

RT3050 RT3040 Inertial and GPS Measurement System

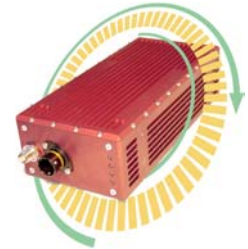
Features

- Satellite Corrections
- 50cm CEP (VBS)
- 10cm CEP (HP)
- 0.1 km/h Velocity
- 0.05° Pitch/Roll
- 0.3° Heading
- Yaw Rate
- Other Measurements
- NMEA Output
- 100Hz
- Real-Time
- Low Latency
- 500MB Logging
- 5 min Installation
- RS232, Ethernet
- Optional CAN
- Compact Size

Applications

- Vehicle Tracking
- Land Survey
- Aerial Survey
- Mining
- Agriculture
- Mapping
- Road Monitoring

Inertial and GPS Navigation System with OmniStar Differential Corrections



Introduction

The RT3050 and RT3040 products combine the robust positioning solution of an Inertial Navigation System with the precision of a Differential GPS.

Using an Inertial Navigation System makes the system immune to short breaks in the GPS. The position is still output, at the 100Hz update rate, when the GPS is obstructed.

The differential service is provided by OmniStar. OmniStar offer two levels of correction service, a 50cm CEP service (known as VBS) and a 10cm CEP service (known as HP).

Specifications

Parameter	RT3050	RT3040
Positioning	VBS	HP
Position	50cm CEP	10cm CEP
Velocity	0.1 km/h	0.08 km/h
Acceleration	10 mm/s ²	10 mm/s ²
Pitch, Roll	0.05°	0.04°
Heading ¹	0.3°	0.3°
Rates	0.01°/s	0.01°/s

1. Heading accuracy depends on dynamics.

Inertial Navigation

The RT3000 measurements are made by integrating the accelerations experienced by the vehicle. Heading, Pitch and Roll are all needed to track which direction the acceleration are in.

RT3050, OmniStar GPS Antenna with Integral Ground Plane



All the outputs are carefully computed at a 100Hz rate, giving the minimum amount of interpolation between points compared to GPS alone.

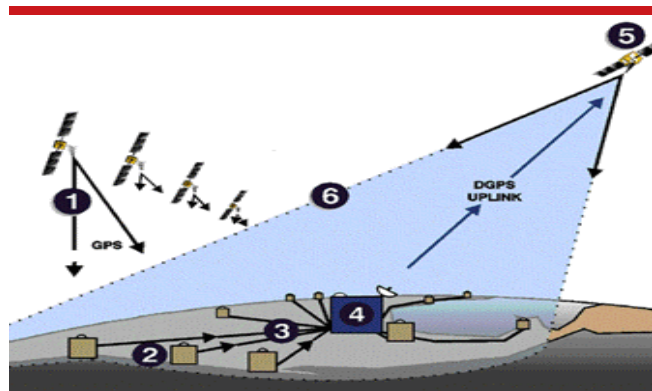
The Differential GPS is used to correct the Inertial Navigation System when it is available.

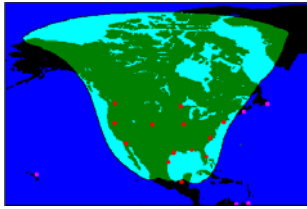
The RT3000 products use GPS corrections at 10Hz to minimize the amount of drift.

OmniStar Corrections

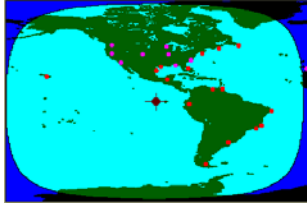
OmniStar uses a combination of 86 reference stations around the globe to provide a *virtual base station* for your local area. The *High Performance* option corrects both L1 and L2 signals, giving very precise measurements.

The GPS Signal (1) is received by the reference stations (2) and transmitted to a central control (4). GPS corrections are sent on an uplink to various communication satellites (5). The corrections can be received over a wide area (6) and used to correct GPS receivers.

