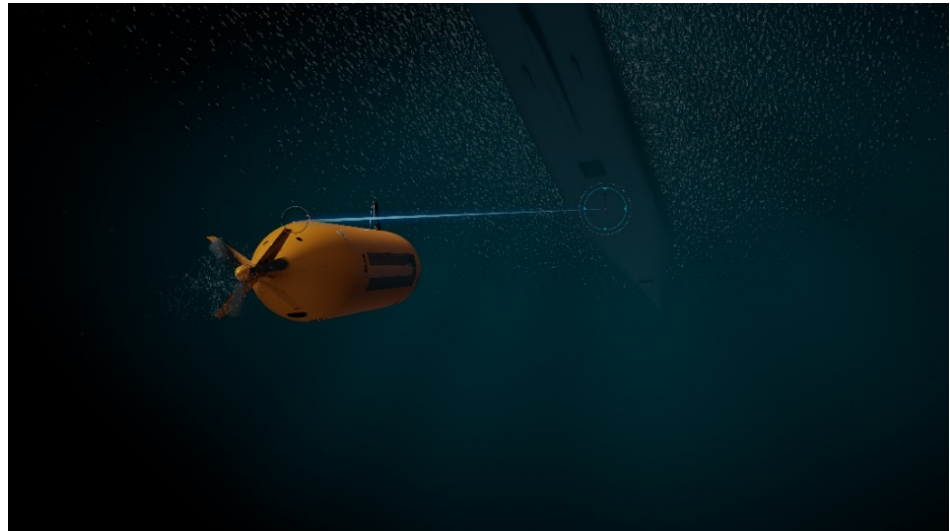




KONGSBERG

# HiPAP 602

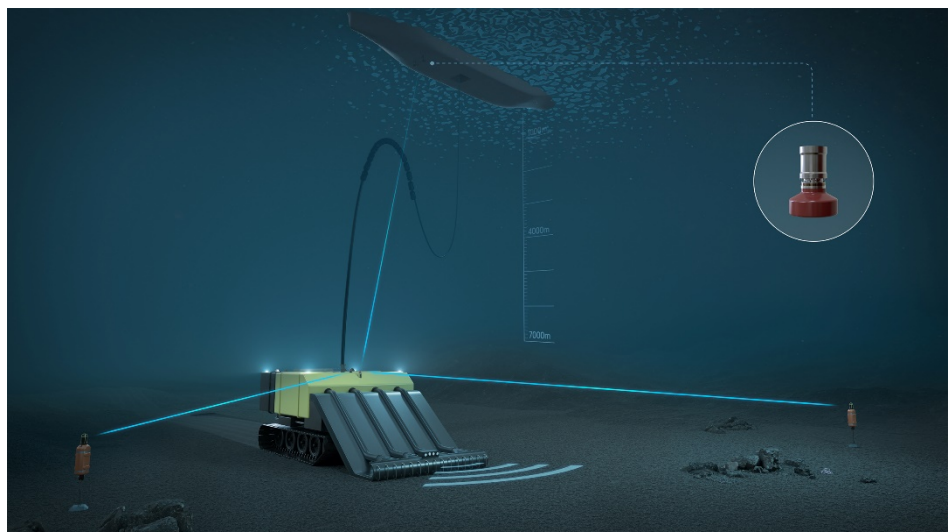


## HiPAP 602 DEEP WATER ACOUSTIC POSITIONING SYSTEM

The HiPAP 602 system is an acoustic positioning system designed to provide extreme range and accuracy for positioning ROVs, AUVs and operate as a DP reference.

To achieve the accuracy, the HiPAP system utilizes a unique signal processing technique. This technique enables narrow transmitter and receiver beams to be generated in all directions within the lower half of the transducer. The HiPAP 602 large diameter multi element planar array combined with electronic beamforming provides high accuracy and long-range positioning capabilities, making it well suited for deep water operations.

- 7000m range capability
- 560 Cymbal Wideband channels
- Narrow receiver beams
- Modem capability
- SSBL and LBL positioning
- Fast Track mode
- Easy setup
- Compatible with cNODE
- HAIN Compatible
- APOS Operator software





## Applications

### Seabed Mining

HiPAP 602 is ideal for deep water mining and is fully compatible with the HAIN Subsea 7000 inertial navigation system which allows for fast calibration of sparse LBL arrays with the ROV box-in technique. The new HAIN user interface runs on the HiPAP system.

### Construction Survey and DP

The increased angular accuracy offered by HiPAP 602 saves operational cost as it can extend the range that SSBL can be used for construction survey and DP operations prior to switching to LBL, dependant upon project specifications.

HiPAP 602 has full LBL calibration and positioning capabilities. It can be used for transponder position box in, baseline calibration and positioning of LBL vehicles including ROVs, AUVs, surface vessels and mobile structures, with a comprehensive range of transceivers and transponders with sensor modules available.

