

SPEEDBOX MINI - High Accuracy, Non-contact Speed Sensor



The **SPEEDBOX MINI** is a very high accuracy non-contact speed sensor which has been designed for professional automotive testing as well as other industrial and high-end motorsport applications. It outputs a low latency, non-interpolated speed measurement comprised of GPS and inertial data combined using an adaptive filter for exceptional performance even in environments where accuracy of GPS-only sensors is severely degraded.

- Highly accurate: 0.02m/s speed accuracy.
- 20Hz **PurePhase** GPS developed by Race Technology specifically for automotive testing.
- 3 axis accelerometer.
- Accelerometers combined with GPS create maximum accuracy even during short GPS signal drop-outs.
- Self-optimising Kalman filter used to maintain GPS and accelerometer data.
- Outperforms even top of the range survey grade receivers in speed measurement.
- Digital pulse output for speed & distance measurement.
- Trigger input for data synchronisation with external events.
- Serial and USB ports for data output, in uBlox, Race Technology format, ASCII messages in NMEA format.
- Fully configurable CAN output.
- Live Monitor software for live script based testing

The high accuracy 20Hz **PurePhase** GPS solution is optimised for speed measurement, outperforming even top of the range 'survey-grade' GPS receivers in this respect. This unique GPS technology outperforms "GPS-only sensors", offering lower noise, lower latency and superior bandwidth, and is far more resistant to drop-outs. It offers an ideal replacement/upgrade for 5th wheel, optical and GPS-only sensors.

GPS positional accuracy can be improved to within the range of 2-3cm by combining the SPEEDBOX MINI with the GPS2 product.

The **SPEEDBOX MINI** cases are designed to stack securely with other system components, allowing full systems to be integrated and installed as complete connected systems. This makes the transition from setting up on the bench to testing in the vehicle quick and easy.



Race Technology
www.race-technology.com

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Is suitable for most straight line testing: pedal triggered brake tests, measuring deviation from a line under braking, acceleration timings, general high accuracy accel/speed measurement for tyre testing etc and also for some special applications like gradient measurement.

	SPEEDBOX MINI	Options		
		+RTK	+INS Dual Antenna	+INS Single Antenna
Accelerations	200Hz, 0.1m/s	200Hz, 0.1m/s ²	200Hz, 0.01m/s ²	200Hz, 0.01m/s ²
Speed	200Hz, 0.02m/s	200Hz, 0.02m/s	200Hz, 0.015m/s	200Hz, 0.015m/s
Distance	200Hz, 3cm in 40m	200Hz, 3cm in 40m	200Hz, 3cm in 40m	200Hz, 3cm in 40m
Position	20Hz, 3m (note 1)	20Hz, 3m (note 1)	200Hz, 2m (note 1)	200Hz, 2m (note 1)
Roll / Pitch / Yaw rate			200Hz, 0.01deg/s	200Hz, 0.01deg/s
Yaw		20Hz, 0.2deg	200Hz, 0.08deg	200Hz, 0.08deg
Roll / Pitch		20Hz (note 2), 0.6deg	200Hz, 0.04deg	200Hz, 0.04deg
Price Comparison	\$\$	\$\$\$\$	\$\$\$\$\$\$	\$\$\$\$\$\$

The SPEEDBOX MINI is also available with the following options:

+RTK

This adds slip angle measurement to the standard SPEEDBOX. Roll and pitch measurements are also possible but with limited accuracy

+INS Single Antenna

Very high accuracy, full vehicle attitude measurement for all types of brake testing and dynamic chassis development. Also much greater robustness to poor GPS data conditions and test accuracy estimates.

+INS Dual Antenna

This adds the ability to initialise when stationary to the SPEEDBOX, ideal for applications where the size and weight penalty of the dual antenna is not a concern but the vehicle can not easily be moved to get the system initialised, such as on mining trucks or other large vehicles.

The figures given in the table are for 50% CEP accuracy, with a good GPS signal.

Note 1: Positional accuracy can be improved to 2-3cm using the GPS2 RTK product in combination with SPEEDBOX systems.

Note 2: for the RTK option only either Pitch or Roll is available at one time, not both. For the INS option, all outputs are available simultaneously.

Note that 20Hz measurements need a GPS fix to be valid, all 200Hz measurements are from the inertial sensors and robust to GPS outages making them far more suited to highway testing.

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