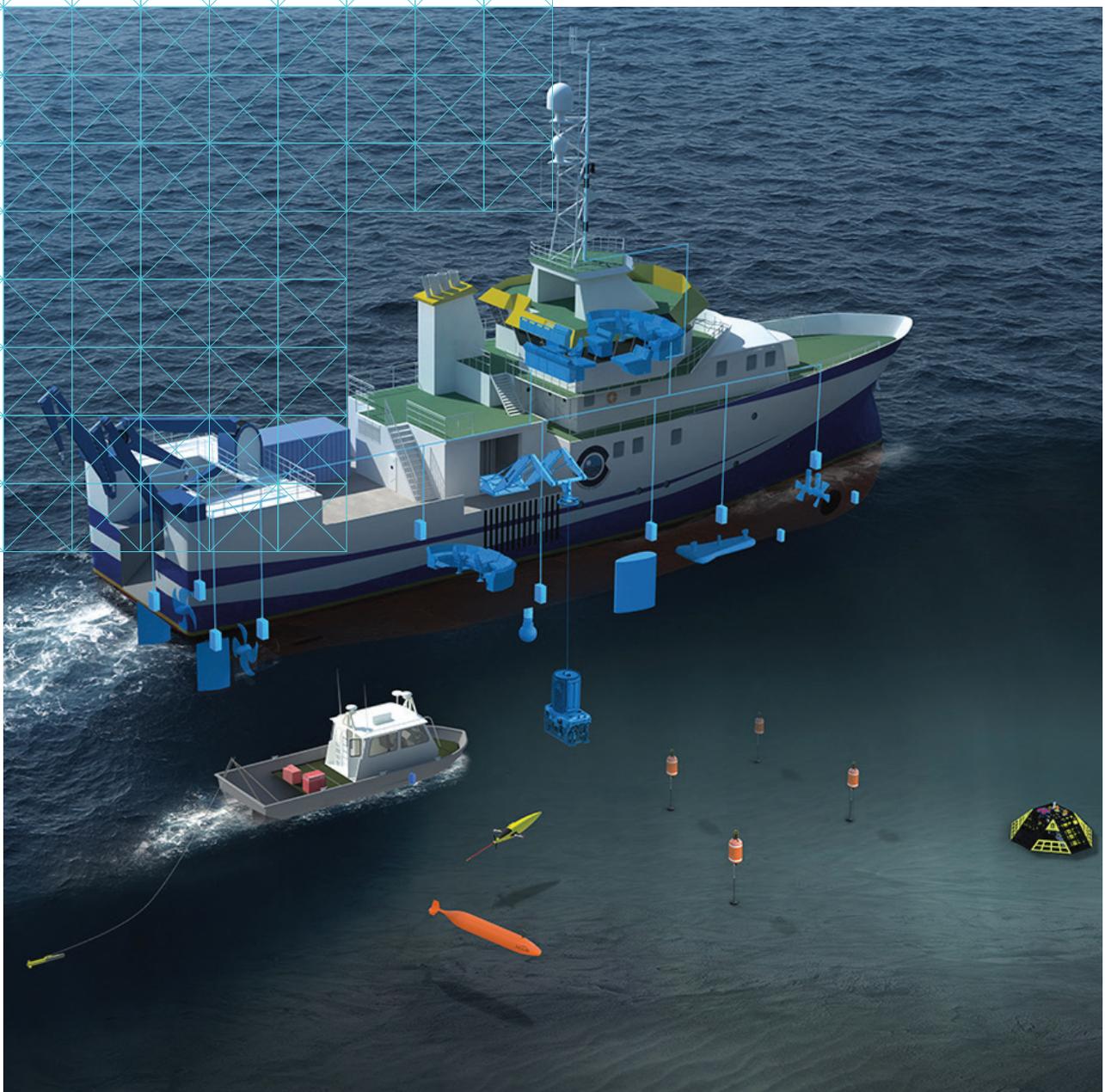




KONGSBERG

RENTAL BROCHURE

GLOBAL



KONGSBERG MARITIME RENTAL

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

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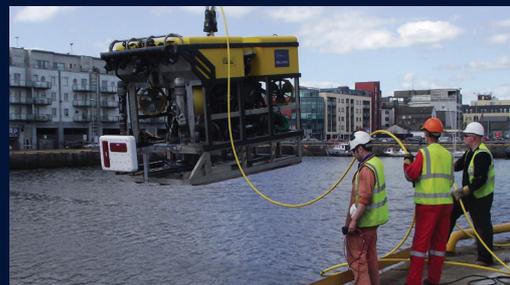
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UNDERWATER POSITIONING – POSITIONING SYSTEMS

HiPAP® 352P-MGC Portable System

Calibration Free 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: $\pm 80^\circ$

Range detection accuracy (Cymbal): 2 cm

Angular accuracy (S/N [20 dB Rel. 1 μ Pa]): 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: $\pm 80^\circ$

Range detection accuracy (Cymbal): 2 cm

Angular accuracy (S/N [20 dB Rel. 1 μ Pa]): 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: $\pm 80^\circ$

Range detection accuracy (Cymbal): 2 cm

Angular accuracy (S/N [20 dB Rel. 1 μ Pa]): 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: $\pm 80^\circ$

Range detection accuracy (Cymbal): 2 cm

Angular accuracy (S/N [20 dB Rel. 1 μ Pa]): 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.

£230 £195 £165
 \$300 \$255 \$215



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 / <math><1.0^\circ</math>
 Operating range: 1 - 4000 m
 Angular accuracy: 0.25°
 Position accuracy: 0.45% (1 Sigma, SNR > 20dB rel. 1µPa in bandwidth)
 Data telemetry: up to 2,5kBit/s (application dependent)
 Transducer beam width: ± 80°
 Material, depth rating: Bronze/Stainless steel, up to 50 m
 Length, diameter; weight air/water: 250,190 mm; 13 kg/8 kg
 Supplied with a 50 m or 70 m length transducer cable
 Supplied as standard with an APOS laptop computer
 Optional system item:

- Responder drive kit.



cPAP® 34 MKII, Subsea LBL Positioning System

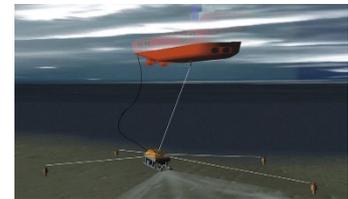
ROV Mount Transceiver

30 kHz band (MF)
 FSK and PSK (Cymbal®) signalling modes
 For use in support of Long Base Line (LBL) positioning operations
 Polyurethane coated aluminium housing
 Depth rated: up to 4000 m
 APOS interface: RS-232
 User interface: RS-232/422/485
 Power supply: 20-28 Vdc, 1 Ampere (max)
 Internal battery type: Lithium Iron Phosphate (Li-Fe - rechargeable)
 Length, diameter; weight air/water: 278,105 mm; 4.2 kg/2.2 kg
 Transceiver supplied with the following items:

- cPAP MKII 34, Subsea LBL Transceiver, (part no. 447900)
- Transducer 34-30H for cPAP (part no. 345773)
- Subsea Cable for cPAP to transducer, 6 m, (part no, 345772)
- Subsea Pigtail for cPAP (part no. 408094)
- cNODE® MiniS Battery Charger (part no. 404199).

