GeneSys

Sensor Systems, Service & Smiles

ADMA-Micro

Our smallest GNSS-aided inertial navigation system with maximum performance level.

The ADMA-Micro is our smallest GNSS-aided inertial measurement unit (IMU). It measures the 3D position in real-time within an accuracy of 0.01 m (1σ) *[2]. Based on accelerations and rotation rates, which are also measured, velocities, position angles and heading can be determined. The use of MEMS gyros and accelerometers makes it possible to create a highly accurate, compact and lightweight device. Different structural shape allows choosing the right design for a variety of applications, including vehicles and VRUs (Vulnerable Road Users), construction machines, UGVs (Unmanned Ground Vehicles) and robotics.

Thanks to almost 30 years of GeneSys experience in inertial navigation systems, the ADMA-Micro is a fully-fledged GNSS-aided INS system combined with an advanced Kalman filter. High flexibility and an embedded webinterface provide quick and individual workflows. A wide range of free software solutions, such as the Data Reader Library for decoding the ADMAnet data stream or the ROS driver, allow an easy toolchain integration.

0.01 m	0.06 km/h	< 1 ms	100 Hz / 200 Hz
Position accuracy (1σ)*[2]	Velocity accuracy (RMS)*[3]	Data latency	Data output rate

KEY FEATURES

- Our smallest GNSS/INS system
- Advanced Kalman filter for sensor fusion
- Centimeter-level positional accuracy RTK
- Real-time 3D position, velocity and attitude measurement up to 200Hz
- Data latency <1 msec
- Dual antenna support for highly accurate heading in static and low dynamic conditions
- Multi GNSS capability for a high position reliability
- Fully compatible with existing ADMA systems
- Embedded webinterface for easy configuration

APPLICATIONS

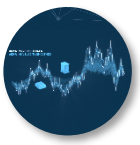
The ADMA-Micro achieves highly accurate measurements of position, velocity, angles, rotation rates or accelerations of a moving object. The system is small, rugged and low powered, making it ideal for a range of applications including:

- Autonomous vehicle (AV) operation
- ADAS Evaluation e.g., ACC, FCW, AEB (VRU, Car2Car), LSS (LDW, LKA)
- Simultaneous Localization And Mapping (SLAM)
- Validation of predictive vehicle safety functions with e.g., Camera, Radar, Lidar sensors
- Vulnerable Road Users (VRU) Tracking
- Comprehensive vehicle safety functions with connected sensor systems and V2X

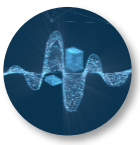
ADMA ADD-ONS AND OPTIONS

Meet new measurement and testing requirements with Add-Ons and Options.

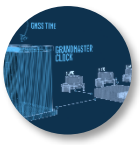
The new generation of ADMA 3.5 devices now allows our customers to meet their new and changing needs. Our focus is on straight-forward use and increased productivity. The Add-Ons and Options can be activated quickly and conveniently by entering a license key. This is possible at any time without modifications to the hardware. A high degree of flexibility is thus ensured.



Add-On Smoothing
Define maximum step size for the GNSS signal

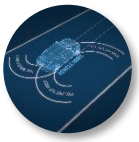


Add-On FILTER
Option for online signal filtering

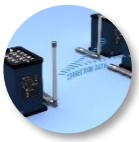


Add-On PTP
Time synchronization with generalized Precision Time Protocol (gPTP)

