Πειραιάς, 16 Φεβρουαρίου 2026

ΠΡΟΣ ΤΟ:

ΥΠΟΥΡΓΕΙΟ ΝΑΥΤΙΛΙΑΣ ΚΑΙ ΝΗΣΙΩΤΙΚΗΣ ΠΟΛΙΤΙΚΗΣ

ΑΡΧΗΓΕΙΟ ΛΙΜΕΝΙΚΟΥ ΣΩΜΑΤΟΣ – ΕΛΛΗΝΙΚΗΣ ΑΚΤΟΦΥΛΑΚΗΣ

ΚΛΑΔΟΣ ΑΣΦΑΛΕΙΑΣ ΚΑΙ ΑΣΤΥΝΟΜΕΥΣΤΗΣ

ΔΙΕΥΘΥΝΣΗ ΛΙΜΕΝΙΚΗΣ ΑΣΤΥΝΟΜΙΑΣ

ΕΞΑΙΡΕΤΙΚΑ ΕΠΕΙΓΟΝ

ΘΕΜΑ: ΘΑΛΑΣΣΙΑ ΜΕΛΕΤΗ ΓΙΑ ΤΗΝ ΕΓΚΑΤΑΣΤΑΣΗ ΔΥΟ ΥΠΟΒΡΥΧΙΩΝ ΜΕΣΗΣ ΤΑΣΗΣ ΣΤΟΝ ΔΙΑΥΛΟ ΣΑΜΟΥ – ΙΚΑΡΙΑΣ. ΑΙΤΗΜΑ ΚΑΤ' ΕΞΑΙΡΕΣΗ ΧΟΡΗΓΗΣΗΣ ΑΔΕΙΑΣ ΕΚΤΕΛΕΣΗΣ ΕΡΓΑΣΙΩΝ ΥΠΟΘΑΛΑΣΣΙΑΣ ΜΕΛΕΤΗΣ ΜΕ ΤΟ ΕΞΕΙΔΙΚΕΥΜΕΝΟ ΕΡΕΥΝΗΤΙΚΟ ΣΚΑΦΟΣ "MED SURVEYOR" (ΣΗΜΑΙΑΣ ΠΑΝΑΜΑ)

Με το παρόν επιθυμούμε να σας γνωρίσουμε ότι κατόπιν διαγωνισμού και ανάθεσης από τον ΔΕΔΔΗΕ, η εταιρεία POWER SUB LINK SA με το εξειδικευμένο σκάφος MED SURVEYOR, θα διενεργήσει την απαραίτητη υποθαλάσσια μελέτη μεταξύ των θαλάσσιων περιοχών Σάμου – Ικαρίας.

Η έναρξη της ερευνητικής διαδικασίας από το MED SURVEYOR αναμένεται κατά προσέγγιση να αρχίσει την 20/2/2026 και να περατωθεί περί την 1/6/2026. Θα πραγματοποιηθεί με την χρήση εξειδικευμένου εξοπλισμού και προσωπικού που διαθέτει το εν λόγω σκάφος και για τον λόγο αυτό αιτούμαστε τη χορήγηση κατ' εξαίρεση άδειας εκτέλεσης των ανωτέρω εργασιών κατά την συγκεκριμένη περίοδο αλλά και γενικότερα προς αυτό το σκοπό.

Η μελέτη θα πραγματοποιηθεί εντός διαδρόμου χαρτογράφησης βάσει των κάτωθι προδιαγραφών:

✓ Εύρος βαθυμετρικής αποτύπωσης : 1200 μέτρα, ήτοι 600 μέτρα εκατέρωθεν της κάθε οριζομένης όδευσης,

✓ Εύρος γεωφυσικής διασκόπησης: 1200 μέτρα, ήτοι 600 μέτρα εκατέρωθεν της κάθε οριζομένης όδευσης με πλευρικό ηχοβολιστικό (120, 410 & 850 kHz) και υψίσυχνο ακουστικό τομογράφο (2-16 kHz),

✓ Βιντεοσκόπηση της προτεινόμενης όδευσης μέχρι το βάθος των 30 μέτρων και δειγματοληψία επιφανειακού ιζήματος,

✓ Δειγματοληψίες με πυρηνολήπτη βαρύτητας (3 μέτρων) εντός του οριζομένου διαδρόμου / δειγματοληψίες επιφανειακών ιζημάτων με αρπάγη FT560 VAN VEEN και

✓ CPT όπου αυτό απαιτείται για την εκτίμηση των γεωτεχνικών ιδιοτήτων που επηρεάζουν την ταφή του υποβρυχίου καλωδίου.

Η POWER SUB LINK SA θα ήθελε να επισημάνει ότι οι συντεταγμένες (που επισημαίνονται παρακάτω) έχουν ήδη λάβει την έγκριση στις 11 Φεβρουαρίου 2026 με σχετική απόφαση της ΕΧΑΕΘ σύμφωνα με την κείμενη νομοθεσία και τις προβλεπόμενες διαδικασίες.

Το σκάφος θα ενημερώσει την Υδρογραφική Υπηρεσία, την Διοίκηση Υποβρυχίων και την ΔΛΑ 72 ώρες πριν την έναρξη των εργασιών και σε καθημερινή βάση, παρέχοντας όλες τις αναγκαίες πληροφορίες, συντεταγμένες, περιγραφή εργασιών, αναγκαία απόσταση ασφαλείας κλπ.

Παρακαλούμε για τις δικές σας ενέργειες, την σχετική έγκριση των τοπικών λιμεναρχείων και παραπλεόντων σκαφών τα οποία θα πρέπει να τηρούν απόσταση ασφαλείας τουλάχιστον ενός μιλίου από το εν λόγω σκάφος.

Κύρια Στοιχεία Πλοίου

1. Ερευνητικό πλοίο **R/V MED SURVEYOR** (IMO: 7629946) , το οποίο φέρει εξοπλισμό χαρτογράφησης βαθέων υδάτων και δειγματοληψιών, με όργανα ιδιοκτησίας της εταιρείας PSL. Το πλοίο θα εκτελέσει εργασίες χαρτογράφησης για βάθη νερού από 20 μέτρα έως το μέγιστο βάθος εκάστης όδευσης.
   (α) Πολυδεσμικό βυθόμετρο ELAC SEABEAM 3030, συχνότητας 24 kHz, μονίμως εγκατεστημένο στη γάστρα του πλοίου με δυνατότητα βαθυμετρικής αποτύπωσης έως 7000 μέτρα βάθους νερού.
   (β) Αισθητήρα κίνησης CODA OCTOPUS F285, μονίμως εγκατεστημένο στο πλοίο.
   (γ) Υποβρύχιο σύστημα εντοπισμού θέσης Sonardyne Mini Ranger 2 (USBL) για τον εντοπισμό συρόμενου εξοπλισμού με δυνατότητα εντοπισμού έως 1000 μέτρα.
   (δ) Ηχοβολιστικό πλευρικής σάρωσης (120, 410 & 850 kHz) και υψίσυχνο τομογράφο πυθμένα (2-16 kHz) Edgetech DSS 2050 με επιχειρησιακό βάθος τα 1500 μέτρα βάθος.
   (ε) Μαγνητόμετρο G882 για τον εντοπισμό υφισταμένων καλωδίων και αγωγών.
   (στ) ΣΤ. Πυρηνολήπτη βαρύτητας με δυνατότητα ανάκτησης δειγμάτων – πυρήνων έως 3 μέτρα.
   (ζ) Πενετόμετρο CPT DATEM NEPTUNE 3000 με επιχειρησιακό βάθος 1500 μέτρων για τη μέτρηση γεωτεχνικών ιδιοτήτων πυθμένα.
   (η) Teledyne Reson SeaBat T20-P (ΦΟΡΗΤΟΣ ΠΟΛΥΔΕΣΜΙΚΟΣ ΗΧΟΒΟΛΙΣΤΗΣ)
   (θ) FT560 VAN VEEN ΑΡΠΑΓΗ ΕΠΙΦΑΝΕΙΑΚΩΝ ΙΖΗΜΑΤΩΝ ΒΥΘΟΥ
   (ι) Teledyne Valeport MIDAS SVP (ΠΡΟΦΙΛ ΤΑΧΥΤΗΤΑΣ ΗΧΟΥ)
   (ια) Teledyne Valeport mini SVS (ΑΙΣΘΗΤΗΡΑΣ ΤΑΧΥΤΗΤΑΣ ΗΧΟΥ)
   (ιβ) OCEANEERING C-NAV 3050 (ΣΥΣΤΗΜΑ ΠΡΟΣΔΙΟΡΙΣΜΟΥ ΘΕΣΗΣ - GNSS)
   (ιγ) VALEPORT MIDAS WLR WATER LEVEL RECORDER (ΠΑΛΙΡΡΟΙΟΓΡΑΦΟΣ)
   (ιδ) HEMISPHERE VS1000 DGPS RECEIVER, WITH RTK C/W 2 X A45 ANTENNA'S (ΣΥΣΤΗΜΑ ΠΡΟΣΔΙΟΡΙΣΜΟΥ ΘΕΣΗΣ)
   (ιε) UNI-SHEAVE WIRELESS SHEAVE COUNTER BLOCK (ΜΠΑΣΔΕΚΑ)
   (ιστ) ROMICA DS111 18.5kW ELECTRIC WINCH c/w 3000m (ΗΛΕΚΤΡΙΚΟ ΒΙΝΤΣΙ)
   (ιζ) Edgetech SSS 4125 - ΗΧΟΒΟΛΙΣΤΗΣ ΠΛΕΥΡΙΚΗΣ ΣΑΡΩΣΗΣ
   (ιη) Edgetech SSS 4200 - ΗΧΟΒΟΛΙΣΤΗΣ ΠΛΕΥΡΙΚΗΣ ΣΑΡΩΣΗΣ

Συντεταγμένες Εργασιών:

Ικαρία – Σάμος (Βόρεια όδευση 1)					
Latitude			Longitude		
Μοίρες	Πρώτα	Δεύτερα	Μοίρες	Πρώτα	Δεύτερα
37	40	20.7	26	20	53.6
37	40	11.835	26	21	1.596
37	40	7.499	26	21	7.504
37	39	48.501	26	21	37.499
37	39	42.75	26	21	52.5
37	39	35.796	26	22	36.396
37	39	38.27	26	23	21.729
37	39	46.054	26	24	13.54
37	39	59.488	26	27	22.522
37	40	5.133	26	27	45.172
37	40	12.96	26	28	1.769
37	40	16.292	26	28	8.834
37	40	17.854	26	28	12.146
37	40	32.845	26	28	37.5
37	40	35.794	26	28	41.81
37	40	42.838	26	28	52.104
37	40	55.259	26	29	10.259
37	41	14.482	26	29	37.369
37	41	36.532	26	30	8.468
37	41	57.237	26	30	32.763
37	42	22.5	26	30	56.346
37	43	2.818	26	31	27.182
37	43	14.984	26	31	39.564
37	43	42.431	26	32	7.5
37	44	6.372	26	32	38.628
37	44	10.654	26	32	44.525
37	44	31.61	26	33	13.39
37	44	33.418	26	33	15.861
37	44	56.585	26	33	47.547
37	45	12.59	26	34	8.224
37	45	42.433	26	34	46.78
37	45	59.956	26	35	9.22
37	46	3.92	26	35	14.296
37	46	25.261	26	35	48.369
37	46	39.056	26	36	8.199
37	46	47.023	26	36	16.685
37	47	5.185	26	36	36.033
37	47	6.562	26	36	37.5
37	47	14.422	26	36	50.45
37	47	23.912	26	37	6.088

37	47	43.425	26	37	38.25
37	47	56.542	26	38	8.401
37	47	59.529	26	38	42.762
37	47	57.263	26	39	4.358
37	47	54.33	26	39	13.646
37	47	53.356	26	39	16.73
37	47	51.058	26	39	20.633
37	47	47.226	26	39	27.144
37	47	39.961	26	39	33.72
37	47	38.97	26	39	34.617
37	47	29.577	26	39	36.669
37	47	19.251	26	39	37.671

Ικαρία – Σάμος (Βόρεια όδευση 2)					
Latitude			**Longitude**		
Μοίρες	**Πρώτα**	**Δεύτερα**	**Μοίρες**	**Πρώτα**	**Δεύτερα**
37	40	20.7	26	20	53.6
37	40	3.367	26	20	59.308
37	39	48.36	26	21	9.745
37	39	32.474	26	21	31.688
37	39	21.037	26	22	8.963
37	39	22.5	26	23	16.071
37	39	29.175	26	24	13.266
37	39	30.01	26	24	20.425
37	39	45.219	26	26	40.392
37	39	46.961	26	27	46.961
37	39	50.599	26	28	7.151
37	39	56.389	26	28	22.5
37	40	12.78	26	28	44.79
37	40	37.5	26	29	18.409
37	41	18.826	26	30	3.826
37	42	10.035	26	31	4.965
37	42	45.577	26	31	37.5
37	43	13.059	26	32	5.547
37	43	44.364	26	32	37.5
37	44	22.5	26	33	26.867
37	45	11.47	26	34	21.193
37	45	21.451	26	34	32.267
37	45	44.377	26	35	3.495
37	46	2.678	26	35	28.43
37	46	7.5	26	35	35
37	46	31.346	26	36	7.5
37	46	38.226	26	36	17.804
37	46	41.361	26	36	22.5
37	46	50.197	26	36	40.157

37	46	52.5	26	36	44.758
37	46	59.625	26	36	54.781
37	47	22.183	26	37	26.515
37	47	37.695	26	38	2.926
37	47	44.697	26	38	34.655
37	47	46.26	26	39	5.826
37	47	43.411	26	39	18.119
37	47	38.481	26	39	28.887
37	47	31.131	26	39	33.531
37	47	25.346	26	39	35.547
37	47	19.251	26	39	37.671

