KONGSBERG MARITIME RENTAL

Kongsberg Maritime’s rental division supplies and supports our customers by providing a full rental solution anywhere in the world. The rental pool offers a range of KONGSBERG equipment to key markets including offshore oil and gas, subsea and merchant marine.

There are many benefits to renting equipment and it can often save you time and money. Through our rental service you can rent for short-term or long-term projects and you will have access to KONGSBERG’s expertise and customer support. We will develop a solution that meets your specific requirements.

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<td>Operating range: 1 - 4000 m</td>
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<th>HiPAP® 201-MGC R2 System</th>
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<tr>
<td>Fully compatible with all Cymbal® “M” channels</td>
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</tr>
<tr>
<td>Inbuilt motion and heading sensor: Seatex MGC® R2</td>
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<tr>
<td>Heading accuracy (speed aided): 0.15° RMS (secant latitude)</td>
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<tr>
<td>Roll &amp; pitch accuracy: 0.02° RMS</td>
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<tr>
<td>Operating range: 1 - 4000 m</td>
<td></td>
</tr>
<tr>
<td>Angular accuracy: 0.25°</td>
<td></td>
</tr>
<tr>
<td>Position accuracy: 0.45% (1 Sigma, SNR &gt; 20dB rel. 1μPa in bandwidth)</td>
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</tr>
<tr>
<td>Data telemetry: up to 2.5kBit/s (application dependent)</td>
<td></td>
</tr>
<tr>
<td>Transducer beam width: ± 80°</td>
<td></td>
</tr>
<tr>
<td>Material, depth rating: Bronze/Stainless steel, up to 50 m</td>
<td></td>
</tr>
<tr>
<td>Length, diameter; weight air/water: 400, 190 mm; 17 kg/9 kg</td>
<td></td>
</tr>
<tr>
<td>Supplied with a 50 m or 70 m length transducer cable</td>
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<tr>
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<tr>
<td>Fully compatible with all Cymbal® “M” channels</td>
<td></td>
</tr>
<tr>
<td>Inbuilt motion sensor type / accuracy: Seatex MRU-3 / 0.08°</td>
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<tr>
<td>Operating range: 1 - 905 m</td>
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<tr>
<td>Angular accuracy: 0.25°</td>
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<td>Position accuracy: 0.45% (1 Sigma, SNR &gt; 20dB rel. 1μPa in bandwidth)</td>
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**Note:** No export licence required.
μPAP® 200 System
Portable Hydroacoustic Positioning Reference
Operational modes: SSBL, LBL and data telemetry
Fully compatible with all Cymbal® "M" channels
Inbuilt motion sensor type / accuracy: Xsens MTi-200 / <1.0°
Operating range: 1 - 4000 m
Angular accuracy: 0.25°
Position accuracy: 0.45% (1 Sigma, SNR > 20dB rel. 1μPa in bandwidth)
Data telemetry: up to 2.5kBit/s (application dependent)
Transducer beam width: ± 80°
Material, depth rating: Bronze/Stainless steel, up to 50 m
Length, diameter: weight air/water: 250,190 mm; 13 kg/8 kg
Supplied with a 50 m or 70 m length transducer cable
Supplied as standard with an APOS laptop computer
Optional system item:
- Responder drive kit.

cPAP® 34 MKII, Subsea LBL Positioning System
ROV Mount Transceiver
30 kHz band (MF)
FSK and PSK (Cymbal®) signalling modes
For use in support of Long Base Line (LBL) positioning operations
Polyurethane coated aluminium housing
Depth rated: up to 4000 m
APOS interface: RS-232
User interface: RS-232/422/485
Power supply: 20-28 Vdc, 1 Ampere (max)
Internal battery type: Lithium Iron Phosphate (Li-Fe - rechargeable)
Length, diameter: weight air/water: 278,105 mm; 4.2 kg/2.2 kg
Transceiver supplied with the following items:
- cPAP MKII 34, Subsea LBL Transceiver, (part no. 447900)
- Transducer 34-30H for cPAP (part no. 345773)
- Subsea Cable for cPAP to transducer, 6 m, (part no, 345772)
- Subsea Pigtail for cPAP (part no. 408094)
- cNODE® MiniS Battery Charger (part no. 404199).
Optional system items:
- APOS Survey Operator Station.

cPAP® 37 MKII, Subsea LBL Positioning System
ROV Mount Transceiver
30 kHz band (MF)
FSK and PSK (Cymbal®) signalling modes
For use in support of Long Base Line (LBL) positioning operations
Polyurethane coated titanium housing
Depth rated: up to 7000 m
APOS interface: RS-232
User interface: RS-232/422/485
Power supply: 20-28 Vdc, 1 Ampere (max)
Internal battery type: Lithium Iron Phosphate (Li-Fe - rechargeable)
Length, diameter: weight air/water: 278,105 mm; 4.2 kg/2.2 kg
Package comprises of the following items:
- cPAP MKII 37 Ti, Subsea LBL Transceiver, (part no. 475554)
- Remote Transducer TDR180-St, 7000m rated (part no. 375361)
- Subsea Cable from cPAP to transducer, 6 m, (part no, 345772)
- Subsea Pigtail for cPAP, 0.6 m (part no. 345771)
- cNODE® MiniS Battery Charger (part no. 404199).
Optional system items:
- APOS Survey Operator Station.

cPAP® 30, Portable Telemetry Unit
Portable Medium Frequency (MF) Transceiver Unit
Fully compatible with all Kongsberg (MF) acoustic channels, including
Cymbal® protocol
Operation temperature: -5 to +55°C
Splash proof IP 54 case
Internal rechargeable lead/acid battery pack (3 hours operation)
Power supply: 100-240 Vac
Diameter, weight: 488 x 185 mm, 16 kg
Supplied with a dunking transducer with 70 m cable on reel.
UNDERWATER POSITIONING – SUBSEA HAIN SYSTEM

**HAIN Subsea 7000 with APOS Survey**

*Hydroacoustic Aided Inertial Navigation Package*

System features:
- Integrates DVL, SV, Pressure and LBL into one subsea unit
- Precise, smooth and accurate positioning
- High position update rate
- Precise and accurate depth
- Precise and accurate orientation (heading, roll and pitch)
- Precise and accurate velocity estimate in 3D
- Estimation and compensation of sensor errors
- NavLab post-processing for improved accuracy, precision and integrity.

Package is supplied with Subsea MGC® R3 IMU/Processing module, Nortek DVL500, Valeport miniIPS and APOS Survey computer which enables independent HiPAP®, cPAP® and Subsea HAIN operations from the vessels ROV/Survey area.

The APOS Survey computer includes the following enabled APOS software functions: CYMBAL (requires HiPAP® X81/X82 transceiver unit), LBL ROV, vessel and transponder positioning, interface to cPAP® ROV transceiver unit, Subsea HAIN.

**Subsea MGC® R3 IMU/Processing unit specifications:**

Integrated position accuracy: Up to 3 times better than aiding position
Heading accuracy (GNSS aided): 0.04° RMS (secant latitude)
Dynamic accuracy roll & pitch: 0.01° RMS
Dynamic accuracy heave: 5 cm or 5 % (whichever is highest)
Angle random walk: 0.008° / sq. root hour
Housing connector types: SubConn (1 x 16-pin and 3 x 8-pin):
  - Connection to topside: Ethernet 10 Mbit
  - Interface to DVL and Depth sensor
  - 1 PPS signal output.
Power input: 24 VDC (20–32V input range), 200 W
Power output to sensors: 3 x 24 VDC, total 60 W; 1 x 12 VDC, 60 W
Titanium housing, depth rated to 7000 m
Length, diameter: 368 mm, 187 mm
Weight in air/water: 20 kg /12.5 kg.

**Nortek DVL500 specifications:**

Frequency: 500 kHz
Bottom track range: 0.3 - 200 m
Titanium housing, depth rated to 6000 m
Power input: 12-48 VDC, 3 W (average)
Length, diameter: 203 mm, 186 mm
Weight in air/water: 5.9 kg / 3.1 kg.

**Valeport miniIPS Intelligent Pressure Sensor specifications:**

*Temperature Compensated Piezo-Resistive Sensor*

Pressure range: up to 600 Bar
Accuracy: ±0.01% FS
Resolution: ±0.001% FS
Titanium housing, depth rated to 6000 m
Power input: 9-28 VDC, >0.4 W
Diameter, length: 40 mm, 185 mm (incl. connector)
Weight (air): <1 kg.

**Note:** Sound velocity sensor is optional and not included in package.
NavLab Post-Processing Computer
Installed with latest NavLab software
Supplied with software licence dongle
Used for post-processing of real time subsea HAIN data.
Improves quality of the logged real-time subsea HAIN position.

IMPORTANT NOTES:
The Doppler Velocity Log calibration is processed using the NavLab software. Without NavLab software available onboard the vessel, the system cannot be setup correctly as it will not be possible to do a correct Doppler Velocity Log calibration.

NavLab: software package can also be used to improve the real-time estimates of ROV position and attitude produced by the on-line subsea HAIN system. NavLab is a software system intended not only for navigation data post-processing, but also for navigation system research and development and navigation system accuracy analysis. It can therefore be used to analyse the on-line performance of the Subsea HAIN system and fine-tune its parameters, can also be used to assist in system fault finding.
UNDERWATER POSITIONING – TRANSUDCERS & CABLES

cPAP® 34-30H Transducer
30 kHz band (MF)
For use in Long Baseline (LBL) mode
Aluminium housing, depth rated to 4000 m
30° horizontal beam pattern
Connector type: SubConn MCBH4MSS
Diameter, length, weight (air/water): 77, 213 mm, 1.54 kg/0.8 kg


cPAP® 34-40V Transducer
30 kHz band (MF)
Aluminium housing, depth rated to 4000 m
40° vertical cone beam pattern
Connector type: SubConn MCBH4MSS
Diameter, length, weight (air): 100, 200 mm, 1.54 kg


cPAP® 34-180 Transducer
30 kHz band (MF)
Aluminium housing, depth rated to 4000 m
180° (omni) directional beam pattern
Connector type: SubConn MCBH4MSS
Diameter, length, weight (air): 86, 200 mm, 1 kg

Dunking Transducer TDD 180
MF Transducer & Cable
Part No. 320822
180° beam pattern transducer
To be used for depths down to 500 m
Supplied with a 70 m kevlar armoured cable on drum
Compatible with cPAP® 30 portable transceiver unit
Width, height, depth: 430, 500, 590 mm

Dunking Transducer TDD 30V
MF Transducer & Cable
Part No. 320680
30° vertical beam pattern transducer
To be used for depths down to 4000 m
Supplied with a 70 m kevlar armoured cable on drum
Compatible with cPAP® 30 portable transceiver unit
Width, height, depth: 430, 500, 590 mm

HiPAP®35xP / μPAP® 20x Transducer Cable
Option of 50 m or 70 m length transducer cable
Cable diameter: 12 mm
Subsea plug diameter: Approx. 44 mm
Length, weight: 50 m, 10 kg.
**UNDERWATER POSITIONING – OPTIONAL ITEMS**

**TTC 30**
Transponder Test and Configuration Unit
- Fully compatible with all Kongsberg (MF) acoustic channels, including Cymbal® protocol
- Supplied with TT 30 test transducer (2.5 m cable length)
- Supplied with a 5 m serial cable which enables connection to cNODE transponder
- Operation temperature: -5 to +55°C
- Splash proof IP 54 case
- Internal rechargeable lead/acid battery pack (3 hours operation)
- Power supply: 100-240 Vac
- Diameter, weight: 488 x 185 mm, 16 kg.

**TTC Light**
Transponder Test and Configuration Tool
- TTC Light software installed on PC running Windows 7 or above
- The TTC Light software can be used to:
  - Test cNODE transponders from PC via interface cable to:
    - Read transponder configuration settings (serial number, acoustic channel and mode, battery capacity, transducer type)
    - Configure Cymbal or FSK Mode and channels
    - Upload new transponder firmware.
  - Perform acoustic tests (requires cNODE MiniS) to:
    - Read transponder configuration settings (serial number, acoustic channel and mode, channel number, battery capacity, read sensors)
    - Configure Cymbal or FSK Mode and channels
    - Execute acoustic release
    - In air acoustic range test.

  **Note:** A cNODE MiniS transponder (not included) is required to be connected to the PC via the supplied serial cable and act as a transducer/transceiver to run acoustic tests to all cNODE transponder types.

**ACU 30, Acoustic Command Unit**
Portable Medium Frequency (MF) Transceiver Unit
- Part No. 320101
- Fully compatible with Kongsberg ACS 500 Cymbal protocol
- Operation temperature: -5 to +55°C
- Splash proof case - IP 54 rated
- Internal rechargeable lead/acid battery pack (3 hours operation)
- Power supply: 100-240 Vac
- Diameter, weight: 488 x 185 mm, 16 kg

  **Note:** Unit configured as per existing installation set-up.

  **Optional system item:**
  - Dunking transducer on 70 m cable reel.

**Responder Drive Kit for HiPAP® 35xP/50x or μPAP® 20x**
Hardware for providing responder trigger signals from HiPAP or μPAP system to responder units
- Technical specifications:
  - Dust and water protected (IP 44 rated)
  - Can be located near ROV control rooms
  - Requires 230 Vac / 150 mA power supply
  - Four + 24 V / 5 ms electrical trigger outputs
  - Four optical pulse outputs
  - Green LED’s for every 8 responder outputs
  - Dimensions (L x W x H): 280 x 200 x 73 mm, Weight: 2.9 kg.

**Remote HiPAP®50x Operator Station**
Acoustic Positioning System Computer
- Supplied with the latest APOS software to allow system master/slave operations from different locations onboard the vessel.

  **APOS computer specifications:**
  - Dimensions (L x W x H): 425 x 425 x 185 mm; Weight: 17 kg.
  - Power: 90-132 / 180-264 Vac, 80 W.
APOS Survey
Acoustic Positioning System Computer for Survey
Enables independent HiPAP, cPAP and Subsea HAIN system operations from the vessels ROV/Survey area.
Supplied with the latest Survey APOS software and licence.
Includes the following enabled APOS software functions:
- CYMBAL (requires HiPAP 351/451/501 transceiver or later)
- SSBL Fast Track
- LBL ROV, vessel and transponder positioning
- Interface to cPAP ROV transceiver unit

APOS Survey computer specifications:
8-port serial card: 4 x RS-232 and 4 x RS-422/485
Ethernet ports: Net A, B and C
Dimensions (L x W x H): 425 x 425 x 185 mm; Weight: 17 kg.
Power: 90-132 / 180-264 V ac, 80 W.

Note: Additional APOS software functions available on request.

APOS LBL Function
APOS software option which enables Long Base Line operations when using HiPAP®, μPAP® and cPAP® systems.
Option includes:
- LBL Geographical Calibration
- Transponder LBL Positioning
- LBL and Sparse LBL Positioning for cPAP / ROV

Note: APOS software option available when supplied with acoustic positioning computer or with portable system.

APOS Transparent Modem Function
APOS software option which enables data communication with subsea modems.
Supports Hugin/Munin AUV positioning and data communication.

Note: APOS software option available when supplied with acoustic positioning computer or with portable system. Compatible with HiPAP®, μPAP® and cPAP® systems enabled with Cymbal acoustic protocol.
cNODE® Micro 31-180
Shallow Water ROV / Diver Positioning Transponder
30 kHz band (MF) Transponder / Responder
Fully compatible with Cymbal® acoustic protocol
SSBL and LBL positioning modes
Beamwidth: ± 90 degrees
Max source level: up to 170 dB
Internal tilt sensor: ± 90 degrees
Polyurethane coated aluminium housing; depth rated to 600 m
Rechargeable battery pack (Li-Ion)
Battery Lifetime (quiescent): < 10 days
Battery Lifetime (operational): > 28 hours (Cymbal® (Low power, 1 sec update rate))
External power: 24 Vdc, 1A
Length, diameter (housing / transducer): 227 mm, 55 mm
Weight in air / water: 1.0 / 0.4 kg.

Suitable for cNODE® Micro and MiniS transponders
Automatic fast / trickle charge modes
Permit fast charge between 5° C and 40° C
Maximum transponder battery charge time: 165 min
Supply voltage: 110-230 Vac
Enclosure protection: IP 30 rated
Width x Height x Depth: 256 x 83 x 355 mm
Weight: 2.9 kg.
**UNDERWATER POSITIONING – ROV TRANSPONDERS (cNODE MINIS)**

**cNODE® MiniS 34-180**  
ROV/Towfish Positioning Transponder  
30 kHz band (MF) Transponder / Responder  
Fully compatible with Cymbal® and HPR400 acoustic protocols  
SSBL / USBL and LBL positioning modes  
Beamwidth: ± 90 degrees  
Max source level: up to 188 dB  
Internal tilt sensor: ± 90 degrees  
Polyurethane coated aluminium housing, depth rating to 4000 m  
Rechargeable battery pack (Li-Ion)  
Battery Lifetime (quiescent): >30 days  
Battery Lifetime (operational): >2.5 days (Cymbal® (Low power, 1 sec update rate))  
External power: 24 Vdc (18-36 Vdc), 1A  
Length, diameter housing / transducer: 305.5 mm, 106 mm  
Weight in air / water: 4.0 / 2.1 kg.  
Optional item:  
- Transducer guard.

