

# Inertial Measurement Unit (RLVBIMU04)



Racelogic's Inertial Measurement Unit (RLVBIMU04-V2) 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.

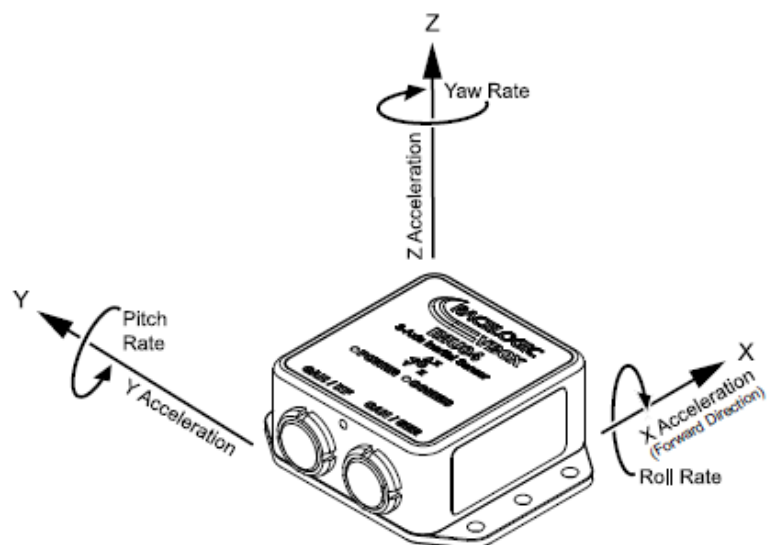
Using synchronous 16 bit sampling for each of the internal sensors provides a high degree of accuracy, with yaw rate resolution at 0.0137 degrees per second and acceleration resolution down to 1.5 mg.

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



## Features

- Yaw rate range  $\pm 450^\circ/\text{s}$
- Acceleration range  $\pm 5$  G in each axis
- Internal temperature compensation
- Yaw rate resolution 0.0137  $^\circ/\text{s}$
- Acceleration resolution 1.5 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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<b>Gyroscopes (Angular rate sensors)*</b>	
Dynamic range	±450 °/s
Nonlinearity	% of full scale: 0.01%
Resolution	16 bits ADC (0.0137 °/s)
Bandwidth	400 Hz
Noise density / Random walk	0.01 °/s/√Hz (0.6 °/√hr)
Bias stability	±0.0028 °/s (10 °/hr)
Bias repeatability (1 year)	0.2 °/s
<b>Accelerometers*</b>	
Range	±5 G
Nonlinearity	% of full scale: 0.1 %
Resolution	16 bits ADC (1.5 mg)
Bandwidth	350 Hz
Noise density / Random walk	60 µg/√Hz (0.0353 m/s/√Hr)
Bias stability	15 µg
Bias repeatability (1 year)	0.005 g
<b>Temperature Sensor</b>	
Temperature calibration range	-40°C to 105°C
Temperature resolution	0.1°C
<b>Current</b>	~150 mA
<b>Voltage</b>	8 – 30 V DC.
<b>Operating Temperature</b>	-40°C to +85°C
<b>Max Ratings (Shock)</b>	Powered (0.5ms): 2000g

## Outputs

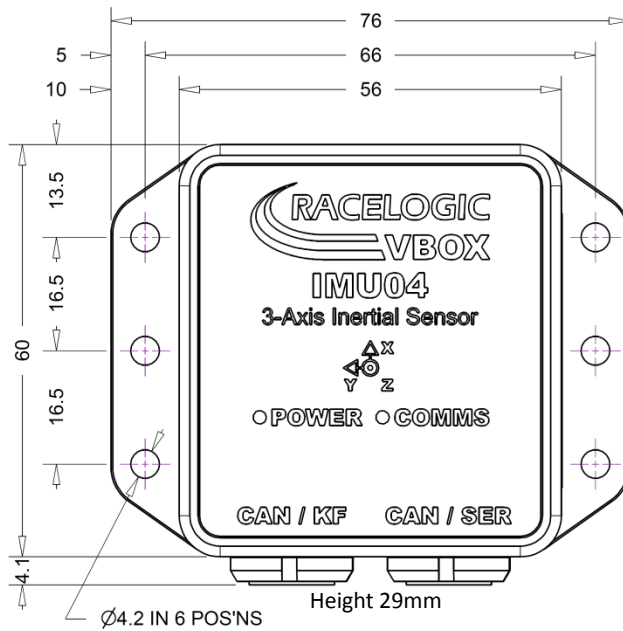
Outputs	
Number of Channels	7
Channel Names	Yaw Rate, Pitch Rate, Roll Rate, X Acceleration, Y Acceleration, Z Acceleration, Temperature

**\*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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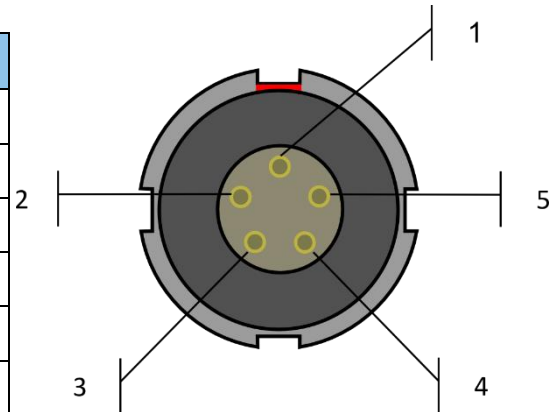


## Dimensions



## 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

