



GPM982 GPS High-Precision Positioning and Orientation Module

Product Manual

V1.3-20260625

Technical Highlights

- ❖ Featuring a compact design, dimensions:
39.23×26×7.6mm;
- ❖ Possesses superior positioning and orientation performance, supporting full-system, full-frequency on-chip RTK positioning and dual-antenna orientation calculation functions;
- ❖ Compatible with multiple frequency signals including BeiDou B1I/B2I/B3I, GPS L1/L2/L5, GLONASS G1/G2, Galileo E1/E5a/E5b, QZSS L1/L2/L5, and SBAS.



Product Introduction

The GPM982 is a newly launched high-precision positioning and orientation module that supports mainstream satellite navigation systems such as BDS/GPS/GLONASS/Galileo/QZSS and multi-frequency signals. This module can simultaneously process signals received from both the main and slave antennas. The main and slave antennas jointly track multi-frequency signals from various systems, including the BeiDou-3 global signal, performing RTK positioning and dual-antenna orientation calculations on the chip. Its built-in high-efficiency anti-interference unit ensures stable positioning accuracy even in complex electromagnetic environments. This product is primarily targeted at high-precision navigation and positioning applications in unmanned intelligent systems, autonomous robots, precision agriculture, and intelligent driving.

Application Scope

- ❖ Unmanned Surface Vessels/Unmanned Vehicles
- ❖ Precision Agriculture Automated Navigation
- ❖ Industrial Park Unmanned Vehicles (AGVs/AMRs)
- ❖ Flight Control Systems (Model Flights/General Aviation Aircraft)



Performance Parameters

GPM982		Parameter
Main antenna performance indicators	Channel	1408 Channel, Based on Nebulas IV™
	Main Antenna Frequency	BDS: B1I / B2I / B3I GPS: L1C/A / L2P (Y)/L2C / L5 GLONASS: G1 / G2 Galileo: E1 / E5a / E5b QZSS: L1 / L2 / L5
	Slave Antenna Frequency	BDS: B1I / B2I / B3I GPS: L1C/A / L2C GLONASS: G1 / G2 Galileo: E1 / E5b QZSS: L1 / L2
	Initial Positioning Time ⁵	Cold start < 30 s Warm start < 4 s
	Initialization Time ¹	< 5s(Typical Value)
	Initialization Reliability	> 99.9%
	Single Point Positioning(RMS) ¹	Plane: 1.5m Elevation: 2.5m
	DGPS(RMS) ^{1,2}	Plane: 0.4m + 1ppm Elevation: 0.8m + 1ppm
	RTK(RMS) ^{1,2}	Plane: 10cm + 1ppm Elevation: 10cm + 1ppm
	PPP (RMS) ³	Plane: 5cm Elevation: 10cm
	Directional Accuracy(RMS)	0.1 degree/1m baseline
	Velocity Accuracy(RMS) ⁴	0.03m/s
	Time Accuracy(RMS)	20ns
	Data Format	NMEA-0183
	Differential Data	RTCM 3.X
Interface type		TTL/USB
Baud rate		9600~115200 bps(Default 115200 bps)
Power supply voltage		5VDC
Rated power		Less than 0.6W
Operating temperature		-40℃~+85℃
Storage temperature		-45℃~+95℃
Physical dimensions		39.23×26×7.6mm
Weight		≤8g
I/O interface		TYPE-C\GH1.25 6PIN socket
Antenna interface		MMCX
Output power supply		+5VDC
Output current		<200mA
Positioning and orientation data update rate		1Hz/2Hz/5Hz/10Hz/20Hz Configurable

¹ Test results may be biased due to atmospheric conditions, baseline length, GNSS antenna type, multipath propagation, number of visible satellites, and satellite geometry.

² Measurements were performed using a 1km baseline and a receiver with good antenna performance, without considering possible antenna phase center offset errors.