Optional system items:

- APOS Survey Operator Station.



cPAP® 37 MKII, Subsea LBL Positioning System

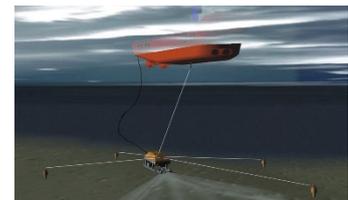
ROV Mount Transceiver

30 kHz band (MF)
 FSK and PSK (Cymbal®) signalling modes
 For use in support of Long Base Line (LBL) positioning operations
 Polyurethane coated titanium housing
 Depth rated: up to 7000 m
 APOS interface: RS-232
 User interface: RS-232/422/485
 Power supply: 20-28 Vdc, 1 Ampere (max)
 Internal battery type: Lithium Iron Phosphate (Li-Fe - rechargeable)
 Length, diameter; weight air/water: 278,105 mm; 4.2 kg/2.2 kg
 Package comprises of the following items:

- cPAP MKII 37 Ti, Subsea LBL Transceiver, (part no. 475554)
- Remote Transducer TDR180-St, 7000m rated (part no. 375361)
- Subsea Cable from cPAP to transducer, 6 m, (part no, 345772)
- Subsea Pigtail for cPAP, 0.6 m (part no. 345771).
- cNODE® MiniS Battery Charger (part no. 404199).

Optional system items:

- APOS Survey Operator Station.



cPAP® 30, Portable Telemetry Unit

Portable Medium Frequency (MF) Transceiver Unit

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



UNDERWATER POSITIONING – SUBSEA HAIN SYSTEM

HAIN Subsea 7000 with APOS Survey Hydroacoustic Aided Inertial Navigation Package

System features:

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

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

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

Subsea MGC® R3 IMU/Processing unit specifications:

Integrated position accuracy: Up to 3 times better than aiding position
 Heading accuracy (GNSS aided): 0.04° RMS (secant latitude)
 Dynamic accuracy roll & pitch: 0.01° RMS
 Dynamic accuracy heave: 5 cm or 5 % (whichever is highest)
 Angle random walk: 0.008 ° / sq. root hour
 Housing connector types: SubConn (1 x 16-pin and 3 x 8-pin):

- Connection to topside: Ethernet 10 Mbit
- Interface to DVL and Depth sensor
- 1 PPS signal output.

Power input: 24 VDC (20–32V input range), 200 W
 Power output to sensors: 3 x 24 VDC, total 60 W; 1 x 12 VDC, 60 W
 Titanium housing, depth rated to 7000 m
 Length, diameter: 368 mm, 187 mm
 Weight in air/water: 20 kg / 12.5 kg.

Nortek DVL500 specifications:

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

Valeport miniIPS Intelligent Pressure Sensor specifications: Temperature Compensated Piezo-Resistive Sensor

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

Note: Sound velocity sensor is optional and not included in package.



UNDERWATER POSITIONING – HAIN POST-PROCESSING SOFTWARE

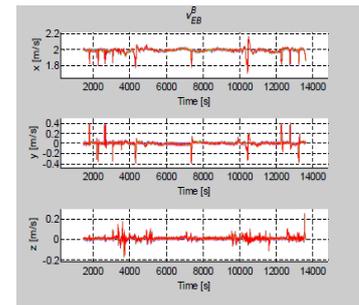
NavLab Post-Processing Computer

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 a 5 m serial cable which enables connection to cNODE transponder

Operation temperature: -5 to +55°C

Splash proof IP 54 case

Internal rechargeable lead/acid battery pack (3 hours operation)

Power supply: 100-240 Vac

Diameter, weight: 488 x 185 mm, 16 kg.



TTC Light

Transponder Test and Configuration Tool

TTC Light software installed on PC running Windows 7 or above

The TTC Light software can be used to:

- Test cNODE transponders from PC via interface cable to:
 - Read transponder configuration settings (serial number, acoustic channel and mode, battery capacity, transducer type)
 - Configure Cymbal or FSK Mode and channels
 - Upload new transponder firmware.
- Perform acoustic tests (requires cNODE MiniS) to:
 - Read transponder configuration settings (serial number, acoustic channel and mode, channel number, battery capacity, read sensors)
 - Configure Cymbal or FSK Mode and channels
 - Execute acoustic release
 - In air acoustic range test.



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

ACU 30, Acoustic Command Unit

Portable Medium Frequency (MF) Transceiver Unit

Part No. 320101

Fully compatible with Kongsberg ACS 500 Cymbal protocol

Operation temperature: -5 to +55°C

Splash proof case - IP 54 rated

Internal rechargeable lead/acid battery pack (3 hours operation)

Power supply: 100-240 Vac

Diameter, weight: 488 x 185 mm, 16 kg

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

Optional system item:

- Dunking transducer on 70 m cable reel.



Responder Drive Kit for HiPAP®35xP/50x or µPAP® 20x Hardware for providing responder trigger signals from HiPAP or µPAP system to responder units

Technical specifications:

- Dust and water protected (IP 44 rated)
- Can be located near ROV control rooms
- Requires 230 Vac / 150 mA power supply
- Four + 24 V / 5 ms electrical trigger outputs
- Four optical pulse outputs
- Green LED's for every 8 responder outputs
- Dimensions (L x W x H): 280 x 200 x 73 mm, Weight: 2.9 kg.



Remote HiPAP®50x Operator Station

Acoustic Positioning System Computer

Supplied with the latest APOS software to allow system master/slave operations from different locations onboard the vessel.

APOS computer specifications:

Dimensions (L x W x H): 425 x 425 x 185 mm; Weight: 17 kg.

Power: 90-132 / 180-264 Vac, 80 W.



