19 inch rack mountable AIS receiver station AIS-OS60

User Manual

AvionixTech

Contents

1. Introduction

AIS-60S is a domestically developed, rack-mounted, high-performance, feature-rich, and highly integrated engineering-grade AIS shore-based receiving station system.

It is specifically designed for installation in standard 19-inch 2U rack slots, making it particularly suitable for AIS ground stations requiring 19-inch plug-and-play compatibility.

Featuring a rugged industrial-grade design, advanced AIS decoder, and high-performance data processor, the AIS-60S can reliably and efficiently receive and decode AIS data, while also supporting the domestic BeiDou navigation system.

Packing List:

No.	Item	Quantity	Remarks
1	AIS-OS60	1 unit	Included
2	Power adapter	1 piece	Included
3	AIS antenna&clamp	1 set	Included

4	AIS antenna cable	1 piece (10 meters)	Included
5	GPS antenna&clamp	1 set	Included
6	GPS antenna cable	1 piece (10 meters)	Included
7	Surge Protector	2 unit	Included

2. Functions

- The AIS-60S can output AIS data via Ethernet and provides interfaces that are highly suitable for secondary development.
- It can output both raw AIS messages and decoded plain-text data, eliminating the need for complex decoding procedures.
- The IP address can be configured directly, allowing the AIS-60S to be connected to the customer's network without requiring a router (a router may also be used depending on site requirements).
- Supports both static IP and DHCP IP address acquisition modes.
- Capable of outputting GPS time stamps, with a minimum time resolution better than 1 ns.
- Optional signal strength output available.
- Supports customer OEM customization (optional).
- Supports ACARS / ADS-B / AIS integration (optional).

3. Specifications

Main Unit:

No.	Specifications	
1	Power Supply	220V AC
2	Power Consumption	5 W
3	Receiving Frequencies	161.975 MHz, 162.025 MHz 156.775 MHz (optional) 156.825 MHz (optional)

4	Sensitivity	≤ -113 dBm
5	Receiving Dynamic Range	-113 dBm to +10 dBm
6	Supported AIS Message Types	1–27
7	AIS Target Processing Capacity	≥ 600 targets
8	Processing Capability	> 2500 packets/s
9	Data Format	AIS Raw Messages / JSON Plain Text
10	Band-Pass Filter	156.3 ~ 162.025 MHz
11	Input Impedance	50 Ω
12	Data Interface	RJ45 Ethernet Port
13	Network Connection Mode	Static IP or DHCP
14	Network Protocol	TCP / UDP
15	ADS-B Antenna Interface	N Female
16	GPS Antenna Interface	N Female
17	Dimensions	43 × 30 × 8.9 cm (excluding antenna connectors and handles), 2U
18	Operating Temperature	-20°C ~ +60°C
19	Storage Temperature	-20°C ~ +70°C
20	Storage Humidity	10% ~ 80%

AIS Antenna (Long Type):

No.	Specifications	
1	Frequency Range	156–166 MHz
2	Antenna Gain	5 dBi
3	Protection Rating	IP67
4	VSWR	≤ 1.5
5	Polarization	Vertical
6	Radiation Pattern	Omnidirectional
7	Input Impedance	50 Ω
8	Power Capacity	50 W
9	Connector Type	N-J
10	Antenna Dimensions	Length: 120 cm, Diameter: 2 cm

11	Antenna Material	Fiberglass
12	Total Weight	364 g
13	Operating Humidity	5% ~ 95%
14	Operating Temperature	-40°C ~ +85°C

GPS Antenna:

No.	Specifications	
1	Frequency Range	1575.42 ± 5 MHz (GPS Frequency) 1561.098 ± 5 MHz (BDS Frequency)
2	Gain	38 dBi ± 2 dBi (including LNA)
3	VSWR	≤ 2.0
4	Polarization	Right-Hand Circular Polarization (RHCP)
5	Axial Ratio	≤ 5 dB
6	3 dB Beam Width	110° ± 10°
7	DC Supply Voltage	4 ~ 6 V
8	Radome Material	ASA engineering plastic with 7% anti-aging agent and UV absorber
9	Antenna Dimensions (Diameter × Height)	Φ110 mm × 105 mm
10	Antenna Weight (Including Mounting Kit)	0.75 kg
11	Operating Temperature	-40°C ~ +75°C
12	Operating Relative Humidity	5% ~ 100%, with condensation conditions
13	Operating Wind Speed	135 km/h
14	Survival Wind Speed	200 km/h
15	Operating Environment	Outdoor natural environmental conditions

4. Interface Description

Front Panel: Power Indicator Light

Rear Panel: From left to right – Power Socket, Network Port, GNSS Antenna Port, AIS Antenna Port

5. Device Connection

Note: Before touching the device, discharge any static electricity from your body.

The default IP address of the AIS-OS60 is 192.168.10.33. 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 AIS-OS60 directly to the computer's Ethernet port using a network cable (or via a USB to RJ45 adapter).
- Open the Network Connections interface on your computer, locate the network adapter connected to the AIS-OS60, and configure its IP address to be on the same subnet as the AIS-OS60 device (the static IP address of the AIS-OS60 is 192.168.10.33).
- Open a web browser, enter 192.168.10.33 in the address bar, and press Enter. The following interface will appear, confirming that the connection to the device

is successful.

Router Connection Method:

- Connect the AIS-OS60 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 192.168.10.33 in the address bar, and press Enter. The following interface will appear, confirming that the connection to the device is successful.

6. Device Configuration

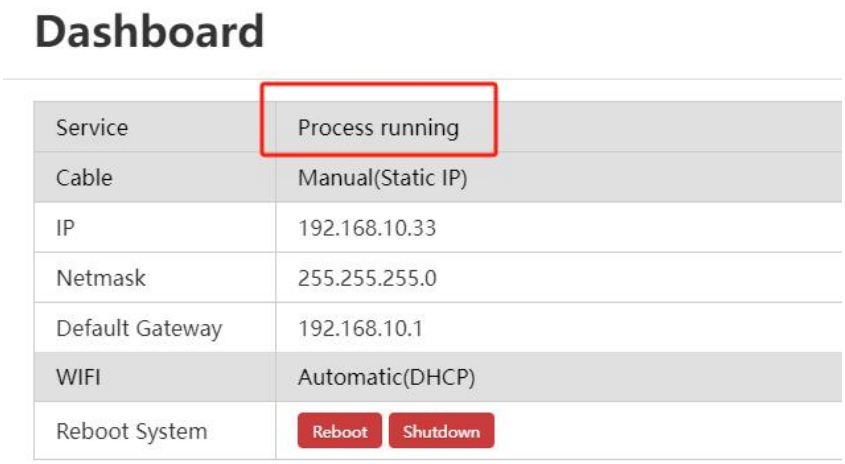
1. Login to the Web Interface

After connecting the device, enter the device's IP address in a web browser and press Enter. You will be prompted to enter the login credentials for device configuration management.