**cNODE® MiniS 34-40V**  
ROV/Towfish Positioning Transponder  
30 kHz band (MF) Transponder / Responder  
Fully compatible with Cymbal® and HPR400 acoustic protocols  
SSBL / USBL and LBL positioning modes  
Beamwidth: ± 20 degrees  
Max source level: up to 203 dB  
Internal tilt sensor: ± 90 degrees  
Polyurethane coated aluminium housing, depth rating to 4000 m  
Rechargeable battery pack (Li-Ion)  
Battery Lifetime (quiescent): >30 days  
Battery Lifetime (operational): >2.5 days (Cymbal® (Low power, 1 sec update rate))  
External power: 24 Vdc (18-36 Vdc), 1A  
Length, diameter housing / transducer: 321 mm, 105 mm  
Weight in air / water: 4.6 / 2.1 kg.  
Optional item:  
- Transducer guard.

**cNODE® MiniS 37-40V-Ti**  
ROV/Towfish Positioning Transponder  
30 kHz band (MF) Transponder / Responder  
Fully compatible with Cymbal® and HPR400 acoustic protocols  
SSBL / USBL and LBL positioning modes  
Beamwidth: ± 20 degrees  
Max source level: up to 203 dB  
Internal tilt sensor: ± 90 degrees  
Polyurethane coated titanium housing, depth rating to 7000 m  
Rechargeable battery pack (Li-Ion)  
Battery Lifetime (quiescent): >30 days  
Battery Lifetime (operational): >2.5 days (Cymbal® (Low power, 1 sec update rate))  
External power: 24 Vdc (18-36 Vdc), 1A  
Length, diameter housing / transducer: 321 mm, 105 mm  
Weight in air / water: 6.4 / 4.0 kg.  
Optional item:  
- Transducer guard.

**cNODE® MiniS / Micro Battery Charger**  
Suitable for cNODE® MiniS and Micro transponders  
Automatic fast / trickle charge modes  
Permit fast charge between 5° C and 40° C  
Maximum transponder battery charge time: 165 min  
Supply voltage: 110-230 Vac  
Enclosure protection: IP 30 rated  
Width x Height x Depth: 256 x 83 x 355 mm  
Weight: 2.9 kg.
UNDERWATER POSITIONING – cNODE MINIS TRANS PonDERS WITH PRESSURE SENSOR

cNODE® MiniS 30-180 P
Positioning Transponder with Pressure Sensor
30 kHz band (MF) Transponder / Responder
Integrated 10 bar pressure sensor, 0.05% FS
Depth rating: 100 m
Fully compatible with Cymbal® and HPR400 acoustic protocols
SSBL / USBL and LBL positioning modes
Beamwidth: ± 90 degrees
Max source level: up to 188 dB
Internal tilt sensor: ± 90 degrees
Polyurethane coated aluminium housing, depth rating to 4000 m
Rechargeable battery pack (Li-Ion)
Battery Lifetime (quiescent): >30 days
Battery Lifetime (operational): >2.5 days (Cymbal® (Low power, 1 sec update rate))
External power: 24 Vdc (18-36 Vdc), 1A
Length, diameter housing / transducer: 305.5 mm, 106 mm
Weight in air / water: 4.0 / 2.1 kg.
Depth rating: 100 m
Optional item:
• Transducer guard
• cNODE® MiniS / Micro battery charger.


cNODE® MiniS 31-180 P
Positioning Transponder with Pressure Sensor
30 kHz band (MF) Transponder / Responder
Integrated 100 bar pressure sensor, 0.05% FS
Depth rating: 1000 m
Fully compatible with Cymbal® and HPR400 acoustic protocols
SSBL / USBL and LBL positioning modes
Beamwidth: ± 90 degrees
Max source level: up to 188 dB
Internal tilt sensor: ± 90 degrees
Polyurethane coated aluminium housing, depth rating to 4000 m
Rechargeable battery pack (Li-Ion)
Battery Lifetime (quiescent): >30 days
Battery Lifetime (operational): >2.5 days (Cymbal® (Low power, 1 sec update rate))
External power: 24 Vdc (18-36 Vdc), 1A
Length, diameter housing / transducer: 305.5 mm, 106 mm
Weight in air / water: 4.0 / 2.1 kg.
Optional item:
• Transducer guard
• cNODE® MiniS / Micro battery charger.


cNODE® MiniS 34-40V P
Positioning Transponder with Pressure Sensor
30 kHz band (MF) Transponder / Responder
Integrated 400 bar pressure sensor, 0.05% FS
Depth rating: 4000 m
Fully compatible with Cymbal® and HPR400 acoustic protocols
SSBL / USBL and LBL positioning modes
Beamwidth: ± 20 degrees
Max source level: up to 203 dB
Internal tilt sensor: ± 90 degrees
Polyurethane coated aluminium housing, depth rating to 4000 m
Rechargeable battery pack (Li-Ion)
Battery Lifetime (quiescent): >30 days
Battery Lifetime (operational): >2.5 days (Cymbal® (Low power, 1 sec update rate))
External power: 24 Vdc (18-36 Vdc), 1A
Length, diameter housing / transducer: 321 mm, 105 mm
Weight in air / water: 4.6 / 2.1 kg.
Optional item:
• Transducer guard
• cNODE® MiniS / Micro battery charger.
cNODE® Mini 34-180
Positioning Transponder
30 kHz band (MF) Transponder / Responder
Fully compatible with Cymbal® and HPR400 acoustic protocols
SSBL / USBL and LBL positioning modes
Beamwidth: ± 90 degrees
Max source level: up to 190 dB
Polyurethane coated aluminium housing, depth rating to 4000 m
Rechargeable battery pack (NiMH)
Battery Lifetime (fully charged): Quiescent 60 days, 1 ping per sec / max source level 100,000 replies
External power: 15 ±10% Vdc, Min 300 W
Length, diameter housing / transducer: 598, 85 / 88 mm
Weight in air / water: 6.7 / 3.4 kg

Note: Battery pack does not take charge from external power supply.

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cNODE® Mini 34-40V
Positioning Transponder
30 kHz band (MF) Transponder / Responder
Fully compatible with Cymbal® and HPR400 acoustic protocols
SSBL / USBL and LBL positioning modes
Beamwidth: ± 20 degrees
Max source level: up to 203 dB
Polyurethane coated aluminium housing, depth rating to 4000 m
Rechargeable battery pack (NiMH)
Battery Lifetime (fully charged): Quiescent 60 days, 1 ping per sec / max source level 100,000 replies
External power: 15 ±10% Vdc, Min 300 W
Length, diameter housing / transducer: 600, 85 / 100 mm
Weight in air / water: 6.7 / 3.4 kg

Note: Battery pack does not take charge from external power supply.

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cNODE® Mini Battery Charger
Suitable for cNODE® Mini 34-40V and 34-180 transponders
Automatic fast / trickle charge modes
Permit fast charge between 5° C and 40° C
Maximum transponder battery charge time: 165 min
Supply voltage: 110-230 Vac
Enclosure protection: IP 30 rated
Width x Height x Depth: 256 x 83 x 355 mm
Weight: 2.9 kg.

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cNODE® Mini Power Convertor Module
Unit for supplying cNODE® Mini transponder with high DC power when not using the internal battery
Depth rating to 4000 m
Input: 110 / 230 Vac
Output: 15 Vdc / 300 W.
UNDERWATER POSITIONING – cNODE MIDI TRANSPONDERS

cNODE® Midi 34-180
Positioning Transponder*
30 kHz band (MF) Transponder with basic end cap
Fully compatible with Cymbal® and HPR 400 acoustic protocols
SSBL / USBL and LBL positioning modes
Beamwidth: +/- 90 degrees
Max source level: 190 dB
Polyurethane coated aluminium housing, depth rating to 4000 m
Supplied with a lithium battery pack (Type: D24-Li), Reg no. 322374)
Length, diameter: 704.5, 166 mm
Weight in air / water: 16.5 / 8.5 kg.

cNODE® Midi 34-180-Si
Positioning Transponder* with Sensor Interface Module
30 kHz band (MF) Transponder
Fully compatible with Cymbal® and HPR 400 acoustic protocols
SSBL / USBL and LBL positioning modes
Beamwidth: +/- 90 degrees
Max source level: 190 dB
Fitted with a modular end cap that can interface up to 3 (max) external sensors via RS-232/422/485 serial communications lines
Polyurethane coated aluminium housing, depth rating to 4000 m
Supplied with a lithium battery pack (Type: D24-Li), Reg no. 322374)
Length, diameter: 737.3, 166 mm
Weight in air / water: 17 / 9 kg

Note: External power source required if transponder is to be interfaced to a Gyrocompass.

cNODE® Midi 34-180-MTS/I
Positioning Transponder*
30 kHz band (MF) Transponder with Modular Top Section (MTS) fitted with inclinometers
Fully compatible with Cymbal® and HPR 400 acoustic protocols
SSBL / USBL and LBL positioning modes
Beamwidth: +/- 90 degrees
Max source level: 190 dB
Polyurethane coated aluminium housing, depth rating to 4000 m
Supplied with a lithium battery pack (Type: D24-Li), Reg no. 322374)
Length, diameter: 888.5, 166 mm
Weight in air / water: 21 / 10 kg
Modular top section incorporates inclinometers
Sensor specifications:
• Inclinometers: 0.05° (range +/- 90 degrees).

cNODE® Midi 34-180-MTS/PI
Positioning Transponder*
30 kHz band (MF) Transponder with Modular Top Section (MTS)
Fully compatible with Cymbal® and HPR 400 acoustic protocols
SSBL / USBL and LBL positioning modes
Beamwidth: +/- 90 degrees
Max source level: 190 dB
Polyurethane coated aluminium housing, depth rating to 4000 m
Supplied with a lithium battery pack (Type: D24-Li), Reg no. 322374)
Length, diameter: 888.5, 166 mm
Weight in air / water: 21 / 10 kg
Modular top section incorporates a Paroscientific Digiquartz® pressure sensor and Inclinometers
Sensor specifications:
• Depth: +/- 0.01% FS (FS = 6000 psi)
• Inclinometers: 0.05° (range +/- 90 degrees).
UNDERWATER POSITIONING – cNODE MAXI TRANSponders

cNODE® Maxi 34-180
Positioning Transponder
30 kHz band (MF) Transponder with basic end cap
Fully compatible with Cymbal® and HPR 400 acoustic protocols
SSBL / USBL and LBL positioning modes
Beamwidth: +/- 90 degrees
Max source level: 190 dB
Polyurethane coated aluminium housing, depth rating to 4000 m
Supplied with a lithium or alkaline battery pack
Length, diameter: 1014.5, 166 mm
Weight in air / water: 28 / 12.6 kg.

Note:

Positioning Transponder with Sensor Interface Module
30 kHz band (MF) Transponder
Fully compatible with Cymbal® and HPR 400 acoustic protocols
SSBL / USBL and LBL positioning modes
Beamwidth: +/- 90 degrees
Max source level: 190 dB
Fitted with a modular end cap that can interface up to 3 (max) eternal sensors via RS-232/422/485 serial communications lines
Polyurethane coated aluminium housing, depth rating to 4000 m
Supplied with a lithium or alkaline battery pack
Length, diameter: 1047.3, 166 mm
Weight in air / water: 28 / 12.6 kg.

Note: External power source required if transponder is to be interfaced to a Gyrocompass.

Positioning Transponder* with Sensor Interface Endcap Module
30 kHz band (MF) Transponder
Fully compatible with Cymbal® and HPR 400 acoustic protocols
SSBL / USBL and LBL positioning modes
Beamwidth: +/- 90 degrees
Max source level: 190 dB
Fitted with a serial interface modular end cap
Polyurethane coated aluminium housing, depth rating to 4000 m
Supplied with a lithium battery pack (Type: D48-Li), Reg no. 319554)
Length, diameter: 1165, 191 (approx.) mm
Weight in air / water: 29 / 13 kg.

Note: The transponder endcap module can be preconfigured to accept a RS-232 serial input from external instruments like a Paroscientific Digiquartz® pressure sensor or Mesotech 1007/1107D altimeter, etc. The serial endcap module can supply an output voltage of 24 VDC to the external sensor.

Positioning Transponder
30 kHz band (MF) Transponder with release mechanism
Fully compatible with Cymbal® and HPR 400 acoustic protocols
SSBL / USBL and LBL positioning modes
Beamwidth: +/- 90 degrees
Max source level: 190 dB
Polyurethane coated aluminium housing, depth rating to 4000 m
Supplied with a lithium or alkaline battery pack
Length, diameter: 1217.5, 166 mm
Weight in air / water: 30 / 14 kg.
cNODE® Maxi 34-180-MTS/i
Positioning Transponder
30 kHz band (MF) Transponder and Modular Top Section (MTS) fitted with inclinometers
Fully compatible with Cymbal® and HPR 400 acoustic protocols
SSBL / USBL and LBL positioning modes
Beamwidth: +/- 90 degrees
Max source level: 190 dB
Polyurethane coated aluminium housing, depth rating to 4000 m
Supplied with a lithium battery pack (Type: D48-Li, Reg no. 319554))
Length, diameter: 1198.5, 166 mm
Weight in air / water: 32 / 15 kg
Modular top section incorporates inclinometers
Sensor specifications:
  • Inclinometers: 0.05° (range +/- 90 degrees).

cNODE® Maxi 34-180-R-IMTS/PI
Positioning Transponder
30 kHz band (MF) Transponder with release mechanism and Modular Top Section (MTS)
Fully compatible with Cymbal® and HPR 400 acoustic protocols
SSBL / USBL and LBL positioning modes
Beamwidth: +/- 90 degrees
Max source level: 190 dB
Polyurethane coated aluminium housing, depth rating to 4000 m
Supplied with a lithium battery pack (Type: D48-Li, Reg no. 319554))
Length, diameter: 1403, 166 mm
Weight in air / water: 34 / 15 kg
Modular top section incorporates a Paroscientific Digiquartz® pressure sensor and Inclinometers
Sensor specifications:
  • Depth: +/- 0.01% FS (FS = 3000 or 6000 psi)
  • Inclinometers: 0.05° (range +/- 90 degrees).

Sensor specifications:
• Sound Velocity: +/- 0.02 m/s (25 mm path length)
• Depth: +/- 0.01% FS (FS = 3000 or 6000 psi).
• Inclinometers: 0.05° (range +/- 90 degrees).

Sensor specifications:
• Sound Velocity: +/- 0.02 m/s (25 mm path length)
• Depth: +/- 0.01% FS (FS = 3000 or 6000 psi).
• Inclinometers: 0.05° (range +/- 90 degrees).

cNODE® Maxi 34-180-IMEC/SiPI
Positioning Transponder with instrumented modular end cap
30 kHz band (MF) Transponder
Fully compatible with Cymbal® and HPR 400 acoustic protocols
SSBL / USBL and LBL positioning modes
Beamwidth: +/- 90 degrees
Max source level: 190 dB
Polyurethane coated aluminium housing, depth rating to 4000 m
Supplied with a lithium battery pack (Type: D48-Li, Reg no. 319554))
Length, diameter: 1165 (approx.), 230 mm
Weight in air / water: 34.6 / 15 kg
Modular end cap incorporates an external serial sensor interface, Paroscientific Digiquartz® pressure sensor and Inclinometers
Sensor specifications:
  • Depth: +/- 0.01% FS (FS = 2000 psi)
  • Inclinometers: 0.05° (range +/- 30 degrees).
cNODE® Maxi 34-180-MEC/MGC R3
Positioning Transponder with instrumented modular end cap*

- 30 kHz band (MF) Transponder
- Fully compatible with Cymbal® and HPR 400 acoustic protocols
- SSBL / USBL and LBL positioning modes
- Beamwidth: +/- 90 degrees
- Max source level: 190 dB
- Polyurethane coated aluminium housing, depth rating to 4000 m
- Battery endurance with MGC: up to 72 hours
- Length, diameter: 1211.5, 212 mm
- Weight in air / water: 45 / 22 kg
- Modular end cap incorporates a Motion Gyro Compass (MGC) sensor

Sensor specifications:
- Heading accuracy: 0.15° RMS (secant latitude)
- Dynamic accuracy roll & pitch: 0.01° RMS.

Note: Day rates listed valid when an external power supply is used to power the MGC module or when customer free issues a battery pack.

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cNODE® Maxi 34-180-MEC/MGC R3-MTS/PI
Positioning Transponder with instrumented modular top and end caps*

- Fitted with Modular Top Section (MTS) and Modular End Cap (MEC)
- 30 kHz band (MF) Transponder
- Fully compatible with Cymbal® and HPR 400 acoustic protocols
- SSBL / USBL and LBL positioning modes
- Beamwidth: +/- 90 degrees
- Max source level: 190 dB
- Polyurethane coated aluminium housing; depth rated to 4000 m
- Supplied with a lithium battery pack (Type: D48-Li), Reg no. 319554)
- Battery endurance with MGC: up to 72 hours
- Length, diameter: 1437, 221 (281) mm
- Weight in air / water: approx. 48.4 / 22.5 kg
- Modular end cap incorporates a Motion Gyro Compass (MGC) R3 sensor
- Modular top section incorporates a Paroscientific Digiquartz® pressure sensor and Inclinometers.

