

ADAS Testing Systems



Advanced Driver Assistance Systems (ADAS) such as Forward Collision Warning and Lane Departure Warning are now common features in a car. However, in order to introduce new systems to their vehicles, manufacturers must conform to NHTSA and ISO regulations.

This has led to the need for a reliable, accurate and flexible way of testing and verifying all ADAS systems.

VBOX GPS Data Loggers allow ADAS developers to easily test and verify the effectiveness of their technology, with real-time vehicle parameter measurements of less than 2cm positional accuracy.

Achieving <2cm accuracy

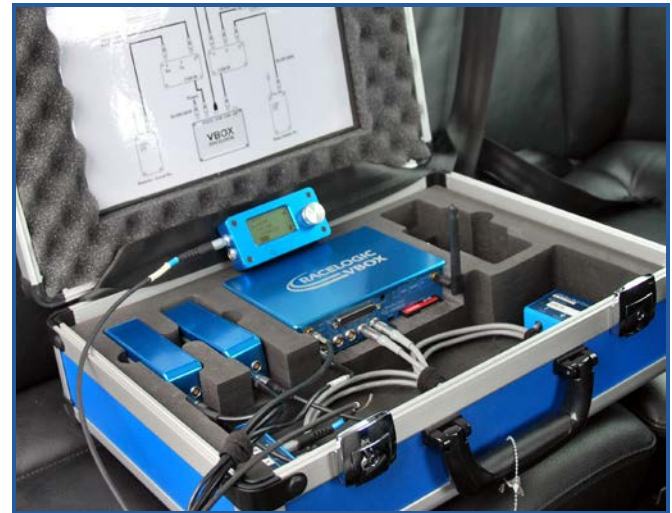
At the core of ADAS system testing is the industry standard **VBOX3i R10G10** Data Logger. In addition to GPS, the system receives Russian GLONASS satellites, offering improved speed and robustness of the satellite lock for greater reliability.

Corrections from a locally placed RTK differential **BaseStation** bring the accuracy to <2cm.

Using the **VBOX3i R10G10** data logger, GPS and CAN data can be viewed real-time or recorded for later analysis. Using a **Video VBOX**, data and video can be logged synchronously and any CAN channels can be overlaid onto the video stream in real time.

Features

- ✓ <2cm positional accuracy
- ✓ 0.1 km/h velocity accuracy
- ✓ Real-Time measurement
- ✓ CAN integration (output + input)
- ✓ Synchronized video
- ✓ 500m range vehicle to vehicle
- ✓ GPS + GLONASS for improved satellite lock
- ✓ Easy to transport and fit
- ✓ Rugged and reliable
- ✓ Low latency
- ✓ True data measurements (no prediction)
- ✓ Satisfies ADAS testing requirements
- ✓ Ideal for a range of testing applications
- ✓ Compatible with driverless robot systems



Applications

VBOX can be used to test and verify the following ADAS systems:

- Adaptive Cruise Control
- Vehicle/Pedestrian Collision Mitigation
- Lane Departure
- Blind Spot Detection or
- Automatic Main Beam Control
- Rear Cross Pass Detection

What parameters can VBOX measure?

Vehicle Separation Channels	Accuracy
Distance between vehicles (m)	0.02m
Angle to remote vehicle (°)	0.1° RMS
Time to collision (s)	0.05 s
Separation time	0.05 s
Lateral relative speed (km/h)	0.2km/h RMS
Longitudinal relative speed (km/h)	0.2km/h RMS
Relative speed (km/h)	0.2km/h RMS
Longitudinal range – local (m)	0.02m RMS
Longitudinal range – remote (m)	0.02m RMS
Lateral range – local (m)	0.02m RMS
Lateral range – remote (m)	0.02m RMS

Lane Departure Channels	Accuracy
Perpendicular distance from vehicle front left to lane edge (m)	0.02m
Perpendicular distance from vehicle front right to lane edge (m)	0.02m
Longitudinal speed (km/h)	0.2km/h RMS
Lateral speed (km/h)	0.2km/h RMS

For a list of all standard GPS data channels and accuracies that are also measured please refer to the [VBOX3i R10G10 data sheet](#).

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Approved by TRC for NHTSA Lane Departure Warning System and Forward Collision Warning System tests.

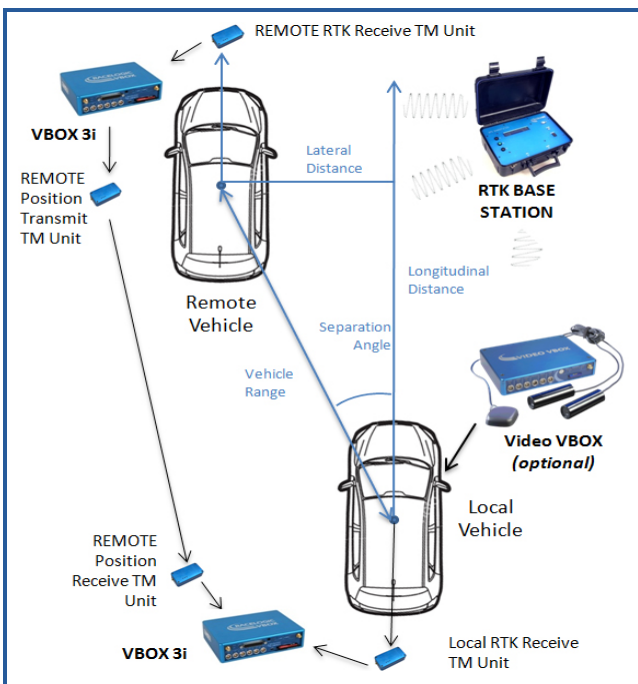
Vehicle Separation Testing Package

The VBOX vehicle separation testing system offers the facility to log data between two different vehicles, which makes it ideal for accurately testing systems such as Active Cruise Control.