### AUV and Hybrid ROV Modem Control

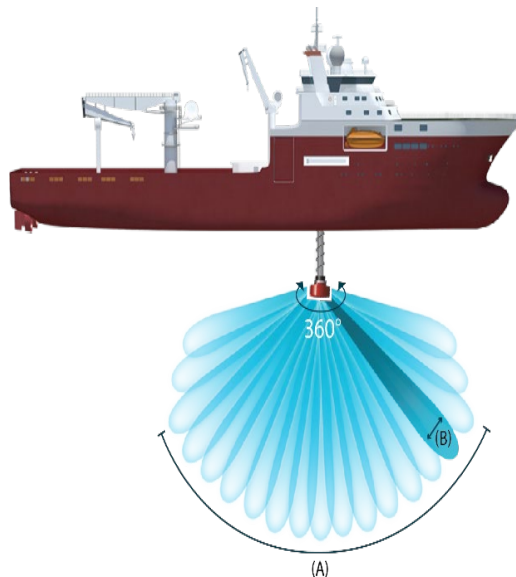
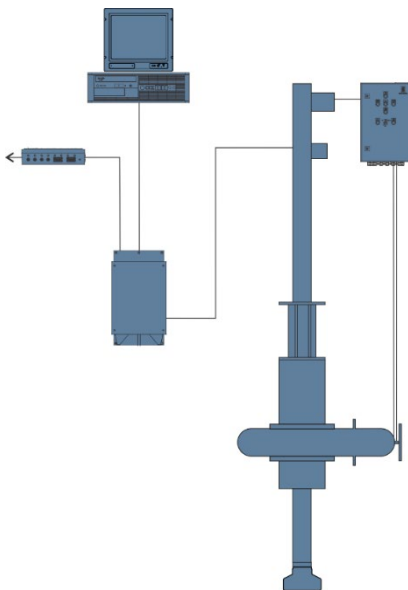
AUV surveys operating in 6000m water depths will benefit from increased position accuracy. The robust high speed modem capabilities allow for 3rd party control and data transfer to and from subsea sensors, AUVs and Hybrid ROVs. A number of link protocols are available to efficiently package and transparently transmit the data.

### Tow Fish Tracking

For long range tow fish tracking the transducer can be fitted with a 30° tilt adapter.

### Transponders

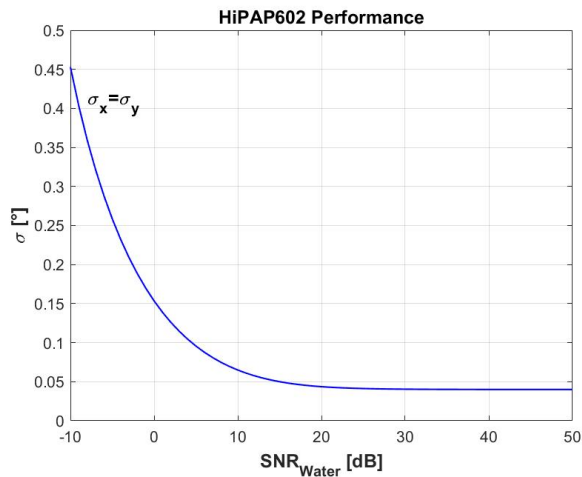
The system is fully compatible with the entire range of medium frequency cNODE transponders and modems, with depth ratings available from 100m to 7000m.





## TECHNICAL DATA

Accuracy, direction <sup>(1)</sup>	0.04° within ±30° sector >0.06° from ±30° to ±60° sector
Repeatability, direction	0.01°, within ±30° sector
Accuracy, range	± 0.02 m
Ray bending compensation	Yes
Frequency	20-30 kHz (MF)
Operational coverage <sup>(3)</sup>	±90° Main coverage ±60°
Receiver beam	8° Ref B in figure
Source level (re 1μPa)	TBD dB
Range capability (m) <sup>(2)</sup>	7000+
Navigation Channels	560 Cymbal, 56 FSK, cNODE Compatible
Operation mode	SSBL, LBL, acoustic modem
INS	Integration to HAIN for improved performance
Transducer deployment depth	< 50 m
Temp. operating/Storage	0°C to +35°C/-20°C to +70°C
Storage humidity	95 % relative, non-condensing
Vibration	5-100 Hz, 5-13.2 Hz ±1.5 mm, 13.2-100 Hz 1 g



1) Accuracy is in X and Y direction. @SNR 20dB rel. 1μPa, 1sigma/RMS. Free line of sight, no ray bending

2) Range capability is depending on line of sight, transponder's transmit power setting, vessel's acoustic system and influence of ambient noise and ray bending.

3) Operational coverage defines the sector where acoustic positioning and communications are operational, ref A in figure. Main Coverage is the sector where maximum range and angular accuracy can be achieved. Outside the main coverage range and elevation angular accuracy are reduced, therefore a depth input for aiding is recommended

*Specifications subject to change without any further notice.*

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