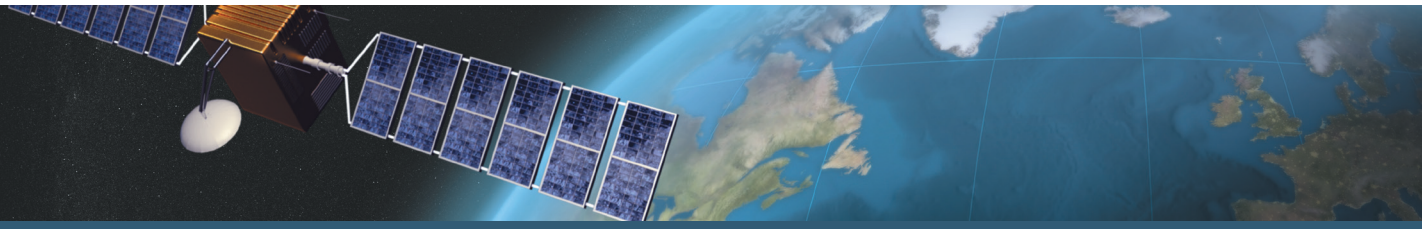
StarPack - High precision GNSS positions, heading and time from a single platform



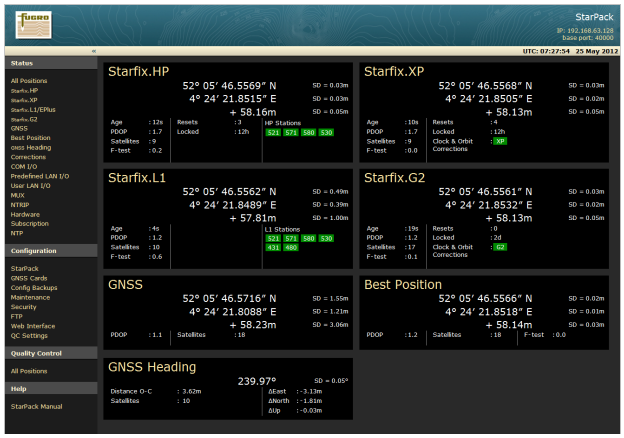
The StarPack is Fugro's answer to increasing market demand for precise, redundant GNSS positioning solutions, including extensive QC and accurate time, from a single, easy to use platform.

StarPack Platform

The StarPack unit consists of a survey grade GNSS combined L-Band receiver and powerful processor, running Linux multitasking operating system. The receiver is capable of tracking all current satellites (GPS, GLONASS) and is Galileo ready. StarPack can be extended with a second GNSS card (in the same unit), to provide accurate, GNSS derived heading. In addition to GNSS observations, the second card also provides L-Band functionality, creating an independent source of corrections for backup.

The combination of receiver and processor provides robust multiple simultaneous precise position calculations and extensive QC. For maximum system reliability, the internal software is embedded on a flash memory. System can be controlled and configured via the front panel, web interface or a serial port.

The StarPack is equipped with four serial ports on the rear panel and LAN interface to provide a multitude of outputs to the user and to read multiple correction sources (in addition to those from the integrated receiver(s)). Raw GNSS data and corrections are continuously logged internally and can be exported to RINEX to enable high quality support and back-up.



User can download this data and send it to Fugro's development centres for re-processing. Additional user defined output can be configured for automatic logging. Firmware can be upgraded using the web interface or using a USB stick at the front panel.

Positioning and Heading Solutions

The embedded processing software of the StarPack GNSS receiver provides multiple configurable simultaneous precise positioning solutions, including G2.

- Four independent correction sources
  - Starfix.G2
  - Starfix.XP
  - Starfix.HP
  - Starfix.L1
- Five solutions: Starfix.G2, Starfix.XP, Starfix.HP, Starfix.EPlus and Starfix.L1
- New "Best Position" solution, combining all available solutions in to one, using proper weighting. "Best Position" provides increased availability and better accuracy.
- A Heading solution between two GNSS antennae, in combination with a second GNSS card (in the same or another receiver).

STARFIX®

StarPack - High precision GNSS positions, heading and time from a single platform

Starpack Applications

- Accurate height for tidal corrections and heave compensation.
- Accurate position for seabed mapping surveys.
- Accurate vertical reference for out of straightness pipeline surveys.
- Accurate (instantaneous) heading source (in combination with a second GNSS card).
- Stable position for station keeping on DP vessels.
- Accurate relative positioning of structures.
- Automated vessel guidance.

NTP Support

The StarPack contains an NTP (Network Time Protocol) server, providing a time accuracy of 500 µs or better with a convergence time after power-on within several minutes.

NTP Client

The StarPack contains also NTRIP (Networked Transport of RTCM via Internet Protocol) client. When internet connection is available StarPack can be connected to Fugro's (or third-party) corrections servers providing additional, independent from L-Band, corrections backup.

Quality Control

Extensive quality control is provided through StarPackQC, a stand-alone PC based application, or on web interface, Quality control parameters indicating precision, reliability and availability can be visualized for estimated positions as well as for corrections and individual satellites.

Technical Specifications

GNSS Hardware engine:	NovAtel OEMV or Trimble BD960: 72 channel GPS/ GLONASS board
Corrections:	Integrated receiver for Starfix differential and orbit/clock corrections.
Processor:	Intel Pentium III, embedded Linux operating system
Data rate:	1 Hz - 5Hz
Data storage:	10 days, raw and correction data (1 Hz) on internal disk
Size:	245 x 60 x 195 mm (W x H x D)
Weight:	2 kg
Input voltage:	80 – 250 VAC, 40 – 60 Hz
Input/output:	4 RS232 ports, LAN with more than 30 configurable ports, 1 PPS
Temperature:	Operating -20°C – +50°C Storage -40°C – +85°C
Humidity:	95% non-condensing
Compliant:	EMC 2004/108/EC (EN60945:2002)

Service / Solution	Accuracy (hor. 95%)	System	Correction Data	Coverage
Starfix.G2	0.1 m	GPS GLONASS	Orbit and clock corrections.	Global
Starfix.XP	0.1 m	GPS	Orbit and clock corrections.	Global
Starfix.HP	0.1 m	GPS	Ionosphere-free carrier phase corrections from multiple reference stations.	Regional <1000km*
Starfix. EPlus	1.0 m	GPS GLONASS	Orbit and clock corrections.	Global
Starfix.L1	1.5 m	GPS	L1 pseudo-range corrections from multiple reference stations.	Regional <500km*
Best Position	0.1 m	GPS GLONASS	All available correction data.	Global
Heading	Better than 0.1° for baselines longer than 3m.	GPS GLONASS		Global

* distance to reference station

Specifications subject to change without further notice

Fugro Survey AS
Nygaardsviken 1,
N-5165 Laksevaag, Norway
Telephone : +47 55 34 94 00
Fax : +47 55 34 94 50