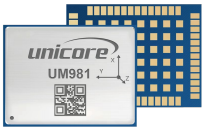
# UM981

GPS/BDS/GLONASS/Galileo/QZSS
All-constellation Multi-frequency
RTK/INS Integrated Positioning Module




17.0 × 22.0 × 2.6 mm

## Features

- Based on the new generation GNSS SoC -NebulasIV, which integrates RF, baseband and high precision algorithm
- All-constellation multi-frequency RTK engine and advanced RTK technology
- Instant RTK initialization technology
- 60 dB narrowband anti-jamming and jamming detection
- Heading2 technology to provide orientation information
- STANDALONE single-station high-precision positioning technology
- Supports B2b-PPP and E6-HAS
- On-board MEMS integrated navigation and U-Fusion technology to ensure
- continuous positioning when loss of lock on GNSS signals occurs

## Applications

- Surveying and Mapping
- Precision Agriculture

UM981 is Unicore's new-generation proprietary RTK/INS integrated navigation module. It can simultaneously track multiple satellite systems and frequencies, including BDS, GPS, GLONASS, Galileo, QZSS, NavIC, SBAS. The module integrates a high-speed floating point processor and an RTK dedicated coprocessor, being able to output positioning data at 100Hz. The on-board MEMS chip and U-Fusion integrated navigation algorithm ensure continuous positioning even loss of lock on GNSS signals occurs , providing high-quality positioning results in complex environments such as building blocks, tunnels, overpasses and tree shades. Due to its high precision and high performance, UM981 is well suited for surveying and s mapping, intelligent driving, precision agriculture, etc.

## Physical Characteristics

| | |
|---|---|
| Packaging | 54 pin LGA |
| Dimension | 17.0 × 22.0 × 2.6 mm |
| Weight | 1.91 g ± 0.03 g |

## Environmental Specifications

| | |
|---|---|
| Working temperature | -40 °C ~ +85 °C |
| Storage Temperature | -55 °C ~ +95 °C |
| Humidity | 95% No condensation |
| Vibration | MIL-STD-810F |
| Shock | MIL-STD-810F |

## Communication Interface

| |
|---|
| 3 x UART (LVTTL) |
| 1 x I²C* |
| 1 x SPI* |
| 1 × CAN* (shared with UART3) |

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

## Performance Specifications

| | | | |
|---|---|---|---|
| Channel | 1408 channels, based on NebulasIV | | |
| Frequency | GPS L1C/A, L1C, L2C, L2P(Y), L5 | | |
| | BDS B1I, B2I, B3I, B1C, B2a, B2b | | |
| | GLONASS G1, G2, G3 | | |
| | Galileo E1, E5a, E5b, E6 | | |
| | QZSS L1C/A, L1C, L2C, L5 | | |
| | NavIC L5 | | |
| | SBAS L1C/A | | |
| Single Point Positioning(RMS) | Horizontal: 1.5 m | Time Accuracy(RMS) | 20 ns |
| | Vertical: 2.5 m | Velocity Accuracy (RMS) | 0.03 m/s |
| DGPS (RMS) | Horizontal: 0.4 m | Cold start | < 30 s |
| | Vertical: 0.8 m | Initialization Time | < 5 s (typical) |
| RTK (RMS) | Horizontal: 0.8 cm + 1 ppm | zility | > 99.9% |
| | Vertical: 1.5 cm + 1 ppm | | 100 Hz IMU raw data |
| PPP (RMS) | Horizontal: 5cm | | 50 Hz* RTK |
| | Vertical: 10 cm | | |

| | | | | |
|---|---|---|---|---|
| Tilt measurement | 10 mm + 0.7 mm/° tilt (accuracy < 2.5 cm within 30° ) | | | |
| Observation Accuracy (RMS) | BDS | GPS | GLONASS | Galileo |
| B1I/B1C/L1 C/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/E5a/E5b Code | 10 cm | 10 cm | 10 cm | 10 cm |
| B2I/L2P(Y)/L2C/G2/E5b Carrier Phase | 1 mm | 1 mm | 1 mm | 1 mm |
| B3I/B2a/E5a/L5 Code | 10 cm | 10 cm | 10 cm | 10 cm |
| B3I/B2a/E5a/L5 Carrier Phase | 1 mm | 1 mm | 1 mm | 1 mm |
| Differential Data | RTCM V3.X | | | |
| Data Format | NMEA-0183, Unicore | | | |