UB9A0

All-Constellation Multi-Frequency
GNSS High-Precision Board

100 x 60 x 11.4 mm

Features

- Based on NebulasIV - a new generation multi-constellation multi-frequency high-precision GNSS SoC, with 1408 channels and powerful signal processing capability
- Supports GPS/BDS/GLONASS/Galileo/QZSS/NavIC/SBAS single-constellation standalone positioning and multi-constellation joint positioning
- Supports advanced multi-path mitigation and low elevation angle tracking
- Supports the output of carrier-phase observations with millimeter-level accuracy
- High reliability, high stability, suitable for challenging environment
- Supports RS232, Ethernet, 1PPS and external clock input
- Supports antenna signal detection and short circuit protection
- Size compatible with mainstream GNSS OEM boards on the market

Applications

- CORS
- GBAS
- Surveying and Mapping

UB9A0 is Unicore's new-generation proprietary high-precision RTK positioning board based on Unicore's proprietary GNSS SoC NebulasIV that integrates RF, baseband and high-precision algorithm, supporting GPS, BDS, GLONASS, Galileo, QZSS, NavIC and SBAS. The board provides millimeter-level carrier-phase observations and centimeter-level RTK positioning output, and supports advanced multi-path mitigation and low elevation angle tracking. UB9A0 is compatible with mainstream GNSS OEM boards on the market and provides UART, Ethernet, and other interfaces to meet the needs of users in different applications such as surveying and mapping, CORS stations, portable base stations, earthquake monitoring and global monitoring stations.

Physical Specifications

Dimensions	100 x 60 x 11.4 mm
Weight	46.5 ± 2.5 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

Electrical Specifications

LNA	+3.0 V ~ +3.6 V DC
Backup Power	+2.2 V ~ +3.6 V DC
Ripple Voltage	100 mVpp (max)
Power Consumption	800 mW (typical)

Communication Interfaces

1 x UART (RS-232)
2 x UART (LVTTL)
1 x LAN, 10 / 100 M
1 × 1PPS (LVTTL)
1 × External Clock, 10M / 20M

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, B3I, B1C, B2a, B2b		
	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	Time Accuracy (RMS)	5 ns
	Vertical: 2.5 m	Velocity Accuracy (RMS)	0.03 m/s
SBAS(RMS)	Horizontal: 0.8 m	Sensitivity: Reacquisition	-148 dBm
	Vertical: 0.8 m	Sensitivity: Tracking	-160 dBm
DGPS (RMS)	Horizontal: 0.4 m	TTFF: Hot Start	< 5 s
	Vertical: 0.8 m	TTFF: Cold Start	12 s
RTK (RMS)	Horizontal: 0.8 cm + 1 ppm	TTFF: Acquisition	1 s (Unlock ≤ 30s)
	Vertical: 1.5 cm + 1 ppm	TTFF: Reacquisition	2 s (30 s ≤ Unlock ≤ 90s)
Data Update Rate	Up to 50 Hz		

Observation Accuracy (RMS)	BDS	GPS/ QZSS	GLONASS	Galileo
B1I/B1C/L1C/L1C/A/G1/E1 Code	10 cm	10 cm	10 cm	10 cm
B1I/B1C/L1C/L1C/A/G1/E1 Carrier Phase	1 mm	1 mm	1 mm	1 mm
B2I/B2a/B2b/L5/L2P(Y)/G3/E5a/E5b Code	10 cm	10 cm	10 cm	10 cm
B2I/B2a/B2b/L5/L2P(Y)/G3/E5a/E5b Carrier Phase	1 mm	1 mm	1 mm	1 mm
B3I/L2C/G2/E6 Code	10 cm	10 cm	10 cm	10 cm
B3I/L2C/G2/E6 Carrier Phase	1 mm	1 mm	1 mm	1 mm

Differential Data	RTCM V3.X, RTCM V2.X, MSM
Data Format	NMEA 0183, Unicore, BINEX