenomenon.

How to check the remaining power

- Lightly press the indicator button on the power display panel, the corresponding power indicator lights up, and automatically turns off after 2 seconds.
- The remaining power value can be read by the LED light on and off.
 1. Four green LED lights are on, indicating that the base station is at 100% power at this time
 2. The three green LED lights are on, indicating that the remaining power of the base station is 75% at this time
 3. Two green LED lights are on, indicating that the base station is at 50% power at this time
 4. A green LED light is on, indicating that the base station is at 25% power at this time
 5. A red LED light is on, indicating that the base station is at 10% power at this time

Check List Before Use

1. Visual inspection

- (1) Whether the RTK antenna is damaged
- (2) Check whether the casing is damaged, so as to prevent the circuit board from being damaged due to the entry of external water
- (3) Whether the sealing plug is tightly closed to prevent the circuit board from being damaged due to the entry of external water

2. Power-on check

- (1) When the device is in the off state, after pressing the Power button ($t > 1.8s$), the device will enter the power-on state, and 10 LEDs on the interface will light up at the same time (mainly to check whether all the LEDs work normally), and after 2s, enter the system initialization;
- (2) System initialization:
 - ① PWR LED is always on;
 - ② The Battery LED first displays the battery level (3s) and then turns off
 - ③ Function module LEDs (communication, WiFi/Bluetooth, DGPS, fault) turn on and off in sequence
 - ④ After the startup is completed, the PWR LED continues to keep on
- (3) Note
 - ① It can be turned off at any time during startup.

3. Shutdown check

- (1) When the device is on or working: Press the Power button ($2.5s < t < 15s$), the 9 LEDs on the interface will turn off at the same time, and the device will enter the standby state first. If there is no instruction for more than 10s, the device will enter the shutdown state ;

4. Battery check

- (1) Short press the switch button ($0.1s < t < 0.5s$), observe the battery light to display the remaining power;
- (2) After pressing the Power button ($0.1s < t < 0.5s$), the Battery LED will display the battery level (3s), and after the display is over ($> 3s$), the LED will turn off; if you press the Power button ($t < 0.1s$ or $t > 0.5s$), the power is not displayed (the command is regarded as invalid);

5. Battery display

- (1) In the case of non-charging, after pressing the Power button ($0.1s < t < 0.5s$), the user can check the power according to the displayed power grid information. For example: when $50\% < SoC < 75\%$,

Batt1+Batt2+Batt3 is always on for 3s, and goes out after 3s;

- (2) When charging: the corresponding battery bar flashes, and the fully charged battery bar is always on. For example: when charging $50\% < \text{SoC} < 75\%$, Batt1+Batt2 are always on, and Batt3 is blinking. When the battery is fully charged, the 4 battery bars are always on. The flashing frequency of the battery bar indicates fast charging or slow charging.

6. low battery indicator

- (1) Working status: Low battery (estimated remaining usage time $\leq 30\text{min}$), Batt1 keeps flashing (on for 1s, off for 1s), and stops flashing when charging;
- (2) Off status: Low battery (estimated remaining usage time $\leq 30\text{min}$), Batt1 keeps flashing (on for 1s, off for 1s), within 3s of battery display keep flashing;

7. Function LED introduction

Functional module LEDs include Comm LED, WiFi/BT LED, DGPS LED, and Fault LED. This part mainly introduces the working display and related faults of the first three LEDs, and the next part mainly introduces fault information and LED display when warning or module failure occurs.

(1) Comm LED display

When there is a communication failure, such as communication failure or communication disconnection, the communication LED + fault LED flashes synchronously;

(2) WIFI/BT LED display

BT is enabled by default when the device is working. The user selects the device to be connected by displaying the scanned device information on the App.

- ① Before WiFi/BT is not connected, the LED does not light up;
- ② After the BT connection is successful (WiFi is not in use), the LED flashes;
- ③ When the WiFi setting is successfully connected (BT is not connected), the WiFi/BT LED is always on;
- ④ BT performs pairing and connection process through the device information displayed on the App:
 - If only one device is scanned, pair it directly (no manual operation required);
 - If multiple devices are scanned, the App will prompt you to select a paired device;
- ⑤ BT pairing failed:
 - WiFi/Bluetooth LED malfunction:
Such as WiFi/Bluetooth failure (Wifi turn-on failure, Bluetooth turn-on failure or WiFi can't find SSID network), WiFi/Bluetooth LED + Fault LED flashes synchronously;
 - In the event of a WiFi/Bluetooth LED malfunction:
The app prompts accordingly, and the fault LED does not flash.
 - a. the device is not bound to the drone or registered in the background;
 - b. BT pairing on the mobile phone fails;
 - c. Pairing failure due to wrong WiFi name or WiFi password.

