ADMA-Slim

Miniaturized GPS/Inertial System

If size and weight matters

Range of applications

- Motion Tracking for applications with size and weight restrictions:
  - Vulnerable road users VRU (e.g. pedestrians, bikers)
  - Over-runnable platforms (e.g. for VRUs and GSTs)
  - Motorbikes
  - Sports cars, Jet-Skis, Snow mobiles
  - ATVs (All Terrain Vehicles)
- Vehicle dynamics testing with MEMS performance
- ADAS testing with MEMS performance

About ADMA-Slim

ADMA-Slim is a fullfledged GNSS/Inertial System based on MEMS gyroscopes and accelerometers and a high performance geodetic GNSS receiver. Performance-wise it is comparable to our ADMA-G-EntryLevel or ADMA-Speed models. The ADMA-Slim has been designed for applications with space or weight restrictions, e.g. to be integrated in over-runnable platforms for GSTs (Guided Soft Targets) or VRU (Vulnerable Road User) dummies.

Ordering Variants

ADMA-Slim is available in three different versions:

- Standard version with 7 LEMO connectors in a waterproof aluminium housing
- Single connector version with MIL connector in a waterproof aluminium housing
- Unhoused OEM version

ADMA-Slim is available either with an L1 GNSS receiver with SBAS and DGPS correction data reception capability or with an L1/L2 GNSS receiver with RTK2 correction data reception capability, allowing for position accuracy down to the centimeter.

Options

In addition, the following options are available for ADMA-Slim:

- **OPT-GLONASS / OPT-BEIDOU**
  Improvement of satellite visibility due to GLONASS or BeiDou reception capability
- **OPT-10g**
  Accelerometers ± 10g
- **OPT-15g**
  Accelerometers ± 15g
- **OPT-DUAL-ANT:**
  2 antenna version for course angle without initialization (e.g. low speed applications)
- **OPT-1KHZ**:
  1 kHz data output rate via Ethernet, as opposed to standard 400 Hz
- **OPT-DELTA** *
- **OPT-BRAKING** *
- **OPT-ACCELERATE** *
- **OPT-DGPS** *
- **OPT-LATDEV** *
- **OPT-GPS-RAW** *

* Refer to page 6 and 7 for more details

Scope of Delivery

- ADMA-Slim module
- GPS / GLONASS / Galileo / BeiDou patch antenna *
- Power cable *
- GPS antenna cable *
- CAN cable *
- Ethernet cable *
- GPS receiver configuration cable *
- Documentation, including test protocol and calibration report
- Software package for configuration and data recording *
- Transport case *

* not included in OEM version package


Standard Version


OEM Version


Single Connector Version

Technical Data

COMPLETE SYSTEM	
Angle Measurement range heading / roll / pitch	± 180 / 60 / 60 °
Angle Measurement accuracy roll & pitch / heading / sideslip*	0.02 (1 σ) / 0.05 (1 σ) / 0.15 ° RMS
Angle resolution	0.005 °
Velocity accuracy*	0.04 km/h RMS
Lateral velocity*	0.2 % RMS
GPS outage position error*	after 10 / 30 / 60 sec: 0.4 / 5.0 / 40.0 m RMS
GPS outage velocity error*	after 10 / 30 / 60 sec: 0.06 / 0.5 / 1.8 m/sec RMS
GPS outage pitch / roll angle error*	after 10 / 30 / 60 sec: 0.05 / 0.15 / 0.35 ° RMS
GPS outage heading angle error*	after 10 / 30 / 60 sec: 0.1 / 0.3 / 0.5 ° RMS
Axis misalignment	± 0.05 °
Initial heading alignment	with internal GPS receiver or by manual input
Data update rate / calculation latency	50 – 400 HZ (1000 Hz optional) / 1ms
INTERFACES	
Ethernet	1 x Gbit, for data output, configuration and firmware update, driving robot data output, optional for relative data calculation (e.g. range) and DGPS routing, input/output
CAN	1 x CAN 2b, 1 Mbit, for data output
Signal inputs	4 x TTL, optically isolated (e.g. for light barrier or brake trigger)
Signal outputs	4 x TTL, optically isolated (e.g. for synchronization and error indication)
DGPS correction data input	1 x RS232, for NTRIP- / RF Modem
Connector type for digital signals and power	7 x LEMO-connector (standard housed version)
	1 x MIL-connector (single connector housed version)
GNSS antenna input	1 x SMA (2 x SMA optional), for GNSS Antenna
MISCELLANEOUS	
Power supply	12 VDC nominal (9-32 VDC), 14 Watt typ. with ADMA-Speed-Ant, without other devices
Dimensions (W x L x H)	130 x 177 x 47 mm (housed version)
	125 x 100 x 30 mm (unhoused OEM version)
Weight	1.50 kg (housed version)
	0.3 kg (unhoused version)
Protection class	IP 67 (housed version)
Temperature range	-20 to +60 °C (housed version)

* typical values according to internal test standards with settled Kalman filter

Technical Data

GYROS	
Quantity / Type	3 MEMS gyros
Measurement range	± 450 °/s
Resolution roll / pitch / yaw	3 x 10^{-7} °/s
Bias variation over temperature range typically	± 0.0025 °/s / °C (1 σ)
In-run-bias typically	6 °/h (1 σ)
Gyro noise typically	0.3 °/√h
Scale factor repeatability	± 1 %
Sensor bandwidth	330 Hz
ACCELEROMETERS	
Quantity / Type	3 MEMS accelerometers
Measurement range	± 5 g, optional ± 10 g, optional 18 g
Measurement accuracy (without Kalman filter corrections)	better than 5 mg
In-run-bias typically	32 µg (1 σ)
Scale factor repeatability	± 0.5 %
Digitized measurement resolution	3.8 x 10^{-9} g
Sensor bandwidth	330 Hz
GNSS	
Position accuracy	0.01 / 0.2 / 0.4 / 0.6 / 1.2 / 1.5 m (depending on license model and DGPS corrections)
Data update rate	up to 50 msec (internally interpolated from 20 to 2.5 msec, optionally 1 msec)
WAAS/EGNOS-DGPS corrections	via satellite
DGPS corrections	via NTRIP-/ RF Modem or Ethernet (optional)
RTK2-DGPS	via NTRIP-/ RF Modem or Ethernet (optional)
Satellite tracking	GPS single antenna (standard)
GLONASS / Galileo / BeiDou / L-Band	optional
Dual antenna version	optional

Auxiliary Accessories

- Signal-In cable (for brake/light barrier trigger)
- Signal-Out cable (for synchronization and error signals)
- NTRIP-DGPS-Box 4 with accessories for RTK network connection
- RF modem set with accessories for DGPS correction data reception from local GPS Base Station
- WiFi Kit for remote access
- Mounting kit with 4 high power magnets

▲ All new functions of ADMA (refer to page 6-7) are also available for ADMA-Slim