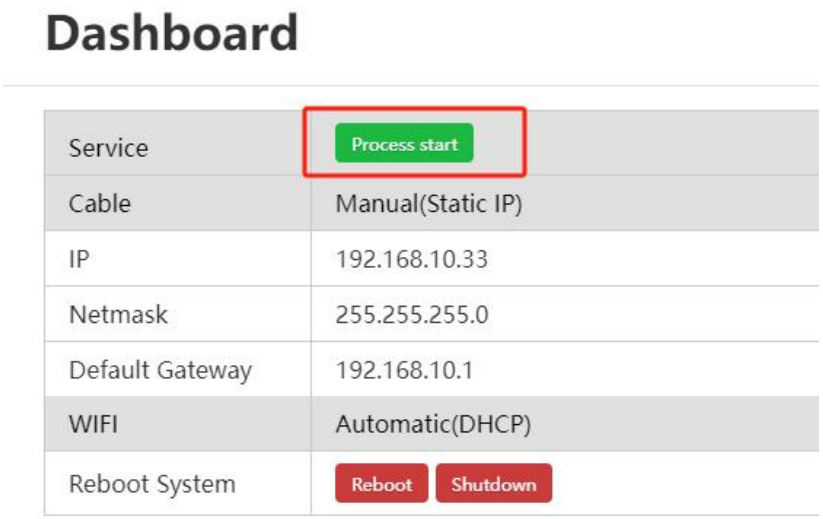
Username: admin

Password: aaareceiver

2. Configuration Interface Home Page



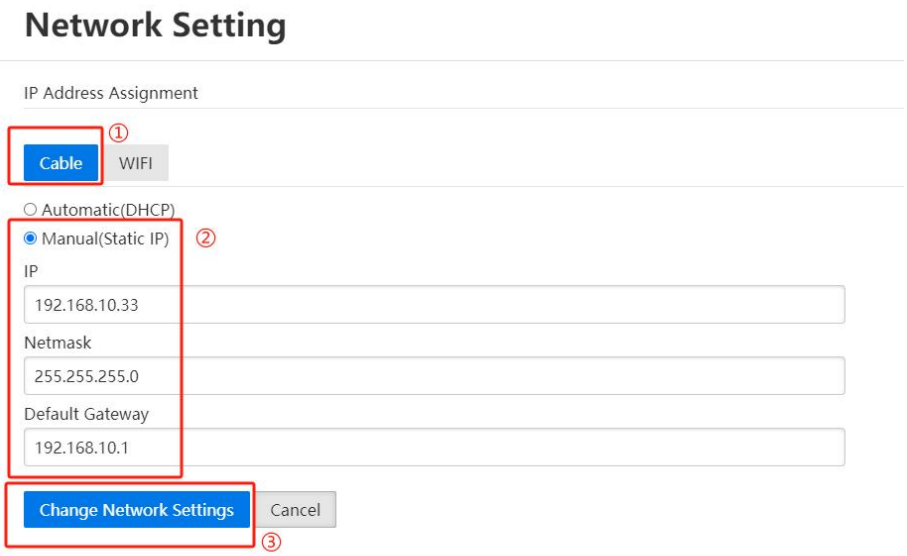
Note: The status under <Service> should show <Process running>. If not, please click "Process start".



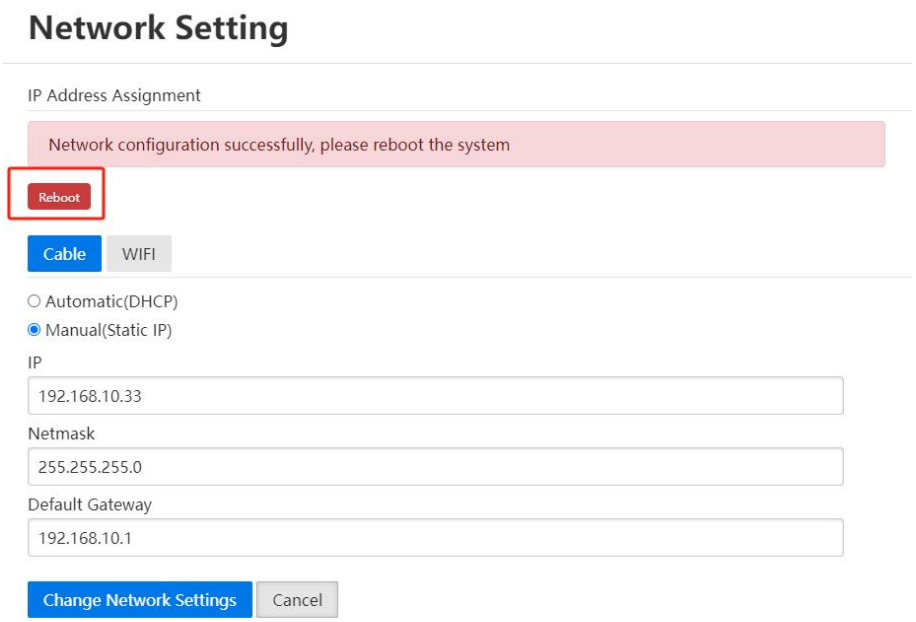
3. Network Configuration

Two modes are available: Automatic (DHCP) and Manual (Static IP).

