

EXD26-30LT

Small Industrial ADS-B Receiver

1. Brief introduction

EXD26-30LT is a small ADS-B receiver with high stability, wide power input and high receiving sensitivity. The signal input of the receiver adopts a two-stage narrow-band filter and a one-stage low-noise amplifier, which can effectively filter out most of the out-of-band noise in the space channel to obtain a better signal-to-noise ratio, and the typical receiving sensitivity can reach -90dBm. The integrated high-dynamic signal processing circuit allows simultaneous reception of ADS-B broadcast information from short to long distance, with a typical monitoring distance of up to 250km.



The device supports Ethernet POE or external DC power supply, supports TCP/UDP protocol, and can be connected to the server to form a large-area airspace monitoring system. It can output the original ADS-B message (DF17/DF18) or aircraft plaintext information (aircraft identification number ICAO, flight number, latitude and longitude, altitude, speed, heading, etc.) through the UART port and LAN port at the same time.

Features

- Maximum receiver sensitivity -90dBm
- Data format: DF17/DF18 or aircraft plaintext data
- UART TTL(3.3V) data interface, baud rate between 9600-921600
- RJ45 Ethernet port, supports TCP/UDP, supports POE
- Metal shielded housing, high stability, wide power input

Application

- ADS-B signal receiver
- Airspace monitoring
- Ground equipment, virtual radar

2. Absolute Maximum Ratings

Table 1 Absolute Maximum Ratings

parameter	value	unit
Supply voltage range V_{in}	-0.5-30	V
All other pin input voltage ranges	-0.5- V_{in}	V
Antenna maximum input power	5	dBm
Operating temperature	-30 to +85	°C
Storage temperature	-40 to +125	°C

3. Basic Parameters

Table 2 Basic operating parameters¹

parameter	Min	typical	Max	unit
Supply voltage	5	12	28	V
Operating current		50	80	mA
Receive sensitivity	-85	-90		dBm
Receive dynamic range	-100		-20	dBm
Antenna input impedance		50		Ω
Operating frequency		1090		MHz
Serial pin IO level high	2.8	3.3	3.3	V
Flag pin outputs level high	3.1	3.3	3.3	V
Maximum Target	100			Batches/racks
Processing delay			50	ms
Monitoring range		250		km
Communication interfaces	1. UART 3.3V TTL level, data format UART, n, 8, 1, baud rate range 9600-921600 2. 10M/100M Ethernet connector (support POE)			
Data format	1. DF17/DF18 raw message 2. Aircraft plaintext data			

1. All data is measured with input voltage 12V

4. Power supply and connection methods

EXD26-30LT supports either Ethernet POE or external DC power supply. If POE power supply is used, please use the 24V POE power adaptor provided by us, and the POE power supply connection method is as follows:

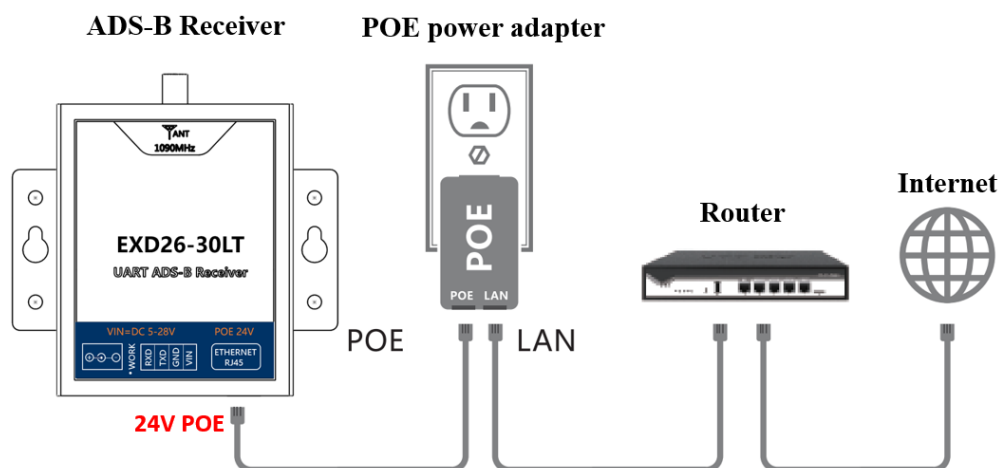


Figure 1 POE power supply and connection method

EXD26-30LT supports external DC power supply and UART communication.

