## Overview

The VBOX is a powerful instrument used for measuring the speed, position and angle of a moving vehicle. It is based on a new generation of high performance satellite receivers, and will measure acceleration figures, braking distances, lap times, cornering forces, slip angle and much more.

Due to the small size and simple installation procedure with built-in configuration screen, the VBOX is ideally suited for use in cars, bikes, off road vehicles and boats.

Features

- Non-contact speed and distance measurement using GPS
- Slip Angle, Yaw Rate, True heading, Lateral Velocity and either one of Pitch or Roll Angle
- CAN Bus interface for connection to VBOX input modules
- USB Interface
- RS-232 serial interface
- SD Card support
- 2 x Analogue speed, slip and pitch/roll outputs
- 2 x Digital speed, slip and pitch/roll outputs
- Digital input/output
- OLED Screen display
- Front panel configuration
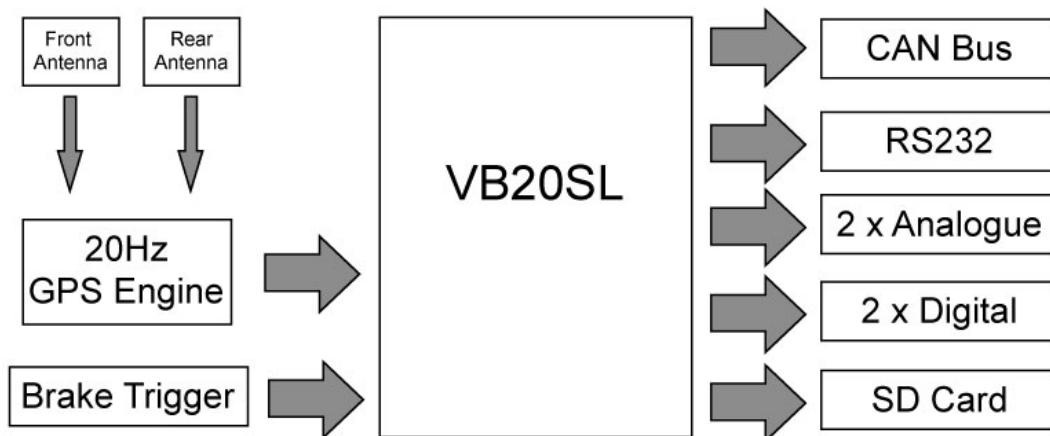
VBOX 20Hz Datalogger with Slip Angle

Specification

Velocity

Accuracy	0.1 Km/h (averaged over 4 samples)
Units	Km/h or Mph
Update rate	20 Hz
Maximum velocity	1000 Mph
Minimum velocity	0.1 Km/h
Resolution	0.01 Km/h
Latency	30.5ms (31.5ms when using twin antennas)

Distance

Accuracy	0.05% (<50cm per Km)
Units	Metres / Feet
Update rate	20Hz
Resolution	1cm
Height accuracy	6 Metres 95% CEP**
Height accuracy with DGPS	2 Metres 95% CEP**

Absolute Positioning

Accuracy	3m 95% CEP**
Accuracy with DGPS	1.8m 95% CEP**
Accuracy with DGPS Base station	40cm 95% CEP**
Accuracy with local differential paid upgrade	20cm 95% CEP**
Update rate	20 Hz
Resolution	1 cm

Slip & Pitch/Roll Angle

Accuracy	0.5° (0.5m ant separation)
	0.25° (1m ant separation)
	0.1° (2m ant separation)

YAW Rate

YAW Rate RMS noise	0.75 degrees/second***

*** Note that for comparison, the VBOX YAW02 or IMU rate sensor 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.

Heading

Resolution	0.01°
Accuracy	0.1°

Time

Resolution	0.01 s
Accuracy	0.01 s

Lap Time

Resolution	0.05 s
Accuracy	0.05 s

Acceleration

Accuracy	0.5%
Maximum	20 G
Resolution	0.01 G
Update rate	20Hz

Memory

External memory support	SD Card 1
Recording time	Dependant on SD capacity. Approx 12.8 megabytes per hour used while logging all GPS and slip module channels.

Outputs

CAN Bus

Bit rate	125 Kbit/s 250Kbit/s ,500Kbit/s & 1Mbit/s selectable baud rate
Identifier type	Standard 11bit 2.0A
Data available	Satellites in view, Latitude, Longitude, Velocity, Heading, Altitude, Vertical velocity, Distance, Longitudinal acceleration & Lateral acceleration, Distance from Trigger, trigger Time, Trigger Velocity, True Heading, Slip Angle, Yaw Rate, Pitch/Roll Angle, Lateral Velocity

Analogue

Voltage range	0 to 5V DC (Velocity) / -5 to 5V DC (Slip and Pitch/Roll)
Default setting *	0.0125V per Km/h (0 to 400Km/h)
Accuracy	0.1 Km/h

Digital

Frequency range	DC to 44.4Khz
Default setting *	25Hz per Km/h (0 to 400Km/h)
Accuracy	0.01Km/h @ 100Km/h

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

Power

Input Voltage range	6-30v DC
Current	Typically 560mA

Environmental and physical

Weight	Approx 500 grammes
Size	154mm x 112mm (decreasing to 99mm) x 30mm
Operating temperature	-30°C to +60°C
Storage temperature	-40°C to +85°C

Definitions

** CEP = Circle of Error Probable	95% CEP (Circle Error Probable) means 95% of the time the position readings will fall within a circle of the stated diameter