

# ADMA-Speed v35

*Precise Speed and Braking Distance Sensor*

**ADMA-Speed is a GNSS speed sensor with integrated inertial sensors. It is optimized for brake tests. For easy installation, the inertial sensors are integrated in the GNSS antenna.**

**All motion data of the vehicle is calculated by means of the tried and tested ADMA technology. In the basic version acceleration, speed and braking distance is transmitted via the CAN and Ethernet interface. ADMA-Speed eliminates the known disadvantages of GNSS speed sensors.**



<b>0.01 m</b>	<b>0.04 km/h</b>	<b>0.05 °</b>	<b>0.02 °</b>	<b>&lt; 1 ms</b>	<b>1 kHz</b>
Position accuracy (1 $\sigma$ ) <sup>*2</sup>	Velocity accuracy (RMS) <sup>*3</sup>	Heading accuracy (1 $\sigma$ ) <sup>*2</sup>	Roll/Pitch accuracy (1 $\sigma$ ) <sup>*2</sup>	Data latency	Data output rate

## APPLICATIONS

ADMA-Speed is a specialized GNSS speed sensor designed specifically for brake tests. A major advantage of the ADMA-Speed is that no offsets need to be determined between the GNSS antenna and the IMU (Inertial Measurement Unit), as both components have been combined in a single housing. This integration greatly simplifies installation and commissioning by eliminating the time-consuming and precise determination of offsets. By bringing GNSS and IMU together in one housing, the ADMA-Speed provides seamless integration and ensures accurate and reliable acquisition of velocity data.

One of the notable features of ADMA-Speed is its ability to expand into a comprehensive GNSS-aided inertial system. This expansion allows for more advanced applications and enhanced accuracy in various scenarios.

- Brake tests
- Precise speed measurement
- Acceleration and deceleration testing
- Basic vehicle dynamics testing
- Tire testing
- ADAS (Advanced Driver Assistance Systems)
- Verification of automotive inertial sensors
- ABS / ESP ISO 26262 certification

## 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 BRAKING**

Real-time calculation of brake performance data according to international regulations



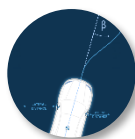
### **Option Full-INS**

Upgrade ADMA-Speed to full ADMA functionality



### **Add-On DELTA 1:5**

Relative data calculation via WiFi in real-time for multi-vehicle operation



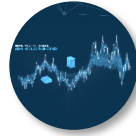
### **Add-On LATDEV**

Real-time calculation of the lateral deviation



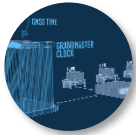
### Add-On FILTER

Option for online signal filtering



### Add-On Smoothing

Define maximum step size for the GNSS signal



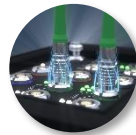
### Add-On PTP

Time synchronization with generalized Precision Time Protocol (gPTP)



### Option RTK2

High-precision position measurement using correction data



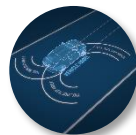
### Option 1kHz

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



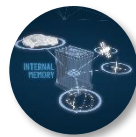
### Option Vehicle Model

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



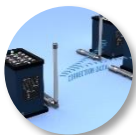
### Option Dual-Ant

Two GNSS antenna option



### Option Internal Memory

Storing ADMA measurement data in internal memory



### Option DGNSS Correction Data

Correction data reception via Ethernet



### Option GNSS-Raw Data

Raw data output via Ethernet for post-processing

## TECHNICAL DATA

<b>Complete system*1</b>	
GNSS constellations	GPS L1, L2 GLONASS L1, L2 BeiDou*4 B1, B2 Galileo*4 E1, E5
Dual antenna	Optional
Position accuracy (1 $\sigma$ )*2	0.01 / 0.20 / 0.60 / 1.20 / 1.50 m
Angle Measurement range roll / pitch / yaw	60 ° / 60 ° / $\pm 180$ °
Angle Measurement accuracy roll & pitch (1 $\sigma$ ) / yaw (1 $\sigma$ ) / sideslip (RMS)	0.02 / 0.05 / 0.15 °
Angle resolution	0.005 °
Velocity accuracy (RMS)*3	0.04 km/h
Position error after 10 / 30 / 60 sec GNSS outage (RMS)*3	0.4 / 5.0 / 40.0 m
Velocity error after 10 / 30 / 60 sec GNSS outage (RMS)*3	0.06 / 0.5 / 1.5 m/sec
Roll / Pitch angle error after 10 / 30 / 60 sec GNSS outage (RMS)*3	0.05 / 0.15 / 0.30 °
Heading angle error after 10 / 30 / 60 sec GNSS outage (RMS)*3	0.05 / 0.15 / 0.30 °
Braking distance accuracy without RTK2 (RMS)*3	0.05 m
Data output rate	50 / 100 / 200 / 250 / 500 Hz / (1000 Hz)*4
Calculation latency	1 msec

### Sensors - Gyros

Sensor Technology	3 MEMS gyros
Measurement range	$\pm 450^\circ/\text{s}$
Data output resolution	$0.0001^\circ/\text{s}$
Bias repeatability typ. ( $1\sigma$ )	$0.2^\circ/\text{s}$
In-run-bias typ.	$6^\circ/\text{h}$
Noise (random walk) typ.	$0.3^\circ/\sqrt{\text{h}}$
Scale factor	0.2 %
Sensor bandwidth	330 Hz

### Sensors - Accelerometers

Sensor Technology	3 MEMS accelerometers
Measurement range	$\pm 5 \text{ g} / (\pm 15 \text{ g})^*4$
Data output Resolution	0.0001 g
Bias repeatability typ.	4 mg
In-run-bias typ. ( $1\sigma$ )	32 $\mu\text{g}$
Noise (random walk) typ.	$50 \mu\text{g} / \sqrt{\text{Hz}}$
Scale factor ( $1\sigma$ )	0.2%
Sensor bandwidth	330 Hz

## Interfaces

Ethernet	2x 1 GBit Data input/output, configuration and firmware update, driving robot data output, optional for relative data calculation and DGNSS routing. 1x 100 MBit GNSS Receiver; GNSS firmware update
CAN	1x CAN, 1x CAN, 2b, 1 Mbit Data output, input <sup>*4</sup>
Serial	1x RS232 GNSS Receiver; DGNSS correction data input 1x RS232 GNSS Receiver; GPLOG Log output, IPS (Indoor Positioning System)
Digital/Analog Input	3x Digital / Analog (16 bit) e.g. Frequency, Brake trigger, ...
Digital Output	4x Digital TTL e.g. PPS, Frequency, PPD Pulse per distance, ...
Connector type	Lemo & Sub-D
GNSS	2x TNC GNSS Antenna connectors

## Hardware / Miscellaneous

Ordering Variants	/
Internal Memory	up to 64 GB
Power supply	9 to 32 VDC typ. 20 W
Dimensions (W x L x H)	Data processing unit 225 x 235 x 75 mm Sensor unit 110 x 130 x 70 mm (with magnets) 87 x 130 x 60 mm (without magnets)
Weight	Data processing unit 2.3 kg Sensor unit 0.75 kg
Operating temperature	Data processing unit -20 to +60 °C

	Sensor unit -40 to +85 °C"
Protection class	Data processing unit IP 50 Sensor unit IP 67

\*1 Open sky conditions.

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

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

\*4 Optional

\*5 Depending on GNSS correction data and license model

**For any further questions:**    [support@genesys-offenburg.de](mailto:support@genesys-offenburg.de)