Sensor specifications:
- MGC heading accuracy: 0.15° RMS (secant latitude)
- MGC dynamic accuracy roll & pitch: 0.01° RMS
- Depth: +/- 0.01% FS (FS = 3000 or 6000 psi)
- Inclinometers: 0.05° (range +/- 90 degrees).

Note: Day rates listed valid when an external power supply is used to power the MGC module or when customer free issues a battery pack.

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cNODE® Maxi 34-30V30H
Positioning Transponder

- 30 kHz band (MF) Transponder with basic end cap
- Fully compatible with Cymbal® and HPR 400 acoustic protocols
- SSBL / USBL and LBL positioning modes
- Dual transducer beam: 30° vertical and 30° horizontal
- Max vertical beam source level: 205 dB
- Polyurethane coated aluminium housing, depth rating to 4000 m
- Supplied with a lithium or alkaline battery pack
- Length, diameter: 1161, 184 mm
- Weight in air / water: 28 / 12.6 kg.

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cNODE® Maxi 34-30V30H-R
Positioning Transponder

- 30 kHz band (MF) Transponder with release mechanism
- Fully compatible with Cymbal® and HPR 400 acoustic protocols
- SSBL / USBL and LBL positioning modes
- Dual transducer beam: 30° vertical and 30° horizontal
- Max vertical beam source level: 206 dB
- Polyurethane coated aluminium housing, depth rating to 4000 m
- Supplied with a lithium or alkaline battery pack
- Length, diameter: 1364, 184 mm
- Weight in air / water: 30 / 14 kg.
cNODE® Maxi 36-30V30H-R-St
Positioning Transponder
30 kHz band (MF) Transponder with release mechanism
Fully compatible with Cymbal® and HPR 400 acoustic protocols
SSBL / USBL and LBL positioning modes
Dual transducer beam: 30° vertical and 30° horizontal
Max vertical beam source level: 206 dB
Polyurethane coated stainless steel housing, depth rating to 6000 m
Supplied with a lithium or alkaline battery pack
Length, diameter: 1364, 184 mm
Weight in air / water: / kg.

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cNODE® Maxi 34-30V
Positioning Transponder
30 kHz band (MF) Transponder with basic end cap
Fully compatible with Cymbal® and HPR 400 acoustic protocols
Beamwidth: +/- 15 degrees
Max vertical beam source level: 206 dB
Polyurethane coated aluminium housing, depth rating to 4000 m
Supplied with a lithium or alkaline battery pack
Length, diameter: 1014.5, 166 mm
Weight in air / water: 26 / 12.6 kg.

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cNODE® Maxi 34-30V-R
Positioning Transponder
30 kHz band (MF) Transponder with release mechanism
Fully compatible with Cymbal® and HPR 400 acoustic protocols
SSBL / USBL positioning modes
Beamwidth: +/- 15 degrees
Max vertical beam source level: 206 dB
Polyurethane coated aluminium housing, depth rating to 4000 m
Supplied with a lithium or alkaline battery pack
Length, diameter: 1217.5, 166 mm
Weight in air / water: 30 / 14 kg.
UNDERWATER POSITIONING – cNODE MIDI/MAXI TRANSPONDER MODULES

cNODE® Maxi/Midi 34 Transducer TD180
Transducer for cNODE® Maxi 34 transponder
Part No. 319750
Beam width: 180°
Receiver sensitivity: 100 dB
Max source level: 190 dB
Anodised aluminium, depth rated to 4000 m
Length, diameter: 169.5, 166 mm.

cNODE® Maxi/Midi 34 Transducer TD30V30H
Transducer for cNODE® Maxi 34 transponder
Part No. 313455
Beam width: 30° vertical / 30° horizontal
Receiver sensitivity: 85 dB
Max source level: 206 dB / 190 dB
Anodised aluminium, depth rated to 4000 m
Length, diameter: 316, 184 mm.

cNODE® Maxi/Midi 34 Transducer TD30V
Transducer for cNODE® Maxi 34 transponder
Part No. 320662
Beam width: 30° vertical
Receiver sensitivity: 85 dB
Max source level: 206 dB
Anodised aluminium, depth rated to 4000 m

cNODE® Maxi/Midi 34 Top End Cap
Top end cap for remote transducer
Part No. 320949
Polyurethane coated anodised aluminium unit
Depth rated to 4000 m
Bulkhead connector type: Subconn
Length, diameter: 62, 166 mm.

cNODE® Maxi/Midi 34 Serial Sensor Interface
Bottom end cap Si for cNODE® Maxi 34 transponder
Part No. 347652
Interface up to a maximum of three (3) external sensors
Serial input types: RS-232 or RS-485/422
Polyurethane coated anodised aluminium unit
Depth rated to 4000 m
Bulkhead connector type: Subconn MCBH16M
Length, diameter: 72.8, 144 mm.

cNODE® Maxi/Midi 34 Modular Top Section
Modular Top Section (MTS/I)
Part No. 407000
Module incorporates inclinometers
Specifications:
• Inclinometer: 0.05°
Polyurethane coated anodised aluminium unit
Depth rated to 4000 m
Length, diameter: 184, 144 mm.

cNODE® Maxi/Midi 34 Modular Top Section
Modular Top Section (MTS/Sv)
Part No. TBC
Module incorporates a Valeport miniSVS sound velocity sensor
Specifications:
• Sound velocity: +/- 0.02 m/s
Polyurethane coated anodised aluminium unit
Depth rated to 4000 m
Length, diameter: 184, 144 mm.
**cNODE® Maxi/Midi 34 Modular Top Section**  
Modular Top Section (MTS/PI)  
Part No. 449270  
Module incorporates a Paroscientific Digiquartz® pressure sensor and inclinometers  
Specifications:  
- Depth: +/- 0.01% FS (FS = 6000 psi)  
- Inclinometer: 0.05°  
Polyurethane coated anodised aluminium unit  
Depth rated to 4000 m  
Length, diameter: 184, 144 mm.

**cNODE® Maxi/Midi 34 Modular Top Section**  
Modular Top Section (MTS/SvPI)  
Part No. 388700  
Module incorporates a Paroscientific Digiquartz® pressure sensor, inclinometers and sound velocity sensor  
Specifications:  
- Depth: +/- 0.01% FS (FS = 6000 psi)  
- Inclinometer: 0.05°  
- Sound velocity: +/- 0.02 m/s.  
Polyurethane coated anodised aluminium unit  
Depth rated to 4000 m  
Length, diameter: 184, 144 mm.

**cNODE® Maxi/Midi 34 Modular End Cap**  
Modular End Cap (MEC/SiPI)  
Part No. 395555  
Module incorporates an external serial sensor interface, Paroscientific Digiquartz® pressure sensor and inclinometers  
Specifications:  
- Depth: +/- 0.01% FS (FS = 2000 psi)  
- Inclinometer: 0.05°  
Polyurethane coated anodised aluminium unit  
Depth rated to 4000 m  
Length, diameter: 190.5, 191.2 mm.

**cNODE® Maxi/Midi 34 Modular End Cap**  
Modular End Cap (Seatex MGC® R3)  
Part No. 397960  
Module incorporates a Motion Gyro Compass sensor  
Specifications:  
- Heading accuracy (unaided): 0.08° RMS (secant latitude)  
- Dynamic accuracy roll & pitch: 0.01° RMS  
Polyurethane coated anodised aluminium unit  
Aluminium housing depth rated to 4000 m  
Power requirements: 10-36 Vdc, 20 W (max)  
Length (with blanking cap), diameter: 324, 212 mm  
Weight in air / water: 19.2 / 8.5 kg.  

**Note:** Non-ITAR product.
### cNODE® Maxi Floatation Collar
Flotation Collar for cNODE® Maxi Transponder
Part No. 320772
Depth rating: 2000 m
Compatible with aluminium cNODE® Maxi 34 transponders
Buoyancy: 30 kg
Width, height, depth: 358, 949, 300 mm
Weight air/water: 43 kg / -30 kg.

### cNODE® Maxi Floatation Collar
Flotation Collar for cNODE® Maxi Transponder
Part No. 319301
Depth rating: 4000 m
Compatible with aluminium cNODE® Maxi 34 transponders
Buoyancy: 30 kg
Width, height, depth: 455, 948, 350 mm
Weight air/water: 70 kg / -30 kg.

### cNODE® Maxi Floatation Collar
Deepwater Floatation Collar for cNODE® Maxi Transponder
Part No. 331151
Depth rating: 6000 m
Compatible with stainless steel cNODE® Maxi X6 transponders
Buoyancy: kg
Width, height, depth: , , mm
Weight air/water: kg / kg.

### cNODE® Maxi Floatation Collar
Flotation Collar for cNODE® Maxi Transponder
Part No. 331150
Depth rating: 7000 m
Compatible with stainless steel cNODE® Maxi X7 transponders
Buoyancy: kg
Width, height, depth: 572, 945, 488 mm
Weight air/water: 98 kg / kg.

### cNODE® MiniS Floatation Collar
Flotation Collar for cNODE® MiniS transponder
Part No. 442750
Depth rating: 4000 m
Buoyancy (collar only): 6.3 kg
Height with cage, diameter; weight in air: 524, 350 mm; 16.66 kg.
Note: transponder not included.

### cNODE® Mini Floatation Collar
Flotation Collar for cNODE® Mini transponder
Part No. 366186
Depth rating: 4000 m
Buoyancy: 3.5 kg
Height with cage, diameter, weight: 597, 290 mm, 9 kg.
Note: transponder not included.
GeoSwath 4R Bathymetric Sonar System
Portable Wide Swath Bathymetry and Side Scan Sonar
IHO SP-44, special order
Frequency: 500 kHz
Range: 1 to 50 m
Maximum swath width: 190 m
Depth resolution: 1.5 mm
Seafloor coverage: up to 12 times water depth
Splash proof deck unit, IP66 rated
Power supply requirements: 24 Vdc, 40 W
Laptop PC running GS4 data acquisition and processing software
Supplied with assembly for mounting transducers and optional sensors
Transducer head dimensions: 330 x 109 x 75 mm
Supplied with 10 m or 20 m length transducer and sensor cables
Optional system items:
- Valeport miniSVS sound velocity sensor
- Seatex Seapath 130 or MRU-3/H/5 (fitted in subsea housing).

Mesotech M3 Sonar - Bathy System
Shallow Water High Resolution Bathymetric Sonar
Sonar head part no. 922-20220000
Frequency: 500 kHz
Range: 0.2 m to 50 m
Maximum 120° view angle
Range resolution: 1 cm
Vertical beamwidth: 3°
Number of beams: 256
Update rate: up to 40 Hz
Supplied with M3 Sonar processor computer and interface unit
Supplied with 6 m or 15 m sonar head cable assembly
Input voltage/power: 12 to 36 VDC / 22 W (typical)
Anodised aluminium sonar head, depth rated to 500 m
Connector type: SEACON / MINK-10-FCRL
Height, width, weight air/water: 145, 213 mm, 4.6/1.7 kg
Optional auxiliary sensors and hardware/software:
- AML Micro X or Valeport miniSVS sound velocity sensor
- Seatex Seapath 130 system
- Over-the-side mounting pole assembly
- QINSy Survey Lite data acquisition software.

Mesotech M3 Sonar - Single Head ROV System
High Resolution Imaging and Profiling Sonar
Sonar head part no. 922-20060000
Frequency: 500 kHz
Range: 0.2 m to 50 m
Field of view: 120° / (EIQ 140°)
Beamwidth (Imaging): 1.6° x (3° / 7° / 15° / 30°)
Beamwidth (EIQ): 0.95° x 30°
Beamwidth (Profiling / Bathymetry): 1.6° x 3°
Telemetry: Ethernet (10/100/1000 Mbps)
Input voltage/power: 12 to 36 VDC / 22 W (typical)
Titanium sonar head, depth rated to 4000 m
Height, width, weight air/water: 159, 217 mm, 8.5/5.3 kg
Supplied with items:
- M3 sonar head, 4000m depth rated
- M3 Sonar Head Accessory Kit
- M3 Sonar cable whip, 4.5m
- M3 Sonar cable whip, 6.1m, Sync/1PPS
- M3 Sonar mounting bracket
- M3 Sonar software.
Mesotech M3 Sonar - Dual Head ROV System

High Resolution Imaging and Profiling Sonar

Sonar head part no. 922-2006000
Frequency: 500 kHz
Range: 0.2 m to 50 m
Field of view: 120° / (EIQ 140°)
Beamwidth (Imaging): 1.6° x (3° / 7° / 15° / 30°)
Beamwidth (EIQ): 0.95° x 30°
Beamwidth (Profiling / Bathymetry): 1.6° x 3°
Telemetry: Ethernet (10/100/1000 Mbps)
Input voltage/power: 12 to 36 VDC / 22 W (typical)
Titanium sonar head, depth rated to 4000 m
Height, width, weight air/water: 159, 217 mm, 8.5/5.3 kg
Package supplied with items:
• 2 x M3 sonar head, 4000m depth rated
• M3 Sonar Head Accessory Kit
• 2 x M3 Sonar cable whip, 4.5m
• M3 Sonar dual head sync cable, 6.1m
• M3 Sonar mounting bracket
• M3 Sonar software.

EM 2040PHS MKII Multibeam Echo Sounder System

Portable Hydrographic System with Single Swath

Frequency range: 200 to 400 kHz (optional: 600 / 700 kHz modes)
Swath coverage sector: up to 170°
Beam width: 1° x 1° @ 400 kHz
Max ping rate: 50 Hz
Number of beams per ping: 512 (single swath)
Range: 0.5 to 270 m (400 kHz, FM mode, cold ocean water)
Depth accuracy: 2 cm
Beam pattern: Equidistant, Equiangular & High Density
Roll, Pitch & Yaw stabilised beams
Laptop computer c/w Seafloor Information System (SIS 5) software
Sonar head depth rating: 30 m
Sonar head dimensions (L x W x H): 482 x 298 x 166 mm
Sonar Head weight air/water: 19.5/1.7 kg
Package comprises of the following main items:
• EM 2040P transducer fitted with AML Sound Velocity Sensor
• 15 m or 30 m length transducer cable
• EM 2040P processing unit, splash-proof version, single swath
• Seatex Seapath 130 system, including MRU-5+ in 10 m subsea bottle
• 3710 DGNSS Receiver kit
• Universal Sonar Mount (USM) expeditionary pole.

EM 2040P MKII Multibeam Echo Sounder System

Portable Transducer System with Single Swath

Frequency range: 200 to 400 kHz (optional: 600 / 700 kHz modes)
Swath coverage sector: up to 170°
Beam width: 1° x 1° @ 400 kHz
Max ping rate: 50 Hz
Number of beams per ping: 512
Range: 0.5 to 270 m (400 kHz, FM mode, cold ocean water)
Depth accuracy: 2 cm
Beam pattern: Equidistant, Equiangular & High Density
Roll, Pitch & Yaw stabilised beams
HWS or laptop computer c/w Seafloor Information System software
Sonar head depth rating: 30 m
Sonar head dimensions (L x W x H): 482 x 298 x 166 mm
Sonar Head weight air/water: 19.5/1.7 kg
Supplied with a 15 m, 30 m or 50 m length transducer cable
Optional system items:
• Transducer mounting bracket
• Universal Sonar Mount (USM) expeditionary pole
• Seatex Seapath 130
• AML Sound velocity sensor.
**EM 2040P Multibeam Echo Sounder System**  
**Portable Transducer System with Single Swath**

- Frequency range: 200 to 400 kHz
- Swath coverage sector: up to 140°
- Beam width: 1° x 1° @ 400 kHz
- Max ping rate: 50 Hz
- Number of beams per ping: 400
- Range: 0.5 to 450 m (300 kHz, FM mode, cold ocean water)
- Depth accuracy: 2 cm
- Beam pattern: Equidistant, Equiangular & High Density
- Roll, Pitch & Yaw stabilised beams
- Supplied with a 15 m, 30 m or 50 m length transducer cable
- HWS computer c/w Seafloor Information System (SIS) software
- Sonar head depth rating: 30 m
- Sonar head dimensions (L x W x H): 560 x 300 x 166 mm
- Sonar Head weight air/water: 19.5/1.7 kg
- Optional system items:
  - Transducer mounting bracket
  - Universal Sonar Mount (USM) expeditionary pole.

**EM 2040P Multibeam Echo Sounder System**  
**Portable Transducer System with Dual Swath**

- Frequency range: 200 to 400 kHz
- Swath coverage sector: up to 140°
- Beam width: 1° x 1° @ 400 kHz
- Max ping rate: 50 Hz
- Number of beams per ping: 800
- Range: 0.5 to 450 m (300 kHz, FM mode, cold ocean water)
- Depth accuracy: 2 cm
- Beam pattern: Equidistant, Equiangular & High Density
- Roll, Pitch & Yaw stabilised beams
- HWS computer c/w Seafloor Information System (SIS) software
- Sonar head depth rating: 30 m
- Sonar head dimensions (L x W x H): 560 x 300 x 166 mm
- Sonar Head weight air/water: 19.5/1.7 kg
- Supplied with a 15 m, 30 m or 50 m length transducer cable
- Optional system items:
  - Transducer mounting bracket
  - Universal Sonar Mount (USM) expeditionary pole.

