

# Standard Outdoor ADS-B Ground Receiver ADSB-RE1090P

## User Manual

AvionixTech

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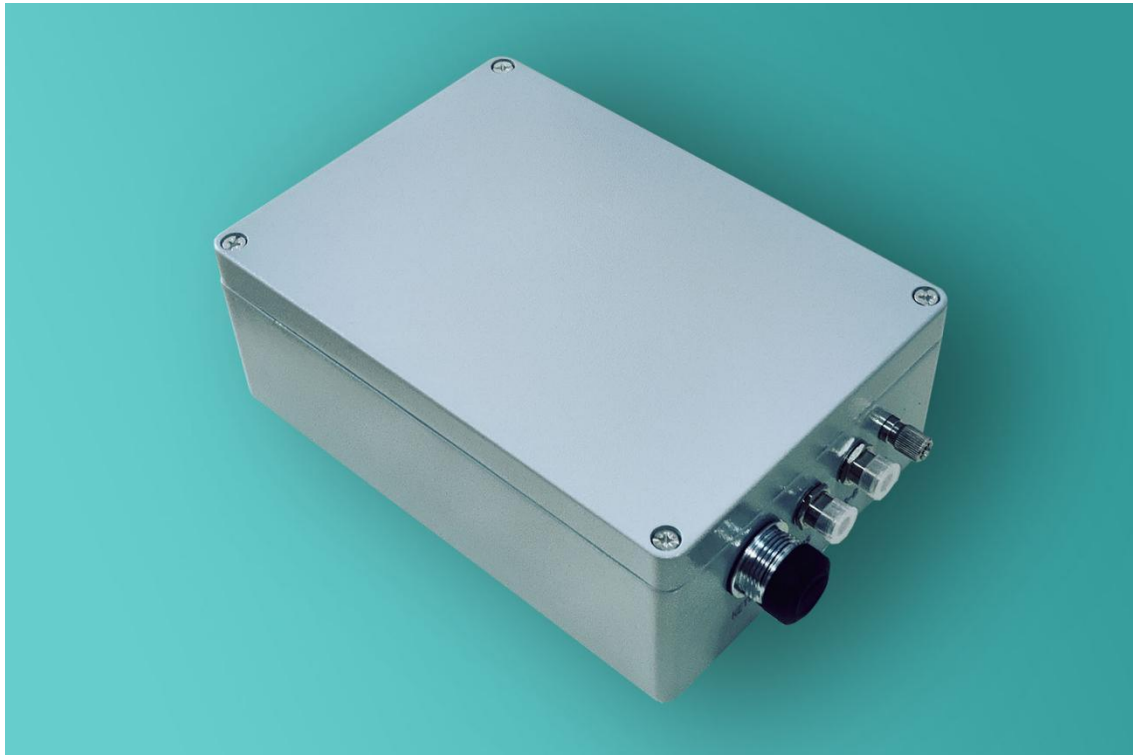
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## 1. Introduction

ADSB-RE1090P is an outdoor-ready ADS-B receiver compliant with the RTCA DO-260B standard. It integrates an ADS-B receiving module and an ADS-B data processing module, and can simultaneously output raw ADS-B messages, CSV plaintext data, and JSON plaintext track data via an RJ45 Ethernet port. This ADS-B receiver supports both BeiDou and GPS, providing users with ADS-B data reception, processing, and display services. It is suitable for applications in civil aviation flight surveillance, airport management, general aviation, low-altitude surveillance, UAV monitoring, radar calibration, experimentation, and education.

**Our equipment is designed for information and surveillance purposes in industrial environments and must not be used for air traffic control, navigation, life-critical and military applications.**



## Packing List:

| No. | Item                                  | Quantity      | Remarks   |
|-----|---------------------------------------|---------------|-----------|
| 1   | ADSB-RE1090P                          | 1 unit        | Included  |
| 2   | PoE Injector                          | 1 Unit        | Included  |
| 3   | Waterproof Ethernet Connector         | 1 Piece       | Included  |
| 4   | ADS-B Antenna & Clamp                 | 1 Set         | Included  |
| 5   | ADS-B Antenna Cable                   | 1 Piece (10m) | Included  |
| 6   | GNSS Antenna & Clamp                  | 1 Set         | Included  |
| 7   | GNSS Antenna Cable                    | 1 Piece (2m)  | Included  |
| 8   | Mounting Clamp for Main Unit          | 1 Set         | Included  |
| 9   | ADS-B Display Software –<br>adsbscope | 1 set         | supported |



## 2. Specifications

ADSB-RE1090P:

| No. | Specifications          |                                                                                                        |
|-----|-------------------------|--------------------------------------------------------------------------------------------------------|
| 1   | Power Supply            | POE                                                                                                    |
| 2   | Power Consumption       | 4W                                                                                                     |
| 3   | Receiving Frequency     | 1090MHz                                                                                                |
| 4   | Sensitivity             | $\leq -95\text{dBm}$                                                                                   |
| 5   | Receiving Range         | $>350\text{km}$ (no interference, unobstructed)                                                        |
| 6   | Dynamic Range           | $\geq 80\text{dB}$                                                                                     |
| 7   | Update Rate             | $\geq 1\text{Hz}$                                                                                      |
| 8   | Target Capacity         | $>600\text{targets}$                                                                                   |
| 9   | Processing Capability   | $>3,500/\text{s}$                                                                                      |
| 10  | Data Format             | DF 17/18/19 and other DF raw message<br>CSV plain text \ JSON plain text<br>JSON plain text track data |
| 11  | Data Interface          | RJ45 network port                                                                                      |
| 12  | Network Connection      | Static IP or DHCP                                                                                      |
| 13  | Network Protocol        | TCP/UDP/HTTP                                                                                           |
| 14  | ADS-B Antenna Interface | N female                                                                                               |
| 15  | GNSS Antenna Interface  | N female                                                                                               |
| 16  | Dimensions              | 340*235*95 mm(main unit)                                                                               |
| 17  | Weight                  | 3000g                                                                                                  |
| 18  | Protection Rating       | IP65                                                                                                   |
| 19  | Operating Temperature   | $-10^{\circ}\text{C} \sim +55^{\circ}\text{C}$                                                         |
| 20  | Storage Temperature     | $-15^{\circ}\text{C} \sim +60^{\circ}\text{C}$                                                         |
| 21  | Storage Humidity        | 10% ~ 80%                                                                                              |

## 3. Features

- **Convenient Secondary Development:** Supports multiple output formats including decoded plaintext, JSON track data, and DF17/DF18/DF19 raw messages.
- **Ethernet Data Transmission:** Data output via RJ45 Ethernet port.
- **Flexible Network Integration:** The ADSB-RE1090P can be directly configured with an IP address and connected to the customer's network without the need for a switch (using a switch is also optional, providing flexibility for the user).
- **Dual IP Assignment Modes:** Supports both Static IP and DHCP.
- **Simultaneous Multi-User Access:** A single receiver can send data to multiple client terminals simultaneously.
- **Comprehensive Signal Reception:** Capable of receiving Mode S and Mode A/C radar transponder signals.
- **Integrated Lightning Protection:** Features three built-in surge protectors (for ADS-B antenna, GPS antenna, and Ethernet), along with an external ground stud for user-installed grounding wire for lightning strike protection.
- **Optional 4G/5G Connectivity:** Supports data transmission via 4G/5G module (optional).
- Messages include timestamps.
- Optional data filtering by range.

