

# iIMU-FSAQ

## FOG Based IMU for Navigation, Surveying, Heave, Guidance & Control

The iIMU-FSAQ is a FOG based Inertial Measurement System for harsh environment consisting of 3 fiber optic gyro axes, 3 servo accelerometers axes and optionally integrated GNSS receiver.

- < 0.15 deg/sqrt(hr), bias day-to-day 0.9 °/hr, bias stability (AV) <0.1 deg/hr (AllanVariance)
- Modular architecture: Several classes of accelerometers can be integrated (up to servo acc. 5 µg/sqrt(Hz) and < 1 µg AllanVariance bias stability)
- Integrated sensor data calibration, data output rate up to 1'200 Hz for calibrated inertial data
- Calibrated raw data available on request (rates / accels)
- RS422 (UART) / CAN interface
- precise time stamping / triggering
- Filtered power supply and EMI/EMC filtering
- Used for Attitude Heading Reference, Surveying, UAV & missile Guidance & Control and Heave Applications

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

The iIMU-FSAQ requires no export license (depending on integrated accelerometers).



The unit can optionally (factory set – please contact iMAR sales) be equipped with Q-Flex type or MEMS type accelerometers in a wide range of performance (measurement. Range, noise, bias accuracy,

bias instability, scale factor performance, bandwidth). The internal accelerometer digitization is performed with 26 bit and covers all available accelerometer types with analog output.

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

	Angular Rate	Acceleration <sup>1</sup>		
		class 1	class 2	class 3
Sensor Range:	± 450 °/s	± 10	± 10	± 10 g
Bias (comp.repeat. 1 year):	< 0.9 °/hr (1 sigma, OTR)	<160	<550	<1'300 µg
Bias Stability:	< 0.1 °/hr (const temp., AV)	<1	<5	<10 µg
Resolution:	0.000'04 °	<1	<1	<1 µg
Scale error:	< 0.03 %	<310	<600	<1'200 ppm
Random walk / Noise:	0.1 °/√h	< 5	< 10	< 10 µg/√Hz
Output:	3 x angular rate + 3 x acceleration + Roll/Pitch/Yaw, velocity, position			
Axis Misalignment:	< 0.5 mrad between all sensor axes			
Digital Output Interface:	RS422 (UART), CAN			
Digital Input Interface:	RS422 (UART) for configuration			
Connector:	Type Micro-SubD15			
Data rate:	internal 1'200 Hz (free running), data output 600 Hz or customized;			
Sensor bandwidth:	gyro bandwidth 500 Hz, accelerometer bandwidth 250 Hz			
SYNC:	Options: SYNC-OUT trigger output with each internal data sample (open drain) SYNC-IN trigger to reset internal µsec counter (RS422 level)			
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	8.5 g rms (operation with isol.; other tbd) 4.8 g rms (operation w/o isolators) 6.3 g rms (endurance, w/o isolators)		
Bonding resistance:	better 2.5 mOhm			
Qualification:	Designed to MIL-STD-810F, MIL-STD-461E, MIL-STD-704D			
Environment / MTBF/ MTTR:	IP66 / > 25.000 hrs (estimated) / 6 minutes			
Size, Weight:	approx. 136 x 170 x 112 mm (plus connector), approx. 2.6 kg			
Power, Start-up-Time:	10...34 V DC ; < 20 W; < 4 sec; reverse-voltage protection			

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<sup>1</sup> Other ranges as option (+/- 3 g ... +/- 40 g); other accelerometer on customer demand possible; class 3: no export license required

