

1 Installation

This chapter introduces the installation preparations, mainly including tool preparation and power supply preparation.

To ensure the normal operation of the equipment and prolong its service life, the installation site must meet the following requirements.

1.1 Installation site selection

- Harmful gas, flammable, and explosive environments are not conducive to the work of the equipment, and the equipment should not be installed in such an environment.
- The installation site should be dry, and it is not recommended to install in a place very close to the sea.
- The distance between the device and the sea is required to be greater than 500m, and it is recommended that the device should not face the direction of the sea breeze.
- The equipment has no protective ability and cannot withstand the rain scene. It is strictly forbidden to install the equipment in places prone to water accumulation.
- When carrying out engineering design, according to the communication network planning and technical requirements of communication equipment, and comprehensively considering factors such as climate, hydrology, geology, earthquake, electricity, transportation, etc., select the address that meets the requirements of communication equipment engineering environment design.
- In order to ensure the accuracy of distance measurement, a space of 30cm should be reserved at the front, rear, left and right sides of the device deployment position.

1.2 Temperature and humidity requirements

The temperature and humidity environment requirements for the equipment to work are as follows:

- Standard working environment temperature $-20^{\circ}\text{C} \sim +65^{\circ}\text{C}$
- Storage temperature $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- Working humidity (non-condensing) $0\% \sim 90\%$

1.3 Tool preparation

When installing the equipment, prepare the tools listed in the table below in advance.

Tool type	Tool list
Universal tool	Electric drill, Phillips screwdriver, hexagon socket head screwdriver, Ethernet cable (category 5e and above are recommended), crystal head, network cable pliers, expansion tube, screws, tail screws
special tools	Computer, laser ruler, tape measure, wire stripper, crystal head wire crimping tool, anti-static tool
Auxiliary tool	ladder
Auxiliary accessories	Hoops, strips, brackets

1.4 Installation location selection

- ◆ The antenna should not be close to metal objects. The reflection of electromagnetic waves through the metal surface will cause a very strong multi-path effect, thus affecting the ranging accuracy;
- ◆ ☐ Do not get close to high-power equipment (full-band harmonics), such as high-power

radio equipment, large machinery, fluorescent lamps, etc. Since the UWB signal is close to the noise level, any high power multiple harmonics will affect it.

- ◆ ☐ Away from the liquid, the electromagnetic wave absorption of the liquid in this frequency band is very obvious.
- ◆ ☐ Choose the installation in a place with a wide field of vision
- ◆ ☐ The working environment temperature supports -20°C ~ 65°C, it is recommended to use it at room temperature. Different temperatures will affect the stability of the product to varying degrees.

1.5 Confirmation before installation

- In order to ensure the normal operation of the equipment and prolong the service life, please observe the following precautions:
- Please place the equipment in a ventilated place;
- Avoid equipment in high temperature environment;
- Please keep the signal of equipment away from high-voltage cables;
- Please keep the equipment away from the strong thunderstorm and strong electric field environment;
- Please unplug the power before cleaning the equipment;
- It is forbidden to wipe the equipment with wet cloth and liquid cleaning;
- Please do not open the case when the equipment is working;
- Ensure that the power supply is consistent with the equipment voltage;
- Please fix the equipment firmly to prevent it from falling;

1.6 Equipment Installation Instructions

1.6.1 Electrical connection

Application Scenario: Take DC12V to supply power to UG-230-C.