**EM 2040C Multibeam Echo Sounder System**  
**Single Compact Transducer System with Single Swath**

- Frequency range: 200 to 400 kHz in steps of 10 kHz
- Swath coverage sector: up to 130°
- Beam width: 1° x 1° (400 kHz)
- Max ping rate: 50 Hz
- Number of beams per ping: 400 (single swath) / 800 (dual swath)
- Range: 0.5 to 450 m (300 kHz, FM mode, cold ocean)
- Depth accuracy: 2 cm
- Beam pattern: Equidistant, Equiangular & High Density
- Roll, Pitch & Yaw stabilised beams
- HWS computer c/w Seafloor Information System (SIS) software
- Sonar Head height, diameter, weight air/water: 119, 332 mm, 21/12.6kg
- Supplied with a 15 m, 30 m or 50 m length transducer cable
- Optional system items:
  - Dual Swath mode - additional cost of £50 per day
  - Transducer mounting bracket, Single RX.

**EM 2040C Multibeam Echo Sounder System**  
**Dual Compact Transducer System with Single Swath**

- Frequency range: 200 to 400 kHz in steps of 10 kHz
- Swath coverage sector: up to 200°
- Beam width: 1° x 1° (400 kHz)
- Max ping rate: 50 Hz
- Number of beams per ping: 800 (single swath) / 1600 (dual swath)
- Range: 0.5 to 450 m (300 kHz, FM mode, cold ocean)
- Depth accuracy: 2 cm
- Beam pattern: Equidistant, Equiangular & High Density
- Roll, Pitch & Yaw stabilised beams
- HWS computer c/w Seafloor Information System (SIS) software
- Sonar Head height, diameter, weight air/water: 119, 332 mm, 21/12.6kg
- Supplied with a 15 m, 30 m or 50 m length transducer cables
- Optional system items:
  - Dual Swath mode - additional cost of £200 per day
  - Transducer mounting bracket, Dual RX.
**EM 2040 MKII (0.7º x 0.7º) Multibeam Echo Sounder System**  
*Single RX Transducer System with Single Swath*

- Frequency range: 200 to 400 kHz  
- Swath coverage sector: up to 170°  
- Max ping rate: 50 Hz  
- Number of beams per ping: 512  
- Range: 0.5 to 470 m (300 kHz, cold ocean)  
- Depth accuracy: 2 cm  
- Beam pattern: Equidistant, Equiangular & High Density  
- Roll, Pitch & Yaw stabilised beams  
- Transducers depth rated to 6000 m  
- Supplied with 15 m, 30 m or 50 m length transducer cables  
- HWS computer c/w Seafloor Information System (SIS) software  
- TX transducer length, width, height (mm), weight air/water (kg): 407 x 142 x 150 mm, 24/16 kg  
- RX transducer length, width, height (mm), weight air/water (kg): 407 x 142 x 136 mm, 23/16 kg  
- Optional system item:  
  - 600 / 700 kHz modes  
  - Transducer mounting POD.

**EM 2040 MKII (0.7º x 0.7º) Multibeam Echo Sounder System**  
*Single RX Transducer System with Dual Swath*

- Frequency range: 200 to 400 kHz  
- Swath coverage sector: up to 170°  
- Max ping rate: 50 Hz  
- Number of beams per ping: 1024  
- Range: 0.5 to 470 m (300 kHz, cold ocean)  
- Depth accuracy: 2 cm  
- Beam pattern: Equidistant, Equiangular & High Density  
- Roll, Pitch & Yaw stabilised beams  
- Transducers depth rated to 6000 m  
- Supplied with 15 m, 30 m or 50 m length transducer cables  
- HWS computer c/w Seafloor Information System (SIS) software  
- TX transducer length, width, height (mm), weight air/water (kg): 407 x 142 x 150 mm, 24/16 kg  
- RX transducer length, width, height (mm), weight air/water (kg): 407 x 142 x 136 mm, 23/16 kg  
- Optional system item:  
  - Transducer mounting POD.

**EM 2040 MKII (0.7º x 0.7º) Multibeam Echo Sounder System**  
*Dual RX Transducer System with Single Swath*

- Supplied with two (2) RX transducers and processing unit(s)  
- Frequency range: 200 to 400 kHz  
- Swath coverage sector: up to 220°  
- Max ping rate: 50 Hz  
- Number of beams per ping: 1024  
- Range: 0.5 to 470 m (300 kHz, cold ocean)  
- Depth accuracy: 2 cm  
- Beam pattern: Equidistant, Equiangular & High Density  
- Roll, Pitch & Yaw stabilised beams  
- Transducers depth rated to 6000 m  
- Supplied with 15 m, 30 m or 50 m length transducer cables  
- HWS computer c/w Seafloor Information System (SIS) software  
- TX transducer length, width, height (mm), weight air/water (kg): 407 x 142 x 150 mm, 24/16 kg  
- RX transducer length, width, height (mm), weight air/water (kg): 407 x 142 x 136 mm, 23/16 kg  
- Optional system item:  
  - Dual Swath mode - additional cost of £200 per day  
  - Transducer mounting bracket, Dual RX - (POA).
EM 2040 MKII (0.4º x 0.7º) Multibeam Echo Sounder System
Single RX Transducer System with Single Swath
Frequency range: 200 to 400 kHz
Swath coverage sector: up to 170°
Max ping rate: 50 Hz
Number of beams per ping: 512
Range: 0.5 to 480 m (300 kHz, cold ocean)
Depth accuracy: 2 cm
Beam pattern: Equidistant, Equiangular & High Density
Roll, Pitch & Yaw stabilised beams
Transducers depth rated to 6000 m
Supplied with 15 m, 30 m or 50 m length transducer cables
HWS computer c/w Seafloor Information System (SIS) software
TX transducer length, width, height (mm), weight air/water (kg): 727 x 142 x 150 mm, 45/30 kg
RX transducer length, width, height (mm), weight air/water (kg): 407 x 142 x 136 mm, 23/16 kg
Optional system item:
• Dual Swath mode - additional cost of £50 per day
• 600 / 700 kHz modes
• Transducer mounting POD.

EM 2040 MKII (0.4º x 0.7º) Multibeam Echo Sounder System
Dual RX Transducer System with Single Swath
Supplied with two (2) RX transducers and dual processing unit
Frequency range: 200 to 400 kHz
Swath coverage sector: up to 220°
Max ping rate: 50 Hz
Number of beams per ping: 1024
Range: 0.5 to 480 m (300 kHz, cold ocean)
Depth accuracy: 2 cm
Beam pattern: Equidistant, Equiangular & High Density
Roll, Pitch & Yaw stabilised beams
Transducers depth rated to 6000 m
Supplied with 15 m, 30 m or 50 m length transducer cables
HWS computer c/w Seafloor Information System (SIS) software
TX transducer length, width, height (mm), weight air/water (kg): 727 x 142 x 150 mm, 45/30 kg
RX transducer length, width, height (mm), weight air/water (kg): 407 x 142 x 136 mm, 23/16 kg
Optional system item:
• Dual Swath mode - additional cost of £200 per day
• Transducer mounting bracket, Dual RX - (POA).

EM 2040 MKII (0.4º x 0.7º) Multibeam Echo Sounder System
Dual RX Transducer System with Dual Swath
Supplied with two (2) RX transducers and two (2) dual processing units
Frequency range: 200 to 400 kHz
Swath coverage sector: up to 220°
Max ping rate: 50 Hz
Number of beams per ping: 1600
Range: 0.5 to 480 m (300 kHz, cold ocean)
Depth accuracy: 2 cm
Beam pattern: Equidistant, Equiangular & High Density
Roll, Pitch & Yaw stabilised beams
Transducers depth rated to 6000 m
Supplied with 15 m, 30 m or 50 m length transducer cables
HWS computer c/w Seafloor Information System (SIS) software
TX transducer length, width, height (mm), weight air/water (kg): 727 x 142 x 150 mm, 45/30 kg
RX transducer length, width, height (mm), weight air/water (kg): 407 x 142 x 136 mm, 23/16 kg
Optional system item:
• Transducer mounting bracket, Dual RX - (POA).
**EM 710 MKII (2° x 2°) Multibeam Echo Sounder System**

**High Resolution Multibeam Echo Sounder**

- Frequency range: 40 to 100 kHz
- Swath coverage sector: up to 140°
- 128 beams
- Range: 3 to 1500 m
- Depth resolution: 1 cm
- Beam pattern: Equidistant, Equiangular & High Density
- Roll, Pitch & Yaw stabilised
- 25 m length transducer cables
- HWS computer c/w Seafloor Information System (SIS) software
- Supplied with a transducer array mounting pod
- Transducer length, width, height (mm) & weight (kg):
  - 490 x 224 x 118 mm, 18 kg
  - 540 x 573 x 750 mm, 83 kg
- Transceiver unit, width x height x depth (mm) & weight (kg):
  - 540 x 573 x 750 mm, 83 kg
- POD length x width x height (mm): 1600 x 1080 x 600 mm
- POD weight in air (kg): 178 kg (including transducers, MRU and excluding transducer cables).

Optional auxiliary sensors:
- Valeport miniSVS sound velocity sensor
- Seatex Seapath 330/380 system
- Seatex 3710 DGNSS receiver.

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**EM 712 (2° x 2°) Multibeam Echo Sounder System**

**High Resolution Multibeam Echo Sounder**

- Frequency range: 40 to 100 kHz
- Swath coverage sector: up to 140°
- Number of soundings per ping: 400 (Dual swath mode)
- Range: 3 to 2300 m
- Depth resolution: 1 cm
- Beam pattern: Equidistant, Equiangular & High Density
- Roll, Pitch & Yaw stabilised
- 15 m length transducer cables
- HWS computer c/w Seafloor Information System (SIS5) software
- Transceiver unit dimensions (mm) & weight (kg):
  - 600(W) x 380(H) x 600(D) mm, 71 kg
- Receiver unit dimensions (mm) & weight (kg):
  - 250(W) x 350(H) x 260(D) mm, 11 kg
- Transducer array mounting pod
- POD length x width x height (mm): 1600 x 1080 x 600 mm
- POD weight in air (kg): 178 kg (including transducers, MRU and excluding transducer cables).

Optional auxiliary sensors:
- Valeport miniSVS sound velocity sensor
- Seatex Seapath 330/380 system
- Seatex 3710 DGNSS receiver.

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**EM 304 MKII (2° x 2°) Multibeam Echo Sounder System**

**High Resolution Deepwater Multibeam Echo Sounder**

- Frequency range: 20 to 32 kHz
- Nominal frequency: 26 kHz
- Swath coverage sector: up to 140°
- Number of beams per ping: 1024 (dual swath)
- Beamwidth TX / RX: 1.8° / 1.85°
- Depth range: 10 m to Full Ocean depth
- Beam patterns: Equidistant and Equiangular
- Roll, Pitch & Yaw stabilised beams
- Compliant to IHO S-44 order 1A
- Supplied with 15 m length transducer cables
- Transmit transducer (x4) array length: 1800 mm
- Receive transducer (x4) array length: 1700 mm
- HWS computer c/w Seafloor Information System (SIS) software

**Note:** supplied with transducer mounting frames but without gondola or POD.

Optional items:
- SIS features - water column phase logging and extra detections
- Sound velocity sensor and/or profiler
- Seatex Seapath 330/380 system
- 3610 or 3710 DGNSS Receiver kit
## UNDERWATER MAPPING – MBES SYSTEM PARTS

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Part No.</th>
<th>Frequency</th>
<th>Angular Coverage</th>
<th>Power</th>
<th>Dimensions (L x W x H)</th>
<th>Weight (mm)</th>
<th>Optional Items</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mesotech M3 Sonar Head</strong></td>
<td>High Resolution Imaging and Profiling Sonar</td>
<td>922-20060000</td>
<td>500 kHz</td>
<td></td>
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<tr>
<td>Titanium sonar head, depth rated to 4000 m</td>
<td></td>
<td></td>
<td>Height, weight air/water: 159, 217 mm, 8.5/5.3 kg</td>
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<tr>
<td><strong>EM 2040 Compact Sonar Head</strong></td>
<td></td>
<td></td>
<td>200 to 400 kHz</td>
<td>130°</td>
<td>24 Vdc, 1 A</td>
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<tr>
<td>Titanium Housing, depth rated to 50 m or 1500 m</td>
<td>Height, diameter, weight air/water (50 m): 119, 332 mm, 23/12.6 kg</td>
<td>Optional item: 15 m, 30 m or 50 m sonar head cable</td>
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<tr>
<td><strong>EM 2040 Portable Sonar Head</strong></td>
<td></td>
<td></td>
<td>200 to 400 kHz</td>
<td>140°</td>
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<tr>
<td>Anodised aluminium housing, depth rated to 30 m</td>
<td>Dimensions (L x W x H): 560 x 300 x 166 mm</td>
<td>Weight air/water: 19.5/1.7 kg</td>
<td>Optional item: 15 m, 30 m or 50 m sonar head cable</td>
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<tr>
<td><strong>EM 2040 MKII 0.7° Receive Transducer</strong></td>
<td></td>
<td></td>
<td>200 to 400 kHz</td>
<td>up to 140°</td>
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<tr>
<td>Swath coverage sector: up to 140°</td>
<td>Transducer depth rated to 6000 m</td>
<td>RX transducer length, width, height (mm), weight air/water (kg): 407 x 142 x 136 mm, 23/16 kg</td>
<td>Optional items:</td>
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<td></td>
<td>• Transducer RX-TX interlink cable.</td>
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<td>• 15 m, 30 m or 50 m length RX transducer cable.</td>
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<tr>
<td><strong>EM 2040 0.7° Transmit Transducer</strong></td>
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<td>200 to 400 kHz</td>
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<tr>
<td>Single TX Transducer</td>
<td>Transducer depth rated to 6000 m</td>
<td>TX transducer length, width, height (mm), weight air/water (kg): 407 x 142 x 150 mm, 24/16 kg</td>
<td>Optional items:</td>
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<td>• Transducer RX-TX interlink cable.</td>
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<td>• 15 m, 30 m or 50 m length TX transducer cable.</td>
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<tr>
<td><strong>EM 2040 0.4° Transmit Transducer</strong></td>
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<td>200 to 400 kHz</td>
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<tr>
<td>Single TX Transducer</td>
<td>Transducer depth rated to 6000 m</td>
<td>TX transducer length, width, height (mm), weight air/water (kg): 727 x 142 x 150 mm, 45/30 kg</td>
<td>Optional items:</td>
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<td>• Transducer RX-TX interlink cable.</td>
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<td>• 15 m, 30 m or 50 m length TX transducer cable.</td>
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<tr>
<td><strong>EM 2040 Single Processing Unit</strong></td>
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<td>19” rack mounted, 2U high</td>
<td>Dimensions (width x height x depth): 482.5 x 88.6 x 424 mm</td>
<td>Weight: 10.5 kg</td>
<td>Power: 115 Vac (60Hz) or 230 Vac (50Hz), &lt;280 W.</td>
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<td><strong>EM 2040 Dual Processing Unit</strong></td>
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</tbody>
</table>
EM 2040 Compact/Portable Sonar Head Cable
Available in 15 m, 30 m, and 50 m cable lengths.

EM 2040 Dual RX Transducer Mounting Bracket
Part No. 358929 and 357504
Aluminium assembly
Flange mount

EM 2040P Universal Sonar Mount (USM) Expeditionary Pole
Over the side pole vessel mount package
Supports fixture of EM 2040P transducer, AML sound velocity sensor, Seapath 130 sensor unit, and Subsea Motion Reference Unit.

M3 Sonar Mounting Kit
Part No. 803-0162000
Over the side pole vessel mount assembly
Supports fixture of M3 sonar head, Sound velocity sensor, Seapath 130 sensor unit, and Subsea Motion Reference Unit.

