

OmniSTAR DGNSS Coverage

OmniSTAR Advantages

- **Worldwide coverage**

The OmniSTAR service is offered worldwide by several overlapping satellite footprints, providing global and seamless coverage. This means that all user equipment, capable of decoding the OmniSTAR signal, can be used worldwide.

- **Consistent high accuracy**

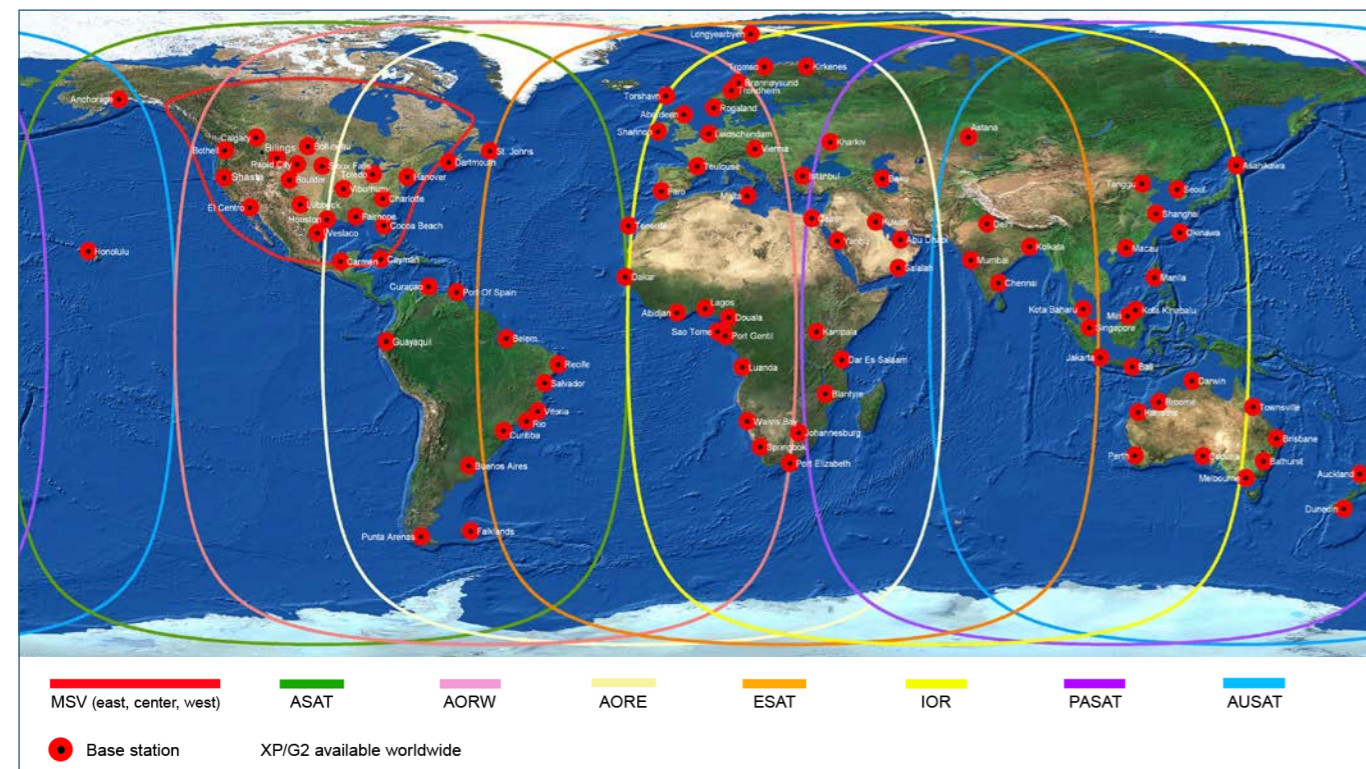
For Network solutions OmniSTAR corrections are not dependent on any one-reference station, but are weighted by a Network Solution algorithm. Therefore non-functioning reference stations have only minor influence on overall accuracy. With the Network Technology OmniSTAR services provide a consistent accuracy over large areas without position jumps when the solution switches from one reference station to another.

