



MicroBrain Intelligent

**UAV-H30-1(CAN)
Altitude Millimeter Wave Radar
User Manual
(Compatible with Open source
flight controller)**

Microbrain Intelligent Technology Co., Ltd.

Disclaimer

Welcome to purchase this product.

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<https://www.microbrain.com.cn/en>.

Please read this statement carefully before using this product. Once used, it is deemed to be recognition and acceptance of the contents of this statement. Please strictly follow the manual to install and use this product. If there is damage or injury caused by improper use, Microbrain Intelligent Technology Co., Ltd. will not be responsible for the corresponding losses and compensation.

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Historic Version

| Date | Version | Updates |
|------------|---------|--|
| 2024.05.13 | 1.0 | UAV-H30-1 compatible with open source flight controller User Manual Version 1 (CAN Protocol) |

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1. UAV-H30-1 Introduction

UAV-H30-1 altitude millimeter-wave radar is independently developed by Microbrain Intelligent Technology Co., Ltd., using the 77GHz-81GHz frequency band, 2cm measurement accuracy, compact size, high sensitivity, light weight, and easy to use Integrated and stable in performance. It can detect the distance to vegetation and the ground at the same time, adapt to various complex terrain environments, and meet the flight height guidance of unmanned flying platforms such as agricultural UAV and small express transport UAV.

2. Product Feature

Type: Altitude Radar

Model: UAV-H30-1

Dimensions: 76*71.5*19.6mm

Weight: 87g (Including cables)

Protection: IP67

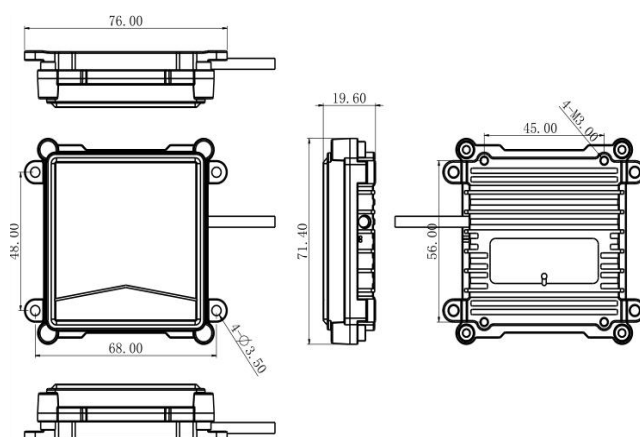


Figure 1 UAV-H30-1

Remark:

Dimensional tolerance:

When $\leq 10\text{mm}$, the tolerance is $\pm 0.3\text{mm}$;

When between (10~50)mm, the tolerance is $\pm 0.5\text{mm}$;

When $\geq 50\text{mm}$, the tolerance is $\pm 0.8\text{mm}$.

3. Performance parameters

UAV-H30-1 adopts linear frequency modulation continuous wave (FMCW) mode, which can accurately measure the distance between the radar and the ground or water surface within the measurement range.

Table 1 UAV-H30-1 performance parameters

| Features | Specification | Parameters |
|-----------------|-----------------------|---|
| Antenna Feature | Azimuth Angle (3dB) | $\pm 15^\circ$ |
| | Elevation Angle (3dB) | $\pm 4^\circ$ |
| | Maximum EIRP (dBm) | 30 |
| Radar Feature | Detection Range (m) | 0.2-27 |
| | Ranging Accuracy (m) | 0.02 |
| | Range Resolution (m) | 0.12 |
| | TX Frequency (GHz) | 77 |
| | Refresh Rate (Hz) | 20 |
| | FM Bandwidth (GHz) | 1.5 |
| System Feature | Working Voltage (V) | 5~24 |
| | Operating Temperature | $-40^\circ\text{C} \sim 85^\circ\text{C}$ |
| | Power Consumption (W) | 3W |
| | Data Interface | CAN |
| | PCB Dimension (mm) | 55*52*1.6 |

4. Packing List

Packing list including: UAV-H30-1 radar sensor $\times 1$

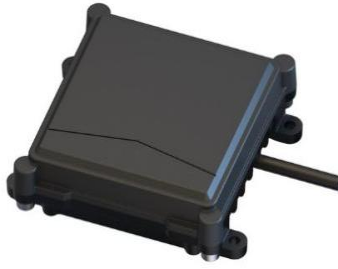


Figure 2 UAV-H30-1 physical picture of delivery

5. Installation

The radar should be installed directly below the drone, with the wiring harness facing ahead.



Figure 3 UAV-H30-1 installation diagram

6. Quick Guidance

- Pin definition

Table 2 UAV-H30-1 Pin Interface Definition:

| Pin | Definition |
|-----|----------------|
| 1 | POWER_IN (Red) |
| 2 | GND (Black) |
| 3 | CAN_L (White) |
| 4 | CAN_H (Green) |

● Debugging

The test software provided by Microbrain Intelligent Technology can acquire and analyze UAV-H30-1 sensor data and intuitively display the observation results.

The testing method using CAN protocol is as follows:

First, download UAV-H30-1 test software and user manual from Microbrain Intelligent customer service or the official website. Then install and configure the test software according to the user manual.