³ Convergence took 20 minutes in an open sky and interference-free environment.

⁴ Open sky, unobstructed scene, 99% static.

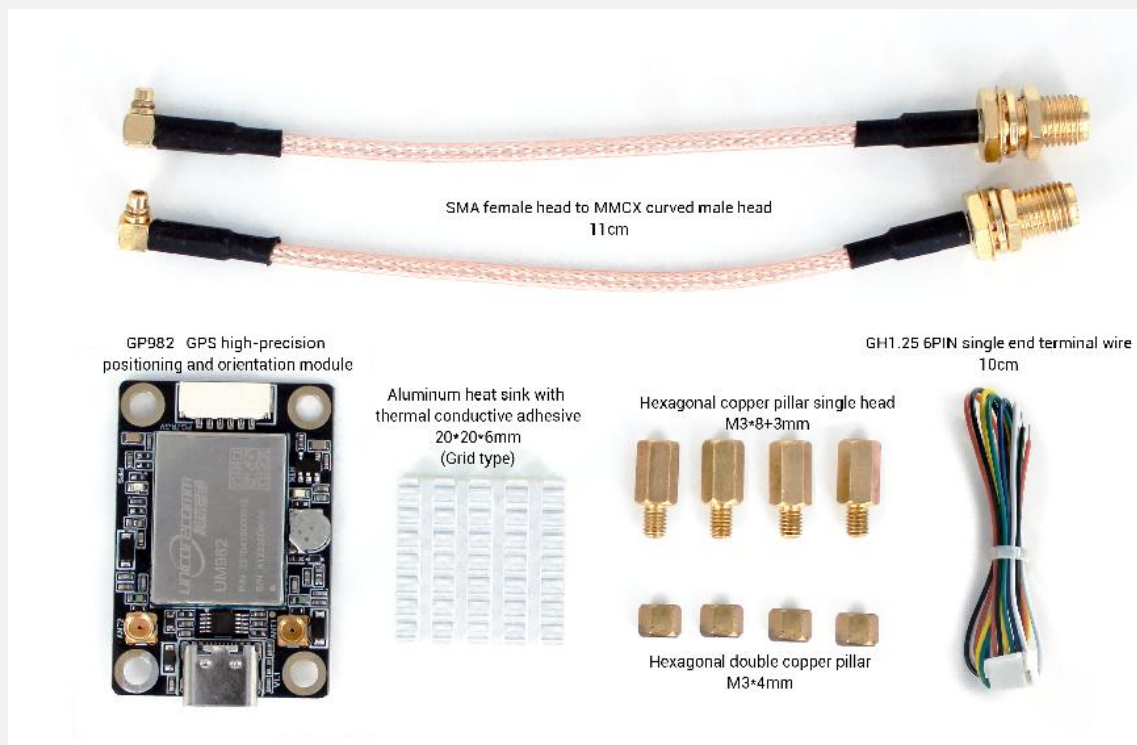
⁵ -130dBm @ more than 12 available satellites.

