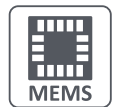




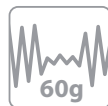
## iNAT-M300/TLN-1



### Reliable INS / GNSS solutions for most demanding environments

iNAT-M300 is a member of iMAR's iNAT series and one of the smallest yet powerful MEMS based INS/GNSS inertial navigation, measurement, surveying and control systems. It provides real time kinematic measurements, such as

acceleration, angular rate, attitude, true heading, velocity and position with a data update rate of up to 1'000 Hz. iNAT-M300 is the successor of iMAR's well-known iNAT-M200 and comes with advanced integrated sensor and data fusion technology.



#### APPLICATIONS

Land & Air  
Unmanned & Manned  
Stabilization & Control  
Localization & Navigation

#### KEY FEATURES

MIL-STD qualified  
Inertial Data Logging (128 GByte)  
Single & Dual Antenna GNSS  
Minimum Latency & Jitter

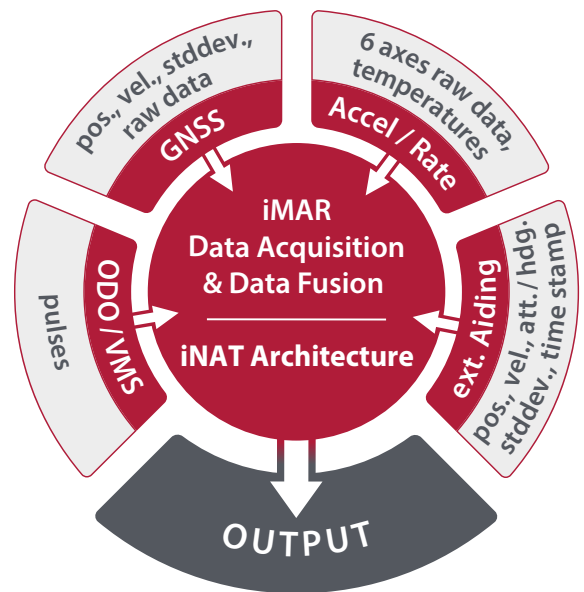
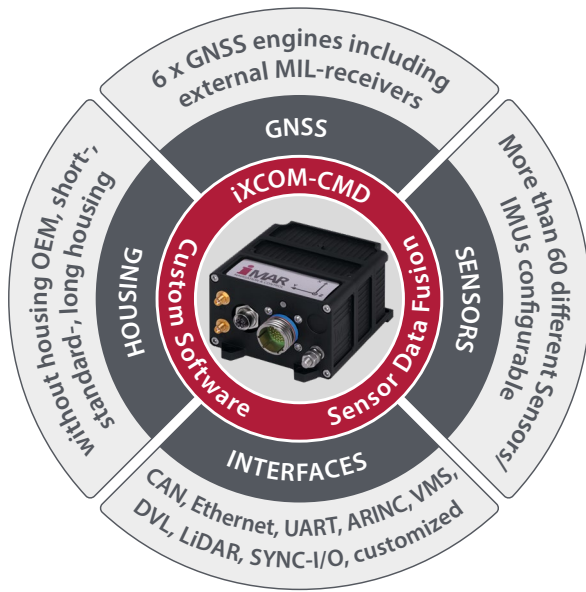
#### PERFORMANCE

Data Rate	up to 1'000 Hz
Heading	< 0.07 °
Attitude	< 0.02 °
Position	< 0.01 m



## iNAT-M300 - Family

### ONE ARCHITECTURE FOR ALL TECHNOLOGIES



#### MADE FOR YOUR APPLICATION



Easy to use: iXCOM-CMD GUI / HMI incl. powerful wizard. iNAT-M300 architecture allows application specification software configurations in order to achieve best performance even in most demanding environments. Integrated maintenance-free realtime clock.

#### QUALIFICATION



iNAT-M300 is qualified according to MIL-STD-810H, MIL-STD-461G, MIL-STD-704F and partially DO160G,CE, partially EN 50121.

#### DATA FUSION



The integrated advanced 42+ state extended Kalman filter allows advanced and predictable data fusion of multiple data sources, e.g. INS, GNSS and additional sensors.

#### INTERFACES & PROTOCOLS



NMEA, IENA, RTCM 104, TCP/IP, UDP, EtherCat, NTRIP, NTP Time Server, CAN, Ethernet, UART RS422/RS232, GP-I/O, PPS, PPT, ODO, USB; iXCOM communication protocol for all processed and raw data.

#### EXTENSIVE AIDING CAPABILITIES



iNAT-M300 is designed to operate with additional external sensors, e.g. odometer, LiDAR, pitot-sensors, magnetometer, balise etc.

#### MODULARITY



The modular nature of iNAT-Family allows iMAR to configure the systems with a wide range of best in class inertial sensors and GNSS receivers, expandable at any time and best fitted to customer's needs.



