

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



GESELLSCHAFT FUER INERTIALE MESS-,  
AUTOMATISIERUNGS- UND REGELSYSTEME MBH  
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# iVRU-FSAQ

## FOG Based AHRS for Navigation, Surveying, Guidance & Control

The iVRU-FSAQ is a FOG based Attitude Heading Reference System for harsh environment consisting of 3 fiber optic gyro axes, 3 servo accelerometer axes and optionally integrated GNSS receiver.

- 0.1 deg/sqrt(hr) / 50 µg/sqrt(Hz); bias day-to-day 0.7 °/hr, 2 mg or 200 µg; bias stability <0.1 deg/hr
- 200 Hz Extended Kalman Filter with position, velocity, RPY, angular rate, acceleration data output; NoA<sup>2</sup> capability
- Integrated or external powerful GNSS engine (GPS / GLONASS / GALILEO, L1 or L1/L2, RTK / Omnistar as option)
- Filtered power supply and EMI/EMC filtering
- Calibrated raw data available on request (rates / accels)
- RS485 (UART) / CAN and CANaero interface
- precise time stamping / triggering
- Used for Attitude Heading Reference, Surveying, UAV & missile Guidance & Control Applications

The iVRU-FSAQ contains full strapdown algorithms and INS/GNSS coupling to provide AHRS information. The integrated GNSS engine supports L1

GPS. The iVRU is designed for ruggedized applications on land vehicles, naval vessels, helicopters, fixed wing aircrafts and UAVs. The iVRU-FSAQ



can be operated at an unregulated wide range power supply (10-34 V DC) and is protected against wrong polarity and moderate over-voltage. Airdata input as option.

The iVRU-FSAQ requires no export license. The unit can optionally be equipped with MEMS accelerometers instead of Q-Flex type accelerometers.

### Technical Data of iVRU-FSAQ (1 sigma values):

	Angular Rate	Acceleration
Sensor Range:	± 450 °/s	± 10 g
Bias:	< 0.7 °/hr (1 sigma, OTR)	2 mg (option: 200 µg)
Bias Stability:	< 0.1 °/hr (const temp., AV)	0.5 mg (option: 50 µg)
Resolution:	0.000'04 °	< 20 µg
Linearity / Scale error:	< 0.05 %	0.15 %
Angular random walk:	0.1 °/√h	< 50 µg/√Hz
Output (with GNSS option):	3 x angular rate + 3 x acceleration + Roll/Pitch/Yaw, velocity, position	
Accuracy:	< 1 deg roll/pitch dynamic flight, 0.1 deg roll/pitch static (standard accel.) < 1 °/hr heading drift; < 0.5 ° CoG, < 3 m position and < 0.1 m/s velocity with GPS	
Axis Misalignment:	< 0.5 mrad between all sensor axes	
Digital Output Interface:	RS485/RS422 (UART), CAN, CANaero-light (ARINC-825 light)	
Digital Input Interface:	RS485/RS422 (UART) for configuration or external GNSS aiding	
Connector:	Type Micro-SubD15	
Data rate:	internal 1'200 Hz, data output 600 Hz or customized;	
Sensor bandwidth:	gyro bandwidth 500 Hz, accelerometer bandwidth 100 Hz	
SYNC:	Option: RS485 level SYNC input to reset internal µsec counter	
Temperature:	-45...+71 °C (operating, case temperature; +85 °C for 30 minutes or tbd), -56...+85 °C (storage)	
Shock, Vibration:	6 g, 20 ms ½ sine saw-tooth; 10...2'000 Hz 4.8 g rms (operation) 6.3 g rms (endurance)	
Bonding resistance:	better 2.5 mOhm	
Qualification:	MIL-STD-810F, MIL-STD-461E, MIL-STD-704D / DO160E	
Environment / MTBF/ MTTR:	IP66 / > 25.000 hrs (estimated) / 6 minutes	
Size, Weight:	approx. 136 x 170 x 112 mm (plus connector), approx. 2.5 kg	
Power, Start-up-Time:	10...34 V DC ; < 20 W; < 4 sec; reverse-voltage protection	
Options:	accelerometers: standard (2 mg bias) or advanced (200 µg)	

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