✓ Ordering and Selecting

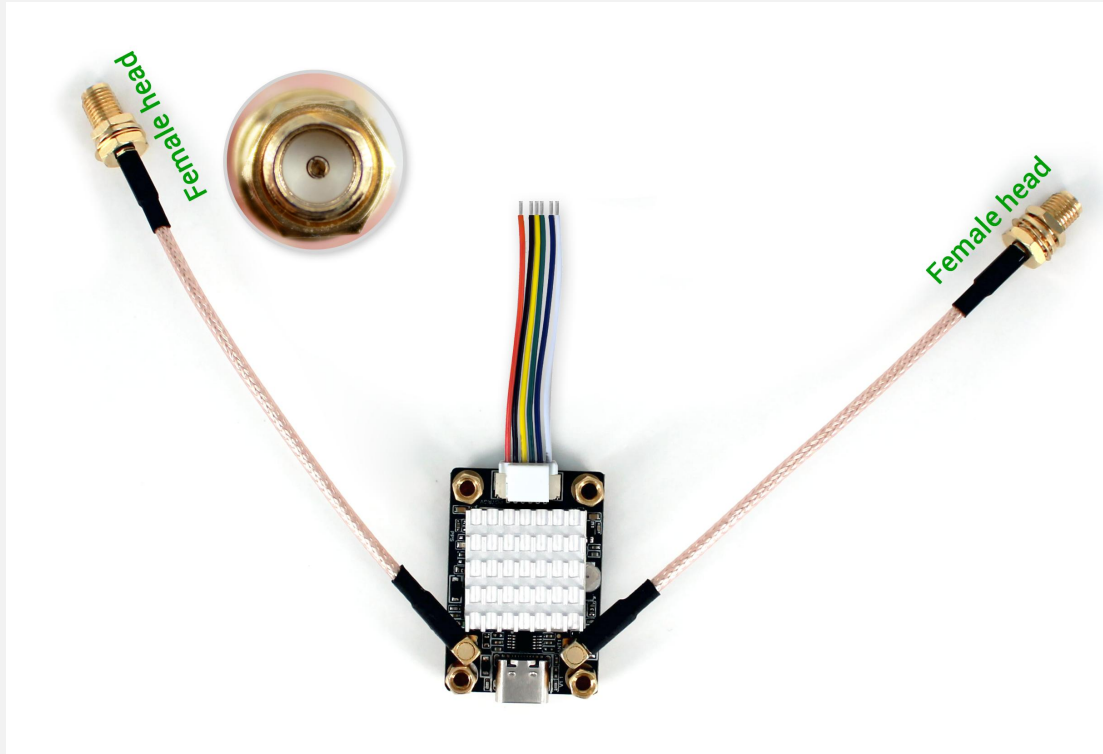
Model	Antenna type
GPM982	- A: HX-CSX644A antenna (main recommendation)
	B: HX-608 antenna (small antenna)
E.g: GPM982-A: HX-CSX644A antenna (main recommendation)	

✓ Product List

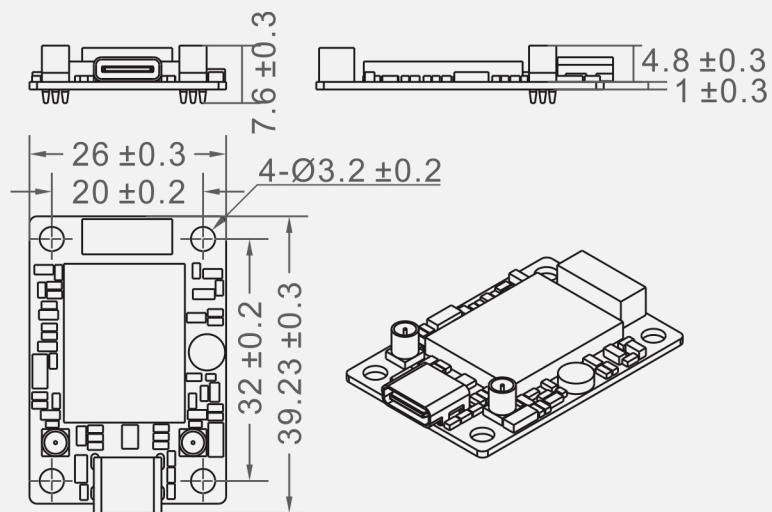
Name	Qty	Dimension	Weight
GPM982 Positioning and Direction Module	1 Unit	39.23×26×7.6mm	6g
MA Female to MMCX Right-Handle Male Connector (Standard)	2 wires	11cm	10g
Hexagonal Copper Single-Pole Connector (Standard)	4 chips	M3*8+3mm	5g
Hexagonal Double-Pole Copper Connector (Standard)	4 chips	M3*4mm	
Aluminum Heatsink with Thermal Adhesive (Standard)	1 piece	20*20*6mm	3g
GH1.25 6-PIN Terminal Cable (Standard)	1 wire	10cm	3g
HX-CSX644A Antenna (Optional)	2 pieces	Ø152×57.7mm / Wire Length 3m	≤400g / Line weight ≤110g
HX-608 Antenna (Optional)	2 pieces	Ø42.2×87.2mm / Wire Length 3m	≤40g / Line weight ≤60g