# iNAT-M300/TLN-1

## TECHNICAL DATA

### NAVIGATION PERFORMANCE

#### Position & Velocity Accuracy

Position (GNSS RTK post-proc.) **)	± 0.01 m
Position (GNSS RTK **)	± 0.02 m
Position (GNSS with / w/o SBAS)	± 0.6 m / ± 1.2 m
Position (GNSS denied + odometer)	0.2 % of dist. travelled
Position (GNSS denied w/o odometer *) **)	0.3 % DT
Velocity (RTK)	0.01 m/s

#### Angles

Range (Heading/Yaw, Roll, Pitch)	unlimited
Heading/Yaw **)	0.07 °
Heading/Yaw (after 60 s GNSS denied)	0.1 °
Heading/Yaw (post-proc.) **)	0.02 °
Roll/Pitch **)	0.02 °
Roll/Pitch (initial, w/o any aiding)	0.1 °
Dual-Antenna initial Heading, with 1 m baseline	0.2 °
with 2 m baseline	0.1 °

### MECHANICAL

Size (W x H x D)	approx. 102 x 65 x 122 mm
Weight	approx. 780 g
Connectors	MIL-C-38999 III (Data, Power)
	SMA (Antenna)
	M12 (Ethernet)

### GNSS

Constellations	GPS, GAL, GLO, BDS, IRNSS
Frequencies	up to all frequencies
Features	SBAS, RTK, PPP, Basestation, etc.
High speed version (> 515 m/s)	on request

### ELECTRICAL

Operating voltage	9 - 34 V DC
Power consumption	approx. 10.5 W
Power inputs	2 x insulated

### IMU SPECIFICATION

	ACCELEROMETER	GYROSCOPE
Range	± 10 g	± 400 °/s
Resolution	< 2 µg	< 0.0001 °/s
Bias instability (AV)	< 50 µg	0.5 °/h
Initial Bias	< 2 mg	< 0.07 °/s
Bias filtered	< 0.5 mg	< 2 °/h
Noise (AV)	45 µg/√Hz	0.15 °/√h
Non-orthogonality	< 0.3 mrad	< 0.3 mrad
Scale factor error	500 ppm	500 ppm
Non-linearity	150 ppm	50 ppm
Bandwidth	240 Hz	240 Hz

### DATA OUTPUT, DATA INPUT

#### Data Output

Data Rate	up to 1'000 Hz
Latency / Jitter / Time stamp	< 6 ms / < 1 ms / < 1 µs

#### Input / Output Interfaces

PPS, PPT, GP Trigger/Sync I/O, odometer / VMS input (wide range opto-coupler; RS422 level)

#### Communication Interfaces (options)

Ethernet (TCP/IP, UDP), 4 x UART (RS232/422), 2 x CAN, USB, NMEA183, ARINC825, NTRIP caster with RTCM 104, NTP, iXCOM, ROS-2, Python, SDK C++

### ENVIRONMENTAL

Temperature (operational / storage)	-40 .. +71 °C / -55 .. +85 °C
Shock (operational)	60 g, 11 ms (half-sine)
Shock (endurance)	1'000 g, 0.5 ms (half-sine)
Vibration operational	10 - 2'000 Hz, 10 g RMS
Vibration endurance	10 - 2'000 Hz, 20 g RMS
Maximum altitude	60'000 ft
Environmental protection	IP67
Magnetic sensitivity	none
Fully hermetic sealed (resistant against Helium)	on request
MTBF	49'000 h

\*) for road and rail applications    \*\*) after sufficient availability of GNSS aiding and motion dynamics

*Each individual iNAT-M300/TLN 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-M300 - Family

## SYSTEM FEATURES AND SENSOR PERFORMANCES

iNAT-M300	PERFORMANCE		GYROSCOPE				ACCELEROMETER			COST
	Accuracy	Vibration immunity	Range	ARW (AV)	AV Bias instability	Scale factor error	Range	Bias day-to-day	VRW	
TLN-2	★★★★☆	★★★★★	±400 <sup>1)</sup>	<0.15	<0.3	<0.05	±10 <sup>1)</sup>	±1	<25	€€€€€
TLN-1	★★★★☆	★★★★★	±400	<0.15	<0.3	<0.05	±10 <sup>1)</sup>	±2	<45	€€€€€
TLE-ULN1	★★★★☆	★★★★★	±200	<0.03	<0.8	<0.2	±10 <sup>1)</sup>	±2	<60	€€€€€
TLE-LN1	★★★★☆	★★★★★	±450	<0.06	<0.8	<0.2	±10 <sup>1)</sup>	±2	<60	€€€€€
TLE-SP1	★★★★☆	★★★★★	±450	<0.08	<1.2	<0.2	±10 <sup>1)</sup>	±2	<60	€€€€€
TLD	★★★★☆	★★★★★	±500 <sup>1)</sup>	<0.15	<2.5	<0.3	±8 <sup>1)</sup>	±2	<23	€€€€€
Custom	Option: integration of any inertial and GNSS sensors									
Table Notes: all values 1σ, except ranges <sup>1)</sup> other ranges available										



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



iNAT Family

