

**use
iNAT-M200 or iNAT-CFM-5
for new projects!**



GESELLSCHAFT FUER INERTIALE MESS-,
AUTOMATISIERUNGS- UND REGELSYSTEME MBH
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iVRU-SNC

Inertial Measurement Unit with MEMS Gyros and Open Loop Accelerometers

iVRU-SNC is an attitude heading reference system designed for stabilization and attitude heading reference tasks. It is fitted with a mounting flange.

- three MEMS rate gyros and three accelerometers
- < 0.0003 deg/s bias stability (AllanVar)
- high shock resistance due to MEMS technology
- RS232 and CAN interfaces
- Sync Input / Output available
- Designed for stabilization and attitude heading reference tasks on naval vessels, helicopters, fixed wing airplanes and land vehicles



the system can be connected with an external GPS engine (NMEA GGA / VTG and PPS signal required). Optionally, the system contains an internal L1 or

L1L2 GPS receiver already, on request with dual antenna support for advanced true heading. As a further option an external magnetometer can be connected. Design according to MIL-STD-810F and MIL-STD-461E. iVRU-SNC provides a grounding bush. The power supply is protected against voltage drops, over-voltage and high voltage light-

ning. The system iVRU-SNC is free of export license requirements. The unit is also available with servo accelerometers (iVRU-SNQ).

iVRU-SNC is a three axes system containing rugged MEMS gyroscopes, three MEMS accelerometers and as an option one incremental encoder for turret angle feedback or vehicle velocity measurement. The system provides digital data transmission (CAN, RS232). Additionally,

Technical Data of iVRU-SNC (all values 1 sigma):

	Gyro Performance	Accelerometer Performance
Sensor Range:	$\pm 400^\circ/\text{s}$	$\pm 5 \text{ g}$ (option: 2/5/10/20/25 g)
Bias (initial):	$< 0.05^\circ/\text{s}$	5.0 mg (at $\pm 2 \text{ g}$ range)
Bias Stability (OTR):	$< 0.006^\circ/\text{s}$ (plus const. initial bias)	within absolute 5 mg
Bias Short Time:	$< 0.0003^\circ/\text{s}$ (short time stability at const. temp.)	0.1 mg
Resolution:	$< 0.0003^\circ/\text{s}$	$< 0.1 \text{ mg}$
Linearity / Scale Error:	$< 0.2\% / < 0.2\%$	$< 0.2\% / < 0.2\%$
Noise (0-100 Hz):	$< 0.2^\circ/\sqrt{\text{h}}$	$< 200 \mu\text{g} / \sqrt{\text{Hz}}$
Bandwidth:	0...200 Hz	0...200 Hz
g-Sensitivity:	$< 0.005^\circ/\text{s/g}$	
Sensor Axes Misalignment:	$< 0.5 \text{ mrad}$	
Attitude / Heading:	$\pm 180^\circ$ Roll, $\pm 90^\circ$ Pitch, $\pm 180^\circ$ relative Heading	
Attitude Accuracy:	$< 0.3^\circ$ rms roll/pitch (static or linear unaccelerated motion, unaided mode) $< 0.5^\circ$ rms roll/pitch (GPS aided and sufficient dynamic); $< 2^\circ$ rms dynamic flight $< 0.003^\circ/\text{s}$ relative attitude drift over 10 seconds (after sufficient KF aiding)	
Track over Ground:	$< 1 \text{ deg}$ (GPS aided, $v > 10 \text{ m/s}$; single GPS antenna); Drift $< 0.006^\circ/\text{s}$ (since outage of GPS)	
True Heading Accuracy:	0.1° resp. 0.2° at 2 m resp. 1 m antenna distance (if 2-antenna L1 GPS option is selected) 0.15° resp. 0.3° at 2 m resp. 1 m antenna distance (if 2-antenna L1L2 GPS option is selected)	
Attitude / Heading Resolution:	$< 0.01^\circ$	
Output:	$\omega_x, \omega_y, \omega_z, a_x, a_y, a_z$ (rate and acceleration), Roll, Pitch, Yaw (attitude, rel. or abs. heading; option:magnetometer/GPS aiding); BIT (PBIT, CBIT, IBIT after reset)	
Digital Resolution:	$> 18 \text{ bit}$ (gyroscope and accelerometer digitalization)	
Digital Interface:	RS232 asynchronous, 9.6...115.2 kBd, CAN; Sync-Trigger-Input/Output	
Integrated Options:	Standard L1 GPS; option: odometer interface; dual-antenna GPS (L1 or L1L2)	
Analog Interface (Option)	0...5 V or $\pm 5 \text{ V}$ or $\pm 10 \text{ V}$ (range is factory set; compensated output)	
Output Data Rate, Connector:	200 Hz via RS422; MIL-C-38999 III	
Temperature, Shock, Vibration:	-40...+71°C (case temperature), 50 g, 11 ms, 6 g rms (10...2'000 Hz) endurance -55...+85°C (storage)	
Size; Bonding Performance:	152.4 x 127 x 130 mm; $< 2.5 \text{ mOHM}$	
Power, Start-up-Time:	11...34 V DC; approx. 8 W; $< 1 \text{ sec}$ (additional 4 W for true heading GPS option)	
Weight, Protection, Qualification:	approx. 1850 grams [+ 260 grams for dual-antenna GPS option]; IP 68	
Environment:	shall not be used in Helium contaminated environment	

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