## 4. Standard & Enhanced Optional Items

- Standard: Display software included
- Standard: High-performance outdoor antenna
- Standard: Lightning arrester
- Optional: Anti-salt spray corrosion antenna for seaside use
- Optional remote data transmission via 4G/5G module (UDP protocol only)

- Optional remote data transmission via 4G/5G module + VPN (supports UDP/TCP/HTTP protocols with encrypted transmission)
- Optional: Dual-unit configuration
- Optional: Customer OEM customization – all our products support customization, including custom branding, logo, product appearance, and packaging
- Optional: ADS-B IQ signal output – capable of outputting and storing IQ data to assist customers with IQ data analysis
- Optional: ACARS/ADS-B/AIS integration – enables integration of ADS-B with ACARS and AIS

### **5. Supported Special Application Scenarios**

Note: The standard application scenario involves installing the main unit indoors and the antenna outdoors. This is the optimal way to use the receiver, providing the best protection for the main unit, minimizing application risks, and maximizing the receiver's service life.

- BeiDou Support: Requires BeiDou compatibility.
- Indoor Installation Not Possible: Special cases where the main unit cannot be installed indoors.
- Seaside Use: Optional anti-salt spray corrosion antenna available.
- Marine/Onboard Use: Optional anti-salt spray corrosion antenna available.
- Thunderstorm-Prone Areas: Standard equipment includes a lightning arrester and built-in surge protector.



## 6. Interface Description



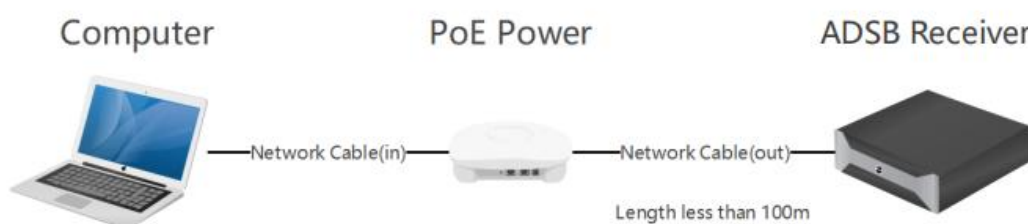
Main Unit Interfaces:

| No. | Interface Name | Function                                 |
|-----|----------------|------------------------------------------|
| 1   | NETWORK        | PoE interface, RJ45 connector            |
| 2   | GPS            | GPS/BDS antenna interface, N-Type Female |
| 3   | ANT            | ADS-B antenna interface, N-Type Female   |
| 4   | GND            | Grounding                                |

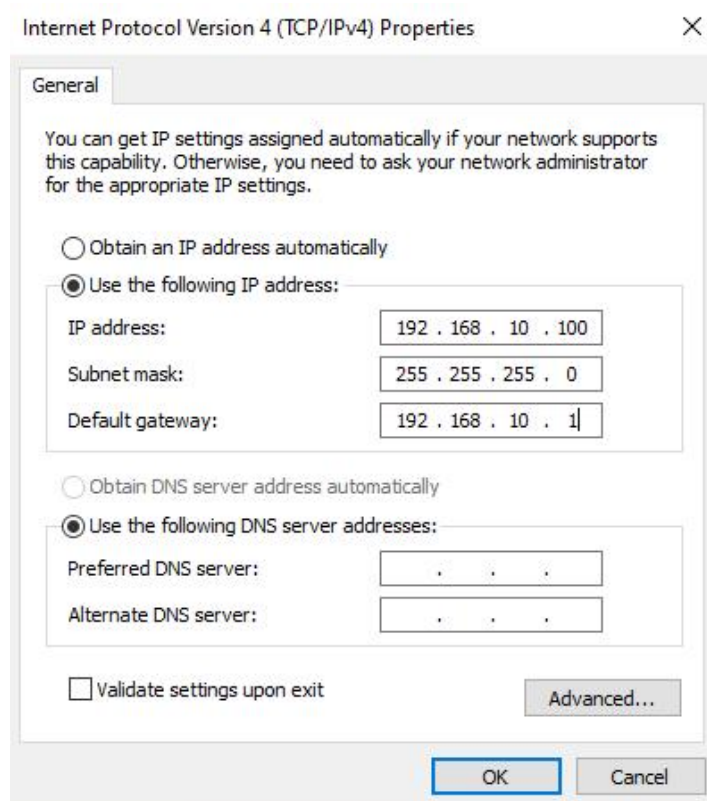
## 7. Device Connection

The default IP address of the ADSB-RE1090P is 192.168.10.10. It must be connected to a computer via the Ethernet port. This can be done either by a direct connection to the computer or through a router.

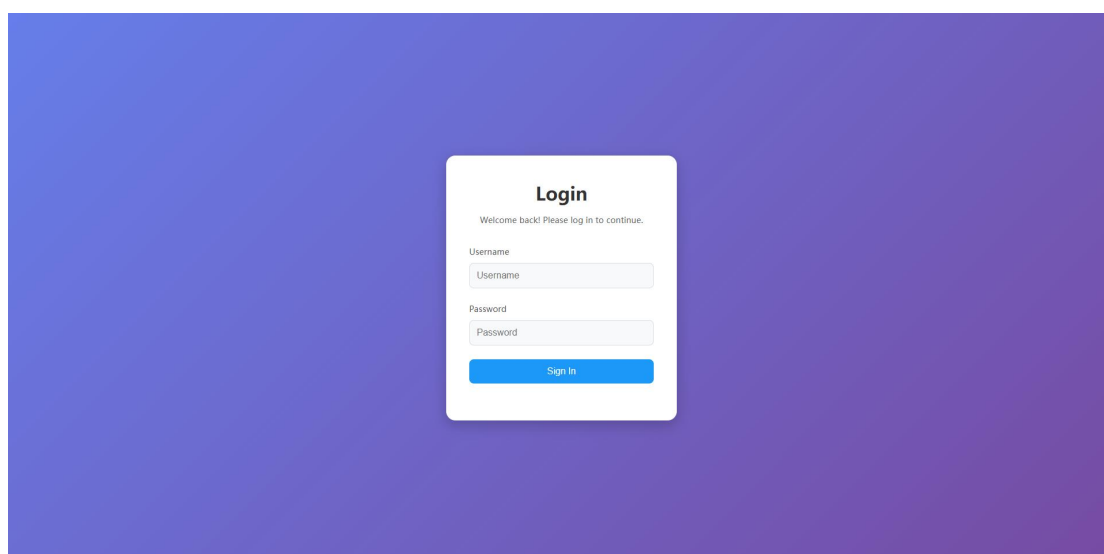
### Direct Connection Method:



- Connect the ADSB-RE1090P directly to the computer's Ethernet port using a network cable.
- Open the Network Connections interface on your computer, locate the network adapter connected to the ADSB-RE1090P, and configure its IP address to be on the same subnet as the ADSB-RE1090P device (the static IP address of the ADSB-RE1090P is 192.168.10.10).



- Open a web browser, enter 192.168.10.10 in the address bar, and press Enter. The appearance of the login screen confirms that the connection to the device is successful.

