iMAR
NAVIGATION & CONTROL

iNAT

**Robust & precise Solutions
for Positioning, Navigation,
Surveying, Guidance, Control,
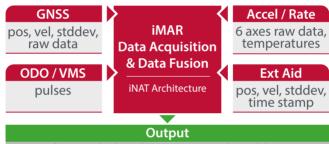Communication & Timing**

iMAR Navigation

iMAR Navigation GmbH, a German company, is a well-known specialist and innovator in leading inertial systems and solutions for more than 30 years. With our extensive long-time experience in production, development, maintenance and support of inertial systems for positioning, navigation, surveying, guidance, stabilization, control and communication (PNT/PNTC) we provide leading systems and solutions destined to a wide range of applications, for unmanned and manned platforms, in industrial, automotive, aerospace, geodetic and defence environment, from stock or as customized solution.

MEMS sensors
iNAT-M300

RLG sensors
iNAT-RQT-4003

HRG sensors
iPEGASUS-LT

MEMS sensors
iNAT-U200-OEM

FOG sensors
iNAT-FSLG

RLG sensors
iPRENA-M

iMAR is manufacturing according to military, industrial and aerospace quality standards. Our facilities are certified according to ISO 9001 / EN 9100 and EASA Part21G. Our extensive in-house calibration and test lab covers full product qualification including motion, temperature, vibration & shock and EMI/EMC according to military and industrial standards.

Advanced Sensor Data Fusion

GNSS	iMAR	Accel / Rate
pos, vel, stddev, raw data	**Data Acquisition & Data Fusion**	6 axes raw data, temperatures
ODO / VMS	iNAT Architecture	**Ext Aid**
pulses		pos, vel, stddev, time stamp

Output

pos, vel, attitude, heading, rates, accels, stddevs, time, status, BIT, raw data, etc.

Each iNAT system contains the inertial sensors, the GNSS engine, the external interfaces, the most precise timing reference, the powerful FPGA for synchronization purposes, the power conditioning, the EMI/EMC filtering and the extended sensor data fusion, which is implemented on an integrated powerful multi-core microprocessor in a real-time environment. The open interfaces to external aiding sensors like external GNSS, airdata, DVL, LiDAR, magnetometer etc. allow the integration of the iNAT systems into nearly all applications. The output of the iNAT system provides all processed result data in real-time as well as sensor and timing raw data.

The iNAT systems can be integrated via the published iXCOM protocol directly by the applicant. With iXCOM-CMD, also a mighty HMI software is available for system configuration, operation (incl. map visualization) and data download. It also contains a useful wizard for installation support and also play-back capabilities, e.g. for the purpose of data analyzis.

With iPosCAL a software is available for powerful INS/GNSS/ODO/XXX sensor data fusion post-processing.

Features of **iNAT Series**

- **robust, compact, light-weight, reliable, accurate – designed & qualified to military and aviation standards – long product-life-cycle**
- available in all performance and for all operational classes, from commercial to highest accuracy, for land / sea / air / space
- high output data rate, low latency, low jitter, most accurate time stamping to support also the most advanced surveying applications. Output data rate adjustable by user (see data sheet)
- output data: Angular rate, acceleration, attitude and heading, position, velocity, estimated sensor biases and scale factors, standard deviations of all data; raw data of IMU, GNSS, odometer, etc.
- interfaces: Ethernet (TCP/IP, UDP), UART (RS232 / RS422), CAN, ARINC429, ARINC825, HDLC, USB, VMS / wheel sensor interface with isolated wide area input, digital I/Os (opto-isolated, RS422 level compatible), analog, customized (see data sheet)
- arbitrary mounting orientation supported. Land based and air/sea based coordinate systems supported (z up or z down/ENU or NED)
- arbitrary definable reference systems like WGS84, ETRS89 etc. supported incl. online coordinate transformation of input (correction or aiding data) and output data
- **iMAR offers solutions with all reliable inertial sensor technologies like MEMS, FOG, RLG, HRG, Q etc. to meet the requirements of customer applications with an optimal balance of performance, reliability & cost.**
- integrated GNSS receivers (up to all-frequencies/all-constellations), from several leading manufacturers (also customized solutions): GPS, GALILEO, BEIDOU, GLONASS,…; DGPS, PPP, RTK,…; M-Code; dual-antenna heading supported
- integration support: Python scripts, C++ code examples / SDK and ROS 2 driver available for easy connectivity
- iXCOM-CMD: User friendly HMI software, available under Linux and MS Windows™ and MacOS™ for system configuration, data visualization (incl. moving map feature) and managing data storage on the user's host PC and on the iNAT device. iXCOM-CMD also contains a configuration wizard to assist the user in an easy installation and operation
- integrated large size non-volatile memory for data storage
- NTP Time Server capability; PTP features; most accurate dig. I/O lines for time and event synchronization (PPS, PPT, PPD, SYNC-I/O, etc.)
- open interfaces to process also external application specific information (position, velocity, attitude/heading, time stamp, standard deviations) for aiding, e.g. from LiDAR
- **hardware and software designed, developed, manufactured, supported and maintained by iMAR Navigation in Germany**

iNAT based Product Range

Economic INS/GNSS systems with MEMS and with

standard GNSS engine as open-frame setup
❱ iNAT-U200/RLD-OEM-DA • iNAT-U200/RLE-OEM-DA

standard GNSS engine, within rugged enclosure
❱ iNAT-U200/RLD-M-DA • iNAT-U200/RLT-M-DA

Miniature INS/GNSS systems with MEMS, within rugged enclosure

standard GNSS receiver, multiple interfaces
❱ iNAT-M300/RLD • iNAT-M300/RLE • iNAT-M300/RLN

high performance GNSS receiver, multiple interfaces
❱ iNAT-M300/TLD • iNAT-M300/TLE • iNAT-M300/TLN

high performance GNSS engine for usage in defence applications
❱ iSULONA/TLD • iSULONA/TLE • iSULONA/TLN

INS/GNSS systems with high performance GNSS engine and with

highly accurate MEMS/FOG/RLG sensors, extended interfaces
❱ iNAT-MSLG-0x/T • iNAT-FSLG-0x/T • iNAT-RQT-400x/T

FOG / RLG sensors and high performance GNSS engine for
advanced automotive testing applications
❱ iTraceRT-MVT300/T-DA • iTraceRT-MVT500/T • iTraceRT-MVT600/T

solutions based on MEMS/FOG/RLG sensors for marine applications
❱ iATTHEMO/RLx-M • iATTHEMO-TRIDENT-Rx

most accurate RLG sensors, for usage in defense applications
❱ iPRENA-IV/T • iPRENA-III/T • iPRENA-II/T • iPRENA-M

accurate FOG sensors, for usage in defense applications
❱ iCOMBANA-III/T-DA • iCOMBANA-II/T

Systems for specific applications

Gravimetry, Pipeline Inspection, Drilling, Railway (excerpt)
❱ iCORUS-0x, iPST-Fx • iANARO-x • iRailLoc, …

GNSS Reference Stations with high performance

all-constellations / all-frequencies GNSS engine
❱ iNAT-M300/T • iREF-GNSS-PRO

Your Source for reliable Solutions

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