GNSS/INS Receiver Datasheet

Model		A1-3	X1-5	X1-6	X1-7
Picture					
Horizontal Accuracy	Single Point Positioning	1.5m			
	RTK	1cm + 1ppm			
Vertical Accuracy	Single Point Positioning	2.5m			
	RTK	1.5cm + 1ppm			
Signal Frequency	GPS	L1CA/L1C, L2C, L2P, L5			
	GLONASS	G1, G2			
	BDS	B1I, B2I/B3I			
	BDS-3	B1I/B1C, B2a/B2b/B3I			
	Galileo	E1, E5b/E5a			
	QZSS	L1CA/L1C, L2C, L5			
	NavIC(IRNSS)	L5			
	SBAS	L1CA			
Measurement Accuracy	Carrier Phase	≤1mm（RMS）			
	Pseudorange L1CA,L2C,L2P,G1,G2	≤ 0.12m（RMS）			
	Pseudorange Other Signals	≤ 0.06m（RMS）			
Time to First Fix	Cold start	≤ 45s			
	Hot start	≤ 30s			
Max. Data Rate	GNSS Observation	5Hz			
	RTK Position	5Hz			
	INS Position	20Hz/100Hz/200Hz	20Hz/125Hz/200Hz		
	IMU Raw Data	20Hz/100Hz/200Hz	20Hz/125Hz/200Hz		
Time Accuracy		20ns RMS			
Velocity Accuracy		0.03m/s RMS			
Heading Accuracy	Baseline = 2m	0.08°			
	Baseline = 4m	0.05°			
Max. Velocity		300m/s			
Max. Accelaration		4g			
Vibration		20-2000Hz 20Grms		20-2000Hz 20Grms	
Gyroscope	Range	±500deg/s	±450 deg/s	±450 deg/s	±450 deg/s
	Bias Repeatability	0.14deg/s (1.4 deg/s Y)	0.1 deg/s	0.1 deg/s	0.1 deg/s
	Bias Stability	2.7deg/hr	3 deg/hr	1.2 deg/hr	0.8 deg/hr
	Angular Random Walk	0.15deg/√hr (0.2deg/√hr Z)	0.2 deg/√hr	0.08 deg/√hr	0.06 deg/√hr
Accelerometer	Range	±8g	±5g	±10g	±10g
	Bias Repeatability	2mg	5mg	3mg	2mg
	Bias Stability	2.7μg (4.4μg Z)	70μg	16μg	12μg
	Velocity Random Walk	0.009m/s/√hr (0.012m/s/√hr Z)	0.03m/s/√hr	0.033m/s/√hr	0.025m/s/√hr
Power Consumpton	Dual antenna (Typical)	2.0W	4.8W		
	Input Voltage	+3.25V ~ +3.45V	+9V ~ +32VDC		
Dimension		71x46x10.6mm	116x114.2x38.6mm		
Weight		25g	458g	458g	458g

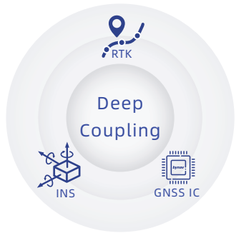
Accesories: surveying antenna; EVK; Rugged enclosure




Technological Innovation

High Precision GNSS ASIC

The GNSS chip designed for high-precision positioning supports multi-constellation, multi-frequency signal reception such as BDS, GPS, GLONASS and Galileo, including modern signals.



Deeply Coupled GNSS/INS Algorithm

With deep coupling GNSS baseband signal processing, RTK ambiguity resolution and MEMS inertial sensors, we can effectively deal with signal blockage and interference, thus achieving reliable high-precision positioning in challenging environments.