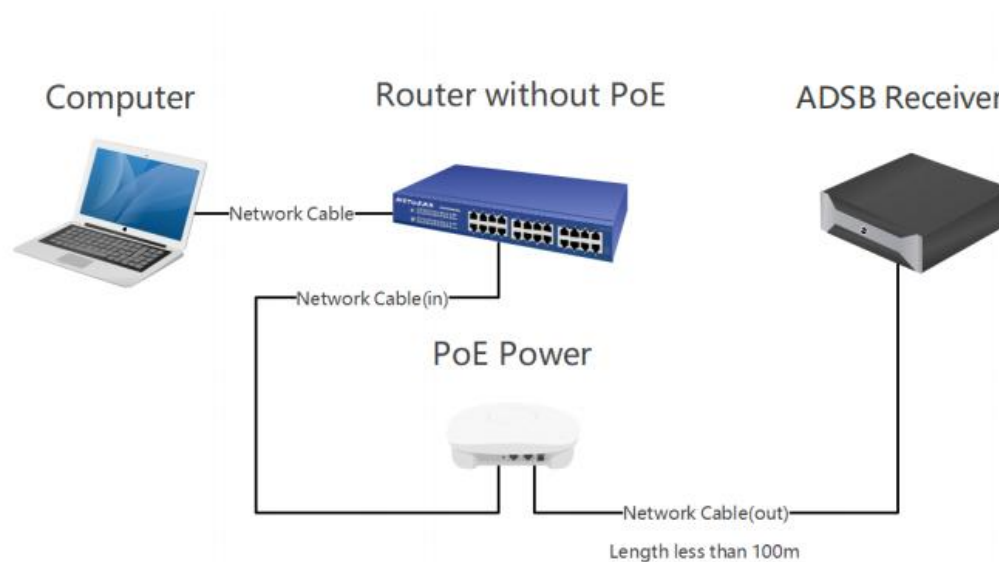


## Router Connection Method:

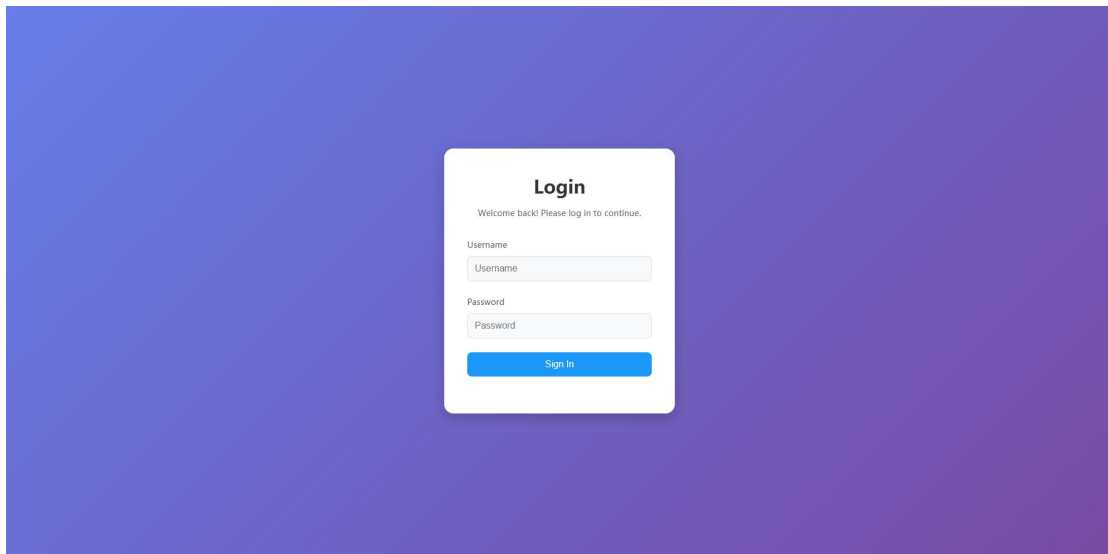
Router with PoE Functionality



### Router without PoE Functionality



- Connect the ADSB-RE1090P via an Ethernet cable to the router that your computer is connected to (ensure the router's gateway is 192.168.10.1).
- Open a web browser, enter 192.168.10.10 in the address bar, and press Enter. The following interface will appear, confirming that the connection to the device is successful.



## 8. Data Format

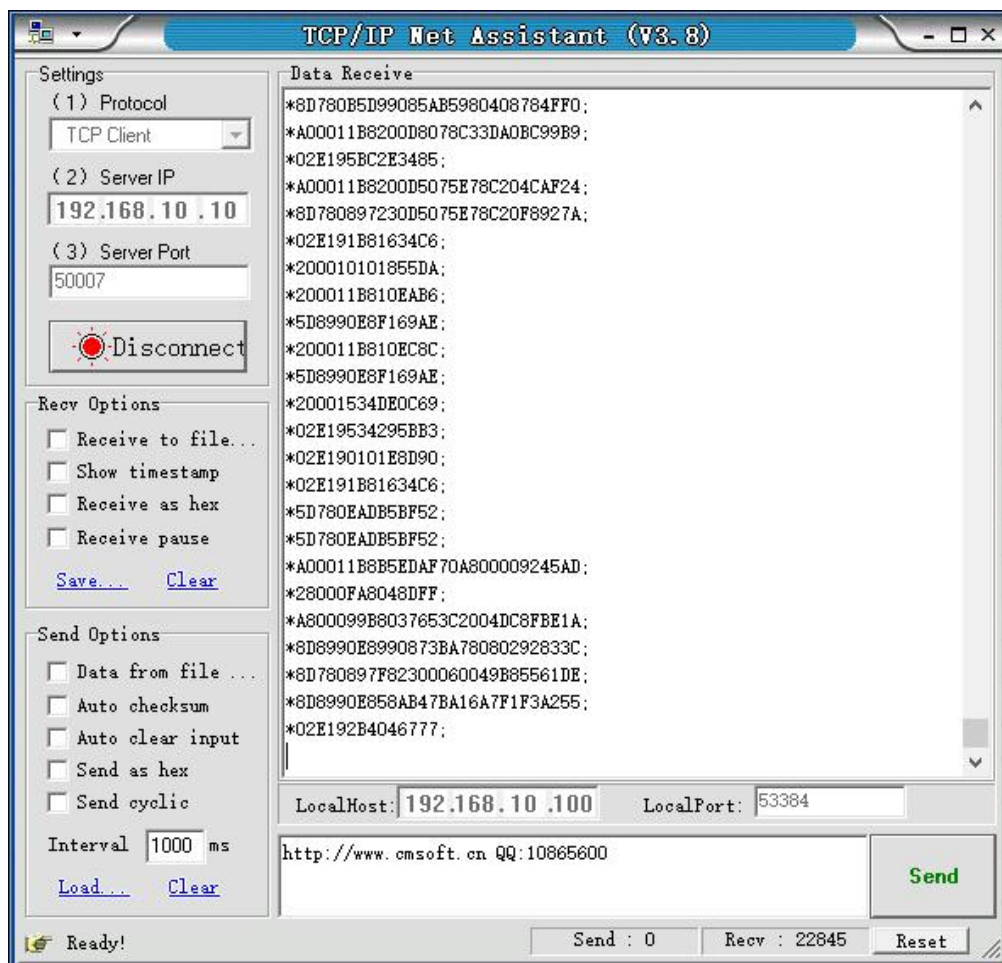
### 1. Raw Message

You can receive ADS-B raw message information via TCP. To configure this, open the network debugging tool and set it as follows:

**Protocol Type:** TCP Client

**Server IP Address:** 192.168.10.10 (the IP address of the ADSBR302)

**Server Port:** 50007 (the TCP port set in the data interface configuration).

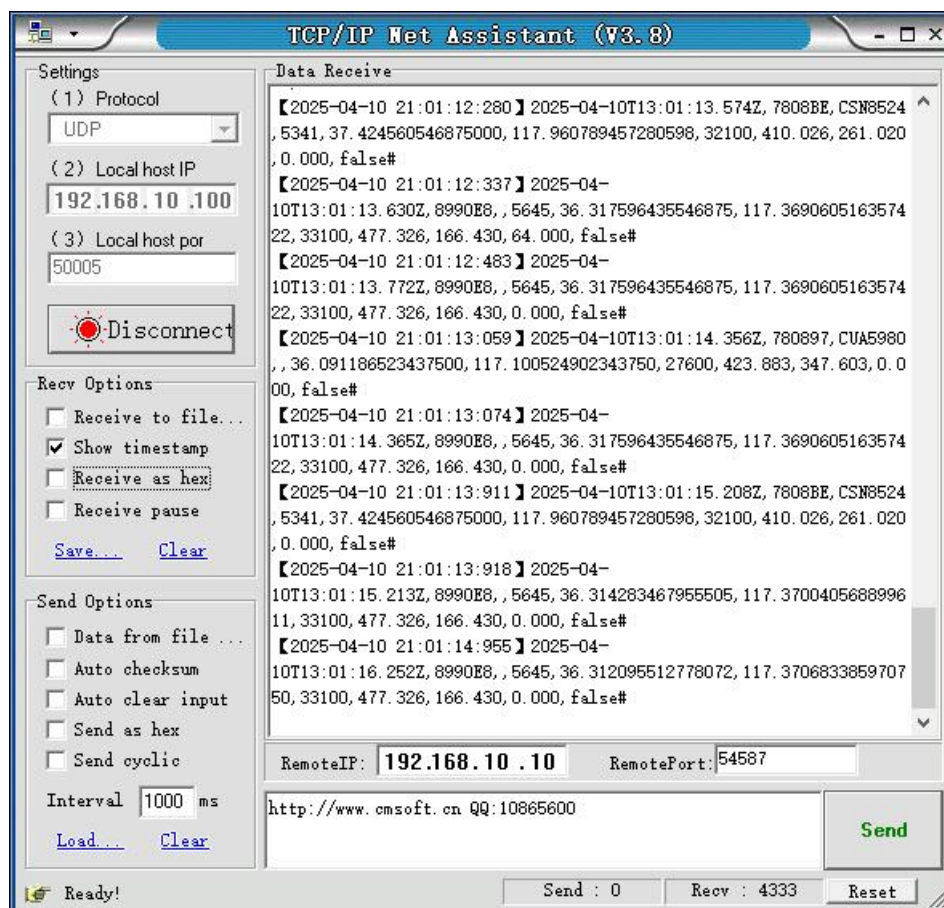


Raw Message Data Example:

```
*5D780CD7AB6A2D;
*5D7BB0F9D35532;
*8D78151CEA38E866033C08E21D45;
*8D7815CB587B8406F1171F42B050;
```

## 2. CSV Plaintext Data

To receive the decoded plaintext via UDP, open the network debugging tool and configure it as follows:



Decoded CSV Plaintext Data Example:

```
2025-01-23T06:23:04.006Z,780BA5,CSN5849,5673,36.009475708007812,117.01738357543
9453,25600,391.175,351.621,64.000,false#
2025-01-23T06:23:04.144Z,780EF1,CHB6279,6276,36.855422973632812,118.87224562624
6681,24600,444.933,96.582,0.000,false#
```

Data Description:

| Data                         | Description            | Remarks                                                                                                   |
|------------------------------|------------------------|-----------------------------------------------------------------------------------------------------------|
| 2025-01-23T<br>06:23:04.006Z | Time                   | The time is the system device's time (reference<br>format: ISO 8601), format:<br>yyyy-MM-ddTHH:mm:ss.zzzZ |
| 780BA5                       | ICAO 24-bit<br>Address | 6-digit hexadecimal format data                                                                           |
| CSN5849                      | Call Sign              | 8 characters output                                                                                       |
| 5673                         | Secondary Code         | 4-digit octal format number                                                                               |
| 36.009475708007812           | Latitude               | Latitude in decimal degrees, North is positive,<br>South is negative                                      |
| 117.01738357543945<br>3      | Longitude              | Longitude in decimal degrees, East is positive,<br>West is negative                                       |



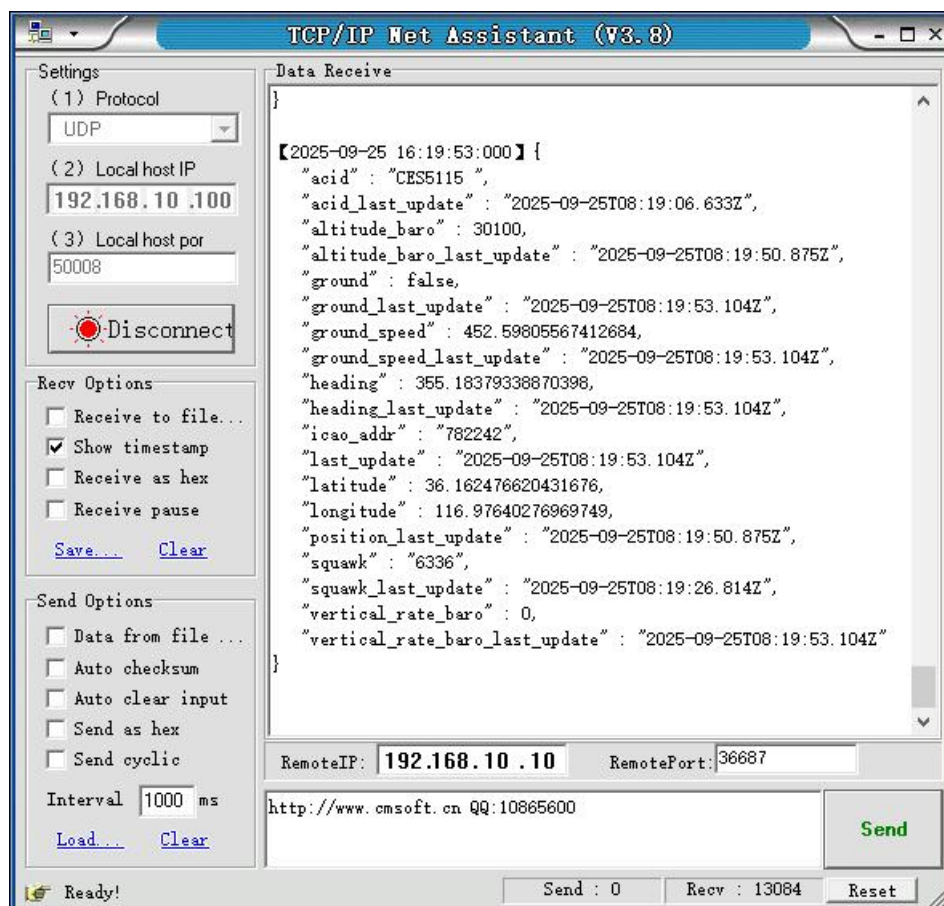
|         |                        |                                                              |
|---------|------------------------|--------------------------------------------------------------|
| 25600   | Pressure Altitude      | Feet                                                         |
| 391.175 | Ground Speed           | Knots per hour                                               |
| 351.621 | Heading Angle          | Decimal, in degrees                                          |
| 64.000  | Pressure Vertical Rate | Meters per minute, negative for descent, positive for ascent |
| false   | Air/Ground Indicator   | true indicates ground, false indicates air                   |

Note: If data is missing, the value will be left empty and will not be output.

## 3. JSON Plaintext Data

JSON plaintext data is received via UDP and outputs standard JSON-formatted data.

