GeneSys

Sensor Systems, Service & Smiles

# ADMA-G-ECO+ v35

*GNSS/INS System with highest performance level*

**The ADMA-G-ECO+ with three open-loop gyro sensors and three servo acceleration sensors class 1 mg provide high-precision data even in the case of strong GNSS interferences. Complies with all international test standards e.g. Euro NCAP & NHTSA.**



| 0.01 m | 0.03 km/h | 0.025 ° | 0.01 ° | < 1.0 mg | < 1 ms | 1 kHz |
|---|---|---|---|---|---|---|
| Position accuracy (1σ)*2 | Velocity accuracy (RMS)*3 | True Heading accuracy (1σ)*3 | Roll/Pitch accuracy (1σ)*3 | Sensor class | Data latency | Data output rate*1 |

# APPLICATIONS

Strap-down technology ensures that the ADMA is stable and resistant to unwanted vibration during use. This makes the ADMA ideal for evaluating vehicle dynamics and driver assistance systems in the automotive sector. The ADMA system is also successfully used in motorsport, driverless systems and construction machinery. It has a proven track record in road and railway measurements.

- Validation of simulation models
- Autonomous Vehicle (AV) validation
- Euro NCAP ADAS Evaluation e.g., ACC, FCW, AEB (VRU, Car2Car), LSS (LDW, LKA)
- NHTSA Evaluation
- Simultaneous Localization and Mapping (SLAM)
- Validation of predictive vehicle safety functions with e.g., Camera, Radar, Lidar sensors
- Driving and steering robot applications

# 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-Ons**




**Add-On DELTA 1:5**
Relative data calculation via WiFi in real-time for multi-vehicle operation



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



**Add-On LATDEV**
Real-time calculation of the lateral deviation



**Add-On BRAKING**
Real-time calculation of brake performance data according to international regulations



**Add-On FILTER**
Option for online signal filtering



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



**Add-On NTRIP-Client**
Integrierte NTRIP-Client-Funktion

## Options



**Option RTK2**
High-precision position measurement using correction data



**Option 1kHz**
Data output rate of 1 kHz via CAN or Ethernet interface



**Option Multi-GNSS**
Multi-GNSS: Use of multiple satellite systems such as GPS, GLONASS, Galileo, BeiDou



**Option Multi-CAN**
Data output via several CAN channels simultaneously



**Option Dual-Ant**
Two GNSS antenna option



**Option GNSS-Raw Data**
Raw data output via Ethernet for post-processing



**Option DGNSS Correction Data**
Correction data reception via Ethernet



**Option Internal Memory**
Storing ADMA measurement data in internal memory

# TECHNICAL DATA

| System performance specification with GNSS | |
|---|---|
| GNSS constellations | GPS L1, L2<br>GLONASS L1, L2<br>BeiDou[*1] B1, B2<br>Galileo[*1] E1, E5 |
| Dual antenna | Optional |
| Position accuracy (1σ)[*2] | Single point 1.20 m<br>SBAS[*5] 0.60 m<br>RTK 0.01 m |
| ITAR-free | Yes |
| Roll / Pitch accuracy (1 σ) | 0.010 ° |
| True Heading accuracy (1 σ) | 0.025 ° |
| Sideslip angle accuracy (RMS) | 0.100 ° |
| Angle resolution | 0.005 ° |
| Velocity accuracy (RMS)[*3] | 0.03 km/h |
| Braking distance accuracy without RTK2 (RMS)[*3] | 0.05 m |
| Data output rate | 50 / 100 / 200 / 250 / 500 Hz / (1000 Hz)[*1] |
| Calculation latency | < 1 ms |

**System performance specification without GNSS (RMS)[*3]**

True real-time performance: GNSS outage specifications represent the directly available ADMA real-time output without external velocity-aiding, DMI-input, or post-processing.

| | 10 s | 30 s | 60 s |
|---|---|---|---|
| Position (m) | 0.20 | 1.00 | 3.00 |
| Velocity (m/s) | 0.02 | 0.10 | 0.20 |
| Roll / Pitch angle (deg) | 0.01 | 0.02 | 0.03 |
| True Heading (deg) | 0.02 | 0.07 | 0.15 |

| Sensors - Gyros | |
|---|---|
| Sensor Technology | 3 open-loop gyros |
| Measurement range | ± 200 °/s |
| Data output resolution | 0.0001 °/s |
| Bias repeatability typ. (1 σ) | 24 °/h (0.0066 °/s) |
| In-run-bias typ. | 1 °/h |
| Noise (random walk) typ. | 0.02 °/√h |
| Scale factor | 0.1 % |
| Sensor bandwidth | 1000 Hz |

| Sensors - Accelerometers | |
|---|---|
| Sensor Technology | 3 servo accelerometers |
| Measurement range | ± 5 g / (± 10 g)[*1] |
| Data output Resolution | 0.0001 g |
| Bias repeatability typ. | < 1.0 mg |
| In-run-bias typ. (1 σ) | 10 µg |
| Noise (random walk) typ. | < 50 µg /√Hz |
| Scale factor (1 σ) | 0.015% |
| Sensor bandwidth | 1500 Hz |

| Interfaces | |
|---|---|
| Ethernet | 2x 1 GBit<br>Data input/output, configuration and firmware update, driving robot data output, optional for relative data calculation and DGNSS routing.<br>1x 100 MBit<br>GNSS Receiver; GNSS firmware update |
| CAN | 1x CAN, 5x CAN[*1], 2b, 1 Mbit<br>Data output, input[*1] |
| Serial | 1x RS232<br>GNSS Receiver; DGNSS correction data input<br>1x RS232<br>GNSS Receiver; GPGGA Log output, IPS (Indoor Positioning System) |
| Digital/Analog Input | 4x Digital / Analog (16 bit)<br>e.g. Frequency, Brake trigger, ...<br>1x Digital / Analog (16 bit)<br>external velocity X |
| Digital Output | 4x Digital TTL<br>e.g. PPS, Frequency, PPD Pulse per distance, ... |
| Connector type | Lemo |
| GNSS | 2x TNC<br>GNSS Antenna connectors |

| Hardware / Miscellaneous | |
|---|---|
| Ordering Variants | / |
| Internal Memory | up to 64 GB |
| Power supply | 9 to 32 VDC typ. 30 W |
| Dimensions (W x L x H) | 110 x 170 x 197 mm |
| Weight | 3.6 kg |
| Operating temperature | -20 to +55 °C |
| Protection class | IP 65*6 |

*1 Optional

*2 Depending on GNSS conditions, correction data

*3 Typical values according to internal test standards with settled Kalman filter and Vehicle Model

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

*5 GPS-only

*6 The housing is protected against dust and water jets in accordance with IP65. Please note that not all plug connections and cables are fully sealed in accordance with the IP standard. The cable is therefore not intended for use in permanently wet or damp environments.

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