Where should I place my GPS Antenna?

Single Antenna Systems

Placement of the GPS antenna is crucial to the quality of the data recorded. Any metal close to a GPS antenna can disturb the signal in an unpredictable way due to interference from reflections of weak GPS signals.

For the best results, use the antenna in the centre of a metal roof away from any roof bars or radio antennas. Do not mount the antenna close to the edge of the roof as reflections from the ground may interfere with the signals. Avoid the edges as reflections from the A-pillars will cause problems.

Mount the antenna as high up as possible and keep above any roll bars. Pieces of metal close to and above an antenna will badly disrupt the GPS signal.

Note for non-magnetic surfaces: You can use fabric tape to secure the antenna, as long as it is not metallic. Non-metallic tapes placed over the top of the antenna will not cause any issues at all. We would recommend that any adhesive tape is placed over the top of the antenna and not underneath, to ensure a good contact with the flat aluminium surface.

https://racelogic.support/01VBOX_Automotive/01General_Information/Knowledge_Base/
If the vehicle being used does not have a metal roof, then place the GPS antenna on a flat piece of metal at least 10 cm in diameter. If this is not possible, copper or aluminium foil can be used to create a shaped ground plane underneath the antenna. For example, on a fibreglass roof, mount the antenna on top of the roof, and place some adhesive backed metal foil underneath, on the inside of the roof.

https://racelogic.support/01VBOX_Automotive/01General_Information/Knowledge_Base/
If an antenna is not mounted on a large enough ground plane then the multipath reflections will also be from the ground beneath the antenna. If you are using the antenna on something without a large ground plane (such as a bike or carrying the unit by hand), then you can put a sheet of metal underneath the antenna (can be silver/copper foil), or use an antenna with strong multipath rejection properties (available from Racelogic). These kinds of antennas are much larger and more expensive than the standard antenna supplied with the VBOX, but they can be mounted on a pole to get them as high as possible.

The GPS antenna should also be placed as far away as possible from any other potential obstructions, such as roof bars or other GPS or Radio antennas. This will reduce the probability of multipath effects.

On a motorbike the antenna should be placed as far from the rider as possible to reduce the satellite signal shadowing effect of the rider. Usually the best place is at the back of the bike, or on the rider’s head. For best results use one of our special GPS antennas which can be mounted on a pole.
Dual antenna systems

When testing using dual antenna mode, the greater the antenna separation, the greater the accuracy of the dual antenna derived data channels.

<table>
<thead>
<tr>
<th>Slip Angle Accuracy</th>
<th>Pitch/Roll Angle Accuracy</th>
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<tbody>
<tr>
<td>&lt;0.2° rms at 0.5 m antenna separation</td>
<td>&lt;0.14° rms at 0.5 m antenna separation</td>
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<tr>
<td>&lt;0.1° rms at 1.0 m antenna separation</td>
<td>&lt;0.07° rms at 1.0 m antenna separation</td>
</tr>
<tr>
<td>&lt;0.067° rms at 1.5 m antenna separation</td>
<td>&lt;0.047° rms at 1.5 m antenna separation</td>
</tr>
<tr>
<td>&lt;0.05° rms at 2.0 m antenna separation</td>
<td>&lt;0.035° rms at 2.0 m antenna separation</td>
</tr>
<tr>
<td>&lt;0.04° rms at 2.5 m antenna separation</td>
<td>&lt;0.028° rms at 2.5 m antenna separation</td>
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</tbody>
</table>

Some vehicle roofs limit the potential separation value. In this case a roof mount ([RLACS171](https://racelogic.support/01VBOX_Automotive/01General_Information/Knowledge_Base)) can be utilised to increase separation.

Antennas should be positioned so that the gold antenna connector of primary and secondary antennas (A+B) are **pointing in the same direction**. This matching positioning ensures that the separation measurement is relative.

![Diagram of dual antenna setup](https://example.com/dual_antenna_setup.png)

We recommend you measure separation from outer edge of antenna connector A, to same outer edge of antenna connector B. Note that accurate entry of [antenna separation](https://racelogic.support/01VBOX_Automotive/01General_Information/Knowledge_Base) is essential for dual antenna operation.
• In pitch alignment, the primary antenna (ANT A) should be placed towards the rear of the vehicle, and the reference antenna (ANT B) placed at the front.

• When in roll alignment, the primary antenna (ANT A) should be placed to the left of the vehicle, and the reference antenna (ANT B) placed to the right.

When mounting the antennas directly to the vehicle roof, ensure that the antenna placement still follows the guidance of the single antenna above (i.e. clear ground-plane, away from obstruction).

The two antennas must be on a similar plane! If there is a degree of separation greater than 10°, the system will not obtain dual antenna lock.

https://racelogic.support/01VBOX_Automotive/01General_Information/Knowledge_Base/