- **High reliability**

All reference stations are dual linked to their respective Network Control Centre. The primary connection is by leased line, VSAT or Internet, backed up by a dial-up line.

- **Increased robustness**

The premium OmniSTAR-service combines several totally independent positioning technologies. In case of a failure of one of the underlying technologies the other will continue to provide position solutions.



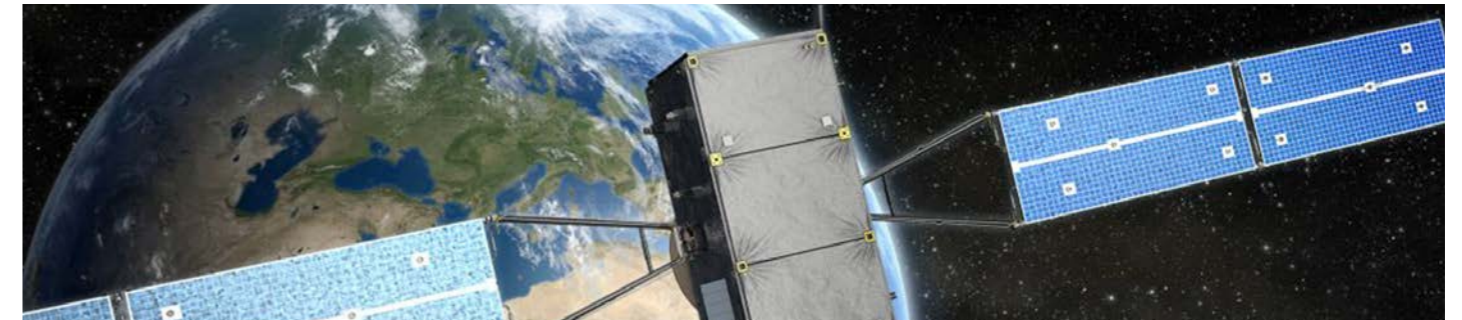
OmniSTAR

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OmniSTAR®

Accuracy
Reliability
Customer service



Worldwide Differential GNSS Services

About OmniSTAR

OmniSTAR is world leader in providing high accuracy DGNSS correction data via satellite channels with offices in The Netherlands, Dubai, the USA, Australia, Singapore and South Africa.

OmniSTAR delivers commercial DGNSS services worldwide by both satellite and internet. It is leading in the design and development of Differential GNSS positioning technology. The OmniSTAR services, OmniSTAR-VBS (Virtual Base Station), OmniSTAR-HP (High Performance), OmniSTAR-XP (Extended Performance) and OmniSTAR-G2 (GPS and GLONASS), were specifically developed to satisfy the need for high accuracy positioning systems and services for landbased applications.

Using over 100 reference stations, 6 high power satellites and 2 global Network Control Centres, OmniSTAR delivers real-time and highly reliable positioning services worldwide, 24 hours a day, 365 days a year.

The OmniSTAR data services are broadcast by L-Band satellite transmissions via a network of geo-stationary satellites, as well as by internet, and are accessible by subscription. The services are unique in that they automatically provide the optimum position solution at the user's location by means of a network solution. Generating differential corrections based on a network solution is more accurate and more reliable than generating differential corrections based on data from single stand-alone GNSS reference stations.