(3) DGPS LED

- ① When GPS is off: always off;
- ② When the base station is positioning, quickly ($0.1\text{s} < t < 1\text{s}$) press the Power button 28 times, it will enter the indefinite positioning mode. In infinite positioning mode, the positioning LED light: 2.8s on, 0.2s off. To exit the indefinite positioning mode, press the Power button 2 times quickly ($0.1\text{s} < t < 1\text{s}$).
After exiting from the infinite positioning mode, the base station will judge whether to continue

positioning or enter the differential mode according to the time-limited positioning (10min backward differential) conditions. Positioning LED flashes:

- a. When the remaining time is less than 2min, the positioning LED light flashes: 0.5s on, 0.5s off;
 - b. When the remaining time is less than 2min, the positioning LED light flashes: 0.5s on, 0.5s off;
 - c. Remaining time >5min, positioning LED light: 1.7s on, 0.3s off;
- ③ When the base station is in the differential state, the differential LED flashes to display the accuracy of the base station's own positioning:
- 1) The base station's own positioning accuracy (error standard deviation<0.3m) includes RTK accuracy, and the blue LED flashes: 1.7s on, 0.3s off;
 - 2) The base station's own positioning accuracy is normal ($0.3 < \text{error standard deviation} < 1\text{m}$), the blue LED flashes: 1.0s on, 1.0s off;
 - 3) The positioning accuracy of the base station itself is low (error standard deviation>1m). The blue LED flashes: on for 0.5s and off for 0.5s.
- ④ When the base station fails:
- 1) When there is a fault in the positioning, the DGPS (Location LED) and the Fault LED flash synchronously: on for 0.2 seconds and off for 0.3 seconds;
 - 2) When the differential fault occurs, the DGPS (differential LED) and the Fault LED flash simultaneously: on for 0.2 seconds and off for 0.3 seconds;
 - 3) When the system has a serious fault, the 5 LEDs of the function module flash synchronously (the DGPS two-color LED flashes alternately): on for 0.2s and off for 0.3s.

Operation Steps

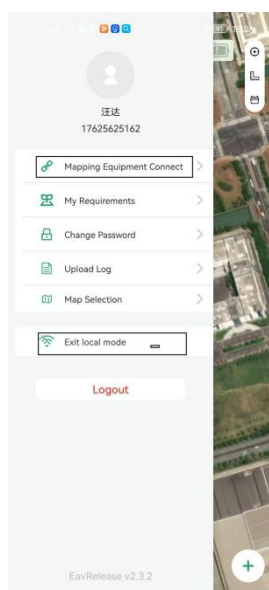
Preparation before use

- Please log in EAVISION Surveying APP and EAV Smart Agriculture APP before entering the area with no network.
- Enter the operation area and erect the base station in the appropriate positions.
- Turn on all the devices in the offline system.

Check base station state



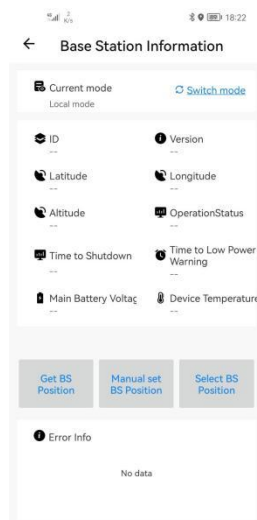
- Enter the EAVISION Surveying APP. Click the left sidebar on the main screen to open the menu bar.



- Click the “Enter offline mode” and then click on “Mapping Equipment Connect” .



- After the connection of surveying tool, the base station is connected automatically.
- Click the base station icon in the upper left corner of the home screen



- The display interface is as shown in the figure

Appendix

Product parameters

Standby time	10-12 h
Charging time	4-6 h
weight	2380 g
size	700*185*140 mm
coverage	10 km
Working accuracy	1-10 cm
Input voltage/frequency	100-240V~50/60hz
Output voltage	5V-3A/9V-2A/12V-1.5A

Warranty Certificate

EAVISION Robotics Technologies					
Warranty Certificate					
(Customer)					
Product Information	Product Name	Autonomous Plant Protection Drone			
	Model Specification				
	Manufactured In	Suzhou, China			
	Serial Number				
User Information	Name		Address		
	Phone Number		Email		
Sales Information	Sales Unit		Address		
	Contact Number		Email		
	Sales Date		Unit Price		
	Invoice Number		Sales Unit Stamp		
Manufacturer Information	Manufacturer Name		Address		
	Phone Number		Email		
Maintenance Records	Repair Date	Delivery Date	Failure Description	Repair Details	Repairer
Remarks: 1. This certificate must be stamped by the authorized sales unit of EAVISION Robotic Technologies Co., Ltd. to take effect. 2. For details, please refer to the Applicable detailed list of company guarantees.					

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YouTube, Facebook, Twitter, LinkedIn, Instagram

The contents of this manual and product specifications are subject to change without prior notice.

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