OE10-104 Medium Duty Pan & Tilt Unit
Electric Multi-Purpose Pan and Tilt Unit for M3 Sonar
Maximum Output Torque: 37 Nm @ 24 VDC
Shear Pin Torque: 45 Nm
Nominal Output Speed: 13 to 30 degrees per second
Position Feedback: 9-bit resolution accuracy serial output (approx. ±2°)
Control: Digital RS-232 serial link
Gearbox: Harmonic Drive
Maximum Payload: 25 kg in air
Backlash: ±0.08°
Housing Material: Stainless Steel 316L A4
Depth Rating: 6000 m
Connector Type: Burton 5506-2008 as standard
Power Input: 16 to 24 VDC, 2.4 A (max)
Dimensions: 168 mm (H) x 167 mm (L) x 124 mm (D – Excl. connector)
Weight: 10.0 kg in air, 8.5 kg in water
Package supplied with items:
  • OE10-104 Multi-Purpose Pan & Tilt
  • Rotator cable whip 4.5m
  • M3 sonar and rotator to pole mount bracket.
UNDERWATER MAPPING – SINGLE BEAM ECHO SOUNDERS

**EA440SP Hydrographic Echo Sounder**
**Portable Wideband Single Beam Echo Sounder**
- Frequency: 38 kHz and 200 kHz
- Variable power output up to 1 kW
- Depth range 38 kHz/1 kW: 2 - 1900 m
- Depth range 200 kHz/1 kW: 0.5 - 450 m
- Max. ping rate: 40 Hz
- Max. resolution 38 kHz/200 kHz: 2.4 cm / 0.6 cm
- Transducer type: 38/200D Combi (13° x 21° / 7° x 7°)
- Supplied as standard with a 15 m transducer cable
- Ruggedised and splashproof suitcase with laptop computer
- Power requirements: 110/220 VAC or 12 to 15 VDC, 5A
- Width, height, depth, weight: 488, 190, 386 mm, approx. 11 kg

**EA640 Hydrographic Single Beam Echo Sounder**
**15 kHz Precision Echo Sounder**
- Frequency: 15 kHz
- Circular beam width: 17°
- Variable power output up to 2 kW
- Max depth range at 15 kHz /2 kW: 7000 m
- Transducer type: 15-17 c/w 15 m cable
- Transducer diameter, height; weight: 368, 121 mm; 28 kg
- Supplied with Hydrographic Operation Station (HOS) c/w display
- Power requirements: 110/220 VAC or 12 to 15 VDC, 5A
- Optional system item: Seatex MRU-5.
**TOPAS PS120 Sub-Bottom Profiler**
**Portable Parametric Sub-Bottom Profiler**

- **Primary frequency:** 70 kHz - 100 kHz
- **Parametric frequency:** 2 kHz - 30 kHz
- **Pulse lengths:** 0.04 - 30 ms
- **Output power:** >8 kW
- **Beamwidth (primary):** ∼3.5°
- **Beamwidth (secondary):** 4° x 6°
- **Source level (12 kHz):** >202 dB re μPa @ 1m
- **Dynamic range:** <110 dB
- **Operating depth range:** 2 m - 500 m
- **Penetration:** >50 m
- **Range resolution:** 0.5 - 4 cm
- **Sediment layer resolution:** <5 cm
- **Max ping rate:** 40 Hz

Supplied with 15 m length transducer cable

Transducer dimensions, weight: 324 x 422 x 68 mm, 13 kg

Transceiver dimensions, weight: 520 x 700 x 400 mm, 45 kg.
**PulSAR Side Scan Sonar System**

**High Resolution Side Scan Sonar**

- Frequency: 600 kHz - 1000 kHz
- Wide bandwidth FM and CW pulses
- Max range (m per side): 600 kHz - 100 m CW or 150 m FM
- Max resolution (across track): 10 mm
- Tow speed: 1 to 12 knots
- IP-66 rated Control unit containing acquisition/processing software
- Integrated GPS module (SBAS corrections) in Control Unit
- Tow fish: Stainless body steel with shear release carry handle/tow point, plastic nose cone
- Depth rating: 1000 m
- Dimensions: (L)110 cm x (D)9 cm, tail fins protrude by 7.5 cm
- Weight: 16.5 kg
- Power requirements: 10-30 Vdc or 110/230 Vac (50 W max)
- Supplied with a ruggedized laptop computer
- Supplied with 30 m soft tow cable
- Optional system item:
  - 300 m soft tow cable on hand reel.

**PulSAR Side Scan Sonar Cable**

- 300 m length soft tow cable on hand reel.
Flexview Sonar
Small Observation Class ROV Multibeam Sonar
Part No. 922-20200000-7804
Operating frequency: 950 kHz - 1400 kHz
Field of view: Up to 140° (Imaging)
Range: 0.2 m to 100 m
Range resolution: 1 cm
Power (sonar head): 12-36 VDC, 22 W (avg.) <60 W (peak)
Telemetry: Ethernet (10/100 Mbps) / VDSL
Connector type: SubConn MCBHRA8MSS
Depth rating: 300 m
Material housing: Hard anodised aluminium
Dimensions: (W)169 mm x (H)86 mm x (D)249 mm
Weight air/water: 3.75 kg / 1.38 kg
Package includes:
- Accessory kit
- Cable whip, 4.5 m
- Datasheet and QuickStart guide
- Sonar software
- Equipment case.
UNDERWATER MAPPING – SCANNING SONARS

**MS1071 High Resolution Sonar Head**
*Geared Fan/Cone Transducer Head*
Part No. 974-23050000
MS1000 software switchable between imaging and profiling modes.
Specifications:
- Operating Frequency: 675 kHz
- Beamwidth: 0.9°x30° (Fan), 1.7° (Cone)
- Range: 0.5 - 100 m (typical), 150 m (obtainable)
- Range/Sampling Resolution: ≥ 19 mm / ≥ 2.5 mm
- Mechanical Step Size: ≥ 0.225°
- Power Input: 22-60 VDC, 33 W
- Telemetry: RS-232/RS-485
- Connector Type: Seacon RMG-4-BCL
- Depth rating: 3000 m
- Material Housing: Anodised Aluminium
- Dimensions Housing/Transducer: (L)569 mm x (D)89 mm / (W)140 mm
- Weight Air/Water: 6.1 kg / 2.9 kg
Optional sonar head items:
- MS1000 Sonar Processing Software with or without Laptop PC
- MS1000 Interface Unit
- Non-strain bearing umbilical cable
- Tripod for sonar head.

**MS1171 High Resolution Multi-Frequency Sonar Head**
*Fan/Cone Transducer Head with Tilt Block & Internal Compass*
Part No. 975-23800000
MS1000 software switchable between imaging and profiling modes.
Specifications:
- Operating Frequency: 600-1200 kHz
- Beamwidth: 0.6°x30° (Fan) @ 900 kHz, 1.0° (Cone) @ 1.5 MHz
- Range (max): up to 150+ m
- Power Input: 22-60 VDC, 28 W
- Telemetry: RS-232/RS-485
- Connector Type: Seacon RMG-4-BCL
- Depth Rating: 3000 m
- Material Housing: Anodised Aluminium
- Option: Tilt Block and Compass Module.
- Dimensions Housing/Transducer: (L)624 mm x (D)89 mm / (W)140 mm
- Weight Air/Water: 6.9 kg / 3.5 kg
Optional sonar head items:
- MS1000 Sonar Processing Software with or without Laptop PC
- MS1000 Interface Unit
- Non-strain bearing umbilical cable
- Tripod for sonar head.

**Clariscan 1171 Multi-Frequency Imaging Sonar Head**
*Imaging Sonar Head with Composite Transducer & Acoustic Lens*
Part No. 975-21190000
Specifications:
- Domed dual fan oil-filled transducer
- Operating Frequency: Tuneable in 5 kHz steps from 300 - 600 kHz and 605 - 1200 kHz in both CW and LFM modes
- Beamwidth: 2.7° x 26° @ 330 kHz, 1.4° x 36° @ 675 kHz, 0.9° x 22° @ 1000 kHz
- Range (max): 300 m @ 330 kHz, 100 m @ 675 kHz, 50 m @ 1000 kHz
- Power Input: 22 - 26 VDC @ ≤ 0.8A
- Telemetry: RS-232/RS-485
- Connector Type: Seacon RMG-4-BCL
- Depth Rating: 4000 m
- Material Housing: Anodised Aluminium
- Dimensions Housing/Transducer: (L)292 mm x (D)130 mm
- Weight Air/Water: 4.1 kg / 1.8 kg.
Domed 1171 Multi-Frequency Profiling Sonar Head
Domed Cone Transducer
Part No. 975-21040000
Specifications:
- Domed dual fan oil-filled transducer
- Operating Frequency: User selectable from 675 kHz to 1350 kHz
- Beamwidth: 1.9° x 26° @ 675 kHz
- Range (typical): 0.5 m to 75 m @ 675 kHz
- Range Resolution: ≥ 0.5 cm
- Step Size: 0.45° - 7.2° (user selectable)
- Power Input: 22 - 26 VDC @ ≤ 0.8A
- Telemetry: RS-232/RS-485
- Connector Type: Seacon RMG-6-BCL
- Depth Rating: 4000 m
- Material Housing: Anodised Aluminium
- Dimensions Housing/Transducer: (L)290 mm x (D)107 mm
- Weight Air/Seawater: 3.5 kg / 1.5 kg.

Optional sonar head items:
- MS1000 Sonar Processing Software with or without Laptop PC
- MS1000 Interface Unit
## UNDERWATER MAPPING – SCANNING SONAR PARTS

### MS1000 Interface Unit
- Part No. 901-60240001
- Telemetry: USB/RS-485
- Output Power: 56 VDC (long line)
- Enclosure Rating: IP66 (splashproof)

### MS1000 Interface Unit
- Part No. 901-60310001
- Telemetry: USB/RS-485
- Output Power: 28 VDC
- Enclosure Rating: IP66 (splashproof)

### MS1000 Sonar Processing Software (standard version)
- Acquisition software for Mesotech scanning sonars and altimeters
- Software and USB license dongle key for customer supplied PC.

### MS1000 Sonar Processing Laptop PC
- Laptop PC supplied with MS1000 Software (standard version) and USB license dongle key.

### Sonar Cable on Reel with Slip Ring
- Umbilical Cable Type/Function: Kevlar reinforced / Power & RS-485
- Umbilical Cable Length/Diameter: 150 m / 12 mm
- Deck Cable Length: 7.6 m
- Connector Type: RMG-4-FS

### Tripod for High Resolution MS1071/1171 Sonar Head
- Part No. 975-80110000
## UNDERWATER MAPPING – ALTIMETERS

### MS1007D Altimeter
**Compact Digital Altimeter**  
Part No. 974-70130000 and 975-71120000  
**Specifications:**  
- Operating Frequency: 200 kHz  
- Beamwidth: 10° (nominal)  
- Range (max): 300 m usable (807 mode)  
- Output Resolution: Adjustable, > 2.4mm (807 mode)  
- Operating Mode: Configurable 807, 809 or MS1000  
- Serial Interface: RS-232/RS-485  
- Aux. Analog Output: Configurable, 0-5V or 0-10V  
- Power Input: 22-26 VDC, 1.8 A (start-up) and 250 mA (continuous)  
- Connector Type: Seacon XSG-6-BCL  
- Depth rating: 3000 m  
- Material Housing: Anodised Aluminium  
- Dimensions Housing/Transducer: (L)197 mm x (D)88 mm  
- Weight Air/Water: 2.4 kg / 1.1 kg.

### MS1107D Altimeter
**Compact Digital Altimeter**  
Part No. 975-71500000  
**Specifications:**  
- Operating Frequency: 675 kHz  
- Beamwidth: 2.7° (nominal)  
- Range (max): up to 110 m  
- Output Resolution: Between 2.4 mm and 25 mm (affected by mode and range settings)  
- Operating Mode: Configurable 807, 808, 809 or MS1000  
- Serial Interface: RS-232/RS-485  
- Aux. Analog Output: Configurable, 0-5V or 0-10V  
- Power Input: 22-26 VDC, 1.0 A (start-up) and 250 mA (continuous)  
- Connector Type: Burton 5507-1508  
- Depth rating: 6000 m  
- Material Housing: Anodised Aluminium  
- Dimensions Housing/Transducer: (L)212mm x (D)114 mm  
- Weight Air/Water: 5.0 kg / 2.7 kg.
## UNDERWATER MAPPING – ACQUISITION & PROCESSING SOFTWARE

### Seafloor Information System (SIS) Software
Acquisition software for EM multibeam systems
Supplied with a software license key and/or Hydrographic Workstation.

### GeoSwath 4 (GS4) Software
Acquisition and post-processing software for GeoSwath shallow water wide swath bathymetry systems.

**Note:** Software and USB license dongle key for customer supplied PC (offline processing).

### MS1000 Sonar Processing Software (standard version)
Acquisition software for Mesotech scanning sonars and altimeters

**Features:**
- Imaging, profiling and data storage to hard drive
- Data replay and image capture
- Track Plotter module allows user to plot scanned area, geo-reference targets and create GeoTIFFs
- Simultaneous multi sonar head operation.

**Note:** Software and USB license dongle key for customer supplied PC.

### QPS Multibeam Processing Bundle
Sonar data processing software package

**Features:**
- Qimera Pro
- Fledermaus Geocoder Toolbox add-on
- Fledermaus GIS add-on
- Fledermaus Midwater add-on
- Fledermaus Viz4D.

**Note:** Software and USB license dongle key for customer supplied PC.

### QPS QINSy Survey Lite
Real-time data acquisition, full survey planning, data cleaning/validation and map plotting functionality
Supports single multibeam echo sounder system and includes calibration/backscatter module
Supplied with a computer and/or software license key.
<table>
<thead>
<tr>
<th>Sound Velocity Profiler</th>
<th>Technical Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valeport 650 Sound Velocity Profiler</td>
<td>Speed of Sound range: 1400 to 1600 m/s, acc. ±0.05, res. 0.001 m/s</td>
</tr>
<tr>
<td>Speed of Sound Range: 1400 to 1600 m/s, acc. ±0.05, res. 0.001 m/s</td>
<td><strong>Temperature:</strong> -5 to +35°C, acc. ±0.01, res. 0.002°C</td>
</tr>
<tr>
<td>Temperature: -5 to +35°C, acc. ±0.01, res. 0.002°C</td>
<td><strong>Pressure:</strong> 5000 dBar, acc. ±0.1%FS, res. 0.005%FS dBar</td>
</tr>
<tr>
<td>Pressure: 5000 dBar, acc. ±0.1%FS, res. 0.005%FS dBar</td>
<td><strong>Titanium housing, depth rated to 5000 m</strong></td>
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<tr>
<td>Titanium housing, depth rated to 5000 m</td>
<td><strong>Supplied fitted with a deployment cage</strong></td>
</tr>
<tr>
<td>Diameter, length; weight air/water: 88, 337 mm; 12.5/9 kg.</td>
<td><strong>Supplied fitted with a deployment cage</strong></td>
</tr>
<tr>
<td><strong>Valeport Midas Sound Velocity Profiler</strong></td>
<td><strong>Speed of Sound range: 1375 to 1900 m/s, acc. ±0.02, res. 0.001 m/s</strong></td>
</tr>
<tr>
<td><strong>Digital Time of Flight Sound Velocity Profiler</strong></td>
<td><strong>Temperature:</strong> -5 to +35°C, acc. ±0.01, res. 0.005°C</td>
</tr>
<tr>
<td><strong>Self-Recording &amp; Direct Reading</strong></td>
<td><strong>Pressure:</strong> 6000 dBar, acc. ±0.1%FS, res. 0.001% range</td>
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<td>**S</td>
<td>Valeport midSVP Sound Velocity Profiler</td>
</tr>
<tr>
<td><strong>Valeport midSVP Sound Velocity Profiler</strong></td>
<td><strong>Speed of Sound range: 1375 to 1900 m/s, acc. ±0.02, res. 0.001 m/s</strong></td>
</tr>
<tr>
<td><strong>True Velocity Sound Measurement</strong></td>
<td><strong>Pressure:</strong> 300 or 600 Bar, acc. ±0.05% range, res. 0.001% range</td>
</tr>
<tr>
<td><strong>External Power Supply:</strong> 9-28 VDC, &lt;250 mW</td>
<td><strong>Titanium housing, depth rated to 6000 m</strong></td>
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<td><strong>Titanium housing, depth rated to 6000 m</strong></td>
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<tr>
<td><strong>Diameter, length; weight air/water:</strong> 110, 450 mm; 1.6/- kg.</td>
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</tr>
<tr>
<td><strong>Valeport miniSVS Sound Velocity Sensor</strong></td>
<td><strong>Small Direct Reading Sensor: SV only</strong></td>
</tr>
<tr>
<td><strong>Valeport miniSVS Sound Velocity Sensor</strong></td>
<td><strong>Part No.: 0652005 (50 mm path length)</strong></td>
</tr>
<tr>
<td><strong>Valeport miniSVS Sound Velocity Sensor</strong></td>
<td><strong>Speed of Sound range: 1375 to 1900 m/s</strong></td>
</tr>
<tr>
<td><strong>True Velocity Sound Measurement</strong></td>
<td><strong>Accuracy:</strong> ±0.019 m/s</td>
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<tr>
<td><strong>Part No.: 0652005 (50 mm path length)</strong></td>
<td><strong>Resolution:</strong> 0.001 m/s</td>
</tr>
<tr>
<td><strong>Speed of Sound range: 1375 to 1900 m/s</strong></td>
<td><strong>External Power Supply:</strong> 9-28 VDC, 250 mW</td>
</tr>
<tr>
<td><strong>Accuracy:</strong> ±0.019 m/s</td>
<td><strong>Titanium housing, depth rated to 6000 m</strong></td>
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<tr>
<td><strong>Resolution:</strong> 0.001 m/s</td>
<td><strong>Supplied with a 20 m data / power cable</strong></td>
</tr>
<tr>
<td><strong>External Power Supply:</strong> 9-28 VDC, 250 mW</td>
<td><strong>Diameter, length; weight air/water:</strong> 40, 217 mm; 0.53/- kg.</td>
</tr>
<tr>
<td><strong>Titanium housing, depth rated to 6000 m</strong></td>
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<tr>
<td><strong>AML Minos X SVP/CTD Profiler</strong></td>
<td><strong>Real-time Vertical Profiler</strong></td>
</tr>
<tr>
<td><strong>Xchange™ field swappable sensors</strong></td>
<td><strong>Self-Recording &amp; Direct Reading</strong></td>
</tr>
<tr>
<td><strong>Speed of Sound range: 1375 to 1625 m/s</strong></td>
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</tr>
<tr>
<td><strong>Accuracy:</strong> ±0.025 m/s</td>
<td><strong>Speed of Sound range: 1375 to 1625 m/s</strong></td>
</tr>
<tr>
<td><strong>Resolution:</strong> 0.001 m/s</td>
<td><strong>Accuracy:</strong> ±0.025 m/s</td>
</tr>
<tr>
<td><strong>Pressure: 6000 dBar acc. ±0.05% FS, res. 0.01 dBar</strong></td>
<td><strong>Resolution:</strong> 0.001 m/s</td>
</tr>
<tr>
<td><strong>Conductivity, Temperature: 0-90 mS/cm, -5-45 °C</strong></td>
<td><strong>Pressure: 6000 dBar acc. ±0.05% FS, res. 0.01 dBar</strong></td>
</tr>
<tr>
<td><strong>Titanium housing, depth rated to 6000 m</strong></td>
<td><strong>Conductivity, Temperature: 0-90 mS/cm, -5-45 °C</strong></td>
</tr>
<tr>
<td><strong>Supplied fitted with a deployment cage</strong></td>
<td><strong>Titanium housing, depth rated to 6000 m</strong></td>
</tr>
<tr>
<td><strong>Diameter, length; weight air/water:</strong> 76, 597 mm; 4.7/3.2 kg.</td>
<td><strong>Diameter, length; weight air/water:</strong> 76, 597 mm; 4.7/3.2 kg.</td>
</tr>
</tbody>
</table>
**AML-3 SVP Sensor**