Ικαρία – Σάμος (Νότια όδευση 1)					
Latitude			**Longitude**		
Μοίρες	**Πρώτα**	**Δεύτερα**	**Μοίρες**	**Πρώτα**	**Δεύτερα**
37	40	20.7	26	20	53.6
37	40	3.314	26	20	59.324
37	39	48.209	26	21	9.89
37	39	32.455	26	21	31.742
37	39	21.037	26	22	8.963
37	39	22.5	26	23	16.071
37	39	30.389	26	24	23.659
37	39	37.5	26	25	29.167
37	39	45.222	26	26	40.41
37	39	46.961	26	27	46.961
37	39	48.241	26	28	36.179
37	39	52.5	26	29	30.259
37	39	56.855	26	30	22.5
37	39	57.115	26	31	52.5
37	39	52.827	26	33	35.628
37	39	49.228	26	34	28.539
37	39	48.264	26	34	42.717
37	39	46	26	35	16
37	39	44.713	26	36	14.433
37	39	49.441	26	37	2.393
37	39	56.1	26	37	48.9
37	40	11.825	26	38	38.617
37	40	32.5	26	39	57.5
37	40	47.03	26	40	32.273
37	40	58.75	26	40	52.5
37	41	23.168	26	41	15.697
37	41	47.611	26	41	24.264
37	42	11.944	26	41	24.538
37	42	23.906	26	41	23.906
37	42	33.1	26	41	21.27

Ικαρία – Σάμος (Νότια όδευση 2)					
Latitude			Longitude		
Μοίρες	**Πρώτα**	**Δεύτερα**	**Μοίρες**	**Πρώτα**	**Δεύτερα**
37	40	20.7	26	20	53.6
37	40	11.836	26	21	1.596
37	40	7.444	26	21	7.568
37	40	0.649	26	21	18.319
37	39	48.5	26	21	37.5
37	39	42.75	26	21	52.5
37	39	35.798	26	22	36.408
37	39	38.269	26	23	21.731
37	39	46.049	26	24	13.509
37	40	0	26	27	30
37	39	58.731	26	28	30.638
37	40	3.214	26	29	7.5
37	40	5.921	26	29	54.079
37	40	8.206	26	31	7.399
37	40	6.918	26	32	7.48
37	40	3.226	26	32	56.685
37	40	0.004	26	34	35.556
37	39	59.894	26	34	38.885
37	39	59.378	26	34	54.638
37	39	57.478	26	35	52.549
37	40	0	26	36	52.5
37	40	12.374	26	37	59.347
37	40	37.954	26	39	30.648
37	40	54.957	26	40	10.696
37	41	19.83	26	40	45.948
37	41	39.94	26	41	2.865
37	42	4.342	26	41	10.658
37	42	24.086	26	41	18.581
37	42	33.1	26	41	21.27

Περίοδος εργασιών από: **20 Φεβρουαρίου 2026** έως **1 Ιουνίου 2026**

Παρακαλούμε για τις δικές σας ενέργειες για τη σχετική έγκριση των εργασιών και την περαιτέρω ενημέρωση των κατά τόπους λιμενικών αρχών προκειμένου να εκτελεσθεί το επείγον και σημαντικό αυτό έργο χωρίς καθυστέρηση.

Με εκτίμηση,

R/V MED Surveyor

IMO: 7629946

Research & Survey Vessel

The oceanographic vessel R/V Med Surveyor is fully equipped with a Hull Mounted Multibeam Echosounder (ELAC 3030), along with the latest technology of electronic equipment for Bathymetric and Oceanographic Surveys. A large array of winches and A-frames can support all types of survey and research equipment while the dedicated spaces onboard allow set up of every kind of scientific laboratory and accommodation of up to 19 passengers additional to the vessel's crew. The ship can support ROV operations and provides a stable platform designed to cater for every research or survey operational requirement.

Key Features

- Hydrographic, Trawl, Constant Tension, Net Reel and Oceanographic Winches
- Deck crane, Three (3) A-Frames and Movable Gantry for ROV support
- 80 m^2 deck space of which 16m^2 protected deck space plus 50m^2 lab spaces

Hull Mounted MBES

R/V MED Surveyor

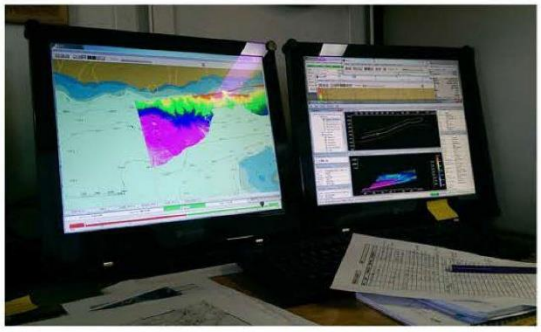
IMO: 7629946

GENERAL

Name:	MED Surveyor
Type:	Research & Survey Vessel
Rebuilt	1999 / 2014
Builder:	South Portland Engineering
Class:	ABS
Flag:	Panama
Length overall:	47.2 m
Breadth:	9.1 m
Draft:	6.0 m
Service Speed:	10 knots
Endurance:	25 days
Crew:	13 pax
Accommodation:	16 pax (4x2 beds, 2x4 beds)
Displacement:	897 tons

MACHINERY

Main Engine:	General Diesel EMD-567C, V-12, 1200 HP
Reduction gear:	Lufkin Marine 3.22:1, two speed ahead single astern
Bow thruster:	Hydraulic Omnithruster 250 HP
Main Generators:	2 x Detroit Diesel/General Motors 6VT-92, 270 kW
Emergency Gen:	Perkins, 1000 series, 70 kW



CRANES & WINCHES

Telescoping Deck Crane:
Length: 10 m 3 tonnes (all radius)/Max SWL 4.6 mt

Oceanographic Winch:
NETEC Electrohydraulic 60 m/min @ 5 tonnes, 10 tonnes @ 30 m/min,capacity: 4,400 m of 3/4 in or 600 m of 1.0 in conducting cable.

Constant Tension Winch:
NETEC Electrohydraulic, 100 m/min, 1.56 t tension 329m of 0.5 in conducting cable

Net Reel:
NETEC Diesel Hydraulic, 10 tonne, 30 m/min

Forward Hydrographic Winch:
Two Drum Almon Johnson Hydraulic, 80 m/min, 2.5 tonnes, 2,000 m of 1/4 in and 3/8 in conducting wire

Aft Hydrographic Winch:
Almon Johnson Hydraulic, 100 m/min, 2.5 tonne with 6,000 m of 1/4 or 3/8 conducting wire (Interchange-able drums)

A-FRAMES

A-Frame Stern, Movable, Gantry
Over Side Clearance: 1.8 m
Work Area below: 3m wide by 5.2 high, SWL 9.0 t

Forward A-Frame Starboard
Over Side Clearance: 2.4m
Work Area below: 1.8m wid by 4m high, SWL 2.5 t

Aft A-Frame Starboard
Over Side Clearance: 2.4 m,
Work area below: 1.8m wide by 5m high. SWL 3.5 t

R/V MED Surveyor

IMO: 7629946

NAVIGATION & PROCESSING

CNAV-3050 +Navigator III Correction signal not included & Spare unit
Online survey suite+ 1 Spare
Offline Data processing suite
2 TSS DMS-05 Motion Sensor Complete with assecories
Coda DA 2000
Sound Velocity Profiler

NAVIGATION

Navigation Depth Sounder
Doppler Speed Log
X-Band and S-Band Radars, ARPA displa
Digital Global Positioning System (DGPS)
Doppler Current Profiler

SPECIAL OPERATIONS FACILITIES

Wet lab:	25 m^2
Dry/Chem lab:	20 m^2
Protected w area:	16 m^2
Scientific Freezer:	Forward Main Deck, Walk-in, 5.7 m^3

FUEL

Capacity:	100 tonnes
Consumption:	Approx. 4800 lt/d

FRESHWATER SYSTEM

Storage Capacity:	27.3 mt
Maker	TEMAK
Type	TSW 14
Performance	290 ltr/h, 6,9 mt/day

Dry Dock: April, 2016

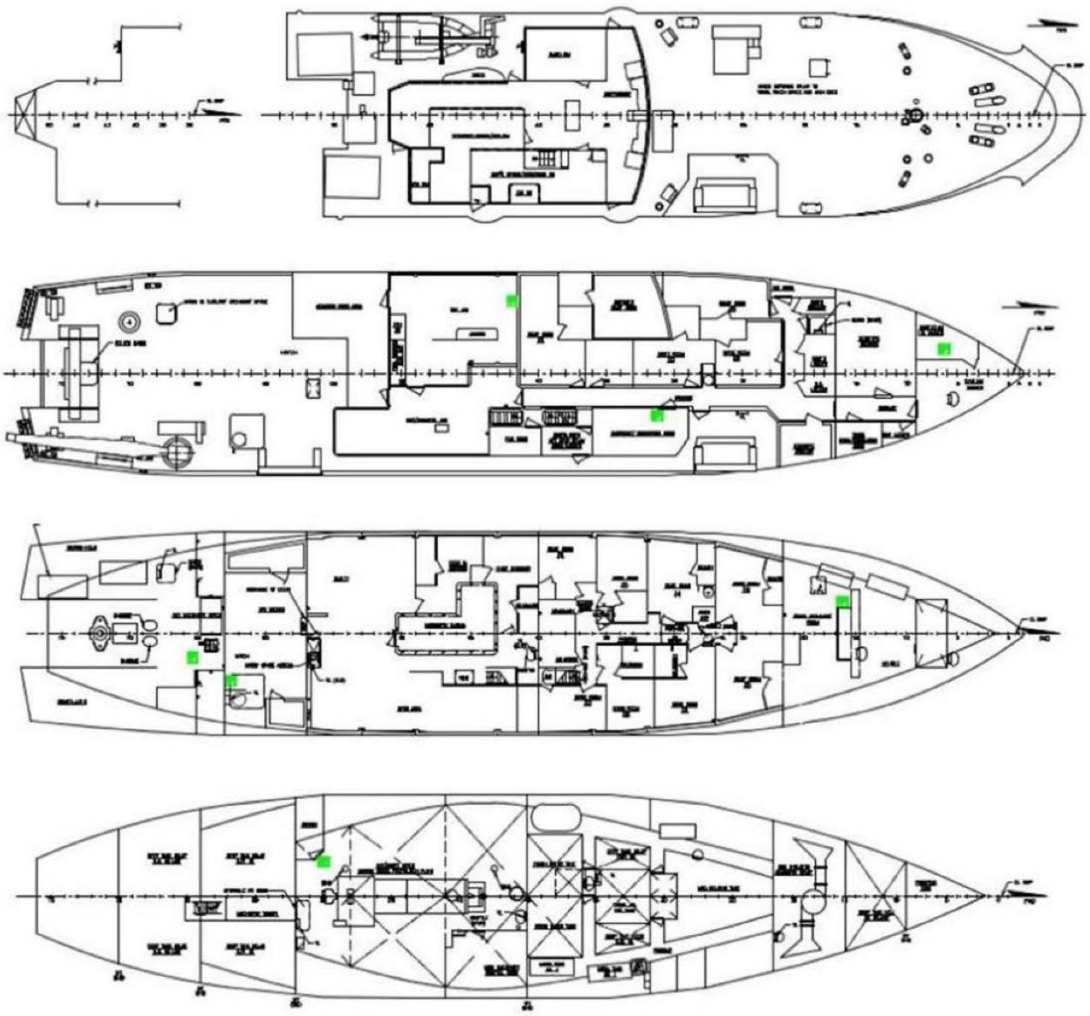
COMMUNICATIONS

VSAT SAILOR, type 60 GX
VHF-FM Marine Band Transceivers
HF Marine Band Transceivers
HF Alarm Watch Radio Receiver (2182 kHz)
Emergency Position Indicator Radio Beacons
Search and Rescue Transponders (X-Band Radar Frequency)
Personal EPIRB (PEPIRB)
Inmarsat Standard C Radio Transceiver
Narrow Band Direct Printing Terminal
NAVTEX Receiver
Weather Fax Receiver
BNWAS
Internet

R/V MED Surveyor

IMO: 7629946

DRAWINGS

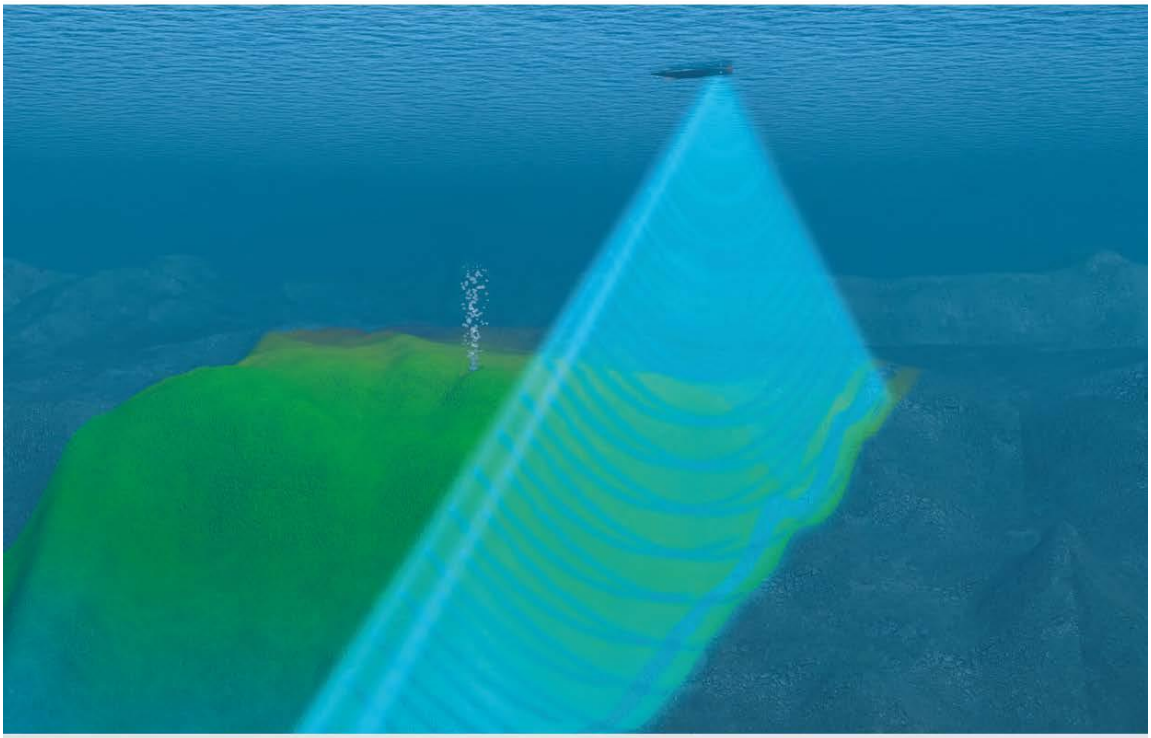


ELAC Nautik

SeaBeam 3030

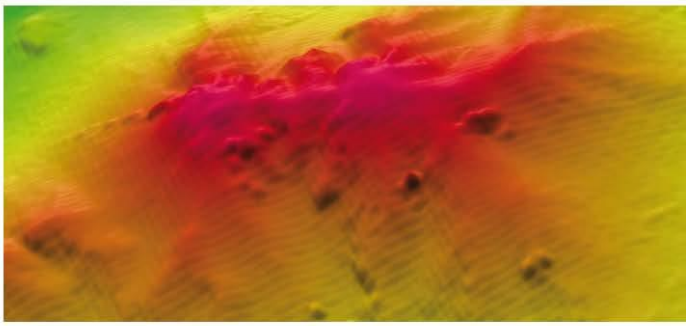
Mapping the Continental Rise

30 kHz I 7,000 m Depth Performance I 7,000 m Swath Coverage I Multi-Ping Mode I WCI



ELAC Nautik

DISCOVER THE UNKNOWN



SeaBeam 3030

Medium Depth and Deep Water Multibeam System

The SeaBeam 3030 multibeam echo sounder collects bathymetric, corrected backscatter, sidescan and Water Column Imaging (WCI) data in medium depth and deep waters over a wide swath in excess of 140 degrees, meeting all relevant survey standards. Due to its depth performance in combination with wide coverage, SeaBeam 3030 is the ideal hydrographic sensor for mapping the continental rise.

Multi-Ping Technique

A big advantage of the SeaBeam 3030 is the new multi-ping technique. The system compensates fully for vessel roll, pitch and yaw motion and transmits and processes two swaths in one ping. Bathymetric depth information, amplitude (backscatter) data, WCI data and side scan imagery are acquired by the system in real-time.

The new multi-ping technique allows a higher maximum survey speed without losing 100% bottom coverage by creating two swaths per ping cycle, which is important especially for narrow along-ship beam widths.

For 1° along-ship resolution and 140° swath width SeaBeam 3030 allows for a survey speed of more than 14 knots. On the other hand, at the same survey speed a bottom segment is ensonified two times more often than using a single-ping mode.

The result is a higher data density at the same survey speed. This increases the target detection and classification abilities. A high data density is advantageous for post-processing with modern processing methodologies like CUBE and enhances the quality of the final products.

Performance

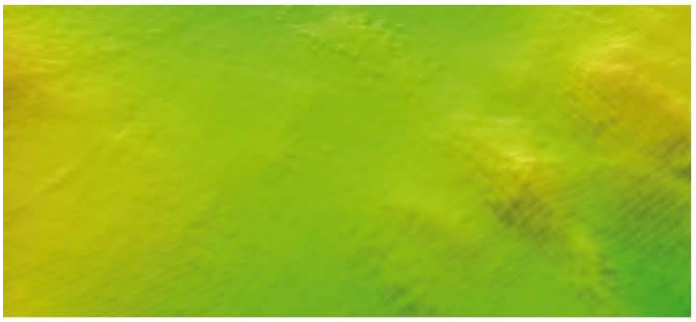
The system operates in the 30 kHz frequency band in water depths ranging from 6 m below the transducers to approx. 7,000 m. SeaBeam 3030 can be utilized at survey speeds of up to 14 knots. It has an across-ship swath width of up to 140 degrees. A maximum of 630 beams is provided for each multi-ping. The depth accuracy of the sonar sensor exceeds the IHO requirements.

Transmission Technique

SeaBeam 3030 uses a transmission technique, which compensates fully for vessel pitch and yaw motion. This is achieved by splitting the transmit fan in several sectors which can be steered individually. This technique achieves full motion compensation and guarantees a stable straight coverage under the vessel.

Key Features
Up to 7,000 m Depth Performance
Up to 7,000 m Bottom Coverage
Multi-Ping Mode
Real-time Water Column Imaging (WCI)
Mobile Version for up to 3° x 2° Beam Width
optional: Transducers adapted to Specific Ship's Hull

SeaBeam 3030 multibeam system



System Overview
Compact Design for Easy Customizing

Transducer Array
The projector array and the hydrophone array are arranged in a mills-cross configuration. Preamplifiers are built in the hydrophone array. The projector array as well as the hydrophone array is split in multiple modules (projector module LSE 331 and hydrophone module KE 16).

Gondola installation and mobile bracket

This allows the customization of the required along-ship and across-ship beam widths. The standard installation of the transducer array is flush with the ship hull. A blister or a gondola installation is also possible. For mobile applications of up to 3°x2° resolution a transducer bracket for pole installation is available.

Transceiver Unit SEE 37
The transceiver unit contains the transmitter and receiver electronics. It consists of the transmitter amplifiers, the transmit beam former and the sonar controller board, which provides the interfaces to the other units and mainly handles all control tasks within the transceiver unit.

Furthermore, the transceiver unit contains the necessary elements for signal conditioning and sonar processing. This includes the Digital Down Conversion (DDC) and the receive beam former as well as information processing like the bottom depth finder, sound velocity correction and alignment correction.

In order to minimize the big data volumes, which are acquired during high-resolution Water Column Imaging (WCI) without information loss related to the wanted signal, specific algorithms and software components are implemented.

Operator Station
The operation station (and also the optional WCI workstation) is typically a high-end marine COTS PC or laptop, which is currently available on the market and which is running under Microsoft Windows. The operator station provides the human machine interface (HMI) to the operator. It shows the various depths, backscatter amplitudes, side scan data, position and other relevant information. Furthermore, it offers the operator the possibility to make appropriate settings for SeaBeam 3030.

The standard sonar HMI application for control and data acquisition is HydroStar ONLINE. The system also supports third party data acquisition software solutions like HYPACK, EIVA, QINSy and Triton.

Water Column Imaging Workstation
SeaBeam 3030 is WCI ready, no extra installation is needed. The HydroStar WCI Viewer is a tool for online and offline visualization of high-resolution WCI or stave-oriented raw data. The data formats are open to the public. The HydroStar WCI Viewer software package is adapted to scientific and operational requirements concerning Water Column Imaging.

Gas Bubble Detection
Submarine gas hydrates are of major importance concerning climate change and energy supply. An important basis for gas hydrate exploration is the ability to detect gas bubbles in the water column online and offline. This ability requires the storage and visualization of high-resolution Water Column Image (WCI) data during surveying.

This technical challenge has been addressed by the German lighthouse research project SUGAR (Submarine Gas Hydrate Reservoirs), in which L-3 ELAC Nautik participates as an important industrial partner.

Specifications and Technical Data

SeaBeam 3030 at a Glance

Technical Data	
Operating frequency	30 kHz band (nominally 26 kHz)
Along track beam width	1° / 1.5° or 3°
Across track beam width	1° or 2°
Pulse length	0.4 ms - 10 ms (0.4 ms only available in single-ping mode)
Pulse length modes	Manual and automatic
Operation modes	Single-ping and multi-ping mode
max. ping rate	50 swaths per second
max. number of soundings	630 (2 x 315)
Beam spacing	Equidistance or equiangular
Range resolution	Down to 4 cm
Depth accuracy (sonar sensor)	In accordance with IHO SP44
max. swath coverage sector	140°
max. coverage (approx.)	7,000 m
min. depth (below transducer)	6 m
max. depth (approx.)	7,000 m
max. range sampling rate	10 kHz (= 5 kHz inphase, quadrature phase)

Interfaces	
Power	115 V / 60 Hz or 230 V / 50 Hz single phase
Motion	RS232 / RS422 or Ethernet
Heading	RS232 / RS422 or Ethernet
Position	RS232 / RS422 or Ethernet
Surface sound velocity	RS232 / RS422
Sound velocity profile	RS232 / RS422 or Ethernet

Stabilization	
Roll	±10°
Pitch	±10°
Yaw	±5°

Reliability 1° x 1°	
System MTBF	3,281 h
System MTBCF	3,600 h
Overall MTTR	0.90 h

Physical Specifications*	Height (mm)	Width (mm)	Depth (mm)	Weight (kg)
Hydrophone array* 1° / 2°	176 / 176	402 / 402	3,134 / 1,620	Without frames and cables 168 / 84
Projector array* 1° / 1.5° / 3°	195 / 195 / 195	3,820 / 2,732 / 1,644	530 / 530 / 530	Without frames and cables 300 / 200 / 100
Transmit and receive unit*	1,352	607	904	225
Operator station*	177 (4 HE)	483 (19" rack)	505	14

Dimensions may change due to special installation requirements. Please ask for dimensional drawings.

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Coda Octopus:MOTION
Precision Attitude & Positioning

/MOTION Lightweight Pre-Calibrated System for F285

Benefits

Accurate and precise position, heading, heave, pitch and roll in a single compact unit

Pre-calibrated (Rapid Deployment with no Field Calibration Required)

All systems are GPS, GLONASS, and BeiDou capable for position and heading seeding.

Ruggedized IP67 Rated Housing

Built-in NTRIP Client

Built in iHeave (no additional software or hardware required)

Improved Heading Lock Stabilization

Optimal performance and accuracy under conditions of poor GNSS access

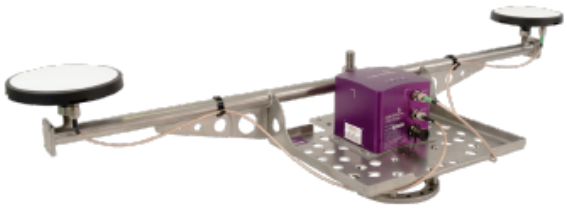
Applicable for surveying to International Hydrographic Organization (IHO) S-44 standard

F280 series directly supported in leading Hydrographic Survey applications

Easy to use Web Interface

Highly Competitive Price

Round -the-Clock Technical Support



Pre-calibrated Variant F285® for accurate and reliable MOTION and Positioning data in a compact Ruggedized IP67 Rated Housing.

The Pre-calibrated Variant of the F280® GNSS-Aided Inertial Navigation System (Attitude and Positioning Systems) is delivered calibrated and ready for use, thus facilitating rapid and repeatable field deployment and removes the need for field calibration (in the form of figure of 8's). The F280® Pre-calibrated variant is one of the models within the F280 Series® which is our new generation of high accuracy measurement instruments for use in the marine hydrographic and laser survey market. This new generation of GNSS-Aided INS systems embeds high accuracy inertial components and smart fusion algorithms.

Includes built-in NTRIP Client that allows receiving GNSS RTK quality GNSS Corrections over the internet without need of any PC. F280 Series® must be connected to Ethernet network with Internet access and a separate NTRIP subscription.

Designed to meet the exacting and demanding requirements of the hydrographic survey market, the F280® instruments are easy to install and use. These instruments produce very accurate positioning, heading and MOTION data in the most dynamic offshore conditions. The Pre-calibrated variant facilitates rapid and repeatable deployment since this variant removes the requirement for field calibration.

The light and rugged F280®, packaged in an IP67 rated housing, is a reliable, repeatable, and cost-effective solution suitable for use on vessels of all sizes. The F280® is one model within the F280 Series® of GNSS-Aided instrument. This model is single frequency, dual antenna multi-GNSS receiver for improved constellation coverage and heading lock stabilization. The unit supports SBAS and DGPS corrections services.

An easy-to-use and intuitive web interface provides configuration, control and processing functionality including built-in iHeave (intelligent heave). In addition to real-time heave measurement and output, the F280® now directly computes and outputs our long-standing and proven iHeave (intelligent Heave) solution without the need for top-side processing or software

Features

- One-Box solution Survey Grade GNSS, attitude and heave sensor
- Multi-frequency multi-GNSS receiver and RTK corrections activation to allow a maximum positional accuracy of 1 cm.
- Connectivity to multiple sensors simultaneously over Ethernet and Serial
- Built-in NTRIP Client capable of receiving GNSS Corrections over Internet.
- Multiple Lever Arms to support precise INS Positioning for Multiple Platforms locations or Sensors
- Explicit vessel Centre of Gravity (COG) support for improved heave accuracy
- Rapid Heading Initialization (Under 30 seconds typically)
- Web-Based Set Up
- Real Time Monitoring of MOTION Events
- Option for Multiple Configuration Profiles and Instantaneous Recall of Profiles
- Tightly Integrated GNSS and Inertial Components resulting in increased accuracy and reduced setting up times when compared to outputs from separate sensors
- Enhanced performance under conditions of poor GNSS access
- Multi-GNSS support (GPS, GLONASS, BeiDou, GALILEO, QZSS)
- Industry standard formats and interfaces
- iHeave (Intelligent Heave) Processing Capability included as standard
- Compatible with HYPACK, QINSy, CARIS and other navigation packages
- Pre-calibrated and repeatable (No field calibration required)
- Fully integrates with Motion UI for precise IMU to Antenna alignment
- Extendable to 2-meter Antenna Separation for higher heading accuracy solution
- ITAR free

Applications

- Hydrographic Survey
- Bridge, dam, harbour inspection
- Dredging
- Offshore renewable energy
- Environmental survey
- Shipping channel survey
- Marine laser scan survey

Coda Octopus:MOTION
Precision Attitude & Positioning

/MOTION Lightweight Pre-Calibrated System for F285

F285 Pre-Calibrated Variant

The Specification in this Data Sheet applies to the F285 Pre-calibrated variant, which is one of the models within our F280 Series®. F285 Pre-calibrated variant is a Multi Frequency multi GNSS system with RTK, DGPS and SBAS GNSS corrections capabilities (1cm positional accuracy). Higher accuracy models also available.

iHeave is a tailored solution specifically for long period ocean swell compensation and is fully integrated with the F285 Precision Attitude and Positioning Systems. In many parts of the world, hydrographic survey is severely affected by low frequency ocean swells often up to 70 seconds long, resulting in distortions in bathymetric measurements. Conventional techniques for real-time heave measurement can only offer limited accuracy and are insensitive to ocean swells exceeding 10 to 20 seconds. The inbuilt iHeave algorithm analyzes the raw motion data and allows a more accurate determination of the real heave motion experienced by a vessel and enables the output of precise heave values for all ocean swells

Pre-Calibrated Housing Assembly Configuration

Dimensions (l x d x h)	Option 1 2-meter antenna separation assembly 2152mm x 287mm x 231mm (84.7in x 11.3in x 9.1in) Option 2 1-meter antenna separation assembly 1232mm x 287mm x 231mm (48.5in x 11.3in x 9.1in)
Weight (excluding F280 & antenna)	8.5 kg (18.7lbs)
Weight (including transit case)	19.5 kg (42.9lbs)
Humidity	Waterproof

F285

The F285 is a Multi Frequency multi GNSS system with RTK, DGPS and SBAS GNSS corrections capabilities (1cm positional accuracy). Higher accuracy models also available.

All systems are GPS, GLONASS, and BeiDou capable for position and heading seeding.

Models within F280 Series® are field-upgradable. Pre-calibrated housing upgrades can be applied to any model.

Dynamic Positioning

Positional Accuracy (RMS)	0.30m with DGPS correction (all models) 0.30m with SBAS correction (all models) 1.20m no correction (all models)
Roll and Pitch (1σ)	0.02°
True Heading (1σ)	0.04° (2m baseline) 0.025° (4m baseline)
Heave (1σ)	5cm or 5% (on-line) 3.5cm or 3.5% (iHeave)
Velocity (1σ)	0.014 m/s

Physical (F280 Series®)

Dimensions	127mm x 155mm x 113mm (5in x 6.1in x 4.4in)
Weight	2.2kg (4.9 lbs)
Power	9-36Vdc, 15 Watts (110-240Vac adapter supplied)
Power and Data Cable	5m standard, or 20m, or 50m optional (16.40ft standard, or 65.62ft or 164.04ft optional)
Antennas	Single-Frequency, Multi-GNSS, SBAS capable
Antenna Cables	1.3m standard
Operating Temperature	-10° to 60° C 14° to 140° F
Waterproof	IP67 Rated (Maximum depth of 1 meter up to 30 minutes. When Power and Antenna connectors are mated.)
Vibration	0.1g²/Hz, 5-500 Hz

Interfaces

Ethernet 100Mbit	Full control and configuration, high speed data output (COMPAC), NTRIP corrections User-configurable for position, heading and attitude strings. Choose from: TSS1, TSSHHRP, EM1000, EM3000, COMPAC, GGA, GSA, GST, GSV, GGK, HDT, PASHR, PRDID, PTCF, RMC, ROT, VTG, UTC, ZDA, PPS and SPD.
Serial Port 1	User-configurable for position, heading and attitude strings. Choose from: TSS1, TSSHHRP, EM1000, EM3000, COMPAC, GGA, GSA, GST, GSV, GGK, HDT, PASHR, PRDID, PTCF, RMC, ROT, VTG, UTC, ZDA, PPS and SPD.
Serial Port 2 & 3	As Serial Port 1
GNSS Correction Port	Correction input (DGPS, RTK) Formats: RTCM 2.1/2.2/2.3/3.0/3.1; CMR, CMR+
Other	1 PPS on BNC

PC System Requirements

Web Interface	Compatible with all major browsers.

Coda Octopus
Sound Underwater Intelligence

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2050 DSS

COMBINED SIDE SCAN SONAR & SUB-BOTTOM PROFILING SYSTEM

FEATURES

- Fully integrated turnkey system
- Tri-Frequency Side Scan Sonar & Sub-Bottom Profiler
- Digital telemetry over single coaxial tow cable
- Choice of side scan frequencies
- Built-in Pressure (Depth) Heading, Heave, Pitch and Roll sensors

APPLICATIONS

- Cable and Pipeline Surveys
- Geological/Geophysical Surveys
- Sediment Classification
- Pre/Post Dredging Surveys
- Archeological Surveys
- Scour/Erosion Investigation
- Marine Construction Surveys

The EdgeTech 2050-DSS is the latest product to combine EdgeTech's highly successful line of side scan sonars and sub-bottom profilers into one fully integrated system. This is especially useful where high resolution sub-bottom profiler data, that requires the system to be towed near the seabed, is required.

The 2050-DSS is a tri-frequency side scan sonar system, where any two, operator selectable, frequencies can be operated simultaneously. The system can be provided with either a 120, 410 & 850 kHz towfish, or a 230, 540 & 850 kHz towfish. Both towfish options are equipped with a 2-16 kHz sub-bottom profiler, that utilizes a PVDF panel receive hydrophone. Use of an area based receive hydrophone panel provides improved beam patterns and therefore improved signal to noise ratio's, which in turn means cleaner data.

A standard System comes complete with a combined towfish, digital telemetry that runs over a single coaxial cable, a 19 inch rack mount topside interface, and EdgeTech's DISCOVER acquisition software. The 2000 Series System can be integrated with a number of auxiliary sensors such as magnetometer, depth, altitude and USBL responder. Additionally, an interface is fitted to the electronics so that the electronics and sensors can be mounted onto an ROV.

For requirements that call for combined side scan sonar and sub-bottom profiling incorporating lower frequency sub-bottom transducers and optional bathymetry EdgeTech offers the 2300 and 2300 with Bathymetry Combined systems.

For more information please visit EdgeTech.com

info@EdgeTech.com | USA 1.508.291.0057

EdgeTech

2050 DSS

COMBINED SIDE SCAN SONAR & SUB-BOTTOM PROFILING SYSTEM

KEY SPECIFICATIONS

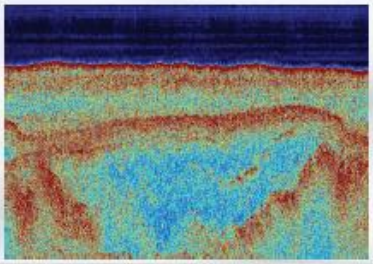
SIDE SCAN SONAR		
Available Frequency (dual simultaneous CHIRP)	120/410/850 kHz	230/540/850 kHz
Operating Range	120 kHz: 600 meters/side 410 kHz: 200 meters/side 850 kHz: 90 meters/side	230 kHz: 350 meters/side 540 kHz: 150 meters/side 850 kHz: 90 meters/side
Beam Width (2-way) & Along Track Resolution	120 kHz 0.70 deg or 1.20 m @ 100 m 410 Khz 0.28 deg or 0.50 m @ 100 m 850 kHz 0.23 deg or 0.20 m @ 50 M	230 kHz: 0.44 deg or 0.80 m @ 100 m 540 kHz: 0.26 deg 0.45 m @ 100 m 850 kHz: 0.23 deg 0.20 m @ 50 m
Across Track Resolution	120 kHz: 8 cm 410 kHz: 2 cm 850 kHz: 1 cm	230 kHz: 3 cm 540 kHz: 1.5 cm 850 kHz: 1 cm
Vertical Beam Width	50°	

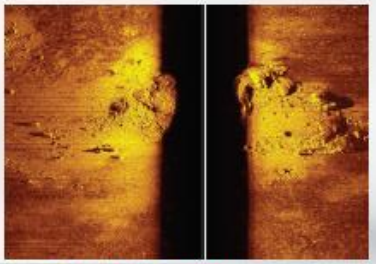
SUB-BOTTOM PROFILER	
Frequency Band	2-16 kHz
Resolution	6-10 cm
Receiver	PVDF
Penetration in coarse sand	6m
Penetration in clay	80m

TOWFISH	
Length X Width X Height	149 cm (58.7") X 78.7 cm (31") X 83.8 cm (33")
Weight in Air	151 kg (332 lbs.)
Weight in saltwater	71 kg (156 lbs.)
Maximum Water Depth	3,000 m

TOPSIDE PROCESSOR	
Hardware	Standard 19" rack
File Format	Native JSF or XTF for side scan, Native JSF, XTF, and/or SEG-Y for sub-bottom
Power Input	100-264 VAC, 50/60 Hz, auto-switching

Tow Cable	
	Double-armored coaxial, customer specified length





For more information please visit EdgeTech.com

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MIDAS SVP - Sound Velocity Profiler

The MIDAS SVP is the most accurate Sound Velocity Profiler in the world. As well as using Valeport's digital time of flight sound velocity sensor, it now comes as standard with a 0.01% pressure sensor. Every detail from the sensor accuracy through the titanium construction to the large memory and choice of communications methods has been considered - we truly believe it to be the ultimate SVP.

Sensors

The MIDAS SVP is fitted with Valeport's digital time of flight sound velocity sensor, a high accuracy temperature compensated piezo-resistive pressure transducer, and a fast response PRT temperature sensor.

Sound Velocity	
Range:	1375 – 1900m/s
Resolution:	0.001m/s
Accuracy:	±0.02m/s

Temperature	
Range:	-5°C to +35°C
Resolution:	0.005°C
Accuracy:	±0.01°C

Pressure	
Range:	10, 50, 100, 300 or 600bar
Resolution:	0.001% range
Accuracy:	±0.01% range

Data Acquisition

The MIDAS SVP uses the concept of distributed processing, where each sensor has its own microprocessor controlling sampling and calibration of readings. Each of these is then controlled by a central processor, which issues global commands and handles all the data. This means that all data is sampled at precisely the same instant, giving superior quality profile data.

Sampling Modes	
Continuous:	Regular output from all sensors at 1, 2, 4 or 8Hz
Burst:	Regular sampling pattern, where instrument takes a number of readings, then sleeps for a defined time.
Trip/Profile:	Data is output as a chosen parameter changes by a set value, usually Pressure for profiling.
Conditional:	Instrument sleeps until a selected parameter reaches a set value.
Delay:	Instrument sleeps until predefined start time

Communications

The instrument will operate autonomously, with setup and data extraction performed by direct communications with PC before and after deployment. It also operates in real time, with a choice of communication protocols for a variety of cable lengths, all fitted as standard and selected by pin choice on the output connector:

Standard	
RS232	Up to 200m cable, direct to serial port via USB adaptor
RS485	Up to 1000m cable, addressable half duplex comms

Optional FSK	
2 wire power & comms up to 6000m of cable (cable dependant)	
Baud Rate:	2400 - 115200 (FSK fixed at 19200, USB 460800)
Protocol:	8 data bits, 1 stop bit, No parity, No flow control

Memory

The MIDAS SVP is fitted with 16Mb solid state non-volatile FLASH memory. Total capacity depends on sampling mode; continuous & burst modes have a single time stamp at the start of the file, trip mode (profiling) stores a time stamp with each reading. A single line of SVP data uses 8 bytes, and a time stamp uses 7 bytes.

Continuous:	>2,000,000 data points
Profile:	>1,000,000 data points (>100 profiles to 6000m)

Electrical	
Internal:	8 x C cells, 1.5V alkaline or 3.6V lithium
External:	9 – 30V DC
Power:	0.6W (sampling), <1mW (sleeping)
Battery Life:	<100 hours operation (alkaline)
	<250 hours operation (lithium)
Connector:	SubConn Titanium MCBH10F

Physical	
Materials:	Titanium housing, polyurethane & carbon composite sensor components, stainless steel (316) deployment cage
Depth Rating:	6000m (may be limited by pressure sensor)
Instrument Size:	88mmØ x 665mm long
Cage Size:	750 x 140 x 120mm
Weight:	11.5kg (in air), 8.5kg (in water) including cage
Shipping:	100 x 18 x 49cm
	24kg

Software

System is supplied with DataLog Express Windows based PC software, for instrument setup, data extraction and display. DataLog Express is license free.

Ordering

0650003-**XX**	MIDAS SVP Profiler Supplied with: • Deployment cage • SubConn switch plug • 3m Communications Lead • USB adaptor • DataLog x2 software • Manual, tool kit and transit case.
Note:	**XX** denotes transducer range Select from 10, 50, 100, 300 and 600bar.
0400002	16 Mbyte memory upgrade (max 64 Mbyte)
0400EA5	FSK modem adaptor
TB0400FSK	Probe board set required for FSK operation

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miniSVS Sound Velocity Sensor

Valeport's unique digital time of flight technology gives unmatched performance figures, with signal noise an order of magnitude better than any other sensor. The miniSVS is available in a selection of configurations and with optional pressure or temperature sensors. There are a number of size options to suit many applications.

miniSVS - still the most accurate sound velocity sensor in the world. Nothing else comes close.

Sound Velocity Measurement

Each sound velocity measurement is made using a single pulse of sound travelling over a known distance, so is independent of the inherent calculation errors present in all CTDs. Our unique digital signal processing technique virtually eliminates signal noise, and gives almost instantaneous response; the digital measurement is also entirely linear, giving predictable performance under all conditions.

Range:	1375 - 1900m/s	
Resolution:	0.001m/s	
Accuracy:	Dependent on sensor size	
100mm	Random noise (point to point)	±0.002m/s
	Max systematic calibration error	±0.013m/s
	Max systematic clock error	±0.002m/s
	Total max theoretical error	**±0.017m/s**
50mm	Total max theoretical error	±0.019m/s
25mm	Total max theoretical error	±0.020m/s

Acoustic Frequency: 2.5MHz

Sample Rate: Selectable, dependent on configuration

Rate	SV	SV+P	SV+T
Single Sample	•	•	•
1Hz	•	•	•
2Hz	•	•	•
4Hz	•	•	•
8Hz	•	•	•
16Hz	•	•	•
32Hz	•	•	
60Hz	•		

Optional Sensors

The miniSVS may be optionally supplied with either a pressure or temperature sensor (but not both). Data is sampled at the rates shown above

Sensor	Pressure	Temperature
Type	Strain Gauge	PRT
Range	5, 10, 50, 100 or 600 Bar	-5°C to +35°C
Resolution	0.001% range	0.001°C
Accuracy	±0.05% range	±0.01°C

Data Output

The miniSVS has RS232 & RS485 output, selected by command code. RS232 data may be taken directly into a PC over cables up to 200m long, hereas RS485 is suitable for longer cables (up to 1000m) and allows for multiple addressed units on a single cable.

Baud Rate:	2400 - 115200 (NB. Low baud rates may limit data rate)
Protocol:	8 data bits, 1 stop bit, No parity, No flow control

Electrical

Voltage:	8 - 30vDC
Power:	0.25W (SV only), 0.35W (SV + Pressure)
Connector:	SubConn MCBH6F (alternatives on request)

Data Format

Examples of data formats are:
<space>{sound_velocity}<CR><LF>
<space>{pressure}<space>{sound_velocity}<CR><LF>
<space>{temperature}<space>{sound_velocity}<CR><LF>

SV:	Choose from: mm/s (1510123) m/s to 3 decimal places (1510.123) m/s to 2 decimal places (1510.12)
Pressure:	If fitted, pressure is always output in dBar with 5 digits, with a decimal point, including leading zeroes if necessary. Position of the point is dependent on sensor range, e.g.
	50dBar 47.123
	100dBar 047.12
	1000dBar 0047.1
Temperature:	If fitted, temperature is output as a 5 digit number with 3 decimal places and leading zeroes, signed if negative, e.g.
	21.456
	02.298
	-03.174

Physical

Please refer to factory for detailed dimensions if required.

Depth Rating:	6000m (Titanium), 500m (Acetal)
Weight:	1kg (housed type)
Housing & Bulkhead:	Titanium or Acetal, as selected
Transducer Window:	Polycarbonate
Sensor Legs:	Carbon Composite
Reflector Plate:	Titanium.

Ordering

All systems supplied with operating manual and carry case. OEM units come with a test lead, housed units with a 0.5m pigtail.

Configuration	100mm	50mm	25mm
Titanium Housing	0652004	0652005	0652006
Acetal Housing	0652045	0652046	0652047
Bulkhead OEM	0652001	0652002	0652003
Remote OEM	0652007	0652008	0652009
Titanium + Pressure	0652004-P	0652005-P	0652006-P
Titanium +Temperature	0652004-T	0652005-T	0652006-T

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4125i

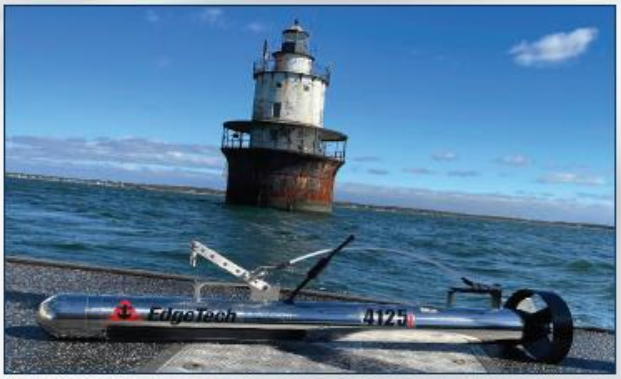
SIDE SCAN SONAR SYSTEM

FEATURES

- Ultra high resolution images
- Lightweight for one person deployment
- Standard heading, pitch, roll & pressure sensors
- Choice of dual simultaneous frequencies
- Runs on AC or DC
- Pole mount option for shallow water use

APPLICATIONS

- Hydrographic Surveys
- Geological Surveys
- Search & Recovery
- Channel/Clearance Surveys
- Bridge/Pier/Harbor Wall Inspection
- Hull Inspections



EdgeTech's 4125i Side Scan Sonar System was designed with both the Search & Recovery (SAR) and shallow water survey communities in mind. The 4125i utilizes EdgeTech's Full Spectrum® CHIRP technology, which provides higher resolution imagery at ranges up to 50% greater than non-CHIRP systems operating at the same frequency. This translates into more accurate results and faster surveys, thus cutting down on costs.

Two dual simultaneous frequency sets are available for the 4125i depending on the application. The 400/900 kHz set is the perfect tool for shallow water survey applications, providing an ideal combination of range and resolution. The 600/1600 kHz set is ideally suited for customers that require ultra high resolution imagery in order to detect very small targets (SAR).

The 4125i system can be powered by both AC and DC for added versatility and is delivered in portable rugged cases for ease of transport from site-to-site. As is standard with all of EdgeTech's towed side scan systems, the 4125i comes with a safety recovery system which will prevent the loss of a towfish if it becomes snagged on an obstacle during a survey.

A standard 4125i System comes with a rugged stainless steel towfish and a portable water resistant topside processor including a laptop computer (Optional: Splash Proof/Ruggedized Laptop). A 50 meter Kevlar tow cable is included as standard with customer-specified lengths also available. Multiple options are available such as a v-fin depressor, keel weight, pole mount and hull scan bracket for added versatility.

For more information please visit EdgeTech.com

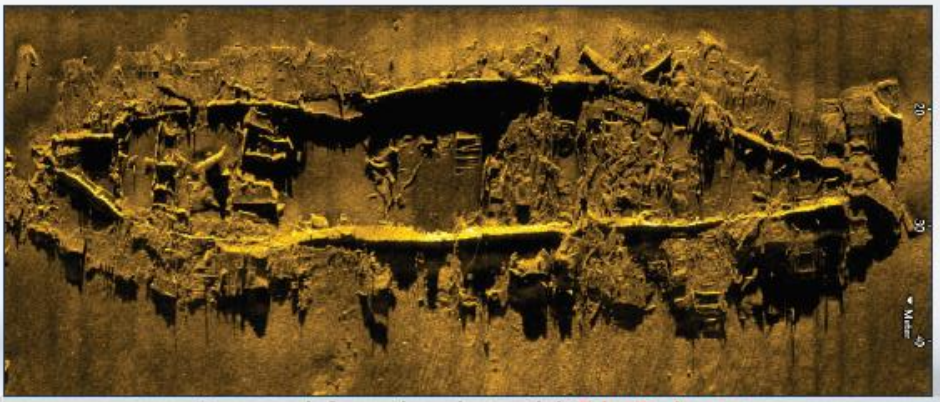
info@EdgeTech.com | USA 1.508.291.0057

4125i

SIDE SCAN SONAR SYSTEM

KEY SPECIFICATIONS

SONAR	
Frequencies (Dual Simultaneous)	Choice of either a 400/900 kHz or 600/1600 kHz towfish
Pulse Type	EdgeTech's Full Spectrum® CHIRP
Operating Range	200m @ 400 kHz, 75m @ 900 kHz; 120m @ 600 kHz, 35m @ 1600 kHz
Horizontal Beam Width	0.46° @ 400 kHz, 0.28° @ 900 kHz; 0.33° @ 600 kHz, 0.20° @ 1600 kHz
Vertical Beam Width	50°
Resolution Across Track	400 kHz: 2.3 cm, 900 kHz: 1.0 cm, 600 kHz: 1.5 cm, 1600 kHz: 0.6 cm
TOWFISH	
Diameter	9.5 cm (3.75 inches)
Length	112 cm (44 inches)
Weight in Air	20 kg (44 pounds)
Tow Cable Type	Coaxial up to 600m max length (will provide a typical operational depth down to 200m)
Max Depth Rating of Towfish	200m
Material	Stainless Steel
Standard Sensors	Heading, Pitch, Roll, Pressure (Depth)
TOPSIDE PROCESSOR	
Power Input	12-24 VDC or 115/230 VAC, 50/60 Hz
Connections	AC, DC, Ethernet (to laptop), Towfish
Hardware	Laptop Computer (Optional: Splash Proof/Ruggedized Laptop)
Operating System	Windows
Acquisition Software	EdgeTech DISCOVER
SYSTEM OPTIONS	
	Keel weight, v-fin depressor wing, pole mount, quick change hull scan bracket



For more information please visit EdgeTech.com

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4200 SERIES

SIDE SCAN SONAR SYSTEM

FEATURES

- Optional Multi-Pulse (MP) technology for high speed surveys
- Crisp, high resolution CHIRP images
- Multiple dual simultaneous frequency sets to choose from
- Stainless steel towfish
- Easily integrates to other 3rd party sensors
- Meets IHO & NOAA Survey Specifications

APPLICATIONS

- Cable & Pipeline Surveys
- Geological/Geophysical Surveys
- Mine Countermeasures (MCM)
- Geohazard Surveys
- Channel Clearance
- Search and Recovery
- Archeological Surveys

The 4200 Series is a versatile side scan sonar system that can be configured for almost any survey application from shallow to deep water operations. The 4200 utilizes EdgeTech's Full Spectrum® CHIRP technology to provide crisp, high resolution imagery at ranges up to 50% greater than non-CHIRP systems; thus allowing customers to cover larger areas and save money spent on costly surveys.

One of the unique features of the 4200 is the optional Multi-Pulse (MP) technology, which places two sound pulses in the water rather than one pulse like conventional side scan sonar systems. This allows the 4200 to be towed at speeds of up to 10 knots while still maintaining 100% bottom coverage. In addition, the MP technology will provide twice the resolution when operating at normal tow speeds, thus allowing for better target detection and classification ability. The addition of the optional MP technology provides the operator with two modes of operation; either High Definition Mode (HDM) or High Speed Mode (HSM). This software-selectable mode of operation provides the operator the ability to select the best configuration for the specific job type.

All EdgeTech 4200 systems are comprised of a topside system and a reliable stainless steel towfish. A choice of dual simultaneous frequency sets are available to the user and topside processors come in a choice of configurations from portable to rack mounted units. In addition, an easy-to-use GUI software is supplied with every unit.

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4200 SERIES

SIDE SCAN SONAR SYSTEM

KEY SPECIFICATIONS

SONAR SPECIFICATIONS	STANDARD	WITH OPTIONAL MP TECHNOLOGY	
Frequency	Choice of either 100/400, 100/600, 300/600 or 300/900 kHz dual simultaneous		
Operating Range (meters/side)	100 kHz: 500m, 300 kHz: 230m, 400 kHz: 150m, 600 kHz: 120m, 900 kHz: 75m		
Horizontal Beam Width:	100 kHz: 1.5°, 300 kHz: 0.5°, 400 kHz: 0.4°, 600 kHz: 0.26°, 900 kHz: 0.2°	In High Speed Mode: 100 kHz: 1.26°, 300 kHz: 0.54°, 400 kHz: 0.4°, 600 kHz: 0.34°, 900 kHz: 0.3° In High Definition Mode: 100 kHz: 0.64°, 300 kHz: 0.28°, 400 kHz: 0.3°, 600 kHz: 0.26°, 900 kHz: 0.2°	
Resolution Along Track	100 kHz: 5 m @ 200 m 300 kHz: 1.3 m @ 150 m 400 kHz: 0.6 m @ 100 m 600 kHz: 0.45 m @ 100 m 900 kHz: 18 cm @ 50 m	High Definition Mode: 100 kHz: 2.5m @ 200m 300 kHz: 1.0m @ 200m 400 kHz: 0.5m @ 100m 600 kHz: 0.45m @ 100m 900 kHz: 18 cm @ 50m	High Speed Mode: 100 kHz: 4.4m @ 200m 300 kHz: 1.9m @ 200m 400 kHz: 0.7m @ 100m 600 kHz: 0.6m @ 100m 900 kHz: 26 cm @ 50m
Resolution Across Track	100 kHz: 8 cm, 300 kHz: 3 cm, 400 kHz: 2 cm, 600 kHz: 1.5 cm, 900 kHz: 1 cm		
Vertical Beam Width	50°		
Depression Angle	Tilted down 20°		
TOWFISH	**STAINLESS STEEL**		
Diameter	11.4 cm (4.5 inches)		
Length	125.6 cm (49.5 inches)		
Weight in Air/Saltwater	48 / 36 kg (105 / 80 pounds)		
Depth Rating (Max)	2,000m		
Standard Sensors	Heading, pitch & roll		
Optional Sensor Port	(1) Serial – RS 232C, 9600 Baud, Bi-directional & 27 VDC		
Options	Pressure Sensor, Magnetometer, Integrated USBL Acoustic Tracking System, Built-in Responder Nose, Depressor, Power Loss Pinger and Custom Sensors		
TOPSIDE PROCESSOR	**4200-P**	**4200**	**701-DL INTERFACE**
Hardware	Portable splash-proof case	19" rack mount computer	19" rack mount interface
Display & Interface	Splash-proof laptop	21" flat panel monitor, keyboard & trackball	Customer-supplied
Power Input	20-36VDC or 115/230VAC	115/230VAC	115/230VAC
Operating System	Windows® 7		
File Format	Native JSF or XTF		
Output	Ethernet		
TOW CABLE			
	Coaxial Kevlar or double-armored up to 6,000m, winches available		

G-882
Cesium Marine Magnetometer

GEOMETRICS
Simplify your search

Geometrics' G-882 Marine Magnetometer is the leading marine system in the industry with over 1,000 systems sold! The G-882 is the only system that meets the standards for UXO clearance in the North Sea.

This very high-resolution Cesium vapor marine magnetometer is low in cost, small in size, and offers flexibility for professional surveys in shallow or deep water. Use your personal computer with our MagLog™ software to log, display and print GPS position and magnetic field data.

The system directly interfaces to all major side-scan manufacturers for tandem tow configurations. Being small and lightweight, it is easily deployed and operated by one person. But add several streamlined weight collars and the system can quickly weigh more than 100 lbs for deep-tow applications.

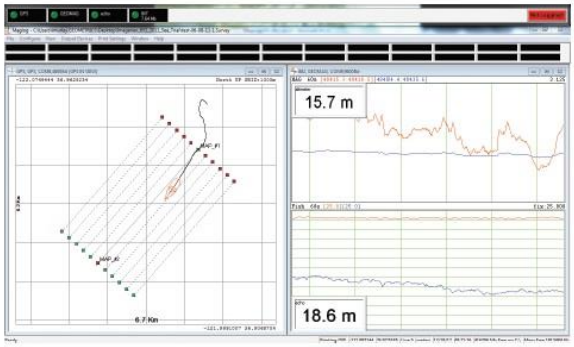
This marine magnetometer system is particularly well-suited for the detection and mapping of all sizes of ferrous objects. This includes anchors, chains, cables, pipelines, ballast stones and other scattered shipwreck debris, munitions of all sizes (UXO), aircraft, engines and any other object with a magnetic expression. The G-882 is also perfect for geological studies. Its high sensitivity and high sample rates are maintained for all applications.

Objects as small as a 5-inch screwdriver are readily detected provided that the sensor is close to the seafloor and within practical detection range (refer to table on back).

FEATURES & BENEFITS

- **Cesium Vapor High Performance** – Highest detection range and high probability of detecting all sized ferrous targets.
- **Streamlined Design for Tow Safety** – Low probability of fouling in fishing lines or rocks. Rugged fiber-wound fiberglass housing.
- **Sample at up to 20Hz** – Unparalleled data density while also covering larger areas per day.
- **Sensor can be Rotated for Optimal Signal** – Can be used worldwide.
- **Easy Portability and Handling** – No winch required. Built-in easy-carry handle. Operable by a single man; only 44 lb with 200 ft cable.
- **Combine Multiple Systems for Increased Coverage** – Internal CM-221 Mini-counter provides multi-sensor sync and data concatenation, allowing side-by-side coverage which maximizes detection of small targets and reduces noise.
- **Export Version Available** – Use anywhere in the world without need for an export license (except embargoed countries). See specifications.

SPECIFICATIONS | G-882 Cesium Marine Magnetometer



MagLogLite™ Data Logging software is included with each magnetometer and allows recording and display of data and position with automatic anomaly detection. Additional software options include: MagLog Pro™, advanced logging software; MagMap™, a plotting and contouring package; and MagPick™ post-acquisition processing software.

MAGNETOMETER / ELECTRONICS

Operating Principle: Self-oscillating split-beam Cesium vapor (non-radioactive).

Operating Range: 20,000 to 100,000 nT.

Operating Zones: The earth's field vector should be at an angle greater than 10° from the sensor's equator and greater than 6° away from the sensor's long axis. Automatic hemisphere switching.

Noise: <0.004 nT/$\sqrt{\text{Hz}}_{\text{rms}}$. (SX (export) version: <0.02 nT/$\sqrt{\text{Hz}}_{\text{rms}}$).

Max Sample Rate: 20 Hz.

Heading Error: < 1 nT (over entire 360° spin).

Output: RS-232 at 1,200 to 19,200 Baud.

Power: 24 to 32 VDC, 0.75 A at power-on and 0.5 A thereafter.

MECHANICAL

Sensor Fish

DIA: 7 cm; L: 137 cm (2.75x54 in) (with fin assembly).
Weight: 18 kg (40 lb).

Includes sensor and electronics and 1 main weight. Additional collar weights are 6.4 kg (14 lb) each; total of 5 capable.

Tow Cable

DIA: 12 mm; L: 800 m (0.47 in x 2,625 ft).
Weight: 7.7 kg (17 lb) with terminations.
Break strength: 1,630 kg (3,600 lb)
Bend diameter: 30 cm (12 in).

Typical Detection Range for Common Objects

1.	Ship: 1000 tons	0.5 to 1 nT at 800 ft (244 m)
2.	Anchor: 20 tons	0.8 to 1.25 nT at 400 ft (120 m)
3.	Automobile	1 to 2 nT at 100 ft (30 m)
4.	Light Aircraft	0.5 to 2 nT at 40 ft (12 m)
5.	Pipeline (12 inch)	1 to 2 nT at 200 ft (60 m)
6.	Pipeline (6 inch)	1 to 2 nT at 100 ft (30 m)
7.	Iron: 100 kg	1 to 2 nT at 50 ft (15 m)
8.	Iron: 100 lb	0.5 to 1 nT at 30 ft (9 m)
9.	Iron: 10 lb	0.5 to 1 nT at 20 ft (6 m)
10.	Iron: 1 lb	0.5 to 1 nT at 10 ft (3 m)
11.	Screwdriver: 5-inch	0.5 to 2 nT at 12 ft (4 m)
12.	Bomb: 1000 lb	1 to 5 nT at 100 ft (30 m)
13.	Bomb: 500 lb	0.5 to 5 nT at 50 ft (16 m)
14.	Grenade	0.5 to 2 nT at 10 ft (3 m)
15.	Shell: 20 mm	0.5 to 2 nT at 5 ft (1.8 m)

ENVIRONMENTAL

Operating Temperature: -35°C to +50°C (-30°F to +122°F).

Storage Temperature: -45°C to +70°C (-48°F to +158°F).

Altitude: 9,000 m (30,000 ft).

Depth: 4,000 psi (2,730 m; 8956 ft).

Water Tight: O-Ring sealed for up to 4,000 psi depth operation.

ACCESSORIES

Standard: Operation manual, shipping/storage container, ship kit with tools and hardware, power supply, MagLogLite™, MagMap™ and MagPick™ processing software, depth transducer, altimeter.

Optional: Steel tow cable to 6,000 m (19,600 ft) with telemetry, longitudinal or transverse gradiometer, plastic Pelican® case, MagLogPro™, collar weights.

GEOMETRICS
Simplify your search

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Hemisphere®

Vector™ VS1000 GNSS Receiver

atlas®

The Vector VS1000 is Hemisphere GNSS' premiere multi-GNSS, multi-frequency receiver designed specifically for the professional marine market. Providing precise heading, Athena RTK positioning, and full Atlas capability, its rugged design is compliant to 60529:2013 IP67 and IEC 60945:2002 8.7 standards.

The VS1000 supports antenna separations up to 10 meters, offering heading accuracy to 0.01 degrees RMS in addition to RTK position accuracy and full support for Hemisphere GNSS' Atlas worldwide L-band corrections.

Key Features

- Athena™ RTK and Atlas® L-band capable
- Extremely accurate heading (to 0.01° RMS)
- Multi-frequency GPS/GLONASS/BeiDou/Galileo
- Purpose-built for the most challenging environments
- Supports Ethernet, CAN, Serial, USB, Bluetooth, and Wi-Fi
- Powerful WebUI accessed via Wi-Fi plus a 128x64 display and 10 multi-color LEDs

GNSS Receiver Specifications

Receiver Type:	Vector GNSS RTK Receiver
Signals Received:	GPS, GLONASS, BeiDou, Galileo, & Atlas [3]
Channels:	1059
GPS Sensitivity:	-142 dBm
SBAS Tracking:	2-channel, parallel tracking
Update Rate:	10 Hz standard, 20 Hz optional
Timing (1PPS) Accuracy:	20 ns
Rate of Turn:	100°/s maximum
Cold Start:	60 s (no almanac or RTC)
Warm Start:	30 s typical (almanac and RTC)
Hot Start:	10 s typical (almanac, RTC and position)
Heading Fix:	10 s typical (valid position)
Antenna Input Impedance:	50 Ω
Maximum Speed:	1,850 kph (999 kts)
Maximum Altitude:	18,000 m (59,055 ft)
Differential Options:	SBAS, Atlas (L-band), RTK

Accuracy

Positioning:	**RMS (67%)**	**2DRMS (95%)**
Single Point: [1]	2.4 m	
SBAS: [2]	0.6 m	
Atlas H10: [6]	0.08 m	0.16 m
Atlas H30: [6]	0.3 m	
Atlas Basic: [6]	0.5 m	
RTK: [1, 3]	8 mm + 1 ppm	15 mm + 2 ppm
Heading (RMS):	0.2° @ 0.5 m antenna separation 0.1° @ 1.0 m antenna separation 0.05° @ 2.0 m antenna separation 0.02° @ 5.0 m antenna separation 0.01° @ 10.0 m antenna separation	
Pitch/Roll (RMS):	1°	
Heave (RMS):	30 cm (DGPS) [1], 10 cm (Atlas) [1, 6], 5 cm (RTK) [1, 6]	

L-Band Receiver Specifications

Channels:	1525 to 1560 MHz
Sensitivity:	-130 dBm
Channel Spacing:	5 kHz
Satellite Selection:	Manual or Automatic
Reacquisition Time:	15 sec (typical)

1. Depends on multipath environment, number of satellites in view, satellite geometry, no SA, and ionospheric activity
2. Depends on multipath environment, number of satellites in view, WAAS coverage and satellite geometry
3. Depends on multipath environment, number of satellites in view, satellite geometry, baseline length (for differential services), and ionospheric activity
4. Based on a 40 second time constant
5. Hemisphere GNSS proprietary
6. Requires a Hemisphere GNSS subscription
7. CMR and CMR+ do not cover proprietary messages outside of the typical standard

Communications

Ports:	1x CAN, 1x Ethernet, 1x USB, 1x 12-pin multi-purpose (RS232, RS422, CAN, 1PPS, Event Marker)
Baud Rates:	4800 - 115200
Radio Interfaces:	Bluetooth 2.0 (Class 2), Wi-Fi 2.4 GHz
Correction I/O Protocol:	Hemisphere GNSS proprietary ROX format, RTCM v2.3, RTCM v3.2, CMR[7], CMR+[7]
Data I/O Protocol:	NMEA 0183, Hemisphere GNSS binary
Timing Output:	1PPS (CMOS, rising edge sync)
Event Marker Input:	Open drain, falling edge sync, 10 kΩ, 10 pF load

Environmental

Operating Temperature:	-40°C to +70°C (-40°F to +158°F)
Storage Temperature:	-40°C to + 85°C (-40°F to + 185°F)
Humidity:	95% non-condensing
Enclosure:	ISO 60529:2013 for IPx6/IPx7
Vibration:	IEC 60945:2002 Section 8.7 Vibration
EMC:	IEC 60945:2002, EN 301 489-1 V2.1.1, EN 301 489-5 V2.1.1, EN 301 489-19 V2.1.0, EN 303 413 V1.1.1

Mechanical

Dimensions:	
No Plate:	23.2 L x 16.5 W x 7.9 H (cm) 9.1 L x 6.5 W x 3.1 H (in)
With Plate:	23.2 L x 21.4 W x 8.3 H (cm) 9.1 L x 8.4 W x 3.3 H (in)
Display:	128 x 64 Resolution
Weight:	1.7 kg (3.8 lb)
Status Indications (LED):	Power, Primary Antenna, Secondary Antenna, Heading, Quality, Atlas, Bluetooth, Wi-Fi, CAN, Ethernet
Power/Data Connector:	M12 CAN/Power, 12-pin multi-purpose, RJ45, USB
Antenna Connectors:	BT/Wi-Fi

Aiding Devices

Gyro:	Provides fast reacquisition and reliable heading for short periods when loss of GNSS has occurred
Tilt Sensors:	Provide pitch, roll data and assist in fast start-up and reacquisition of heading solution

Hemisphere®

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www.hgnss.com

Rev. A5 (08/2021) PN: 875-0459-10

PRODUCT DATASHEET

TELEDYNE MARINE

SeaBat® T20-P

High resolution multibeam echosounder

Superior acoustic quality engineered for the demanding marine environment

The T20-P is a new addition to the leading SeaBat product range engineered from the ground up to evolve with your business. Combined with the Portable Sonar Processor the T20-P provides uncompromised survey data in a highly portable waterproof package designed for small vessel use.

The solution includes a range of powerful software features at an attractive price, with the option for future feature expansions to grow with your needs.

The T20-P can be supplied in ruggedized flight cases with total weight and dimensions suitable for check-in on commercial airlines and can be transported by one person.

