



TERRASTAR-D™

TERRASTAR-D™ is a global,
high accuracy GNSS Precise
Point Positioning service using
both the GPS and GLONASS
satellite constellations.

The **TERRASTAR-D™** service is a precise positioning GNSS augmentation service designed to deliver decimetre level position accuracy to land users globally, while providing a solution that is more resilient to satellite masking and ionospheric scintillation. The service is based around Precise Point Positioning (PPP) techniques using both GPS and GLONASS, where all GNSS system errors are removed or minimised by direct calculation, precise modelling or estimation.

PPP consists of a single set of corrections to the GPS and GLONASS satellite orbits and clocks, allowing position accuracy to be maintained regardless of user location. Measurement precision is achieved by using both L1 and L2 carrier phase observations, along with C/A and P-Code measurements.

To carry out this absolute positioning technique, orbit and clock corrections derived from the **TERRASTAR™** network of stations are broadcast for every GPS and GLONASS satellite to allow the removal of satellite-based error components. The reference network has multiple and redundant Orbit and Clock Determination Systems (OCDS) running in dedicated **TERRASTAR™** Network Control Centres in Aberdeen and Singapore.

The use of dual-frequency GNSS hardware at the user end allows the calculation and removal of local ionospheric errors, while tropospheric delays are estimated within the calculation. Other sources of error, including ocean loading, earth tides and phase windup are also modelled.

To obtain the high-accuracy solution, multipath and GNSS receiver noise errors are minimised through the use of carrier phase observables, which are precise to the millimetre level.

TERRASTAR-D™ provides a truly global, seamless, high-accuracy position, which is robust and effective in all locations, including areas of ionospheric disturbance, and the large number of GPS and GLONASS satellites typically in view helps maintain reliable and accurate positioning even in difficult user environments, and leads to faster convergence of the positioning solution.

The advantages of **TERRASTAR-D™** can therefore be summarised as:

- Over 50 GPS and GNSS satellites provide consistent and accurate positioning even in difficult topographic and urban environments
- Fully independent reference and control centre network
- Dual frequency phase observations for stability and accuracy even in areas affected by ionospheric disturbance
- Better than 10cm horizontal and 20cm vertical accuracies
- The accuracy, stability and consistent performance make **TERRASTAR-D™** ideal for many applications including machine guidance and autosteer

TERRASTAR-D™

TECHNICAL SPECIFICATIONS

Process Type:

Precise Point Positioning

Orbit and Clock Corrections:

TERRASTAR™ Orbit and Clock Corrections (OCDS)

Observations used:

GPS L1/L2 carrier phase

GLONASS L1/L2 carrier phase

Availability:

Worldwide

Geostationary broadcast satellites:

Inmarsat 25E, 98W, 143E, AORE, AORW, IOR, POR

Data Format:

Proprietary

Typical Correction Update Rate:

30 seconds

Typical latency:

2 seconds

Normal Horizontal Accuracy:

Better than 10cm (95%)

Normal Vertical Accuracy:

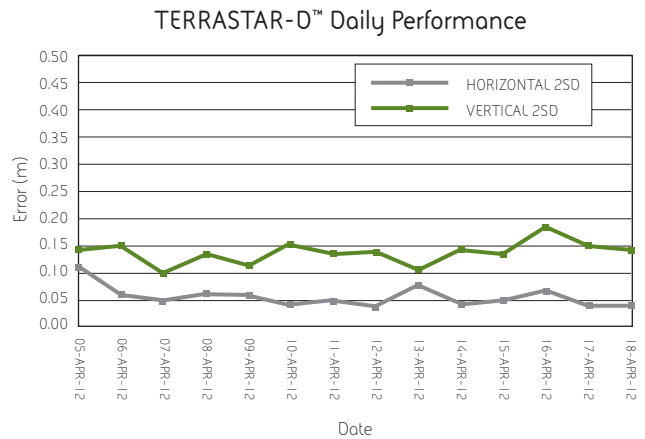
Better than 20cm (95%)

Co-ordinate reference frame:

ITRF 2008

Specifications subject to change without notice

DAILY PERFORMANCE 5TH TO 18TH APRIL 2012



DETAILED HORIZONTAL AND VERTICAL TIME SERIES PLOTS FOR 17TH APRIL 2012

