

Inertial Measurement Unit (RLVBIMU04)



Racelogic's Inertial Measurement Unit (RLVBIMU04) provides highly accurate measurements of pitch, roll, and yaw rate using three rate gyros, as well as x, y, z acceleration via three accelerometers. The CAN based unit is temperature compensated and has improved calibration and stability.

The RLVBIMU04 is designed for use either as a stand-alone sensor with simple connection and configuration via the CAN bus interface, or for use with VBOX GPS data loggers.

When used in conjunction with VBOX 3i, data from the IMU can be seamlessly integrated with GPS to produce pitch and roll angle accurate to 0.06° (RMS) as well as smoother velocity data. This ensures GPS data even when satellite reception is interrupted.

The RLVBIMU04 is constructed with a splash-proof casing, which is rated to a limited ingress IP rating of IP67*, making it ideal for use on boats or in harsh environments, as well as automotive testing.

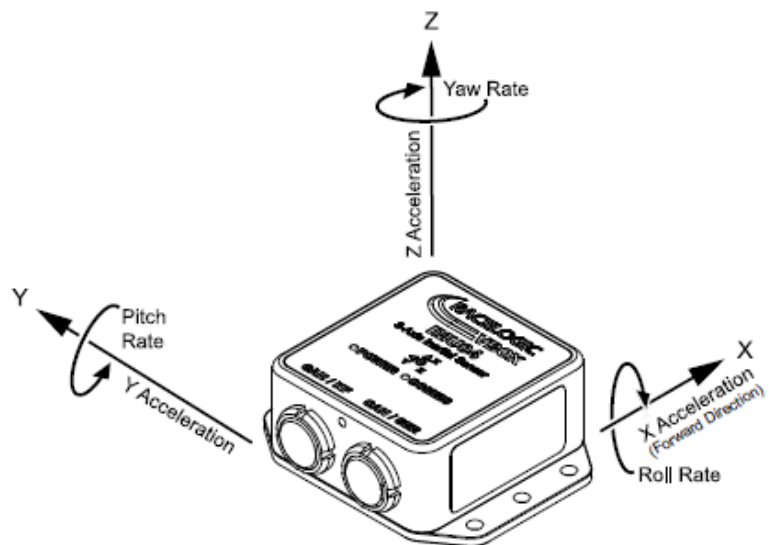
Using synchronous 16 bit sampling for each of the internal sensors provides a high degree of accuracy, with yaw rate resolution typically <0.01 degrees per second and acceleration resolution down to 0.15 mg.

*providing unused connectors are fitted with Lemo bungs (RLACS080)



Features

- Yaw rate range $\pm 450^\circ/\text{s}$
- Acceleration range $\pm 5\text{ g}$ in each axis
- Internal temperature compensation
- Yaw rate resolution $<0.001^\circ/\text{s}$
- Acceleration resolution 0.15 mg
- CAN Bus interface
- Integration with GNSS for consistent and accurate data in weak/degraded satellite signal conditions.
- Splash proof: IP65 rating / IP67 providing unused connectors are fitted with Lemo bungs (RLACS080)
- 0.06° (RMS) pitch/roll accuracy and 0.5° (RMS) yaw angle accuracy when used in conjunction with a VBOX 3i



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Specification

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Gyroscopes (Angular rate sensors)*	
Dynamic range	±450 °/s
Non-linearity	0.01% FS
Resolution	16 bit ADC (<0.01°/s)
Bandwidth	50 Hz
Noise density	0.015 °/s/√Hz
Bias stability	±0.0035 °/s
Bias repeatability (1 year)	0.5 °/s
Accelerometers*	
Range	±5g
Non-linearity	0.03 % FS
Resolution	16 bit ADC (0.15 mg)
Bandwidth	50 Hz
Noise density	150 µg/√Hz
Bias stability	40 µg
Bias repeatability (1 year)	0.005 g
Maximum Power Consumption	1.7 W
Typical Power Consumption	1.3 W
Voltage	7 – 30 V DC
Specified Performance Operating Range	-15 to 55°C
Operating Temperature	-20 to +70°C
Maximum Ratings (Shock)	Powered (0.5 ms): 2000 g

Outputs

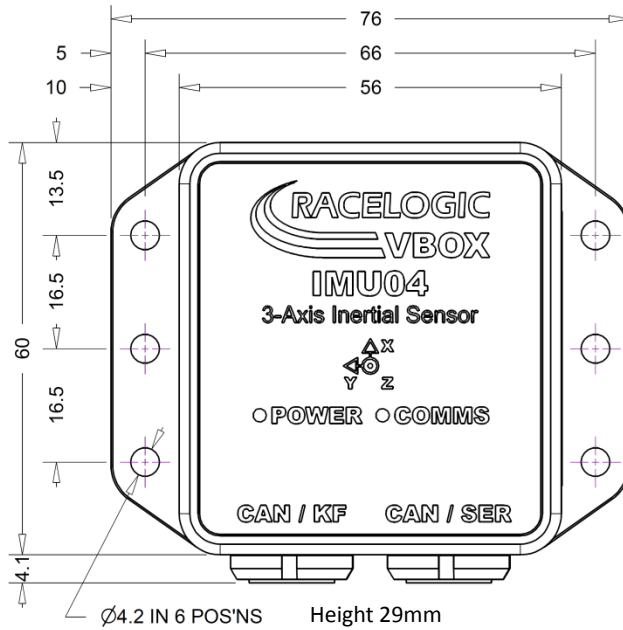
Outputs	
Number of Channels	7
Channel Names	Yaw Rate, Pitch Rate, Roll Rate, X Acceleration, Y Acceleration, Z Acceleration, Temperature

***Please note:** Inertial measurement sensors are highly sensitive mechanical systems. Their performance and life span can be impacted by severe vibration or heavy knocks, and we can only guarantee the gyroscope and accelerometer specifications for a maximum of 2 years from the date of purchase.

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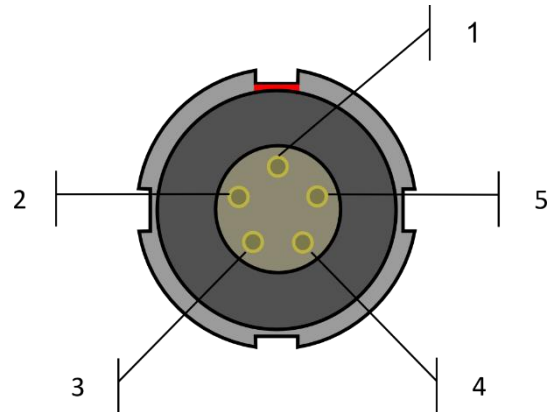


Dimensions



Lemo Socket Connections CAN / SER

Pin	I/O	Function
1	O	TxD, Serial Data Transmit – Configuration – RS232
2	I	RxD, Serial Data Receive – Configuration – RS232
3	I/O	CAN High
4	I/O	CAN Low
5		+ V Power 7 V to 30 V DC
Chassis		Ground



Lemo Socket Connections CAN / KF

Pin	I/O	Function
1	O	TxD, Serial Data Transmit – RS232
2	I	RxD, Serial Data Receive – RS232
3	I/O	CAN High
4	I/O	CAN Low
5		+ V Power 7 V to 30 V DC
6	I	1PPS
Chassis		Ground