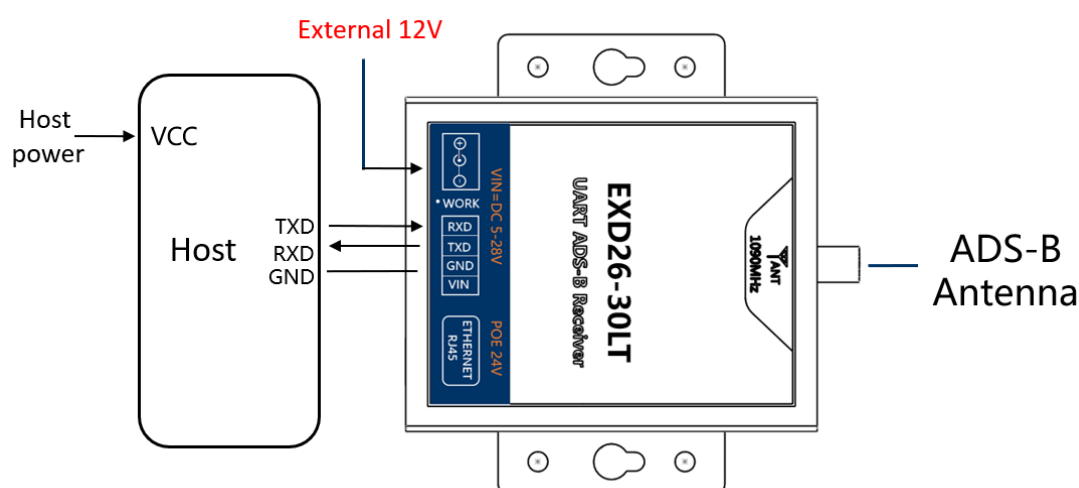


Figure 2 DC power supply and UART communication

5. Detailed introduction

5.1 Operating Instructions

Before using the device, please check whether the appearance of the device is damaged, whether the ADS-B antenna is installed correctly and whether it is loose, and

follow the steps below after checking that it is correct:

A: Connect the POE power adapter to the AC 110-220V power supply, connect the POE port of the POE power adapter to the ADS-B receiver, and connect the LAN port to the computer or gateway router, as shown in Figure 1 above.

B: Use the Network Configuration Tool to modify the network parameters of the device (the first time you use it, you generally need to modify the network parameters of the device, otherwise you will not receive the data of the device, after configuring the network parameters, you do not need to reconfigure it the next time you power on.) See Section 5.2 below for how to configure the network).

C: Open the Serial Network Debug Tool, after setting the IP and port, send VS00, # command with the Tool. If you receive the firmware version returned by the device, it proves that the network parameters are configured correctly and the communication is normal, at this time, if the ADS-B antenna is placed outdoor and there is an aircraft nearby, then the Serial Network Debug Tool will print the data output by the device in real time. The working mode of the device can also be configured through this Tool, and the configuration instructions are shown in chapters 5.4 below.

5.2 Instructions for using the network configuration tool

The Network Configuration Tool allows you to configure the network parameters of the EXD52-LS receiver. The basic parameters include: device name, DHCP (automatic IP address), manual setting of IP address (including IP address, subnet mask, default gateway), in which the device name is mainly for convenient module management in the LAN, and the length does not exceed 20 characters. It is not recommended to select DHCP.

The port parameters section mainly modifies the following parameters: network mode, local port, destination IP/domain name and destination port, and other parameters such as baud rate are not recommended. Here's how to use the network configuration tool:

1. Select the computer network card, note that the receiver must be in the same LAN as the computer to search for the receiver. The same LAN means that the receiver and computer are connected to the same router/switch or the IP range is the same.
2. Click Search Device, at this time, a few words of the search device will be grayed out, and wait for about 10 seconds to complete the search.
3. Double-clicking on the searched device will automatically get the parameters of the current receiver, and then modify the parameters you need to modify,

generally only need to modify the network mode, port and IP parameters.

