

# iVRU-CB-M

## Small Size Vertical Reference Unit with Advanced MEMS Gyros, MEMS Accelerometers and integrated Strapdown Processor

iVRU-CB-M is a MEMS sensor based vertical reference and motion reference unit (IMS) used for applications which require stable accuracy and simple usage.

- three MEMS rate gyros and three MEMS accelerometers
- < 0.003 deg/s short time bias stability
- internal GPS receiver (SBAS capability) and odometer interface
- CAN / RS232 / RS422 interfaces
- AHRS, vehicle guidance and stabilization, UAV control; integrated 15+ state INS/GNSS EKF
- Navigation, Guidance & Attitude Control
- Installed on 250+ UAVs and 300+ autonomous land vehicles

The iVRU-CB-M is a triaxial gyro system with three orthogonal mounted rugged MEMS gyroscopes, three MEMS accelerometers and an integrated powerful micro-processor with >16 bit sensor data digitalisation included to provide digital data transmission (CAN, RS232, RS422) and extended internal error modelling.

As an option an external dual antenna GNSS receiver (iDAGOS) or/ and an external magnetometer (iMAG) can be provided. Also a wheel sensor can be connected to achieve higher perfor-



mance also in difficult ground environment. As an option an additional flange plate is available.

### Technical Data of iVRU-CB-M:

	Gyro Performance	Accel Performance
Sensor Range:	$\pm 300$ °/s	$\pm 4.5$ g
Bias:	< 0.01 °/s (stabil. at const. temp.) < 0.2 °/s (OTR -40...+71 °C) < 0.003 °/s (short time stability; AllanVar)	< 1 mg < 10 mg (typ. 0.1% of range) < 0.2 mg
Resolution:	< 0.002 °/s	< 0.2 mg
Linearity / Scale error:	< 0.2 % / < 0.2 % (1 sigma OTR)	< 0.2 % / < 0.3 %
g-sensitivity:	< 0.003 °/s/g	
Noise (0-100 Hz):	< 0.25 °/s (in band), < 0.75 °/√h (ARW)	< 1 mg/√Hz
Bandwidth:	0...70 Hz	0...50 Hz
Orthogonality:	< 1 mrad	< 1 mrad
Attitude / Heading Range:	$\pm 180$ ° Roll, $\pm 90$ ° Pitch, $\pm 180$ ° true or magn. or COG related or relative heading	
Attitude Accuracy:	< 0.3 ° rms (typical) roll/pitch (static condition or or unaccelerated motion) < 0.15 ° rms (typical) roll/pitch under motion with GPS aiding	
Heading:	< 0.5° rms (typical) true heading using GPS aiding under sufficient dynamics < 0.5 ° rms mag. heading using external 3D magnetometer iMAG-DMC (if connected)	
Attitude / Heading Resolution:	< 0.01 °	
Position/Velocity:	GPS based (WGS84), with up to 100 Hz data rate; advanced 15+ state Kalman filter	
Digital Output:	$\omega_x, \omega_y, \omega_z, a_x, a_y, a_z$ (rate and acceleration), position, velocity, Roll, Pitch, true heading or course over ground or magnetic heading, BIT	
Further integrated features:	Standard L1 GPS, odometer interface	
Digital Interface; start-up-time:	CAN (up to 1 MBit/s; remote and continuous), External Sync Input available, RS232 or RS422 (up to 115,200 Bd); < 1 sec	
Output Data Rate, Connector:	up to 100 Hz via CAN / RS232; MIL-C-38999 III 37 pin; SMA for GPS antenna	
Available Options:	<i>iDAGOS: Dual Antenna L1L2 GNSS receiver (connected via CAN bus); Version with up to 500 Hz and integrated L1L2 GNSS → iNAT-U200/RLD-CB-DA</i>	
Temperature:	-40...+71 °C (case temperature);option: +85°C; storage: -55...+85 °C	
Power, shielding:	11...34 V DC, approx. 6 W ; EMI/EMC shielded / protected	
Size:	L x H x W = 105 x 70 x 75 (metal case, IP65); optional additional flange plate with 125 x 75 x 3 mm mounting holes available	
Weight, Shock, Vibration:	approx. 550 grams; 90 g, 6 ms ; 20...2'000 Hz 5 g(rms) endurance	

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