HS-MX1201GT
User Manual

Version 1.9

(Sep2025)

HS-MX1201GT

Multi-Function Embedded AIS Transceiver Module

Version 1.9

1. Product Overview

The HS-MX1201GT is our company's independently developed next-generation embedded AIS Automatic Identification System module solution. It addresses the needs of marine navigation and communication equipment, smart navigation aids, bridge collision avoidance systems, integrated navigation aid lights, maritime electronic fences, and portable AIS base stations. This module provides critical and effective navigation assistance and communication capabilities for vessel collision avoidance warnings, monitoring and management, and vessel operators.

The HS-MX1201GT module employs a dedicated AIS signal processing chip. Based on a highly integrated, low-power, low-cost software-defined radio design architecture, it supports 2W/5W transmit power. This design effectively meets the diverse AIS functional requirements and demands across various application scenarios, installation environments, and user needs.

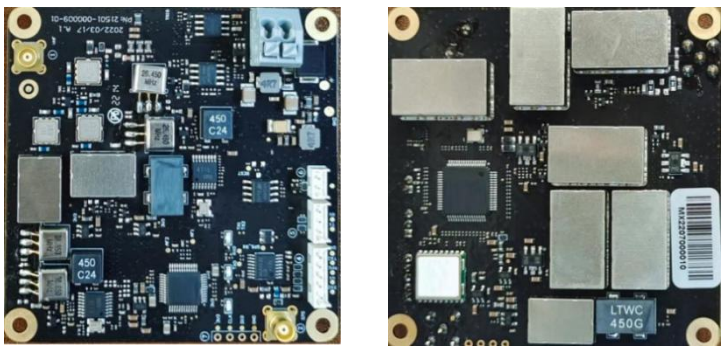

Figure 1 Physical Diagram

2. Features and Functions

- Features a dedicated AIS processor SoC chip
- Fully integrated AIS transceiver module
- Supports low and high transmit power of 2W and 5W
- Meets ultra-high sensitivity reception requirements down to -119dBm
- Compatible with the requirements and specifications for AIS AtoN with Types I/II/III
- Supports automatic receiving and processing of AIS message from other vessels or VTS shore stations
- Extracts position, heading, speed, and other information, encapsulating data in standard AIS message format
- Complies with IEC 60945, IEC 62287-1, IEC 62320-2, and ITU-R M1371-5 standards
- Ultra-compact size (70mm x 70mm x 14mm), suitable for embedded and miniaturized AIS applications
- Suitable for general maritime communication and navigation systems, portable shore-based stations, inland and offshore navigation aids, offshore platforms, marine buoys, smart fisheries, offshore wind power equipment, and bridge collision avoidance warning systems.

3. Typical Specifications

Parameters	Specification	Remarks
AIS1	161.975 MHz	
AIS2	162.025 MHz	
Receiver Sensitivity	≤-119dBm (@12dB SINAD)	
Co-channel Rejection	0 to -10dB	
Adjacent Channel Selectivity	≥70 dB	
Spurious Suppression	≥70dB	

Intermodulation	≥65dB	
Blocking	≥-23dBm	
Communication Port	TTL & RS232 serial port	NMEA0183 data format
Baud Rate	38400bps	
Operating Voltage	9V~36V DC	
Frequency Range	156.025 MHz to 162.025 MHz	
Frequency Deviation	≤±0.5kHz	
Output Power	2W/5W	
Transmitter Spurious Emissions	≤0.25 μW	
Operating Temperature	-20°C to 60°C	

