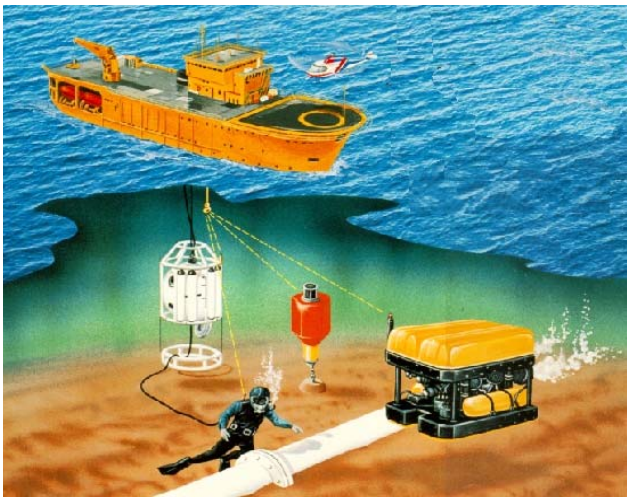
HPR 410

KONGSBERG

Hydroacoustic Positioning Reference SSBL principle

Introduction

The Super Short Base Line (SSBL) principle has the obvious advantage that it only requires installation of one hull-mounted transducer and one subsea transponder to establish a three-dimensional position of a subsea transponder. This is based on measuring the horizontal and vertical angles together with the range to the transponder.



Flexible solution

The system can be used in relative positioning, as a stand-alone navigation system, or it can be integrated with surface navigation systems for absolute geographical positioning. High accuracy and reliability also ensure secure reference to Dynamic Positioning (DP) systems. To ensure safe operation of the system in environments with high noise levels, severe aeration, drilling mud, etc, different types of transducers and beamwidths including two separately mounted transducer units can be installed with each system. Use of up to 56 transponders is made possible by utilising individual interrogation and reply frequencies. Depending on required performance, the customer may choose the appropriate configuration of the HPR 410 system, which may at any time be upgraded, with a whole range of options.

Suppression of noise

All the HPR 410 transducers have directive receiving beams. This will minimise the influence from noise coming in from the vessel's thrusters and propellers.

Automatic compensation for ray bending and sound velocity errors

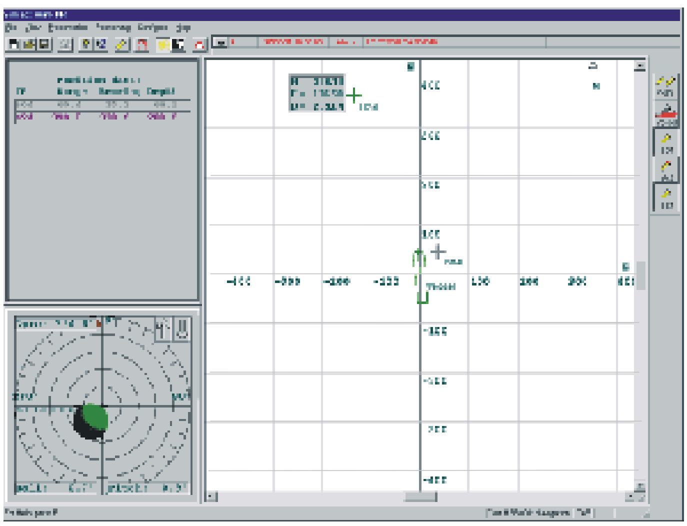
The HPR 410 takes input of the local sound velocity profile, it calculates, error compensates and displays the effect of the physical phenomena of sound velocity differences in the water layers.

Deep-water version

The system can also be delivered as an ultra deep-water version using deep-water transponders. Even a combination of deep water and standard is made possible by having two transducers interfaced to one transceiver unit.

Long Base Line upgrade possibility

The HPR 410 system can be upgraded to also include Long Base Line (LBL) functions. Please refer to the HPR 418 product information.