APOS Survey

Acoustic Positioning System Computer for Survey

Enables independent HiPAP, cPAP and Subsea HAIN system operations from the vessels ROV/Survey area.

Supplied with the latest Survey APOS software and licence.

Includes the following enabled APOS software functions:

- CYMBAL (requires HiPAP 351/451/501 transceiver or later)
- SSBL Fast Track
- LBL ROV, vessel and transponder positioning
- Interface to cPAP ROV transceiver unit



APOS Survey computer specifications:

8-port serial card: 4 x RS-232 and 4 x RS-422/485

Ethernet ports: Net A, B and C

Dimensions (L x W x H): 425 x 425 x 185 mm; Weight: 17 kg.

Power: 90-132 / 180-264 V ac, 80 W.

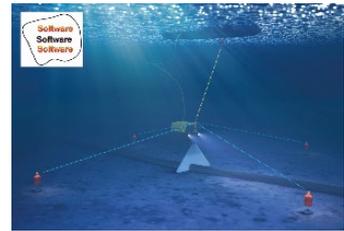
Note: Additional APOS software functions available on request.

APOS LBL Function

APOS software option which enables Long Base Line operations when using HiPAP®, µPAP® and cPAP® systems.

Option includes:

- LBL Geographical Calibration
- Transponder LBL Positioning
- LBL and Sparse LBL Positioning for cPAP / ROV

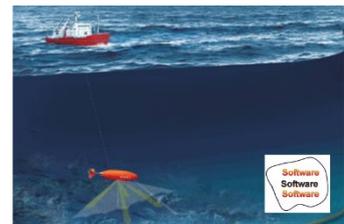


Note: APOS software option available when supplied with acoustic positioning computer or with portable system.

APOS Transparent Modem Function

APOS software option which enables data communication with subsea modems.

Supports Hugin/Munin AUV positioning and data communication.



Note: APOS software option available when supplied with acoustic positioning computer or with portable system. Compatible with HiPAP®, µPAP® and cPAP® systems enabled with Cymbal acoustic protocol.

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 / 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: $15 \pm 10\%$ 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: $15 \pm 10\%$ 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 interfaced to a Gyrocompass.

cNODE® Midi 34-180-MTS/I

Positioning Transponder*

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

- Inclinometers: 0.05° (range +/- 90 degrees).



cNODE® Midi 34-180-MTS/PI

Positioning Transponder*

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

- Depth: +/- 0.01% FS (FS = 6000 psi)
- Inclinometers: 0.05° (range +/- 90 degrees).



UNDERWATER POSITIONING – cNODE MAXI TRANSPONDERS

cNODE® Maxi 34-180

Positioning Transponder

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



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 interfaced 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 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 36-30V30H-R-St

Positioning Transponder

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



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
Flotation Collar for cNODE® MiniS transponder
Part No. 442750
Depth rating: 4000 m
Buoyancy (collar only): 6.3 kg
Height with cage, diameter; weight in air: 524, 350 mm; 16.66 kg.



Note: transponder not included.

cNODE® Mini Floatation Collar
Flotation Collar for cNODE® Mini transponder
Part No. 366186
Depth rating: 4000 m
Buoyancy: 3.5 kg
Height with cage, diameter, weight: 597, 290 mm, 9 kg.



Note: transponder not included.

UNDERWATER MAPPING – MULTIBEAM ECHO SOUNDER SYSTEMS

GeoSwath 4R Bathymetric Sonar System

Portable Wide Swath Bathymetry and Side Scan Sonar

IHO SP-44, special order

Frequency: 500 kHz

Range: 1 to 50 m

Maximum swath width: 190 m

Depth resolution: 1.5 mm

Seafloor coverage: up to 12 times water depth

Splash proof deck unit, IP66 rated

Power supply requirements: 24 Vdc, 40 W

Laptop PC running GS4 data acquisition and processing software

Supplied with assembly for mounting transducers and optional sensors

Transducer head dimensions: 330 x 109 x 75 mm

Supplied with 10 m or 20 m length transducer and sensor cables

Optional system items:

- Valeport miniSVS sound velocity sensor
- Seatex Seapath 130 or MRU-3/H/5 (fitted in subsea housing).



Mesotech M3 Sonar - Bath System

Shallow Water High Resolution Bathymetric Sonar

Sonar head part no. 922-20220000

Frequency: 500 kHz

Range: 0.2 m to 50 m

Maximum 120° view angle

Range resolution: 1 cm

Vertical beamwidth: 3°

Number of beams: 256

Update rate: up to 40 Hz

Supplied with M3 Sonar processor computer and interface unit

Supplied with 6 m or 15 m sonar head cable assembly

Input voltage/power: 12 to 36 VDC / 22 W (typical)

Anodised aluminium sonar head, depth rated to 500 m

Connector type: SEACON / MINK-10-FCRL

Height, width, weight air/water: 145, 213 mm, 4.6/1.7 kg

Optional auxiliary sensors and hardware/software:

- AML Micro X or Valeport miniSVS sound velocity sensor
- Seatex Seapath 130 system
- Over-the-side mounting pole assembly
- QINSy Survey Lite data acquisition software.



Mesotech M3 Sonar - Single Head ROV System

High Resolution Imaging and Profiling Sonar

Sonar head part no. 922-20060000

Frequency: 500 kHz

Range: 0.2 m to 50 m

Field of view: 120° / (EIQ 140°)

Beamwidth (Imaging): 1.6° x (3° / 7° / 15° / 30°)

Beamwidth (EIQ): 0.95° x 30°

Beamwidth (Profiling / Bathymetry): 1.6° x 3°

Telemetry: Ethernet (10/100/1000 Mbps)

Input voltage/power: 12 to 36 VDC / 22 W (typical)

Titanium sonar head, depth rated to 4000 m

Height, width, weight air/water: 159, 217 mm, 8.5/5.3 kg

Supplied with items:

- M3 sonar head, 4000m depth rated
- M3 Sonar Head Accessory Kit
- M3 Sonar cable whip, 4.5m
- M3 Sonar cable whip, 6.1m, Sync/1PPS
- M3 Sonar mounting bracket
- M3 Sonar software.



**Mesotech M3 Sonar - Dual Head ROV System
High Resolution Imaging and Profiling Sonar**

Sonar head part no. 922-20060000
 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
 Package supplied with items:

- 2 x M3 sonar head, 4000m depth rated
- M3 Sonar Head Accessory Kit
- 2 x M3 Sonar cable whip, 4.5m
- M3 Sonar dual head sync cable, 6.1m
- M3 Sonar mounting bracket
- M3 Sonar software.