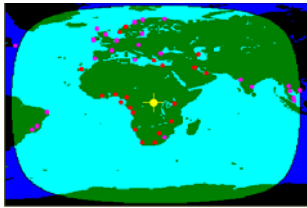




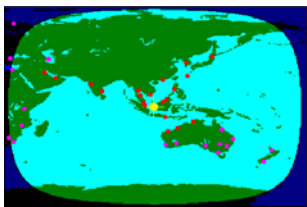
AMSC



AM-SAT



EA-SAT



AP-SAT



OPTUS

Coverage

Worldwide coverage on land is provided by several different geo-stationary satellites, as shown on the left. Each satellite transmits the corrections for a specific area.

By selecting the best satellite for your area, the OmniStar receiver will compute the correction using a weighted combination of the closest reference stations.

Subscription

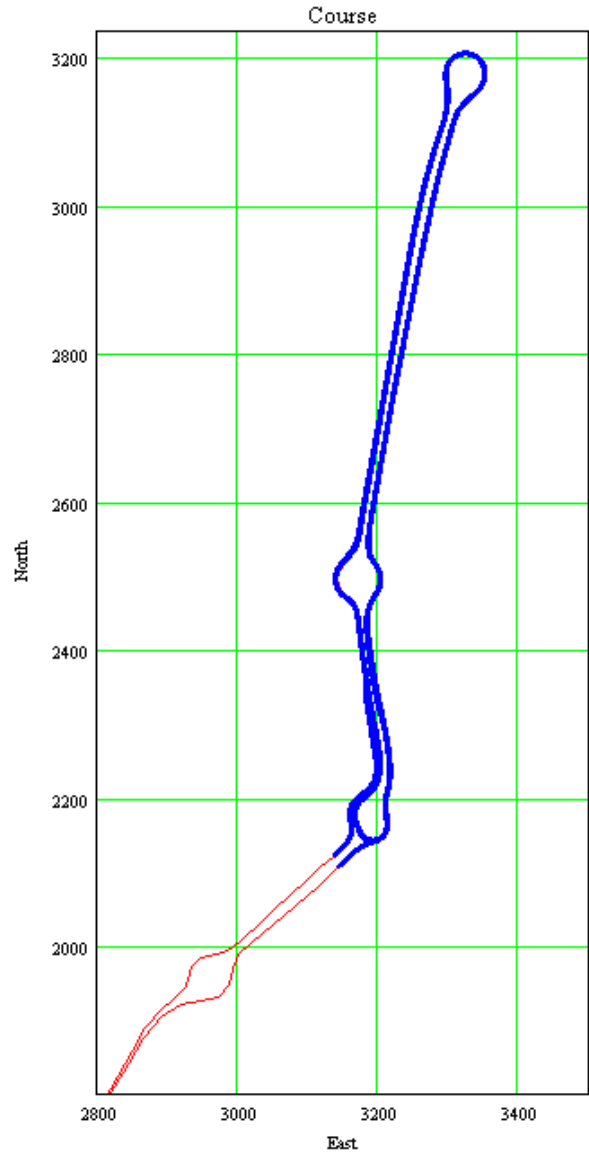
The OmniStar service requires a subscription. Quarterly or yearly subscriptions are available. The subscription can be limited to a local area or be available nation-wide or worldwide.

OmniStar have 200 offices in 45 countries and offer 24 hour service, sales and support.

Hardware

The RT3050 and RT3040 systems are single box solutions that contain the Inertial Sensors, the GPS and the navigation computer. The special hardware required to receive the OmniStar corrections is already fitted inside the compact box. No other external hardware is required.

A special GPS antenna, capable of receiving the OmniStar corrections is supplied. This antenna has an integral ground plane to minimise the effect of multipath and give the highest possible level of performance.



Compatibility

The outputs of the RT3040 and RT3050 can be configured for NMEA operation, making them compatible with many GPS receivers.

A special binary output is available that gives all the measurements over RS232 at 100Hz.

Example Data

The example presented here, using the VBS service, shows the track between three roundabouts driven five times. The pitch and roll for blue course above is shown in the graph below. Note the distinct carriageways and that the pitch and roll do not drift, even in the presence of nearly constant accelerating, turning and braking manoeuvres.