Click on Network Configuration > Wired, enter the desired IP address, Subnet Mask, and Gateway, then click Modify Network Configuration.



To use automatic mode, select Automatic (DHCP), click Modify Network Configuration, and then restart the device for the changes to take effect.



Note: After switching to Automatic mode, the device must be connected to a router with DHCP enabled; otherwise, you will not be able to access the device.

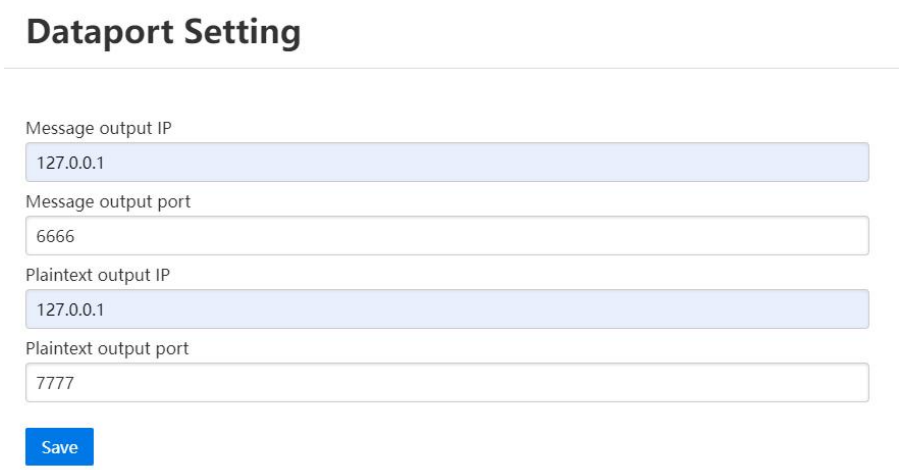
Note: Wireless configuration is disabled in the current version.

4. Data Interface Configuration

Click on Data Interface Configuration to access the data interface settings. When outputting data externally, the AIS-OS60acts as a UDP client.

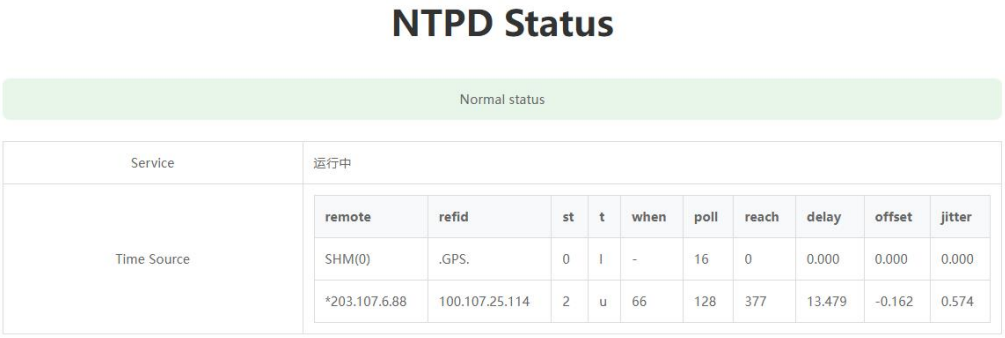
Raw Messages: Standard AIS messages with signal strength and timestamp.

Plain text: Decoded AIS data with signal strength and timestamp.



