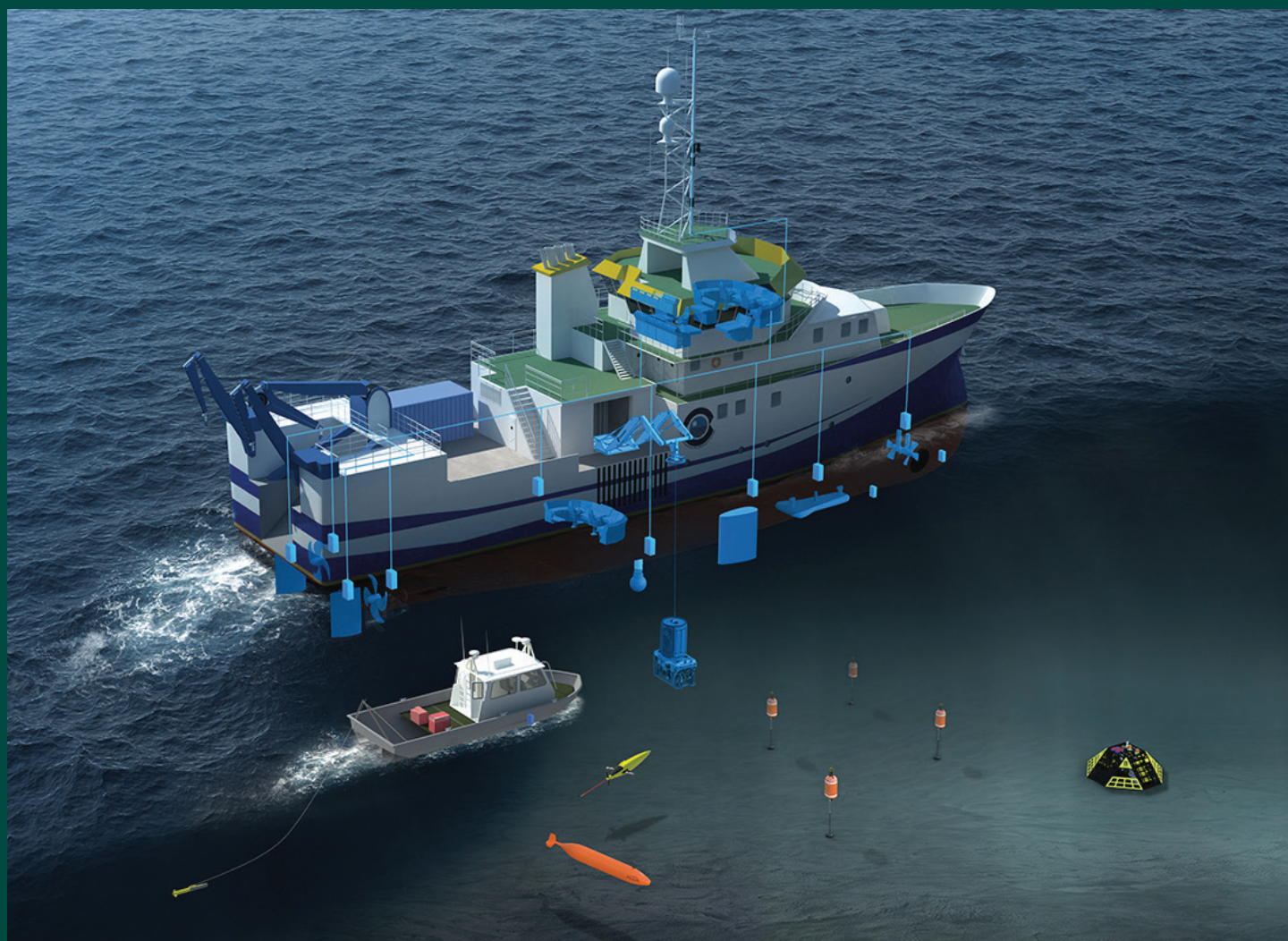Kongsberg Discovery

Rental brochure

Global

Kongsberg Discovery Rental

Kongsberg Discovery'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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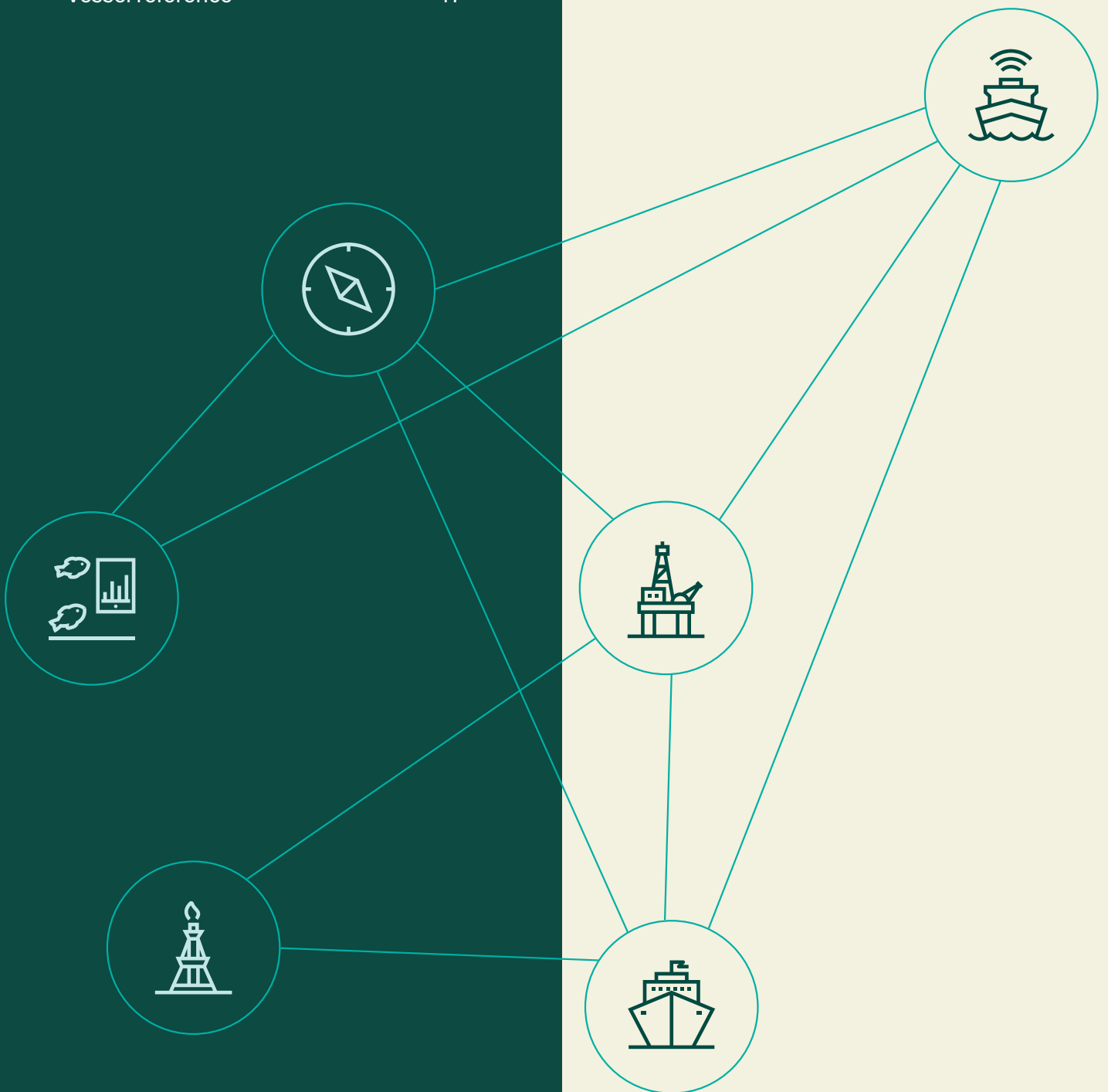Tel: +55 21 9 9965 5170
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Content

