

# UM982C

GPS/BDS/GLONASS/Galileo/QZSS  
All-Constellation Multi-Frequency  
High-Precision Positioning & Heading  
Module (L-Band & CLAS Supported)



16.0 × 21.0 × 2.6 mm



## Applications



UAV



Autonomous Machine



Precision Agriculture

## Physical Characteristics

Packaging	48 pin LGA
Dimensions	16.0 × 21.0 × 2.6 mm
Weight	1.82 ± 0.03 g

## Environmental Specifications

Operating Temperature	-40°C ~ +85°C
Storage Temperature	-55°C ~ +95°C
Humidity	95% No condensation
Vibration	GB/T 28046.3, ISO 16750-3
Shock	GB/T 28046.3, ISO 16750-3

## Communication Interfaces

3 × UART (LVTTL)
1 × SPI*
1 × I <sup>2</sup> C*
1 × CAN* (shared with UART3)

**Note:** Items marked with \* are only supported by specific firmware.  
1. This is a paid service  
2. Under open sky and without jamming

## Features

- » Based on Unicore's proprietary GNSS SoC NebulasIV which integrates RF-baseband and high-precision algorithm
- » All-constellation, multi-frequency on-chip RTK positioning and dual-antenna heading solution
- » Dual RTK engine using master-slave antenna GNSS raw observations for independent positioning solution
- » Excellent anti-jamming and anti-spoofing capabilities, supporting jamming detection and spoofing detection
- » Adaptive recognition of RTCM format differential data
- » STANDALONE single-station high-precision positioning technology
- » Supports B2b-PPP, E6-HAS and QZSS L6E (MADOCA) PPP and SouthPAN L5 PVS
- » Supports QZSS L6D (CLAS) PPP-RTK solution
- » Supports TruePoint | REACH Sat L-band-based PPP-AR service<sup>1</sup>

UM982C is Unicore's new-generation proprietary all-constellation, multi-frequency high-precision GNSS positioning and heading module, developed based on the GNSS SoC NebulasIV which integrates RF, baseband and high-precision algorithm. The module supports all-constellation multi-frequency on-chip RTK positioning and dual-antenna heading solution, supports QZSS L6D (CLAS) PPP-RTK solution, and supports TruePoint | REACH Sat L-band-based PPP-AR service. UM982C can be used as a rover or a base station for applications such as UAV, precision agriculture, and autonomous machine.

UM982C supports configuring the multi-system joint positioning mode or single-system stand-alone positioning mode, and tracking multiple signals. With the built-in anti-jamming unit, the module ensures accurate positioning even in complex electromagnetic environments.

UM982C has various types of interfaces for different purposes, including UART, I<sup>2</sup>C\*, SPI\*, PPS, EVENT and CAN\*.

## Performance Specifications

Channel	1408 channels, based on NebulasIV	PPP-AR (RMS) <sup>2</sup>	Horizontal: 3 cm @5min	
Master Antenna	Slave Antenna		Vertical: 6 cm @5min	
GPS L1C/A, L2P(Y), L2C, L5	GPS L1C/A, L2C	CLAS (RMS) <sup>2</sup>	Horizontal: 5 cm @1min	
BDS B1I, B3I, B2a, B2b	BDS B1I, B3I		Vertical: 10 cm @1min	
GLONASS G1, G2	-	Heading Accuracy (RMS)	0.1°/1 m baseline	
Galileo E1, E5a, E5b, E6	Galileo E1, E5b	Time Accuracy (RMS)	20 ns	
QZSS L1C/A, L1C/B, L2C, L5, L6	QZSS L1C/A, L2C	Velocity Accuracy (RMS)	0.03 m/s	
L-Band	-	TTF	Cold Start < 30 s	
	Horizontal: 1.5 m		Hot Start < 4 s	
	Vertical: 2.5 m	Initialization Time	< 5 s (typical)	
DGPS (RMS)	Horizontal: 0.4 m	Initialization Reliability	> 99.9%	
	Vertical: 0.8 m	Data Update Rate	20 Hz (RTK+Heading)	
RTK (RMS)	Horizontal: 0.8 cm + 1 ppm	Differential Data	RTCM V3.X	
	Vertical: 1.5cm + 1 ppm	Data Format	NMEA 0183, Unicore	
PPP (RMS) <sup>2</sup>	Horizontal: 5 cm @20min			
	Vertical: 10 cm @20min			
Observation Accuracy (RMS)	BDS	GPS	GLONASS	Galileo
B1I/L1C/A/G1/E1 Code	10 cm	10 cm	10 cm	10 cm
B1I/L1C/A/G1/E1 Carrier Phase	1 mm	1 mm	1 mm	1 mm
B2I/L5/E5a/E5b Code	10 cm	10 cm	10 cm	10 cm
B2I/L5/E5a/E5b Carrier Phase	1 mm	1 mm	1 mm	1 mm
B3I/L2P(Y)/L2C/G2 Code	10 cm	10 cm	10 cm	10 cm
B3I/L2P(Y)/L2C/G2 Carrier Phase	1 mm	1 mm	1 mm	1 mm