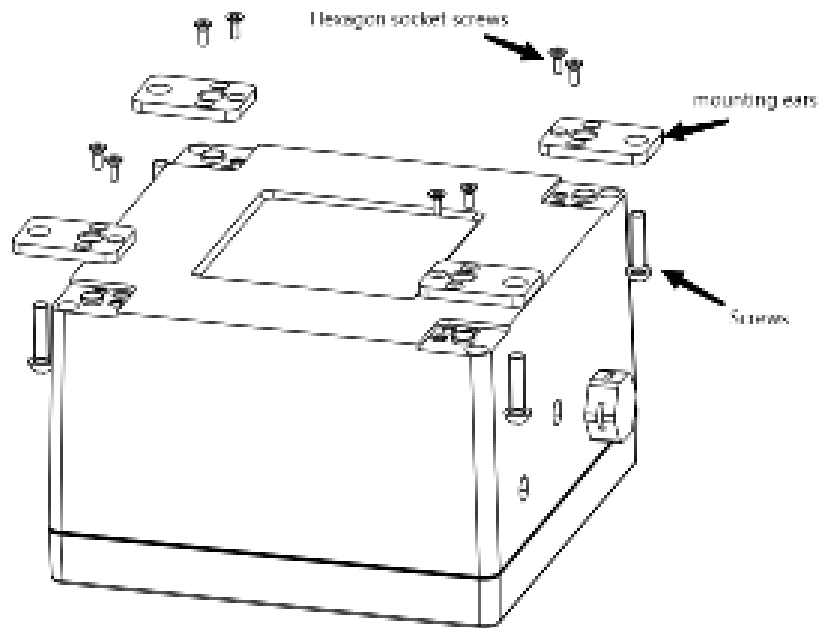
The UG-230-C is fixed on the bracket through the mounting ears, and the bracket is generally painted to prevent rust. The height of the bracket is higher than the driving railing to avoid blocking between the device antennas.

1.6.2 Fixed

The first consideration for the installation of the anchor is the antenna installation requirements. Generally, in order to meet the antenna installation conditions, it is necessary to extend the equipment through the I-beam bracket, which is higher than the driving railing.

During the installation, first fix the 4 mounting ears on the UG-230-C with the hexagon socket screws through hexagon socket head screwdriver.

Fixing the UG-230-C mounting ears on the I-beam bracket by screws, and fixing the power supply wire harness on the bracket to ensure stability.

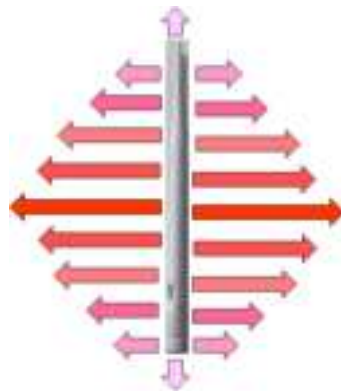


The anchor is fixed on the bracket by screws, and the bracket needs to be fixed on the vehicle by spot welding by professionals.

Finally install the antennas (see details 1.6.3) then power on.

1.6.3 Antenna Installation Instructions

Brief Description of Antenna Field Strength



P1 Antenna Field Strength Illustration

From the bottom to the tip of the white rod antenna, the signal strength changes from weak to strong, and then from strong to weak. (See picture 1). The middle part has the best signal strength.

Antenna Installation Requirements

- (1) The antennas between the devices should be vertically or horizontally parallel to ensure that the middle parts of the antennas are opposite.
- (2) There can be no objects between the antennas, and the requirements of the wireless TV distance must be met.
- (3) It is strictly forbidden to install the antenna top-to-top, top-to-bottom, bottom-to-bottom, and top/bottom-to-middle.
- (4) No objects (except mounting brackets) are allowed in the 30~50cm space around the antenna on the device.

Antenna Delay Calibration

There are differences between antennas, so you need to calibrate in the device to obtain the prepared antenna delay parameters to ensure the accuracy of ranging. The calibration method is as follows:

Command used Set antenna_delay 16520

instruction:

Set (command)

antenna_delay (Antenna Delay Parameters)

16520 (The value of the set antenna delay, decimal)

Test Calibration Method:

Anchor ----- Anchor

After the anchor and anchor ranging are stable, take the more stable value and average it to get RNG_AVERAGE;

Use accurate distance measurement equipment (such as total station, etc.) to measure the actual distance between the antenna end of the tag and the antenna end of the anchor as RNG_ACTUAL(Following Distance);

Fixed label antenna_delay value, Modify anchor antenna_delay value until

$|RNG_AVERAGE - RNG_ACTUAL| \text{ Absolute value} < \text{System allowable error value}$

