

VBOX 20Hz Slip Angle Sensor (VBS20SL)



The **VBOX Slip Angle Sensor (VBS20SL)** is a multi-purpose non-contact speed sensor. Using an advanced dual antenna GPS engine, the VBS20SL can calculate not only speed and direction of travel of the vehicle but also an accurate slip angle.

The VBOX Slip Angle Sensor also features a built-in graphic display allowing the user to set up and configure the unit without using a laptop PC.



It can be used in conjunction with any VBOX GPS data logger, as well as most third-party data loggers.

The VBOX Slip Angle Sensor logs slip angle, yaw rate (RMS noise 0.75%), pitch or roll angle, true heading, lateral velocity, satellites in view, UTC time, latitude, longitude, velocity, heading, altitude, vertical velocity, distance, longitudinal acceleration, lateral acceleration, distance from trigger, trigger time, trigger velocity.

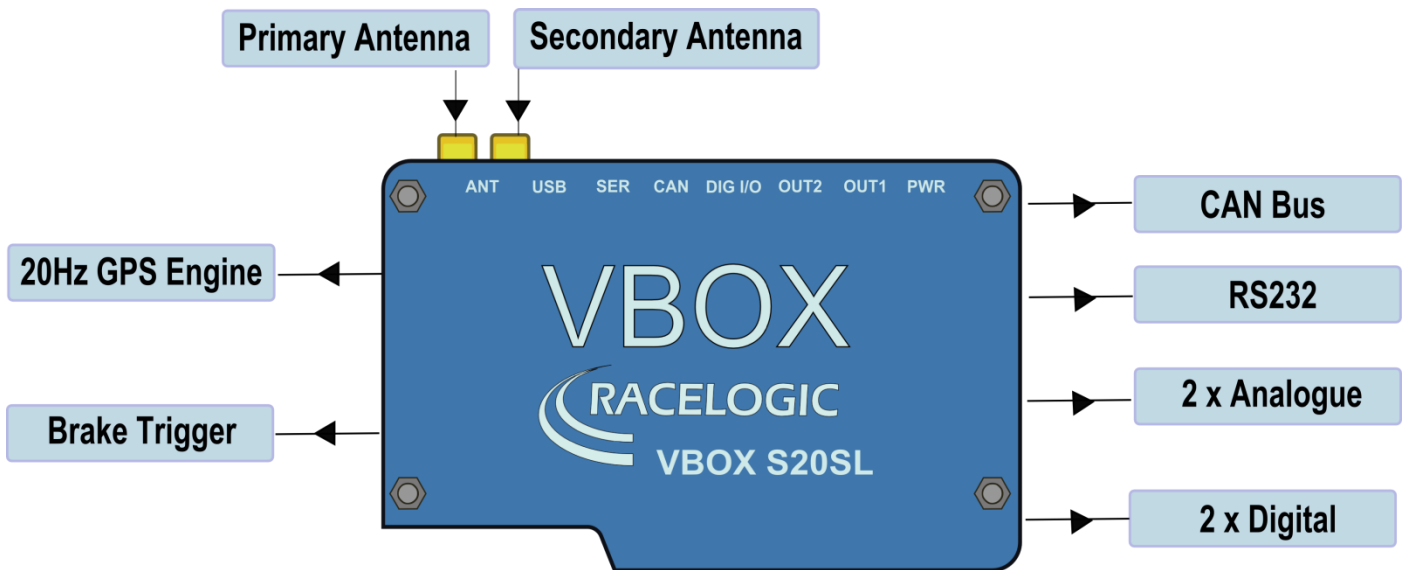
Features

- Non-contact 20Hz speed and distance measurement using GPS
- Slip angle, Yaw rate and True Heading measurement
- Pitch or Roll angle measurement
- 2 x 16 bit user configurable analogue outputs
- 2 x 24 bit digital outputs
- Brake / Event trigger input
- CAN bus interface for data output
- RS232 serial interface
- USB interface