**EM 2040PHS MKII Multibeam Echo Sounder System
Portable Hydrographic System with Single Swath**

Frequency range: 200 to 400 kHz (optional: 600 / 700 kHz modes)
 Swath coverage sector: up to 170°
 Beam width: 1° x 1° @ 400 kHz
 Max ping rate: 50 Hz
 Number of beams per ping: 512 (single swath)
 Range: 0.5 to 270 m (400 kHz, FM mode, cold ocean water)
 Depth accuracy: 2 cm
 Beam pattern: Equidistant, Equiangular & High Density
 Roll, Pitch & Yaw stabilised beams
 Laptop computer c/w Seafloor Information System (SIS 5) software
 Sonar head depth rating: 30 m
 Sonar head dimensions (L x W x H): 482 x 298 x 166 mm
 Sonar Head weight air/water: 19.5/1.7 kg
 Package comprises of the following main items:

- EM 2040P transducer fitted with AML Sound Velocity Sensor
- 15 m or 30 m length transducer cable
- EM 2040P processing unit, splash-proof version, single swath
- Seapath 130 system, including MRU-5+ in 10 m subsea bottle
- 3710 DGNSS Receiver kit
- Universal Sonar Mount (USM) expeditionary pole.



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

Frequency range: 200 to 400 kHz (optional: 600 / 700 kHz modes)
 Swath coverage sector: up to 170°
 Beam width: 1° x 1° @ 400 kHz
 Max ping rate: 50 Hz
 Number of beams per ping: 512
 Range: 0.5 to 270 m (400 kHz, FM mode, cold ocean water)
 Depth accuracy: 2 cm
 Beam pattern: Equidistant, Equiangular & High Density
 Roll, Pitch & Yaw stabilised beams
 HWS or laptop computer c/w Seafloor Information System software
 Sonar head depth rating: 30 m
 Sonar head dimensions (L x W x H): 482 x 298 x 166 mm
 Sonar Head weight air/water: 19.5/1.7 kg
 Supplied with a 15 m, 30 m or 50 m length transducer cable
 Optional system items:

- Transducer mounting bracket
- Universal Sonar Mount (USM) expeditionary pole
- Seatex Seapath 130
- AML Sound velocity sensor.



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

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

- Transducer mounting bracket
- Universal Sonar Mount (USM) expeditionary pole.



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

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

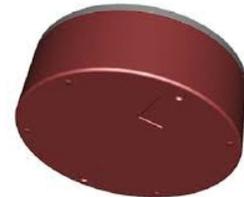
- Transducer mounting bracket
- Universal Sonar Mount (USM) expeditionary pole.



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

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

- Dual Swath mode - additional cost of £50 per day
- Transducer mounting bracket, Single RX.



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

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

- Dual Swath mode - additional cost of £200 per day
- Transducer mounting bracket, Dual RX.



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

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

- 600 / 700 kHz modes
- Transducer mounting POD.



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

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

- Transducer mounting POD.



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

Supplied with two (2) RX transducers and processing unit(s)
 Frequency range: 200 to 400 kHz
 Swath coverage sector: up to 220°
 Max ping rate: 50 Hz
 Number of beams per ping: 1024
 Range: 0.5 to 470 m (300 kHz, cold ocean)
 Depth accuracy: 2 cm
 Beam pattern: Equidistant, Equiangular & High Density
 Roll, Pitch & Yaw stabilised beams
 Transducers depth rated to 6000 m
 Supplied with 15 m, 30 m or 50 m length transducer cables
 HWS computer c/w Seafloor Information System (SIS) software
 TX transducer length, width, height (mm), weight air/water (kg):
 407 x 142 x 150 mm, 24/16 kg
 RX transducer length, width, height (mm), weight air/water (kg):
 407 x 142 x 136 mm, 23/16 kg
 Optional system item:

- Dual Swath mode - additional cost of £200 per day
- Transducer mounting bracket, Dual RX - (POA).



**EM 2040 MKII (0.4° x 0.7°) Multibeam Echo Sounder System
Single RX Transducer System with Single Swath**

Frequency range: 200 to 400 kHz
 Swath coverage sector: up to 170°
 Max ping rate: 50 Hz
 Number of beams per ping: 512
 Range: 0.5 to 480 m (300 kHz, cold ocean)
 Depth accuracy: 2 cm
 Beam pattern: Equidistant, Equiangular & High Density
 Roll, Pitch & Yaw stabilised beams
 Transducers depth rated to 6000 m
 Supplied with 15 m, 30 m or 50 m length transducer cables
 HWS computer c/w Seafloor Information System (SIS) software
 TX transducer length, width, height (mm), weight air/water (kg):
 727 x 142 x 150 mm, 45/30 kg
 RX transducer length, width, height (mm), weight air/water (kg):
 407 x 142 x 136 mm, 23/16 kg
 Optional system item:

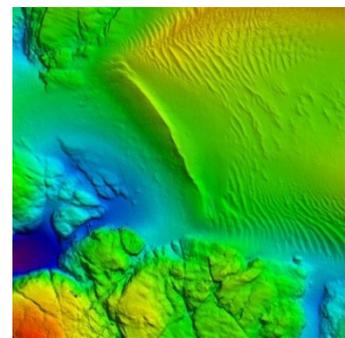
- Dual Swath mode - additional cost of £50 per day
- 600 / 700 kHz modes
- Transducer mounting POD.



**EM 2040 MKII (0.4° x 0.7°) Multibeam Echo Sounder System
Dual RX Transducer System with Single Swath**

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

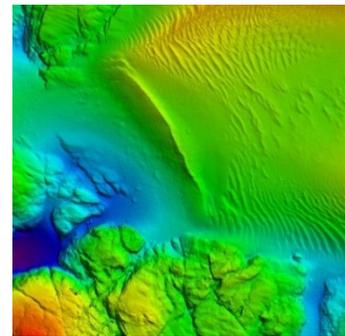
- Dual Swath mode - additional cost of £200 per day
- Transducer mounting bracket, Dual RX - (POA).



**EM 2040 MKII (0.4° x 0.7°) Multibeam Echo Sounder System
Dual RX Transducer System with Dual Swath**

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

- Transducer mounting bracket, Dual RX - (POA).



