UM4B0

GPS/BDS/GLONASS/Galileo Multi-freqency High Precision RTK Module

Product Introduction

UM4B0 is the smallest high precision positioning and heading module in the world. Based on Nebulas-II SoC, it can track all current visible GNSS satellite signals, including BDS B1/B2/B3, GPS L1/L2/L5, GLONASS L1/L2, Galileo E1/E5a/E5b and QZSS L1/L2/L5. With a 6-axis on-board MEMS, it supports autonomous integrated navigation. Its targeted application fields include light-weight robots, GIS, intelligent driving, UAV etc.

The smallest multi-system multi-frequency RTK Module

UM4B0 is the first multi-constellation and multi-frequency RTK SMD module in the world (30x40 mm). With the highest level of integration among the industry, this module contributes to a significant reduction of terminal size.

Integrated MEMS Navigation

The UB4B0M integrates 6-axis on-board MEMS chip and U-Fusion INS algorithm, resulting in optimized continuity and reliability of accurate heading and positioning output in tough environments such as city canyons, tunnels and overpasses. The board also supports odometer inputs to provide better navigation and positioning performance.

"UGypsophila" RTK processing technology

Coupled with a high-performance data-sharing capability and simplified operating system within the Nebulas II, UM4B0 performs sufficient optimization on the multi-dimensional RTK matrix computation. The receiver will try to track all visible satellites of all systems to be used in the RTK and heading solutions, resulting in a shortened RTK initialization time of 5 seconds and improved accuracy and reliability.

Nebulas-II GNSS SoC

UM4B0 is based on Unicore's Nebulas-II multi-system, multi-core, high precision SoC. The SoC supports 432 channels, includes a built-in high performance ADC, an anti-interference unit, two 600MHz ARM processors and two precision floating-point processing units, providing powerful GNSS signal processing capability.

Application Fields

- ADAS, Intelligent Drive
- Robots, Robotic lawn mower
- High precision GIS
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Product Characteristics

- 30x40 mm
- 20 Hz RTK update rate
- Integrated 6-axis MEMS chip and capable of independent integrated navigation
- Advanced multi-path mitigation technology

- Centimeter-level RTK positioning
- Multiple physical interfaces including serial port, SPI, IPPS, Event
- Adaptive recognition of RTCM format

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Technical Specifications

Performance Specifications

Channel	432 channels,	Velocity Accuracy(RMS)	0.03 m/s
	based on Nebulas-II chip	Time to First Fix (TTFF)	Cold start 25 s
Frequency	BDS B1/B2/B3	Initialization Time	< 5 s (typical)
	GPS L1/L2/L5	Initialization Reliability	> 99.9%
	GLONASS L1/L2	Reacquisition	<1 s
	Galileo E1/E5a/E5b	Correction	RTCM v2.3 /3.0 /3.2
	QZSS L1/L2/L5, SBAS L1	Data output	NMEA-0183 , Unicore
Single point positioning(RMS)	Horizontal : 1.5 m	Update Rate	20 Hz
	Vertical : 2.5 m	Time Accuracy (RMS)	20 ns
DGPS(RMS)	Horizontal : 0.4 m	Dead Reckoning	<5% of distance
	Vertical : 0.8 m	Error	travelled during
RTK(RMS)	Horizontal : 1 cm+1 ppm		GPS denied conditions
	Vertical : 1.5 cm+1 ppm		

Physical Specifications

Size	30 × 40 × 4 mm
Weight	8 g

Environmental Specifications

Temperature	Working : -40 °C~+85 °C
	Storage : -55 °C~+95 °C
Humidity	95% No condensation
Vibration	GJB150.16-2009,MIL-STD-810
Shock	GJB150.18-2009,MIL-STD-810

Functional Ports

3 x UART, 1 x I2C, 1 x SPI (LV-TTL)

1 x PPS (LV-TTL), 1 x Event input

Electrical Specifications

Voltage	3.3 VDC +5%/–3%
LNA	4.75~5.0 V, 0~100 mA
Ripple Voltage	100 mV p-p （max）
Power Consumption	1.8 W (typical)

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