



iATTHEMO-M

True North Finding Stabilization Reference Sensor for Guidance & Control in Marine and Naval Applications

iATTHEMO-M is a miniaturized dual-antenna GNSS compass for marine and naval applications with an integrated MEMS based inertial measurement system, which provides true heading as well as attitude, velocity, position, angular rates and acceleration at high performance. It is a small size unit and easy to use.

- True Heading with up to 500 Hz data rate, Dual Antenna GNSS, using up to L1L2 GPS/GAL/GLO
- Accurate roll, pitch, WGS84 position & velocity, rates, acceleration and standard deviations for ride control and vessel guidance & control
- Integrated propeller interface (option)
- CAN / UART RS232 & RS422 / Ethernet TCP/IP and UDP and NMEA183 interfaces
- Supports [iDMN](#) Dynamic Mesh Communic. Network
- Supports Multi Vehicle Tracking applications ([MVT](#))
- Real-world proven also on high speed crafts
- PPS output for synchronization

Due to its advanced architecture, [iATTHEMO-M](#) provides true north related heading, even under such motion conditions, where other GNSS/MEMS based systems fail (e.g. at standstill or motion with strong side slip angle). While standard GNSS based systems provide data only with low data rate, iATTHEMO-M provides all

data with up to 500 Hz, and from standstill up to very high dynamic conditions.

So, the iATTHEMO-M is a most suitable sensor, coming in a robust enclosure including strong EMI / EMC filtering, to provide **ATT**itude, **HEA**ding and **MO**tion measurements for manned and unmanned naval and marine applications. As an option, the system is also available as single antenna version (iNAT-M200/SLC-STAB).



Beside of iATTHEMO-M, with iNAT-F iMAR offers also other, even higher accurate dual-antenna based systems on FOG basis. Last but not least, our iATTHEMO-TRIDENT-H might be of interest as well: A Gyro Compass & Motion Reference Unit, including GNSS which provides 3 marine functionalities in a single, maintenance-free device.

Technical Data of iATTHEMO-M (rms):

	Gyro Performance	Accelerometer Performance
Sensor Range:	± 100 °/s	± 8 g
Bias Stability (Allan Var.):	< 1.8 °/hr	0.004 mg
ARW / Noise:	0.09 °/ $\sqrt{\text{h}}$	0.016 mg/ $\sqrt{\text{Hz}}$
Bandwidth:	0...200 Hz	0...200 Hz
Scale Factor Accuracy:	0.1 %	0.1 %
Attitude / Heading Range:	± 180 ° Roll, ± 90 ° Pitch, ± 180 ° true heading (Yaw)	
Attitude Accuracy:	< 0.1 ° rms roll/pitch under sufficient motion with GNSS aiding ¹	
Heading:	< 0.2 ° rms true heading with 1 m antenna baseline and GNSS available ¹	
	< 0.1 ° rms true heading with 2 m antenna baseline and GNSS available ¹	
	< 0.05 ° rms true heading with 4 m antenna baseline and GNSS available ¹	
	< 0.1 ° rms under sufficient motion and sufficient GNSS availability (for single antenna operation) ¹	
Attitude/Heading Resol. / Drift:	< 0.01 °; < 0.01 °/s drift on heading during short GNSS outages	
Position/Velocity:	using L1L2 GNSS based position / velocity; coordinated in WGS84, up to 500 Hz data rate; performance: 1.5 m RMS (S/A off, no SBAS)	
Digital Output:	Option -R: RTK accuracy (sub-decimeter CEP; requires appropriate RTK correction data)	
Integrated Features:	Option -T: PPP accuracy (sub-meter CEP); requires TerraStar corrections and subscription	
Digital Interface:	angular rate and acceleration, position in WGS84, velocity, roll, pitch, heading; BIT, status, std.dev.	
Output Data Rate, Connector:	INS/GNSS data fusion; Dual-Antenna L1L2 GPS+GLONASS (option: additional GALILEO); ODO	
Temperature; MTBF:	optional support: external 3D magnetometer, baro sensor	
Power:	CAN (up to 1 MBit/s), UART RS422 and RS232 (up to 921.6 kBd), USB, Ethernet (TCP/IP, UDP), dig. I/O	
Size:	up to 500 Hz via CAN / RS422; MIL-C-38999 III 37 pin; 2 x SMA for GNSS antennas	
Weight, Shock, Vibration:	-40...+71 °C (case temperature); storage: -55...+85 °C; $> 30'000$ hrs (estimated, surveying applications)	
Software:	9...34 V DC, approx. 8 W	
	approx. W x L x H = 102 x 122 x 65 (metal case, IP65);	
	approx. 850 grams; 60 g, 11 ms ; 20...2'000 Hz 5 g (rms) endurance	
	iXCOM-CMD (under Windows and Linux available) for configuration and data storing	

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¹ under sufficient motion and with suitable GNSS aiding

