UM981C

GPS/BDS/GLONASS/Galileo/QZSS All-Constellation Multi-Frequency RTK/INS Integrated Positioning Module (L-Band & CLAS Supported)

17.0 × 22.0 × 2.6 mm

Features

- Based on Unicore's proprietary GNSS SoC NebulasIV that integrates RF, baseband and high-precision algorithm
- All-constellation multi-frequency RTK engine and advanced RTK technology
- Instant RTK initialization technology
- Excellent anti-jamming and anti-spoofing capabilities, supporting jamming detection and spoofing detection
- Output 100 Hz IMU raw data or integrated positioning data
- Supports B2b-PPP, E6-HAS and QZSS L6E (MADOCA) PPP
- Supports QZSS L6D (CLAS) PPP-RTK solution
- Supports TruePoint|REACH Sat L-band-based PPP-AR service[1]
- On-board MEMS integrated positioning technology to ensure continuous positioning when loss of lock on GNSS signals occurs

Applications

Precision Agriculture

UM981C is Unicore's new-generation proprietary all-constellation, multi-frequency high-precision RTK/INS integrated positioning module, developed based on the GNSS SoC NebulasIV which integrates RF-baseband and high-precision algorithm. The module supports multiple systems, including GPS, BDS, GLONASS, Galileo, QZSS, NavIC and SBAS, supports QZSS L6D (CLAS) PPP-RTK solution, and supports TruePoint|REACH Sat L-band-based PPP-AR service. It integrates a high-speed floating point processor and an RTK co-processor to enable position data output at 100 Hz. Additionally, its on-board MEMS chip and integrated algorithm effectively solves the issue of position loss due to loss of signal lock, ensuring continuous, accurate positioning output even in challenging environments such as urban canyons, tunnels, overpasses and tree shades. UM981C is ideal for high-precision agriculture applications.

Physical Characteristics

Packaging	54 pin LGA
Dimensions	17.0 × 22.0 × 2.6 mm
Weight	1.91 ± 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 × I²C*
1 × CAN*

Note: Items marked with * are only supported by specific firmware.

1. This is is a paid service
2. Under open sky and without jamming

Performance Specifications

Channel	1408 channels, based on NebulasIV
Frequency	BDS B1I, B3I, B1C, B2a, B2b
	GPS L1C/A, L1C, L2C, L2P(Y), L5
	GLONASS G1, G2, G3
	Galileo E1, E5a, E5b, E6
	QZSS L1C/A, L1C, L2C, L5, L6
	NavIC L5
	SBAS L1C/A
	L-Band
Single Point Positioning(RMS)	Horizontal: 1.5 m
	Vertical: 2.5 m
DGPS (RMS)	Horizontal: 0.4 m
	Vertical: 0.8 m
RTK (RMS)	Horizontal: 0.8 cm + 1 ppm
	Vertical: 1.5cm + 1 ppm
PPP (RMS)[2]	Horizontal: 5 cm @20min
	Vertical: 10 cm @20min
PPP-AR (RMS)[2]	Horizontal: 3 cm @5min
	Vertical: 6 cm @5min

CLAS (RMS)[2]	Horizontal: 5 cm @1min
	Vertical: 10 cm @1min
Time Accuracy (RMS)	20 ns
Velocity Accuracy (RMS)	0.03 m/s
Attitude Accuracy	Heading 0.3° Roll 0.2° Pitch 0.2°
Positioning Error of INS only	< 5 % of the distance traveled without GNSS signals
TTFF (Time to First Fix)	Cold Start < 12 s
	Hot Start < 4 s
Initialization Time	< 5 s (Typical)
Initialization Reliability	> 99.9%
Data Update Rate	100 Hz IMU raw data or integrated positioning data output
	Up to 50 Hz RTK positioning data output

Observation Accuracy (RMS)	BDS	GPS	GLONASS	Galileo
B1I/B1C/L1C/A/G1/E1 Code	10 cm	10 cm	10 cm	10 cm
B1I/B1C/L1C/A/G1/E1 Carrier Phase	1 mm	1 mm	1 mm	1 mm
B2I/B2a/B2b/L5/G3/E5a/E5b Code	10 cm	10 cm	10 cm	10 cm
B2I/B2a/B2b/L5/G3/E5a/E5b Carrier Phase	1 mm	1 mm	1 mm	1 mm
B3I/L2P(Y)/L2C/G2/E6 Code	10 cm	10 cm	10 cm	10 cm
B3I/L2P(Y)/L2C/G2/E6 Carrier Phase	1 mm	1 mm	1 mm	1 mm
Differential Data	RTCM V3.X			
Data Format	NMEA 0183, Unicore			