Robust GNSS-based Vehicle Localization

The signal tracking and positioning performance is optimized for typical urban environment like urban canyon, foliage canopy and elevated road, and apply land dynamic vehicle model contraints and ZUPT

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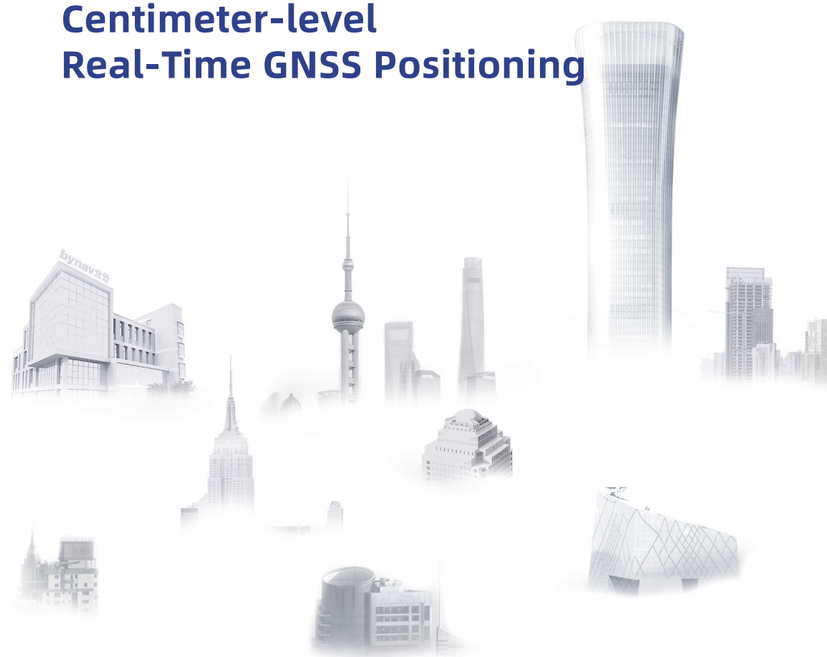
High Precision GNSS Receivers

ACIS GNSS+INS

Reliable Continuous Centimeter-level Real-Time GNSS Positioning



To Provide Reliable High-Precision Positioning in Harsh Environmentt

ABOUT US

Company Introduction

About Us

Bynav specializes in the development of GNSS high-precision positioning core components, and is committed to providing reliable high-precision positioning in challenging environments with its GNSS ASIC, high-precision GNSS receivers and GNSS/INS receivers, which have been widely used in autonomous driving, driver testing, UAVs, precision agriculture, surveying and mapping, deformation monitoring, robotics, machine control and other fields.

Bynav's R&D team originated from the main force of China Beidou Satellite Navigation System and has won 4 National Scientific And Technological Awards. Our team has deep technical accumulation and excellent innovation ability in the fields of high-precision satellite navigation and multi-source fusion positioning, and has applied for more than 30 national invention patents.

As a leading provider of high precision positioning service in China driver testing market with thousands of driver testing vehicles equipped with Bynav GNSS receivers operating on a daily basis all over China, Bynav has become one of the few companies in the world which has the self-developed high precision GNSS baseband ASIC Alita and RFIC Ripley successfully taped out and applied in mass applications.

2019 Undertook Chinese Beidou special project "Multi-source fusion high-precision GNSS chips".

2017 Delivered the 10,000th GNSS high-precision board.

2016 High-precision receivers are widely used in driver testing in southwestern mountainous area of China.

2015 Won the title of high-tech enterprise and applied for more than 30 National Invention Patents.

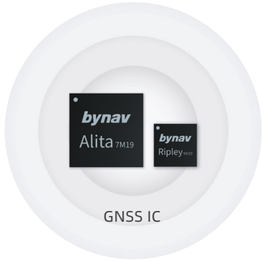
2013 Released the first BYNAV's GNSS high-precision heading board.

Origin 2002 Participated in the construction of BDS system and won several National Scientific And Technological Awards.

PRODUCTS

GNSS High-Precision Products

With deep coupling GNSS baseband signal processing, RTK ambiguity resolution and MEMS inertial sensors, Bynab products can effectively deal with signal blockage and interference, thus achieving reliable high-precision positioning in challenging environments.



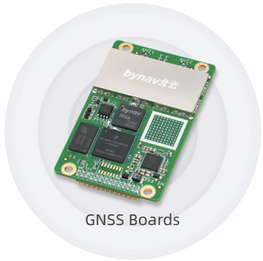
GNSS IC

GNSS ASIC

Our self-designed dedicated chips receive multi-constellation multi-frequency signals such as BDS, GPS, GLONASS and GALILEO. Our solutions bring about less power consumption, better performance, smaller size and lower cost, and chips can be integrated into various navigation systems much more easily than FPGA-based solutions.

