

UAV Terrain following radar

Model: UAV-H200-1 (CAN/UART)

Application: 0.9-200m UAV Terrain following radar



UAV

-Terrain following radar
-Obstacle avoidance radar

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Overview

UAV-H200-1 multi-target height fixing millimeter-wave radar is a multi-target height fixing millimeter-wave radar. It adopts linear frequency-modulated continuous wave (FMCW) modulation mode in 77GHz-81GHz band. It can accurately measure the distance between radar and ground or water and calculate the height of vegetation at the same time within the measuring range. 10cm measurement precision, small size, high sensitivity, light weight, easy integration, stable performance, can simultaneously detect the distance between vegetation and ground, can adapt to a variety of complex terrain environment, to meet the height guidance of unmanned flight platforms such as agricultural plant protection aircraft, small express transport aircraft, can also be applied to hydrological monitoring, liquid level measurement and other fields of application.

Features:

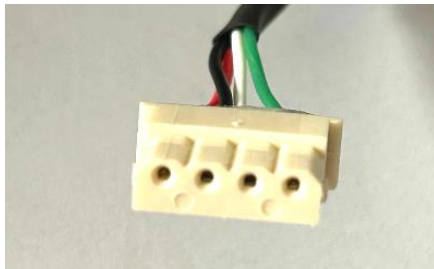
1. Power and antenna board higher integration;
2. power supply range 5-24V;
3. Stronger energy and stronger ability to detect targets;
4. The hardware bottom noise is relatively low, can set a high sensitivity
5. Fewer false positives
6. Light weight design at 90g.

Specifications:

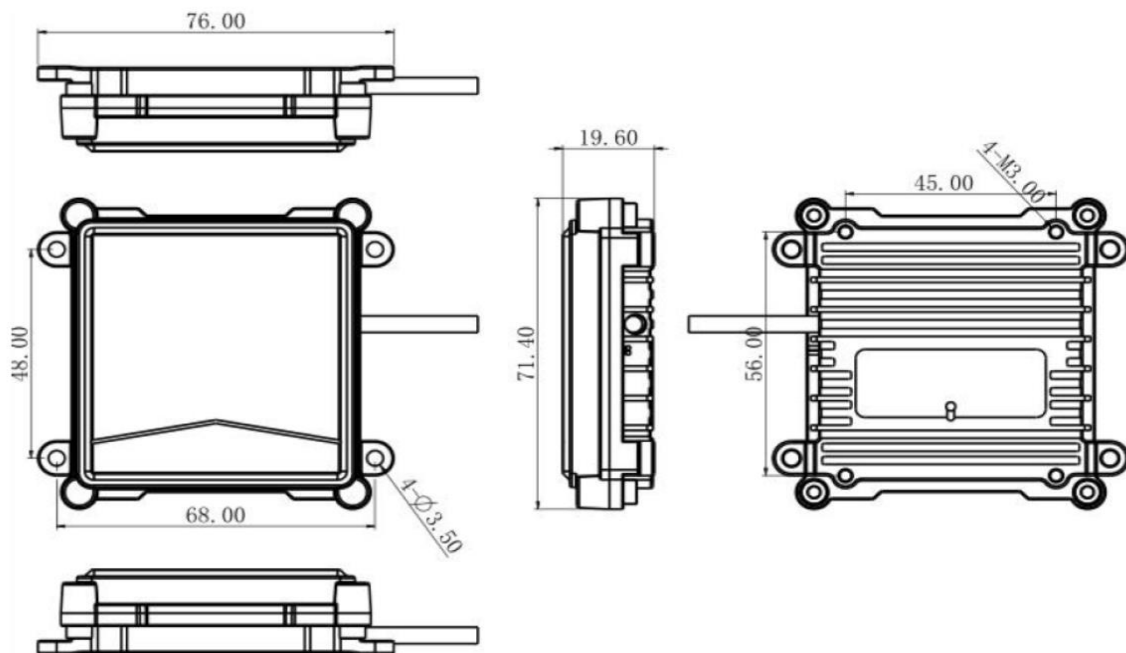
Feature	Parameter	Data
Antenna performance	Azimuth beam (3dB)	+/- 15°
	Pitch beam width(3dB)	+/- 4°
	Max EIRP(dBm)	30
Radar performance	Detect range(m)	0.9-200
	Ranging accuracy(m)	0.1
	Range resolution(m)	0.9
Radar attribute	Transmitting frequency(GHz)	77-81
	Refresh rate(Hz)	20
	Bandwidth(GHz)	1.5
System attribute	Operating voltage(VDC)	5~24VDC
	Operating temperature	-40~ +85°C
	Power consumption(W)	3.0
	Data interface	UART/CAN
	IP rating	IP67
	Size(mm)	76*71.5*19.6
	Weight(g)	90

2.54mm 4P Connector define:

Pins	Define	Parameter
1	DC_In (Red)	5~24VDC
2	GND (Black)	GND
3	RX (White)/CAN_L	0~3.3V
4	TX (Green)/CAN_H	0~3.3V



Product Dimisions:



Data Output explain

Serial port data parsing:

UART-TTL default baudrate at 115200 bps, Detect data each frame are 18 bytes, DATA is hexadecimal, the Strongest target is DATA[0], DATA[1], DATA[2], DATA[3], the height byte first. The data is accurate to three decimal places, and the data format is as follows:

Name	Length(Byte)	Value	Explain
HEAD	2	0xFE,0xFC	Start Bits
DATA[0] DATA[1] DATA[2] DATA[3]	4	-	Strongest target (negative numbers are invalid, high byte first, unit: mm)
DATA[4] DATA[5] DATA[6] DATA[7]	4	-	Nearest target (negative numbers are invalid, high byte first, unit: millimeters)
DATA[8] DATA[9] DATA[10] DATA[11]	4	-	Maximum height (negative numbers are invalid, high byte first, unit: millimeters)
SEQ	1	0~255	Frame loop (This bit indicates the number of frames sent. If the number of frames is greater than 255, the frame number is cleared to zero)
CRC	1	-	Check bit (The first 15 bytes are summed for verification)
TAIL	2	0x1D,0x1D	End Bits

Example: 0xFE 0xFC 0x00 0x00 0x08 0x4F 0x00 0x00 0x08 0x4E 0x00 0x00 0x13 0x6F
0xE6 0x0F 0x1D 0x1D

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H1 = (uint32_t)( (0x00*16777216) +(0x00465536)+(0x08*256)+ 0x4F) (mm)
H2= (uint32_t)( (0x00*16777216) +(0x00*65536)+(0x08+256)+ 0x4E) (mm)
H3= (uint32_t)( (0x00*16777216) +(0x00*65536)+(0x13*256) + 0x6F) (mm)
CRC = (0xFE+ 0xFC+0x00+0x00 +0x08+ 0x4F+ 0x00+ 0x00+ 0x08+ 0x4E+ 0x000+00
+0x13+ 0x6F+ 0xE6 ) & 0xFF;

```

CAN port data parsing:

The UAV-H200-1 supports a CAN interface. The CAN bus communication network conforms to the ISO11898-2 standard, with a default transmission rate of 1000K. Target measurement information is transmitted via the CAN interface. Message IDs use a 29-bit extended frame, with a default ID of 0x73C, and a data length of 6 bytes (48 bits).

The bus message definitions are as follows:

CAN	Format	ID	Data Length (bit)	Data format	Target
1	CAN2.0A (29bit)	0x73C	48	0-7 is High 8 bit 8-15 is Low 8 bit	Target 1 (Height)
				16-23 is High 8 bit 24-31 is Low 8 bit	Reserved
				32-39 is High 8 bit 40-48 is Low 8 bit	Reserved

Data Example: 00 F8 00 F8 00 F8 00 00

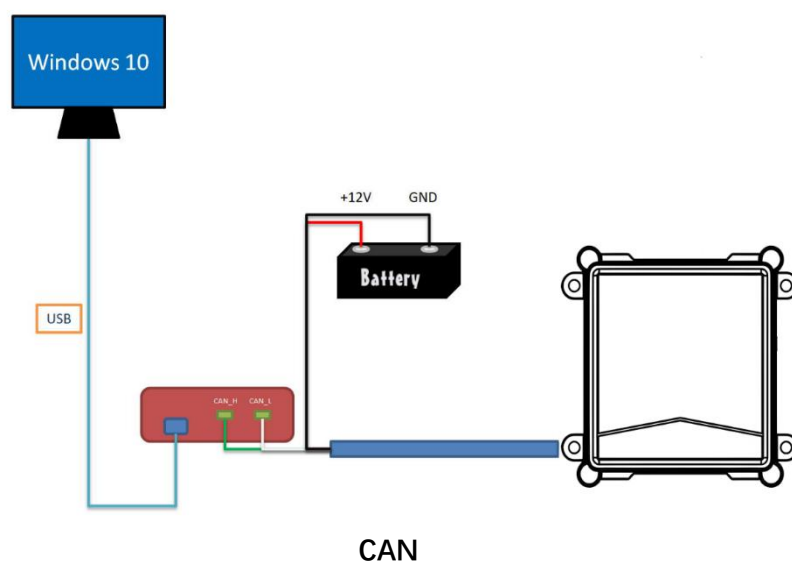
Each frame data is 6 bytes, 2bytes each target

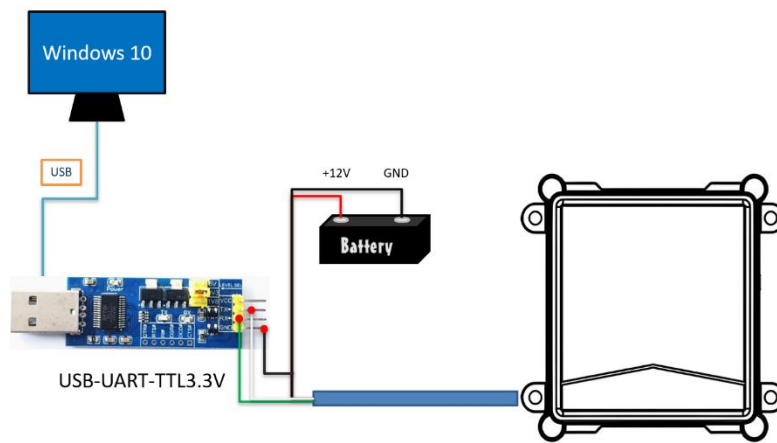
Height: $H = (0x00 * 256) + 0xF8$ (cm)

$H = 2.48\text{m}$

Hardware Connection for Test:

No.	Description	Qty
1	Radar Sensor	1
2	Windows OS PC	1
3	USB to UART-TTL tool / USB CANalyst-II tool	1
4	12VDC Power supplier	1
5	Test software	1





UART

Test Software:

