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2024

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Getting to the bottom of things

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SEABED
END OF SUMMER
DEMO DAYS

Interesting demonstrations of the latest equipment, sunny weather, beautiful location, great food and valuable conversations were the main features of the Seabed demo days 2023.

We are so grateful that so many find their way to the Seabed demo days again year after year.

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Seabed
Orinoco Solo V3

**Based on the successful Orinoco line of tide gauges, the OrinocoSolo V3 is the latest offspring. The basic unit is a high capacity data logger with up to eight analogue inputs and up to four RS232 inputs (optional)
and one serial data output which supports multiple formats.**

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Getting to the bottom of things

Meet...

Jaimy Grevelt
Junior Engineer

Date of birth?
16th of Januari 2001. I usually celebrate my birthday together with the birthdays of my friends. Often we play D&D for the day, some good memories are attached to that.

Single, in a relationship or married?
Currently single.

Any hobbies?
Several! I like to play video games with my friends, I play D&D, I am currently trying to learn game making and 3D-modeling, and who doesn't go down a YouTube rabbit hole every now and then?

Fast food, bistro or Michelin starred restaurant?
Depends on the occasion… All of the above!

Netflix or the cinema? And what is your favourite TV-series or movie?
Again, depends on the occasion. Of course I love to go to the theatre, however every now and then watching a movie at home is a great break. To pick one favorite is a difficult task… I think it is a close battle between Cars, the first movie I have ever seen in cinema. And Herby reloaded, a movie that I watched so much as a child that I could almost read the entire script while the movie was going.

What kind of job did you want growing up?
I used to play video games since I could hold a Gameboy and much hasn't changed since, I liked it so much that I always had the dream of becoming a game tester. That dream has never really left my brain.

What is it you like most about your current job?
The colleagues, everyone is so friendly! Not to mention the great activities we do!

What do you learn from your colleagues?
So much that it is difficult to pick out a single thing. I think that one of the greatest lessons I learned here was living up to your mistakes.

If you would win the lottery, what would your life look like?
I would most likely no longer live at my parents house. Get a new car, new gaming rig. But that pales to the dream I had that I did want to see the world. I might make a world tour!

How real-time hydrophones are reshaping the ocean technology sector

By Mark Wood, Founder and CEO, Ocean Sonics

Most large technology companies today have developed strategies to address customers' instant demands. Technologies like facial recognition and Siri operate in "real-time" through edge processing, meaning data is processed at the source (i.e., within the actual phone itself).

Real-time processing captures and handles data as it occurs, from a radio, Wi-Fi, or even satellite while streaming. This stands in contrast to traditional batch data processing, where large amounts of data are collected and processed later, not as events happen. Real-time functionality has not only become a significant convenience for everyday life but has also empowered industries and organizations to accelerate decision-making.

So why does this matter?

Right now, decision-making is the greatest catalyst for progress across all industries, and the ocean sector is no exception. For over a decade, Ocean Sonics has been working in the ocean technology sector, developing smart digital hydrophones known as the icListen. We were the first company to produce a smart digital "real-time" hydrophone, earning us the title of the "digital hydrophone capital of the world."

We developed the icListen which uses edge processing to enable the user to make smarter and more informed decisions while listening to underwater sound events. This real-time processing within the hydrophone is key to monitor and research marine activities. Having processed information from the hydrophone provides workers and researchers with immediate insights into the acoustic landscape of the oceans – facilitating the monitoring of marine mammal activities, underwater machine health, and even tsunamis and earthquakes. The continuous and instantaneous nature of real-time hydrophone information allows users to respond promptly to dynamic changes in the marine environment, contributing to a better understanding of underwater ecosystems and supporting efforts in ocean conservation, resource management, and even saving lives.

All of these factors have enabled the icListen to enter sectors that hydrophones traditionally did not exist in before incorporating edge processing.

The real-time capabilities of icListen hydrophones have revolutionized our involvement in these sectors, including ocean science, offshore energy, defense and security, maritime transportation, and aquaculture and fisheries. In ocean science, researchers benefit from immediate access to underwater acoustic information, enabling the study of marine ecosystems, monitoring climate-related changes, and understanding intricate communication patterns of marine life. In offshore energy, real-time hydrophone information aids in detecting potential environmental impacts and ensures the efficient operation of underwater infrastructure. For defense and security applications, receiving instant acoustic information enhances underwater surveillance, situational awareness and threat detection. In maritime transportation, real-time hydrophone monitoring contributes to the monitoring of underwater radiated noise (URN). Additionally, in aquaculture and fisheries, icListen hydrophones provide timely insights into fish behavior, optimizing farming practices and supporting sustainable fisheries management. The versatility of icListen hydrophones underscores their importance in advancing our understanding and management of human activities that threaten ocean life.

Potentially one of the most useful cases for real-time digital information is the exploration of the vast areas of the oceans that are unexplored. Then ROV's (Remote Operated Vehicles-tethered) became the norm but one always needed a ship with a crew to deploy it. However, emerging technologies like ROV's and ASV's (autonomous surface vehicles) are gradually complementing human efforts, providing safer and more efficient alternatives for data collection. The icListen has been specifically designed for integration on ASV's and ROV's in order to provide a safer alternative for collecting underwater sound in harsh environments.

Getting timely and processed information can help users spot trends quickly and make decisions. Whether that is the decision to slow down a shipping container due to underwater radiated noise (URN) impacts, or evacuate a town due to a potential tsunami, real-time hydrophones allow users to make quick adjustments when allocating resources and money.

Overall, the outcome of real-time information from the processed data is crucial for organizations aiming to thrive in today's fast-paced environment. As technology continues to advance, organizations that harness the power of real-time information will be more agile and adaptable to make informed decisions.

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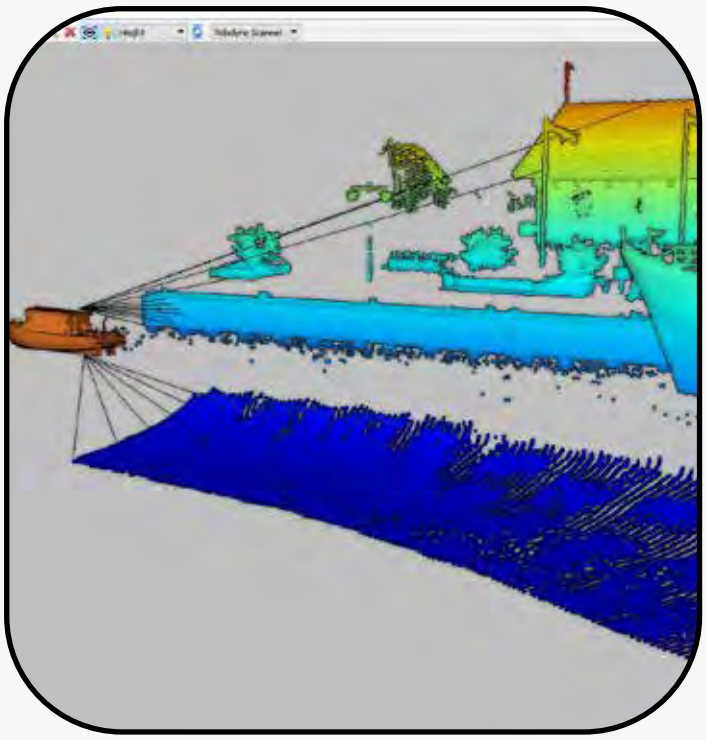

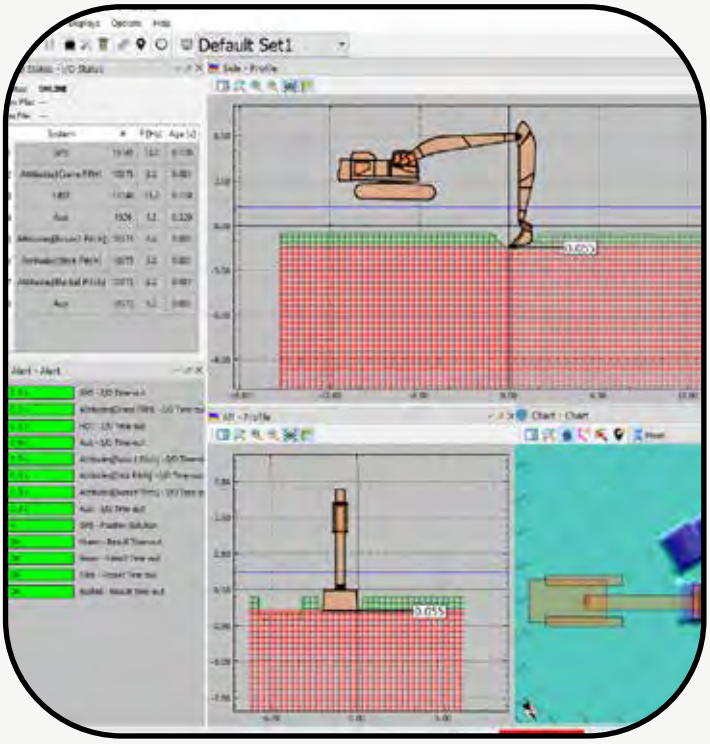

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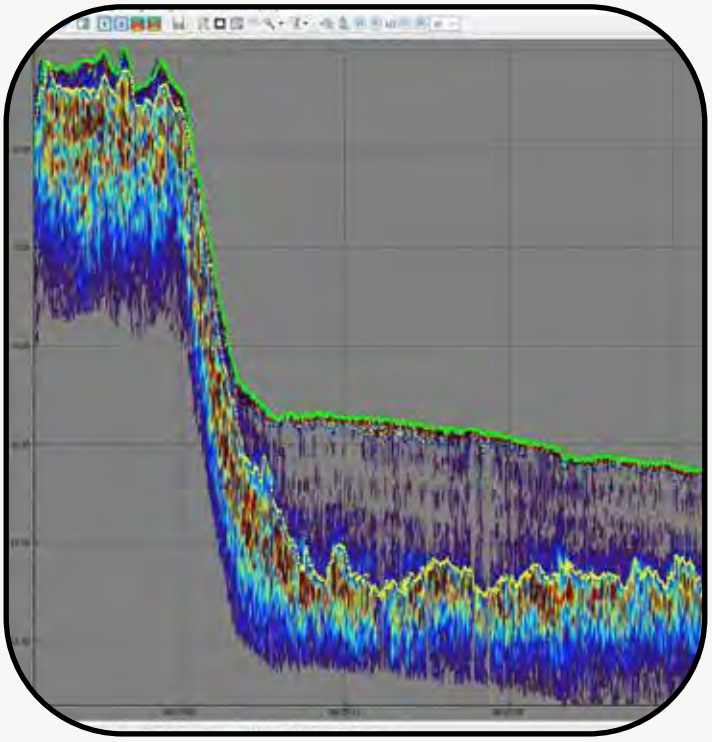