Option Dual-Ant
Two GNSS antenna option



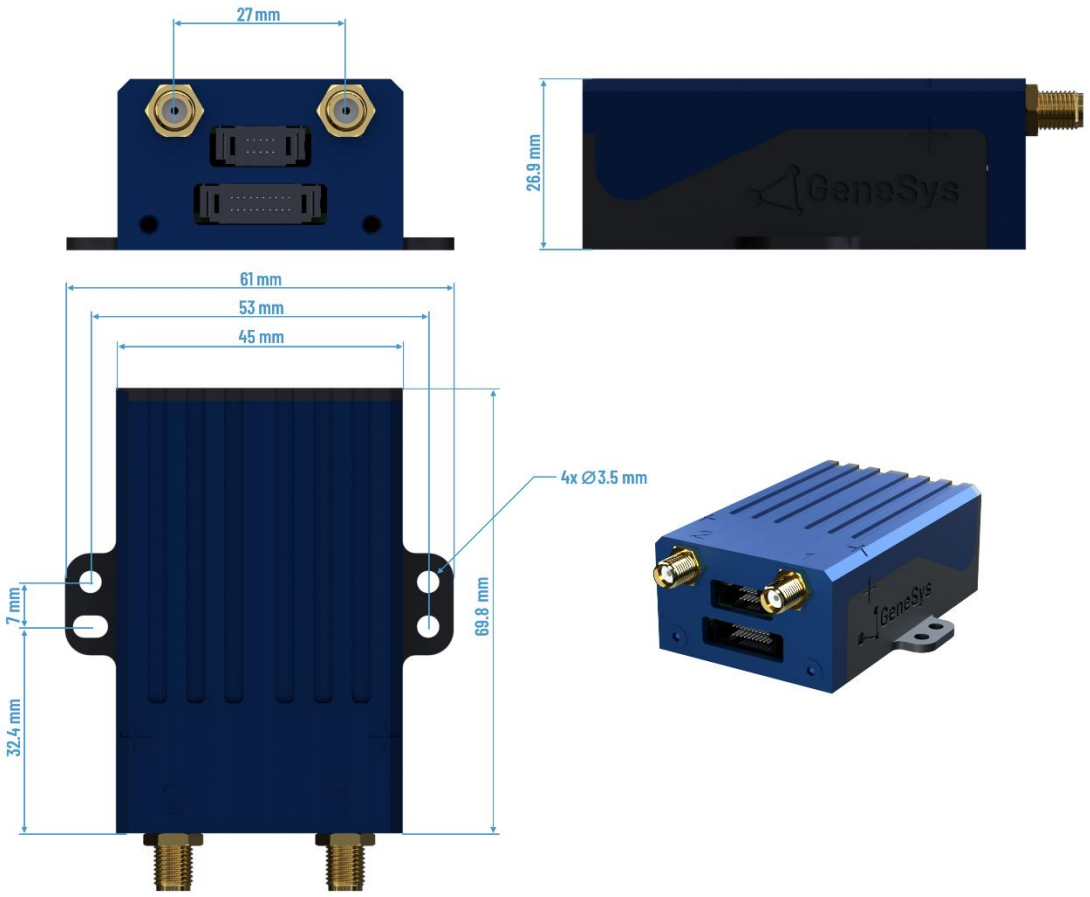
Option Vehicle Model
2D vehicle model predicts vehicle behavior, supports IMU & adapts to conditions



Option DGNSS Correction Data
Correction data reception via Ethernet

Option Internal Memory
Storing ADMA measurement data in internal memory

DIMENSIONS



TECHNICAL DATA

Complete system	
GNSS constellations	GPS L1, L2 GLONASS L1, L2 BeiDou B1, B2 Galileo E1, E5
Dual antenna	Optional
Position accuracy (1σ)[*2]	0.01 / 0.20 / 0.60 / 1.20 / 1.50 m
Angle measurement range roll / pitch / yaw	60 ° / 60 ° / ± 180 °
Velocity accuracy (RMS)[*3]	0.06 km/h RMS
Data update rate	100 Hz / 200 Hz
Calculation latency	1 msec

Sensors - Gyros	
Sensor Technology	3 MEMS gyros
Measurement range[*4]	± 450 °/sec
Data output resolution	0.0001 °/s
Bias repeatability typ. (1 σ)	0.14 °/sec y-axis and z-axis 1.4 °/sec x-axis
In-run-bias typ.	2.7 °/h x-axis 2.2 °/h y-axis 1.6 °/h z-axis
Noise (random walk) typ.	0.15 °/√h x-axis and y-axis 0.2 °/√h z-axis
Sensor bandwidth	480 Hz x-axis and y-axis 590 Hz z-axis

Sensors - Accelerometers	
Sensor Technology	3 MEMS accelerometers
Measurement range	± 15 g
Data output resolution	0.0001 g
Bias repeatability typ.	15 mg
In-run-bias typically (1σ)	12.75 µg x-axis and y-axis 13.66 µg z-axis
Noise (random walk) typ.	90 µg /√Hz x-axis and y-axis 75 µg /√Hz z-axis
Sensor bandwidth	750 Hz

Interfaces	
Ethernet	1x 1 Gbit Data input/output, configuration and firmware update, driving robot data output, optional for relative data calculation and DGNSS routing.
CAN	1x CAN 2b, 1 Mbit Data output, input[*1]
Serial	1x RS232 GNSS Receiver / DGNSS correction data input, IPS (Indoor Positioning System)
Digital/Analog Input	2x Digital / Analog (16 bit) e.g. Frequency, Brake trigger, ...
Digital Output	2x Signal Out e.g. PPS, Frequency, PPD Pulse per distance, ...
Connector type	Samtec T1M-10-GF-DH Main Connector Samtec T1M-05-GF-DH Ethernet Connector
GNSS	2x SMA GNSS Antenna connectors

Hardware / Miscellaneous	
Dimension (W x L x H)	Housed-Version 78.0 x 61.0 x 26.9 mm OEM-Version 91.0 x 43.0 x 14.0 mm
Internal Memory	up to 8 GB
Weight	0.116 kg
Power supply	5 VDC typ. 7.5 W
Operating temperature	-20 °C to +75 °C
Protection class	IP 20

*1 Optional

*2 Depending on GNSS conditions, correction data and license model

*3 Typical values according to internal test standards with settled Kalman filter.

*4 Calibration range 0 °/sec to 200 °/sec

For any further questions: support@genesys-offenburg.de