4. Finally, click Configure Device Parameters to complete the configuration.

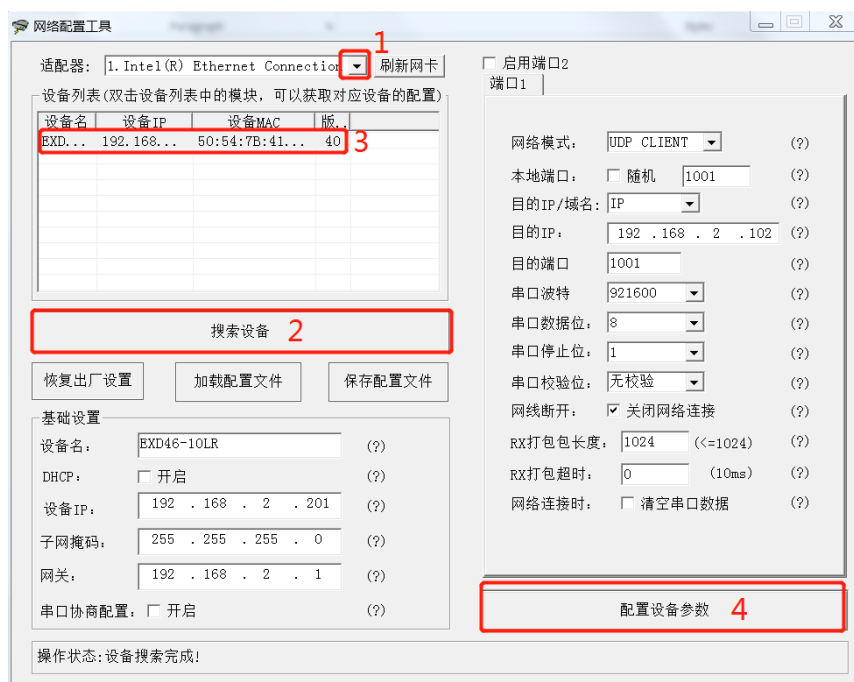


Figure 3: The Network Configuration Tool software interface

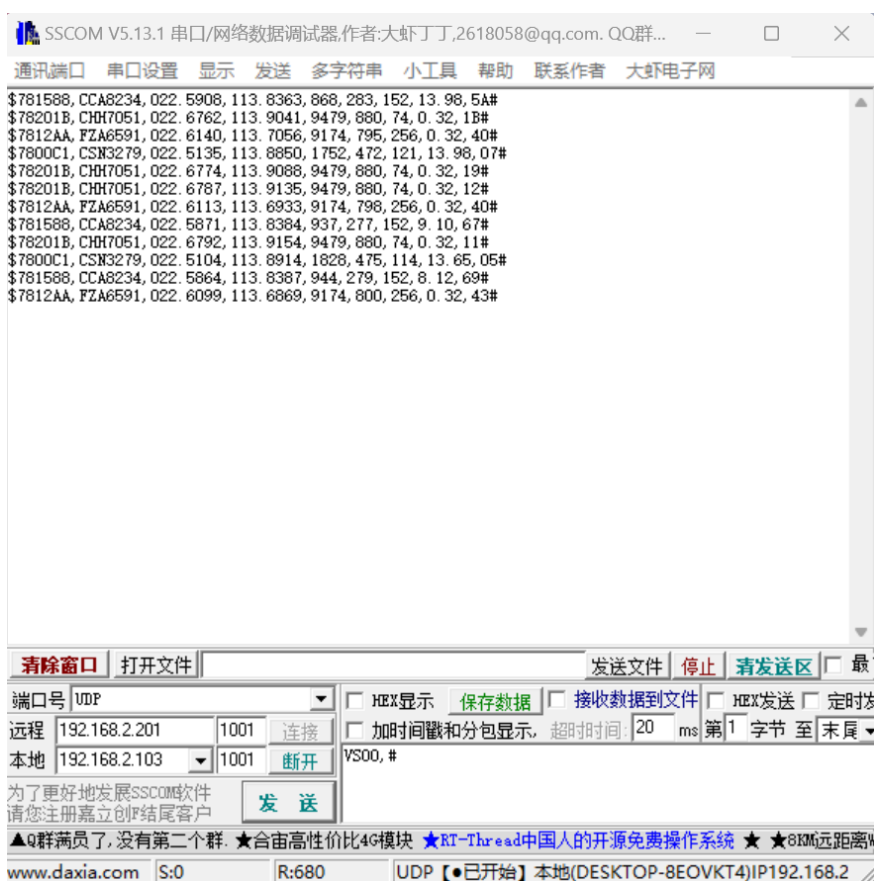


Figure 4 Serial Network Debug Tool interface

5.3 Working Mode

The EXD26-30LT has three working modes, and the default working mode is Mode 2. Use UART command in table 4 to configure the device in different working modes.