UNDERWATER POSITIONING – POSITIONING SYSTEMS

HiPAP® 102P-MGC Portable System
Deepwater Portable Hydroacoustic Positioning Reference
Long Base Line (LBL) and Supershort Base Line (SSBL) functionality
Fully compatible with Cymbal® acoustic protocol
Inbuilt motion and heading sensor: Seatex MGC® R3
Frequency band: 10 - 15 kHz (LF)
Operating range (typical): 1 - 13000 m
Main operational coverage area: ± 60°
Range detection accuracy (Cymbal): 2 cm
Angular accuracy (S/N [20 dB Rel. 1µPa]): 0.14°
Heading accuracy (GNSS aided): 0.1° RMS (secant latitude)
Dynamic accuracy roll & pitch: 0.01° RMS
Length, diameter; weight (air): 535.5, 477 mm; 80 kg
Supplied with a 50 m or 70 m length transducer cable
Supplied with an APOS laptop or 19" rack mounted computer
Optional system item:
• Responder drive kit.

HiPAP® 352P-MGC Portable System
Portable Hydroacoustic Positioning Reference
Long Base Line (LBL) and Supershort Base Line (SSBL) compatibility
Fully compatible with Cymbal® and HPR400 acoustic protocols
Inbuilt motion and heading sensor: Seatex MGC® R3
Operating range: 1 - 5000 m
Main operational coverage area: ± 80°
Range detection accuracy (Cymbal): 2 cm
Angular accuracy (S/N [20 dB Rel. 1µPa]): 0.10°
Heading accuracy (GNSS aided): 0.1° RMS (secant latitude)
Dynamic accuracy roll & pitch: 0.01° RMS
Depth rating: up to 50 m
Length, diameter; weight (air): 661, 338 mm; 51 kg
Supplied with a 50 m or 70 m length transducer cable
Supplied with an APOS laptop or 19" rack mounted computer
Optional system item:
• Responder drive kit.

HiPAP® 352P Portable System
Portable Hydroacoustic Positioning Reference
Long Base Line (LBL) and Supershort Base Line (SSBL) compatibility
Fully compatible with all Cymbal® "M" channels
Inbuilt motion sensor type / accuracy: Seatex MRU-H / 0.05°
Operating range: 1 - 5000 m
Main operational coverage area: ± 80°
Range detection accuracy (Cymbal): 2 cm
Angular accuracy (S/N [20 dB Rel. 1µPa]): 0.10°
Depth rating: up to 50 m
Length, diameter; weight (air): 513, 341 mm; 42 kg
Supplied with a 50 m or 70 m length transducer cable
Supplied with an APOS laptop or 19" rack mounted computer
Optional system item:
• Responder drive kit.

HiPAP® 351P-MGC Portable System
Portable Hydroacoustic Positioning Reference
Long Base Line (LBL) and Supershort Base Line (SSBL) compatibility
Fully compatible with Cymbal® and HPR400 acoustic protocols
Inbuilt motion and heading sensor: Seatex MGC® R3
Operating range: 1 - 4000 m
Main operational coverage area: ± 80°
Range detection accuracy (Cymbal): 2 cm
Angular accuracy (S/N [20 dB Rel. 1µPa]): 0.18°
Heading accuracy (GNSS aided): 0.1° RMS (secant latitude)
Dynamic accuracy roll & pitch: 0.01° RMS
Depth rating: up to 50 m
Length, diameter; weight (air): 663, 341 mm; 51 kg
Supplied with a 50 m or 70 m length transducer cable
Supplied with an APOS laptop or 19" rack mounted computer
Optional system item:
• Responder drive kit.

HiPAP® 351P-5 Portable System
Portable Hydroacoustic Positioning Reference
Long Base Line (LBL) and Supershort Base Line (SSBL) compatibility
Fully compatible with Cymbal® and HPR400 acoustic protocols
Inbuilt motion sensor type / accuracy: Seatex MRU-5 / 0.02°
Operating range: 1 - 4000 m
Main operational coverage area: ± 80°
Range detection accuracy (Cymbal): 2 cm
Angular accuracy (S/N [20 dB Rel. 1µPa]): 0.18°
Depth rating: up to 50 m
Length, diameter; weight (air): 513, 341 mm; 42 kg
Supplied with a 50 m or 70 m length transducer cable
Supplied with an APOS laptop or 19" rack mounted computer
Optional system item:
- Responder drive kit.

HiPAP® 351P Portable System
Portable Hydroacoustic Positioning Reference
Long Base Line (LBL) and Supershort Base Line (SSBL) compatibility
Fully compatible with Cymbal® and HPR400 acoustic protocols
Inbuilt motion sensor type / accuracy: Seatex MRU-H / 0.05°
Operating range: 1 - 4000 m
Main operational coverage area: ± 80°
Range detection accuracy (Cymbal): 2 cm
Angular accuracy (S/N [20 dB Rel. 1µPa]): 0.18°
Depth rating: up to 50 m
Length, diameter; weight (air): 513, 341 mm; 42 kg
Supplied with a 50 m or 70 m length transducer cable
Supplied with an APOS laptop or 19" rack mounted computer
Optional system item:
- Responder drive kit.

µPAP® 201-MGC R2 System
Calibration Free Portable Hydroacoustic Positioning Reference
Operational modes: SSBL, LBL and data telemetry
Fully compatible with all Cymbal® "M" channels
Inbuilt motion and heading sensor: Seatex MGC® R2
Heading accuracy (speed aided): 0.15° RMS (secant latitude)
Roll & pitch accuracy: 0.02° RMS
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: 400,190 mm; 17 kg/9 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.

µPAP® 201-H System
Portable Hydroacoustic Positioning Reference
Operational modes: SSBL, LBL and data telemetry
Fully compatible with all Cymbal® "M" channels
Inbuilt motion sensor type / accuracy: Seatex MRU-H / 0.05°
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: 400,190 mm; 17 kg/9 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.

µPAP® 201-3-NEL System
Portable Hydroacoustic Positioning Reference
Operational modes: SSBL, LBL and data telemetry
Fully compatible with all Cymbal® M"" channels
Inbuilt motion sensor type / accuracy: Seatex MRU-3 / 0.08°
Operating range: 1 - 995 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: 400,190 mm; 17 kg/9 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.

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.