*Sound Velocity Profiling Data Logger*

- Fitted with Xchange2 field swappable SV and P sensors
- Speed of sound range: 1375 to 1625 m/s, acc. ±0.025, res. 0.001 m/s
- Pressure: 500 dBar, acc. ±0.05% FS, res. 0.01 dBar
- Communication: WiFi, USB-C
- Acetal housing, depth rated to 500 m
- Input voltage: 8-30 VDC
- Diameter, length; weight air/water: 76, 343 mm; 1.36/0.69 kg
- Supplied with Sailfish software.

**AML Micro X SV Sensor**

*True Velocity Sound Measurement*

- Small Direct Real-time Reading Sensor: SV only
- Xchange™ field swappable sensor
- Speed of Sound range: 1375 to 1625 m/s
- Accuracy: ±0.025
- Resolution: 0.001 m/s
- Input voltage: 8-26 VDC
- Delrin or Titanium housing: 500 m or 6000 m depth rating
- Supplied with a 20 m or 50 m data / power cable
- Diameter, length; weight air/water: 33 mm; 246 mm, 0.39/0.25 kg.

**OCEANOGRAPHIC – PRESSURE SENSORS**

**Valeport miniIPS Intelligent Pressure Sensor**

*Temperature Compensated Piezo-Resistive Sensor*

- Pressure range: up to 600 Bar
- Accuracy: ±0.01% FS
- Resolution: ±0.001% FS
- Tare function that allows correction for atmospheric offset
- Data output: RS-232 or RS-485
- Power input: 9-28 VDC, >0.4 W
- Titanium housing, depth rated to 6000 m
- Connector type: SubConn MCBH6F (titanium)
- Diameter, length; weight (air): 40 mm, 185 mm (incl. connector); <1 kg.

**OCEANOGRAPHIC – TIDE MONITORING**

**Valeport TideMaster**

*Portable Water Level Recorder Set*

- Vented strain gauge, with stainless steel mounting bracket
- 1 bar transducer c/w 20 m cable and connector
- Accuracy: ±0.1% Full Scale
- GSM/GPRS transmitter in IP67 housing c/w integral antenna

*Note:* customer responsible to ensure the SIM card meets network coverage requirements.
cNODE® MiniS Modem 34-180
Positioning and Transparent Modem Transponder
Frequency: 21 - 30 kHz band (MF)
Fully compatible with Cymbal® acoustic link protocol
SSBL / USBL and LBL positioning modes
Beamwidth: ± 90 degrees
Source level (high): 182 dB
Data Rate: up to 6 kB/s
Polyurethane coated aluminium housing, depth rating to 4000 m
Rechargeable battery pack (Li-Ion)
External power: 24 Vdc, 1A
Length, diameter housing / transducer: 305.5 mm, 106 mm
Weight in air / water: 4.0 / 2.1 kg.
Note: Operates in conjunction with compatible HiPAP and cPAP 30 systems enabled with APOS Cymbal and Transparent Modem functions.

cNODE® MiniS Modem 34-40V
Positioning and Transparent Modem Transponder
Frequency: 21 - 30 kHz band (MF)
Fully compatible with Cymbal® acoustic link protocol
SSBL / USBL and LBL positioning modes
Beamwidth: ± 20 degrees
Source level (high): 197 dB
Data Rate: up to 6 kB/s
Polyurethane coated aluminium housing, depth rating to 4000 m
Rechargeable battery pack (Li-Ion)
External power: 24 Vdc, 1A
Length, diameter housing / transducer: 321 mm, 105 mm
Weight in air / water: 4.6 / 2.1 kg
Note: Operates in conjunction with compatible HiPAP and cPAP 30 systems enabled with APOS Cymbal and Transparent Modem functions.

cNODE® MiniS Modem Battery Charger
Suitable for cNODE® MiniS Modem transponders
Automatic fast / trickle charge modes
Permit fast charge between 5° C and 40° C
Maximum transponder battery charge time: 165 min
Supply voltage: 110-230 Vac
Enclosure protection: IP 30 rated
Width x Height x Depth: 256 x 83 x 355 mm
Weight: 2.9 kg.
### Maritime Broadband Radio System

**MBR 179 MK2 Single System with Power Supply Unit**
- **Operational range:** 0 to 45 km (28 miles)
- **User data:** 0.7 to 16.5 Mbps
- **Operational coverage area:** 360° azimuth, omni-directional
- **Frequency band:** 4.9 GHz to 5.9 GHz
- **Channel bandwidth:** 20 MHz
- **Transmission power:** up to 4 W
- **Data Interface:** 1 x Ethernet / LAN port, RJ-45
- **Input voltage:** 24 – 48 VDC
- **Power consumption (max):** 210 W
- **MBR 19" rack mounted power supply unit:** 110 to 240 VAC
- **Operational temperature range:** -40 °C to +55 °C
- **MBR radio enclosure protection:** IP66 rated
- **MBR radio dimensions (L x W x H):** 323 x 323 x 111 mm
- **MBR radio with mounting bracket weight:** 10.9 kg
- Supplied with 30m length combined ethernet/power cable.

**MBR 189 MK2 Single System with Power Supply Unit**
- **Operational range:** 0 to 50 km (>30 miles)
- **User data:** 0.7 to 16.5 Mbps
- **Operational coverage area:** 100° azimuth x 100° elevation
- **Frequency band:** 4.9 GHz to 5.9 GHz
- **Channel bandwidth:** 20 MHz
- **Transmission power:** up to 4 W
- **Data Interface:** 1 x Ethernet / LAN port, RJ-45
- **Input voltage:** 24 – 48 VDC
- **Power consumption (max):** 210 W
- **MBR 19" rack mounted power supply unit:** 110 to 240 VAC
- **Operational temperature range:** -40 °C to +55 °C
- **MBR radio enclosure protection:** IP66 rated
- **MBR radio dimensions (L x W x H):** 323 x 323 x 111 mm
- **MBR radio with mounting bracket weight:** 10.48 kg
- Supplied with 30m length combined ethernet/power cable.

**MBR 144 System for Fixed Installation**
- **Operational range:** 0 to 20 km (>12 miles)
- **User data:** 0.7 to 16.5 Mbps
- **Operational coverage area:** 360° azimuth, omni-directional
- **Frequency band:** 4.9 GHz to 5.9 GHz
- **Channel bandwidth:** 20 MHz
- **Transmission power:** up to 2 W
- **Data Interface:** 1 x Ethernet / LAN port, RJ-45
- **Supplied with 10m cable**
- **MBR power consumption (max):** 25 W
- **MBR power supply voltage:** 24 VDC
- **Operational temperature range:** -40 °C to +55 °C
- **MBR radio enclosure protection:** IP66 rated
- **MBR radio dimensions (L x W x H):** 260 x 115 x 115 mm
- **MBR radio weight:** 2.5 kg

**MBR 179 MK2 Single Systems with Power Supply Unit**
- **2 x MBR 179 MK2 single radios with single power supply units**
- **Operational range:** 0 to 45 km (28 miles)
- **User data:** 0.7 to 16.5 Mbps
- **Operational coverage area:** 360° azimuth, omni-directional
- **Frequency band:** 4.9 GHz to 5.9 GHz
- **Channel bandwidth:** 20 MHz
- **Transmission power:** up to 4 W
- **Data Interface:** 1 x Ethernet / LAN port, RJ-45
- **Input voltage:** 24 – 48 VDC
- **Power consumption (max):** 210 W
- **MBR 19" rack mounted power supply unit:** 110 to 240 VAC
- **Operational temperature range:** -40 °C to +55 °C
- **MBR radio enclosure protection:** IP66 rated
- **MBR radio dimensions (L x W x H):** 323 x 323 x 111 mm
- **MBR radio with mounting bracket weight:** 10.9 kg
- Supplied with 30m length combined ethernet/power cable.

**Maritime Broadband Radio System – Bundle Package**
- **MBR 179 MK2 Single Systems with Power Supply Unit**
- **2 x MBR 179 MK2 single radios with single power supply units**
- **Operational range:** 0 to 45 km (28 miles)
- **User data:** 0.7 to 16.5 Mbps
- **Operational coverage area:** 360° azimuth, omni-directional
- **Frequency band:** 4.9 GHz to 5.9 GHz
- **Channel bandwidth:** 20 MHz
- **Transmission power:** up to 4 W
- **Data Interface:** 1 x Ethernet / LAN port, RJ-45
- **Input voltage:** 24 – 48 VDC
- **Power consumption (max):** 210 W
- **MBR 19" rack mounted power supply unit:** 110 to 240 VAC
- **Operational temperature range:** -40 °C to +55 °C
- **MBR radio enclosure protection:** IP66 rated
- **MBR radio dimensions (L x W x H):** 323 x 323 x 111 mm
- **MBR radio with mounting bracket weight:** 10.9 kg
- Supplied with 30m length combined ethernet/power cable.
Maritime Broadband Radio System – Bundle Package
MBR 144 Systems for Fixed Installation~
2 x MBR 144 fixed installation radios with power supply units
Operational range: 0 to 20 km (>12 miles)
User data: 0.7 to 16.5 Mbps
Operational coverage area: 360° azimuth, omni-directional
Frequency band: 4.9 GHz to 5.9 GHz
Channel bandwidth: 20 MHz
Transmission power: up to 2 W
Data Interface: 1 x Ethernet / LAN port, RJ-45
Supplied with 10m cable
MBR power consumption (max): 25 W
MBR power supply voltage: 24 VDC
Operational temperature range: -40 °C to +55 °C
MBR radio enclosure protection: IP66 rated
MBR radio dimensions (L x W x H): 260 x 115 x 115 mm
MBR radio weight: 2.5 kg.

Maritime Broadband Radio System – Bundle Package
MBR 144 Fixed and MBR 179 MK2 Systems~
1 x MBR 144 Fixed and 1 x MBR 179 MK2 radios

Note: The operational range is dependent on antenna placement and height above sea level.

~Note: Radio frequency license for MBR system - the product contains a radio transmitting device and a national license for the use of frequencies is required for operation. Use in national waters will require a frequency license issued by the relevant national authorities. The owner and user of the equipment are responsible for obtaining such a license prior to switching the product ON. It may be required to switch the product OFF when the product is brought close to shore (closer than 12 NM).
VESSLE REFERENCE – RELATIVE POSITIONING SYSTEMS

RADius 1000 Single Interrogator System
Relative Positioning System
Operational range: up to 1100 metres (dependant on transponder type)
DP range: up to 550 m (dependant on transponder type)
Coverage sector: up to 90° (Horizontal)
Distance accuracy (within 200 m): < 0.5 m
Angle accuracy (within 200 m): 0.5°
Frequency band: 5.51 - 5.61 GHz
Interrogator opening angle: ±45° (vertical/horizontal)
Interrogator enclosure protection: IP 66 rated
Interrogator height, width & depth, weight: 412 x 562 x 184 mm, 7 kg
19” rack mount cabinet (6U) c/w integrated keyboard/mouse
Width, height, depth (6 U cabinet): 593, 890, 800 mm
Power requirements: 110/220 Vac, 160 W
Standard LCD desktop monitor
Supplied with 60 m interrogator power & data cables
Supplied with a RADius 700 transponder for commissioning purposes.

RADius 1000 Dual Interrogator System
Relative Positioning System
Operational range: up to 1100 metres (dependant on transponder type)
DP range: up to 550 m (dependant on transponder type)
Coverage sector: up to 180° (Horizontal)
Distance accuracy (within 200 m): < 0.5 m
Angle accuracy (within 200 m): 0.5°
Frequency band: 5.51 - 5.61 GHz
Interrogator opening angle: ±45° (vertical/horizontal)
Interrogator enclosure protection: IP 66 rated
Power requirements: 110-220 Vac, 160 W
Standard LCD desktop monitor
Supplied with 60 m interrogator power & data cables
Supplied with a RADius 700 transponder for commissioning purposes
Interrogator height, width & depth, weight: 412 x 562 x 184 mm, 7 kg.

RADius 1000 Triple Interrogator System
Relative Positioning System
Operational range: up to 1100 metres (dependant on transponder type)
DP range: up to 550 m (dependant on transponder type)
Coverage sector: up to 270° (Horizontal)
Distance accuracy (within 200 m): < 0.5 m
Angle accuracy (within 200 m): 0.5°
Frequency band: 5.51 - 5.61 GHz
Interrogator opening angle: ±45° (vertical/horizontal)
Interrogator enclosure protection: IP 66 rated
Power requirements: 110-220 Vac, 160 W
Supplied with 60 m interrogator power & data cables
Supplied with a RADius 700 transponder for commissioning purposes
Interrogator height, width & depth, weight: 412 x 562 x 184 mm, 7 kg.

RADius 1000 Quad Interrogator System
Relative Positioning System
Operational range: up to 1100 metres (dependant on transponder type)
DP range: up to 550 m (dependant on transponder type)
Coverage sector: up to 360° (Horizontal)
Distance accuracy (within 200 m): < 0.5 m
Angle accuracy (within 200 m): 0.5°
Frequency band: 5.51 - 5.61 GHz
Interrogator opening angle: ±45° (vertical/horizontal)
Interrogator enclosure protection: IP 66 rated
Power requirements: 110-220 Vac, 160 W
Supplied with 60 m interrogator power & data cables
Supplied with a RADius 700 transponder for commissioning purposes
Interrogator height, width & depth, weight: 412 x 562 x 184 mm, 7 kg.

Note: RADius transponders must be rented individually as standalone units for an existing system.
Units supplied on rental for DP use, assume that the vessel has a correctly installed and operational interface.
The use of “Pseudo” DP interfaces is not recommended, and is in no way supported by Kongsberg Maritime.
IMCA guidelines should be adhered to at all times when systems are used as DP reference.
Please make contact with the DP system supplier if any doubt exists, in the case of any of the Kongsberg Maritime range of DP systems, assistance can
be supplied at the time of rental enquiry.
**VESSEL REFERENCE – RELATIVE POSITIONING SYSTEM PARTS**

### RADius 1000 Interrogator Unit

Interrogator unit for RADius 1000 System*

- Frequency band: 5.51 - 5.61 GHz
- Interrogator opening angle: ±45° (vertical & horizontal)
- Interrogator enclosure protection: IP 66 rated
- Power requirements: 48 Vdc ±10%, 70 W (max)
- Width, height & depth, weight: 562 x 412 x 184 mm, 8 kg

*Note: The power / connection shelf may have to be upgraded if the interrogator is added to an existing RADius 1000 system.

### RADius 1000 Remote Interrogator Unit

Remotely located Interrogator unit for RADius 1000 System*

- Frequency band: 5.51 - 5.61 GHz
- Interrogator opening angle: ±45° (vertical & horizontal)
- Interrogator and remote cabinet protection: IP 66 rated
- Remote Cabinet power requirements: 110-240 Vac, 70 W (max)
- Interrogator width, height & depth, weight: 562 x 412 x 184 mm, 8 kg
- Remote Cabinet width, height, depth: 360, 360, 242 mm

*Note: The cabling from the remote interrogator cabinet to controller unit is not supplied but maybe purchased on request.

