

# iNAT-U200/RLD-CB-DA

## Small Size INS/GNSS & Vertical Reference Unit with Advanced Inertial Sensors, Dual-Antenna Support and integrated Strapdown Processor

iNAT-U200/RLD-CB-DA is a MEMS sensor based full INS/GNSS system, which also supports optional odometer aiding. It is also used as Vertical Reference Unit (VRU) as a form-fit-function replacement for the traditional iVRU-CB-M product, being in production for more than 15 years now. The iNAT-U200/RLD-CB is used for applications which require stable accuracy, advanced signal processing and simple usage.

- small size, highly robust, easy to use
- 2.5 °/h short time bias stability (AV)
- internal GNSS receiver (SBAS & RTK support); both, single-antenna as well as dual-antenna operation (for heading determination without motion) supported
- odometer interface for wheel sensor aiding
- CAN / RS232 / RS422 / Ethernet interfaces
- AHRS, vehicle guidance and stabilization, UAV control; integrated 42+ state INS/GNSS EKF
- Navigation, Guidance & Attitude Control
- Predecessor iVRU-CB-M is installed on 2'500+ UAVs, straddle carriers and other automated land vehicles

The iNAT-U200/RLD-CB-DA is a triaxial measurement, surveying and control system with three orthogonal mounted rugged MEMS gyroscopes, three MEMS accelerometers

and an integrated powerful micro-processor with an operational system certifiable for safety critical applications. It provides all common interfaces (Ethernet, CAN, RS232, RS422) and extended internal error modelling. The internal dual antenna GNSS receiver (-DA) is standard equipment, an external magnetometer (iMAG) can be provided if required. A wheel sensor interface is also provided within



the standard configuration. As an option an additional customized flange plate can be provided for easy integration.



### Technical Data of iNAT-U200/RLD-CB-DA (1 $\sigma$ ):

	Gyro Performance	Accel Performance
Sensor Range:	$\pm 500$ °/s	$\pm 8$ g
Bias:	5 °/h 0.2 °/s 2.5 °/h	(filtered / with GNSS data fusion) < 1 mg (OTR -40...+71 °C) < 2 mg (short time stability; AllanVar) < 0.1 mg
Resolution:	< 0.0001 °/s	< 20 $\mu$ g
Linearity / Scale error:	< 0.2 % / < 0.3 %	(1 sigma OTR) < 0.5 % / < 0.1 %
g-sensitivity:	< 0.01 °/s/g	
Noise (0-100 Hz):	< 0.15 °/ $\sqrt{h}$ (ARW)	< 30 $\mu$ g/ $\sqrt{Hz}$
Bandwidth:	0...100 Hz	0...100 Hz
Axes Orthogonality:	< 0.5 mrad	< 0.5 mrad
Attitude / Heading Range:	$\pm 180^\circ$ Roll, $\pm 90^\circ$ Pitch, $\pm 180^\circ$ true or magn. or COG related heading	
Attitude Accuracy:	0.1° (typical) roll/pitch (static condition or or with sufficient GNSS observability and motion) 0.05° (typical) roll/pitch under sufficient motion, with sufficient RTK GNSS aiding	
Heading Accuracy:	0.3° (typical) true heading using GNSS aiding under sufficient dynamics and satellite visibility 0.15° (typical) true heading using RTK aiding under sufficient dynamics and availability 0.1° rms at 2 m GNSS antenna baseline in dual-antenna mode [0.2 °/m]	
Attitude / Heading Resolution:	< 0.01°	
Velocity Accuracy:	0.02 m/s rms (typically) with sufficient GNSS / RTK aiding	
Digital Output:	angular rate and acceleration, position, velocity, roll / pitch / true heading / course over ground / magnetic heading, BIT / status	
Digital Interface; start-up-time:	CAN (up to 1 MBit/s; remote and continuous), External Sync Input available; Ethernet; RS232 or RS422 (up to 460,800 Bd); < 1 sec	
Output Data Rate, Connector:	integer divisor of 500 Hz; MIL-C-38999 III 37 pin; SMA for single (frontside) or dual (backside) antenna GNSS	
Temperature:	-40...+71 °C (case temperature); storage: -55...+85 °C	
Power, shielding:	10...34 V DC, approx. 5 W ; up to 60 V over-voltage protection ; EMI/EMC shielded / protected	
Size, IP, P/N:	L x H x W = (105 x 70 x 75) mm <sup>3</sup> ; metal case, IP67 ; P/N 00190-00504-0457 (iXCOM-version, -DA)	
Weight, Shock, Vibration:	approx. 550 grams; 90 g, 6 ms ; 20...2'000 Hz 5 g (rms) endurance	
Communication Interface:	standard iXCOM (iNAT) protocol or on request also protocol of iVRU-CB-M (factory set)	

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