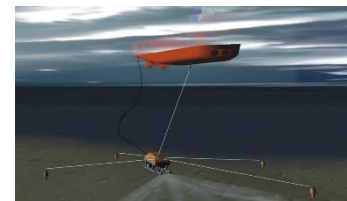**cPAP® 34 MKII, Subsea LBL Positioning System**
ROV Mount Transceiver
30 kHz band (MF)
FSK and PSK (Cymbal®) signalling modes
For use in support of Long Base Line (LBL) positioning operations
Polyurethane coated aluminium housing
Depth rated: up to 4000 m
APOS interface: RS-232
User interface: RS-232/422/485
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 item:

- 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 item:

- APOS Survey Operator Station.
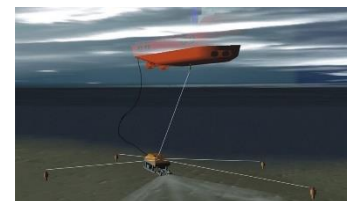
cPAP® 30, Portable Telemetry Unit
Portable Medium Frequency (MF) Transceiver Unit
Fully compatible with all Kongsberg (MF) acoustic channels, including
Cymbal® protocol
Operation temperature: -5 to +55°C
Splash proof IP 54 case
Internal rechargeable lead/acid battery pack (3 hours operation)
Power supply: 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 not included in package.

UNDERWATER POSITIONING – HAIN POST-PROCESSING SOFTWARE

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.
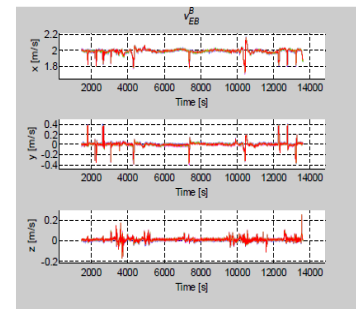
UNDERWATER POSITIONING – TRANSDUCERS & CABLES

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 5 m length serial cables 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 tablet 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.

HiPAP® Operator Station
Acoustic Positioning System Computer
Supplied with the latest APOS software
Includes the following enabled APOS software functions:
- CYMBAL (requires HiPAP 351/451/501 transceiver or later)
- SSBL

Unit 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 for HiPAP®
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.

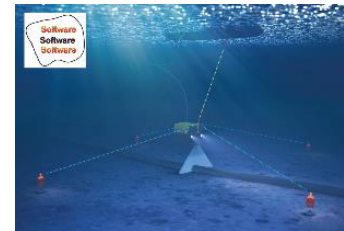**Note:** Additional APOS software functions available on request.

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
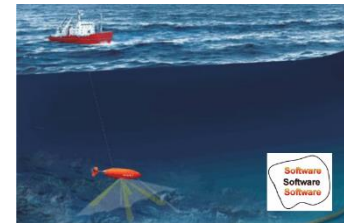- LBL and Sparse LBL Positioning for cPAP / ROV

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.

UNDERWATER POSITIONING – DIVER TRANSPONDERS (cNODE MICRO)

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.

cNODE® Micro / MiniS Battery Charger
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 17-180 Ti
ROV/AUV/Towfish Positioning Transponder
12 kHz band (LF) 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 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
External bulkhead connector: Seacon MCBH8MDO
Length, diameter housing / transducer: 306 mm, 105 mm
Weight in air / water: 6.5 / 4.0 kg.

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 TRANSPONDERS 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.

UNDERWATER POSITIONING – cNODE MINI TRANSPONDERS

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.

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.

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.

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) eternal
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 intefaced
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.

cNODE® Maxi 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) 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 intefaced
to a Gyrocompass.

cNODE® Maxi 34-180-MEC/Si 24 VDC
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.

cNODE® Maxi 34-180-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
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-MTS/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).

cNODE® Maxi 34-180-R-MTS/SvPI
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: 1401.5, 166 mm
Weight in air / water: 34.6 / 15 kg
Modular top section incorporates a Paroscientific Digiquartz® pressure
sensor, Inclinometers and a Valeport sound velocity sensor
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-MEC/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: / 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
Supplied with a lithium battery pack (Type: D48-Li), Reg no. 319554))
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.

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.

cNODE® Maxi 17-180-R-St
Positioning Transponder
12 kHz band (LF) 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 stainless steel housing, depth rating to 7000 m
Supplied with a lithium or alkaline battery pack
Length, diameter: 1254, 166 mm
Weight in air / water: 62 / kg.

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: 206 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.

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 34-30V30H-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: 30° vertical and 30° horizontal
Max source level: 206 dB
Polyurethane coated aluminium housing, depth rating 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: 1358, 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.

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: 63 / kg.

cNODE® Maxi 34-30V
Positioning Transponder
30 kHz band (MF) Transponder with basic end cap
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: 1014.5, 166 mm
Weight in air / water: 28 /12.6 kg.

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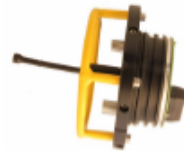**Transducer for cNODE® Maxi 34 transponder**
Part No. 313455
Beam width: 30° vertical / 30° horizontal
Receiver sensitivity: 85 dB
Max source level: 206 dB / 190 dB
Anodised aluminium, depth rated to 4000 m
Length, diameter: 316, 184 mm.

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.

UNDERWATER POSITIONING – TRANSPONDER FLOATATION COLLARS

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 Flotation 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
Floatation 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
Floatation 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.

UNDERWATER MAPPING – MULTIBEAM ECHO SOUNDER SYSTEMS

Mesotech M3 HF Sonar - Single Head
High Frequency Imaging and Profiling Sonar
Sonar head part no. 922-20300000
Frequency: 700 kHz - 1400 kHz
Range: 0.2 m to 100 m
Range resolution: 1 cm
Field of view: 120° / (EIQ 140°)
Beamwidth (Imaging): 0.8° x 27° @ 950 kHz
Beamwidth (Profiling / Bathymetry): 0.8° x 1.5° @ 950 kHz
Telemetry: Ethernet (10/100 Mbps)
Synchronization: PRI Sync, 1PPS
Input voltage/power: 12 to 36 VDC / 50 W (average)
Titanium sonar head, depth rated to 4000 m
Connector type: SEACON MINK-10-FCRL
Height, width, weight air/water: 144, 218 mm, 7.8/5.0 kg
Supplied with items:
- M3 HF sonar head, 4000 m depth rated
- M3 Sonar Head Accessory Kit
- M3 Sonar cable whip, 4.5m
- M3 Sonar Head Cable Assembly, 6 m or 15 m (Use with SIU)
- M3 Sonar mounting bracket - 10° or 15° tilt down
- M3 Sonar software
- Equipment case.

Mesotech M3 Sonar - Single Head
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, 4000 m 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
- Equipment case.

Mesotech M3 Sonar – Single Head
Shallow Water High Resolution Bathymetric Sonar
Sonar head part no. 922-20220000
Frequency: 500 kHz
Range: 0.2 m to 50 m
Maximum 120º 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.

EM 2040PHS MKII Multibeam Echo Sounder System
Portable Hydrographic System with Dual Swath
Frequency range: 200 to 400 kHz
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 225 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 comprising of the following main items:
- EM 2040P MKII sonar head
- 15 m or 30 m length transducer cable
- EM 2040P processing unit, splash-proof version, single swath
- Seapath 130 system, including MRU-5+ in 10 m subsea bottle
- Kongsberg 3710 DGNSS receiver kit
- Universal Sonar Mount (USM) expeditionary pole.
- **AML Sound Velocity Sensor**

EM 2040P MKII Multibeam Echo Sounder System
Portable Transducer System with Single Swath
Frequency range: 200 to 400 kHz
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 225 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
Supplied with either splash-proof or standard single processing unit
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 items:
- 600 / 700 kHz modes
- Transducer mounting bracket
- Universal Sonar Mount (USM) expeditionary pole
- Seapath 130 system
- AML Sound velocity sensor.