Open the Network Debug Assistant and configure it as follows:



Decoded JSON Data Example:

```
{
  "acid": "CUA5978 ",
  "acid_last_update": "2025-08-02T01:49:45.386Z",
```



```

"altitude_baro" : 27600,
"altitude_baro_last_update" : "2025-08-02T01:49:38.648Z",
"ground" : false,
"ground_last_update" : "2025-08-02T01:49:42.957Z",
"ground_speed" : 414.56603816521198,
"ground_speed_last_update" : "2025-08-02T01:49:42.957Z",
"heading" : 355.01828648354956,
"heading_last_update" : "2025-08-02T01:49:42.957Z",
"icao_addr" : "7810A0",
"last_update" : "2025-08-02T01:49:45.386Z",
"squawk" : "5051",
"squawk_last_update" : "2025-08-02T01:49:42.958Z",
"vertical_rate_baro" : 0,
"vertical_rate_baro_last_update" : "2025-08-02T01:49:42.957Z"
}
{
  "acid" : "CSN8976 ",
  "acid_last_update" : "2025-08-02T01:48:37.492Z",
  "altitude_baro" : 27600,
  "altitude_baro_last_update" : "2025-08-02T01:49:45.387Z",
  "ground" : false,
  "ground_last_update" : "2025-08-02T01:49:45.387Z",
  "ground_speed" : 451.7842405396629,
  "ground_speed_last_update" : "2025-08-02T01:48:31.466Z",
  "heading" : 350.05813916085731,
  "heading_last_update" : "2025-08-02T01:48:31.466Z",
  "icao_addr" : "782209",
  "last_update" : "2025-08-02T01:49:45.387Z",
  "squawk" : "5041",
  "squawk_last_update" : "2025-08-02T01:48:38.735Z",
  "vertical_rate_baro" : 0,
  "vertical_rate_baro_last_update" : "2025-08-02T01:48:31.466Z"
}

```

## Data Description:

| Data Items                | Example Data             | Descriptions                           |
|---------------------------|--------------------------|----------------------------------------|
| acid                      | CDG2230                  | Callsign                               |
| acid_last_update          | 2025-01-23T06:36:46.170Z | Last Updated Time of Callsign          |
| altitude_baro             | 20700                    | Pressure Altitude (feet)               |
| altitude_baro_last_update | 2025-01-23T06:37:15.406Z | Last Updated Time of Pressure Altitude |

|                                |                          |                                                                            |
|--------------------------------|--------------------------|----------------------------------------------------------------------------|
| ground                         | false                    | Ground Indicator, true indicates on the ground, false indicates in the air |
| ground_last_update             | 2025-01-23T06:37:15.406Z | Last Updated Time of Ground Indicator                                      |
| ground_speed                   | 438.308110807911         | Ground Speed (knots)                                                       |
| ground_speed_last_update       | 2025-01-23T06:37:14.160Z | Last Updated Time of Ground Speed                                          |
| heading                        | 130.55875881014302       | Heading Angle (degrees)                                                    |
| heading_last_update            | 2025-01-23T06:37:14.160Z | Last Updated Time of Heading Angle                                         |
| icao_addr                      | 7809A2                   | ICAO 24-bit Address                                                        |
| last_update                    | 2025-01-23T06:37:15.406Z | Last Updated Time of Track                                                 |
| latitude                       | 36.25309753417969        | Latitude (degrees)                                                         |
| longitude                      | 117.35332489013672       | Longitude (degrees)                                                        |
| position_last_update           | 2025-01-23T06:37:15.406Z | Last Updated Time of Position                                              |
| squawk                         | 0052                     | Secondary Code                                                             |
| squawk_last_update             | 2025-01-23T06:37:01.379Z | Last Updated Time of Secondary Code                                        |
| vertical_rate_baro             | 0                        | Vertical Rate (feet/minute)                                                |
| vertical_rate_baro_last_update | 2025-01-23T06:37:14.160Z | Last Updated Time of Vertical Rate                                         |

#### 4. JSON Plaintext Track Data

To receive JSON plaintext track data, use the HTTP service. The data is output in standard JSON format.

To access the data, enter the following URL in your browser:

<http://192.168.10.10:8888>

(Note: Replace 192.168.10.10 with the IP address of your ADSBR302 device.)

The fixed request port is 8888.

# Standard Outdoor ADS-B Ground Receiver ADSB-RE1090P

```
1 [
2 {
3   "acid": "CH7664",
4   "acid_last_update": "2025-01-23T06:36:22.712Z",
5   "altitude_baro": 23600,
6   "altitude_baro_last_update": "2025-01-23T06:36:24.554Z",
7   "ground": false,
8   "ground_last_update": "2025-01-23T06:36:24.554Z",
9   "ground_speed": 382.558960722527,
10  "ground_speed_last_update": "2025-01-23T06:36:04.441Z",
11  "heading": 276.811392244995,
12  "heading_last_update": "2025-01-23T06:36:04.441Z",
13  "icao_addr": "780688",
14  "last_update": "2025-01-23T06:36:24.554Z",
15  "vertical_rate_baro": 0,
16  "vertical_rate_baro_last_update": "2025-01-23T06:36:04.441Z"
17 },
18 {
19   "acid": "T071507",
20   "acid_last_update": "2025-01-23T06:35:46.538Z",
21   "altitude_baro": 20700,
22   "altitude_baro_last_update": "2025-01-23T06:36:16.623Z",
23   "ground": false,
24   "ground_last_update": "2025-01-23T06:36:25.135Z",
25   "ground_speed": 408.8275920238261,
26   "ground_speed_last_update": "2025-01-23T06:36:25.135Z",
27   "heading": 96.74256860639846,
28   "heading_last_update": "2025-01-23T06:36:25.135Z",
29   "icao_addr": "781B7F",
30   "last_update": "2025-01-23T06:36:25.206Z",
31   "latitude": 36.84544372558594,
32   "longitude": 119.02273178100586,
33   "position_last_update": "2025-01-23T06:36:16.623Z",
34   "vertical_rate_baro": 0,
35   "vertical_rate_baro_last_update": "2025-01-23T06:36:25.135Z"
36 },
37 {
38   "acid": "CDG2203",
39   "acid_last_update": "2025-01-23T06:35:39.846Z",
40   "altitude_baro": 31100,
41   "altitude_baro_last_update": "2025-01-23T06:36:23.300Z",
42   "ground": false,
43   "ground_last_update": "2025-01-23T06:36:24.354Z",
44   "ground_speed": 460.2195128414266,
45   "ground_speed_last_update": "2025-01-23T06:36:24.354Z",
46   "heading": 167.3226530108672,
47   "heading_last_update": "2025-01-23T06:36:24.354Z",
48   "icao_addr": "780D0A",
49   "last_update": "2025-01-23T06:36:24.354Z",
50   "latitude": 36.43657619670286,
51   "longitude": 117.32743932845746,
52   "position_last_update": "2025-01-23T06:36:23.300Z",
53   "vertical_rate_baro": -64,
54   "vertical_rate_baro_last_update": "2025-01-23T06:36:24.354Z"
55 },
56 {
57   "acid": "CH6261",
58   "acid_last_update": "2025-01-23T06:36:16.103Z",
59   "altitude_baro": 32100,
60   "altitude_baro_last_update": "2025-01-23T06:36:24.158Z",
61   "ground": false,
62   "ground_last_update": "2025-01-23T06:36:24.607Z",
63   "ground_speed": 373.68703482994985,
64   "ground_speed_last_update": "2025-01-23T06:36:24.607Z",
65   "heading": 260.9157790756205,
66   "heading_last_update": "2025-01-23T06:36:24.607Z",
67   "icao_addr": "780D19",
68   "last_update": "2025-01-23T06:36:24.607Z",
69   "latitude": 37.42418192200741,
70   "longitude": 117.95763762100883,
```

