01 - Base Station Introduction

The Racelogic DGNSS RTK Base Station is designed to improve positional accuracy of VBOX’s and other compatible GNSS systems by calculating and transmitting differential correction data. By setting up the Base Station in a known position, it is able to accurately monitor the difference between its known position and the position that it is calculating from GNSS satellite signals.

The difference is then transmitted via radio to allow a remote GNSS system to correct its position. The differential correction message can be broadcasted in RTCM v2, RTCM v3, RTCM v3.2 MSM4 and MSM7, or proprietary RTK formats using an internal or mast mounted radio modem transmitter. Depending on the type of base station and roving unit used, position accuracies of up to 2 cm (95 % CEP) are available.

The 95 % CEP value refers to the Circular Error Probable. For example, in the case of the RTK enabled base station in conjunction with an RTK enabled VBOX III or VBOX 3i, the GPS position calculated will be within a 2 cm radius of the true position 95 % of the time.

Features

- Survey grade GPS/GLONASS receiver with L1/ L2 (RLVBBS5) or GNSS multi-band receiver with GPS L1/L2/L1C/L2C, GLONASS L1/L2, Galileo E1/E5a/ E5b and BeiDou B1/B2 (RLVBBS6).
- Accuracy:
  - RLVBBS5: Up to 2 cm.
  - RLVBBS6: Horizontal up to 5 mm + 0.5 ppm x Baseline; Vertical up to 10 mm + 0.8 ppm x Baseline.
- Outputs:
  - RLVBBS5: RTCM, CMR, RTCM v3 or proprietary
  - RLVBBS6: RTCM v2, RTCM v3, RTCM v3.2 MSM4 and MSM7 or proprietary
- 25-position memory to store and recall different reference locations
- Optional integral or mast mount radio transmitters with range of up to 10 km (approx 6.2 miles) line of sight and 2 km in a built up area
- Self-survey mode
- Up to 18 hours battery life (depending on radios in use) or external power
- Rugged IP 64 (splash proof) enclosure
- Compatible with wide range of radios to suit location and range requirements

The image below shows the results of static positional data from VBOX systems with and without local DGPS

https://racelogic.support/01VBOX_Automotive/05Telemetry_Systems/Base_Station/
corrections.

- The red plot shows position scatter from a **non-corrected** VBOX.
- The blue plot shows position scatter from an **SBAS corrected** VBOX.
- The green plot shows position scatter from an **RTCM (40 cm) corrected** VBOX.
- The purple plot shows position scatter from a **20 cm corrected** VBOX 2 series product.
- The yellow plot shows position scatter from an **RTK (2 cm) corrected** VBOX 3 series product.