EM 2040P MKII Multibeam Echo Sounder System
Portable Transducer System with Dual Swath
Frequency range: 200 to 400 kHz
Swath coverage sector: up to 170°
Beam width: 1° x 1° @ 400 kHz
Max ping rate: 50 Hz
Number of beams per ping: 1024
Range: 0.5 to 225 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
Supplied with either splash-proof or standard dual processing unit
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 items:
- 600 / 700 kHz modes
- Transducer mounting bracket
- Universal Sonar Mount (USM) expeditionary pole
- Seapath 130 system
- AML Sound velocity sensor.

EM 2040C MKII 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 140°
Beam width: 1° x 1° (400 kHz)
Max ping rate: 50 Hz
Number of beams per ping: 512
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 items:
- Dual Swath mode
- 600 / 700 kHz modes
- Transducer mounting bracket, Single RX.

EM 2040C MKII 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: 1024
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 15 m, 30 m or 50 m length transducer cables
Optional item:
- Transducer mounting bracket, Dual RX.

EM 2040C MKII Multibeam Echo Sounder System
Dual Compact Transducer System with Dual 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: 2048
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 15 m, 30 m or 50 m length transducer cables
Optional item:
- Transducer mounting bracket, Dual RX.

EM 2042-07 Multibeam Echo Sounder System
Single RX Transducer System with Dual Swath and SIS
Frequency range: 150 to 700 kHz
Swath coverage: up to 170°
Max ping rate: Up to 50 Hz
Number of soundings: Up to 1024
Range: 0.5 m to max 600 m
Depth accuracy: Up to 5.5 mm
Beam pattern: Equidistant, Equiangular & High Density
Roll, Pitch & Yaw stabilised beams
Transducers depth rated to 50 m
Supplied with standard processing unit with 1x CBMF MK2 card
HWS computer c/w Seafloor Information System (SIS) software
Supplied with 15 m, 30 m or 45 m length transducer cables
TX transducer length, width, height (mm), weight air/water (kg):
372 x 120 x 138.1 mm, 10.9/5.0 kg
RX transducer length, width, height (mm), weight air/water (kg):
340 x 124 x 120 mm, 6.1/1.6 kg
Optional items:
- Quad Swath
- Embedded AML X2change SVT sensor in receiver
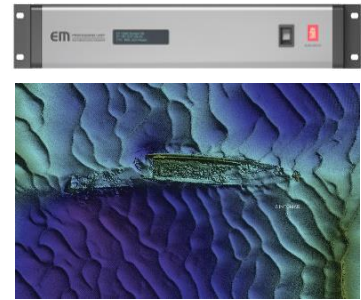- Transducer mounting bracket.

EM 2042-07 Multibeam Echo Sounder System
Dual RX Transducer System with Single Swath and SIS
Frequency range: 150 to 700 kHz
Swath coverage: up to 220°
Max ping rate: Up to 50 Hz
Number of soundings: Up to 1024
Range: 0.5 m to max 600 m
Depth accuracy: Up to 5.5 mm
Beam pattern: Equidistant, Equiangular & High Density
Roll, Pitch & Yaw stabilised beams
Transducers depth rated to 50 m
Supplied with 2x RX transducers
Supplied with standard processing unit c/w 2x CBMF MK2 card
HWS computer c/w Seafloor Information System (SIS) software
Supplied with 15 m, 30 m or 45 m length transducer cables
TX transducer length, width, height (mm), weight air/water (kg):
372 x 120 x 138.1 mm, 10.9/5.0 kg
RX transducer length, width, height (mm), weight air/water (kg):
340 x 124 x 120 mm, 6.1/1.6 kg
Optional items:
• Dual Swath
• Embedded AML X2change SVT sensor in one receiver
• Transducer mounting bracket.

EM 2042-04 Multibeam Echo Sounder System
Single RX Transducer System with Dual Swath and SIS
Frequency range: 150 to 700 kHz
Swath coverage: up to 170°
Max ping rate: Up to 50 Hz
Number of soundings: Up to 1024
Range: 0.5 m to max 600 m
Depth accuracy: Up to 5.5 mm
Beam pattern: Equidistant, Equiangular & High Density
Roll, Pitch & Yaw stabilised beams
Transducers depth rated to 50 m
Supplied with standard processing unit with 1x CBMF MK2 card
HWS computer c/w Seafloor Information System (SIS) software
Supplied with 15 m, 30 m or 45 m length transducer cables
TX transducer length, width, height (mm), weight air/water (kg):
691.2 x 120 x 138.1 mm, 20.0/9.0 kg
RX transducer length, width, height (mm), weight air/water (kg):
340 x 124 x 120 mm, 6.1/1.6 kg
Optional items:
• Quad Swath
• Embedded AML X2change SVT sensor in receiver
• Transducer mounting POD.

EM 2040-07 MKII 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 465 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):
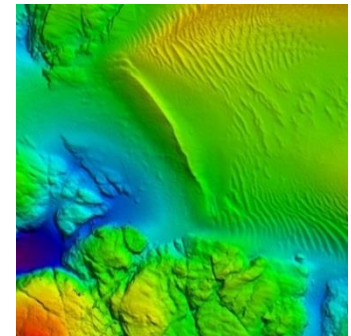407 x 142 x 136 mm, 23/16 kg
Optional items:
• 600 / 700 kHz modes
• Transducer mounting POD.

EM 2040-07 MKII 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 465 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 item:
- Transducer mounting POD.

EM 2040-07 MKII 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 465 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 item:
- Transducer mounting bracket, Dual RX - (POA).

EM 2040 MKII (0.7º x 0.7º) Multibeam Echo Sounder System
Dual RX Transducer System with Dual Swath
Frequency range: 200 to 400 kHz
Swath coverage sector: up to 220°
Max ping rate: 50 Hz
Number of beams per ping: up to 2048
Range: 0.5 m to 465 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
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
Package comprising of the following main items:
- 0.7-degree TX transducer
- 2 x 0.7-degree RX MKII transducers
- 2 x EM 2040 dual processing units, 2U
- Hydrographic Workstation (HWS) - MC330 type (Win10)
- Seafloor Information System (SIS 5) software
- SIS 5 licence dongle key
- Display unit
- 15 m, 30 m or 50 m length RX and TX transducer cables
- Dual RX sync cable, 1.5 m.
Optional item:
- 0.7 x 0.7 deg. dual RX mounting bracket - (POA).

EM 2040-04 MKII 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):
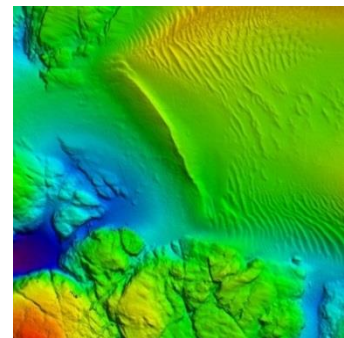407 x 142 x 136 mm, 23/16 kg
Optional items:
- 600 / 700 kHz modes
- Transducer mounting POD.

EM 2040-04 MKII 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 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 items:
- 600 / 700 kHz modes
- Transducer mounting POD.