## Decoded JSON Track Data Example:

```
{
  "altitude_baro": 22600,
  "altitude_baro_last_update": "2025-01-23T06:37:14.213Z",
  "ground": false,
  "ground_last_update": "2025-01-23T06:37:14.485Z",
  "ground_speed": 396.50472884948044,
  "ground_speed_last_update": "2025-01-23T06:37:14.485Z",
  "heading": 182.89126959679598,
  "heading_last_update": "2025-01-23T06:37:14.485Z",
  "icao_addr": "7820E2",
  "last_update": "2025-01-23T06:37:14.485Z",
  "latitude": 36.20709228515625,
  "longitude": 117.28546142578125,
  "position_last_update": "2025-01-23T06:37:14.213Z",
  "squawk": "4136",
  "squawk_last_update": "2025-01-23T06:37:02.356Z",
  "vertical_rate_baro": 0,
  "vertical_rate_baro_last_update": "2025-01-23T06:37:14.485Z"
},
{
  "acid": "CDG2230",
```

```

"acid_last_update": "2025-01-23T06:36:46.170Z",
"altitude_baro": 20700,
"altitude_baro_last_update": "2025-01-23T06:37:15.406Z",
"ground": false,
"ground_last_update": "2025-01-23T06:37:15.406Z",
"ground_speed": 438.308110807911,
"ground_speed_last_update": "2025-01-23T06:37:14.160Z",
"heading": 130.55875881014302,
"heading_last_update": "2025-01-23T06:37:14.160Z",
"icao_addr": "7809A2",
"last_update": "2025-01-23T06:37:15.406Z",
"latitude": 36.25309753417969,
"longitude": 117.35332489013672,
"position_last_update": "2025-01-23T06:37:15.406Z",
"squawk": "0052",
"squawk_last_update": "2025-01-23T06:37:01.379Z",
"vertical_rate_baro": 0,
"vertical_rate_baro_last_update": "2025-01-23T06:37:14.160Z"
},

```

## Data Description:

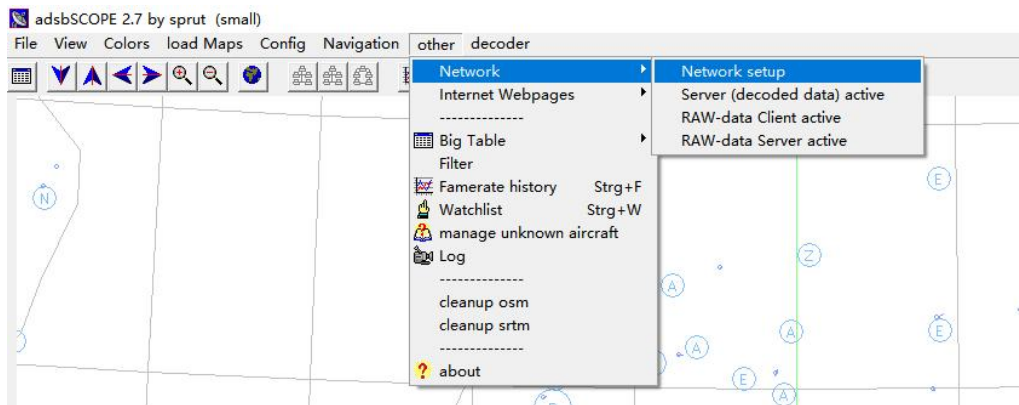
| Data Items                | Example Data             | Descriptions                                                               |
|---------------------------|--------------------------|----------------------------------------------------------------------------|
| acid                      | CDG2230                  | Callsign                                                                   |
| acid_last_update          | 2025-01-23T06:36:46.170Z | Last Updated Time of Callsign                                              |
| altitude_baro             | 20700                    | Pressure Altitude (feet)                                                   |
| altitude_baro_last_update | 2025-01-23T06:37:15.406Z | Last Updated Time of Pressure Altitude                                     |
| ground                    | false                    | Ground Indicator, true indicates on the ground, false indicates in the air |
| ground_last_update        | 2025-01-23T06:37:15.406Z | Last Updated Time of Ground Indicator                                      |
| ground_speed              | 438.308110807911         | Ground Speed (knots)                                                       |
| ground_speed_last_update  | 2025-01-23T06:37:14.160Z | Last Updated Time of Ground Speed                                          |
| heading                   | 130.55875881014302       | Heading Angle (degrees)                                                    |
| heading_last_update       | 2025-01-23T06:37:14.160Z | Last Updated Time of Heading Angle                                         |
| icao_addr                 | 7809A2                   | ICAO 24-bit Address                                                        |

|                                |                          |                                     |
|--------------------------------|--------------------------|-------------------------------------|
| last_update                    | 2025-01-23T06:37:15.406Z | Last Updated Time of Track          |
| latitude                       | 36.25309753417969        | Latitude (degrees)                  |
| longitude                      | 117.35332489013672       | Longitude (degrees)                 |
| position_last_update           | 2025-01-23T06:37:15.406Z | Last Updated Time of Position       |
| squawk                         | 0052                     | Secondary Code                      |
| squawk_last_update             | 2025-01-23T06:37:01.379Z | Last Updated Time of Secondary Code |
| vertical_rate_baro             | 0                        | Vertical Rate (feet/minute)         |
| vertical_rate_baro_last_update | 2025-01-23T06:37:14.160Z | Last Updated Time of Vertical Rate  |

## 9. Software Connection

The ADSB-RE1090P can be connected to the display software adsbScope. The detailed steps are as follows:

- (1) Open the display software adsbScope, such as adsbscope27\_256.exe.
- (2) In the top menu, go to Other, then select Network and Network Setup.



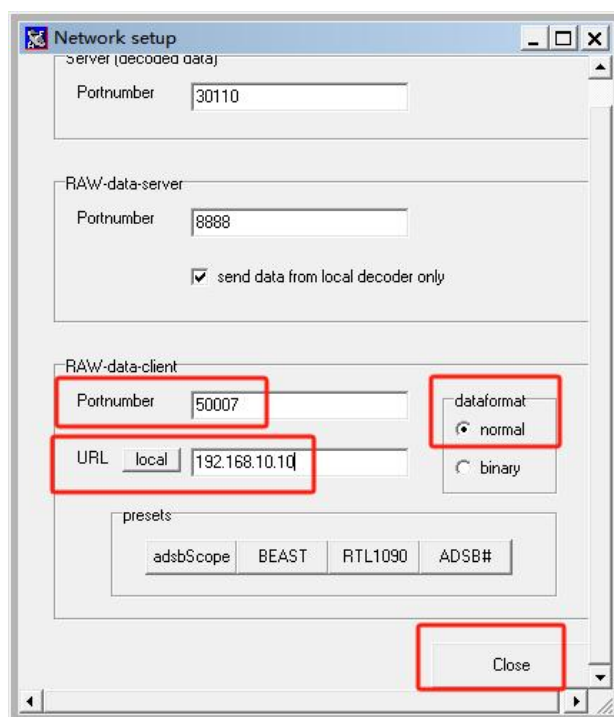
- (3) In the pop-up window, enter the following:

Port number: Fill in the TCP port used in the ADSB-RE1090P raw message.