Assembly diagram:



Dimensions Diagram

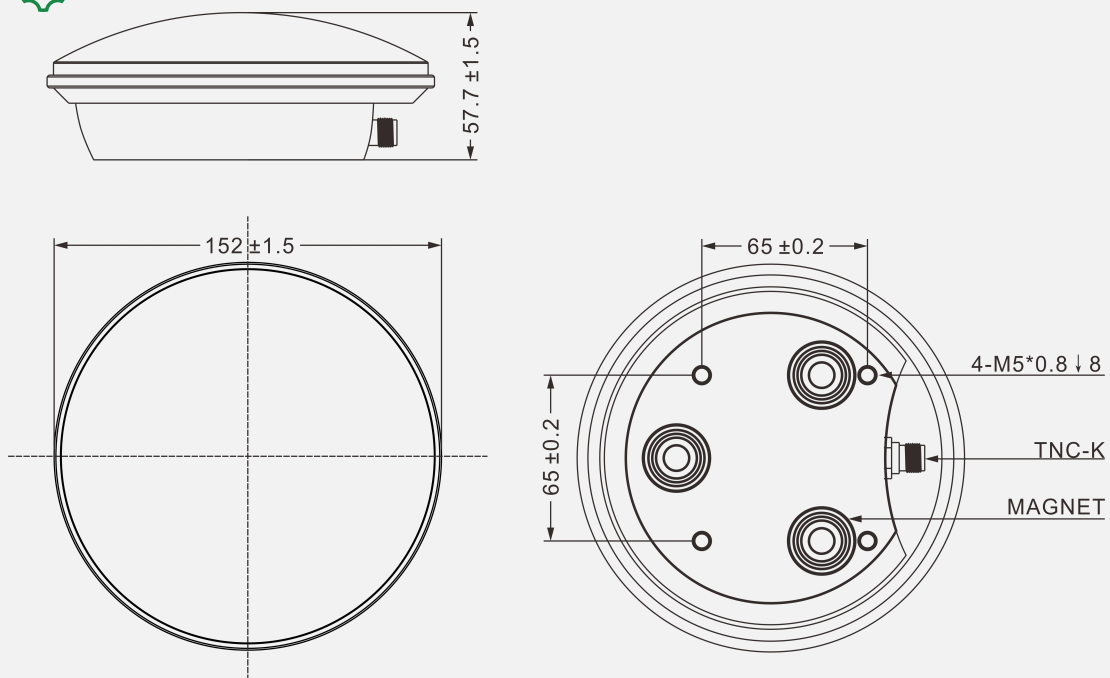


Dimensions: 39.23×26×7.6mm

Installation dimensions: 32×20×1mm

Recommended screws: 4 M3 screws

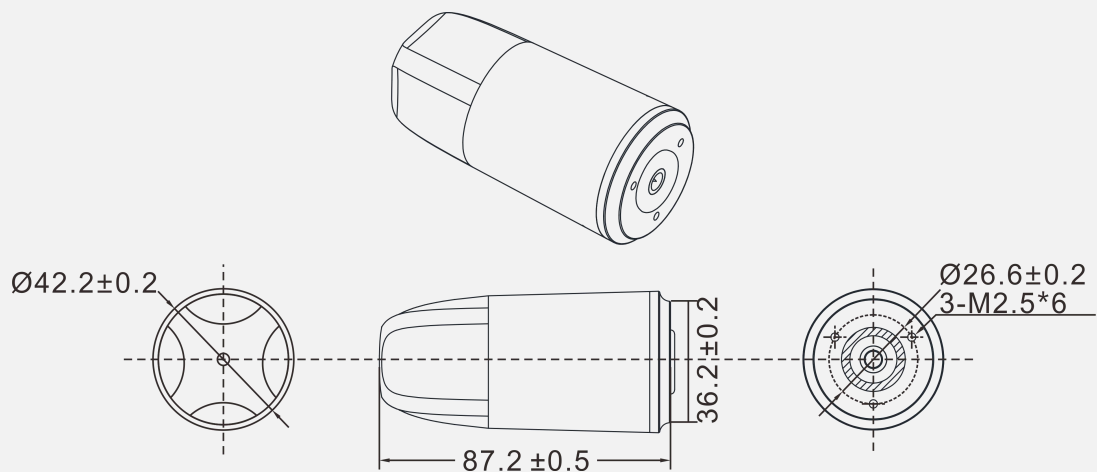
✓ Antenna size



Antenna model: HX-CSX644A

External dimensions: $\varnothing 152 \times 57.7$ mm

Installation method: strong magnetic adsorption



Antenna Model: HX-608

External Dimensions: $\varnothing 42.2 \times 87.2$ mm

Mounting Method: 3 M2.5 screws

Hardware Introduction

1. USB interface function description

A standard Type-C connector can power the module and facilitate data exchange. A Type-C to USB cable allows direct connection between the module and the computer; however, the USB cable must be a data cable capable of transferring data and files. After connecting to the computer, check in Device Manager to see if a serial port is displayed. If not, the CH340 driver needs to be installed. The image on the right shows the installed CH340 driver in Device Manager:



Note: The USB interface is connected to the module's COM1 port.

1.1 Embedded interface function description

The module uses a GH1.25, 6-pin 1.25mm pitch socket for power supply and data exchange, defined as follows:

PIN	Definition	I/O	Description
PIN1	1PPS	Output	Second pulse signal, LVTTTL level, output pulse width and polarity adjustable
PIN2	GND	—	Power ground
PIN3	TXD	Output	Module serial port transmit, LVTTTL level
PIN4	RXD	Input	Module serial port receive, LVTTTL level
PIN5	GND	—	Signal ground
PIN6	VCC	POWER	Power input, +5.0V

Note: The USB and embedded interface cannot power the module simultaneously; each must be used individually. When the USB is connected, the power supply pins of the embedded interface must not be connected.

Remark: The embedded interface is connected to the module's COM2 port.

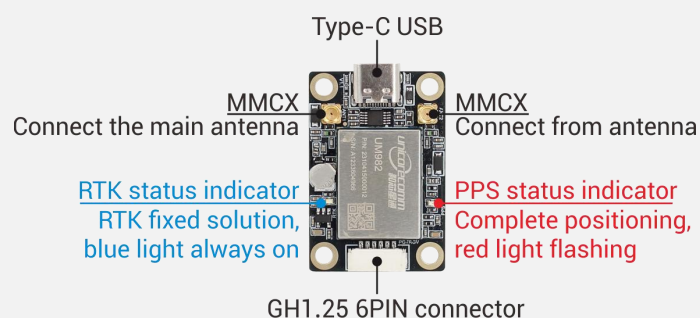
1.2 Antenna characteristics

The module connects to the satellite antenna via an MMCX connector. ANT1 is the main antenna and ANT2 is the slave antenna. A measurement antenna that supports the entire system and all frequency bands needs to be selected to achieve the optimal performance of the module.

