



M992-INS

DUAL-ANTENNA TIGHTLY COUPLED BOARD

The A&I M992-INS is a dual-antenna tightly coupled board independently developed by Archimedes Innovation. This board adopts dual anti-interference design at both GNSS and IMU sides, ensuring reliable positioning and attitude output under external interference. The M992-INS supports seamless calibration, eliminating the need for cumbersome lever arm measurements, allowing for easy installation and immediate use. It is suitable for a wide range of applications of autonomous driving, maritime navigation, machine control, and so forth.



Seamless Calibration, Plug-and-Play

To address the cumbersome calibration process of mainstream products on the market, the self-developed algorithm engine eliminates the need for complex lever arm measurements, allowing for plug-and-play functionality.

Applicable to multiple platforms

It supports external high-performance IMU devices and L-band satellite-based augmentation signals, suitable for various platforms including low-speed vehicles, drones, USV, and port or mining vehicles.

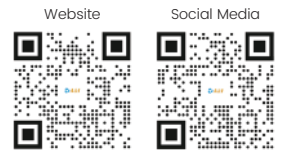
PTP time synchronization, with support for output up to 1000Hz

It supports multiple time synchronization methods including PPS, NTP, and PTP, with the capability to output high-precision positioning and orientation information at 200Hz, and up to 1000Hz maximum.

Embedded with a web interface for easy querying and configuration

It allows users to easily query and configure the board via a web interface.

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— GNSS Performance

GNSS Band	BDS	B1I、B1C、B2I、B2a、B2b*			
	GPS	L1 C/A、L5、L2C			
	Galileo	E1、E5a、E5b			
	GLONASS	G1*			
	QZSS	L1 C/A、L2C、L5			
	NavIC	L5*			
	SBAS	L1*			
	Lband*				
Positioning Accuracy (1σ)	Single Point	Vertical	1.5m	Elevation	2.5m
	DGPS	Vertical	0.4m	Elevation	0.8m
	PPP	Vertical	10cm	Elevation	20cm@10min
	RTK	Vertical	0.8cm + 1ppm	Elevation	1.5cm+1ppm
Velocity Accuracy (1σ)		0.03m/s			
Directional Accuracy (1σ)		0.1°/m baseline			
Timing Accuracy		PPS ≤10ns	GPTP≤1us	NTP ≤10ms	
Cold Start		30s			
Dual-antenna GNSS Observation		10Hz (Max 20Hz)			
Dual-antenna GNSS Position & Heading		10Hz (Max 20Hz)			
INS Raw Observations		200Hz (Max 1000Hz)			
INS Fusion Position Frequency		200Hz (Max 1000Hz)			
DR Accuracy		0.2% (1km@3min)			
Combination navigation mode		Single antenna, dual antenna, single point, floating, fixed, satellite base*			

— IMU

Gyroscope		Accelerometer	
Measure Range	$\pm 300^\circ/\text{s}$	Measure Range	$\pm 6\text{ g}$
Bias Repeatability	$0.5^\circ/\text{s}$	Bias Repeatability	20 mg
Bias Instability	$1.8^\circ/\text{h}$ (XY) $1.4^\circ/\text{h}$ (Z)	Bias Instability	15 μg
Angle Random Walk	$0.09^\circ/\sqrt{\text{h}}$ (XY) $0.10^\circ/\sqrt{\text{h}}$ (Z)	Angle Random Walk	$0.035\text{ m/s}/\sqrt{\text{h}}$

— Communications

RS232	3
RS422	1
CAN	2
Ethernet	1
1PPS	1

— Physical

Size	71L X 45W X 10Hmm
Weight	24g
Operation Temperature	$-40^\circ\text{C} \sim +85^\circ\text{C}$
Storage Temperature	$-55^\circ\text{C} \sim +95^\circ\text{C}$
Humidity	95%Non-condensing
Shock	EP455 Section5.14.1 Operational
Vibration	EP455 Section5.15.1 Random