

# Speed Sensor Range (VBSS05 – VBSS100\_V3)



Based on a range of high accuracy GPS engines, VBOX Speed Sensors offer the ultimate non-contact measurement solution.

With 5Hz, 10Hz, 20Hz and 100Hz GPS update rate options available, the speed sensor range suits a variety of budgets and requirements. The 10Hz, 20Hz and 100Hz GPS units are also compatible with the DGPS BaseStation for increased positional accuracy.

VBOX Speed Sensors are perfect for automotive testing, motorsport, marine, telematics, and data logging applications. The IP66 rating means that each unit is water and dustproof, allowing them to be used in a variety of conditions.

Data output is via CAN Bus, offering easy integration with data loggers and testing applications.



Each speed sensor also features analogue and digital outputs. The analogue output can be assigned to vehicle speed, lateral acceleration, longitudinal acceleration, or lap beacon marker with user selectable scaling.

The digital output can be configured as either a digital speed pulse output or a lap beacon marker.

## Features

- High Performance GPS Receivers: 5Hz – 100Hz
- CAN Bus Output of position, velocity, distance, time, heading, height, vertical velocity, longitudinal and lateral acceleration, trigger to zero distance, trigger time, trigger speed, radius of turn
- RS232 Serial Output of NMEA\*, position velocity and time
- User configurable analogue + digital outputs
- Virtual Lap Beacon Output
- Compatible with DGPS BaseStation\*
- Rugged Deutsch ASDD Autosport connector
- High quality aluminium enclosure
- IP66 rated: water + dustproof
- Wide 6.5V – 30V operating range and low current consumption

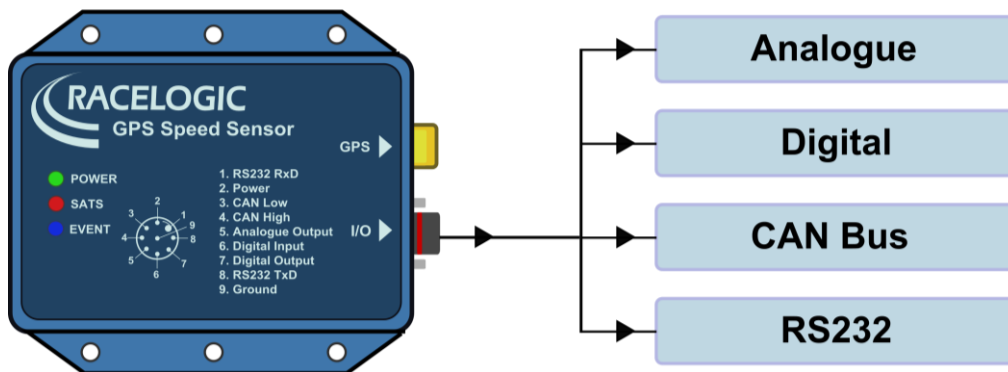
\*except 5Hz speed sensor version

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## Interfaces

Inputs	
Input Voltage range	7v – 30v DC
Power	3.7w Max (except 5Hz option: 2w Max)
GPS Antenna	3V Active Antenna (inc) / 5V for 100Hz version
Digital Input	Set Lap beacon Position / Brake Trigger Event
LED	Power, Satellite Count, Event Out



Outputs	
<b>CAN Bus</b>	
Output Data Rate	125Kbit, 250Kbit, 500Kbit & 1Mbit selectable baud rate. Software controlled CAN termination.
Data available	Position, velocity, vertical velocity, heading, lateral acceleration, longitudinal acceleration, satellite count, time, radius of turn, altitude, brake stop time, brake stop distance, brake trigger velocity, DGPS status.
<b>RS232</b>	
Output Data Rate	Dependant on unit type and mode
Data Available	NMEA and RL Serial, dependant on unit type
<b>Analogue</b>	
Output Data Rate	0 to 5v DC
Data Available	Either Speed, Lateral Acceleration, Longitudinal Acceleration, or Lap Beacon
<b>Digital Output</b>	
Output Data Rate	Low = 0v, High = 5v, Max. frequency 4.4Khz
Data Available	Speed or Lap Beacon