5. NTPD Status

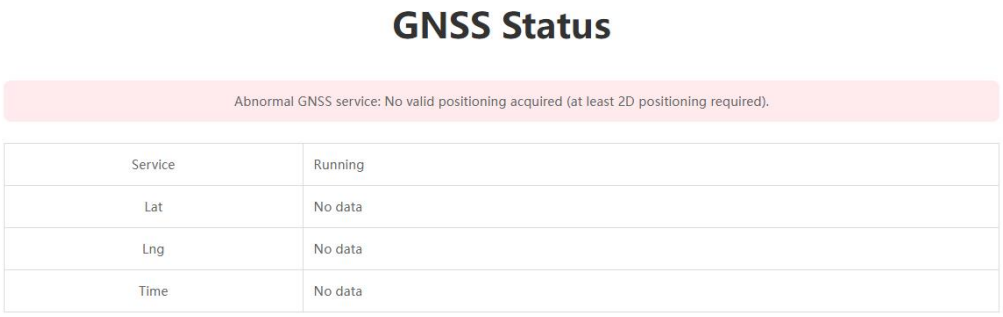
The NTPD Status is used to view the current status of the time synchronization service. By default, the time service is enabled upon device startup. If the service is in a stopped state, it should be manually started.



6. GNSS Status

The GNSS Status section is used to view the current status of the GNSS service. After connecting the antenna and adjusting it to a location with signal reception, it may take a few minutes to acquire satellites. Please be patient. If the following interface appears, it indicates that the GNSS system is working normally.

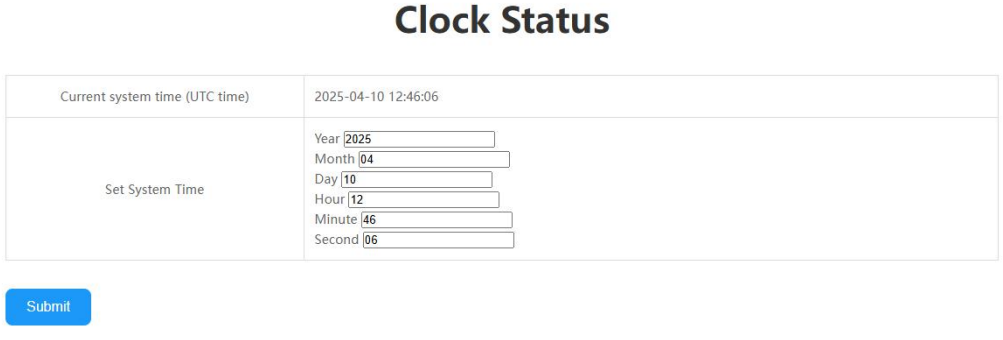
If the following interface appears, it indicates that the GNSS service has started normally, but the GNSS antenna is either not connected or is not receiving satellite signals properly. Please connect the antenna or adjust its position.



7. Clock Status

This section is used to check the current system clock status. If the clock status is abnormal (i.e., the time deviates from the current time), it will affect message time synchronization. When the time deviation is too large and exceeds the system's automatic time synchronization threshold, the automatic time synchronization will fail, and manual time adjustment will be required.

In the Clock Status interface, enter the current time (in UTC time). For example, if the current time is in the UTC+8 time zone, the UTC time will be the time 8 hours earlier.



7. Data Format

1. Raw Messages

Raw Message Example:

The following content shows messages with timestamp output. The timestamp and the message are connected using an underscore (“_”). The first section before the underscore is the timestamp information, and the second section is the message content.

```
2026-01-22 12:06:45 35086454_!AIVDM,1,1,,A,1000h>A00:5GDb0Igth1Ggvt1Url,0*35
2026-01-22 12:06:45 157648588_!AIVDM,1,1,,B,1000h>A00:5GDb0Igth1Ggvt1Url,0*36
```

Timestamp Description:

The timestamp consists of three parts, separated by spaces:

The first part is the date, in the format Year-Month-Day, displayed as Y-m-d

The second part is the time, in the format Hour:Minute:Second, displayed as H:M:S

The third part is the nanosecond value, representing the number of nanoseconds elapsed from the message time to the current second

Note: All timestamps are in UTC time.