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www.beamworx.com

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AML-6 CTDSV with Seabed Timing Module (STM) integration

If you are looking for real-time timestamped UTC synchronized data for an ROV deployment; Seabed and AML can provide you with the solution.

Seabed developed a miniature circuit board to integrate GNSS synchronized time output with the loggings of the AML6 instrument, with an easy integration in any subsea navigation system. The seabed timing module (STM) communicates with the AML6 internally and adds the time stamp from the ZDA string and sends the resulting data out over Ethernet. This integrated timestamp can be implemented in all acquisition programs.

The benefits of having a timing module inside the AML6 is, that only one instrument is required with the highest quality timestamped with a synced GNSS UTC time.

The following key features are included with the STM:

- STM is housed inside the AML instrument.
- Data is available at a maximum of 20 Hz.
- STM is WebUI accessible over Ethernet.
- STM delivers SV output via serial.
- GNSS ZDA can be inputted via Ethernet or Serial.
- Settings for serial in and output can be adjusted in the WebUI.

The STM has been designed to meet all the requirements of the AML6, so the AML6 manual can be referenced for all power and deployment requirements. For more information on the AML 6 please scan the QR code.

For more information or assistance please call +31(0)20 636 84 43 or visit our website www.seabed.nl/contact/

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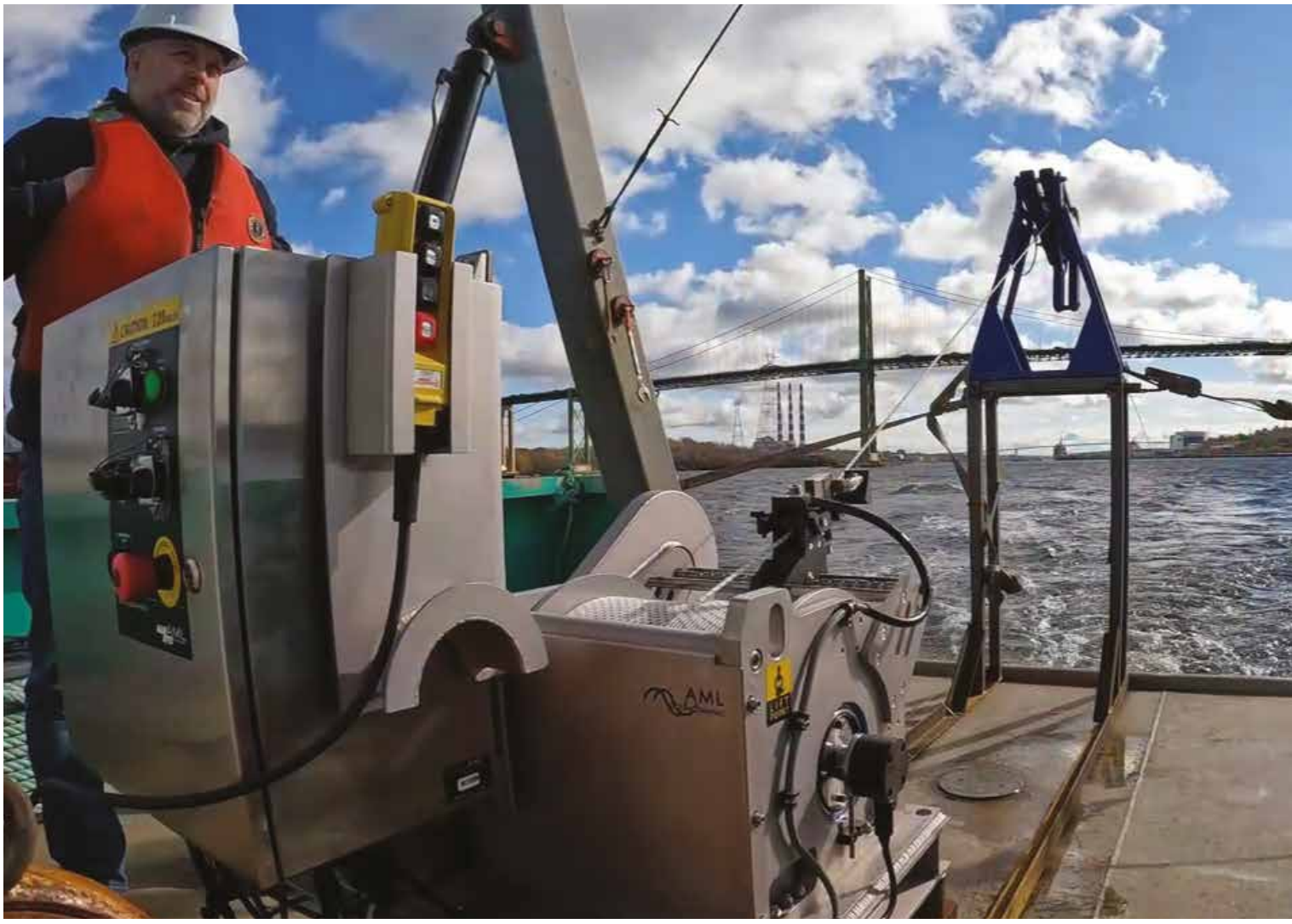
Moving Vessel Profiler (MVP) on Uncrewed Surface Vehicles (USV)



Offshore surveys have long been a precarious balance of human safety, data quality, and cost control. Technological innovation - and the operational improvements that it yields - continually flirt with these three factors, either individually or - occasionally, and dramatically - all three together.

The Moving Vessel Profiler (MVP) technology - first commercialized in the early 2000s - is one example of a dramatic step change that addressed all three factors at the same time. A Moving Vessel Profiler made it possible for survey operators to collect sound velocity profiles in real-time while underway, enabling more survey swathes in a single day, thus reducing cost. At the same time, data density increased dramatically, improving survey quality. In turn, human safety is strengthened given the user's ability to operate the MVP system without being on deck.

More recently, Uncrewed Surface Vehicles (USVs) have emerged as the go-to technology to achieve step change in cost, quality, and safety. USV usage has grown dramatically and USV capabilities continue to improve. USVs are larger, with enhanced autonomy and field capabilities that challenge conventional crewed survey vessels.

And yet...sound velocity profiles are still required for USVs conducting multibeam surveys. Uncrewed or not, surface survey platforms still depend on the frequent collection of accurate sound velocity profiles.

How then to marry these 2 game-changing innovations? Over the past year, AML has designed two MVP systems for

deployment on unmanned platforms. The system's ability to operate remotely has required adaptations in three domains: 1) changes in the communications infrastructure; 2) updates to the control architecture; and 3) the creation of a more capable client software with an API.

An interesting off-shoot of our uncrewed MVP testing was a re-design of AML's core oceanographic instrumentation to support wireless charging. More detail is offered below...

At a high level, a conventional MVP system consists of the winch, a control box, a communication interface box (CIB), and the MVP Controller Software. System operation is managed by the MVP Controller Software - running on a local computer - which interfaces with the CIB via serial communication. The CIB, in turn, drives the signals for the control box to operate the winch.