4. Dimensions (unit: mm)

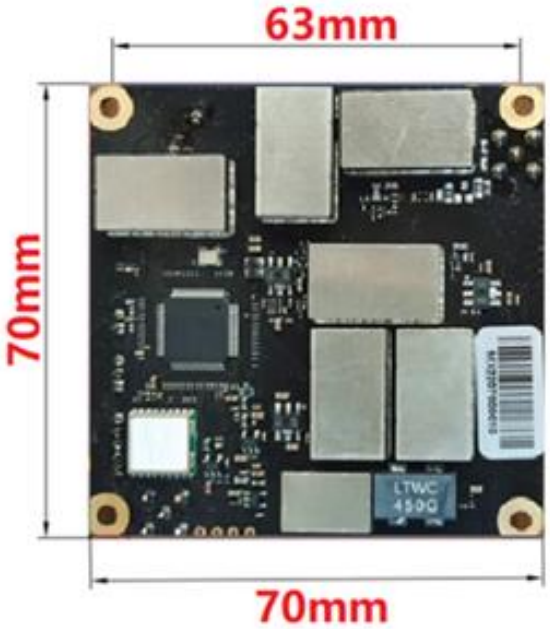

Figure 2 Module Dimensions (70mm x 70mm x 14mm)

5. Interface Definition

Connector ①			
Serial Number	Definition	Connection Instructions	Remarks
①	VHF	Connect to AIS Antenna	MCX (female)

Connector ②			
Serial Number	Definition	Connection Instructions	Remarks
②	GPS	Connect to GPS/BeiDou Antenna	MCX(Female)
Connector ③			
Serial Number	Definition	Connection Instructions	Remarks
③	GND	Power Supply Negative	
	VCC	Power Supply Positive,_12V DC	

Connector ④			
Serial Number	Definition	Connection Instructions	Remarks
④	TXD	RS232 data output	Customization
	RX	External GPS, TTL Serial Input	
	1PPS	UTC second pulse input	
	RXD	RS232 data input	
	GND	Ground	

Connector ⑤			
Serial Number	Definition	Connection Instructions	Remarks
⑤	TX	TTL Output	
	RX	TTL Input	
	GND	Ground	

Connector ⑥			
Serial Number	Definition	Connection Instructions	Remarks
⑥	SILENT	Silent Switch	
	GND	Ground	

6. Connections

6.1 Power Supply

12VDC(Typical) regulated power supply input. Note polarity.

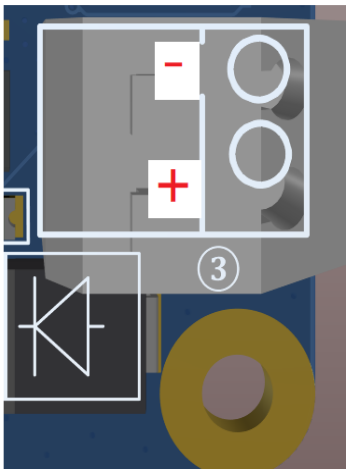

Figure 3 Power Supply Connection

6.2 Communication Interface

Use an RS232-to-USB adapter cable to connect to a PC. Configure the correct COM port with a baud rate of 38.4 kbps. A universal serial debugging tool is recommended. The following diagram illustrates an RS232 DB9 male connector.

