

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 over 25 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.

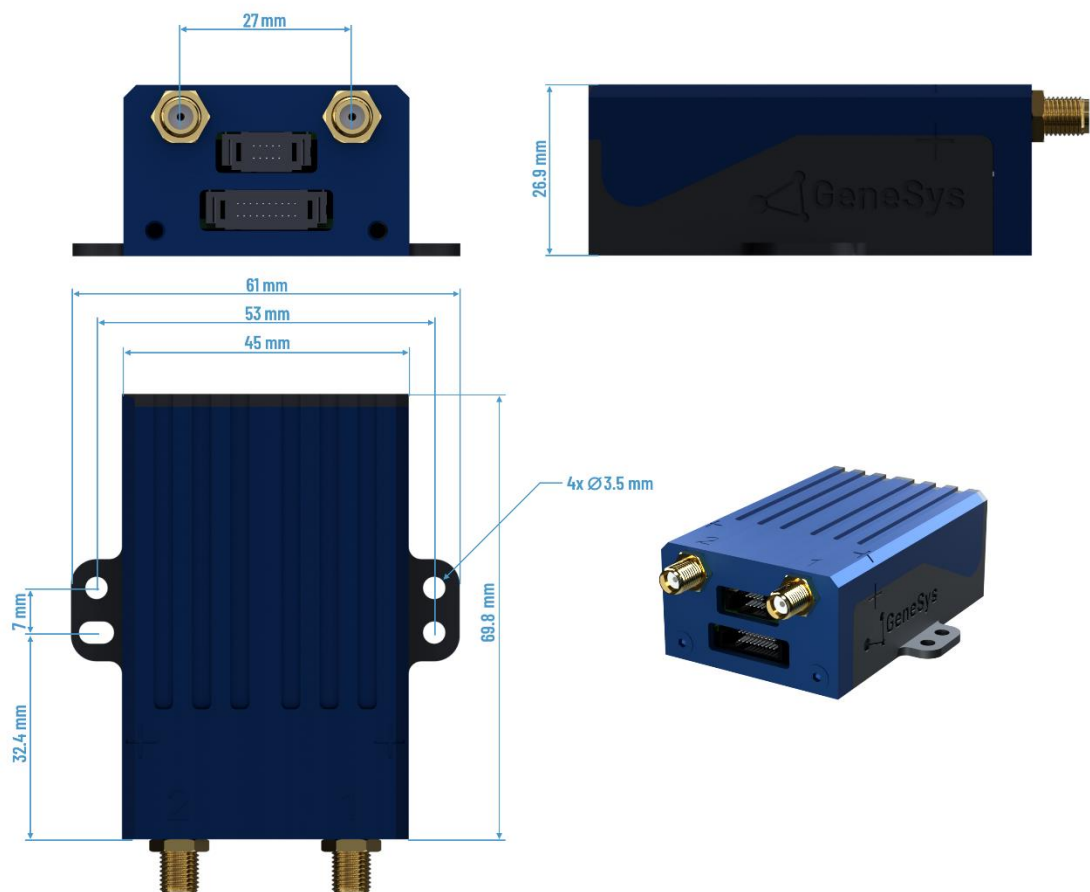
KEY FEATURES

- Our smallest GNSS/INS system
- Advanced Kalman filter for sensor fusion
- Centimetre-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
- Ready for series production

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



TECHNICAL DATA

Complete system*1	
GNSS constellations	GPS L1, L2C GLONASS L1, L2 BeiDou B1, B2 Galileo E1, E5
Dual antenna	Optional
Position accuracy (1 σ)*2	0.01 / 0.20 / 0.60 / 1.20 / 1.50 m
Angle measurement range roll / pitch / yaw	$\pm 60 / 60 / 180$ °
Velocity accuracy (RMS)*3	0.04 km/h RMS
Data update rate	100 Hz / 200 Hz
Calculation latency	< 1 msec

Sensors - Gyros	
Sensor Technology	MEMS
Measurement range	± 450 °/sec
Data output resolution	0.0001 °/s
Bias repeatability typ. (1 σ)	0.14 °/sec x-axis and z-axis 1.4 °/sec y-axis
Noise (random walk) typ.	0.29 °/ \sqrt{h} x-axis and y-axis 0.32 °/ \sqrt{h} z-axis"
Sensor bandwidth	573 Hz x-axis and y-axis 639 Hz z-axis

Sensors - Accelerometers

Sensor Technology	MEMS
Measurement range	± 15 g
Data output resolution	0.0001 g
In-run-bias typically (1 σ)	12.75 μ g x-axis and y-axis 13.66 μ g z-axis
Noise (random walk) typ.	90 μ g / $\sqrt{\text{Hz}}$ x-axis and y-axis 75 μ g / $\sqrt{\text{Hz}}$ 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
Serial	1x RS232 GNSS Receiver / DGNSS correction data input
Digital I/O	2x Signal Out PPS, Frequency – e.g. for synchronisation and error indication. 2x Signal In. Analog, Digital – e.g. for light barrier or brake trigger.
GNSS Receiver	2x SMA GNSS Antenna connectors
Connectors	Samtec T1M-10-GF-DH Main Connector Samtec T1M-05-GF-DH Ethernet Connector

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 Open sky conditions.

*2 With RTK2 corrections at <10km from the GNSS Outdoor Base Station

*3 Typical values according to internal test standards with settled Kalman filter, without use of RTK.

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