CONVENTIONAL MVP ARCHITECTURE

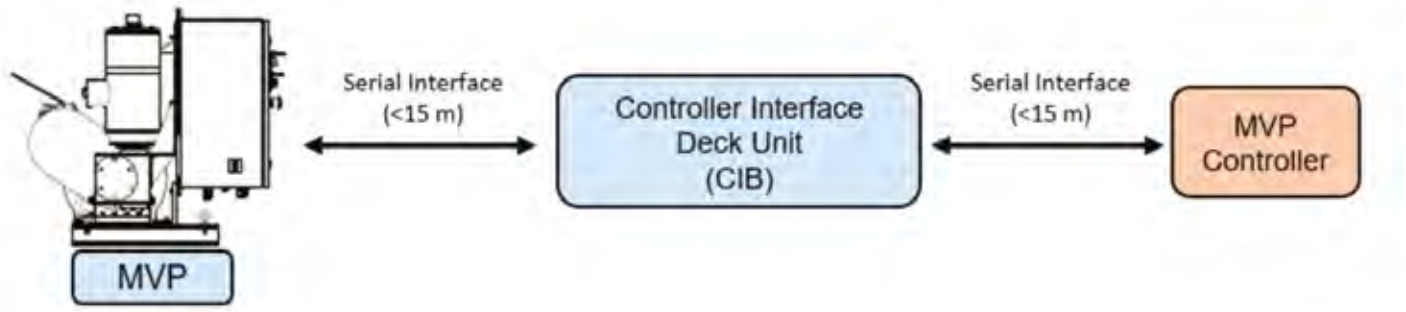
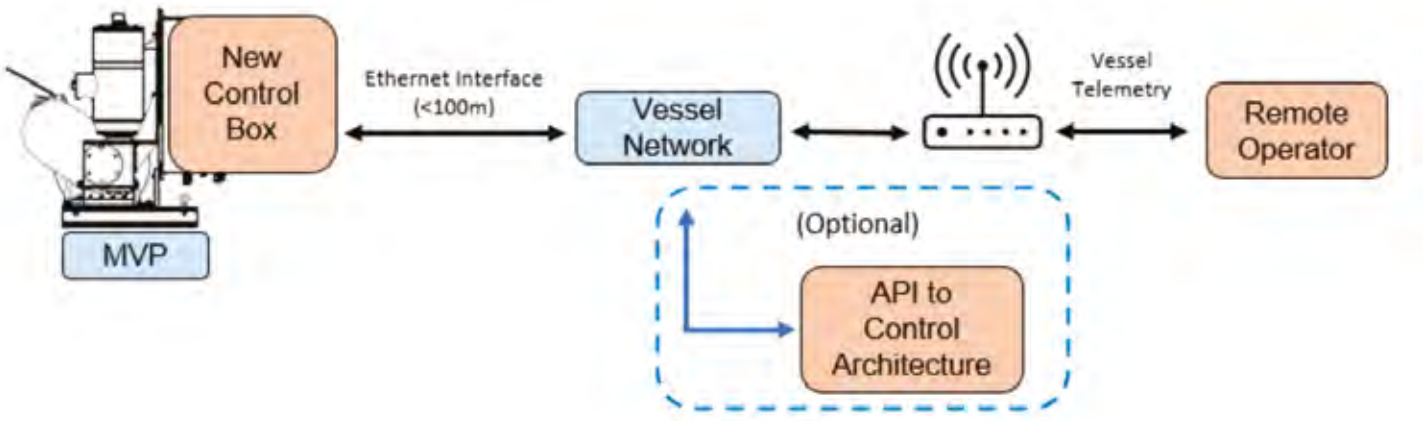


DIAGRAM 2: UNCREWED MVP ARCHITECTURE



Ethernet Instead of Serial:
The legacy MVP system relies on serial communications between control software operated by a user and the winch. Most obviously, this dependency was the first barrier that had to be removed. In the unmanned version of the system, the winch - and its strengthened smart controller - are connected directly to the vessel network via ethernet. With this direct connection to the vessel's network, the MVP may be controlled from a remote PC running client software.

Smarter Control Architecture
In the first project, host software to control the unmanned MVP was also embedded directly into the control box. This software runs on a low-power computer and system-specific electrical components. Acting as a crucial bridge, this computer connects the required serial interface to the winch with the network interface essential for remote operation, data monitoring, and overall system oversight. The incorporation of additional electrical components enables users to seamlessly utilize the remote interface to replicate the physical interface of the winch, thus ensuring a cohesive and user-friendly experience.

In a second demonstration project, an alternate version of the control system adopts a Programmable Logic Controller (PLC). Leveraging the distinct advantage of not necessitating further hardware modification, the PLC is marked by its flexibility and expandability features. Serving a dual purpose, the PLC not only provides the requisite network interface for data monitoring and acquisition but also empowers users with the capability to manipulate the winch system directly. This innovative approach underscores the adaptability of the MVP technology, ensuring its relevance in the rapidly evolving landscape of unmanned surface vehicles and maritime survey operations.

Client Software Gets API:
While the MVP control software has historically provided limited system monitoring, the core objective of the development has

been to enable comprehensive remote monitoring capabilities. The focus extends beyond data monitoring and logging, seeking to implement comprehensive control of the MVP system. Of particular interest is ensuring communication robustness and reliability, marking a crucial evolution in the capabilities of the MVP technology; essentially system health.

AML has implemented an Application Programming Interface (API), which allows users to utilize either the standard MVP control software to control the winch OR to utilize a 3rd party application and hardware, for system control and data communication. Users are empowered with the ability to effortlessly initiate or halt winch operations, as well as tailor the mode of operation suite specific needs. The system offers sophisticated mechanisms for resetting and clearing software-driven error states, ensuring seamless performance. Moreover, users can fine-tune the parameters governing winch operation, enhancing adaptability to diverse scenarios. A robust software-winch reconnection method is in place, guaranteeing uninterrupted functionality even in the face of potential disruptions.

WIRELESS CHARGING

These new data streams contribute to the reliability of the overall system. The real-time data stream includes data from the winch interface in addition to the raw data directly from the sensor payload, navigation system data, and comprehensive status and control information. In the event of a loss of remote communication, users can rely on the system's proactive capabilities to take corrective action. This suite of features positions the MVP systems as the next stage in USV survey vessels, elevating efficiency, and reliability.

"Uncrewed Technology Platforms"

The advances described above were achieved in collaboration with a US government partner. In the first project, the unmanned MVP was placed on a remotely operated, unmanned vessel that had been retrofitted as an unmanned technology demonstration platform. The system operator was placed on a second vessel and connected to the MVP system via wireless communications.

In the second project - also an unmanned technology platform - the MVP system was deployed on a stationary platform, deployed at sea off the coast of Alaska. This time, the operator was on land, working out of a fixed command centre many miles away.

In both scenarios, the existence of the API was critical, given the reliance on 3rd party software applications to generate critical inputs into the MVP system... and the importance of leveraging MVP system outputs to initiate ancillary actions on the demonstration platform.

Wireless Charging Cradle:

As demonstration testing progressed, it became clear that another aspect of a robust solution for unmanned platforms - completely independent of MVP - is instrument charging. We hear again and again that unmanned platforms MUST be able to dynamically charge their instrument payloads. To address that missing capability, AML pivoted towards the development of a wireless charging cradle for our AML•3 and AML•6 instruments.

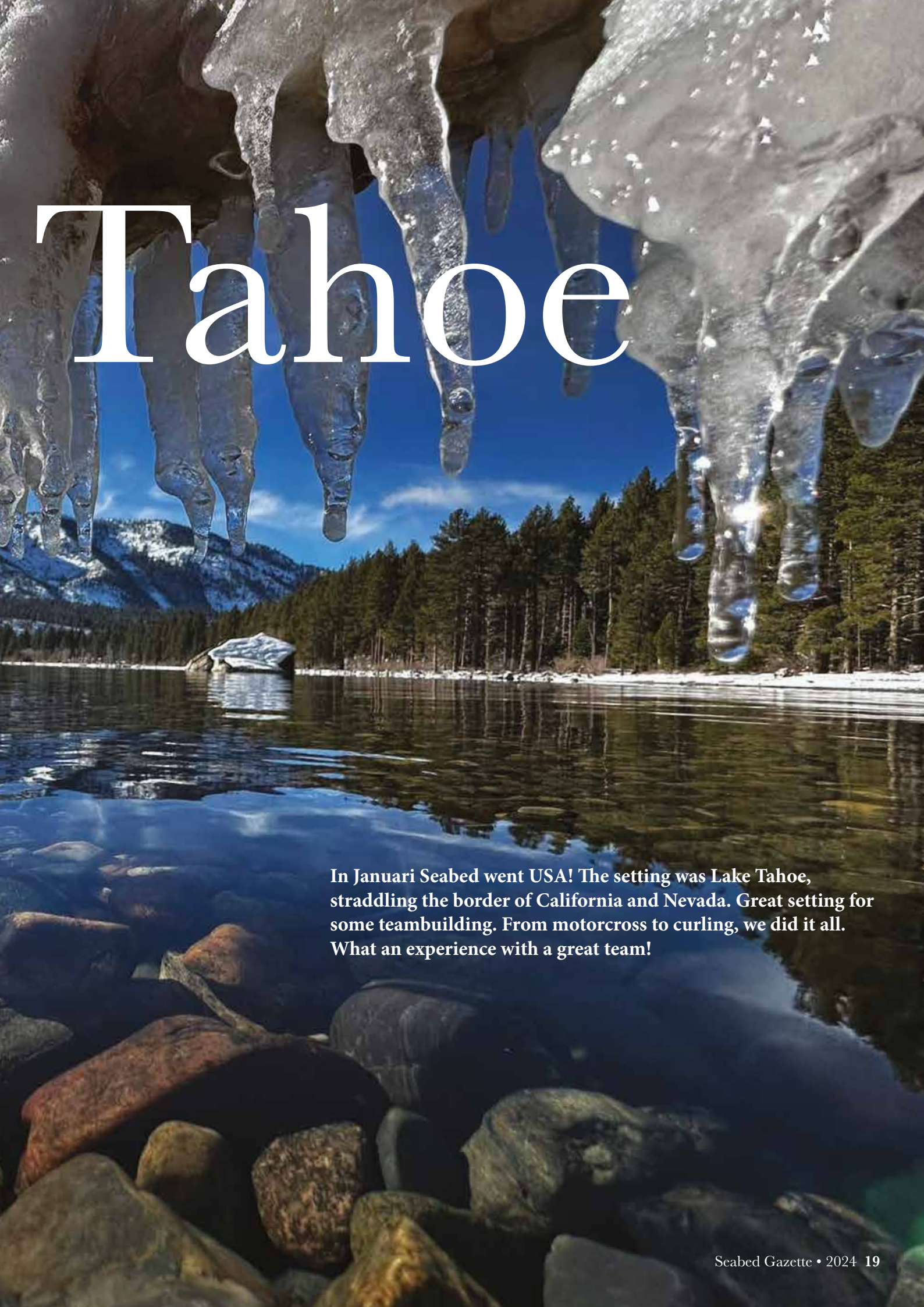
A primary focus of this development was to deliver a charging system that guarantees reliable, robust performance in challenging unmanned environments. To resolve the challenge, our design team embraced technology reminiscent of contemporary Qi-enabled devices like smartphones. With this in our back pocket, we developed an inductive charging capability for oceanographic instrumentation. When an instrument, along with its internal receiver, is docked into the charging cradle, our system detects the device, initiating the inductive transfer of power from the platform to the instrument. This seamless charging process simplifies the physical integration, removing the need for an electromechanical cable.

