# Speed Sensor Dual Antenna
## (VBSS100SL)

The Speed Sensor Dual Antenna (VBSS100SL) is a 100Hz GPS/GLONASS system, which combines high level accuracy and test repeatability with the ability to measure slip and pitch/roll angles at 100Hz.

Data is present on multiple outputs such as CAN, RS232, Analogue and Digital lines.

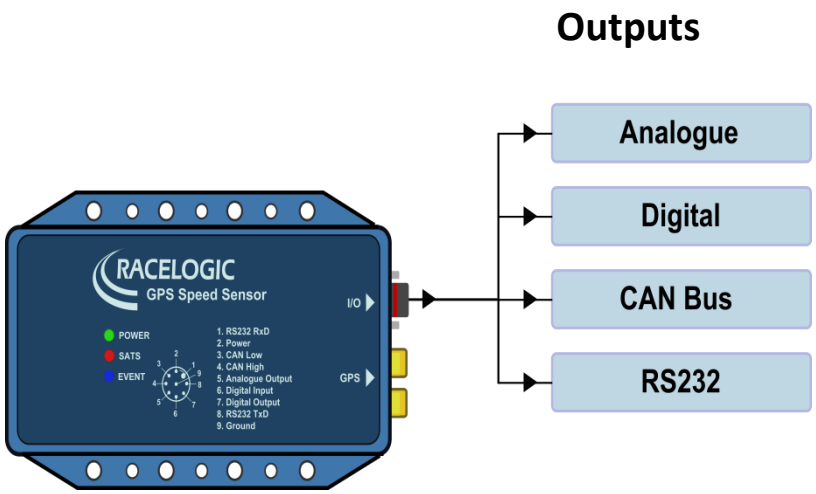
The VBSS100SL can be used for non-contact sensing of velocity providing signal output data on CAN, analogue and digital, allowing easy integration with data loggers and testing applications. The analogue output can be assigned to vehicle speed, lateral acceleration, longitudinal acceleration, or lap beacon marker with user selectable scaling. The digital output can be configured as either a digital speed pulse output or a lap beacon marker.


With only 13cm in length , the 100Hz speed sensor is easy to mount and transport, making it ideal for automotive testing, motorsport, marine, and telematics.

The VBSS100SL comes with a VBOX Manager, which enables the user to setup the dual antenna separation, change the dynamic modes, level and align the antennas.

## Features

- High Performance GPS and GLONASS receiver:  100Hz
- CAN Bus Output includes:  Speed, Heading, True Heading, Slip Angle, Pitch or Roll Angle, Slip Translations, Brake Stop Distance, Radius of Turn, Gyro Yaw Rate.
- 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
- Low current consumption



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## GPS 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 | 100 Hz | Update rate | 100Hz |
| Maximum velocity | 1000 Mph | Resolution | 1cm |
| Minimum velocity | 0.1 Km/h | Height accuracy | 6 Metres 95% CEP[1] |
| Resolution | 0.01 Km/h | Height accuracy with DGPS | 2 Metres 95% CEP[1] |
| Latency | 8.5 ms ±1 or 15.5 ms* | | |
| | | | |
| **Absolute Positioning** | | **Time** | |
| Accuracy | 3m 95% CEP[2] | Resolution | 0.01 s |
| Accuracy with SBAS DGPS | <1.8m 95% CEP[1] | Accuracy | 0.01 s |
| Accuracy with BaseStation RTCM DGPS | 40cm 95% CEP[1] | | |
| Update rate | 100 Hz | | |
| Resolution | 1.8 cm | | |
| | | | |
| **Heading** | | **Acceleration** | |
| Resolution | 0.01° | Accuracy | 0.50% |
| Accuracy | 0.1° | Maximum | 20 G |
| | | Resolution | 0.01 G |
| | | Update rate | 100 |

* With fixed CAN latency

| Brake Stop Accuracy (Trigger Activated) | | | |
|---|---|---|---|
| Accuracy | ±1.8 cm[2] | | |
| **Slip Angle Accuracies** | | **Pitch/Roll Angle accuracies** | |
| <0.2° rms at 0.5m antenna separation<br><0.1° rms at 1.0m antenna separation<br><0.05° rms at 2m antenna separation<br><0.04° rms at 2.5m antenna separation | | <0.14° rms at 0.5m antenna separation<br><0.07° rms at 1.0m antenna separation<br><0.035° rms at 2m antenna separation<br><0.028° rms at 2.5m antenna separation | |

**Definitions**

[1] Circle of Error Probable: 95% of the time the position readings will fall within a circle of the stated radius.
[2] Based on <50m brake stop distance.

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## Outputs

| CAN Bus | |
|---|---|
| Output Data Rate | 125Kbit, 250Kbit, 500Kbit & 1Mbit selectable baud rate. Software controlled CAN termination. |
| Data available | Position, vehicle speed, heading, lateral acceleration, longitudinal acceleration, satellite count, time, radius of turn, altitude, Distance from Trigger, Trigger Time, Trigger Velocity, True Heading. Slip angle, Yaw rate, Pitch/Roll angle, Longitudinal and Lateral Velocity |
| **RS232** | |
| Output Data Rate | Up to 100Hz |
| Data Available | NMEA or RL Serial |
| **Analogue Output** | |
| Output Data Rate | 0 to 5v DC |
| Data Available | Either Speed, Lateral Acceleration, Longitudinal Acceleration, or Lap Beacon |
| **Digital Output** | |
| Output Data Rate | Low = 0v, High = 5v, Max. frequency 4.4Khz |
| Data Available | Speed or Lap Beacon |

## Inputs

| Power | |
|---|---|
| Input Voltage range | 1st Gen = 6.5v – 30v DC / 2nd Gen = 7v – 30v DC |
| Power | 3.7w Max |
| GPS Antenna | 5V Active Antenna (inc) |
| Digital Input | Cold Start Activate / Set Lap beacon Position |
| LED | Power, Satellite Count, Event Out |

## Environmental and physical

| Environmental and physical | | | |
|---|---|---|---|
| Weight | Approx 250g | Operating temperature | -30˚C to +70˚C |
| Size | 140mm x 92mm x 31.85mm | Storage temperature | -40°C to +85°C |
| | | Connectors | Deutsch ASDD Autosport Rated IP66 |

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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 |
|---|---|
| 1x Speed Sensor Unit | VBSS100SL |
| 2x GPS L1 +GLONASS L1 Antenna | RLACS156 |
| 1x VBOX Manager | VBFMAN |
| 1x VBOX Manager Manual | VBFMANMAN |
| 1x 5way Lemo to 5way Lemo cable – CAN only (2m) | RLCAB005-C |
| 1x VBOX Speed Sensor User Manual | VBSSMAN |
| 1x VBOX Speed Sensor Software CD | CDVBSS |
| 1x VBOX Tape Measure | RLACS091 |
| 1x Carry Case | RLACS106 |
| ***Supplied separately*** | |
| VBOX Speed Sensor Interface Cable with 5 way Lemo socket for CAN Communication | RLCAB093-C |

## Required equipment for Slip and Pitch measurements

- VBSS100SL
- Connecting Loom (RLCAB093-C)
- VBOX File Manager + Lemo to Lemo cable (RLCAB005-C)
- 2 x GPS & GLONASS antenna (RLACS156)
- Tape measure