### RADius 1000 Processing Unit

Processing unit for RADius 1000 System

- Communication Ports: 8 x isolated serial ports (6 configurable between RS-232 or RS-422), 4 x Ethernet ports, 3 x USB ports
- Power: 110 to 240 Vac (50/60Hz), 60 W (max)
- Width, Height, Depth: 485 x 88.1 x 412 mm
- Weight: 5.4 kg
**VESSEL REFERENCE – RELATIVE POSITIONING SYSTEM TRANSPONDERS**

**RADius 550X**  
*Low Power, Long Range ATEX Rated Transponder*  
Operational Range: 550 metres  
DP Range: 350 metres  
Operating Sector: ±45° (vertical & horizontal)  
Intrinsically Safe (category 2) Zone 1 & 2 Rated  
Powered from an encapsulated lithium battery  
Width, height & depth, weight: 220 x 400 x 147 mm, 3.6 kg  
ATEX Certificate: DNV-2005-ATEX-0040

**RADius 600X**  
*High Gain ATEX Rated Transponder*  
Operational Range: up to 1100 metres  
Operating Sector: ±45° (vertical & horizontal)  
Intrinsically Safe (category 2) Zone 1 & 2 Rated  
Powered from power supply located in safe area  
Width, height & depth, weight: 220 x 400 x 147 mm, 3.3 kg  
ATEX Certificate: DNV-2005-ATEX-0040

**RADius 700X**  
*Low Power, Long Range ATEX Rated Transponder*  
Operational range: up to 1000 metres  
DP range: >550 metres  
Operating Sector: ±45° (vertical & horizontal)  
Intrinsically safe (category 2) hazardous zone 1 and 2 rated  
Powered from an encapsulated lithium battery pack  
Width, height & depth, weight: 560 x 564 x 214 mm, 7.4 kg  
ATEX Certificate: DNV-2005-ATEX-0040

**RADius 700**  
*Low Power, Long Range Transponder*  
Operational range: up to 1000 metres  
DP range: >550 metres  
Operating Sector: ±45° (vertical & horizontal)  
Powered by lithium metal battery cells  
Width, height & depth, weight: 562 x 412 x 184 mm, 6 kg  

**Note:** Not ATEX Rated.
### Seatex SpotTrack System

**High Precision Positioning and Tracking System**

- **Vertical angular coverage**: 65º (min)
- **Horizontal angular coverage**: 360º
- **DP range**: 10 to 1000 m
- **Horizontal position accuracy**: (2σ) 1 m at 1000 m range
- **Bearing accuracy**: (2σ) 1 mrad (0.06º)
- **Vertical stabilization**: < ± 0.5º for roll, pitch < ± 20º
- **Multi-target**: up to 10 targets simultaneously
- **SpotTrack sensor operating conditions**: IP 66 rated, -25°C to +55°C
- **SpotTrack sensor (diameter, height, weight)**: 173, 455 mm; 6 kg
- **Supplied with**: sensor power & data cables

### Fanbeam Mk5 System

**Precision Positioning and Tracking System**

- **AutoTilt laser tracking system**
- **AutoTilt mechanism**: ±15º range (5º increments)
- **Operating range**: up to a maximum of 2000m (weather dependant)
- **Range accuracy**: 20 cm
- **Angular accuracy**: 0.1º
- **Single target, auto & fixed sector tracking**
- **Scanning head operating conditions**: IP 66 rated, -20°C to +55°C
- **Power requirements**: 85-264 Vac, 61 W
- **Scanning head width, height, depth, weight**: 300, 290, 200 mm, 12.9 kg.

### Fanbeam and SpotTrack Reflector Tube / Single Prism

- **Reflective tube**: covers approx. 360 degrees, range 10 m to 150 m
- **Single prism**: covers approx. 60 degrees, range 50 m to 500 m

### Fanbeam 6-way Prism Cluster (6 prisms)

- **Range**: 50 m to 2000 m
- **Angle coverage**: 150º
- **Dimensions (with mount)**: (H) 271 mm, (W) 163.2 mm, (D) 107 mm

### SpotTrack 8-way Prism Cluster

- **Range**: 50 m to 2000 m
- **Angle coverage**: 180º horizontal / ±15º vertical
- **Weight (with mount)**: 2.8 kg
- **Dimensions (with mount)**: (H) 394 mm, (W) 175 mm, (D) 133 mm

### Note:

- Regarding reflector targets:
  - Reflective tube covers approx. 360 degrees, range from 10 m to around 150 m
  - Single prism covers approx. 60 degrees, range from 50 m to around 500 m
  - 6-way prism cluster covers approx. 150 degrees, range from 50 m to around 2000 m
  - 8-way prism cluster covers approx. 180 degrees, range from 50 m to around 2000 m

*Note: Regarding DP Use:

Units supplied on rental for DP use, assume that the vessel has a correctly installed and operational interface. The use of “Pseudo” DP interfaces is not recommended, and is in no way supported by Kongsberg Maritime. IMCA guidelines should be adhered to at all times when systems are used as DP reference. Please make contact with the DP system supplier if any doubt exists, in the case of any of the Kongsberg Maritime range of DP systems, assistance can be supplied at the time of rental enquiry.*
### Seatex DPS 114 System
**GNSS Based Position Reference Sensor**

- Multi-frequency GPS, GLONASS, Galileo, Beidou and SBAS receiver
- Built-in L-band receiver with Fugro Seastar XP / G4 capability
- IALA beacon capability
- Accepts standard RTCM corrections input
- SeaSTAR G4 accuracy: < 1 m, 95 % CEP
- SBAS accuracy: < 1 m, 95 % CEP
- Velocity accuracy: < 0.05 m/s, 95 % CEP

**Output rate:** 1 Hz

**Interface Ports:**
- 3 x isolated serial ports (2 x NMEA output, 1 x RTCM input - RS-232 and RS-422), 1 x Ethernet / LAN, 3 x USB

**DPS 114 unit - width, height, depth; weight:** 444, 88.1, 357 mm; 5.8 kg

**Power:** 100 - 240 VAC, 50/60 Hz, max 60 W

**Supplied with:** Spotbeam and IALA beacon antennas

**Supplied as standard with:** 25 m length RG-214 antenna cables

**Note:** Subscription to Fugro correction services not included.

**Optional system item:**
- External display unit.

### Seatex DPS 232 System
**GNSS Based Position Reference Sensor**

- Combined GPS L1/L2, GLONASS L1/L2 and SBAS receiver
- MULTIREF capability
- Accepts DGPS/DGLONASS corrections: RTCM-SC104 ver. 2.2, 2.3, 3.0, 3.1, SeaSTAR HP/XP/G2
- SBAS accuracy: < 1 m, 95 % CEP, 0.6 m, 1σ
- SeaSTAR XP/HP/G2 horizontal accuracy: 10 cm, 95 % CEP
- SeaSTAR XP/HP/G2 vertical accuracy: 15 cm, 95 % CEP

**Interface Ports:**
- 8 x isolated serial ports (6 configurable between RS-232 and RS-422), 4 x Ethernet / LAN
- 19” rack mount cabinet (6U) c/w integrated keyboard & mouse

**Width, height, depth (6 U cabinet):** 553, 660, 600 mm

**Power:** 100 - 240 VAC, 50/60 Hz, max 60 W

**Supplied with:** GNSS and DGPS IALA radio beacon antennas

**Supplied as standard with:** 30 m length RG-214 antenna cables

**Optional system item:**
- Fugro 3610 or Seatex 3710 DGNSS receiver.

### Seatex DPS 432 System
**GNSS Based Position Reference Sensor**

- Combined GPS L1/L2/L5, GLONASS L1/L2, Galileo E1/E5, Beidou B1/B2, QZSS and SBAS receiver
- MULTIREF capability
- Dual frequency ionospheric compensation
- Accepts DGNSS corrections: RTCM-SC104 ver. 2.2, 2.3, 3.0, 3.1, 3.2; SeaSTAR XP/XP2/G2/G2+/G4/G4+
- High precision accuracy*: 10 cm, 95 % CEP
- DGPS/DGLONASS accuracy: < 1 m, 95 % CEP
- SBAS accuracy: < 1 m, 95 % CEP
- Velocity accuracy: < 0.05 m/s, 95 % CEP

**Output rate:** 1 Hz

**Interface Ports:**
- 8 x isolated serial ports (6 configurable between RS-232 and RS-422), 4 x Ethernet / LAN
- 19” rack mount cabinet (6U) c/w integrated keyboard & mouse

**Width, height, depth (6 U cabinet):** 553, 660, 600 mm

**Power:** 100 - 240 VAC, 50/60 Hz, max 60 W

**Supplied with:** GNSS and DGPS IALA radio beacon antennas

**Supplied as standard with:** 30 m length RG-214 antenna cables

**Optional system item:**
- Fugro 3610 or Seatex 3710 DGNSS receiver.
Seatex DPS i2 System
GNSS Based Position Reference Sensor
Combined GPS L1/L2, GLONASS L1/L2 and SBAS receiver
MULTIREF capability
INS aided RAIM capability for enhanced integrity and reliability
Accepts DGNSS corrections: RTCM-SC104 ver. 2.2, 2.3, 3.0, 3.1;
SeaSTAR HP/XP2/G2/G2+
Non-differential position accuracy: 1.3 m, 95 % CEP
SeaSTAR XP/HP/G2/G2+ position accuracy: 10 cm, 95 % CEP
SBAS position accuracy: < 1 m, 95 % CEP
Interface Ports: 8 x isolated serial ports (6 configurable between RS-232 and RS-422), 4 x Ethernet / LAN, 1 x IMU (RS-422)
19” rack mount cabinet (6U) c/w integrated keyboard & mouse
Width, height, depth (6 U cabinet): 593, 660, 600 mm
Power: 100 - 240 VAC, 50/60 Hz, max 115 W
Supplied with GNSS and DGPS IALA radio beacon antennas
Supplied as standard with 30 m length RG-214 antenna cables
Optional system item:
- Fugro 3610 or Seatex 3710 DGNSS receiver
- Seatex MGC R2/3 or MRU-5+

Seatex 3710 DGNSS Receiver
DGNSS Correction Services Receiver Unit
Fugro Seastar XP2/G2/G2+/G4/Std L1 capability
External Interfaces: 1 x Serial port (RS-232 or RS-422)
Baud rate 115 200 bytes/sec, 1 x Ethernet / LAN, USB
Data Outputs:-
Message format: Multiplexed (MUX) correction format
Message type: Multiplexed correction data output with status
Power: 100 - 240 VAC, 50/60 Hz, max 75 W
Supplied with type AD430-3141 DGNSS (Spotbeam) antenna

Note: Subscription to Fugro correction services not included.

Fugro 3610 DGNSS Receiver
DGNSS Correction Services Receiver Unit
Fugro Seastar XP/HP/G2/DGNSS capability
Power: 9-24 Vdc, 50/60 Hz, < 16 W
Dimensions (W x H x D): 109.5 x 65 x 235 mm
Supplied with type AD430-3141 DGNSS (Spotbeam) antenna

Note: Subscription to Fugro correction services not included.

VESSEL REFERENCE – (D)GNSS POSITIONING SYSTEM PARTS

Seatex DPS 322 Processing Unit
GNSS Based Position Reference Sensor
Combined GPS L1/L2, GLONASS L1/L2 and SBAS receiver
19” rack mount, 2U height
Power: 100 - 240 Vac, 50/60 Hz, max 60 W.

Seatex DPS 432 Processing Unit
GNSS Based Position Reference Sensor
Combined GPS L1/L2/L5, GLONASS L1/L2, Galileo E1/E5, Beidou B1/B2, QZSS and SBAS receiver
19” rack mount, 2U height
Power: 100 - 240 Vac, 50/60 Hz, max 60 W.
**VESSEL REFERENCE SYSTEMS – POSITION, HEADING & ATTITUDE SYSTEMS**

**Seatex Seapath 130-3 System**  
**Compact GNSS Aided Heading, Attitude and Positioning Sensor**  
Real-time, Position, Roll, Pitch, Heave & Heading  
Supplied with a MRU-3 Motion Sensor in Subsea Housing  
Dual frequency GPS/GLONASS and SBAS receiver  
Position accuracy: 0.5m RMS or 1m (95% CEP) with DGNSS/SBAS  
Dynamic accuracy Roll/Pitch; Heading: 0.02°; 0.1° RMS  
Heave accuracy (real-time): 5cm or 5% whichever is highest  
Heave accuracy (delayed signal): 4cm or 5% whichever is highest  
Data output rate: up to 100 Hz  
Data I/O Ports: 3 x Serial RS-232/422 lines, 8 x Ethernet UPD/IP ports  
Power: Sensor Unit: 24 Vdc, 10W; MRU: 24 Vdc, max. 5.5W  
Sensor Unit length, width, height; weight: 1210, 210, 94 mm; 6.8 kg  
Supplied as standard with a 20 m sensor spider cable.  

**Seatex Seapath 130-H System**  
**Compact GNSS Aided Heading, Attitude and Positioning Sensor**  
Real-time, Position, Roll, Pitch, Heave & Heading  
Supplied with a MRU-H Motion Sensor in Subsea Housing  
Dual frequency GPS/GLONASS and SBAS receiver  
Position accuracy: 0.5m RMS or 1m (95% CEP) with DGNSS/SBAS  
Dynamic accuracy Roll/Pitch; Heading: 0.01°; 0.1° RMS  
Heave accuracy (real-time): 5cm or 5% whichever is highest  
Heave accuracy (delayed signal): 2cm or 2% whichever is highest  
Data output rate: up to 100 Hz  
Data outputs: 3 x Serial RS-232/422 lines, 8 x Ethernet UPD/IP ports  
Power: Sensor Unit: 24 Vdc, 10W; MRU: 24 Vdc, 12W  
Sensor Unit length, width, height; weight: 1210, 210, 94 mm; 6.8 kg  
Supplied as standard with a 20 m sensor spider cable.  

**Seatex Seapath 130-5 System**  
**Compact GNSS Aided Heading, Attitude and Positioning Sensor**  
Real-time, Position, Roll, Pitch, Heave & Heading  
Supplied with a MRU-5 Motion Sensor in Subsea Housing  
Dual frequency GPS/GLONASS and SBAS receiver  
Position accuracy: 0.5m RMS or 1m (95% CEP) with DGNSS/SBAS  
Dynamic accuracy Roll/Pitch; Heading: 0.01°; 0.08° RMS  
Heave accuracy (real-time): 5cm or 5% whichever is highest  
Heave accuracy (delayed signal): 2cm or 2% whichever is highest  
Data output rate: up to 100 Hz  
Data outputs: 3 x Serial RS-232/422 lines, 8 x Ethernet UPD/IP ports  
Power: Sensor Unit: 24 Vdc, 10W; MRU: 24 Vdc, 12W  
Sensor Unit length, width, height; weight: 1210, 210, 94 mm; 6.8 kg  
Supplied as standard with a 20 m sensor spider cable.  

**Seatex Seapath 130-5+ System**  
**Compact GNSS Aided Heading, Attitude and Positioning Sensor**  
Real-time, Position, Roll, Pitch, Heave & Heading  
Supplied with a MRU-5+ Motion Sensor in Subsea Housing  
Dual frequency GPS/GLONASS and SBAS receiver  
Position accuracy: 0.5m RMS or 1m (95% CEP) with DGNSS/SBAS  
Dynamic accuracy Roll/Pitch; Heading: 0.007°; 0.08° RMS  
Heave accuracy (real-time): 5cm or 5% whichever is highest  
Heave accuracy (delayed signal): 2cm or 2% whichever is highest  
Data output rate: up to 100 Hz  
Data outputs: 3 x Serial RS-232/422 lines, 8 x Ethernet UPD/IP ports  
Power: Sensor Unit: 24 Vdc, 10W; MRU: 24 Vdc, 12W  
Sensor Unit length, width, height; weight: 1210, 210, 94 mm; 6.8 kg  
Supplied as standard with a 20 m sensor spider cable.
### Seatex Seapath 330-5 System
**GNSS Aided Heading, Attitude and Positioning Sensor**
- Real-time, Position, Roll, Pitch, Heave & Heading
- Supplied with MRU-5 Motion sensor
- Dual frequency GPS/GLONASS and SBAS receiver
- Position accuracy: 0.5 m RMS /1 m (95% CEP) with DGNSS corrs
- Heading accuracy: 0.065° RMS (2.5m baseline)
- Dynamic accuracy Roll & Pitch: 0.02° RMS for +/- 5° amplitude
- Heave accuracy (real-time): 5cm or 5% whichever is highest
- Data output rate: up to 200 Hz
- Power: 100-240 VAC, 138 W (max).
- Antenna Beam width, depth, length: weight: 250, 40, 2560 mm; 7 kg
- Supplied as standard with 2 x 25 m GNSS cables (RG-214)
- Optional system items:
  - Trimble SPS 852 Reference Station
  - 3610/3710 DGNSS Corrections Receiver.