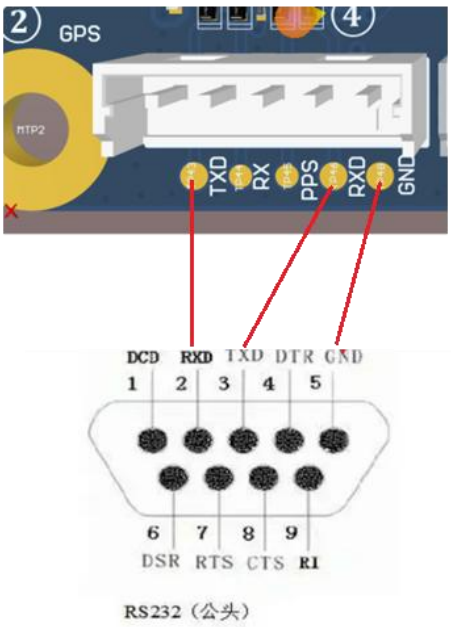

Figure 4 RS232 Communication Connection

6.3 AIS an GPS Antenna Connection

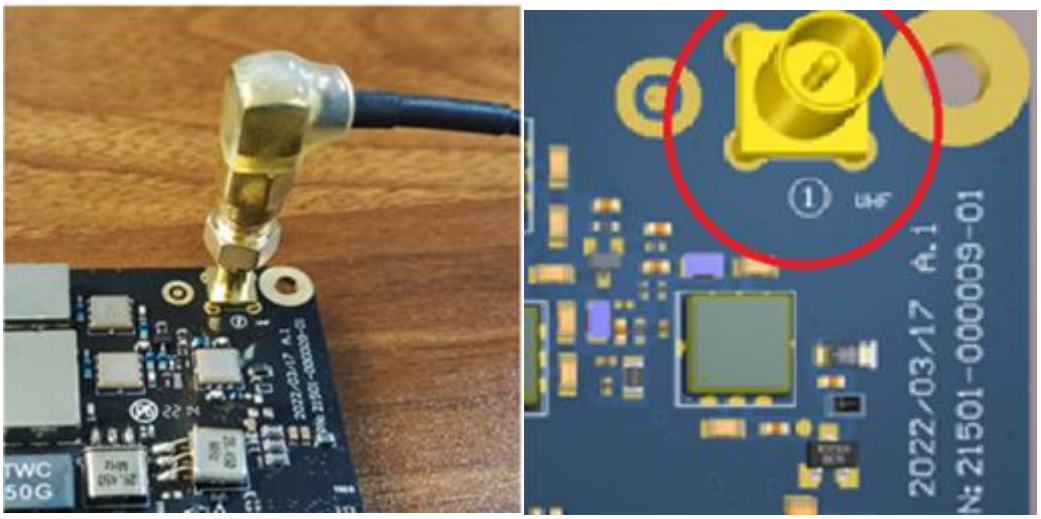

Figure 5 VHF Antenna Connection

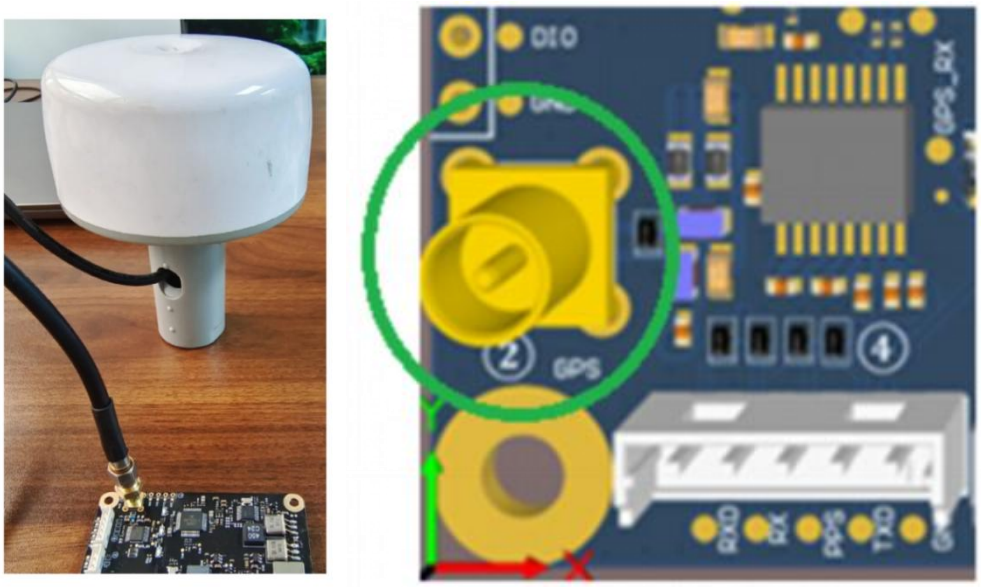

Figure 6 GPS Antenna Connection

7. Status and Indicator Light Description

7.1 POWER Indicator

When the module is connected to a 12V power source, LED1 remains solid yellow after power-up.

7.2 TX Transmission Indicator

LED3 flashes when an AIS message is being transmitted.