Table 3 Antenna Characteristics

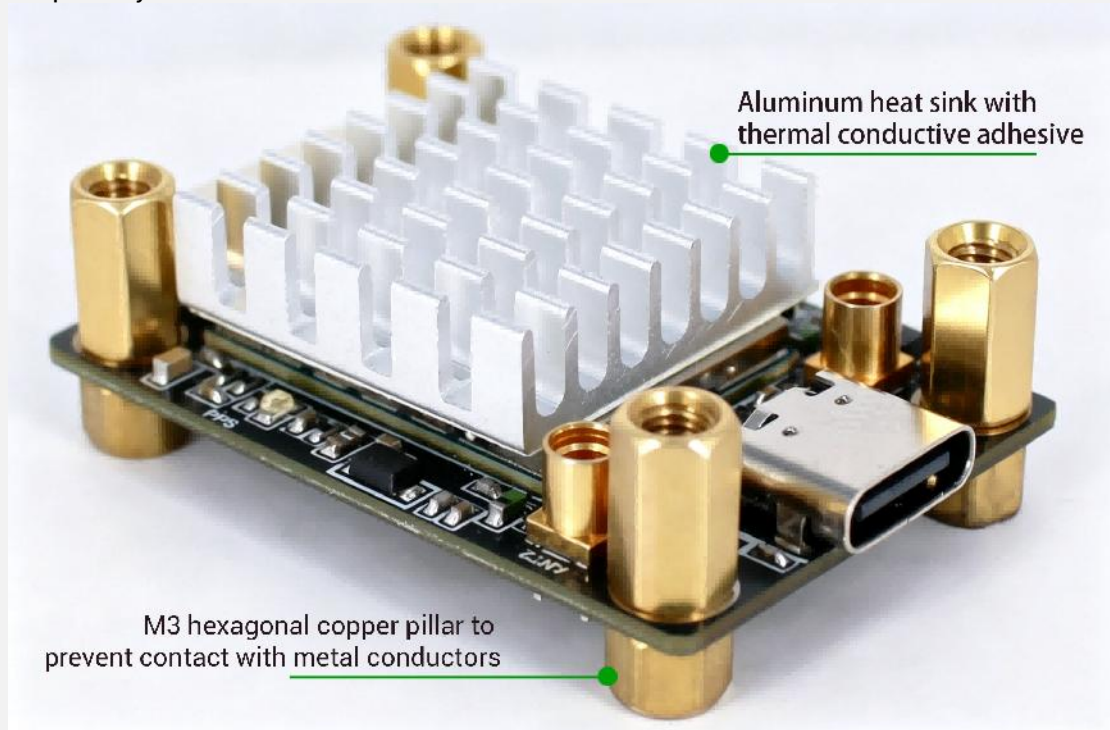
Parameter	Symbol	Minimum Value	Typical Value	Maximum Value	Unit	Condition
Optimal Input Gain	Gant	18	30	36	dB	

1.3 Top view of the actual object:



1.4 Installation and heat dissipation

The module is mounted and secured using four Ø3.2 screw holes. The bottom can be supported using M3 copper pillars to prevent contact with metal conductors. Since the module generates its own heat, it is recommended to add thermally conductive rubber to the bottom or top to increase the heat dissipation area and improve the module's environmental adaptability.



2. Software usage

2.1 Upper Computer Software UPrecise usage

Users can communicate with the module through the UPrecise.exe host computer software, and can view data and configure the module accordingly.

2.2 Serial Port Assistant

Users can communicate with the module through a serial port assistant and enter corresponding configuration commands to configure the module.

- 1) GNGGA 1(Enter to add a newline character)//The current serial port is configured to output 1Hz, GGA statement.
- 2) GNRMC 1(Enter to add a newline character)//The current serial port is configured to output 1Hz, RMC statement.
- 3) GPHTD 1(Enter to add a newline character)//The current serial port is configured to output 1Hz, HDT statement.
- 4) SAVECONFIG(Enter to add a newline character)//Save current configuration
- 5) UNLOGALL(Enter to add a newline character)//Disable all statement output on the current serial port.

Remark: 1:1hz, 0.1:10hz, 0.05:20hz.