### Seatex Seapath 330-5+ System
**GNSS Aided Heading, Attitude and Positioning Sensor**
- Real-time, Position, Roll, Pitch, Heave & Heading
- Supplied with a MRU-5+ Motion sensor
- Dual frequency GPS/GLONASS and SBAS receiver
- Position accuracy (X and Y): 1 cm + 1.6 ppm RMS with RTK corrs
- Position accuracy (Z): 2 cm + 3.2 ppm RMS with RTK corrs
- Heading accuracy: 0.065° RMS (2.5m baseline)
- Dynamic accuracy Roll & Pitch: 0.008° RMS for +/- 5° amplitude
- Heave accuracy (real-time): 5cm or 5% whichever is highest
- Data output rate: up to 200 Hz
- Power: 100-240 VAC, 138 W (max).
- Antenna Beam width, depth, length: weight: 250, 40, 2560 mm; 7 kg
- Supplied as standard with 2 x 25 m GNSS cables (RG-214)
- Optional system items:
  - Trimble SPS 852 Reference Station
  - 3610/3710 DGNSS Corrections Receiver.

### Seatex Seapath 380-3 System
**GNSS Aided Heading, Attitude and Positioning Sensor**
- Real-time, Position, Roll, Pitch, Heave & Heading
- Supplied with a MRU-3 Motion sensor
- Combined GPS, GLONASS, Galileo, Beidou, QZSS and SBAS receiver
- Position accuracy (DGNSS/GLONASS): 0.5 m RMS or 1 m 95% CEP
- Position accuracy (Fugro XP2/G2/G4): 0.1 m RMS or 2 m 95% CEP
- Heading accuracy: 0.07° RMS (2.5m baseline)
- Dynamic accuracy Roll & Pitch: 0.02° RMS for +/- 5° amplitude
- Heave accuracy (real-time): 5cm or 5% whichever is highest
- Data outputs: 8 x serial RS-232/RS-422 lines, 4 x Ethernet/LAN ports, 3 x Analogue channels and 1 x 1PPS
- Data output rate: up to 200 Hz
- Power: 100-240 VAC, 138 W (max).
- Antenna Beam width, depth, length: weight: 250, 40, 2560 mm; 7 kg
- Supplied as standard with 2 x 25 m GNSS cables (RG-214)
- Optional system items:
  - Trimble SPS 852 Reference Station
  - 3610/3710 DGNSS Corrections Receiver.

### Seatex Seapath 380-H System
**GNSS Aided Heading, Attitude and Positioning Sensor**
- Real-time, Position, Roll, Pitch, Heave & Heading
- Supplied with a MRU-H Motion sensor
- Combined GPS, GLONASS, Galileo, Beidou, QZSS and SBAS receiver
- Position accuracy (DGNSS/GLONASS): 0.5 m RMS or 1 m 95% CEP
- Position accuracy (Fugro XP2/G2/G4): 0.1 m RMS or 2 m 95% CEP
- Heading accuracy: 0.07° RMS (2.5m baseline)
- Dynamic accuracy Roll & Pitch: 0.01° RMS for +/- 5° amplitude
- Heave accuracy (real-time): 5cm or 5% whichever is highest
- Data outputs: 8 x serial RS-232/RS-422 lines, 4 x Ethernet/LAN ports, 3 x Analogue channels and 1 x 1PPS
- Data output rate: up to 200 Hz
- Power: 100-240 VAC, 138 W (max).
- Antenna Beam width, depth, length: weight: 250, 40, 2560 mm; 7 kg
- Supplied as standard with 2 x 25 m GNSS cables (RG-214)
- Optional system items:
  - Trimble SPS 852 Reference Station
  - 3610/3710 DGNSS Corrections Receiver.
### Seatex Seapath 380-5 System
**GNSS Aided Heading, Attitude and Positioning Sensor**
- Real-time, Position, Roll, Pitch, Heave & Heading
- Supplied with a MRU-5 Motion sensor
- Combined GPS, GLONASS, Galileo, Beidou, QZSS and SBAS receiver
- Position accuracy (DGNSS/GLONASS): 0.5 m RMS or 1 m 95% CEP
- Position accuracy (Fugro XP2/G2/G4): 0.1 m RMS or 2 m 95% CEP
- Heading accuracy: 0.04° RMS (2.5m baseline)
- Dynamic accuracy Roll & Pitch: 0.01° RMS for +/- 5° amplitude
- Heave accuracy (real-time): 5cm or 5% whichever is highest
- Data outputs: 8 x serial RS-232/RS-422 lines, 4 x Ethernet/LAN ports, 3 x Analogue channels and 1 x 1PPS
- Data output rate: up to 200 Hz
- Power: 100-240 VAC, 138 W (max).
- Antenna Beam width, depth, length; weight: 250, 40, 2560 mm; 7 kg
- Supplied as standard with 2 x 25 m GNSS cables (RG-214)
- Optional system items:
  - Trimble SPS 852 Reference Station
  - 3610/3710 DGNSS Corrections Receiver.

### Seatex Seapath 380-5+ System
**GNSS Aided Heading, Attitude and Positioning Sensor**
- Real-time, Position, Roll, Pitch, Heave & Heading
- Supplied with a MRU-5+ Motion sensor
- Combined GPS, GLONASS, Galileo, Beidou, QZSS and SBAS receiver
- Position accuracy (DGNSS/GLONASS): 0.5 m RMS or 1 m 95% CEP
- Position accuracy (Fugro XP2/G2/G4): 0.1 m RMS or 2 m 95% CEP
- Heading accuracy: 0.04° RMS (2.5m baseline)
- Dynamic accuracy Roll & Pitch: 0.007° RMS for +/- 5° amplitude
- Heave accuracy (real-time): 5cm or 5% whichever is highest
- Data outputs: 8 x serial RS-232/RS-422 lines, 4 x Ethernet/LAN ports, 3 x Analogue channels and 1 x 1PPS
- Data output rate: up to 200 Hz
- Power: 100-240 VAC, 138 W (max).
- Antenna Beam width, depth, length; weight: 250, 40, 2560 mm; 7 kg
- Supplied as standard with 2 x 25 m GNSS cables (RG-214)
- Optional system items:
  - Trimble SPS 852 Reference Station
  - 3610/3710 DGNSS Corrections Receiver.

### Seatex Seapath 380-R3 System
**GNSS Aided Heading, Attitude and Positioning Sensor**
- Real-time, Position, Roll, Pitch, Heave & Heading
- Supplied with a MGC R3 Motion and Gyrocompass
- Combined GPS, GLONASS, Galileo, Beidou, QZSS and SBAS receiver
- Position accuracy (DGNSS/GLONASS): 0.5 m RMS or 1 m 95% CEP
- Position accuracy (Fugro XP2/G2/G4): 0.1 m RMS or 2 m 95% CEP
- Heading accuracy: 0.03° RMS (2.5m baseline)
- Dynamic accuracy Roll & Pitch: 0.01° RMS for +/- 5° amplitude
- Heave accuracy (real-time): 5cm or 5% whichever is highest
- Data outputs: 8 x serial RS-232/RS-422 lines, 4 x Ethernet/LAN ports, 3 x Analogue channels and 1 x 1PPS
- Data output rate: up to 200 Hz
- Power: 100-240 VAC, 138 W (max).
- Antenna Beam width, depth, length; weight: 250, 40, 2560 mm; 7 kg
- Supplied as standard with 2 x 25 m GNSS cables (RG-214)
- Optional system items:
  - Trimble SPS 852 Reference Station
  - 3610/3710 DGNSS Corrections Receiver.

### Seatex SeaNav 300
**GNSS Heading and Positioning Sensor**
- Heading Accuracy (dynamic): 0.5° RMS
- Position Accuracy: 1.2 m RMS / 2.5 m (95% CEP) with corrections
- Power: 12 to 24 Vdc, <5 W
- Data Outputs: Serial RS-232/422, Ethernet and 1PPS
- Sensor Unit Dimensions / Weight: 780 x 180 x 100 mm / 2.5 kg.
Trimble SPS852 Reference Station
RTK Base Station for Seapath 130/330/380

GNSS antenna type: Zephyr Geodetic™ 2
Signal tracking: GPS L1/L2, GLONASS, SBAS, OmniSTAR
Correction message types: RTCM 18 & 19, ver 3 or Trimble CMR™
Power: 12 VDC (external lead acid battery pack)
UHF radio receiver type: DGPS 464 (19” rack mounted)
Frequency band: 430 - 470 MHz
Power: 100 - 230 VAC / 50 - 60 Hz, 5 W (typical)

Note: A communications radio license maybe required to operate the unit in the location or country of use, subject to local regulations. It is the responsibility of the end user to obtain an operator's permit or license for the receiver for the location or country of use.
### Seatex MGC® R3 Compass
**Motion Sensor & Gyro Compass**
- Real-time, Roll, Pitch, Heave & Heading
- Roll & Pitch accuracy: 0.01° RMS
- Heave accuracy (real-time): 5 cm or 5 %, whichever is highest
- Heading accuracy (Un-aided): 0.04° RMS (secant latitude)
- Heading accuracy (GNSS aided): 0.02° RMS (secant latitude)
- Heading settling time to full accuracy (typical): 17 min from start-up
- Position output (free inertial): 5 nm/h
- Data outputs: RS-232, RS-422 and Ethernet
- Data output rate (max): 200 Hz
- Power supply: 18-32 V dc, max 12 W
- Height, length, width; weight: 188.9, 189.5, 189.5 mm; 8.0 kg
- Supplied with items:
  - MGC angle bracket
  - Junction box c/w 3 m cable
  - Transit case.

### Seatex MRU-5+
**Motion Sensor**
- Real-time Roll, Pitch and Heave
- Dynamic Accuracy Roll & Pitch: 0.008° RMS
- Dynamic Accuracy Heave (real-time): 5 cm or 5 % whichever highest
- Data Outputs: RS-232, RS-422 and Ethernet
- Data Output Rate (max): 200 Hz
- Power Supply: 10-36 V dc, max 12 W
- Diameter, height, weight: 105, 140 mm, 2.4 kg
- Optional items:
  - 10 m or 500 m MRU subsea housing
  - MRU wall or floor mounting bracket
  - MRU junction box (required for analogue channels).

### Seatex MRU-5
**Motion Sensor**
- Real-time, Roll, Pitch, Heave
- Static Accuracy Roll & Pitch: 0.02° RMS
- Dynamic Accuracy Roll & Pitch: 0.02° RMS (for a ±5° amplitude)
- Dynamic Accuracy Heave: 5 cm or 5 % whichever highest
- Power Supply 12-30 V dc, max 8 W
- Diameter, height, weight: 105, 205 mm, 2.5 kg
- Optional items:
  - 10 m or 1000 m MRU subsea housing
  - MRU wall mounting bracket
  - MRU junction box.

### Seatex MRU-5 (5th Generation)
**Motion Sensor**
- Real-time Roll, Pitch and Heave
- Dynamic Accuracy Roll & Pitch: 0.02° RMS
- Dynamic Accuracy Heave (real-time): 5 cm or 5 % whichever highest
- Data Outputs: RS-232, RS-422 and Ethernet
- Data Output Rate (max): 200 Hz
- Power Supply: 10-36 V dc, max 12 W
- Diameter, height, weight: 105, 140 mm, 2.4 kg
- Optional items:
  - 10 m or 500 m MRU subsea housing
  - MRU wall or floor mounting bracket
  - MRU junction box (required for analogue channels).

### Seatex MRU-H
**Motion Sensor**
- Real-time, Roll, Pitch, Heave
- Static Accuracy Roll & Pitch: 0.04°/s RMS
- Dynamic Accuracy Roll & Pitch: 0.05° RMS (for a ±5° amplitude)
- Dynamic Accuracy Heave: 5 cm or 5 % whichever highest
- Power Supply 12-30 V dc, 6 W
- Diameter, height, weight: 105, 205 mm, 2.5 kg
- Optional items:
  - 10 m or 1000 m MRU subsea housing
  - MRU wall mounting bracket
  - MRU junction box.
**Seatex MRU-H (5th Generation)**

**Motion Sensor**
- Real-time Roll, Pitch and Heave
- Angular Orientation Range: ±180°
- Dynamic Accuracy Roll & Pitch: 0.05° RMS
- Dynamic Accuracy Heave (real-time): 5 cm or 5% whichever highest
- Data Outputs: RS-232, RS-422 and Ethernet
- Data Output Rate (max): 200 Hz
- Power Supply: 10-36 V dc, max 12 W
- Diameter, height, weight: 105, 140 mm, 2.4 kg
- Optional items:
  - 10 m or 500 m MRU subsea housing
  - MRU wall or floor mounting bracket
  - MRU junction box (required for analogue channels).

**Seatex MRU-E**

**Extended Temperature Motion Sensor**
- Real-time Roll, Pitch and Heave
- Angular Orientation Range: ±180°
- Dynamic Accuracy Roll & Pitch: 0.05° RMS
- Dynamic Accuracy Heave (real-time): 5 cm or 5% whichever highest
- Data Outputs: RS-232, RS-422 and Ethernet
- Data Output Rate (max): 200 Hz
- Power Supply: 10-36 V dc, max 8 W
- Operational Temperature Range: 25 °C to +70 °C
- Diameter, height, weight: 105, 140 mm, 2.2 kg
- Optional items:
  - 10 m or 500 m MRU subsea housing
  - MRU wall or floor mounting bracket
  - MRU junction box (required for analogue channels).

**Seatex MRU-Z**

**Motion Sensor**
- Real-time, Roll, Pitch and Heave
- Static Accuracy Roll & Pitch: 0.1°/s RMS
- Dynamic Accuracy Roll & Pitch: 0.15° RMS (for a ±5° amplitude)
- Dynamic Accuracy Heave: 5 cm or 5% whichever highest
- Power Supply: 12-30 V dc, 3 W
- Diameter, height, weight: 105, 129 mm, 1.5 kg
- Optional items:
  - MRU wall mounting bracket
  - MRU junction box.

**Seatex MRU-3 (5th Generation)**

**Motion Sensor**
- Real-time Roll, Pitch and Heave
- Angular Orientation Range: ±45°
- Dynamic Accuracy Roll & Pitch: 0.08° RMS
- Dynamic Accuracy Heave (real-time): 5 cm or 5% whichever highest
- Data Outputs: RS-232, RS-422 and Ethernet
- Data Output Rate (max): 200 Hz
- Power Supply: 10-36 V dc, max 12 W
- Diameter, height, weight: 105, 140 mm, 2.4 kg
- Optional items:
  - 10 m or 500 m MRU subsea housing
  - MRU wall or floor mounting bracket
  - MRU junction box (required for analogue channels).

**Note:** No export licence required.

**Seatex MRU-S**

**Motion Sensor Designed for Fish Finding Equipment**
- Real-time Roll, Pitch and Heave measurements
- Angular Orientation Range: ±45°
- Dynamic Accuracy Roll & Pitch: 0.3° RMS
- Dynamic Accuracy Heave (real-time): 15 cm or 15% whichever highest
- Acceleration Accuracy: 0.05 m/s² RMS
- Data Outputs: RS-232, RS-422 and Ethernet
- Data Output Rate (max): 200 Hz
- Power Supply: 10-36 V dc, max 5.5 W
- Diameter, height, weight: 105, 140 mm, 2.0 kg
- Optional items:
  - 10 m or 500 m MRU subsea housing
  - MRU wall or floor mounting bracket
  - MRU junction box (required for analogue channels).

**Note:** No export licence required.
Seatex MRU-2
Roll & Pitch Sensor
Real-time, Roll, Pitch
Static Accuracy Roll & Pitch: 0.08° RMS
Dynamic Accuracy Roll & Pitch: 0.1° RMS (for a ±5° amplitude)
Power Supply 12-30 V dc, 6 W
Diameter, height, weight: 105, 205 mm, 2.5 kg
Optional items:
• MRU wall mounting bracket
• MRU junction box.

Seatex MRU-D
Roll & Pitch Sensor
Real-time, Roll, Pitch
Static Accuracy Roll & Pitch: 0.3° RMS
Dynamic Accuracy Roll & Pitch: 0.35° RMS (for a ±5° amplitude)
Power Supply 12-30 V dc, 3 W
Diameter, height, weight: 105, 129 mm, 1.5 kg
Optional items:
• MRU wall mounting bracket
• MRU junction box.

Note: No export licence required.

Seatex MRU-D (5th Generation)
Roll & Pitch Sensor
Real-time, Roll, Pitch
Static Accuracy Roll & Pitch: 0.3° RMS
Dynamic Accuracy Roll & Pitch: 0.35° RMS (for a ±5° amplitude)
Power Supply 10-36 V dc, max 3 W
Diameter, height, weight: 105, 140 mm, 2.4 kg
Optional items:
• MRU wall mounting bracket
• MRU junction box.

Note: No export licence required.
Global and local support
We provide global support from local service and support facilities at strategic locations worldwide. Service and support work is carried out under the supervision of your personal account manager, who will ensure that you receive high-quality service and support where and when you need it. Your account manager will ensure continuity and work closely with your personnel to improve and optimise system availability and performance. Under the direction of your account manager, and with a local inventory of spare parts, our well-qualified field service engineers will be able to help you quickly and effectively.

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