Uncrewed surface vehicles are the wave of the future and are bound to have a significant impact on offshore operations. As is typical, the innovation of one new technology - USVs - has initiated a chain reaction of follow-on development to ensure supporting tools to catch up. The net result of fully baked, mature solutions: step changes in human safety, data quality, efficiency, and cost control.

AML OCEANOGRAPHIC

Oh Lake

Tahoe



In Januari Seabed went USA! The setting was Lake Tahoe, straddling the border of California and Nevada. Great setting for some teambuilding. From motorcross to curling, we did it all. What an experience with a great team!


ELDORADO


9DOJ807

Integration of USV with high-resolution multibeam echosounder for complete automation of bathymetric measurements

mKurs USV with iWBMS

Imagine you are a surveyor, comfortable seated by a lake or a sunny beach observing a small, autonomous boat performing a bathymetric survey. Your only responsibility is to monitor the screen where bathymetric data is covering more and more of your survey area and to signal other boats with a honk if they cross your path.

Is it just a naive surveyor's dream? We may be closer to such a solution than you think.

mKurs running autonomous survey

The beginning

It was a fortunate occurrence when representatives from the Polish company K2sea and NORBIT (Norway) started to chat and share their experiences. They both felt that it would be valuable to try integrating the small uncrewed surface vehicle (USV) mKurs with the NORBIT iWBMS multibeam sonar. The outcome of this collaboration was highly successful and worth the effort.

The purpose of the integration is not only to mount the multibeam sonar on the USV to provide a simple way of operating them both simultaneously. To fully understand issue's complexity, one must consider that the USV is an independent system with its own power supply, propulsion, suitable user interface, and communication method. Similarly, the multibeam echosounder has its own dedicated software for handling settings and data acquisition. How can we effectively integrate these programs and requirements without relying on multiple screens and computers in a control room? Can we accomplish this task with just a laptop and a tablet?

The meeting place

Following extensive discussions and preliminary tests, both teams opted for a crucial final trial, intending to validate our concepts and technical skills. Our destination was Lake Drawsko in north-central Poland. It has a post-glacial character and is the second-deepest lake in the country (79.7m deep). We were warmly welcomed by the local historical and cultural association Tempelburg, which guards the mysteries associated with the lake. It's not a huge secret that the famous Templars had their castle by the lake, but modern times also ignite the imagination. During World War II, this site was likely a training centre for Kriegsmarine cadets, and perhaps small submarines of the 'Seehund' type were tested here, with one of them supposedly remaining forever in the waters of Drawsko. We decided to explore the lakebed hoping it would reveal more secrets.

The Integration

NORBIT iWBMS multibeam echosounder with narrow transmit is a part of NORBIT curved array, bathymetric integrated systems family. It has 512 true beams (0.9°x0.9°, at 400kHz), a high-end navigation system and a very compact deck unit with small power consumption. All those features and light weight make this sonar perfect for integrating onto, especially for medium and small size, unmanned vehicles.

The NORBIT user interface has recently been enriched with a straightforward Data Acquisition software (DCT) operating within a web browser window. It can be remotely accessed from any browser, anywhere worldwide, through VPN connectivity. Specifically tailored for autonomous vehicles, an Autopilot application has been developed to link the data acquisition program with the controlling and navigating system of the USV.

These programs constitute a part of the NORBIT Open Hydrographic Platform (OHP), which enables visualization and redirection of the collected echosounder data streamed into any open-source software or GIS.

The Autopilot application assists in autonomously planning survey lines based on the already measured bathymetry to keep full data coverage and transmitting information to the USV about subsequent waypoints and alterations in the planned route, making this setup a real autonomous surveying platform (ASV).

The USV by K2sea is a compact, highly versatile, small, uncrewed surface vessel of 1.6m in length. Engineered for various survey tasks, especially bathymetric measurements, it features a dynamic shape which ensures stability and high-quality hydrographic operations. The USV has two efficient electric motors with Kort-nozzled propellers, guaranteeing high manoeuvrability and an independent power source for critical vessel systems. The attached gondola carries the NORBIT iWBMS echosounder. To mitigate potential communication issues via WiFi or LTE, the boat's control system and multibeam echosounder computer were placed onboard, ensuring data integrity. A web browser on a tablet allowed remote access to the Data Acquisition software (DCT), enabling setup and monitoring of the progress during autonomous data acquisition. Additionally, the mKurs was outfitted with an automatic winch for conducting sound velocity casts using a small profiler.

The survey

The survey was conducted during two hot summer days. We were monitoring from the shore how the ASV was doing the job. We confirmed the deepest point in Drawsko Lake for more than 79m (depending on the water level). We also mapped a shallower part where some interesting artefacts were expected to be found. However, despite the high-resolution data (10cm), we saw only a small wreck of 2.5m long boat and some stones.

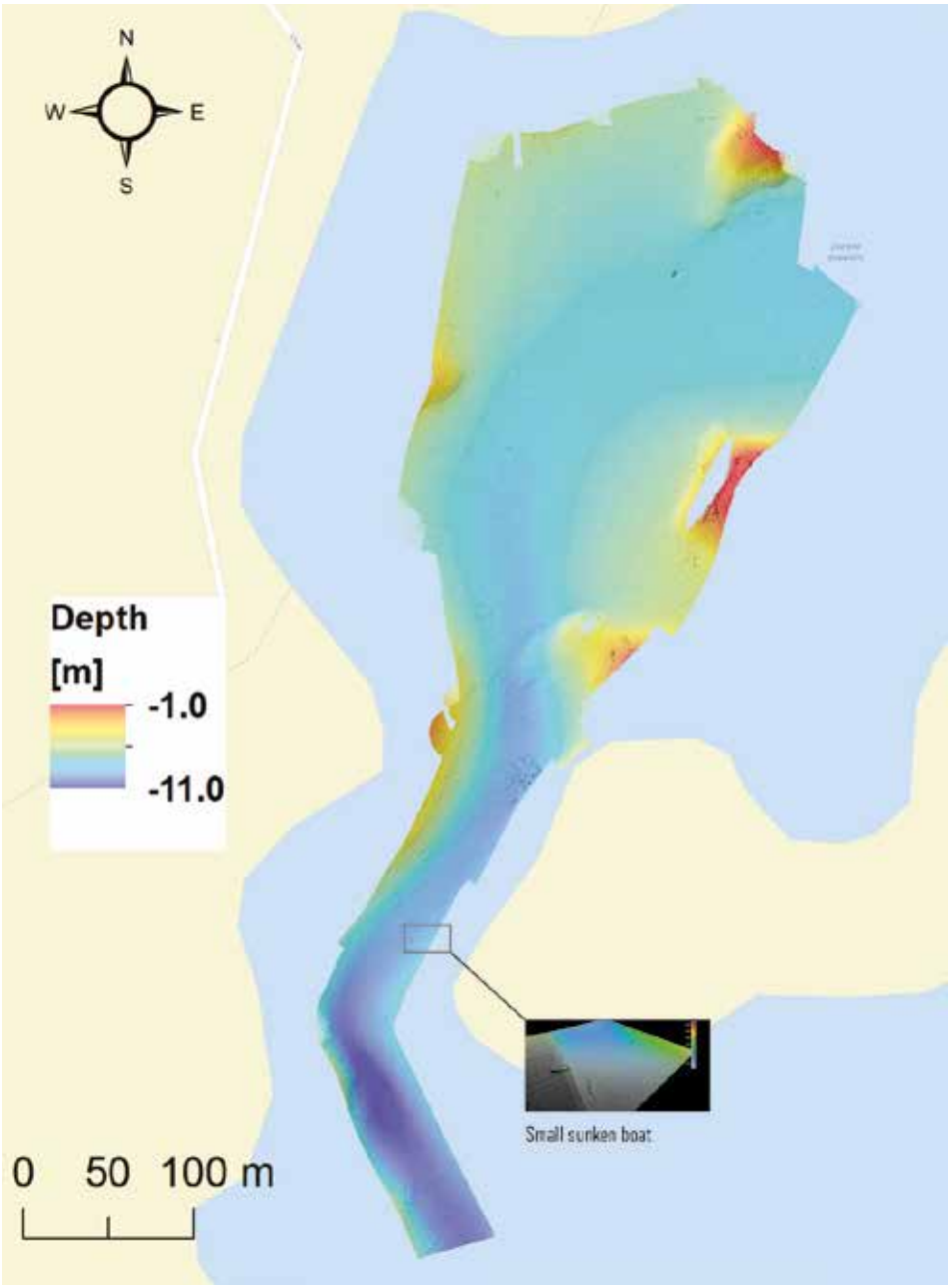
Autopilot in use, Surveyor observes Real time updates on the tablet.

The autonomous hydrographic system created by this collaboration has passed the exam and demonstrated its capability to operate with minimal assistance from a hydrographer on land. The operation was seamless, and the data quality obtained was excellent.

.We would like to thank the members of the historical and cultural association Tempelburg for their outstanding hospitality, open-mindedness for high-tech solutions in exploration and understanding of the specificity of field data collection.

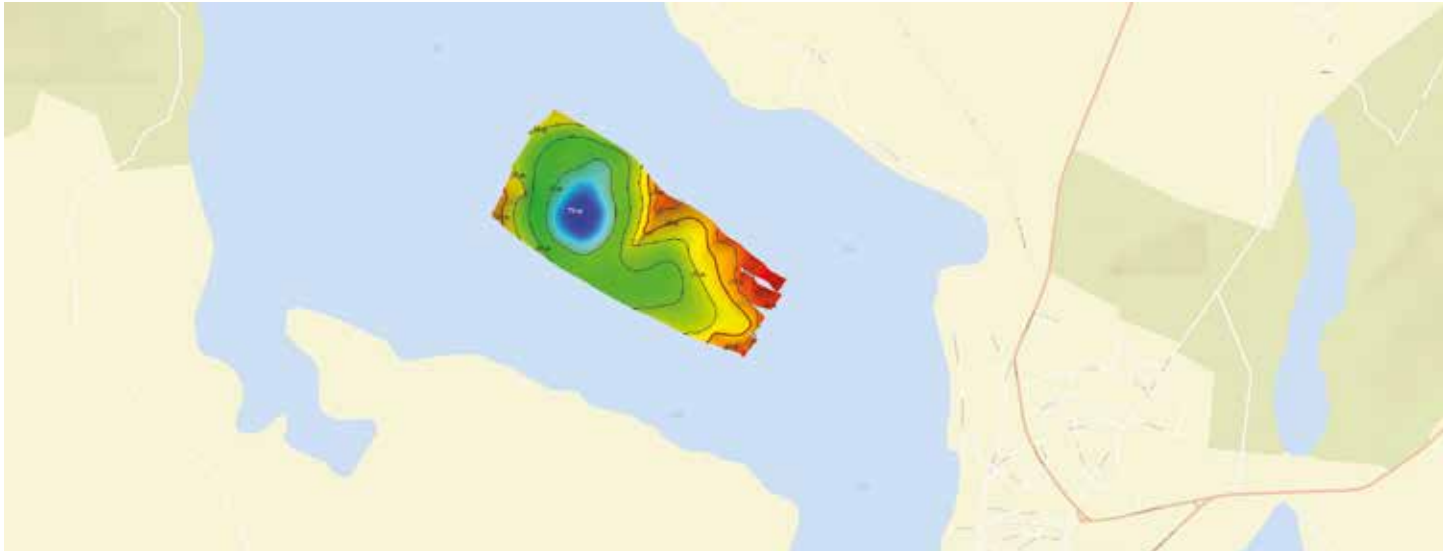
NORBIT

K2 sea
UNMANNED MARINE SOLUTIONS



Shallow Water Survey

Deeper Water Survey



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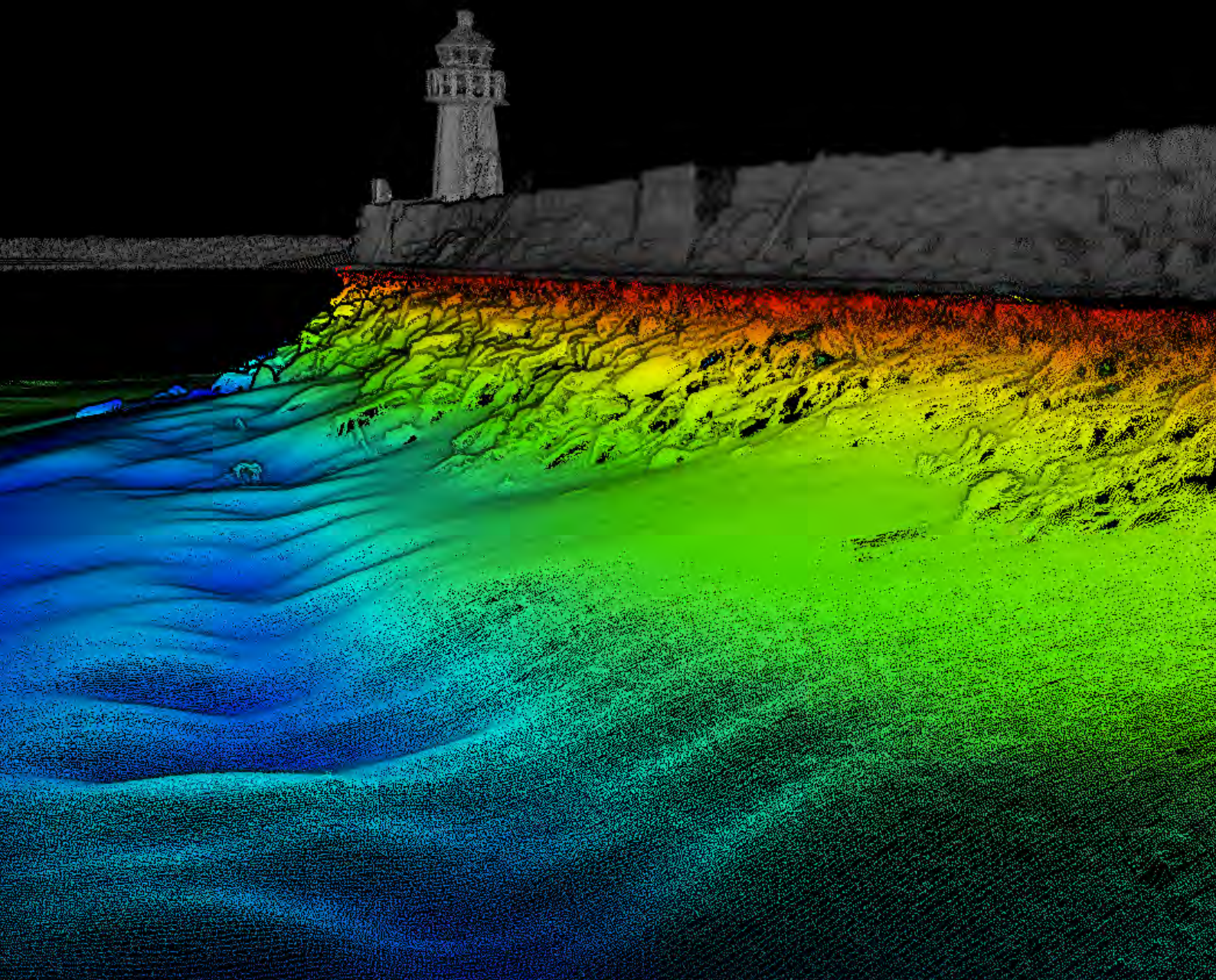

Ultra High-Resolution Multibeam Sonar

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20 YEARS
SEABED

Has it been 20 years already?

Seabed's 20th Anniversary! Almost unbelievable!! Quite a journey! Picking up in 2004 from what was left after a technical bankruptcy of Seabed Technology B.V. based in IJmuiden to end up with the whole crew celebrating Seabed's 20th in 2024! A journey where Seabed had to reconnect with their clients, withstand two global recessions and had to respond to a shift in communication with client and suppliers due to the rise and use of the internet.

During the first period Seabed transformed itself to a dedicated system integrator and product developer with an extensive product knowledge within the hydrographical and dredging market and other related areas. You might recognise or have been using some of our products: Seabed Crane System, the SVC500 Vibrocorer, the Orinoco Solo Tide Gauge, the DLS TP level system, the SGR line of GNSS receivers, the ILidar and the STM data interface.

At the basis of this success is off course the group of people that made it all possible. Without them the journey would not be as joyful, successful and colourful as we have been experiencing. Starting with a group of 4 dedicated specialists growing to a max of 22 people in 2009, we now hold a group of 10 specialist with the wish to expand with 2 engineers in the months to come. The diversity in the group of people that we work with makes Seabed what it is in the present, was in the past and I am convinced it will continue in the future.

In the second part of the 20-year Seabed's strategy of being a value-added partner for our clients and for the suppliers started to pay off. Our portfolio of dealerships and their products increased to an almost complete package we have now. To be of service in our market we also gradually building our rental pool to be more adaptive to clients' short term needs. And to top off with the yearly demo days being the centre point of new released equipment and information.

We would like to thank NORBIT, AML, HEMISPHERE, QPS, SYNERGETICS, OCEAN SONICS, SUB C IMAGING, SEA EYE, FSI, SEABER, BEAMWORX, HONEYWELL and SUBCONN for their constant trust, dedication and support in Seabed for being their motivated representative in the BENELUX. Last but not least we would like to show our gratitude to all of our clients in the world that have been and still are using equipment delivered by Seabed. So, everybody who reads this: "Thank you from the BOTTOM of our hearts!"

The new age of hydrographic survey

Demcon unmanned systems (DUS), a part of the DEMCON group, develops and produces high-tech electric uncrewed autonomous vessels (USVs) for inspection, monitoring, and maintenance applications in inland waters, coastal, and offshore environments.