Table 4 VS12-11T work mode

Mode	UART cmd	description
Mode 0	VS11, 0#	Outputs all aircraft plaintext information once per second \$7810EA, DKH1157, 022. 5921, 113. 7482, 3901, 596, 250, 0, 6321, 56# \$7808A5, , 022. 6822, 113. 7679, 3360, 712, 354, 3. 57, 3360, 44#
Mode 1	VS11, 1#	Output DF17/DF18 raw data *8D89630AEA469858011C0864254E; *8D780BC5230D8078CF8C204F503E; *8D780BC5581BD30422CB6A10347F;
Mode 2	VS11, 2#	Outputs aircraft plaintext information immediately \$7810EA, DKH1157, 022. 5921, 113. 7482, 3901, 596, 250, 0, 6321, 56# \$7808A5, , 022. 6822, 113. 7679, 3360, 712, 354, 3. 57, 3360, 44#

● **Mode 0: Output aircraft plaintext once per second**

In working mode 0, the EXD26-30LT serial port aggregates and outputs all aircraft plaintext information once per second. The data format of the data is as follows, each ASCII frame starts with \$ and ends with #+ <CR><LF>. The parameters are separated by a "," sign, where the altitude is the barometric altitude, the unit of speed is km/h, the unit of climb rate is m/s, and the check code is \$ (excluding \$) to the last "," between which all data is taken as hexadecimal values. The data format is as follow:

For example:

```
$7811AD,CSZ9457,022.4753,113.7895,8930,474,230,10.72,2433,4E#
$4BA94E,THY24__,022.5175,113.5534,44927,958,118,-0.32,5740,16#
$78136B,CSZ9937,022.6667,113.9978,3299,578,349,-0.65,4225,22#
$780254,,022.6010,113.8319,3474,312,154,11.05,0000,08#
$78136B,CSZ9937,022.6673,113.9977,3299,578,349,-0.65,4225,28#
```

● **Mode 1: Output DF17/DF18 text data in real time**

In working mode 1, the receiver outputs DF17/DF18 ADS-B text data in real time. Each ASCII frame starts with *, to; + <CR><LF> ends.

For example:

```
*8D780BC5581B86C4842957C96C3F;
*8D780BC599886F9B10C406E69A89;
```

*8D89630AEA469858011C0864254E;
*8D780BC5230D8078CF8C204F503E;
*8D780BC5581BD30422CB6A10347F;

● **Mode 2: Outputs aircraft plaintext information immediately**

The protocol format of the aircraft plaintext information output by working mode 2 is the same as that of working mode 0, except that the device in mode 0 summarizes all the aircraft information received in the previous second every second, and then outputs all the aircraft plaintext information once a second, and will stop outputting the plaintext information of the aircraft if the aircraft signal is not received for 3 consecutive seconds. When the device works in mode 2, as long as the latitude and longitude of the received aircraft changes, it will immediately output the plaintext information of the aircraft, which is suitable for occasions with high real-time requirements for monitoring the position of the aircraft.

By default, the device works in Mode 2.

5.4 UART interface information

The EXD26-30LT can be connected to a host system or microcontroller via a UART interface. The UART interface can be used to send ADS-B text messages and receive control messages. There are 4 types of baud rate to choose from, namely 9600, 115200, 460800 and 921600, the default baud rate is 921600, and the I/O level is TTL 3.3V (refer to basic parameter data), if you need a 5V level, you need to do a level conversion. In order to ensure the real-time performance of the data output of the module in a busy airspace, it is recommended to use a higher communication baud rate.

The UART interface protocol is: n,8,1, and the factory default baud rate is 921600

5.3 Introduction to Configuration Commands

All configuration directives start with "VS" and end with "#". The parameters in the configuration directive are separated by ",". If it is a query command, you do not need to fill in the parameters. OK is returned if the configuration is successful, otherwise ERR is returned.