7.3 GPS Positioning Indicator

When the module's GPS has acquired a position, LED2 remains solid red; otherwise, the indicator continues to flash.

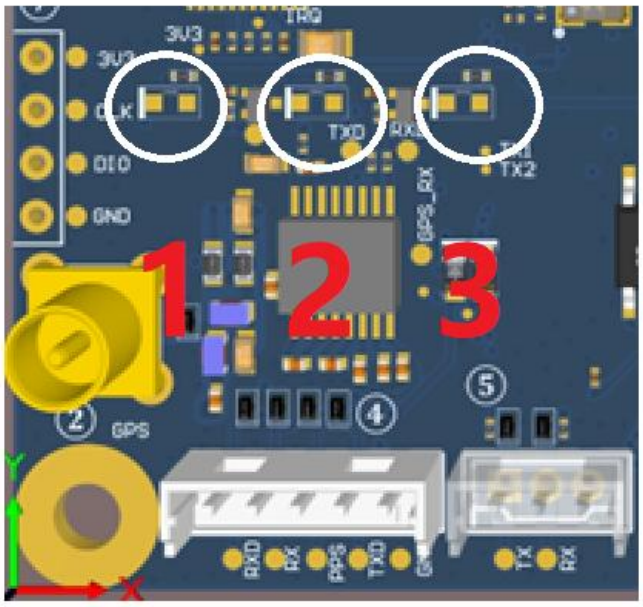

Figure 7 Operating and Status Indicators

8. Default Settings

8.1 Manufacturing Default

The module ships in AIS portable base station mode, supporting features like virtual beacons, and defaults to outputting correctly parsed AIS message data via the RS232 serial port.

The module supports two positioning modes. When using an external active GPS antenna input or the module's built-in GPS signal reception, no hardware modification is required. Simply configure the following software commands:

$PAIS,CMD,C,GPS_SOURCE,BUILT-IN*68
$PAIS,CMD,C,GPS_SOURCE,NMEA0183*09.

By default, the module disables GPS data output. To enable GPS data

output, configure it via serial software using AT commands.

8.2 Hardware Configuration and Precautions

To operate the module in AIS Class B mode, configure via software commands over the RS232 serial port. Refer to Figure 4 for RS232 serial communication connections.

To switch to TTL communication, configure the circuit by relocating the two resistors circled in red in Figure 8 to the corresponding positions circled in red below, thereby enabling TTL communication.

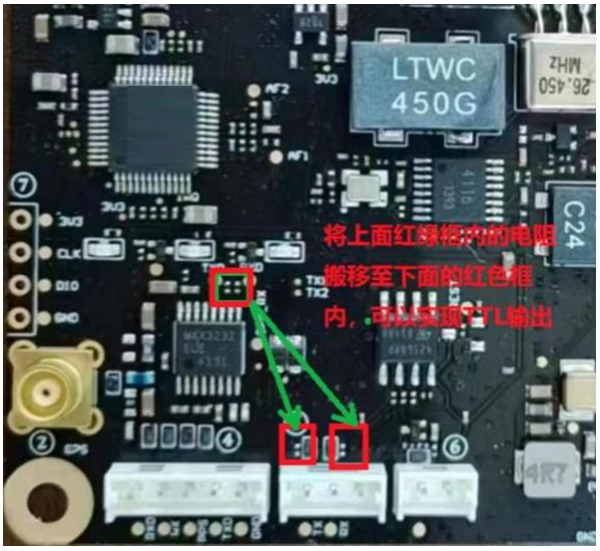

Figure 8 TTL Communication Port Configuration

9. Software Configuration

Please refer to the <HS-MX1201GT Configuration Command Guide>.

10. Ordering Model Summary

Product Model	Communication Port	Function	Code	MOQ	Remark
MX1201GTHC	3.3V TTL	AIS Class B	32001-000017-01	10+	None
MX1201GTTA	3.3V TTL	AIS AtoN	32001-000017-02	10+	Yellow
MX1201GTHA	RS232	AIS AtoN	32001-000019-00	1000	Custom