S V2500

Since 2017, DUS has been developing, making and supplying various USV platforms. In 2017, DUS collaborated with the maritime contractor Van Oord to develop a reliable and autonomous alternative to traditional manned vessels powered by fossil fuels. Such as the DUS v2500 types, compact and robust 3-meter inspection platform that is a reliable and autonomous alternative to traditional manned vessels powered by fossil fuels. Multiple vessels have been successfully deployed globally. Helping maritime and surveying companies to reduce emissions, lower cost and increase efficiency in their project. Take, for example, Van Oord survey, which already works with 4 of these vessels in their daily operations.

In addition to the DUS v2500, the company has also developed a smaller type, the DUS v1375, for very shallow inland waters. And the new DUS v5750 class type USV platforms. This lager USV type is specifically developed for challenging offshore conditions and longer operations at sea. Making these USVs perfect for survey activities in near shore dredging operations and the construction and maintenance of offshore wind farms. By keeping all developments in-house, fully customized solutions are possible based on specific technical and functional customer requirements.

These autonomous vessels have proven to be highly effective for surveying activities that need to be performed remotely, efficiently, and cost-effectively. By minimizing the use of traditional manned vessels and the associated costs and environmental impact, DUS vessels are an excellent alternative for coastal and offshore inspections and monitoring.

The USVs use the company's own developed patented small dynamic positioning system. A fixed rim-driven thruster configuration enables full motion control in all directions without moving steering components such as rudders or rotating thruster pods, requiring less maintenance and lowering failure chances. The vessels can remain stationary at GPS coordinates for measurements or move sideways for water traffic safety. This innovative system won the Maritime Innovation Award in 2021.

The innovative and modular autonomous navigation system of these vessels allows for obstacle detection and collision avoidance, ensuring safe and reliable operations. Full electric propulsion makes these USVs quiet, environmentally friendly, and limit fluids on board. In combination with shallow draft and with their lightweight and compact design, DUS vessels can collect high-quality data without disturbing the local marine environment.

In addition to providing efficient and sustainable solutions, DUS vessels are also modular and customizable, making them ideal for various applications and system hardware and software updates over time. With the ability to adapt to specific requirements and changing environments, DUS vessels have become a high quality solution for marine inspection and monitoring activities.

More information about DUS autonomous unmanned vessels can be found on the website: **www.demcon.com/unmanned**

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Federico de Francesco - Mechanical Engineer,
Evert Bootsman - Senior Engineer,
Hans Tuinman - Director,
Middle row:
Anya Siemons - Financial Admin,
Elice Collewijn - General Manager,
Jaimy Grevelt - Junior Engineer,
Front row:
Suzanne Cranfield - Process Manager,
Bart Admiraal - Electronical Engineer,
Lying down:
Remy Pronk - Engineer

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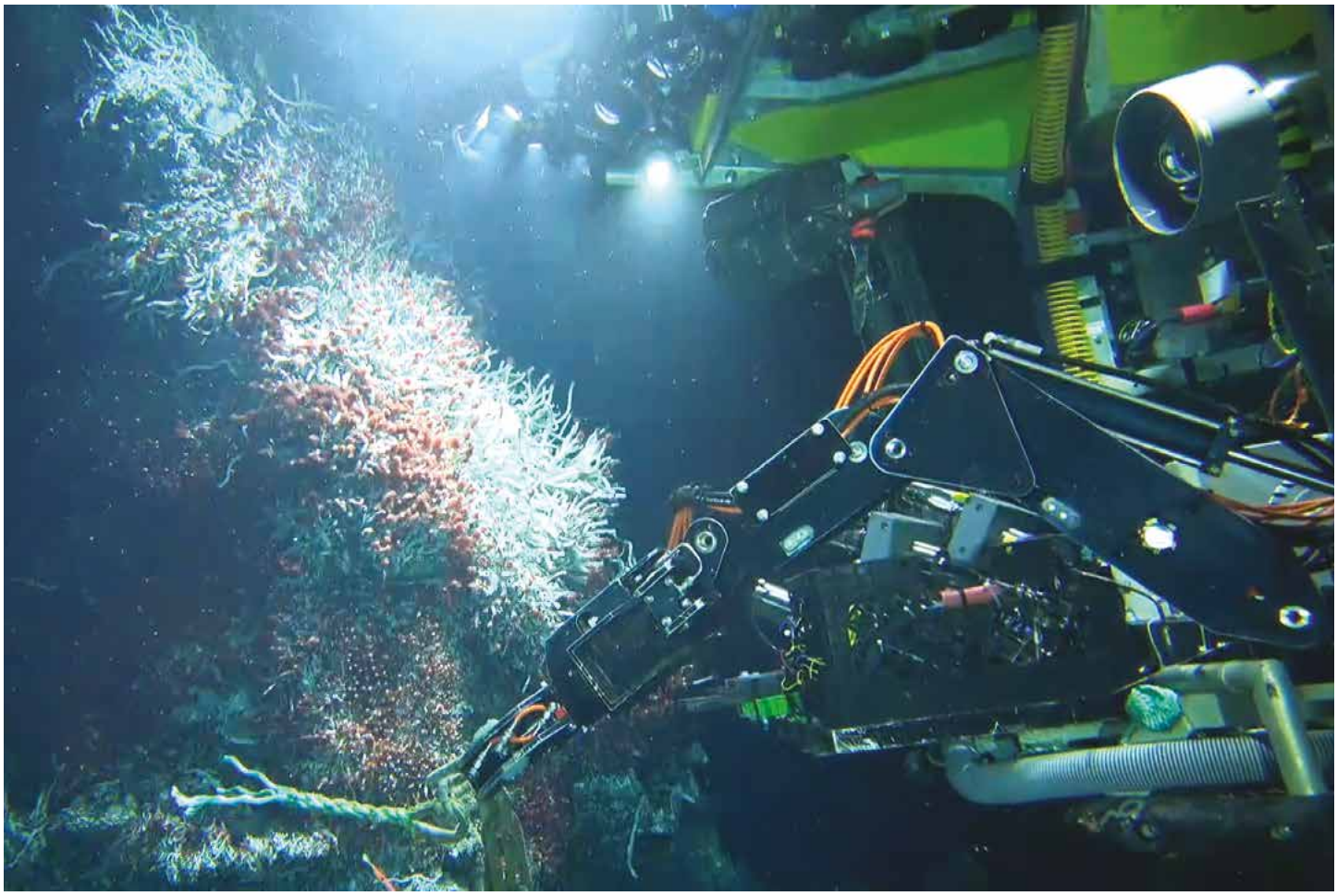
eabed Team

Unleashing the Power of Immediate Image and Data Access in Live Underwater Inspections



Live underwater inspections and surveys are a critical component of ensuring the integrity and functionality of offshore structures. However, the traditional methods employed in these inspections to access images and data often pose significant challenges, hindering the efficiency and effectiveness of the entire process. This article explores these challenges and introduces a groundbreaking solution - the Rayfin Single Channel Inspection system - or Rayfin SCI - designed to revolutionize underwater inspections through the power of real-time image and data access.

Current Image and Data Challenges With Underwater Inspections

Overreilance on Multiple Software Applications

One of the primary challenges in underwater inspections is the reliance on multiple software applications. This introduces a layer of complexity that operators grapple with on a daily basis. When relying on distinct software to control the camera and manage recording, a disjointed workflow emerges, often leading to confusion and redundancy. Navigating the intricacies of different interfaces demands a diverse skill set from operators, contributing to a steeper learning curve. The inherent lack of seamless integration between these software components not only hinders the overall user experience but also poses a potential bottleneck in the inspection process. The need to cobble together various software solutions, such as camera control software and a DVR, further exacerbates the issue, requiring operators to master disparate systems. This challenge underscores the industry's demand for a unified and streamlined approach to underwater inspections, where disparate software solutions no longer impede operational efficiency.