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Inputs and Outputs



Inputs	Outputs
Brake/Event Trigger Polarity: User selectable Timer: 16bit Resolution: 12µs	CAN Bus Bit rate: User selectable baud rate Identifier type: 11bit or 29bit Data available: Slip Angle, Yaw Rate, Pitch or Roll Angle, True Heading, Lateral Velocity, Satellites in View, Time, Latitude, Longitude, Velocity, Heading, Altitude, Vertical velocity, Distance, Longitudinal Acceleration & Lateral Acceleration, Distance from Trigger, Trigger Time, Trigger Velocity.
	Digital Frequency range: DC to 44.4Khz Default setting: * 25Hz per Km/h (0 to 400Km/h) 90 pulses per metre Accuracy: 0.01Km/h @ 100Km/h Update rate: 20Hz
	Analogue Voltage range: -5V to +5Volts DC Default setting: * Velocity 0.0125Volts per Km/h (0 to 400Km/h) Accuracy: 0.1 Km/h @ 100Km/h Update rate: 20Hz

*The range settings can be adjusted by the user in software.

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Specifications

Velocity		Distance	
Accuracy	0.1 Km/h (averaged over 4 samples)	Accuracy	0.05 % (<50cm per Km)
Units	Km/h or Mph	Units	Metres / Feet
Update rate	20 Hz	Update rate	20 Hz
Maximum velocity	1000 Mph	Resolution	1 cm
Minimum velocity	0.1 Km/h		
Resolution	0.01 Km/h		
Absolute Positioning		Time	
Accuracy	3m 95% CEP**	Accel/Brake Test (MFD)	
Accuracy with DGPS	1.8m 95% CEP**	Resolution	0.01 s
Update rate	20 Hz	Accuracy	0.05 s
Resolution	1cm	Lap Timing (OLED)	
Height accuracy	6 Metres 95% CEP**	Resolution	0.01 s
Height accuracy with DGPS	2 metres 95% CEP**	Accuracy	0.01 s*
Acceleration		Environmental and physical	
Accuracy	0.50%	Weight	Approx. 600 grams
Maximum	20 G	Size	170 x 121 x 41mm
Resolution	0.01 G	Operating temperature	-10°C to +60°C
Update rate	20 Hz	Storage temperature	-30°C to +80°C
Heading		Yaw Rate	
Resolution	0.01°	Yaw rate RMS Noise	0.75 degrees per scnd***
Accuracy	0.1°		
Power		Slip Angle	
Input Voltage Range	6v – 30V DC	Accuracy	<0.5° rms at 0.5m antenna separation
Power	Max. 4.5 Watts		<0.25° rms at 1m antenna separation
			<0.1° rms at 2m antenna separation

Definitions

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

** CEP = Circle of Error Probable. 95% CEP means 95% of the time the position readings will fall within a circle of the stated radius. 2cm accuracy requires an RTK option and RTK enabled Base Station

***Note that for comparison, the YAW rate sensor or IMU has an RMS noise of 0.05 degrees per second, so it should be noted that the Slip Angle sensor calculated YAW rate is significantly noisier than a solid state sensor for YAW rate measurement

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Hardware & Software Support

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 the original purchaser. Contract includes: telephone/ email technical support provided by local VBOX Distributor and firmware/ software upgrades (where applicable).

Package Contents

Description	Product Code
1 X 20Hz Slip Angle Sensor	VBS20SL
2 X GPS ground plane antenna for VBOX	RLACS103
1 X USB lead A – B 2M	RLCAB042
1 X 5 way Lemo – CAN only	RLCAB005 – C
1 X 2 way Lemo to 2 wire unterminated	RLCAB014L
1 X 5 way Lemo to 9 way D connector	RLCAB019L
2 X 3 way Lemo to single BNC pin 1	RLCAB008
1 X CD ROM containing VBOX software	RLVBACS030
1 X VBOX speed sensor with slip manual	VBS20SLMAN
1 X VBOX padded carry case	RLVBACS013