EM 2040-04 MKII 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 item:
- Transducer mounting bracket, Dual RX - (POA).

EM 2040-04 MKII 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: 2048
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
Package comprising of the following main items:
- 0.4-degree TX transducer
- 2 x 0.7-degree RX MKII transducers
- 2 x EM 2040 dual processing units, 2U
- Hydrographic Workstation (HWS) - MC330 type (Win10)
- Seafloor Information System (SIS 5) software
- SIS 5 licence dongle key
- Display unit
- 15 m, 30 m or 50 m length RX and TX transducer cables
- Dual RX sync cable, 1.5 m.
Optional item:
- Transducer mounting bracket, Dual RX - (POA).
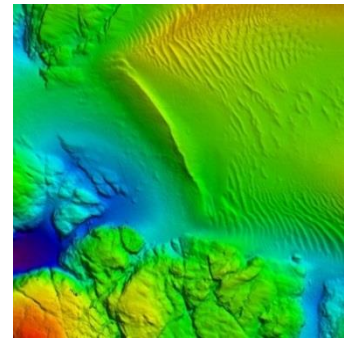
EM 712 (2º x 2º) Multibeam Echo Sounder System
High Resolution Multibeam Echo Sounder
Frequency range: 40 to 100 kHz
Swath coverage sector: up to 140°
Number of soundings per ping: 400 (Dual swath mode)
Range: 3 to 2000 m
Depth resolution: 1 cm
Beam pattern: Equidistant, Equiangular & High Density
Roll, Pitch & Yaw stabilised beams
Supplied with 15 m or 25 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):
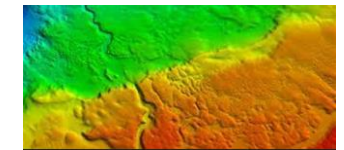250(W) x 350(H) x 260(D) mm, 11 kg
TX/RX transducer dimensions (mm):
224(W) x 490(L) x 118(D) mm
Supplied as standard with transducer mounting frame
Optional items:
- Transducer extension cables
- Transducer mounting POD
- Sound velocity sensor and/or profiler
- Seapath 330/380 system
- Kongsberg 3710 DGNSS receiver.

EM 304 MKII (2º x 2º) 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: 1.80° / 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 25 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
Optional items:
- Transducer gondola and cradle assembly
- Transducer extension cables, 15 m / 25 m length
- SIS features - water column phase logging and extra detections
- Sound velocity sensor and/or profiler
- Seapath 330/380 system
- Kongsberg 3710 DGNSS receiver kit.
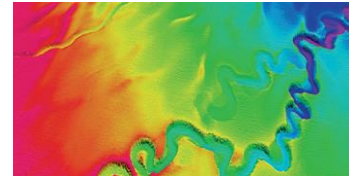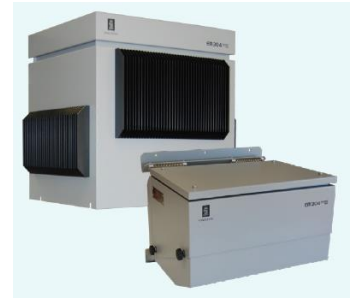
UNDERWATER MAPPING – MBES SYSTEM PARTS

Mesotech M3 Sonar Head
High Resolution Imaging and Profiling Sonar
Part No. 922-20060000
Frequency: 500 kHz
Titanium sonar head, depth rated to 4000 m
Height, width, weight air/water: 159, 217 mm, 8.5/5.3 kg

EM 2040 Compact Sonar Head
Frequency: 200 to 400 kHz
Maximum Angular Coverage: 130º
Power: 24 Vdc, 1 A
Titanium Housing, depth rated to 50 m or 1500 m
Height, diameter, weight air/water (50 m): 119, 332 mm, 23/12.6 kg
Optional item: 15 m, 30 m or 50 m sonar head cable.

EM 2040 Portable Sonar Head
Frequency: 200 to 400 kHz
Maximum Angular Coverage: 140º
Anodised aluminium housing depth rated to 30 m
Dimensions (L x W x H): 560 x 300 x 166 mm
Weight air/water: 19.5/1.7 kg
Optional item: 15 m, 30 m or 50 m sonar head cable.

EM 2040 MKII 0.7º Receive Transducer
Single RX Transducer
Frequency range: 200 to 400 kHz
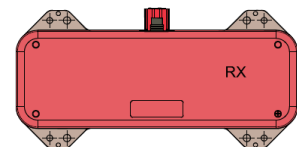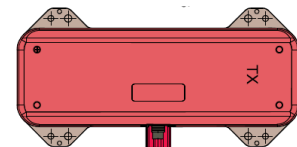Swath coverage sector: up to 140°
Transducer depth rated to 6000 m
RX transducer length, width, height (mm), weight air/water (kg):
407 x 142 x 136 mm, 23/16 kg
Optional items:
- Transducer RX-TX interlink cable.
- 15 m, 30 m or 50 m length RX transducer cable.

EM 2040 0.7º Transmit Transducer
Single TX Transducer
Frequency range: 200 to 400 kHz
Transducer depth rated to 6000 m
TX transducer length, width, height (mm), weight air/water (kg):
407 x 142 x 150 mm, 24/16 kg
Optional items:
- Transducer RX-TX interlink cable.
- 15 m, 30 m or 50 m length TX transducer cable.

EM 2040 0.4º Transmit Transducer
Single TX Transducer
Frequency range: 200 to 400 kHz
Transducer depth rated to 6000 m
TX transducer length, width, height (mm), weight air/water (kg):
727 x 142 x 150 mm, 45/30 kg
Optional items:
- Transducer RX-TX interlink cable.
- 15 m, 30 m or 50 m length TX transducer cable.
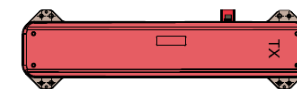
EM 2040 Single Processing Unit
19" rack mounted, 2U high
Dimensions (width x height x depth): 482.5 x 88.6 x 424 mm
Weight: 10.5 kg
Power: 115 Vac (60Hz) or 230 Vac (50Hz), <280 W.

EM 2040 Dual Processing Unit
19" rack mounted, 2U high
Dimensions (width x height x depth): 482.5 x 88.6 x 424 mm
Weight: 10.5 kg
Power: 115 Vac (60Hz) or 230 Vac (50Hz), <280 W.