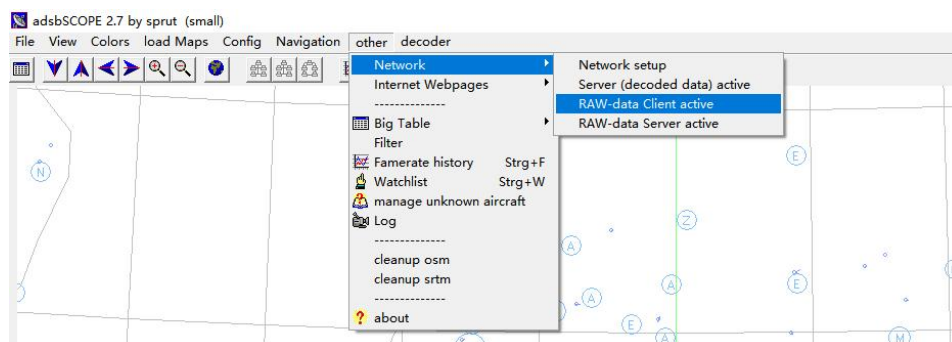
URL: Enter the device IP address.

Data format: Select Normal.

Click the Close button.

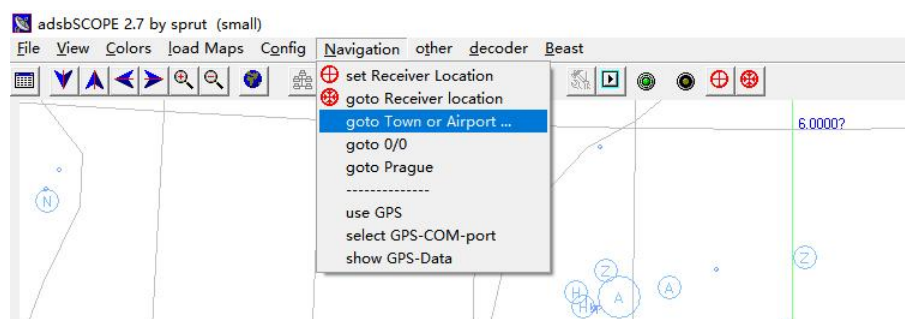


(4) Then, click Network in the top menu again, and select RAW-data Client Active.



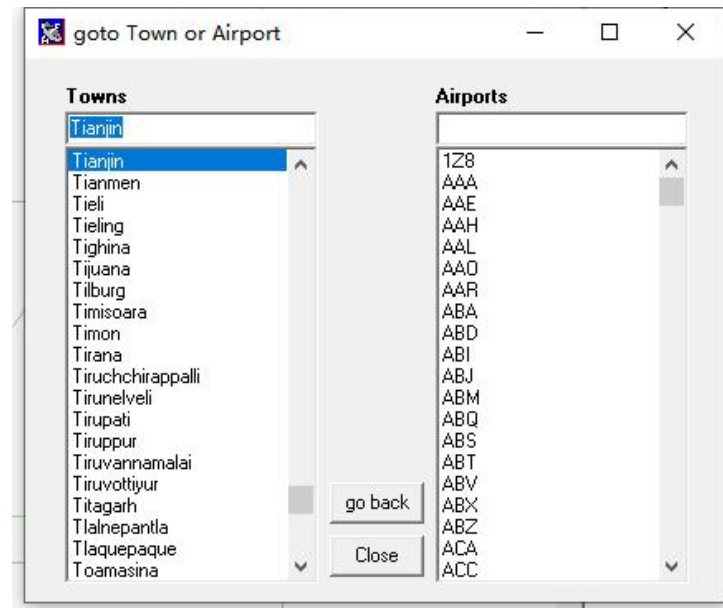
(5) At this point, you should see the received data on the right side of the software.

(6) Next, select Navigation in the menu and then Goto Town or Airport....



(7) In the pop-up window, type the name of the nearest airport (in English) in the Towns input box. Select the airport from the query list below, then click Close at the

top right corner.



(8) The display software will now show the aircraft's location properly.

## 10. ADS-B Antenna



- High Quality Fiberglass
- Sturdy Durable Anticorrosive.
- Aluminum Alloy Base. The base is perfectly made of aluminum and firm enough to against strong wind and other terrible weather.
- Waterproof Sealing Technology. The top and bottom of antenna are used double sided waterproof processing and effectively against rainy weather.
- Stable performance

- High gain
- Lower VSWR

Specifications:

| No. | Specifications  |                       |
|-----|-----------------|-----------------------|
| 1   | Frequency Range | 1060-1120MHz          |
| 2   | Bandwidth       | 60MHz                 |
| 3   | Gain            | 6dBi                  |
| 4   | VSWR            | $\leq 1.5$            |
| 5   | Direction Type  | Omnidirectional       |
| 6   | Polarization    | Vertical polarization |
| 7   | Length          | 60cm                  |
| 8   | Weight          | 0.6kg                 |
| 9   | Connector Type  | N female              |
| 10  | Mounting Type   | Mast mount            |

Mounting Method:

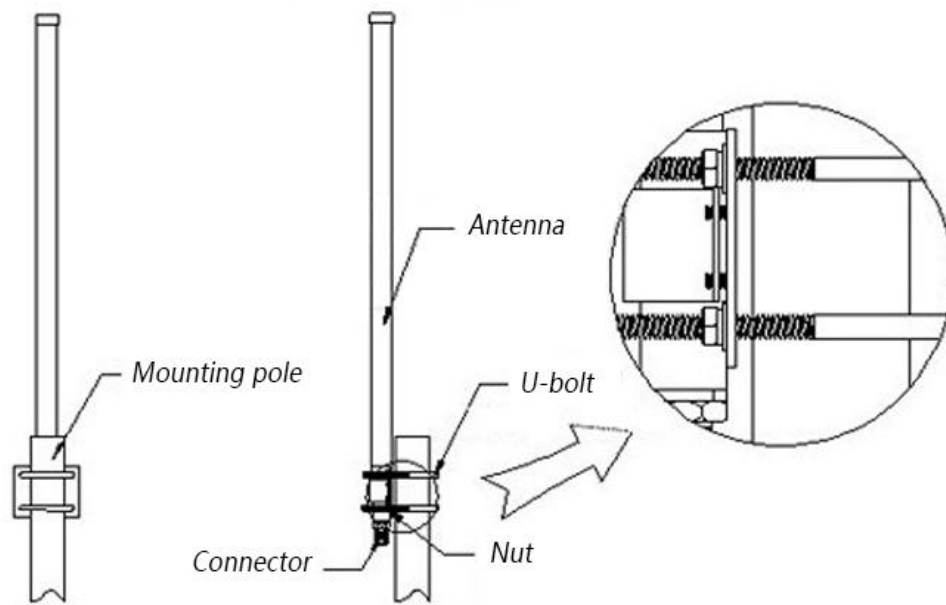
The antenna should be installed in an open area, free from tall surrounding obstructions. A certain installation height is required—the higher the antenna, the better the signal reception.

The antenna should be mounted vertically to ensure its polarization aligns with that of the aircraft's transmitted signal, which will provide optimal reception performance.

Compatible with pole diameters ranging from  $\Phi 30$  mm to  $\Phi 60$  mm;  $\Phi 50$  mm is recommended.