Worldwide Differential GNSS Services

ACCURACY
RELIABILITY
CUSTOMER SERVICE

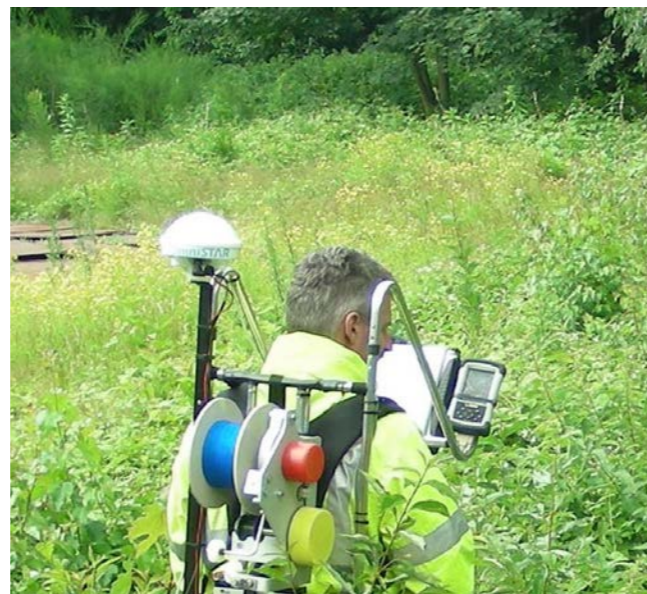
The Standard Service: OmniSTAR-VBS

OmniSTAR-VBS is OmniSTAR's standard, single frequency DGNSS service that uses a network of reference stations (or base stations) to measure and reduce the errors induced into the GPS signal by atmospheric, timing and orbital effects.

This reference data is gathered at Network Control Centres, where it is checked for integrity and reliability and is then up-linked to a chain of geo-stationary satellites, which broadcast the data over a wide (coverage) area. Alternatively, this data is also offered real-time on the internet. This procedure ensures that all reference data generated for a given area is quickly available to the user's receiver. The receiver processes the data from all available reference stations to provide the optimum position solution.

For the position solution determination all data, as generated by OmniSTAR's reference stations, is available to the user equipment, allowing the use of all this information simultaneously, thereby taking into account the distance between the user's position and the location of each of OmniSTAR's reference stations. This is done by mathematically weighting the corrections from each reference station as a function of their distance to the user. The result is one set of corrections, optimised for the user's location. These optimised corrections are calculated every time that reference information is received from the satellite.

This makes the OmniSTAR-VBS service ideally suited for use over a wide area and it assures that OmniSTAR corrections never rely solely on the performance of one single reference station, thus making the solution more consistent, robust and reliable. OmniSTAR-VBS accuracies have been demonstrated as better than 0,70 m (2D 95%) and < 20 cm pass-to-pass horizontal.



The High Performance Service: OmniSTAR-HP/XP/G2

OmniSTAR-HP/XP/G2 is a dual frequency premium augmentation solution in the OmniSTAR family of High Performance services. OmniSTAR-HP/XP/G2 delivers centimetre accuracy derived by a number of independent positioning technologies:

• Network technology (OmniSTAR-HP)

OmniSTAR's primary network of dual frequency reference stations provide for measurements that eliminate errors caused by signal delays in the ionosphere. The combining of these measurements with carrier phase data offers highly accurate positioning results that are valid across the coverage area of this reference station network.



• Precise Orbits & Clocks technology (OmniSTAR-XP/G2)

Separate networks of dual frequency reference stations enable us to generate information with regard to precise satellite orbits and satellite clock offsets. Correcting these measurements for earth tides, ocean loading and polar motion also allows us to create accurate positioning results that are valid worldwide, also outside the coverage area of OmniSTAR's primary network.

Now also OmniSTAR has added a further service enhancement with precise orbits & clocks corrections for GLONASS (G2). With 24 more GLONASS satellites, it will then bring the total number of observed GNSS satellites to 56.

The higher number of 'observables' will increase the availability and robustness of our solutions, especially under more challenging conditions such as in urban canyons, near tree lines and during banking manoeuvres in flight. It may even shorten the convergence time required to start-up.

Inside our regional Network coverage areas OmniSTAR combines both Network and Orbits & Clocks technologies into one solution (HP/XP/G2), increasing performance and robustness. Accuracies have been demonstrated as better than 10 cm horizontal and 15 cm vertical (2D 95%); <5 cm pass-to-pass.