2. JSON Plaintext

JSON Plaintext Example：

```
{
"msg_type": 1,
"repeat": 0,
"mmsi": 12345,
"status": 1,
"turn": 0.0,
"speed": 1.0,
"accuracy": false,
"lon": 75.0,
"lat": 45.0,
"course": 35.0,
"heading": 511,
"second": 30,
"maneuver": 0,
```

"raim": false,
"radio": 417460,
"time": "2026-01-22 12:09:58 759082566",
}

Timestamp Description:

The timestamp consists of three parts, separated by spaces:

The first part is the date, in the format Year-Month-Day, displayed as Y-m-d

The second part is the time, in the format Hour:Minute:Second, displayed as H:M:S

The third part is the nanosecond value, representing the number of nanoseconds elapsed from the message time to the current second

Note: All timestamps are in UTC time.

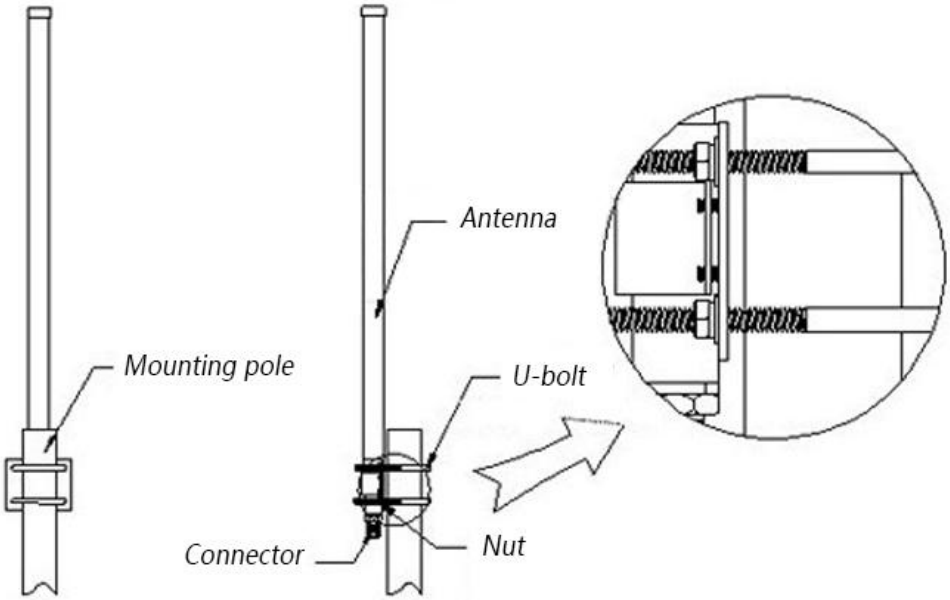
8. Antenna Installation

AIS Antenna Installation Method:

The antenna should be installed in an open area free from tall surrounding obstructions. A certain installation height is required, and higher installation positions generally provide better signal reception performance.

The antenna should be installed vertically to ensure that its signal reception polarization matches the polarization of the aircraft transmission signal, thereby achieving optimal reception performance.

Pole-mount installation is supported. Optional pole diameters range from Φ30 mm to Φ60 mm, with Φ50 mm recommended. The installation method is shown in the figure below:



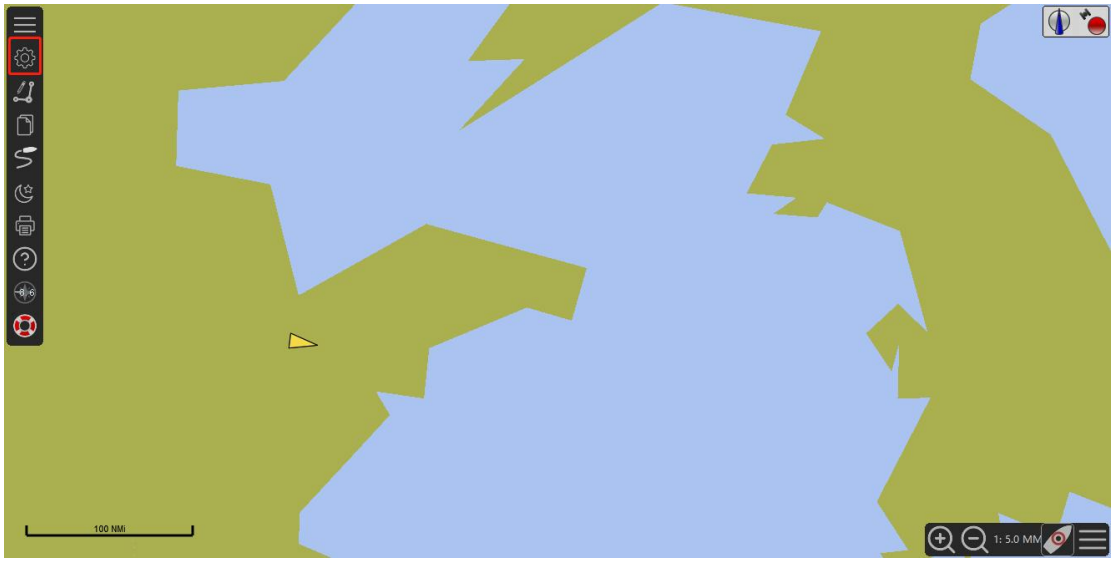
GNSS Antenna Installation Method:

Pole-mount installation is supported. Optional pole diameters range from Φ30 mm to Φ60 mm, with Φ50 mm recommended. The installation method is shown in the figure below:

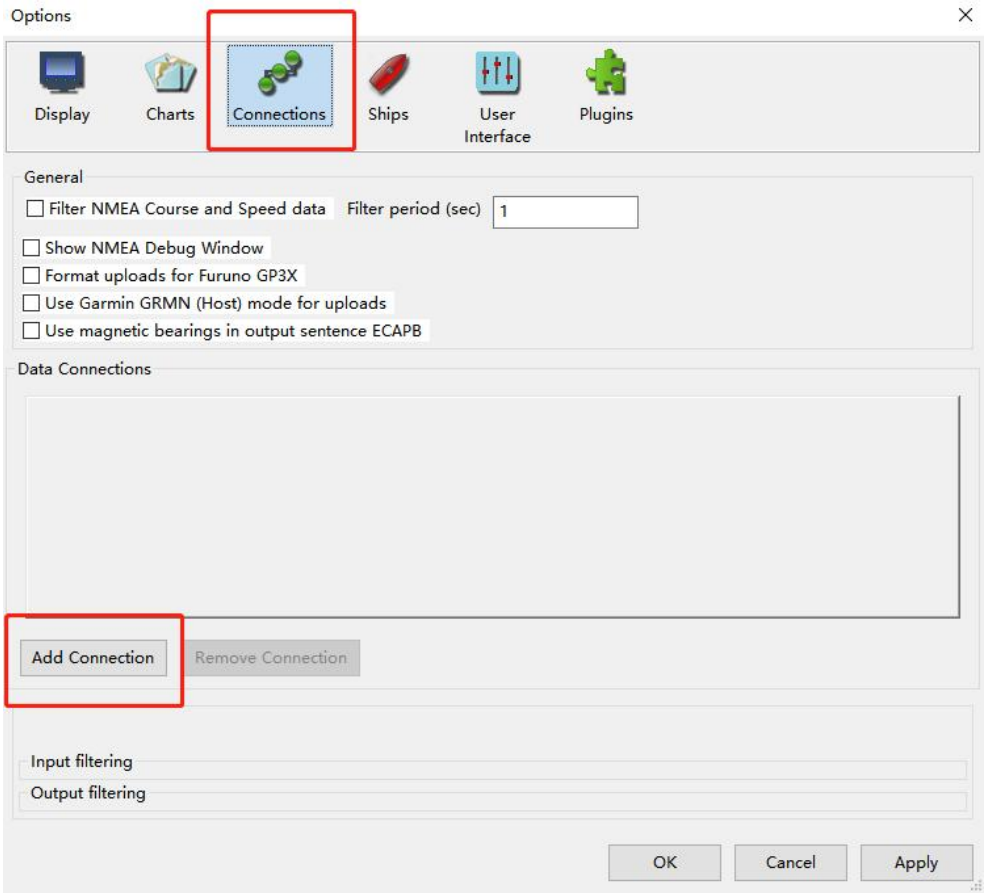
9. Works with OpenCPN

AIS-OS60can work with OpenCPN

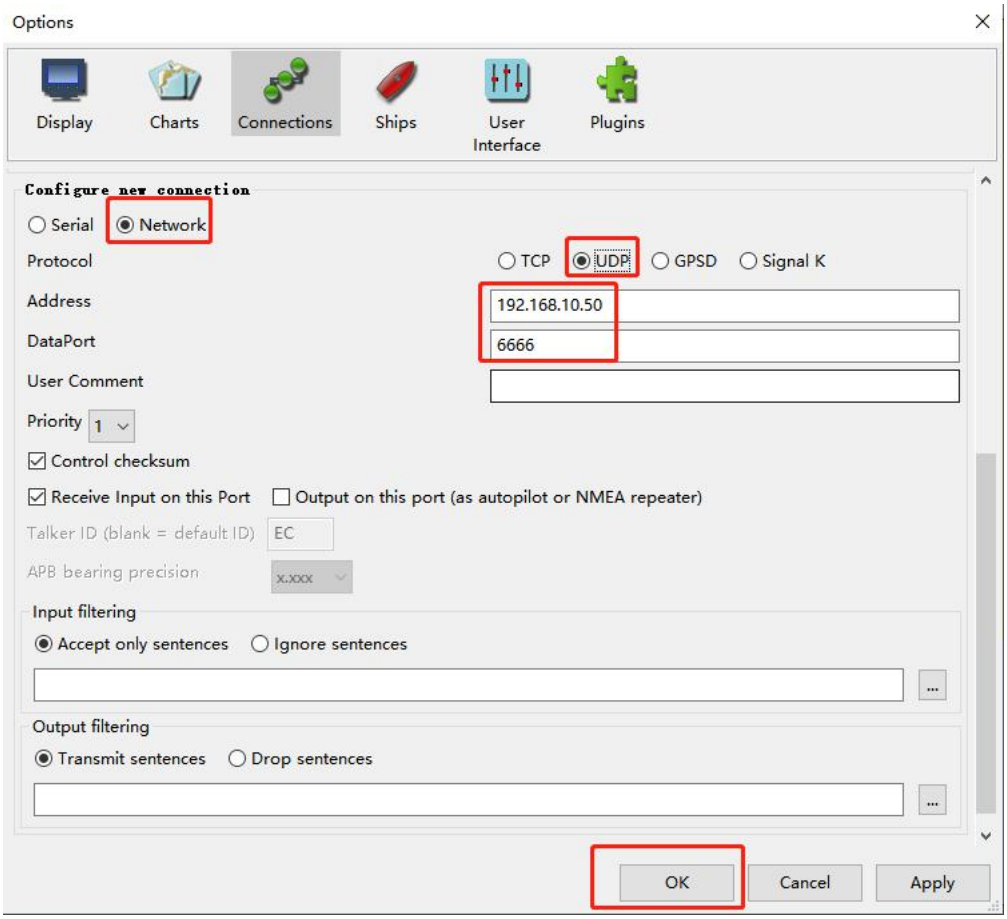
Open OpenCPN, click set



Click Connections, and then click Add Connection



Select Network, UDP. In the Address area, input the AIS-OS60message output IP (usually this is your computer IP). In DataPort area, input the message output port (in this manual example it’s 6666), click OK.



Done!

10. Customization

All our products can be supplied tailored to your specific needs and customized with your brand and logo. We tailor designs, enclosures, features, and data formats to meet your specifications. Our OEM services empower you to launch unique products swiftly and risk-free.

11. Important Note

Please note:

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

12. Why Choose Us

- Comprehensive product range to meet users' needs for various levels of AIS receiver 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.