Table 3 Tools used for product testing

| No. | Device/Software | Qty |
|-----|-------------------------|-----|
| 1 | UAV-H30-1 Radar Sensor | 1 |
| 2 | PC | 1 |
| 3 | Zhou Ligong CAN Module | 1 |
| 4 | 5~24V Power Adapter | 1 |
| 5 | Test Debugging Software | 1 |

- 1) Connect the PC and UAV-H30-1 radar sensor through the CAN module. The connection diagram is as follows:

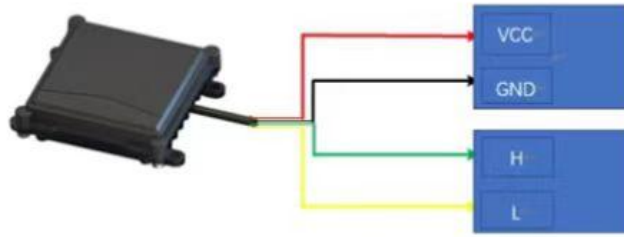


Figure 4 CAN cable connection diagram

Note:

The test requires communication with UAV-H30-1 using the CAN box shown below, The shipping list does not include the Zhou Ligong CAN box by default. Clients can obtain Zhou Ligong CAN box link address from Microbrain Intelligent Technology customer service to purchase.



Figure 5 CAN cable connection diagram

1) CAN Module connect with PC, click Start. The test results are shown in the figure:

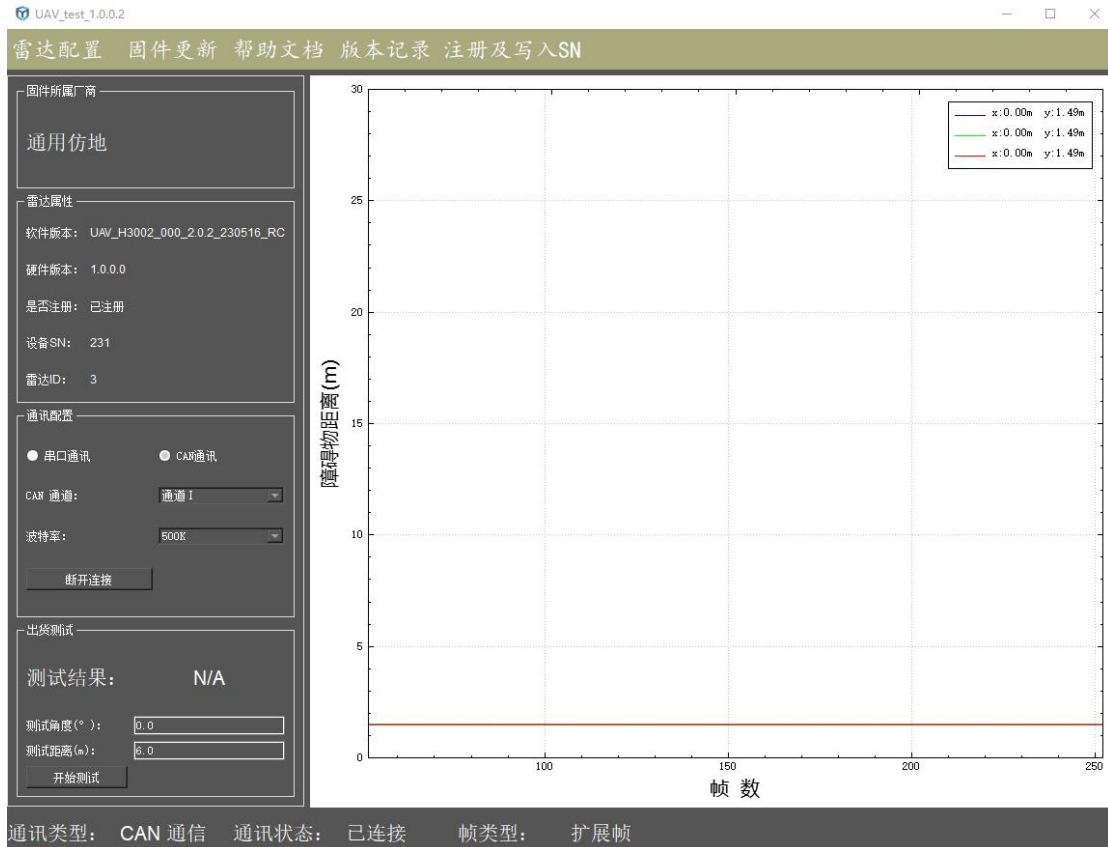


Figure 6 Test Software Window

7. CAN Port Data Analysis

UAV-H30-1 radar sensor support CAN port, The bus communication network of CAN complies with ISO11898-2 standard, the default transfer rate is 500Kbps. The target measurement information is transmitted through the CAN interface. The message ID uses a 29bit extended frame, UAV-H30-1 radar default ID: 0x75C, The data length is 6 bytes 48bit. UAV-H30-1 Bus messages are defined in the following table:

Table 4 UAV-H30-1 Radar data message frame format definition

| CAN | Frame Format | MIRS-H3 Radar ID | Data length (bit) | Data Format | Target |
|-----|-----------------|------------------|-------------------|---|----------|
| 1 | CAN2.0A (29bit) | 0x75C | 48 | 0-7: high 8 bits 8-15:lower 8 bits | Target 1 |
| | | | | 16-23:high 8 bits 24-31:lower 8 bits | Target 2 |
| | | | | 32-39:high 8 bits 40-48:lower 8 bits | Target 3 |

8. Precautions for product use

- The power pin needs to be connected to a separate external 5~24V DC regulated power supply;
- Use 4 M4 screws to fix UAV-H31-1;
- Please keep the radar cover surface clean during installation. To clean the cover surface, wipe it with a soft damp cloth and then let it dry naturally;
- Please pay attention to the shape of the radar when installing, ensure that the installed radar is not deformed, and do not squeeze, bump, or hit;
- When installing, make sure the radar is complete and do not disassemble or assemble it by yourself.

If you encounter problems that cannot be solved during the installation process, please contact the customer service staff of Microbrain Intelligent Technology Co., Ltd. We will serve you wholeheartedly!

9. FAQ

- 1) What is the height accuracy of UAV-H30-1?

The height accuracy of UAV-H30-1 is 2cm.

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