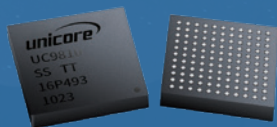


# NebulasIV UC9810

22nm All-constellation

All-frequency RF Baseband and  
High-precision Algorithm  
Integrated GNSS SoC



NebulasIV UC9810 is Unicore’s new generation proprietary GNSS SoC that integrates RF, baseband, and high precision algorithm. By leveraging 22nm process node architecture, high-performance multi-mode baseband GNSS processor and embedded microprocessor, the chip delivers superb performance and maintains low power consumption. UC9810 supports 1408 channels and tracks multiple signals, including GPS L1C/A, L1C, L2C, L2P(Y), BDS B1I, B2I, B3I, B1C, B2a, B2b, L5, GLONASS G1, G2, G3, Galileo E1, E5a, E5b, E6 and QZSS L1, L2, L5 as well as L-band. The integrated RTK matrix processing technology allows the chip to deliver an enhanced all-system all-frequency centimeter-level RTK positioning and orientation.

Due to the tight integration, high performance, low power consumption and compact form factor, NebulasIV is an ideal solution for technically demanding high-precision applications, such as drones, robotic lawn mowers, precision agriculture, surveying and mapping, intelligent driving and timing.

NebulasIV supports a wealth of external interfaces that cover almost all common application interfaces, including DMA, timer, watchdog, battery, SDRAM, FLASH, CAN, network, UART, SPI, I2C, odometer, freely configurable GPIOs, etc.

## Applications



UAV



Surveying and Mapping



Robot



Telecom Timing



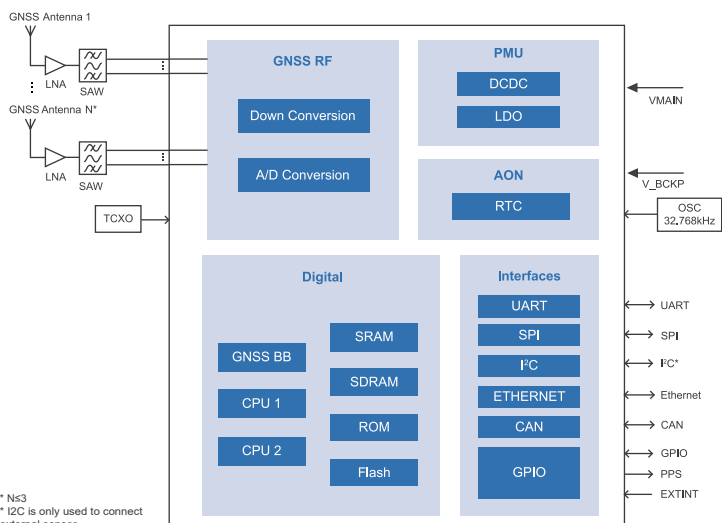
Deformation Monitoring



Autonomous Driving



Precision Agriculture



## Key Technologies

- » Dual-processor primary-secondary asynchronous architecture
- » Dedicated RTK matrix processor
- » UPF low-power technology
- » All-system and all-frequency joint acquisition and tracking algorithm
- » Anti-jamming capability (JamShield)
- » RTKKEEP technology

## Features

- » All-system all-frequency RF + baseband and high-precision algorithm integrated GNSS SoC
- » Supports 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 L1/L2/L5 and L-band
- » Ultra-small size of 7 × 7 mm with a minimum PCB layout area of only 12×16 mm
- » Ultra-low power consumption of 300mW
- » 1408 channels and up to 100 Hz data update rate
- » All-system all-frequency on-chip RTK positioning and dual-antenna heading Solution

## Performance

Channels	1408 channels		
Frequencies	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 L1/L2/L5 SBAS L-band		
Dimensions	7 × 7 mm		
Cold Start	< 12 s		
TTFF	< 12 s		
RTK Initialization Time	< 5 s		
Positioning Accuracy	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: 1.5 cm + 1 ppm
Initialization Reliability	> 99.9%		
Differential Data	RTCM V3.0, 3.1, 3.2, 3.3		
Data Update Rate	100 Hz		
Timing Accuracy	2.5 ns (1 $\sigma$ )		
Power Consumption	300 mW (single antenna)		
Heading Accuracy	0.2°/1 m baseline		