

CLAP-B7

High precision GNSS/INS Board



CLAP™ (Concurrent Locating & Attitude Pilot) is a high-precision multi-sensor fusion positioning and heading technology developed by Unicore Communications. By using the latest "CLAP" technology, Unicore has launched CLAP series products, characterized as the miniaturized and high-performance integrated navigation boards. Based on multi-mode and multi-frequency, dual-antenna positioning and orientation, high-precision GNSS board, and integrated MEMS inertial measurement unit, the CLAP series products provide low-latency, high-precision three-dimensional position, velocity, attitude, IMU original acceleration and angular velocity measurement results. Even when the GNSS signal is completely blocked, the performance remains stable and continuous, by combining the absolute accuracy of GNSS positioning and the reliability of inertial measurement.

The CLAP series products have the functions of moving base alignment, inertial/satellite combined navigation, independent zero speed correction, independent calibration and many more. It can be combined with the odometer data to further improve the accuracy of vehicle navigation.

All the settings and data collection can be completed by using simple commands and data recording interface via the standard serial port. Once the hardware is installed, the system can be set up within a few minutes.

CLAP-B7 is a compact size, light weight, low power consumption, low cost, user-friendly integration and mass production OEM board, designed for automatic driving, traverse measurement, unmanned aerial vehicles and various attitude stabilization platforms.

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FEATURES

- Compact size and high-performance integrated navigation board, dimension: 46×71×17.1 mm
- The best PPS output precision with 6 ns RMS in industry
- "WINS" optimized technology (Wheel INS) for vehicles, wheeled robots
- Combined algorithm of inertial/GNSS/odometer
- Built-in high performance and high precision GNSS board of Unicore
- 100 Hz positioning result/original IMU measurement output
- 20 Hz GNSS original measurement output
- BDS B1/B2 + GPS L1/L2 + GLONASS L1/L2 + Galileo E1/E5b signal tracking
- Dual-antenna/single antenna functionality
- 3.3~5V DC input

CLAP-A8



High Precision GNSS/INS Board

Application Area



— Autonomous Vehicles



— Geographic Survey



— UAV(Unmanned Aerial Vehicle)



— Attitude Stabilization Platform

Performance

Position Accuracy	Single Point: 1.5m
	SBAS: 80cm
	DGPS: 40cm
	PPP: 20cm
	RTK: 1cm + 1ppm
Velocity	0.02 m/s RMS
Time Accuracy	5ns RMS, peak-to-peak 35ns (24h)

IMU performance

Gyroscope	Range $\pm 2000^{\circ}/s$
	Bias instability(1 σ) $8^{\circ}/h$
	Angular random walk $< 0.34^{\circ}/\sqrt{hr}$
Accelerometer	Range $\pm 40g$
	Bias instability (1 σ) $< 0.1mg$
	Velocity random walk $0.037m/s/\sqrt{hr}$

Environmental

Operating temperature	-25° ~85°C
Storage temperature	-40° ~85°C
Humidity	95% non-condensing
Vibration	2g@ 5~2000Hz
Shock	40g/50ms

Physical characteristics

Size	46 × 71 × 17.1 mm
Weight	22g
MTBF	30000 hour
Life	15 year

Functional Ports

RS432x2, RS232x1, 921.6kbps max

Status LED

Power, GNSS status, INS status

Performance during GNSS outage¹

Outage Duration	Positioning mode	Position accuracy (m)RMS		Velocity accuracy (m/s) RMS (m/s)		Attitude accuracy (deg) RMS		
		horizontal	vertical	horizontal	vertical	roll	pitch	heading
00s	RTK	0.02	0.03	0.02	0.03	0.1	0.1	0.15
	SP	1.50	2.0	0.02	0.03	0.1	0.1	0.15
10s	RTK	0.50	0.6	0.12	0.18	0.2	0.2	0.35
	SP	2.0	3.0	0.12	0.18	0.2	0.2	0.35

¹Typical values. Performance specifications subject to GNSS system characteristics, US DOD operational degradation, ionospheric and tropospheric conditions, satellite geometry, baseline length, multipath effects and the presence of intentional or unintentional interference sources.