GNSS OEM Boards

Based on bynav GNSS Baseband ASIC Alita and RFIC Ripley and embedded with bynav's new generation REAL (Ransac Enhanced Advanced Location) positioning engine, the GNSS OEM receiver supports full-constellation and multi-frequency RTK positioning and dual-antenna heading, thus delivering continuous reliable high precision positioning, heading, velocity and timing with smarter algorithm engine, higher-efficency RTK solution and better performance in multipath mitigation and anti-interference.



GNSS Boards

Receivers

GNSS Rugged Receivers

Built-in bynav high precision GNSS boards, supporting portable charger and (optional) 4G, Bluetooth, radio, antenna and other accessories. The receivers is plug-and-play and can be widely used in driver testing, mapping, CORS reference station, deformation monitoring, precision agriculture, engineering machinery and many other fields.

IMU-Enhanced GNSS Receivers

Highly integrated and deeply coupled with bynav high precision RTK positioning and dual-antenna heading GNSS OEM board and a tactical-grade IMU and embedded with deeply coupled algorithm engine and tilt measuremen, the GNSS/INS receiver can provide reliable continuous and high precision position, 3D attitude, velocity for different applications like autonomous driving, UAV and other umanned systems.

GNSS + INS

Please scan the QR code to view product details.

DATASHEET

GNSS Receiver Datasheet

Model		C1-8S	C1-8D	C1-FS	C1-FD
Function	Description	8-freq. Single-ant.	8-freq. Dual-ant.	Full-freq. Single-ant.	Full-freq. Dual-ant.
	Dual Antenna Heading	-	●	-	●
	Single Point Positioning	●	●	●	●
	RTK	●	●	●	●
	Timing	●	●	●	●
	Reference Station Mode	●	●	●	●
	Rover Station Mode	●	●	●	●
	Output Raw Observation	Single	Dual	Single	Dual
	NTRIP	●	●	●	●
Signal Frequency	GPS	L1CA/L1C,L2C, L2P		L1CA/L1C,L2C, L2P,L5	
	GLONASS	G1，G2		G1，G2	
	BDS	B1I，B2I		B1I，B2I/B3I	
	BDS-3	B1I/B1C，B2a/B2b		B1I/B1C，B2a/B2b/B3I	
	Galileo	E1, E5b/E5a		E1, E5b/E5a	
	QZSS	L1CA/L1C，L2C		L1CA/L1C，L2C，L5	
	NavIC(IRNSS)	-		L5	
	SBAS	-		L1CA	
Measurement Accuracy	Carrier Phase	≤1mm（RMS）			
	Pseudorange L1CA,L2C,L2P,G1,G2	≤ 0.12m（RMS）			
	Pseudorange Other Signals	≤ 0.06m（RMS）			
Single Point Accuracy	Horizontal	1.5m RMS			
	Vertical	2.5m RMS			
RTK Accuracy	Horizontal	1.0cm + 1ppm RMS			
	Vertical	1.5cm + 1ppm RMS			
Heading Accuracy		-	0.2°/m RMS	-	0.2°/m RMS
Timing Accuracy		20ns RMS			
Velocity Accuracy		0.03m/s RMS			
Max. Data Rate	Raw Data	5Hz	5Hz	10Hz	10Hz
	RTK	5Hz	5Hz	10Hz	10Hz
	RTK+Heading	-	5Hz	-	10Hz
Time to First Fix	Cold Start	≤45s			
	Hot Start	≤30s			
RTK Initialization Time		≤10s			
Reacquisition		≤1s			
Environmental	Operating	-40℃ ~ +85℃			
	Storage	-55℃ ~ +95℃			
	Humidity	95% non-condensing			
	Vibration	GJB 150.16A-2009			
Power Consumption	Typical Value	1.5W	1.8W	1.6W	1.9W
	Input Voltage	+3.25V ~ +3.45V			
Physical&Electrical	Dimension	71mm×46mm×11mm			
	Weight	20g			
	RF Connector	MMCX-K × 1	MMCX-K × 2	MMCX-K × 1	MMCX-K × 2
	Power&Data Connector	28-pin, double row, male (2mm)			
	Comminucatiom Ports	UART × 3 1PPS × 1 EVENT IN × 3 EVENT OUT × 3 CAN × 1 LAN × 1 I2C* × 1			

Notes: "●" means Supported, "-" means Not Supported.