**EM 710 MKII (2° x 2°) Multibeam Echo Sounder System
High Resolution Multibeam Echo Sounder**

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

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



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

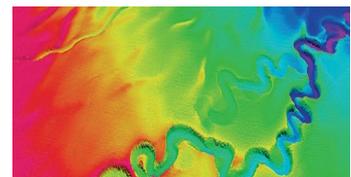
Frequency range: 40 to 100 kHz
 Swath coverage sector: up to 140°
 Number of soundings per ping: 400 (Dual swath mode)
 Range: 3 to 2300 m
 Depth resolution: 1 cm
 Beam pattern: Equidistant, Equiangular & High Density
 Roll, Pitch & Yaw stabilised
 15 m length transducer cables
 HWS computer c/w Seafloor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

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



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

Frequency range: 20 to 32 kHz
 Nominal frequency: 26 kHz
 Swath coverage sector: up to 140°
 Number of beams per ping: 1024 (dual swath)
 Beamwidth TX / RX: 1.80° / 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 15 m length transducer cables
 Transmit transducer (x4) array length: 1800 mm
 Receive transducer (x4) array length: 1700 mm
 HWS computer c/w Seafloor Information System (SIS) software
Note: supplied with transducer mounting frames but without gondola or POD.



Optional items:

- SIS features - water column phase logging and extra detections
- Sound velocity sensor and/or profiler
- Seatex Seapath 330/380 system
- 3610 or 3710 DGNSS Receiver kit

UNDERWATER MAPPING – MBES SYSTEM PARTS

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: 130°

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: 140°

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 0.7° Receive Transducer

Single RX Transducer

Frequency range: 200 to 400 kHz

Swath coverage sector: up to 140°

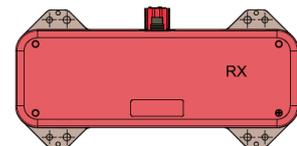
Transducer depth rated to 6000 m

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 0.7° Transmit Transducer

Single TX Transducer

Frequency range: 200 to 400 kHz

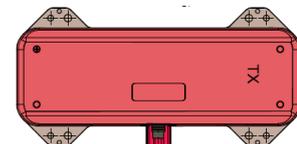
Transducer depth rated to 6000 m

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 0.4° Transmit Transducer

Single TX Transducer

Frequency range: 200 to 400 kHz

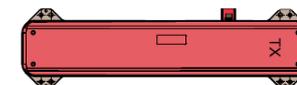
Transducer depth rated to 6000 m

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 Compact/Portable Sonar Head Cable

Available in 15 m, 30 m, and 50 m cable lengths.



EM 2040 Dual RX Transducer Mounting Bracket

Part No. 358929 and 357504

Aluminium assembly

Flange mount

EM 2040P Universal Sonar Mount (USM) Expeditionary Pole

Over the side pole vessel mount package

Supports fixture of EM 2040P transducer, AML sound velocity sensor, Seapath 130 sensor unit, and Subsea Motion Reference Unit.



M3 Sonar Mounting Kit

Part No. 803-0162000

Over the side pole vessel mount assembly

Supports fixture of M3 sonar head, Sound velocity sensor, Seapath 130 sensor unit, and Subsea Motion Reference Unit.



OE10-104 Medium Duty Pan & Tilt Unit

Electric Multi-Purpose Pan and Tilt Unit for M3 Sonar

Maximum Output Torque: 37 Nm @ 24 VDC

Shear Pin Torque: 45 Nm

Nominal Output Speed: 13 to 30 degrees per second

Position Feedback: 9-bit resolution accuracy serial output (approx. $\pm 2^\circ$)

Control: Digital RS-232 serial link

Gearbox: Harmonic Drive

Maximum Payload: 25 kg in air

Backlash: $\pm 0.08^\circ$

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.

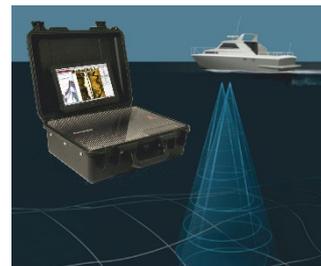


UNDERWATER MAPPING – SINGLE BEAM ECHO SOUNDERS

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 (13° x 21° / 7° x 7°)
Supplied as standard with a 15 m transducer cable
Ruggedised and splashproof suitcase with laptop computer
Power requirements: 110/220 VAC or 12 to 15 VDC, 5A
Width, height, depth, weight: 488, 190, 386 mm, approx. 11 kg

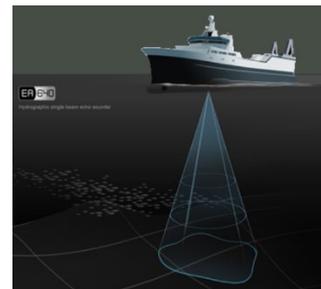


EA640 Hydrographic Single Beam Echo Sounder

15 kHz Precision Echo Sounder

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

- Seatex MRU-5.



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): ~3.5°

Beamwidth (secondary): 4° x 6°

Source level (12 kHz): >202 dB re μPa @ 1m

Dynamic range: <110 dB

Operating depth range: 2 m - 500 m

Penetration: >50 m

Range resolution: 0.5 - 4 cm

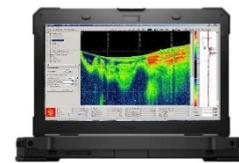
Sediment layer resolution: <5 cm

Max ping rate: 40 Hz

Supplied with 15 m length transducer cable

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

Transceiver dimensions, weight: 520 x 700 x 400 mm, 45 kg.



UNDERWATER MAPPING – SIDE SCAN SONAR SYSTEMS

PuISAR 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.



PuISAR 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

Gearred 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: $\geq 0.225^\circ$
- 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 @ ≤ 0.8 A
- 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 @ ≤ 0.8 A
- 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)



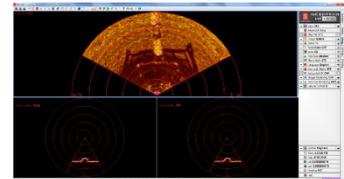
MS1000 Interface Unit

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 for customer supplied PC.



