Speed Sensor Range
(VBSS05 – VBSS100_V4G)

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

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

The 100 Hz Speed Sensor and the Base Station track the Russian GLONASS range of navigation satellites as well as the normal GPS constellation, using almost twice as many measurements for accurate results and reception in areas of poor satellite visibility.

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 Receiver (5 Hz – 20 Hz), GPS/GLONASS receiver (100 Hz)
- 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
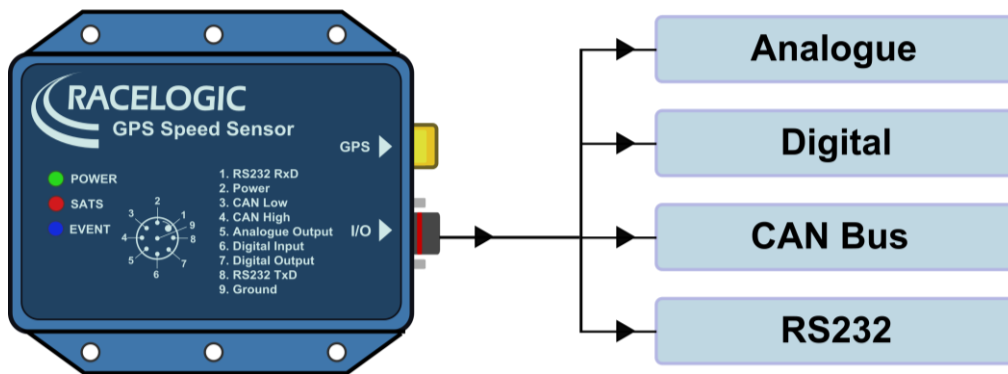- Wide 6.5 V – 30 V operating range and low current consumption

*except 5 Hz speed sensor version

Interfaces

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

Outputs	
CAN Bus	
Output Data Rate	12 5Kbit, 250 Kbit, 500 Kbit & 1 Mbit 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.
RS232	
Output Data Rate	Dependant on unit type and mode
Data Available	NMEA and RL Serial, dependant on unit type
Analogue	
Output Data Rate	0 to 5 V DC
Data Available	Either Speed, Lateral Acceleration, Longitudinal Acceleration, or Lap Beacon
Digital Output	
Output Data Rate	Low = 0 V, High = 5 V, Max. frequency 4.4 KHz
Data Available	Speed or Lap Beacon

* excluding 5 Hz unit

VBOX AUTOMOTIVE

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Specifications

	5 Hz	10 Hz	20 Hz	100 Hz
Velocity				
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	>160 ms	41.5 ms	41.5 ms	8.5 ms ±1 or 15.5 ms*
Distance				
Accuracy	0.05% (<50 cm per km)	0.05% (<50 cm per km)	0.05% (<50 cm per km)	0.05% (<50 cm per km)
Units	m / ft	m / ft	m / ft	m / ft
Update rate	5 Hz	10 Hz	20 Hz	100 Hz
Resolution	1 cm	1 cm	1 cm	1 cm
Absolute Positioning				
Accuracy	3 m**	3 m**	3 m**	3 m**
Accuracy with SBAS DGPS				
-Europe (EGNOS)	<1 m**	<1 m**	<1 m**	<1 m**
-USA (WAAS) / ASIA (MSAS)	<1.8 m**	<1.8 m**	<1.8 m**	<1.8 m**
Accuracy with BaseStation RTCM DGPS	N/A	40 cm**	40 cm**	80 cm**
Accuracy with BaseStation DGPS + GPS upgrade (RLVBUP30)	N/A	20 cm**	20 cm**	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 m**	6 m**	6 m**	6 m**
Height accuracy with DGPS	N/A	2 m**	2 m**	2 m**
Time				
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
Heading				
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 100 km/h.

**** With fixed CAN latency.

Specifications continued

	5 Hz	10 Hz	20 Hz	100 Hz
Acceleration				
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
Brake stop Accuracy (Trigger Activated)				
Accuracy	N/A	±20 cm*	±10 cm*	±1.8 cm*
Physical				
Weight	190 g	250 g	250 g	250 g
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	90x65x31.85 mm	90x65x31.85 mm	90x65x31.85 mm	140x92x31.85 mm
Connectors	Deutsch ASDD Autosport	Deutsch ASDD Autosport	Deutsch ASDD Autosport	Deutsch ASDD Autosport
IP rating	IP66	IP66	IP66	IP66

* Based on <50 m 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, 20 Hz option	Product code
Speed Sensor unit	RLVBSS*XX*
GPS Antenna	RLVBACS018
VBOX Speed Sensor User manual	VBSSMAN
VBOX Speed Sensor Software CD	CDVBSS

100 Hz option	Product code
Speed Sensor unit	RLVBSS100-V4G
GPS/GLONASSS Low Profile Antenna	RLACS156
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