

iVRU-FC-FF

Vertical Reference Unit with Fiber Optic Gyros, MEMS Accelerometers and integrated Strapdown Processor

With iVRU-FC a vertical reference unit is provided for applications which require high accuracy and simple using.

- Three rate gyros and three accels
- < 0.003 deg/s bias stability
- high shock resistance due to FOG / MEMS technology
- CAN / RS232 / HDLC interfaces
- Sync Input / Output available
- Navigation and Guidance



scopes, three ultra ruggedised MEMS accelerometers and an integrated powerful micro-processor with

16 bit sensor data digitalisation to provide digital data transmission (CAN, RS232) and extended internal error modelling. As an option also analog output data can be provided. As a further option an internal GPS / magnetometer can be provided as well as a speed sensor interface to achieve higher performance also in difficult environment. Interfaces for platform stabilisation are available on request. Qualification according to MIL-STD-810F and MIL-STD-461E.

iVRU-FC is a triaxial system with three orthogonal mounted rugged fiber optic gyro-

Technical Data of iVRU-FC-FF:

	Gyro Performance	Accel Performance
Sensor Range:	± 200 %/s (*)	$\pm 2 / 10 / 30$ g
Bias	< 0.003 %/s (const. temp., short time stability) < 0.01 %/s (OTR, long-term bias, 1 sigma)	< 0.5 / 1 / 5 mg < 2.5 / 10 / 30 mg (typ. 0.1% of range)
Resolution:	< 0.001 %/s	< 0.1 mg
Linearity / Scale error:	< 0.2 % / < 0.2 %	< 0.3 % / < 0.3 %
Noise (0-200 Hz):	< 0.1 % \sqrt{h} (6 %h \sqrt{Hz})	< 15 / 50 / 250 $\mu\text{g}\sqrt{Hz}$
Bandwidth:	0...200 Hz (option: 300 Hz)	0...200 / 200 / 100 Hz (depends on range)
g-sensitivity:	none	
Attitude / rel. Heading Range:	± 180 ° Roll, ± 90 ° Pitch, ± 180 ° relative Heading	
Attitude Accuracy:	< 0.3 / 1.0 / 2.5 ° roll/pitch in static or linear unaccelerated motion (unaided mode) or with velocity aiding (e.g. GPS / odometer option)	
Attitude short time stability:	< 0.1 ° (roll, pitch, assumes proper velocity aiding)	
Track / Heading Accuracy:	depends on aiding options (if any: GPS and/or 3D magnetometer -> 0.2...3 °)	
Position / Velocity:	depends on GPS: < 20 m (S/A off), < 0.5 m/s [if GPS available]	
Attitude / Heading Resolution:	< 0.01 °	
Output:	$\omega_x, \omega_y, \omega_z, a_x, a_y, a_z$ (rate and acceleration) Roll, Pitch, delta_Yaw (attitude, rel. heading; option: magnetometer aiding)	
Digital resolution:	> 18 bit (internal oversampling > 10 kHz for high resolution applications)	
Digital Interface (options):	CAN (up to 1 MBit/s; remote and continuous); Sync-Trigger-Input/Output ; RS232 (up to 115,200 Bd); RS422, HDLC	
Integrated Options:	Standard L1 GPS; odometer interface	
Analog Interface (option)	0...5 V or +/- 5V or +/- 10 V (range is factory set; compensated output)	
Output Data Rate, Connector:	up to 200 Hz via CAN (400 Hz as an option); MIL-C-38999 III	
Temperature:	-40...+71 °C operating, -56...+85 °C storage (case temperature)	
Power, Start-up-Time, Warm-up:	11...34 V DC; approx. 10 W ; < 1 sec ; approx. 3...30 sec	
Size:	approx. 152.4 x 127 x 130 mm	
Weight, Protection, EMI/EMC:	approx. 1'950 grams / IP68; MIL-STD-461E	
Shock, Vibration:	60 g / 11 ms; 10...2'000 Hz / 6 g random (MIL-STD-810F)	
	(*) = other on request (up to 300 %/s as standard, even > 1000 %/s and high-g-shock possible as special design)	

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

Typical Application of the IMUs and AHRS of type iVRU-Fx:

- Gun Stabilisation Tasks
- Attitude Heading Reference for Missile Attack Warning Systems
- AHRS for Unmanned Aerial Vehicles (UAV)
- Dynamic Motion Analysis of Airborne Vehicles, Power Boats etc.
- Motion Reference for Stabilised Platforms



References:

- EADS
- Rheinmetall

