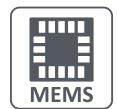




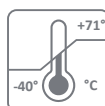
iNAT-CB-M / iNAT-CB-M-SC



Small Size INS and Vertical Reference Unit with advanced Inertial Sensors and integrated Strapdown Processor

iNAT-CB-M is a MEMS-based inertial navigation system with an optional multi-frequency, multi-constellation GNSS receiver and interfaces for optional odometer or magnetometer or airdata aiding. It is designed to replace the legacy iVRU-CB-M and offers stable accuracy, advanced signal

processing, and easy operation. **iNAT-CB-M-SC** without integrated GNSS engine is specifically designed for straddle carrier applications. Both systems feature triaxial MEMS gyroscopes and accelerometers and a powerful microcontroller. Common communication interfaces are provided.



APPLICATIONS

UAVs, UGVs
Straddle Carriers
Automated cargo handling

KEY FEATURES

Small size, highly robust, easy to use
integrated 42+ state INS
Navigation, Guidance, Attitude Control

PERFORMANCE

Bias stability (AV)	2.5 °/h
g-sensitivity	< 0.01 %/s/g
Bandwidth	0 ...100 Hz



iNAT-CB-M / iNAT-CB-M-SC

TECHNICAL DATA

■ NAVIGATION PERFORMANCE (RMS)

Position & Velocity Accuracy

Position (GNSS RTK post-proc.) *)	± 0.02 m
Position (GNSS RTK *)	± 0.1 m
Position (GNSS with / w/o SBAS)	± 0.4 m / ± 1.8 m
Velocity (RTK)	0.02 m/s

Angles

Range (Heading/Yaw, Roll, Pitch)	unlimited
Heading/Yaw *)	0.3 °
Heading/Yaw (after 60 s GNSS denied)	0.1 °
Heading/Yaw (post-proc.) *)	0.2 °
Roll/Pitch *)	0.1 °
Roll/Pitch (initial, w/o any aiding)	0.15 °
Dual-Antenna initial Heading, with 1 m baseline	0.2 °
with 2 m baseline	0.1 °

■ ENVIRONMENTAL

Temperature (operational)	-40 ... +71 °C
Temperature (storage)	-55 ... +85 °C
Shock (operational)	90 g, 6 ms
Vibration (endurance)	20 - 2'000 Hz, 5 g RMS
Environmental protection	IP67
Resistance against Helium	yes
Magnetic sensitivity	none
MTBF	> 60'000 h

■ MECHANICAL

Size (W x H x D)	approx. 75 x 70 x 115 mm
Weight	approx. 550 g
Case material	aluminum
Connectors	MIL-C-38999 III 37 pin

■ IMU SPECIFICATION (1 σ)

ACCELEROMETERS

GYROSCOPES

Sensor Range	± 8 g	± 500 °/s
Bias (OTR -40 ... +70 °C)	< 2 mg	0.2 °/s
Bias (short time stability)	< 0.1 mg	2.5 °/h
Resolution	< 20 μ g	< 0.0001 °/s
Linearity (1 σ OTR)	< 0.5 %	< 0.2 %
Scale error (1 σ OTR)	< 0.1 %	< 0.3 %
g-sensitivity	< 0.01 °/s/g	
Noise (0 ... 100 Hz)	30 μ g/ $\sqrt$ Hz ... 0.15 °/ $\sqrt$ h (ARW)	
Bandwidth	0 ... 100 Hz	0 ... 100 Hz
Axes Orthogonality	< 0.5 mrad	< 0.5 mrad

■ DATA OUTPUT, DATA INPUT

Digital Output

Angular rate and acceleration, position, velocity, roll / pitch / true heading / course over ground / magnetic heading, BIT / status
Output data rate integer divisor of 500 Hz

Digital Interface

Ethernet; RS232 or RS422 (up to 460,800 Bd)
External Sync Input available;
CAN (remote and continuous) up to 1 MBit/s
Start-up-time < 1 sec

Communication Interface

Standard iXCOM (iNAT), MQTT, NMEA183, protocol or on request also protocol of iVRU-CB-M (factory set)

■ ELECTRICAL

Operating voltage	10 ... 34 V DC
Power consumption	approx. 5 W
Shielding	EMI
Protecting	EMC

*) requires sufficient GNSS coverage and sufficient motion dynamics (only for iNAT-CB-M version)

Each individual iNAT-CB-M undergoes a calibration and verification testing process at iMAR's calibration laboratory. Performance specifications are based on comprehensive field testing and results from real-world applications, and are regularly tested to ensure continued conformance to such specifications.



iNAT-CB FAMILY

SYSTEM FEATURES AND SENSOR PERFORMANCES

iNAT-	PERFORMANCE		GNSS	GYROSCOPES			ACCELEROMETERS			COST
	Accuracy	Vibration immunity	included	Range	ARW (AV)	AV [°/h] Bias instability	Range	Bias day-to-day	VRW	
CB-M-SC	★★★★★	★★★★★	yes	±500	<0.15	<2.5	±8 ¹⁾	±2	<23	€€€€€
CB-M	★★★★★	★★★★★	no	±450	<0.06	<0.8	±10 ¹⁾	±2	<60	€€€€€
CB-M/RLE-xxx	★★★★★	★★★★★	no	±450	<0.08	<1.2	±10 ¹⁾	±2	<60	€€€€€
CB-M/TLE-xxx	★★★★★	★★★★★	no	±500 ¹⁾	<0.15	<2.5	±8 ¹⁾	±2	<23	€€€€€
CB-M/TLN-1	★★★★★	★★★★★	no							€€€€€
CB-M/TLD	★★★★★	★★★★★	no							€€€€€
Custom	Option: integration of other inertial and GNSS sensors									
Table Notes: all values 1σ, except ranges					¹⁾ other ranges available					



iNAT Family



General information about iMAR's INS/GNSS solutions for all applications

