



Offshore Positioning Services



Offshore positioning uses high-precision satellite-based technology to identify the exact location of vessels, equipment and infrastructure in order to inform a wide variety of offshore activities.

When 'near enough' won't do

A 'precise position' is the fundamental parameter for all survey and engineering operations at sea. Such operations rely on a global infrastructure and expertise to deliver high accuracy positioning, globally, at any point in time.

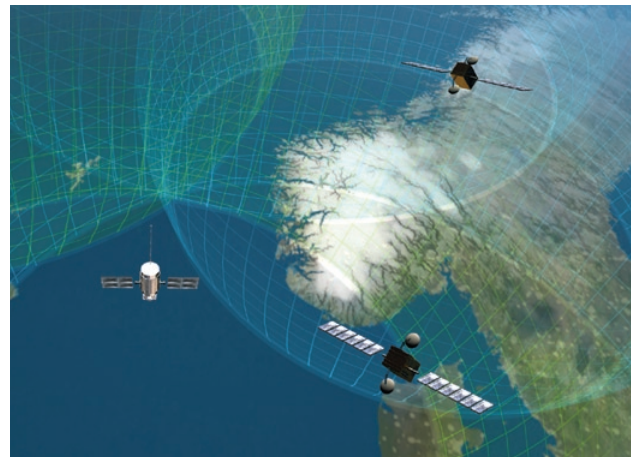
Global solutions from Fugro

Fugro's innovative positioning infrastructure and expert staff have ensured a quality-controlled and cost-effective positioning service to the offshore industry for nearly 30 years. Based on Fugro proprietary infrastructure, hardware and software, we provide:

- Positioning services with less than 10 cm accuracy worldwide
- Full redundancy along the entire positioning supply chain
- Full use of all available navigation satellite systems (GPS and GLONASS)
- Expert staff to support the most demanding offshore project
- Acoustic and INS underwater positioning
- Fugro propriety 'Starfix' software to support complex offshore operations



Providing accurate DGPS for demanding offshore operations



Ensuring worldwide differential accuracy and coverage



Using state-of-the-art independent control centres

Offshore Positioning Services

**ADVANCED TECHNOLOGY
SUPERIOR QUALITY
UNRIVALLED EXPERIENCE
'FIT FOR PURPOSE' SOLUTIONS**

Rig Move Services

Drilling rig operations and similar high-cost activities call for quick response times and minimal downtime.

That's why Fugro's extensive range of drill rig positioning services include specially designed hardware, positioning systems, vessel spread and tug management systems, GPS kinematic solutions and vertical seismic profiling (VSP) services. Together, these support tow-outs, inter-field moves, alongside positioning, anchor drop control, positioning confirmation and attitude monitoring.



Subsea Acoustic Positioning

If you're looking for the most accurate subsea navigation and positioning system available, look no further than Fugro.

Our long baseline (LBL), ultra short baseline (SBL) and combined techniques (LUSBL) provide readily-configurable systems to suit your exact underwater positioning or tracking requirements with guaranteed precision.

Additional support in the form of Starfix.Acoustics and Starfix.USBL software modules provides enhanced integration, calibration and processing potential.

Dredging and Coastal Operations

Dredging activities, aggregate collection, coastal and harbour works - these are ideal operations to benefit from Fugro's Starfix DGPS system and portable receiver packages.

Fugro assists in the correct positioning and monitoring of dredging vessels and equipment.

Infrastructure Positioning

All the major barge contractors have, at some stage over the last three decades, depended on Fugro's specialist skills to support their marine infrastructure positioning operations.

From templates and jackets, deep-water moorings and suction piles to wellheads, manifolds, pipelines and umbilicals, our specialised application software integrates acoustic and visual sensors to provide real-time guidance and control information for safe and efficient operations.

Fleet Management

Fugro's diverse experience in fleet-tracking and positioning allows it to provide turnkey solutions, tailored to the specific monitoring and tracking requirements of marine vessels.