Racelogic's vehicle separation test system is supplied as a complete system using two VBOX units with base station for 2cm accuracy, plus telemetry.

As you can see below, two **VBOX3i R10G10** testing units are placed in separate vehicles and linked using Radio Telemetry Modules, with RTK corrections received from a **BaseStation**.

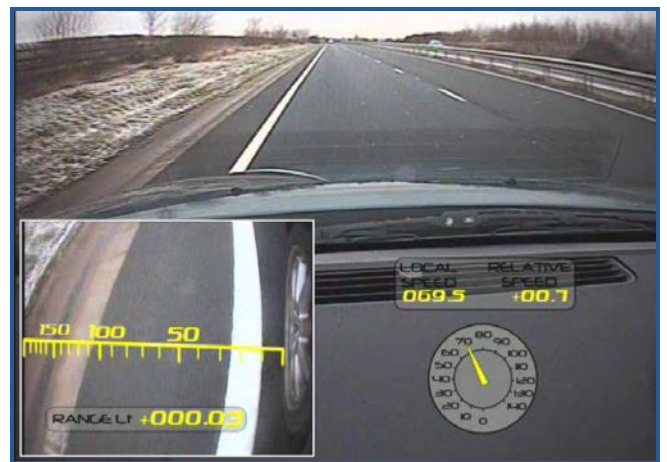


Lane Departure Warning Testing Package

Accurate testing of any Lane Departure Warning System (LDWS) is possible with the standard parameters measured by the VBOX Lane Departure Warning testing solution.

Measured data is overlaid onto the video stream in real time using a **Video VBOX** (screenshot below) and up to 4 cameras can be used.

Overlaying a calibrated ruler onto the video gives a useful visual correlation to the data being captured and requires no post processing to achieve.



Full ADAS Testing Package

The full ADAS package allows you to test a wide range of ADAS applications including Adaptive Cruise Control, Brake Assistance, Collision Mitigation, Static points (e.g. balloon cars) + Dynamic points and high accuracy vehicle to vehicle measurements.



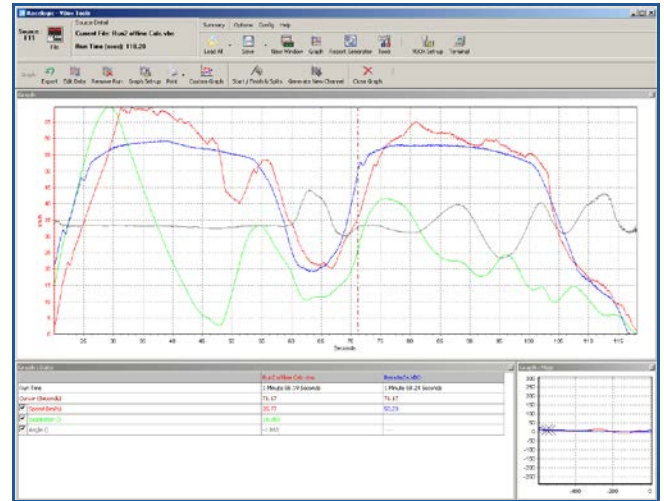
Above: Using the **Full ADAS Package** you can integrate video into your separation test.

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Software

VBOX Tools Analysis Software is a flexible and powerful package which allows for detailed post processing of the logged files in order to test the accuracy of your ADAS system. A laptop running VBOX Tools can be used to monitor the measured parameters in real time, either by a serial, USB, or Bluetooth connection. For Video VBOX files, video can be viewed synchronized with the data within the software.



Equipment Overview

These packages are suggested as guidelines – custom solutions can be put together to suit particular applications.

Units	Vehicle Separation Package (Dual Vehicle Tests)	Lane Departure Warning Package (Single Vehicle Tests with video)	Full ADAS Package (Single + dual vehicle tests with video)
VBOX 3i 100Hz WITH 100Hz Glonass and RTK systems (datasheet)	x2	x1	x2
DGPS Base Station RTK 1Hz with GLONASS (datasheet)	✓	✓	✓
Telemetry Link System (10 Channel, 5Hz) (datasheet) and radio telemetry module	✓	-	✓
VBOX Manager (datasheet)	✓	✓	✓
Video VBOX: 4 cameras + CAN logging (datasheet)	-	✓	✓
Video VBOX Preview Monitor	-	✓	✓
Adjustable camera mounting arms	-	✓	✓
Inertial Measurement Unit (see datasheet)	-	✓	✓
All cabling / connectors / mounts	✓	✓	✓
VBOX Tools Analysis Software	✓	✓	✓
Transport Case	✓	✓	✓