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Typical HPR 410 system configuration

The HPR 410 system operates with the transducer mounted on a hull deployment unit, allowing the transducer to be lowered some metres below the keel. The transceiver unit containing transmitter, preamplifiers and beam-forming electronics is interfaced to the transducer and hull unit. The system can be configured with one or two hull-mounted transducers. With the use of two transducers, flexibility and redundancy will be further improved. The system is controlled and operated from an operator station using the APOS software. The APOS software runs on a Windows XP platform, using standard windows graphical user interface.

Hull deployment units

A key element in the reliability and precision of the HPR systems is the range of high quality hull units, which allows the transducer to be lowered to a depth sufficient to minimise the effect of noise and air layers below the vessel. The hull unit is installed on top of a gate valve, which can be closed when servicing and maintaining the transducer. These high quality hull units can, either locally or remotely, automatically raise and lower the transducer through the vessel's hull.

"World record" in transponder channels

The HPR 410 can operate with up to 56 transponder channels, in addition to the "old HPR 309" channels, and has also transponder telemetry communication for use with transponder release and sensor readings.

Perfect survey tool and preferred DP reference

With its high accuracy, good repeatability and high reliability, HPR 410 is the multi-purpose hydroacoustic positioning system.

Accuracy

Standard transducer, 20-32 kHz:

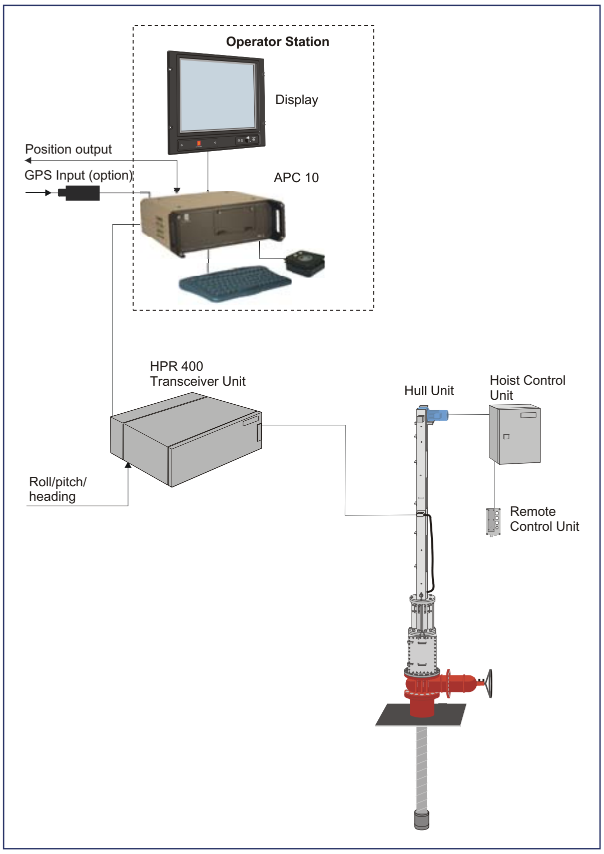
Wide beam ±80°............................ ≤5% of slant range
Medium beam ±55° .... ≤2% of slant range

Narrow beam transducer, 20-32 kHz:

Wide beam ±80°............................ ≤5% of slant range
Narrow beam ±22.5°..................... ≤1% of slant range

LF transducer, 10-15 kHz:

Wide beam ±80°............................ ≤5% of slant range
Medium beam ±55° .... ≤2% of slant range



The accuracy specifications are based on:

- Line of sight from transducer to transponder
- No influence from ray bending
- Signal to Noise ratio ≥20 dB. rel. 1μPa
- Relevant signal output from transponder
- No error from heading and roll / pitch sensors

Operating range 20 - 32 kHz

Standard transponder

w/ 188 dB SL ....Typical max. 1500 m

High power transponder

w/ 195 dB SL ....Typical max. 2000 m
w/ 206 dB SL ....Typical max. 3000 m

The range capabilities are very much depending on the vessel's noise level and reduction in transponder signal level due to ray bending.

Operating range 10 - 15 kHz

w/ 205 dB SL ....Typical max. 10 000 m

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