MS1000 Sonar Processing Laptop PC

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



Sonar Cable on Reel with Slip Ring

Umbilical Cable Type/Function: Kevlar reinforced / Power & RS-485
Umbilical Cable Length/Diameter: 150 m / 12 mm
Deck Cable Length: 7.6 m
Connector Type: RMG-4-FS



Tripod for High Resolution MS1071/1171 Sonar Head

Part No. 975-80110000



UNDERWATER MAPPING – ALTIMETERS

MS1007D Altimeter

Compact Digital Altimeter

Part No. 974-70130000 and 975-71120000

Specifications:

- Operating Frequency: 200 kHz
- Beamwidth: 10° (nominal)
- Range (max): 300 m usable (807 mode)
- Output Resolution: Adjustable, > 2.4mm (807 mode)
- Operating Mode: Configurable 807, 809 or MS1000
- Serial Interface: RS-232/RS-485
- Aux. Analog Output: Configurable, 0-5V or 0-10V
- Power Input: 22-26 VDC, 1.8 A (start-up) and 250 mA (continuous)
- Connector Type: Seacon XSG-6-BCL
- Depth rating: 3000 m
- Material Housing: Anodised Aluminium
- Dimensions Housing/Transducer: (L)197 mm x (D)88 mm
- Weight Air/Water: 2.4 kg / 1.1 kg.



MS1107D Altimeter

Compact Digital Altimeter

Part No. 975-71500000

Specifications:

- Operating Frequency: 675 kHz
- Beamwidth: 2.7° (nominal)
- Range (max): up to 110 m
- Output Resolution: Between 2.4 mm and 25 mm (affected by mode and range settings)
- Operating Mode: Configurable 807, 808, 809 or MS1000
- Serial Interface: RS-232/RS-485
- Aux. Analog Output: Configurable, 0-5V or 0-10V
- Power Input: 22-26 VDC, 1.0 A (start-up) and 250 mA (continuous)
- Connector Type: Burton 5507-1508
- Depth rating: 6000 m
- Material Housing: Anodised Aluminium
- Dimensions Housing/Transducer: (L)212mm x (D)114 mm
- Weight Air/Water: 5.0 kg / 2.7 kg.

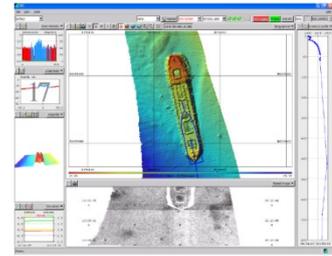


UNDERWATER MAPPING – ACQUISITION & PROCESSING SOFTWARE

Seafloor Information System (SIS) Software

Acquisition software for EM multibeam systems

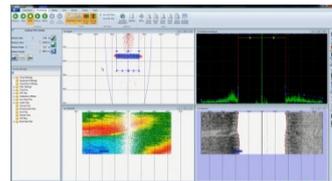
Supplied with a software license key and/or Hydrographic Workstation.



GeoSwath 4 (GS4) Software

Acquisition and post-processing software for GeoSwath shallow water wide swath bathymetry systems.

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



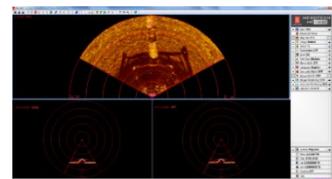
MS1000 Sonar Processing Software (standard version)

Acquisition software for Mesotech scanning sonars and altimeters

Features:

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

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



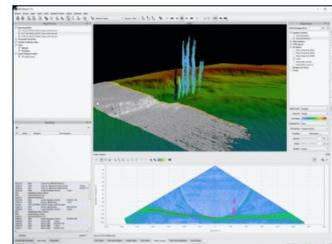
QPS Multibeam Processing Bundle

Sonar data processing software package

Features:

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

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

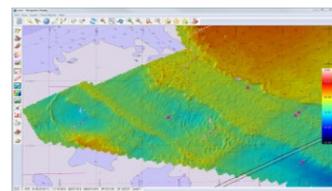


QPS QINSy Survey Lite

Real-time data acquisition, full survey planning, data cleaning/validation and map plotting functionality

Supports single multibeam echo sounder system and includes calibration/backscatter module

Supplied with a computer and/or software license key.



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. $\pm 0.1\%$ 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. $\pm 0.01\%$ 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. $\pm 0.01\%$ 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. $\pm 0.05\%$ 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. $\pm 0.05\%$ 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. $\pm 0.05\%$ 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: $\pm 0.01\%$ FS
Resolution: $\pm 0.001\%$ 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: $\pm 0.1\%$ 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® MiniS Modem 34-180

Positioning and Transparent Modem Transponder

Frequency: 21 - 30 kHz band (MF)
Fully compatible with Cymbal® acoustic link protocol
SSBL / USBL and LBL positioning modes
Beamwidth: ± 90 degrees
Source level (high): 182 dB
Data Rate: up to 6 kB/s
Polyurethane coated aluminium housing, depth rating to 4000 m
Rechargeable battery pack (Li-Ion)
External power: 24 Vdc, 1A
Length, diameter housing / transducer: 305.5 mm, 106 mm
Weight in air / water: 4.0 / 2.1 kg.



Note: Operates in conjunction with compatible HiPAP and cPAP 30 systems enabled with APOS Cymbal and Transparent Modem functions.

cNODE® MiniS Modem 34-40V

Positioning and Transparent Modem Transponder

Frequency: 21 - 30 kHz band (MF)
Fully compatible with Cymbal® acoustic link protocol
SSBL / USBL and LBL positioning modes
Beamwidth: ± 20 degrees
Source level (high): 197 dB
Data Rate: up to 6 kB/s
Polyurethane coated aluminium housing, depth rating to 4000 m
Rechargeable battery pack (Li-Ion)
External power: 24 Vdc, 1A
Length, diameter housing / transducer: 321 mm, 105 mm
Weight in air / water: 4.6 / 2.1 kg



Note: Operates in conjunction with compatible HiPAP and cPAP 30 systems enabled with APOS Cymbal and Transparent Modem functions.

cNODE® MiniS Modem Battery Charger

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



DATA TELEMETRY – RADIO MODEM

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

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 – Bundle Package

MBR 179 MK2 Single Systems with Power Supply Unit~

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



Maritime Broadband Radio System – Bundle Package

MBR 144 Systems for Fixed Installation~

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



Maritime Broadband Radio System – Bundle Package

MBR 144 Fixed and MBR 179 MK2 Systems~

1 x MBR 144 Fixed and 1 x MBR 179 MK2 radios



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

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

VESSEL REFERENCE – RELATIVE POSITIONING SYSTEMS

RADius 1000 Single Interrogator System

Relative Positioning System

Operational range: up to 1100 metres (dependant on transponder type)
 DP range: up to 550 m (dependant on transponder type)
 Coverage sector: up to 90° (Horizontal)
 Distance accuracy (within 200 m): < 0.5 m
 Angle accuracy (within 200 m): 0.5°
 Frequency band: 5.51 - 5.61 GHz
 Interrogator opening angle: ±45° (vertical/horizontal)
 Interrogator enclosure protection: IP 66 rated
 Interrogator height, width & depth, weight: 412 x 562 x 184 mm, 7 kg
 19" rack mount cabinet (6U) c/w integrated keyboard/mouse
 Width, height, depth (6 U cabinet): 553, 660, 600 mm
 Power requirements: 110/220 Vac, 160 W
 Standard LCD desktop monitor
 Supplied with 60 m interrogator power & data cables
 Supplied with a RADius 700 transponder for commissioning purposes.