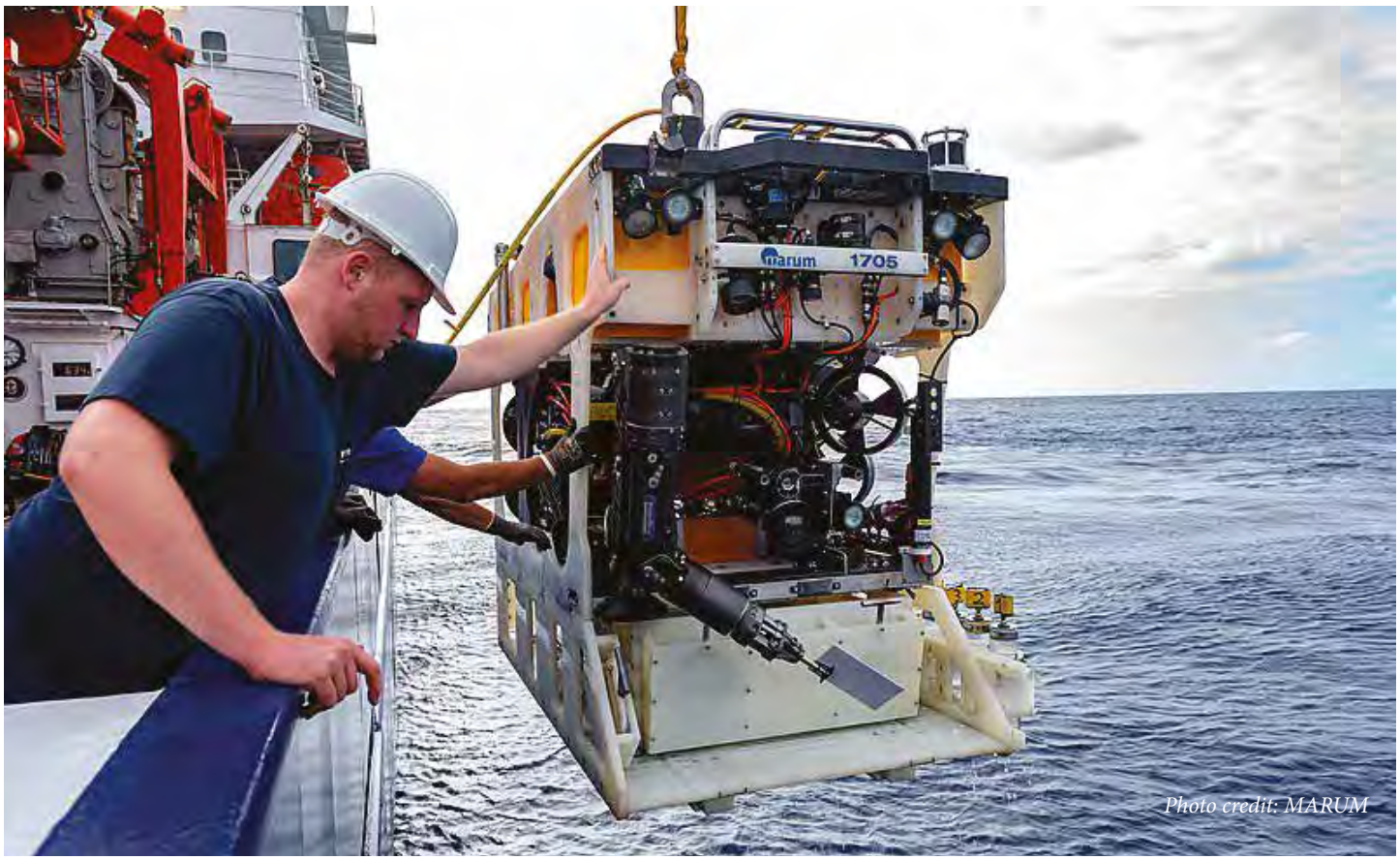


Photo credit: MARUM

Cumbersome Post-Mission Data Downloads

Another critical issue is the absence of live transfer for videos, images, and data. This issue introduces a new set of operational bottlenecks, primarily revolving around the cumbersome process of post-mission data downloads. Operators face a daunting challenge as they grapple with the laborious task of downloading media after each mission, a time-consuming endeavor that not only drains valuable resources but also hampers the efficiency of the entire workflow. For example, there could be the need to power on the inspection ROV for extended periods solely for data retrieval. This exacerbates the issue, contributing to increased operational costs. The absence of live data transfer not only impedes timely decision-making but also highlights the critical need for a solution that streamlines the downloading process, minimizing operational complexities.

Manual Data Matching Complexities

The manual matching and linking of videos, data, and stills post-inspection further compound the problem, introducing the risk of inaccuracies in data integration. The absence of a well-optimized media structure poses a formidable challenge in the realm of post-inspection data download and organization for offshore operations. Without a cohesive framework, operators are forced to grapple with the tedious and error-prone task of manually organizing data, images, and video after each inspection. This lack of structure not only prolongs the post-mission process but also introduces the risk of mismanaged data integration. The inefficiencies compound further when attempting to match and link videos, data, and stills together, demanding significant time and resources. Subsequently, this challenge not only jeopardizes the accuracy of data integration but also hinders the overall efficiency of offshore inspections.

Introducing Rayfin Single Channel Inspection: A Comprehensive Solution

SubC Imaging introduces the Rayfin SCI (Single Channel Inspection Suite), a state-of-the-art solution crafted to transform the landscape of underwater assessments. Rayfin SCI stands as a comprehensive end-to-end single-channel live inspection suite, seamlessly integrating software and hardware to empower operators with superior control and immediate access to crucial data during offshore inspections and occasional surveys.

Unified Interface for Seamless Offshore Control

At the core of Rayfin SCI is its groundbreaking single interface, consolidating control over the camera, lights, and laser, along with DVR and overlay capabilities. This unified approach eliminates the complexities associated with toggling between different systems, offering operators a streamlined workflow tailored for offshore inspections. Rayfin SCI not only simplifies the process but also eradicates the need for multiple software applications, directly addressing a key concern in offshore assessments.

Real-Time Topsides Data Transfer for Swift Analysis

Rayfin SCI introduces a revolutionary real-time topside media and data transfer, providing operators with immediate access to images, videos, and data without the hassle of prolonged ROV power-on periods. This feature significantly enhances efficiency, allowing operators to make timely decisions during offshore inspections. By eliminating the need for extensive downloading efforts, Rayfin SCI saves valuable time and resources, fostering a swift and informed analysis of inspection data.

Automated Organization for Efficient Offshore Operations

Rayfin SCI's automatic organization of data, images, and video in a customizable file structure stands as a key feature, streamlining post-inspection data handling in offshore settings. This innovative capability eliminates the need for manual sorting, reducing the risk of errors in data integration. With a tailored and organized file structure, Rayfin SCI ensures operators can effortlessly access and analyze inspection data, contributing to a more efficient and effective workflow for offshore inspections and occasional surveys.

Rayfin Rapid Digital Imaging and Advanced Control Features for Precision Inspections

Equipped with Rayfin Rapid Digital Imaging (RDI) technology, Rayfin SCI provides an adjustable capture rate of up to 2Hz, enhancing visibility in challenging offshore conditions. This feature ensures faster inspections with greater accuracy.

The system also includes fully integrated camera, LED, and laser control features, centralizing control over critical components of the inspection setup. Additionally, Rayfin SCI offers overlay and annotation capabilities on live and recorded video, providing operators with advanced documentation and analysis tools tailored for the demands of offshore operations.

Advanced Data Logging and Dynamic Overlay Capabilities

Another of Rayfin SCI's transformative capabilities is its automatic logging of all incoming data, incorporating precise date and time stamping, GPS coordinates, sensor details, and more. This feature ensures a comprehensive record of each inspection, enabling operators to analyze data with unparalleled accuracy. Furthermore, with embedded EXIF data within images, Rayfin SCI adds an extra layer of detail for thorough post-inspection analysis. Beyond documentation, Rayfin SCI revolutionizes inspection visuals with overlays and annotations on both live and recorded video, providing operators with powerful tools for enhanced communication and detailed analysis.

Rayfin SCI Components

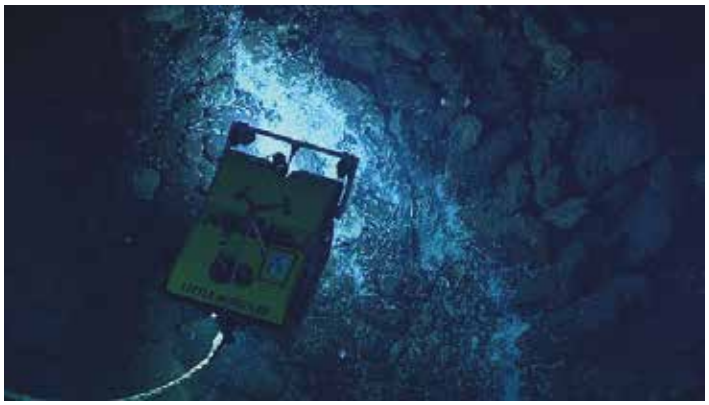


Photo credit: NOAA Okeanos Explorer Program

Additionally, the introduction of voiceover capabilities offers operators the flexibility to provide real-time insights and context during inspections. Together, these features empower operators to elevate their inspection capabilities, fostering precision, communication, and efficiency in every underwater operation

Crafting Solutions, Not Just Products

The Rayfin Single Channel Inspection system stands as a pioneering solution poised to redefine the landscape of underwater inspections. By addressing the inherent challenges in current methods, Rayfin SCI offers a unified and streamlined approach, consolidating control and providing real-time access to critical data.When speaking about this new SubC offering, Adam Rowe, VP and Software Lead says "Rayfin SCI is the result of our deep dive into the real issues our customers face with current camera and recording tech in inspections. We didn't just want to create a product; we wanted to solve problems. By listening to our users and doing the homework, we've crafted a solution that's not just cutting-edge but also user-friendly. Rayfin SCI is all about making underwater inspections smoother and simpler. We're excited about the impact it's making in the field, and we're just getting started!"

SubC Imaging

SubC Imaging

Instant Insights, Zero Wait Time

The Rayfin Single Channel Inspection system delivers

No delays. No downloads.

Just instant live topside viewing and data transfer.

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Evert's 10 year anniversary

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Hydrography – growing in importance

Safety for maritime traffic and harbours

International trade is booming, and shipping along with it. Given the ever growing quantity of shipments and the expansion of harbour locations, there is a corresponding increase in requirements for the secure maintenance of waterways and harbour basins.

In many of the world's largest harbours, appropriate hydrographic monitoring of suspensions accumulating as fluid mud, as well as sediments in the form of more or less consolidated silt, is a necessary requirement in order to keep dredging costs for maintaining a satisfactory nautical bottom[1] within commercially sensible limits.

Every year in Germany alone action taken to secure the prescribed water depth produces an accumulation of around 45 million cubic metres of dredged material, the disposal of which entails high financial and environmental costs. Accurately determining the nautical bottom allows for a considerable reduction in operating costs, since dredging work can be carried out more systematically and efficiently.