Fugro's Vessel Tracking System provides visual tools - based on GIS and web technologies - to analyse vessel movement and provide a comprehensive reporting mechanism. The system is a unique blend of GIS, GPS, Communication and Reporting technologies providing customers with continuous access to essential management information.

Exploration Seismic Solutions

Our DGPS systems are used extensively by the offshore seismic industry to locate source 'guns' and streamer tail buoys.

Fugro has developed a range of specialised positioning solutions to support seismic surveys, including Starfix.OBC for ocean bottom cable and 4D seismic survey operations. Our proven software suites comprise First Break Picking algorithms plus telemetry and control systems, helping to provide comprehensive, cost-effective solutions in support of multi-vessel OBC spreads during laying and positioning of subsea cables.



Remote Services

Fugro offers a range of cost-efficient remote services based on FANS® technology, for remote connection to offshore systems from an office.

The Fugro Remote Monitoring system monitors the movement of floating assets, such as FPSOs, FSOs and TLPs, remotely. Using decimeter accuracy, it can show the actual position at a point in time or movement over a period of time. For nearshore and offshore navigation, the Fugro Stand Alone Navigation solution requires no onboard survey crew, ideally suited for navigation support on jack-up work barges and rigs, tug boats and support and construction vessels.

Inertial Navigation System (INS)

Fugro has pioneered the development of INS (Inertial Navigation System) solutions to address subsea positioning for deep and ultra deep-water oil and gas projects.

This innovative technology enables Fugro to combine the latest advances in Inertial Navigation with proven sensors, offering a time saving subsea positioning tool to suit the demands of the drilling and construction markets.

Fugro Starfix Software

All Fugro positioning and construction services are brought together in the Starfix integrated survey and positioning software, which supports the widest possible scope of positioning and survey activities.

Dedicated modules in the software cover rig move operations, barge operations, marine survey data collection, underwater positioning and much more.

Offshore Positioning Services

Differential Positioning Systems

Fugro's state-of-the-art differential GNSS augmentation systems were developed specifically to meet the offshore community's demand for robust and accurate positioning solutions worldwide.

Using differential GNSS algorithms, Fugro removes any errors from data monitored from over a hundred Fugro land-based monitoring stations. A double redundant network of L band communication satellites delivers the correction data in real-time to vessels and other mobile users the world over.

Fugro positioning systems are delivered to an ever increasing client base comprising:

- Offshore oil and gas companies
- Offshore renewable energy companies
- Offshore contractors
- Offshore drill rig operators
- Survey and research vessels
- Cruise vessels
- Offshore cable installation companies



Advanced Solutions

Fugro positioning systems are completely scalable to meet a broad range of requirements from robust L1 differential GPS to fully redundant dual frequency, orbit and clock correction of multiple navigation satellites constellations.

Fugro Offshore Positioning Services are based on the Starfix range of positioning systems which includes:

- **Starfix.G2** - the Fugro flagship, dual frequency orbit and clock positioning system seamlessly incorporates GPS and GLONASS satellites with 10 cm accuracy worldwide
- **Starfix.HP** - a dual frequency, multi reference station carrier phase computation with less than 10 cm accuracy worldwide
- **Starfix.XP** - a dual frequency, orbit and clock computation, based on NASA/JPL reference stations with less than 15 cm accuracy
- **Starfix.L1** - the single frequency differential GPS service provides worldwide differential accuracy and coverage

All Fugro dual frequency systems are designed to mitigate problems of increased ionospheric activity worldwide that have an adverse effect on the satellite signals used to derive a positioning solution.

Fugro's augmented infrastructure is designed to provide the highest level of redundancy for the most demanding safety critical operations. Differential GNSS solutions are based on at least three fully independent positioning calculations, three separate groups of independent reference stations, two independent network control centres and various hardware platforms. All services are broadcast by at least two different communication satellites anywhere on earth.

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