RADius 1000 Dual Interrogator System

Relative Positioning System

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



RADius 1000 Triple Interrogator System

Relative Positioning System

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



RADius 1000 Quad Interrogator System

Relative Positioning System

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



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

VESSEL REFERENCE – RELATIVE POSITIONING SYSTEM PARTS

RADius 1000 Interrogator Unit

Interrogator unit for RADius 1000 System*

Frequency band: 5.51 - 5.61 GHz
Interrogator opening angle: $\pm 45^\circ$ (vertical & horizontal)
Interrogator enclosure protection: IP 66 rated
Power requirements: 48 Vdc $\pm 10\%$, 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: $\pm 45^\circ$ (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: $\pm 45^\circ$ (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: $\pm 45^\circ$ (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: $\pm 45^\circ$ (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: $\pm 45^\circ$ (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

Seatex SpotTrack System

High Precision Positioning and Tracking System

Vertical angular coverage: 65° (min)
 Horizontal angular coverage: 360°
 DP range: 10 to 1000 m
 Horizontal position accuracy: (2σ) 1 m @ 1000 m range
 Bearing accuracy: (2σ) 1 mrad (0.06°)
 Vertical stabilization: < ± 0.5° for roll, pitch < ± 20°
 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



Note: Regarding reflector targets:

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

*Note: Regarding DP Use:

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

VESSEL REFERENCE – (D)GNSS POSITIONING SYSTEMS

Seatex 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

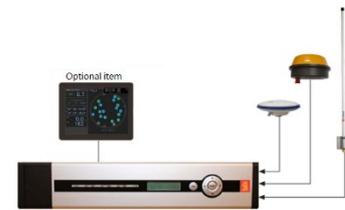
Supplied with Spotbeam and IALA beacon antennas

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.



Seatex DPS 232 System

GNSS Based Position Reference Sensor

Combined GPS L1/L2, GLONASS L1/L2 and SBAS receiver

MULTIREF capability

Accepts DGPS/DGLONASS corrections: RTCM-SC104 ver. 2.2, 2.3, 3.0, 3.1; SeaSTAR HP/XP/G2

SBAS accuracy: < 1 m, 95 % CEP, 0.6 m, 1 σ

SeaSTAR XP/HP/G2 horizontal accuracy: 10 cm, 95 % CEP

SeaSTAR XP/HP/G2 vertical accuracy 15 cm, 95 % CEP

Interface Ports: 8 x isolated serial ports (6 configurable between RS-232 and RS-422), 4 x Ethernet / LAN

19" rack mount cabinet (6U) c/w integrated keyboard & mouse

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

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

Supplied with GNSS and DGPS IALA radio beacon antennas

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

Optional system item:

- Fugro 3610 or Seatex 3710 DGNSS receiver.



Seatex DPS 432 System

GNSS Based Position Reference Sensor

Combined GPS L1/L2/L5, GLONASS L1/L2, Galileo E1/E5,

Beidou B1/B2, QZSS and SBAS receiver

MULTIREF capability

Dual frequency ionospheric compensation

Accepts DGNSS corrections: RTCM-SC104 ver. 2.2, 2.3, 3.0, 3.1, 3.2;

SeaSTAR XP/XP2/G2/G2+/G4/G4+

High precision accuracy*: 10 cm, 95 % CEP

DGPS/DGLONASS accuracy: < 1 m, 95 % CEP

SBAS accuracy: < 1 m, 95 % CEP

Velocity accuracy: < 0.05 m/s, 95 % CEP

Output rate: 1 Hz

Interface Ports: 8 x isolated serial ports (6 configurable between RS-232 and RS-422), 4 x Ethernet / LAN

19" rack mount cabinet (6U) c/w integrated keyboard & mouse

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

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

Supplied with GNSS and DGPS IALA radio beacon antennas

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

Optional system item:

- Fugro 3610 or Seatex 3710 DGNSS receiver.

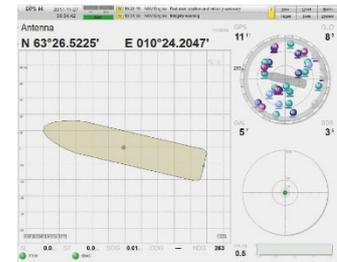


Seatex DPS i2 System

GNSS Based Position Reference Sensor

Combined GPS L1/L2, GLONASS L1/L2 and SBAS receiver
 MULTIREF capability
 INS aided RAIM capability for enhanced integrity and reliability
 Accepts DGNSS corrections: RTCM-SC104 ver. 2.2, 2.3, 3.0, 3.1;
 SeaSTAR HP/XP2/G2/G2+
 Non-differential position accuracy: 1.3 m, 95 % CEP
 SeaSTAR XP/HP/G2/G2+ position accuracy: 10 cm, 95 % CEP
 SBAS position accuracy: < 1 m, 95 % CEP
 Interface Ports: 8 x isolated serial ports (6 configurable between RS-232 and RS-422), 4 x Ethernet / LAN, 1 x IMU (RS-422)
 19" rack mount cabinet (6U) c/w integrated keyboard & mouse
 Width, height, depth (6 U cabinet): 553, 660, 600 mm
 Power: 100 - 240 VAC, 50/60 Hz, max 115 W
 Supplied with GNSS and DGPS IALA radio beacon antennas
 Supplied as standard with 30 m length RG-214 antenna cables
 Optional system item:

- Fugro 3610 or Seatex 3710 DGNSS receiver
- Seatex MGC R2/3 or MRU-5+.



Seatex 3710 DGNSS Receiver

DGNSS Correction Services Receiver Unit

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



Note: Subscription to Fugro correction services not included.

Fugro 3610 DGNSS Receiver

DGNSS Correction Services Receiver Unit

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



Note: Subscription to Fugro correction services not included.

VESSEL REFERENCE – (D)GNSS POSITIONING SYSTEM PARTS

Seatex DPS 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.



