

# Phins Subsea

FOG-based high-performance subsea inertial navigation system for deep water

Phins Subsea is a subsea inertial navigation system providing position, true heading, attitude, speed, depth and heave. Its high-accuracy inertial measurement unit is coupled with an embedded digital signal processor that runs an advanced Kalman filter.

Phins Subsea can be pre-assembled and pre-calibrated with a doppler velocity log version, making the system easy to install and ready to use for more precise navigation.



## FEATURES

- All-in-one high-accuracy 3D positioning with heading, roll and pitch
- FOG, unique strap-down technology
- Multiple aiding sensors available: (DVL, USBL, LBL, RAMSES, GPS, depth sensor)
- Options: DVL or RAMSES easy coupling
- Ethernet, web server (GUI)

## BENEFITS

- High grade INS performance
- High reliability and maintenance free
- Rugged design for water depths up to 6,000 m
- Ultimate sub-metric performance using sparse array transponders and on-the-fly calibration
- Ease of use and quick installation

## APPLICATIONS

- AUV navigation
- Towfish navigation
- Metrology
- Precise positioning
- Out-of-straightness survey

## TECHNICAL SPECIFICATIONS

### Performance / Characteristics

#### Position accuracy<sup>(1)</sup>

With GNSS/USBL/LBL	Three times better than GNSS / USBL / LBL
DVL-Aided straight line performance	0.05 %TD (CEP 50)
DVL-aided optimal performances in typical conditions	0.01 %TD (CEP 50)
No aiding for 60s / 120s	0.06m / 0.3m (CEP50)

#### Heading accuracy<sup>(2)(3)</sup>

With GNSS (or USBL/LBL) & DVL	0.010 deg secant latitude RMS
With GNSS or DVL or USBL/LBL	0.025 deg secant latitude RMS
Roll and pitch dynamic accuracy (no aiding)	0.01 deg RMS

### Operating range / Environment

Operating / storage temperature	-20 to 55°C/-40 to 80°C
Rotation rate dynamic range	Up to 750° /Sec
Acceleration dynamic range	+/-30g
Heading /roll/ pitch ranges	0 to +360 deg / ±180 deg / ±90 deg
MTBF	150,000 hours (System observed) 500,000 hours (FOG + Accelerometers)
Robust to harsh environment, shock and vibration proof	Robust to harsh environment, shock and vibration proof
Depth rating	6,000 m

### Physical Characteristics

Material	Titanium
Weight in air /water	23 / 13 kg
Mounting (∅ in mm)	6 ∅ 6.5 holes
Dimensions (∅ x H in mm)	∅ 255 x 288 mm
Connector	3 x 12 pins, 1 x 19 pins, 1 x 26 pins SEACON

### Interfaces

Sensors	GNSS / USBL / LBL / DVL / EMLOG / DEPTH / CTD / SVP
Serial	5 ports : RS422 or RS232
Ethernet	10/100 Mbits, UDP/TCP (client / server) / web server (GUI)
Pulse	3 inputs / 2 outputs
Input/ output	Configurable 7i / 5o Industry standards: NMEA, ASCII, IXBLUE STD BIN etc... more than 130 output protocols
Baud Rate	Up to 460 kbaud
Data output rate	0.1 Hz to 200 Hz
Power supply / consumption <sup>(5)</sup>	24 VDC (20 - 32 V) / < 20 W

(1) Secant latitude = 1/cosine latitude

(2) Input GPS PPS pulse for accurate time synchronization of PHINS 6000