

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



GESELLSCHAFT FUER INERTIALE MESS-,
AUTOMATISIERUNGS- UND REGELSYSTEME MBH
WWW.IMAR-NAVIGATION.DE

iVRU-FQ / iVRU-FQ-E [-FF]

Vertical Reference and Heave Unit
with Fiber Optic Gyros and Servo Accelerometers

iVRU-FQ is an attitude heading reference system designed for stabilization and attitude heading reference tasks. It comes as an option with a fixation flange (iVRU-FQ-FF).

- three rate gyros and three accelerometers
- < 0.003 deg/s bias stability
- high shock resistance due to FOG / Q-Flex technology
- RS422 and RS232 and CAN interfaces
- Sync Input / Output available
- Designed for stabilization and attitude / heave reference tasks on naval vessels, helicopters, fixed wing airplanes and land vehicles



interface for turret angle feedback or vehicle velocity measurement. The system provides digital data transmission (CAN, RS422, RS232). Additionally, the system can be connected with an external GPS engine (NMEA GGA / VTG / HDG and PPS signal input). Optionally, the system contains an internal L1 GPS receiver already. As a further option an external magnetometer can be connected. Qualification according to MIL-STD-810F and MIL-STD-461E. iVRU-FQ-FF provides a grounding bush; a GORE membrane vent is standard for all units. The power supply is protected against voltage drops, over-voltage and high voltage lightning.

iVRU-FQ is a three axes system containing rugged fiber optic gyroscopes, three Q-Flex servo accelerometers and as an option one incremental encoder

The versions iVRU-FQ-E / iVRU-FQ-E-FF are free of export license requirements.

Technical Data of iVRU-FQ, iVRU-FQ-FF [iVRU-FQ-E, iVRU-FQ-E-FF]:

	Gyro Performance	Accelerometer Performance
Sensor Range:	$\pm 200^\circ/\text{s}$ (other on request)	$\pm 5 \text{ g}$ (option: 2/5/10/20/25 g)
Bias:	< 0.003%/s (short time stability at const. temp.) < 0.01%/s (OTR)	0.1 mg 2 mg [-E version; otherwise 1 mg]
Resolution:	< 0.001%/s	< 0.1 mg
Linearity / Scale Error:	< 0.2% / < 0.2%	< 0.15% / < 0.1%
Noise (0-100 Hz):	< 0.1%/√Hz	< 50 μg / √Hz
Bandwidth:	0...200 Hz (internally filtered to 100 Hz)	0...200 Hz (filtered to 100 Hz)
g-Sensitivity:	none	
Sensor Axes Misalignment:	< 1 mrad	
Attitude / Heading:	$\pm 180^\circ$ Roll, $\pm 90^\circ$ Pitch, $\pm 180^\circ$ relative or magnetic Heading or course over ground	
Attitude Accuracy:	< 0.1° [-E: 0.15°] roll/pitch (static or linear unaccelerated motion, unaided mode) < 0.2° roll/pitch/yaw with proper velocity aiding (odometer option) < 0.005°/s relative attitude drift over 10 seconds < 1° rms dynamic error (depends on motion conditions)	
Heading Accuracy:	rel. heading: drift < 0.01°/s; mag. heading: depending on magnetometer	
Attitude / Heading Resolution:	< 0.01°	
Heave accuracy:	5 % or 5 cm rms, whichever is greater	
Output:	$\omega_x, \omega_y, \omega_z, a_x, a_y, a_z$ (rate and acceleration), Roll, Pitch, rel. or mag. Heading or COG; PBIT, CBIT, IBIT; options: heave output, magnetometer/GPS aiding;	
Digital Resolution:	> 18 bit (gyroscope and accelerometer digitalization)	
Digital Interfaces:	RS422 asynchronous, 9.6...115.2 kBd, CAN; Sync-Trigger-Input/Output	
Integrated Options:	Standard L1 GPS; odometer (RS422 level, A/B) and magnetometer interface	
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:	-30...+63°C (case temperature; oper.), endurance: 50 g, 11 ms, 6 g rms (10...2000 Hz) option: -40...+71°C (case temperature; operational); -55...+85°C (storage)	
Bonding Performance [-FF]:	< 2.5 mOHM	
Power, Start-up-Time:	11...34 V DC; approx. 12 W; < 1 sec	
Size:	120 x 120 x 130 mm [-FF version (flange): 152.4 x 127 x 130 mm]	
Weight, Protection, Qualification:	approx. 1750 grams [-FF: 1850 grams], IP 68, helicopter qualified (MIL-STD 810F)	

iMAR GmbH • Im Reihersbruch 3 • D-66386 St. Ingbert / Germany
Phone: +49-(0)-6894-9657-0 • Fax: +49-(0)-6894-9657-22
www.imar-navigation.de • sales@imar-navigation.de

