

iμIMU-01/ iμVRU-01

Micro IMS with integrated GPS, Magnetometer, Barometer, Odometer

The iμIMU-01 is a MEMS based low-cost IMU consisting of 3 MEMS gyro axes and 3 MEMS accelerometer axes, baro, 3D magnetometer, GPS and odometer interface. The iμVRU-01 additionally provides attitude, velocity, position and true heading (AHRS).

- Calibrated sensor data
- Up to 1'000 Hz data rate with calibrated data
- Filtered power supply via USB
- iμVRU: Attitude Heading Reference, Surveying, UAV & missile Guidance & Control Applications
- Integrated L1 GPS, magnetometer, barometer (altimeter) and odometer interface
- Precise UTC referenced output
- RS232, RS422, USB, CAN, CANaero
- SYNC input and output for time stamping
- Compatible to external iDAGOS 2-antenna GPS heading reference and up to RTK GNSS aiding

The iμVRU is delivered with fully calibrated gyro and accelerometer axes. The IMU is designed for ruggedized industrial applications on autonomous guided vehicles, land vehicles, marine vessels and aircrafts. The iμVRU-01 and the iμIMU-01 can be operated at

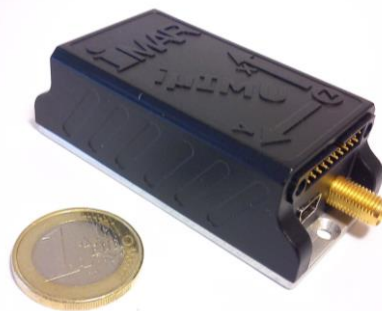
an unregulated wide range power supply (7-34 V DC and via USB 5V) and is protected against wrong polarity.

The iμVRU contains an integrated AHRS processor which provides roll, pitch, heading, position and velocity information.

iMAR's iμVRU is delivered with iMAR's PC based iXCOMsoftware for data collection, parameter adjustment and command interface.

The iμIMU / iμVRU are neither

covered by any export control nor by ITAR restrictions. The iμVRU is used in unmanned aerial vehicles (UAV) as well as in manned and unmanned naval, aerial and automotive vehicle applications.



Technical Data of iμIMU-01 / iμVRU-01 (typical 1 sigma values):

	Angular Rate ¹	Acceleration ¹	Altitude (Baro)	Magnetometer
Sensor Range:	± 250 °/s [2'000 °/s]	± 4 g [16 g]	300...1100 hPa -500...9000 m	± 8 Gauss ± 0.8 mT
Bias (OTR):	< 1 °/s (typ. < 0.2 °/s)	< 15 mg (typ. < 8 mg)	< 1 hPa	< 2 mGauss / 0.2 μT
Bias Stability (AllanVar):	< 10 °/h (@ const.temp)	2 mg	< 0.1 hPa	
Resolution [@range]:	< 0.003 °/s [@ 250 °/s]	< 0.1 mg [@ 4 g]	0.01 hPa (0.1 m)	< 1 mGauss / 0.1 μT
Linearity / Scale error:	< 0.2 % / < 1 %	0.5 % / < 0.5 %		0.1 % / 5 %
Angular random walk, Noise:	0.015 °/s/√Hz (@ 10 Hz)	< 1 mg/√Hz	0.01 hPa/√Hz	
g dependent Drift (comp.):	< 0.01 °/s/g			
Data Rate / Bandwidth:	up to 1'000 Hz / 200 Hz		40 Hz	75 Hz
GPS:	2.5 m CEP, 27 sec cold start, 3 sec aided start; WAAS/EGNOS/MSAS supported			
Output iμIMU-01:	calibrated rate & acceleration, pressure, magnetic field vector, odometer counts, GPS			
iμVRU-01:	additional: roll/pitch 1.5° static, 0.5° dyn.; INS/GPS heading < 0.5°² ; mag. heading < 1°			
Inertial Axis Misalignment:	< 2 mrad between all inertial sensor axes (calibrated)			
Digital Interface:	RS232, RS422, USB, CAN; INS/GNS data up to 200 Hz, calibrated sensor data 1 kHz ARINC-825-light / CANaero-light			
Connector:	Harwin M80, 20 pin; SMA for GPS antenna; Micro USB			
Data rate:	up to 200 Hz all navigation data, or up to 1'000 Hz for calib. raw data			
SYNC:	Option: RS422 level SYNC input to reset internal package counter			
Temperature:	-40...+71 °C (operating, case temperature); magnetometer: -30...+85 °C -45...+85 °C (storage)			
Shock, Vibration:	6 g, 20 ms ½ sine saw-tooth; 10...2'000 Hz 2 g rms (operation) 6.3 g rms (endurance); shock and vibration may affect performance			
Environment / MTBF/ MTTR:	IP54 / > 25.000 hrs (estimated) / 2 minutes			
Size, Weight:	approx. 73.5 x 23 x 34 mm (plus connector), approx. 50 gr			
Power, Start-up-Time:	7...34 V DC ; approx.. < 2 W @ 34 V, < 1 W @ 7 V; < 4 sec; reverse-voltage protection			

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¹ Systems with other (higher and lower) sensor performance available on request

² depends on applied dynamics (typical values)