Table 5 Configuration commands

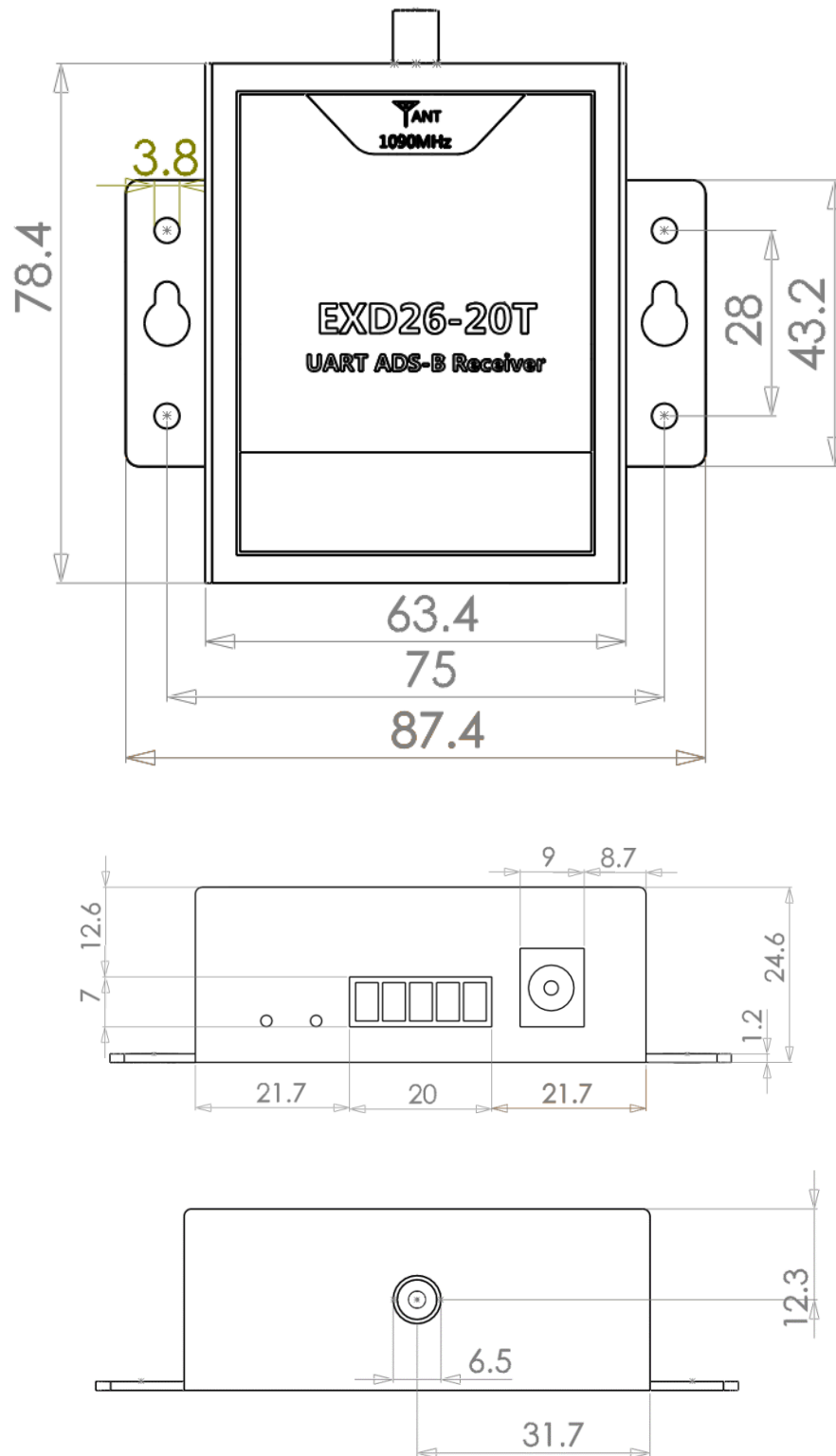
Command description	commands	illustrate
Get Version	VS00,#	Returns the firmware version and firmware time after receiving it.
Get working mode	VS01,#	Returns current working mode of the device.
Get device position	VS03,#	Return the current latitude, longitude and altitude of the device.
Set working mode	VS11,1#	In the example on the left, the device is set to Mode 1.
Set the module baud rate	VS14,3#	0 represents 9600, 1 represents 115200, 2 represents 460800, 3 represents 921600, and the factory default is 921600.

5.4 LED indicator status description

Table 6 LED status description

LED	state	illustrate
red light	ON	The power supply is working fine
	others	The device is abnormal
green light	OFF	no TXD output data
	flashing	outputting data

6. Dimensions



All dimensions in the above picture are in mm.

Cooperative consulting

Our team is skilled in software and hardware development and support tailor made for special application. If you need to customize products, please contact our sales.

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