PRODUCT FEATURES & BENEFITS

Features

- **Sonar User Interface –** highly configurable to suit your needs.
- **Snippets & sidescan backscatter**
- **Full water column backscatter**
- **Tracker –** powerful tool for automated control
- **Selectable Beam Density –** you can define what you need to get the job done

Optional extra features

- **X-Range -** improve range and reduce external noise
- **Multi-Detect -** Multiple detections for enhanced detail over complex features and water column targets
- **FlexMode –** increase data density where you need it most
- **Pipe Detection & Tracking –** unique to SeaBat, optimize detection of pipes
- **Full Rate Dual Head –** simultaneous pinging of both heads to ensure high along track resolution
- **Normalized backscatter –** designed for accurate, reliable and repeatable seabed classification

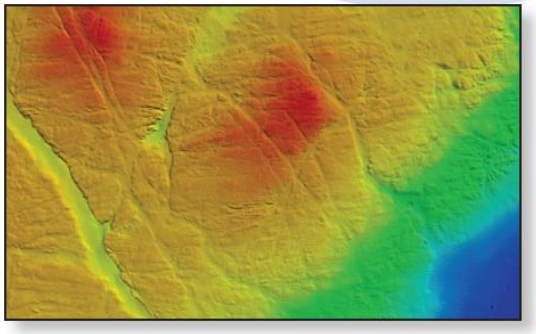
T20-P Standard configuration

Portable Sonar Processor:

- Reduced cable connections – fast mobilization
- Single-point, accurate, sensor time-tagging
- Water-resistant IP54 rated
- 24VDC and 100-230VAC for maximum flexibility
- 10m cable to wet-end components

T20 sonar head assembly

- 190 – 420kHz wide-band
- Robust titanium housing
- Less than 8kg in water



3 years warranty

Our hardware is quality-tested to meet the most demanding standards, and backed by the full support of our comprehensive after-sales program, and 3 years of warranty you can be sure that the T20-P won't let you down.

TELEDYNE MARINE
RESON
Everywhereyoulook™

PRODUCT DATASHEET

TELEDYNE MARINE

SeaBat T20-P High resolution multibeam echosounder

SEABAT T20-P SYSTEM SPECIFICATIONS

Input voltage	24VDC or 100-230VAC 50/60Hz
Power (typical / max)	200W / 300W
Ingress protection	Water resistant (IP54)
TRANSDUCER CABLE LENGTH	10m (standard), 25m, 50m, 100m (optional)
Temperature (operational / storage)	Portable Sonar Processor: -5°C to +45°C / -30°C to +70°C Sonar wet-end: -2°C to +36°C / -30°C to +70°C

	height [mm]	width [mm]	depth [mm]	weight [kg/air]	weight [kg/water]
T20 Rx (EM7219)	102.0	254.0	123.0	5.0	2.2
T20 Tx (TC2181)	86.6	93.1	280	5.4	3.4
Portable Sonar Processor	131	424	379	14	N/A

T20 Acoustic performance	**400kHz (max. frequency)**	**200kHz (min. frequency)**
Across-track receiver beam width[1]	1° (center)	2° (center)
Along-track beam width[1]	1°	2°
Number of beams	Min 10, Max 1024	
Swath coverage (up to)	140° Equi distance 170° Equi Angle (12x water depth with dual head)	
Typical Depth (CW[2])	0.5-150 meters	0.5-375 meters
Max Depth (CW[3])	250 meters	550 meters
Typical Depth (FM[2])	0.5-180 meters	0.5-450 meters
Max Depth (FM[3])	300 meters	575 meters
Ping rate (range dependent)	Up to 50 pings/s	
Pulse length (CW)	15 – 300µs	
Pulse length (FM)	300µs – 10ms	
Depth resolution	6mm	
Depth rating (sonar head)	50 meters	

For relevant tolerances for dimensions above and detailed outlined drawings see Product Description

[1] Nominal values

[2] This is a depth range within which the system is normally operated, from the minimum depth to a depth value corresponding to the max. swath -50%.

[3] This is the single value corresponding to the depth at which the swath is reduced to 10%of its max. value. For actual swath performance refer to Product Description.

[4] An extinction coverage of +/-20° is observed at about 530 meter water.

T20-P SCOPE OF SUPPLY

- Receiver EM7219
- Projector TC2181
- Portable Sonar Processor
- 10m Receiver cable
- 10m Projector cable
- Waterproof cable set
- Wet-end bracket

OPTIONAL EXTRAS

- Normalized backscatter
- 25m, 50m, 100m cable
- Fairing
- Dual head bracket
- Motion and positioning sensors
- RESON Sound Velocity Probes
- RESON Teledyne PDS Survey Package
- RESON Service Level Agreements (SLA)

TELEDYNE MARINE
RESON
Everywhereyoulook™

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Email: reson@teledyne.com

C-Nav®

oceaneering.com/cnav

C-Nav3050®

GNSS Receiver

FEATURES

- Integrated GNSS/L-Band receiver
- Patented multipath rejection
- Software configurable to user requirements

Connecting What's Needed with What's Next™

OCEANEERING®

C-Nav3050®

Technical Specifications

Features

- All-in-view parallel tracking with 66-channels
- Satellite-based augmentation system (SBAS) tracking (WAAS / EGNOS / MSAS / GAGAN)
- Built-in C-NavC[1] and C-NavC[2] L-Band receiver
- C-NavC[2] operating mode with automatic fail-safe to C-NavC[1]
- C/A, P1, P2, L2C, L5, G1, and G2 code tracking
- L1, L2, L5, G1 and G2 full wavelength carrier phase tracking
- C-Nav® corrections over Internet
- High-sensitivity / low-signal level tracking
- Fast signal acquisition / re-acquisition
- Superior interference suppression (both in- and out-of-band) using custom tuned antennas
- Patented multipath rejection
- RTK Extend™
- C-Nav® over-the-air activation capabilities
- Configurable as real time kinematic (RTK) base or rover
- Programmable output rates
- Event marker input / 1 pulse-per-second (PPS) output
- 2GB internal data storage
- C-Setup PC control software included

- For more information: **oceaneering.com/cnav**

Dimensions/weight	
Length	6.47 in / 164 mm
Width	4.60 in / 117 mm
Height	2.37 in / 60 mm
Weight	1.1 lb / 0.5 kg

Front status indication
Power/GNSS Status, correction service status, interface status, and Bluetooth status

External power	
Input	AC / DC Adapter 110 / 220 VAC 12 VDC Nominal 0.5A (9.0 V to 32 VDC)

Connectors	
I/O ports	2 x 9 pin Positronic
DC ports	1 x 9 pin Positronic
RF connector	TNC (with 5VDC bias for antenna / LNA)

Temperature (ambient)	
Operating	-40°F to 158°F / -40°C to 70°C
Humidity	95% non-condensing

Accuracy (RMS) horizontal/vertical	
RTK (<40km)	1 cm + 0.5ppm / 2cm + 1ppm
C-Nav® services (95%)	8 cm / 15 cm
Code DGNSS (<200 km)	40 cm + 3 ppm / 90 cm + 3 ppm
Velocity	0.01 ms
RTK extend (<15 mins)	3 cm + 1 ppm / 6 cm + 2 ppm

User programmable output rate	
Position/velocity/time	1, 5, 10, 25, 50, or 100 Hz
Raw data	1, 5, 10, 25, 50, or 100 Hz

Data latency	
Position/velocity/time	10 ms at all rates
Raw data	10 ms at all rates

Time-to-first-fix	
Cold/warm/hot	< 60 s / < 50 s / < 20 s (Typical values measured per ION-STD 101)

I/O connector assignments	
Data interfaces	2 x RS232 (1-changeable to RS422, 4800 -115200 baud rates) 1 x USB 2.0 (host or device) Bluetooth Ethernet (10T / 100T)

Input/output data messages	
NMEA-0183	ALM, GBS, GGA, GLL, GRS, GSA, GST, GSV, RMC, RRE, VTG, ZDA, GFA, DTM, GNS, MLA
Differential correction	RTCM 2.3 and 3.0, SBAS and C-Nav® (proprietary)
RTK connection	CMR / CMR+, RTCM, NavCom Ultra RTK
Receiver control	NavCom proprietary commands (ASCII)

Compliance/Approvals
IMO performance standard for GPS: IEC 60529
IMO performance standard for GNSS: IEC 61108-1:2003
NMEA-0183 compatibility up to V4.1
FCC Part 15 Class B, CE
QC message strings comply with the recommendations in OGP 373-19 and IMCA S015 (July 2011)

MBRTK - Range and Bearing Option
High-accuracy range and bearing data between vessels
Multiple rovers can use a common base
RTK levels of accuracy for range, irrespective of differential correctors
Converter available to emulate a fanbeam output
Heading accuracy (degrees at 1 sigma) + 0.6 / baseline length in meters
Baseline horizontal accuracy + 1 cm + 1 ppm
MBRTK NMEA-0183 Outputs: HDT, TTM, ROT

OCEANEERING®

Neptune 3000

Miniature Coiled Rod CPT System

- 2cm² Detachable Cone, 5cm² Detachable Cone, T-Bar Detachable Cone
- 10kN Push Capability
- Up to 10m Penetration from Coiled Rod
- Compact & Easily Deployed Sub-Sea Frame
- Real Time Control and Display
- Single Coax Connection for Power and Data
- Automatic Safety Cut-Outs
- Low Maintenance, Low Consumable Use
- Data Comparable to 10cm² Systems
- Easy to Operate Windows™ based PC Control

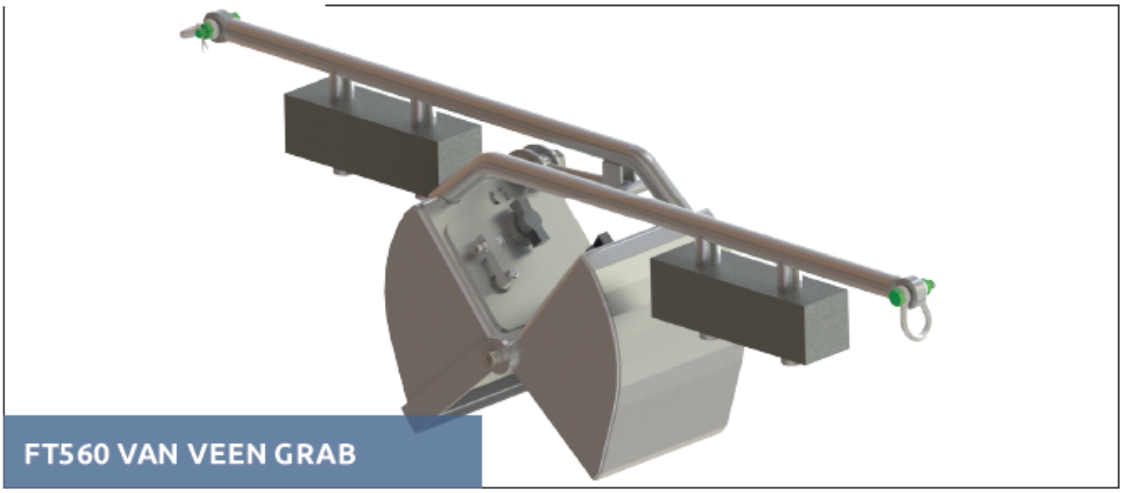
Technical Specification

Dimensions	1602mm(L) x 1602mm(W) x 1963mm(H), all ± 15mm
Weight in Air	1500kg approx.
Weight in Sea Water	1200kg approx.
Thrust Capacity	1000kg (approx. 10kN, 2cm² 50MPa, 5cm² 20MPa)
Max Penetration	10m
Depth Rating	3000m
Penetration Speed	2cm/sec ±10%
Retract Speed	5cm/sec approx.
Power Requirement	240 Vac 1ph 50/60 Hz, 2 kw
Umbilical Voltage	650v
Telemetry Link	FSK
Frame Sensors	Altimeters & Tilt
Frame Sensor Data Rate	1 Hz

Tip Accuracy	Better than 100kPa
Sleeve Accuracy	Better than 10kPa
Inclination Accuracy	Better than 1°
Cone Data Rate	20 Hz
Cone Type	Detachable, Digital Subtraction
Cone Sensors	Tip, Sleeve Friction & Inclination
Optional Sensors	Piezo - Ranges to Suit
Cone Tip Area	2cm²
Cone Sleeve Area	30cm²
Operating System	Microsoft Windows™ XP, Vista and 7

www.datem.co.uk email: sales@datem.co.uk
Woodbridge Road Industrial Estate, Sleaford, Lincolnshire, NG34 7EW
Tel: 01529 419970 Fax: 01529 419989

FERITECH



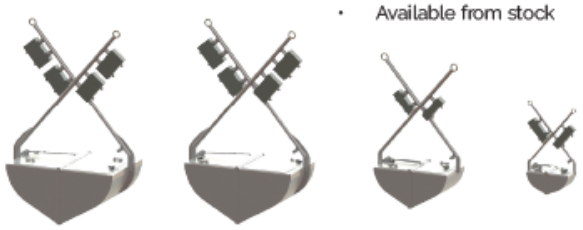
FT560 VAN VEEN GRAB

The Feritech FT560 Van Veen Grab is the most universal of the grab samplers, ideal for taking samples in shallow to medium water depths and for biological, hydrological and environmental studies. Available in 4 different sizes, we have a Van Veen to suit all projects, big or small.

The lead-weighted jaws close positively, capturing the sample for secure recovery to the surface. The weights also enable reliable operation in strong currents, and extra weights can be added for hard seabed conditions.

PRODUCT HIGHLIGHTS

- Comes in 4 sizes: 0.025m², 0.1m², 0.2m² and 0.25m²
- Easy to handle and can be used from any size of vessel
- Inspection lids for easy sampling
- Optional lead weights for extra penetration
- Configurable weights for strong currents and hard seabeds
- Marine AISI 316 grade stainless steel construction
- Works at any depth
- Virtually maintenance free
- Available from stock



Innovative Engineering

All our products are designed, manufactured and tested to the highest standards by our UK team. Many are available immediately from stock, providing unparalleled access to spares and consumables.

