

# UB9A0

All-constellation Multi-frequency  
GNSS High Precision Board



100 x 60 x 11.4 mm



## Applications



CORS



GBAS



Surveying and Mapping

## 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	MIL-STD-810F
Shock	MIL-STD-810F

## Electrical Specifications

LNA	+3.2 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 x 1PPS (LVTTL)
1 x External Clock, 10M / 20M

**NOTE:** Items marked with \* are supported by specific firmware.

## Product Characteristics

- » Based on NebulasIV - a new generation multi-constellation multi-frequency high-precision SoC, with 1408 channels and powerful signal processing ability
- » 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 UART, Ethernet, 1PPS, EVENT and external clock input
- » Supports antenna signal detection and short circuit protection
- » Size compatible with mainstream GNSS OEM boards on the market

UB9A0 is Unicore's new-generation proprietary high-precision RTK positioning board based on NebulasIV SoC which 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.

## 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				
Single Point Positioning(RMS)	QZSS L1C/A, L1C, L2C, L5				
	NavIC L5				
	SBAS L1C/A				
	L-Band*				
SBAS(RMS)	Horizontal: 1.5 m	Time Accuracy (RMS)	20 ns		
	Vertical: 2.5 m	Velocity Accuracy (RMS)	0.03 m/s		
DGPS (RMS)	Horizontal: 0.8 m	Sensitivity	Reacquisition	-148 dBm	
	Vertical: 0.8 m		Tracking	-160 dBm	
RTK (RMS)	Horizontal: 0.4 m + 1ppm	TTFF	Hot Start	< 5 s	
	Vertical: 0.8 m + 1ppm		Cold Start	< 12 s	
PPP (RMS)	Horizontal: 5 cm		Acquisition	1 s (Unlock ≤ 30s)	
	Vertical: 10 cm		Reacquisition	2 s (30 s ≤ Unlock ≤ 90s)	
Data Update Rate	Up to 50 Hz	Differential Data	RTCM V3.X		
Observation Accuracy (RMS)		Data Format	NMEA-0183, Unicore		
B1I/B1C/L1C/L1C/A/G1/E1 Code	10 cm	BDS	GPS/ QZSS	GLONASS	Galileo
B1I/B1C/L1C/L1C/A/G1/E1 Carrier Phase	1 mm	10 cm	10 cm	15 cm	10 cm
B2I/B2a/B2b/L5/L2P(Y)/G3/E5a/E5b Code	10 cm	1 mm	1 mm	1 mm	1 mm
B2I/B2a/B2b/L5/L2P(Y)/G3/E5a/E5b Carrier Phase	1 mm	10 cm	10 cm	10 cm	10 cm
B3I/L2C/G2/E6 Code	10 cm	1 mm	1 mm	1 mm	1 mm
B3I/L2C/G2/E6 Carrier Phase	1 mm	10 cm	15 cm	15 cm	10 cm
		1 mm	1 mm	1 mm	1 mm