Mounting method as shown in the figure:





## 11. GNSS Antenna



## Specifications:

| No. | Specifications                          |                                                                                                                    |
|-----|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| 1   | Frequency Range                         | 1575.42 ± 5 MHz (GPS)<br>1561.098 ± 5 MHz (BDS)                                                                    |
| 2   | Gain                                    | 38 dBi ± 2 dBi (including LNA)                                                                                     |
| 3   | Polarization                            | Right-Hand Circular Polarization (RHCP)                                                                            |
| 4   | Axial Ratio                             | ≤ 5 dB                                                                                                             |
| 5   | 3dB Beam width                          | 110° ± 10°                                                                                                         |
| 6   | Output VSWR                             | ≤ 2.0                                                                                                              |
| 7   | DC Supply Voltage                       | 4V ~ 6V                                                                                                            |
| 8   | Supply Current                          | ≤ 45 mA                                                                                                            |
| 9   | Surge Immunity                          | Compliant with GB/T17626.5-1999; idt<br>IEC61000-4-5:1995;<br>CWG combination wave: 1.2/50μs impulse voltage: 3KV; |
| 10  | Antenna Connector                       | N-Type Female                                                                                                      |
| 11  | Radome Material                         | Engineering plastic ASA with 7% anti-aging agent and UV<br>absorber                                                |
| 12  | Dimensions (Diameter x<br>Height)       | Φ110mm x 105mm                                                                                                     |
| 13  | Weight (including<br>mounting hardware) | 750g                                                                                                               |
| 14  | Operating Temperature                   | -40°C ~ +75°C                                                                                                      |
| 15  | Storage Temperature                     | -40°C ~ +100°C                                                                                                     |
| 16  | Operating Humidity                      | 5%~100%, including condensation conditions                                                                         |
| 17  | Operating Wind Speed                    | 37.5 m/s                                                                                                           |
| 18  | Survival Wind Speed                     | 55 m/s                                                                                                             |
| 19  | Operating Environment                   | Outdoor natural environment                                                                                        |

## 12. ADS-B RF Cable

| No. | Specifications  |               |
|-----|-----------------|---------------|
| 1   | Frequency Range | 30 - 6000 MHz |

|   |                         |                         |
|---|-------------------------|-------------------------|
| 2 | Peak Power              | 16.0 kW                 |
| 3 | Shielding Effectiveness | >90 dB                  |
| 4 | Velocity Factor         | 85%                     |
| 5 | Attenuation             | 14.2 dB/100m @ 1090 MHz |
| 6 | Cable Diameter          | 10.29 mm                |
| 7 | Cable Length            | 10 m                    |
| 8 | Connector Type          | Both ends: N-Type Male  |

### 13. Device Installation Precautions

#### 1. Device Installation Location

Keep away from sources of electromagnetic interference. Equipment such as large motors, high-voltage power lines, and radar stations can generate strong electromagnetic interference that may overwhelm the ADS-B signal, preventing the receiver from correctly decoding it.

For pole mounting, a pole diameter of 50–200 mm is acceptable. See the diagram below for installation reference:



## **2. Antenna Installation**

When installing the antenna, it is recommended to choose an open area with a clear line of sight, avoiding surrounding tall obstructions. Increasing the installation height will help improve signal reception; generally, the higher the antenna, the better the reception performance.

To achieve optimal reception, the antenna must be installed vertically to ensure its polarization matches that of the signals transmitted by aircraft.

The recommended pole diameter for installation ranges from 30 mm to 60 mm, with 50 mm being the preferred choice.

## **3. Lightning Rod**

When the device or antenna is installed at a high location such as on a rooftop, a lightning rod should be installed to prevent direct lightning strikes. The lightning rod must extend above the antenna and other components, typically at least 1–2 meters higher than the antenna. In the event of a direct lightning strike, the rod will be struck first, and the lightning current will be conducted to the ground via the down conductor, protecting the equipment from damage.

## **4. Device Grounding**

The ADSB-RE1090P is equipped with a grounding bolt interface. During installation, connect the grounding bolt to a grounding cable. Multiple metal grounding electrodes (e.g., copper-clad steel rods) should be driven into the ground and connected together with flat steel to form a grounding grid, thereby enhancing the grounding effectiveness.

## **5. Surge Protectors**

The ADSB-RE1090P features three built-in surge protectors for the ADS-B antenna, GPS antenna, and Ethernet port. In the event of an induced surge, these protectors will conduct quickly, discharging the surge current to ground and safeguarding the internal circuits from overvoltage damage.

## **6. Distance from Lightning Protection Devices**

Maintain a safe distance between the device and lightning protection equipment

such as lightning rods. This is important for two reasons: first, to prevent strong electromagnetic fields generated during lightning current discharge from interfering with the device; second, to avoid flashover damage caused by excessive proximity during a lightning event. A horizontal separation distance of at least 3 meters between the device and the lightning rod is generally recommended.

### **7. Sun and Rain Protection**

Although the device is designed for outdoor operation, prolonged exposure to direct sunlight or rain will inevitably shorten its service life. Whenever possible, take measures to protect the device from sun and rain to maximize its operational lifespan.

## **14. Customization**

OEM, ODM, White Label & Customization

We offer flexible OEM, ODM, white-label, and customization solutions for our ADS-B, AIS, ACARS, and other aviation and surveillance products.

Our products can be tailored to your specific technical and commercial requirements and customized with your own brand and logo. Depending on your requirements, we can customize product designs, enclosures, hardware and software features, interfaces, and data formats.

Whether you need a ready-to-brand white-label product, an OEM solution, or a fully customized product for a specific application, our experienced team can help you bring your product to market efficiently while reducing development time and risk.

Contact us to discuss your specific requirements and explore the most suitable solution for your business.

## 15. Important Note

**Please note:**

Our device must not and shall not be used for military or illegal purposes under any circumstances.

Our ADS-B equipment is for informational and surveillance purposes only. It is not certified for, and must never be relied upon for, air traffic control, navigation, or any other safety-critical function where human life may be at risk.

## 16. Why Choose Us

- Comprehensive product range to meet users' needs for various levels of ADS-B ground station systems.
- Easy installation and use, with no complex configuration or high technical requirements for engineers. Simple and user-friendly.
- Complete after-sales service, providing technical support and services to help users maximize product benefits.
- Support for remote upgrades, assisting users in accessing the latest product features.
- Independent product development with customization options based on user requirements, including form factors, logo, software, hardware, performance, and functionality.

## 17. Frequently Asked Questions

**Should an ADS-B receiver be installed indoors or outdoors?**

In most applications, the ADS-B receiver itself is installed indoors, while the ADS-B antenna is mounted outdoors in a location with a clear view of the sky. The GPS antenna is typically installed outdoors as well, although it may also be placed near a

window if sufficient satellite signals are available.

The ADS-B antenna and GPS antenna are connected to the receiver using RF coaxial cables. This installation method provides good protection for the receiver while maintaining reliable signal reception.

However, there is another installation scenario that should be considered.

If the available antenna mounting location is far away from the indoor equipment room, the required RF coaxial cable may become excessively long. Since coaxial cables introduce signal attenuation, longer cables result in greater signal loss. Excessive cable loss reduces the strength of the received ADS-B signal before it reaches the receiver, which may decrease reception performance and coverage.

In such cases, it is often preferable to install the ADS-B receiver outdoors, close to the ADS-B antenna. This minimizes RF cable length and signal attenuation. The receiver can then communicate with the backend system through a standard Ethernet cable, which supports much longer transmission distances with negligible signal degradation.

When installing the receiver outdoors, the following factors should also be considered:

- The receiver enclosure should provide adequate waterproof and dust protection (such as an IP-rated enclosure).
- The equipment should be suitable for the expected operating temperature range.
- Proper lightning protection and grounding should be provided for the entire ADS-B system, including the antenna, mast, coaxial cables, and network cables.
- Outdoor equipment should be installed in a secure location that allows convenient maintenance and inspection.

In general, keeping the RF coaxial cable as short as practical is more important than keeping the network cable short. A well-designed installation balances antenna location, cable length, environmental protection, and maintenance accessibility to achieve the best reception performance.