\* excluding 5Hz unit

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## Specifications

	5Hz	10Hz	20Hz	100Hz
<b>Velocity</b>				
Accuracy	0.1 Km/h*	0.1 Km/h*	0.1 Km/h*	0.1 Km/h*
Units	Km/h, Mph, Knots	Km/h, Mph, Knots	Km/h, Mph, Knots	Km/h, Mph, Knots
Update rate	5 Hz	10 Hz	20 Hz	100 Hz
Maximum velocity	1000 Mph	1000 Mph	1000 Mph	1000 Mph
Minimum velocity	0.1 Km/h	0.1 Km/h	0.1 Km/h	0.1 Km/h
Resolution	0.01 Km/h	0.01 Km/h	0.01 Km/h	0.01 Km/h
Latency	>160ms	41.5ms	41.5ms	8.5 ms ±1 or 15.5 ms*
<b>Distance</b>				
Accuracy	0.05% (<50cm per Km)	0.05% (<50cm per Km)	0.05% (<50cm per Km)	0.05% (<50cm per Km)
Units	Metres / Feet	Metres / Feet	Metres / Feet	Metres / Feet
Update rate	5 Hz	10Hz	20Hz	100Hz
Resolution	1cm	1cm	1cm	1cm
<b>Absolute Positioning</b>				
Accuracy	3m**	3m**	3m**	3m**
Accuracy with SBAS DGPS				
-Europe (EGNOS)	<1m**	<1m**	<1m**	<1m**
-USA (WAAS) / ASIA (MSAS)	<1.8m**	<1.8m**	<1.8m**	<1.8m**
Accuracy with BaseStation RTCM DGPS	N/A	40cm**	40cm**	80cm**
Accuracy with BaseStation DGPS + GPS upgrade (RLVBUP30)	N/A	20cm**	20cm**	N/A
Update rate	5 Hz	10 Hz	20 Hz	100 Hz
Resolution	1.8 cm	1.8 cm	1.8 cm	1.8 cm
Height accuracy	10 Metres**	6 Metres**	6 Metres**	6 Metres**
Height accuracy with DGPS	N/A	2 Metres**	2 Metres**	2 Metres**
<b>Time</b>				
Accuracy				
- Lap Timing (OLED):	0.01 s***	0.01 s***	0.01 s***	0.01 s***
- Accel / Brake Test (MFD):	0.2 s	0.05 s	0.05 s	0.01 s
Resolution	0.01 s	0.01 s	0.01 s	0.01 s
<b>Heading</b>				
Resolution	0.01°	0.01°	0.01°	0.01°
Accuracy	0.1°	0.1°	0.1°	0.1°

\*Averaged over 4 samples

\*\* 95% CEP. 95% of the time the position readings will fall within a circle of the stated radius.

\*\*\* Not using DGPS and crossing the start/finish line at 100km/h.

\*\*\*\* With fixed CAN latency.

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## Specifications continued

	5Hz	10Hz	20Hz	100Hz
<b>Acceleration</b>				
Accuracy	1.00%	0.50%	0.50%	0.50%
Maximum	4 G	20 G	20 G	20 G
Resolution	0.01 G	0.01 G	0.01 G	0.01 G
<b>Brake stop Accuracy (Trigger Activated)</b>				
Accuracy	N/A	±20cm*	±10cm*	±1.8 cm*
<b>Physical</b>				
Weight	190g	250g	250g	250g
Operating temp	-30°C to +70°C	-30°C to +70°C	-30°C to +70°C	-30°C to +70°C
Storage temp	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
Size	90x65x31.85mm	90x65x31.85mm	90x65x31.85mm	140x92x31.85mm
Connectors	Deutsch ASDD Autosport	Deutsch ASDD Autosport	Deutsch ASDD Autosport	Deutsch ASDD Autosport
IP rating	IP66	IP66	IP66	IP66

\* Based on <50m brake stop distance.

## Support

Hardware	One Year Support Contract
Software	Lifetime Support Contract: Valid for a minimum of 5 years from the date of purchase and limited to original purchaser. Contract includes telephone / email technical support provided by local VBOX distributor and firmware / software upgrades where applicable.

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## Package Contents

5, 10, 20Hz option	Product code
Speed Sensor unit	RLVBSSXX
GPS Antenna	RLVBACS018
VBOX Speed Sensor User manual	VBSSMAN
VBOX Speed Sensor Software CD	CDVBSS

100Hz option	Product code
Speed Sensor unit	RLVBSS100-V2
GPS L1 Antenna TW 2010	RLACS158
VBOX Speed Sensor User manual	VBSSMAN
VBOX Speed Sensor Software CD	CDVBSS

Supplied separately	
VBOX Speed Sensor Interface Cable (Analogue / Digital / CAN / Serial / Power)	RLCAB093
VBOX Speed Sensor Interface Cable + 5 way Lemo socket for CAN Communication	RLCAB093-C
VBOX Speed Sensor Interface Cable + 5 way Lemo socket for Serial Communication	RLCAB093-L