EM 2040 Sonar Head Cable
TX/RX/Compact/Portable system transducer cable
Available in 15 m, 30 m, and 50 m cable lengths.
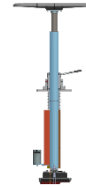
EM 2040 Dual RX Transducer Mounting Bracket
Part No. 358929 and 357504
Aluminium assembly
Flange mount

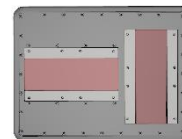**EM 2040P Universal Sonar Mount (USM) Expeditionary Pole**
Over the side pole vessel mount package
Supports fixture of EM 2040P transducer, AML sound velocity sensor,
Seapath 130 sensor unit, and Subsea Motion Reference Unit.
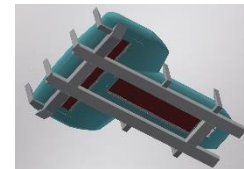
EM 712 (2⁰ x 2⁰) Transducer Housing Assembly
Part No. 322346
Dimensions: 925 mm (L) x 700 mm (W) x 170 mm (H)

EM 304 (2⁰ x 2⁰) Gondola
Gondola and Cradle
Aluminium gondola assembly
Steel cradle assembly
Flange mount
Gondola weight: approx. 670 Kg (including transducers)

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: 169 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
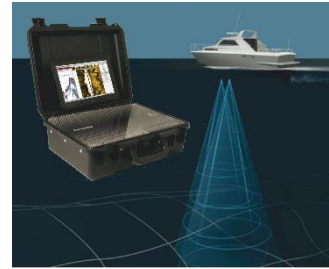Max. resolution 38 kHz/200 kHz: 2.4 cm / 0.6 cm
Transducer type: 38/200D Combi (13º x 21º / 7º x 7º)
Supplied as standard with a 15 m transducer cable
Ruggedised and splashproof suitcase with laptop computer
Power requirements: 110/220 VAC or 12 to 15 VDC, 5A
Width, height, depth, weight: 488, 190, 386 mm, approx. 11 kg

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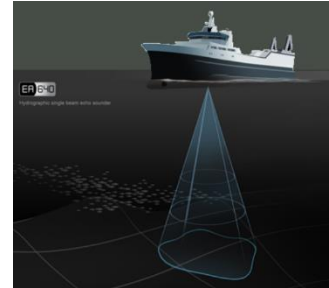Transducer type: 15-17 c/w 15 m cable
Transducer diameter, height; weight: 368, 121 mm; 28 kg
Supplied with Hydrographic Operation Station (HOS) c/w display
Power requirements: 110/220 VAC or 12 to 15 VDC, 5A
Optional item:
- Seatex MRU-5.

UNDERWATER MAPPING – SUB BOTTOM PROFILERS

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): ~3.5º
Beamwidth (secondary): 4º x 6º
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.
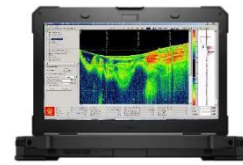
UNDERWATER MAPPING – SIDE SCAN SONAR SYSTEMS

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.

UNDERWATER MAPPING – MULTIBEAM SONARS

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)
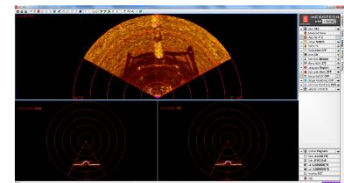Enclosure Rating: IP66 (splashproof)

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)
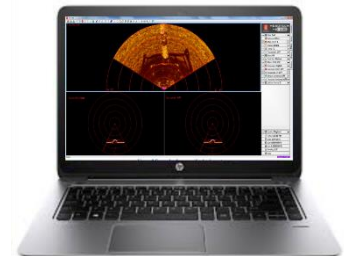Acquisition software for Mesotech scanning sonars and altimeters
Software and USB license dongle key for customer supplied PC.

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 and Wheels
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

Sonar Cable on Reel with Slip Ring
Part No. 975-80120000
Umbilical Cable Type/Function: Kevlar reinforced / Power & RS-485
Umbilical Cable Length / Diameter: 76 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
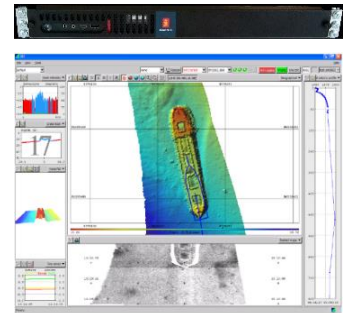- Weight Air/Water: 5.0 kg / 2.7 kg.

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.

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 suppiled PC.
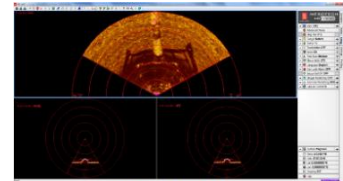
QPS Multibeam Processing Bundle
Sonar data processing software package
Features:
- Qimera Pro
- Fledermaus Geocoder Toolbox add-on
- Fledermaus GIS add-on
- Fledermaus Midwater add-on
- Fledermaus Viz4D.

Note: Software and USB license dongle key for customer suppiled PC.
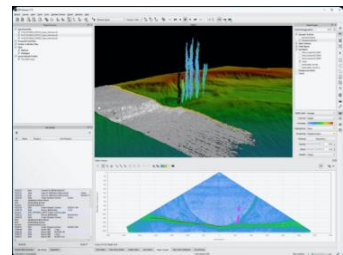
QPS QINSy Survey Lite
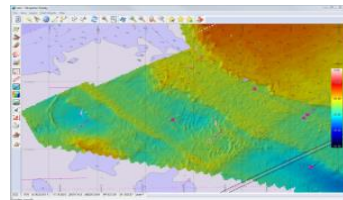Real-time data acquisition, full survey planning, data cleaning/validation and map plotting functionality
Supports single multibeam echo sounder system and includes calibration/backscatter module
Supplied with a computer and/or software license key.

OCEANOGRAPHIC – SOUND VELOCITY SENSORS & PROFILERS

Valeport 650 Sound Velocity Profiler
True Velocity Sound Measurement
Self-Recording & Direct Reading
Speed of Sound range: 1400 to 1600 m/s, acc. ±0.05, res. 0.001 m/s
Temperature: -5 to +35°C, acc. ±0.01, res. 0.002°C
Pressure: 5000 dBar, acc. ±0.1%FS, res. 0.005%FS dBar
Titanium housing, depth rated to 5000 m
Supplied fitted with a deployment cage
Diameter, length; weight air/water: 88, 337 mm; 12.5/9 kg.

Valeport Midas Sound Velocity Profiler
Digital Time of Flight Sound Velocity Profiler
Self-Recording & Direct Reading
Speed of Sound range: 1375 to 1900 m/s, acc. ±0.02, res. 0.001 m/s
Temperature: -5 to +35°C, acc. ±0.01, res. 0.005°C
Pressure: 6000 dBar, acc. ±0.01% FS, res. 0.001% range
Titanium housing, depth rated to 6000 m
Supplied fitted with a deployment cage
Diameter, length; weight air/water (in cage): 88, 665 mm; 11.5/8.5 kg.

Valeport Midas SVX2 Combined CTD & Sound Velocity Profiler
Digital Time of Flight Sound Velocity Profiler & CTD
Self-Recording & Direct Reading
Speed of Sound range: 1375 to 1900 m/s, acc. ±0.02, res. 0.001 m/s
Conductivity: 0-80 mS/cm, acc. ±0.01 mS/cm, res. 0.003 mS/cm
Temperature: -5 to +35°C, acc. ±0.01, res. 0.005°C
Pressure: 6000 dBar, acc. ±0.01% FS, res. 0.001% range
Titanium housing, depth rated to 6000 m
Supplied fitted with a deployment cage
Diameter, length; weight air/water (in cage): 88, 665 mm; 11.5/8.5 kg.

Valeport miniSVP Sound Velocity Profiler
True Velocity Sound Measurement
Self-Recording & Direct Reading
Part No.: 0660002
Speed of Sound range: 1375 to 1900 m/s, acc. ±0.02, res. 0.001 m/s
Pressure: 300 or 600 Bar, acc. ±0.05% range, res. 0.001% range
External Power Supply: 9-28 VDC, <250 mW
Titanium housing, depth rated to 6000 m
Supplied fitted with a deployment cage
Diameter, length; weight air/water: 110, 450 mm; 1.6/- kg.

