

# Phins 9 Compact

Most Compact Inertial Navigation System for UUV's

Phins 9 Compact benefits from Exail standard interface to facilitate integration and several interfaces from ethernet to serial ports, which enables seamless re-use of the control system on any vehicles sizes or types. The algorithm can accept all third-party sensors adapted to underwater navigation, making the Phins 9 Compact adaptable to any architecture



## FEATURES

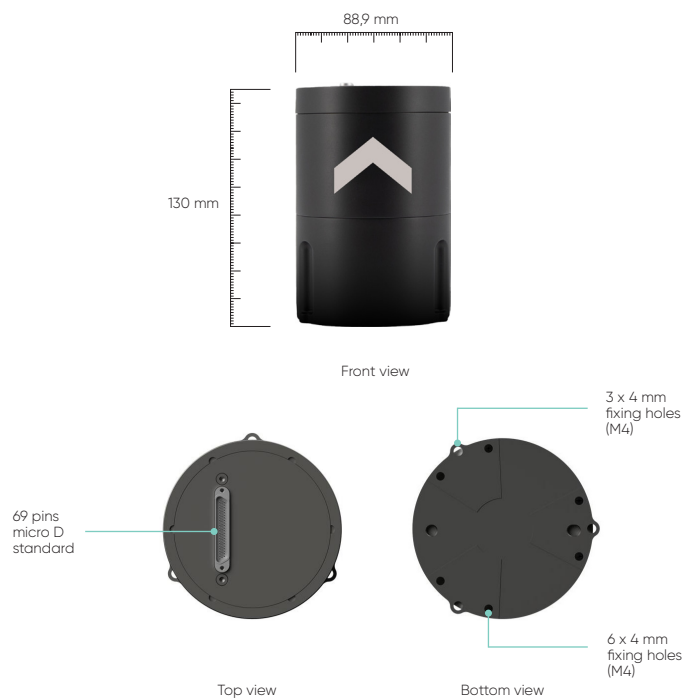
- Most compact high grade INS
- Low power consumption
- Software and algorithm dedicated for subsea operations
- Genuine strapdown solid-state system
- True IMU output

## BENEFITS

- Technology based on Exail's in house technology
- Stealth autonomous navigation
- Very accurate heading, roll, pitch, speed and position
- integration
- Open architecture with 3rd party brand sensors
- Increased autonomy

## APPLICATIONS

- Underwater Unmanned Vehicles (UUV)
- Portable Seabed mapping systems (MBES)
- Tow fishes (SSS, SBP, ROTV)
- Subsea electronic Systems (Plough, Crawlers, ROV)
- Other Subsea Technologies (Cable Smart repeater, Pipes inspection Gauges...)



## TECHNICAL SPECIFICATIONS

### INS Performances

#### Position accuracy

With GNSS/USBL/LBL	Three times better than GNSS / USBL / LBL
DVL-Aided straight line performance	0.1%TD (CEP 50)
DVL-aided optimal performances in typical conditions	0.02 %TD (CEP 50)
No aiding for 60s / 120s	0.2m / 0.6 m (CEP50)

#### Heading accuracy

With GNSS (or USBL/LBL) & DVL	0.04 deg secant latitude RMS
With GNSS or DVL or USBL/LBL	0.07 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	+/- 30 g
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

### Physical Characteristics

Material	Aluminium
Weight in air /water	1.2 kg
Mounting (Ø in mm)	Top: 3 bore holes M4 Bottom: 6 blind holes M4
Dimensions (Ø x H in mm)	Ø88.9 x 130
Connector	69 pins micro D standard

### IMU performances

	FOG	ACC
Noise	0.01 °/√Hz	15 µg/√Hz @ 1Hz
Bias instability	0.01 °/h 1σ	10 µg
Scale Factor	50 ppm 1σ	40 ppm 1σ
Bandwidth	5 kHz	500 Hz
Input range	± 490 °/s	± 30 g

## Interfaces

Sensors	GNSS / USBL / LBL / DVL / EMLOG / DEPTH / CTD / SVP
Serial	6 ports: RS422 or RS232
Ethernet	10/100 Mbits, UDP/TCP (client / server) / web server (GUI)
Pulse	2 inputs / 2 outputs
Input/ output	Configurable 7i / 5o, Industry standards: NMEA, ASCII, Exail STD BIN etc. more than 130 output protocols
INS baud rate	921.6 kbps
INS data rate	0.1 Hz to 200 Hz
Power supply / consumption <sup>(5)</sup>	24 VDC (20 - 32 V) / < 12 W
Embedded Datalogger	4 GB
IMU baudrate	4 MHz max
IMU datarate	10 kHz max
IMU latency	300 $\mu$ s @ 10 kHz