Seatex DPS 432 Processing Unit

GNSS Based Position Reference Sensor

Combined GPS L1/L2/L5, GLONASS L1/L2, Galileo E1/E5,
 Beidou B1/B2, QZSS and SBAS receiver
 19" rack mount, 2U height
 Power: 100 - 240 Vac, 50/60 Hz, max 60 W.



VESSEL REFERENCE SYSTEMS – POSITION, HEADING & ATTITUDE SYSTEMS

Seatech 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.

Seatech 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.



Seatech 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.



Seatech Seapath 130-5+ System Compact GNSS Aided Heading, Attitude and Positioning Sensor

Real-time, Position, Roll, Pitch, Heave & Heading
 Supplied with a MRU-5+ Motion Sensor in Subsea Housing
 Dual frequency GPS/GLONASS and SBAS receiver
 Position accuracy: 0.5m RMS or 1m (95% CEP) with DGNSS/SBAS
 Dynamic accuracy Roll/Pitch; Heading: 0.007°; 0.08° RMS
 Heave accuracy (real-time): 5cm or 5% whichever is highest
 Heave accuracy (delayed signal): 2cm or 2% whichever is highest
 Data output rate: up to 100 Hz
 Data outputs: 3 x Serial RS-232/422 lines, 8 x Ethernet UPD/IP ports
 Power: Sensor Unit: 24 Vdc, 10W; MRU: 24 Vdc, 12W
 Sensor Unit length, width, height; weight: 1210, 210, 94 mm; 6.8 kg
 Supplied as standard with a 20 m sensor spider cable.



Seatex Seapath 330-5 System

GNSS Aided Heading, Attitude and Positioning Sensor

Real-time, Position, Roll, Pitch, Heave & Heading
 Supplied with MRU-5 Motion sensor
 Dual frequency GPS/GLONASS and SBAS receiver
 Position accuracy: 0.5 m RMS /1 m (95% CEP) with DGNSS corrnrs
 Heading accuracy: 0.065° RMS (2.5m baseline)
 Dynamic accuracy Roll & Pitch: 0.02° RMS for +/- 5° amplitude
 Heave accuracy (real-time): 5cm or 5% whichever is highest
 Data output rate: up to 200 Hz
 Power: 100-240 VAC, 138 W (max).
 Antenna Beam width, depth, length; weight: 250, 40, 2560 mm; 7 kg
 Supplied as standard with 2 x 25 m GNSS cables (RG-214)
 Optional system items:

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



Seatex Seapath 330-5+ System

GNSS Aided Heading, Attitude and Positioning Sensor

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

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



Seatex Seapath 380-3 System

GNSS Aided Heading, Attitude and Positioning Sensor

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

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



Seatex Seapath 380-H System

GNSS Aided Heading, Attitude and Positioning Sensor

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

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



Seatex Seapath 380-5 System

GNSS Aided Heading, Attitude and Positioning Sensor

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

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



Seatex Seapath 380-5+ System

GNSS Aided Heading, Attitude and Positioning Sensor

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

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



Seatex Seapath 380-R3 System

GNSS Aided Heading, Attitude and Positioning Sensor

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

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



Seatex SeaNav 300

GNSS Heading and Positioning Sensor

Heading Accuracy (dynamic): 0.5° RMS
 Position Accuracy: 1.2 m RMS / 2.5 m (95% CEP) with corrections
 Power: 12 to 24 Vdc, <5 W
 Data Outputs: Serial RS-232/422, Ethernet and 1PPS
 Sensor Unit Dimensions / Weight: 780 x 180 x 100 mm / 2.5 kg.



Trimble SPS852 Reference Station

RTK Base Station for Seapath 130/330/380

GNSS antenna type: Zephyr Geodetic™ 2

Signal tracking: GPS L1/L2, GLONASS, SBAS, OmniSTAR

Correction message types: RTCM 18 & 19, ver 3 or Trimble CMR™

Power: 12 VDC (external lead acid battery pack)

UHF radio receiver type: DGPS 464 (19" rack mounted)

Frequency band: 430 - 470 MHz

Power: 100 - 230 VAC / 50 - 60 Hz, 5 W (typical)

Note: A communications radio license maybe required to operate the unit in the location or country of use, subject to local regulations. It is the responsibility of the end user to obtain an operator's permit or license for the receiver for the location or country of use.



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: $\pm 180^\circ$
 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: $\pm 180^\circ$
 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 $\pm 5^\circ$ 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: $\pm 45^\circ$
 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: $\pm 45^\circ$
 Dynamic Accuracy Roll & Pitch: 0.3° RMS
 Dynamic Accuracy Heave (real-time): 15 cm or 15 % whichever highest
 Acceleration Accuracy: 0.05 m/s² RMS
 Data Outputs: RS-232, RS-422 and Ethernet
 Data Output Rate (max): 200 Hz
 Power Supply: 10-36 V dc, max 5.5 W
 Diameter, height, weight: 105, 140 mm, 2.0 kg

Optional items:

- 10 m or 500 m MRU subsea housing
- MRU wall or floor mounting bracket
- MRU junction box (required for analogue channels).



Note: No export licence required.

Seatex MRU-2

Roll & Pitch Sensor

Real-time, Roll, Pitch

Static Accuracy Roll & Pitch: 0.08° RMS

Dynamic Accuracy Roll & Pitch: 0.1° RMS (for a ±5° amplitude)

Power Supply 12-30 V dc, 6 W

Diameter, height, weight: 105, 205 mm, 2.5 kg

Optional items:

- MRU wall mounting bracket
- MRU junction box.



Seatex MRU-D

Roll & Pitch Sensor

Real-time, Roll, Pitch

Static Accuracy Roll & Pitch: 0.3° RMS

Dynamic Accuracy Roll & Pitch: 0.35° RMS (for a ±5° amplitude)

Power Supply 12-30 V dc, 3 W

Diameter, height, weight: 105, 129 mm, 1.5 kg

Optional items:

- MRU wall mounting bracket
- MRU junction box.



Note: No export licence required.

Seatex MRU-D (5th Generation)

Roll & Pitch Sensor

Real-time, Roll, Pitch

Static Accuracy Roll & Pitch: 0.3° RMS

Dynamic Accuracy Roll & Pitch: 0.35° RMS (for a ±5° amplitude)

Power Supply 10-36 V dc, max 3 W

Diameter, height, weight: 105, 140 mm, 2.4 kg

Optional items:

- MRU wall mounting bracket
- MRU junction box.



Note: No export licence required.



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