Valeport miniSVS Sound Velocity Sensor
True Velocity Sound Measurement
Small Direct Reading Sensor: SV only
Part No.: 0652005 (50 mm path length)
Speed of Sound range: 1375 to 1900 m/s
Accuracy: ±0.019 m/s
Resolution: 0.001 m/s
External Power Supply: 9-28 VDC, 250 mW
Titanium housing, depth rated to 6000 m
Supplied with a 20 m data / power cable
Diameter, length; weight air/water: 40, 217 mm; 0.53/- kg.

AML Minos X SVP/CTD Profiler
Real-time Vertical Profiler
Self-Recording & Direct Reading
Xchange™ field swappable sensors
Speed of Sound range: 1375 to 1625 m/s
Accuracy: ±0.025 m/s
Resolution: 0.001 m/s
Pressure: 6000 dBar acc. ±0.05% FS, res. 0.01 dBar
Conductivity, Temperature: 0-90 mS/cm, -5-45 °C
Titanium housing, depth rated to 6000 m
Supplied fitted with a deployment cage
Diameter, length; weight air/water: 76, 597 mm; 4.7/3.2 kg.

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.

DATA TELEMETRY – ACOUSTIC MODEM

cNODE® Modem MiniS 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 systems
enabled with APOS Cymbal and Transparent Modem functions.

cNODE® Modem MiniS 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 systems
enabled with APOS Cymbal and Transparent Modem functions.

cNODE® Modem MiniS 17-180 Ti
Positioning and Transparent Modem Transponder
12 kHz band (LF)
Fully compatible with Cymbal® and HPR400 acoustic protocols
SSBL / USBL and LBL positioning modes
Beamwidth: ± 90 degrees
Max source level: up to 188 dB
Data Rate: up to 6 kB/s
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
External bulkhead connector: Seacon MCBH8MDO
Length, diameter housing / transducer: 306 mm, 105 mm
Weight in air / water: 6.5 / 4.0 kg.

Note: Operates in conjunction with compatible HiPAP and cPAP 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.

DATA TELEMETRY – RADIO MODEM

Maritime Broadband Radio System
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.

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.

Maritime Broadband Radio System
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.

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 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.
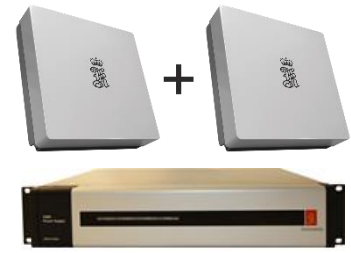
Maritime Broadband Radio System – Bundle Package
MBR 189 MK2 and MBR 179 MK2 Systems~
1 x MBR 189 MK2 and 1 x MBR 179 MK2 radios

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

VESSEL REFERENCE – HAIN SYSTEM

HAIN Reference for DP	£640	£545	£465
Hydroacoustic Aided Inertial Navigation System			
System features:	$800	$680	$580

- Supports HiPAP SSBL and LBL hydroacoustic position aiding
- Improved acoustic position accuracy, typically by 2-3 times
- Higher position update rate
- Position update during acoustic drop-out
- Extended operational depth capabilities.

System package comprises of:
- Seatex MGC R3 Compass
- MGC Angle Bracket
- MGC Mount and Noise Reduction Kit
- MGC Interface Cabinet JB7 (50cm x 50cm)
- 19" Rack Mounted HAIN Computer
- HAIN Operator Software in APOS.

Optional item:
- APOS Computer for HiPAP with HAIN Operator Software.

Note: HAIN requires interface to vessel HiPAP with X81/X82
transceiver unit and compatible APOS computer/software.
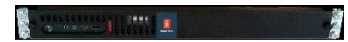
VESSEL REFERENCE – RELATIVE POSITIONING SYSTEM

RADius 2000 Single Interrogator System
Relative Positioning System
DP range: up to 550 m (dependant on transponder type)
Range accuracy: < 0.25 m (1 σ)
Angle accuracy: 0.2° (1 σ)
Operating sector: up to 100°
Data update rate: up to 5 Hz (configurable)
Frequency band: 5.51 - 5.61 GHz
Interrogator opening angle: ±50° (vertical/horizontal)
Interrogator enclosure protection: IP 66 rated
Interrogator height, width & depth, weight: 390 x 470 x 162 mm, 11 kg
Processing unit power requirements: 100-240 VAC, max. 170 W
System comprising of the following main items:
- Interrogator unit c/w junction box
- 19" rack mount processing unit (2U)
- 19" rack mount Interrogator power supply unit (2U)
- Mains and data distribution unit
- Standard desktop display unit
- 60 m length interrogator power & data cables

Optional item:
- RADius 700/700X transponder for test/commissioning purposes.

RADius 2000 Dual Interrogator System
Relative Positioning System
DP range: up to 550 m (dependant on transponder type)
Range accuracy: < 0.25 m (1 σ)
Angle accuracy: 0.2° (1 σ)
Operating sector: up to 180°
Data update rate: up to 5 Hz (configurable)
Frequency band: 5.51 - 5.61 GHz
Interrogator opening angle: ±50° (vertical/horizontal)
Interrogator enclosure protection: IP 66 rated
Interrogator height, width & depth, weight: 390 x 470 x 162 mm, 11 kg
Processing unit power requirements: 100-240 VAC, max. 170 W
System comprising of the following main items:
- 2 x Interrogator unit c/w junction box
- 19" rack mount processing unit (2U)
- 19" rack mount Interrogator power supply unit (2U)
- Mains and data distribution unit
- Standard desktop display unit
- 60 m length interrogator power & data cables

Optional item:
- RADius 700/700X transponder for test/commissioning purposes.

RADius 2000 Quad Interrogator System
Relative Positioning System
DP range: up to 550 m (dependant on transponder type)
Range accuracy: < 0.25 m (1 σ)
Angle accuracy: 0.2° (1 σ)
Operating sector: up to 360°
Data update rate: up to 5 Hz (configurable)
Frequency band: 5.51 - 5.61 GHz
Interrogator opening angle: ±50° (vertical/horizontal)
Interrogator enclosure protection: IP 66 rated
Interrogator height, width & depth, weight: 390 x 470 x 162 mm, 11 kg
Processing unit power requirements: 100-240 VAC, max. 170 W
System comprising of the following main items:
- 2 x Interrogator unit c/w junction box
- 194 rack mount processing unit (2U)
- 19" rack mount Interrogator power supply unit (2U)
- Mains and data distribution unit
- Standard desktop display unit
- 60 m length interrogator power & data cables

Optional item:
- RADius 700/700X transponder for test/commissioning purposes.

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): 553, 660, 600 mm
Power requirements: 110/220 Vac, 160 W
Standard LCD desktop monitor
Supplied with 60 m interrogator power & data cables
Optional item:

• RADius 700/700X transponder for test/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
Interrogator height, width & depth, weight: 412 x 562 x 184 mm, 7 kg
Power requirements: 110-220 Vac, 160 W
Standard LCD desktop monitor
Supplied with 60 m interrogator power & data cables
Optional item:
• RADius 700/700X transponder for test/commissioning purposes.

