Ultra and Ultra^2 Services

GNSS positioning services

VERIPOS Ultra and Ultra^2 services are global, high-accuracy GNSS positioning services designed to meet all offshore positioning and navigation applications. Ultra services provide decimetre accuracy and are complementary to VERIPOS Apex services, which, when taken together, provide the user with correction services derived from independent networks and mitigate for single-point failures.

Precise Point Positioning

Ultra and Ultra^2 services operate using Precise Point Positioning (PPP) – an absolute positioning technique which corrects or models all GNSS error sources, i.e. GNSS satellite orbit and clocks, tropospheric, ionospheric and multipath errors. The PPP technique consists of a single set of 'globally applicable' corrections to the satellite orbits and clocks, so position accuracy is maintained regardless of user location.

Orbit and clocks

Real-time corrections for the Ultra services are provided by the JPL Orbit and Clock Determination System (OCDS) which uses data from JPL reference stations. Redundant orbit and clock corrections are provided to the VERIPOS Network Control Centres in Aberdeen and Singapore. The orbit and clock corrections for all satellites in the GPS and GLONASS constellations are valid globally, meaning position accuracy is maintained regardless of user location.

Constellations

The Ultra service uses satellites from the GPS constellation while the Ultra^2 service uses both the GPS and GLONASS constellations. The satellites from the GLONASS constellation provide additional observations. This can help maintain reliable and accurate positioning when masking of satellites occur (e.g. when working close to a platform) or when suffering from ionospheric scintillation. Another benefit of using both satellite constellations is a faster convergence of the positioning solution.

Ultra and Ultra^2 services are broadcast alongside Apex services via multiple geostationary communications satellites to ensure availability and service redundancy.

Technical Specifications

GNSS Satellite Constellations

Ultra: GPS

Ultra^2: GPS + GLONASS

Observations Used

Ultra: GPS L1/L2

Ultra^2: GPS L1/L2 & GLONASS L1/L2

Positioning Technique

Precise Point Positioning

Reference Station Network

JPL

Availability

Global

Geostationary Satellites

25E, 98W, 143.5E, AORW, IOR

Horizontal Accuracy*

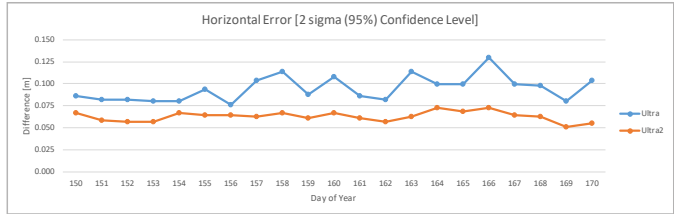Ultra: 10 cm at 2 σ (95%)

Ultra^2: <10 cm at 2 σ (95%)

Vertical Accuracy*

Ultra: <20 cm at 2 σ (95%)

Ultra^2: <15 cm at 2 σ (95%)

Coordinate Reference Frame

ITRF2014

Based on static data logged in Aberdeen, Houston and Singapore over a 7 day period. Accuracy will vary with observing conditions.

Horizontal Error [2 sigma (95%) Confidence Level]

Vertical Error [2 sigma (95%) Confidence Level]
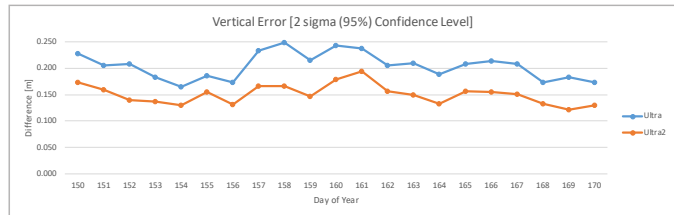
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