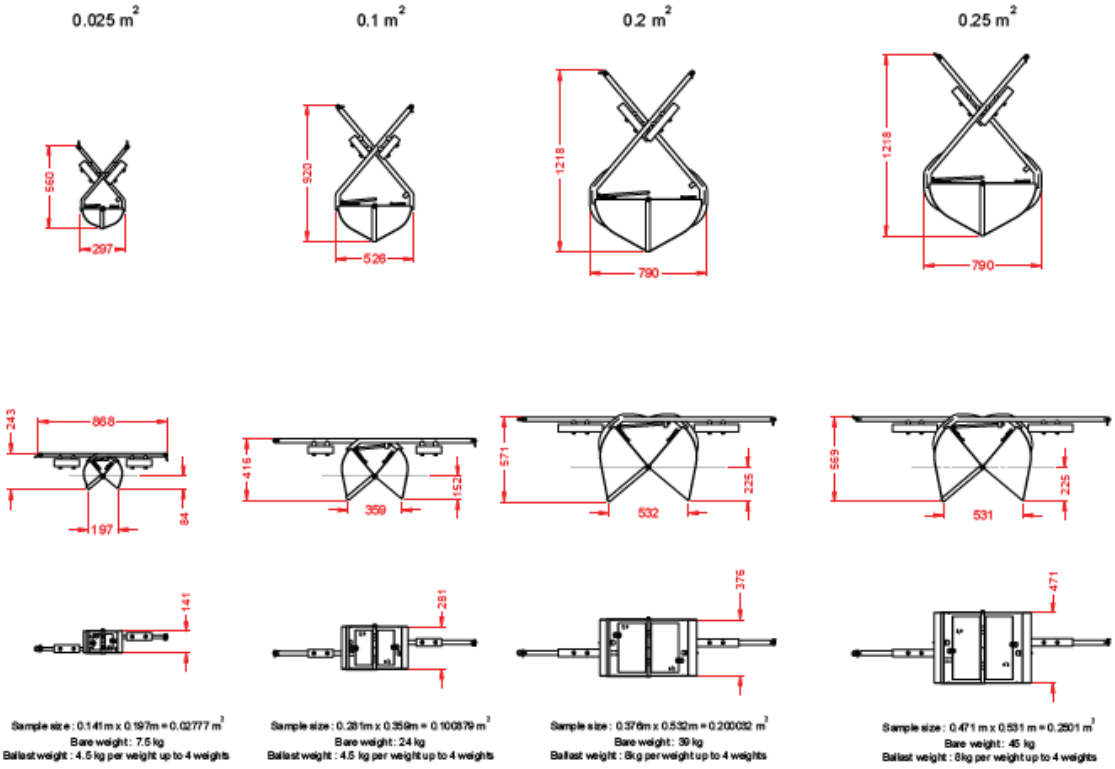
Bespoke Solutions

All our systems work straight out of the box and can be mobilised within hours. As with all Feritech products, we can tailor it to your exact needs. Please contact us to discuss your requirements.

Global Warranty & Support

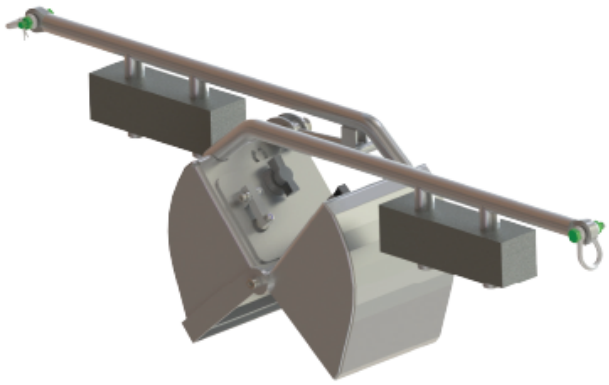
All our equipment comes with a global support and warranty package. With global delivery and exceptional reliability, get the best technical support wherever and whenever you might need it.

+44 (0) 1326 369 444 info@feritech.com www.feritech.com



Further Information

Feritech's continuously expanding geotechnical equipment line offers impressive value-adding extras not found anywhere else. Add in global delivery, outstanding technical support, fast consumables supply and exceptional reliability and you have a winning formula for your geotechnical equipment and consumable supply needs. All our products have been designed, manufactured and tested by a team that truly understand the geotechnical offshore market. With total turnkey system solutions on offer you can rely on Feritech to provide the coring hardware, winch, cabling, spares and consumables you need, on time and within your budget.



FT560 VAN VEEN GRAB SPECIFICATION

Model	Length	Width	Height	Overall Weight (excluding ballast)
0.025m²	868mm	297mm	560mm	7.5kg
0.1m²	1365mm	526mm	920mm	2.4kg
0.2m²	1709mm	790mm	1218mm	39kg
0.25m²	1709mm	790mm	1218mm	45kg

MIDAS WLR -
Water Level Recorder

The MIDAS WLR is a precision water level recorder, designed for use in both autonomous and real time deployments. Fitted with a 0.01% accuracy pressure sensor and accurate PRT temperature sensor as standard, the MIDAS WLR features a variety of operating modes from rapid 8Hz continuous sampling to power saving burst modes for long term monitoring. The titanium housed instrument is suitable for fixed or inline mooring, with a variety of built-in communication options.

DATA SHEET

Product Details

PRESSURE AND TEMPERATURE

DATALOG X2 SOFTWARE

Valeport Limited
St. Peter's Quay, Totnes,
Devon TQ9 5EW United Kingdom

Telephone: +44 (0) 1803 869292
Email: sales@valeport.co.uk
www.valeport.co.uk

VALEPORT

Sensors

The MIDAS WLR comes with a choice of pressure sensor ranges to suit the depth requirement of the operator. The sensor used is a revolutionary piezo-resistive cell with internal temperature compensation, giving the accuracy and resolution levels normally associated with a resonant quartz sensor, but with increased durability, stability and recalibration intervals.

Pressure

Type	Temperature compensated piezo-resistive cell
Ranges	10, 20, 30, 50, 100, 200, 300, 400 or 600 Bar
Accuracy	±0.01%FS
Resolution	0.001%FS

Temperature

Type	Titanium housed PRT
Range	-5°C - +35°C
Accuracy	±0.01°C

Data Acquisition

In line with other Valeport MIDAS series instrumentation, the MIDAS WLR samples data points at up to 8Hz, and has a variety of operating modes including continuous data output, triggered sampling, and data bursting. The typical configuration for this instrument is to sample data in a burst mode for a user defined integration period, selectable from a single sample up to 600 seconds. This data burst may then be repeated at a suitable regular interval, from once per minute to once per day.

Sampled data may either be recorded in its entirety, or simply averaged and recorded along with standard deviation data. It is usually recommended that data is averaged over an integration period of 40 seconds to filter the effects of any wave activity.

Note that Valeport's distributed processing concept allows the pressure data to be automatically converted into the user's choice of units, including metres or feet of water.

Memory

Standard memory is 16Mbyte FLASH, which is capable of storing approximately 2.7 million records. The memory is non-volatile, so data and configuration are retained in the event of power failure.

Communications

RS232	Up to 200m cable, direct to serial port via USB adapter
RS485	Up to 1000m cable, addressable half duplex comms
Baud Rate	2400 -115200 (FSK fixed at 19200, USB 460800)
Protocol	8 data bits, 1 stop bit, No parity, No flow control

Electrical

Internal	8 x C cells, 1.5V alkaline or 3.6V lithium
External	9 – 30V DC
Power	0.3W (sampling), <1mW (sleeping)
Battery Life	125 days operation (alkaline) or 360 days (lithium) based on a 40 second burst sample every 10 minutes
Connector	SubConn MCBH10F

Software

System is supplied with DataLog X2 Windows based PC software, for instrument setup, data extraction and display. DataLog X2 is licence free.

Physical

Instrument	88mmØ x 550mm, 11kg (Titanium)
Cage	750mm x 140mm x 120mm
Depth Rating	6000m (Titanium) Sensor range permitting.
Shipping	100 x 18 x 49cm, 24kg (Titanium)

Ordering

07300 46-XX	MIDAS WLR in Titanium 0.01% pressure sensor PRT temperature sensor Supplied with: • Mooring cage • SubConn switch plug • 3m communications lead • USB adapter • DataLog x2 software • Manual, tool kit and transit case
Note	XX denotes pressure transducer range. Select from 10, 20, 30, 50, 100, 200, 300, 400 or 600 Bar

Datasheet
Mini-Ranger 2

Mini-Ranger 2 is our mid-level USBL system that's also able to support data harvesting, using USVs, from seabed-deployed instruments or communicating with underwater assets such as AUVs.

With a 995 m operating range, extendable to 4,000 m, Mini-Ranger 2 can track up to 10 underwater targets simultaneously, including divers, towed instruments, ROVs and AUVs.

Opt for the Marine Robotics software pack and it will communicate with subsea robotic platforms; sharing position and allowing you to exchange data.

Expected system accuracy is 0.2–1.3% of slant range depending on system configuration. If you need higher precision or looking for a USBL that you can use as a dynamic positioning reference, then take a look at our top performing USBL, Ranger 2 Standard, or Ranger 2 Survey.

Mini-Ranger 2 is a compact, easily installed system, so it's the ideal choice for temporary installation on small survey vessels, as well as uncrewed surface vessels (USVs). It's built around the same market-leading 6G hardware and Wideband 2 digital acoustic technology you'll find in our entire family of USBL systems – even the software is the same.

HPT 3000

At the heart of the system is HPT 3000, a highly capable surface-deployed USBL transceiver which is optimised for; performance in shallow water, high elevation and long lay back operating scenarios, as well data telemetry.

It's typically deployed over the side of a vessel on a simple pole arrangement or under the hull of a USV. If the system is going to be permanently deployed, a though-hull deployment setup is possible.

HPT 3000 is connected to the system's 1U-high Ethernet Serial Hub (ESH) and your PC running the Ranger 2 software application. Fit a transponder to each target you want to track and you're ready to go. Mini-Ranger 2 is simple to configure and easy to use, even with no experience of acoustic tracking technology.

As standard HPT 3000 enables data harvesting from seafloor instruments using a crewed or uncrewed vessel.

Transponder options

A wide range of Sonardyne 6G transponders can be used with Mini-Ranger 2, allowing you to select the most appropriate model for each task. If you're tracking divers, man-portable AUVs and micro-class ROVs, Nano is a popular choice. When tracking larger targets such as; a towfish, a crane wire lowering a structure, or an observation-class ROV, WSM 6+ will meet your requirements.

And if you're looking for a combined tracking and acoustic release transponder, RT 6 is now available. It allows you to deploy, track and recover seafloor equipment, all using the same instrument.

See the Sonardyne website for more information on Mini-Ranger 2.

Specifications
Mini-Ranger 2

Feature	Specification
Design	Powerful features for commercial users
	Easy to transport, hardware comes in one shipping box
	Configurable for manned or uncrewed vessel operations
	Quick to mobilise, configure and uninstall
	Shares common platform with other Sonardyne USBLs
Performance	0.2% positioning repeatability using external MRU
	1.3% positioning repeatability using internal MRU
	Up to 10 targets tracked, simultaneously
	995 m tracking range; extendable to 4,000 m
	Up to 3 Hz position update rate
Acoustics	MF frequency (20–34 kHz)
	Supports Sonardyne Messaging Service for data exchange
	Sonardyne Wideband 2 digital acoustic for reliable performance in both shallow and deep environments
	Transceiver optimised for high elevation tracking
Ownership	What's in the box: HPT 3000, ESH, deck cables, software, manual
	Warranty: 1 year return to Sonardyne service centre
	ITAR Controlled: No
	UK Export License: Not required for 995 m version. Required for extended range (4,000 m) version

sonardyne.com

Specifications subject to change without notice – 10/2023

For further information, contact us at E sales@sonardyne.com

Unique Group

Uni-Count 14” & 20”

Wireless Cable Counter

1. Introduction

Developed by Unique Group to meet the demand for increased back deck survey equipment, the Uni-Count is a reliable and accurate system for measuring the cable passing over the wheel.

Developed to help Oceanographers, Hydrographers and Surveyors who require an accurate measurement of deployed cable in conjunction with applications including Side Scan Tow Fish, Magnetometers, ROVs, CTD Systems, Undulating Towed Vehicles, Sub-bottom Profilers, etc

Capsule Electronics

14” & 20” Uni-Count

2. Features

- Alpha-numeric LCD display
- High Resolution & Accuracy
- Addressable up to 8 counters
- RS232 communication ports + USB port
- Custom OFFSET and RESET of Cable length
- User friendly operation

3. Applications

- Side Scan Sonars
- Sub-Bottom Profilers
- CTD Systems
- ROVs etc.

Unique Group

Uni-Count 14” & 20”

Wireless Cable Counter

4. Specifications

Size	14” Block	20” Block
Height	677mm	817mm
Sheave Wheel Diameter	356mm	508mm
Overall Width	158mm	158mm
Weight	25Kgs	29.5Kgs
Maximum Cable Diameter	6mm to17mm (max)	
Safe Working Load (SWL)	4.5 Ton (at head fitting)	
Material	Strong Aluminum Alloy (Anodized) with SS316L fittings	

5. Transmitter Specifications

Radio Range	500m (max)
Frequency	433 MHz (8 Channels)
Transmit Power	160mW (max)
Power	3.6VDC Li-SoCl2 Battery (non-rechargeable)
Maximum Count	-9999 to 9999

6. Receiver Specification

Dimensions	180 X 132 X 56 mm
Data Output	RS232 (9600,8N1) formats accepted by survey software + USB (Direct Serial Data)
Display	Monochrome LCD Display
Power	12 VDC (External or USB device)
Operating Temperature	-55°C to +85°C (Battery)