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
Interrogator height, width & depth, weight: 412 x 562 x 184 mm, 7 kg
Power requirements: 110-220 Vac, 160 W
Supplied with 60 m interrogator power & data cables
Optional item:
• RADius 700/700X transponder for test/commissioning purposes.

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
Interrogator height, width & depth, weight: 412 x 562 x 184 mm, 7 kg
Power requirements: 110-220 Vac, 160 W
Supplied with 60 m interrogator power & data cables
Optional item:
• RADius 700/700X transponder for test/commissioning purposes.

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*
RADius remote power and modem cabinet
Modem mounted on rail in RADius controller unit cabinet
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
19" rack mounted, 2U high
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.

VESSEL REFERENCE – LASER RANGING SYSTEMS

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 @ 1000 m range
Bearing accuracy: (2σ) 1 mrad (0.06°)
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: ±15° range (5° increments)
Operating range: up to a maximum of 2000m (weather dependant)
Range accuracy: 20 cm
Angular accuracy: 0.1°
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, 12.9kg.

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: 150°
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: 180° horizontal / ±15° vertical
Weight (with mount): 2.8 kg
Dimensions (with mount): (H) 394 mm, (W) 175 mm, (D) 133 mm

VESSEL REFERENCE – (D)GNSS POSITIONING SYSTEMS

Kongsberg DPS 114 System
DGNSS 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: 10 cm, 95 % CEP
DGNSS 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.
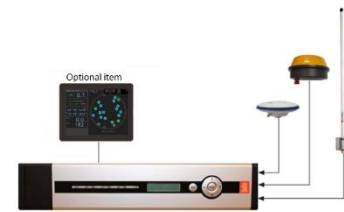
Kongsberg DPS 232 System
GNSS Based Position Reference Sensor
Combined GPS L1/L2, GLONASS L1/L2 and SBAS receiver
MULTIREF capability
Accepts DGPS/DGLONASS corrections: RTCM-SC104 ver. 2.2, 2.3,
3.0, 3.1; SeaSTAR HP/XP/G2
SBAS accuracy: < 1 m, 95 % CEP, 0.6 m, 1σ
SeaSTAR XP/HP/G2 horizontal accuracy: 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 a DGPS IALA radio beacon antenna
Supplied as standard with 30 m length RG-214 antenna cables
Optional system item:
• Fugro 3610 or Seatex 3710 DGNSS receiver.

Kongsberg 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 a DGPS IALA radio beacon antenna
Supplied as standard with 30 m length RG-214 antenna cables
Optional system item:
• Fugro 3610 or Seatex 3710 DGNSS receiver.

Kongsberg DPS i1 System
DGNSS Based Position Reference Sensor
Multi-frequency GPS, GLONASS, Galileo, Beidou and SBAS receiver
Built-in L-band receiver with Fugro Seastar XP2/G4 capability
IALA beacon capability
Accepts standard RTCM corrections input
SeaSTAR G4 accuracy: 10 cm, 95 % CEP
DGNSS 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), 2 x Ethernet / LAN, 1 x USB
DPS i1 unit - width, height, depth; weight: 444, 89, 357 mm; 6.3 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.
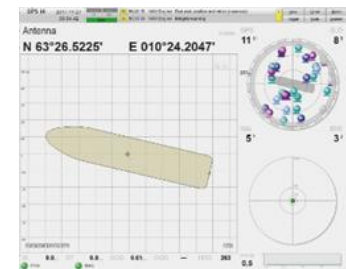Optional system item:
• HMI display unit.
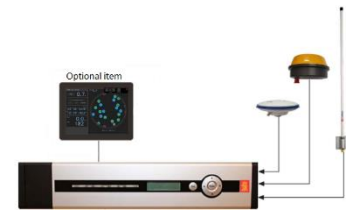
Kongsberg DPS i2 System
GNSS Based Position Reference Sensor
Combined GPS L1/L2, GLONASS L1/L2 and SBAS receiver
MULTIREF capability
INS aided RAIM capability for enhanced integrity and reliability
Accepts DGNSS corrections: RTCM-SC104 ver. 2.2, 2.3, 3.0, 3.1;
SeaSTAR HP/XP2/G2/G2+
Non-differential position 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): 553, 660, 600 mm
Power: 100 - 240 VAC, 50/60 Hz, max 115 W
Supplied with a NovAtel GNSS antenna
Supplied as standard with 30 m length RG-214 antenna cables
Optional system item:
• Kongsberg 3710 DGNSS receiver
• Seatex MGC R2/R3 or MRU-5+.

Kongsberg DPS i3 System
GNSS Based Position Reference Sensor
Combined GPS L1/L2, Galileo 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/XP2/G2/G2+ position accuracy: 10 cm, 95 % CEP
DGNSS position accuracy: < 1 m, 95% CEP
SBAS position accuracy: < 1 m, 95 % CEP
Velocity accuracy: < 0.01 m/s, 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)
Power: 100 - 240 VAC, 50/60 Hz, max 245 W
Supplied with processing and HMI units
Supplied with a NovAtel GNSS 850 antenna
Supplied as standard with a 30 m length RG-214 antenna cable
Optional system item:
• Comrod IALA AR10MA DGPS Antenna
• Kongsberg 3710 DGNSS receiver
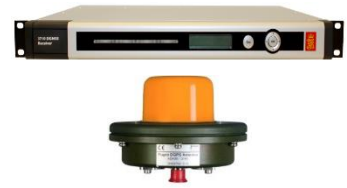• Seatex MGC R2/R3 or MRU-5+.

VESSEL REFERENCE – DGNSS CORRECTION SERVICE RECEIVERS

Kongsberg 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

Kongsberg DPS 232 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.

Kongsberg 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.

Kongsberg DPS i1 Processing Unit
DGNSS Based Position Reference Sensor
Multi-frequency GPS, GLONASS, Galileo, Beidou and SBAS receiver
Built-in L-band receiver with Fugro Seastar XP2/G4 capability
IALA beacon capability
Width, height, depth; weight: 444, 89, 357 mm; 6.3 kg
Power: 100 - 240 Vac, 50/60 Hz, max 60 W.

VESSEL REFERENCE SYSTEMS – POSITION, HEADING & ATTITUDE SYSTEMS

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°; 0.10° 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.

Note: No export licence required.

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°; 0.10° 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.

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.

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.

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 corrns
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.

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 corrns
Position accuracy (Z): 2 cm + 3.2 ppm RMS with RTK corrns
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.

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.

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.

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/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.

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 item:
- Trimble SPS 852 Reference Station
- 3610/3710 DGNSS Corrections Receiver.

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.

Seapath 380-R3 SB50 System
GNSS Aided Heading, Attitude and Positioning Sensor
Real-time, Position, Roll, Pitch, Heave & Heading
MGC R3 fitted in 50 m depth rated subsea bottle
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/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 45 m processing unit to MGC cable and 2 x
25 m GNSS cables (RG-214)
Optional system item:
- 3710 DGNSS corrections receiver and antenna.

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 batytery 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.

VESSEL REFERENCE SENSORS – MOTION REFERENCE UNITS

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: 0.025° 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, 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/s^2 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 24/7 support

Global and local support

We provide global support from local service and support facilities at strategic locations world wide. 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 wellqualified field service engineers will be able to help you quickly and effectively.

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