[1] The nautical bottom is defined as „the level where physical characteristics of the bottom reach a critical limit beyond which contact with a ship's keel causes either damage or unacceptable effects on controllability and manoeuvrability"
(Joint PIANC-IAPH Report on Approach Channels: A Guide for Design, Vol. 2, 1997)

admodus®

admodus® solutions for cost-effective waterway management

Echo-sounding is an internationally recognised technique for establishing the depth of a body of water. Dual frequency echo sounders such as the admodus®*SONAR* work with signals of differing frequency. Where there is a firm subsurface, both signals deliver identical readings for the depth of water, and in this case the readings correspond to the nautical bottom. However, if the results show greater variance this indicates the presence of sediment suspension: while the high frequency signal is dispersed at layers of low density, the low frequency signal penetrates through the suspended matter almost entirely, and is only reflected from deeper, more solid layers. Even though this technique succeeds in identifying accretions of low-viscosity suspended matter and fluid mud, it is not possible to determine the exact location of the nautical bottom. For this, an additional in situ analysis is required.

A method of analysis still frequently used, albeit one which is very time- and cost-intensive, is that of sampling combined with subsequent offline analysis in the laboratory.
An innovative and significantly more cost-effective option is the highly accurate online characterisation of suspensions and sediments achieved using the admodus®*USP pro* depth-profiling probe. The probe is lowered from the vessel, and can thus carry out real-time measurement of the density profile of the layers through which it penetrates, as well as record other parameters of rheological value. With the help of this profile, the nautical bottom can be established on the spot and with great accuracy[2].

[2] The nautical bottom can be defined as a boundary layer with a density of approximately 1.1–1.20 g/cm3.
„Determining the Nautical Bottom", Marcus Jansen

admodus®*USP pro*

Determining nautical depth in real time

The admodus®*USP pro* is an innovative in situ measuring probe for online monitoring of the nautical bottom in harbours and waterways. The system provides a depth-dependent density profile quickly and reliably, as well as a variety of other indicators for characterising suspended matter and sediments.

The probe is a robust and easy-to-use device made of seawater-resistant stainless steel. With its high inherent weight it can be used even in extreme flow conditions

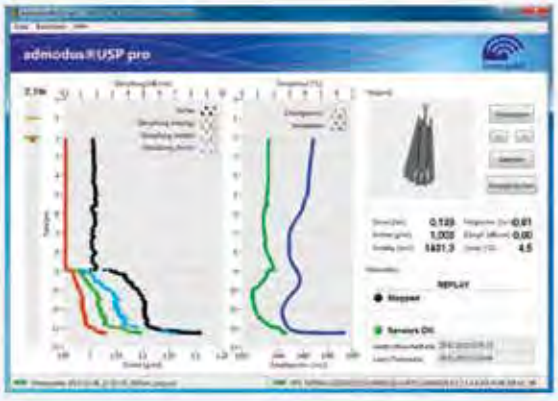
The admodus®*USP pro* is linked via high-speed Ethernet to a PC which displays all measurement data clearly laid out and in real time, stores them, and exports them as a PDF report as required. The user software features an automatic recording mode which permits serial measurements without interaction.

As the probe descends it continuously records its depth and inclination, as well as the density, frequency-dependent acoustic loss, speed of sound and temperature of the medium.

The measurement data ascertained can be stored together with the GPS data of an external receiver, so that the precise location of measuring points and a correlation with echo sounder bearings are both easily achieved.

The highly accurate point-by-point measurements achieved with the admodus®*USP pro*, combined with the area data capturing of the dual-frequency admodus®*SONAR* echo sounder, are one of the most accurate methods for hydrographic surveying currently available.

- Monitoring the navigability of harbours and waterways
- Supporting intelligent dredging management by technically efficient measurement
- Silt and sediment characterisation
- Analysis of fluid mud layers (e.g. in estuaries)
- Monitoring in sedimentation basins
- Investigation of sediment transport
- Online analysis in place of costly sampling



admodus®*SONAR*

Registering and recording sediment layers

The admodus®*SONAR* dual-frequency echo sounder is especially suited for hydrographic surveying of harbours, waterways and coastal water areas.

The admodus®*SONAR* can be operated as a self-contained echo sounder with a variety of different transducers. Furthermore, it can be used as a passive digital supplement to existing analogue echo sounders.

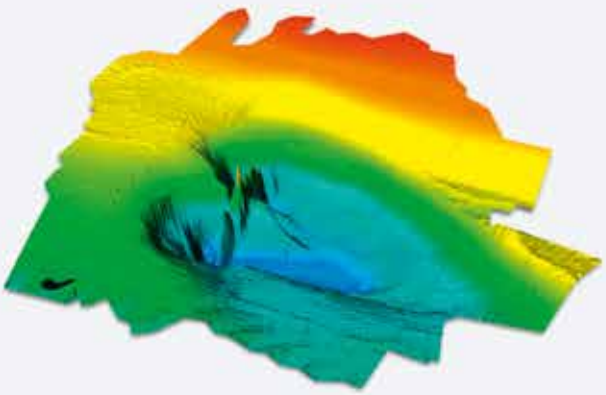
The single beam system with dual frequencies enables effective surveying of seafloor conditions, and of the different layer formations of suspended matter and sediments, ranging from fluid mud to well consolidated silt.

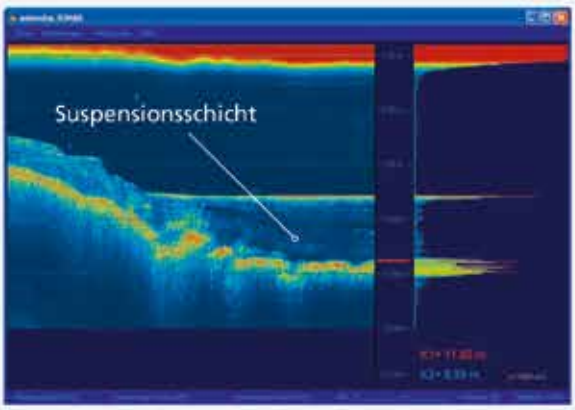
All data are transferred in real time to a computer via Ethernet, then visualised and stored. In addition, the admodus®*SONAR* user software provides an interface with widely available surveying software programs such as QINSy, WinProfile and Profile 2000, so that the horizons identified can also be externally recorded and further processed.

- Hydrographic surveying of harbours, waterways and coastal water areas
- Area monitoring of fluid mud and silt layers
- Supporting intelligent dredging management by technically efficient measurement
- Creation of digital terrain models
- Digitalisation of existing analogue echo-sounder systems

With its compact dimensions and the splash-proof design of its housing, the system is also highly suitable for mobile field work.

The area data capturing of the dual-frequency admodus®*SONAR* echo sounder, combined with the highly accurate point-by-point measurements achieved with the admodus®*USP pro*, is one of the most accurate methods currently available for hydrographic surveying.



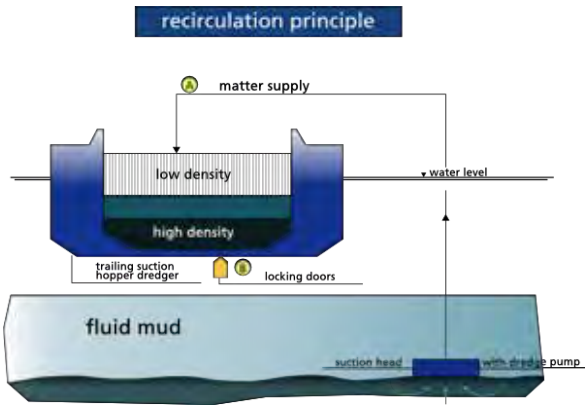


DENSITY matters...

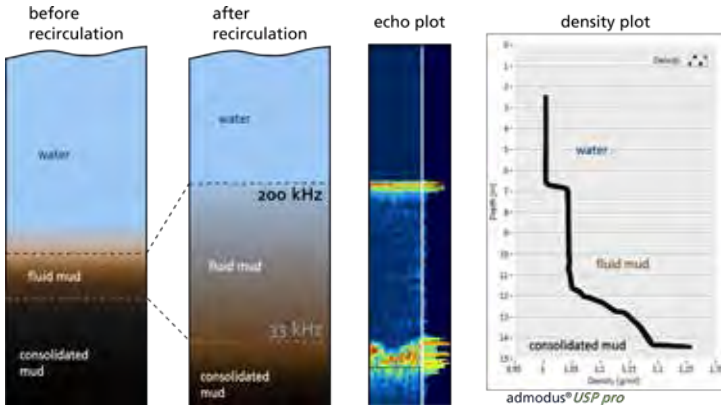
Port of Emden, Germany reducing dredging costs by 90%

In many of the world's largest harbours, appropriate hydrographic survey is a necessary requirement in order to keep dredging costs low. The port of Emden succeeded in reducing the dredging costs by 90% with the help of a new dredging management and hydrographic survey using the density probe **admodus®** *USP pro*.

In 1994, after many years of research, the port authority managed to maintain the fluidity of suspended sediments, which were carried into the harbour basin by the river Ems. This so called "sediment conditioning" is mainly based on the prevention of the fluid mud's reconsolidation process by a regular treatment (recirculation). As a result, these sediments no longer have to be **removed** from the harbour basin and a lot of disposal costs can be saved.



Recirculation principle



Fluid mud layer before and after recirculation.

The challenge:

How to monitor the density of this 'fluid mud' or measure the nautical depth in the harbour basin in a fast and reliable way, in order to guarantee navigability?

After 10 years of experience and development, **admodus® MARITIME DEVICES** released the new **admodus®** *USPpro* in 2013, with improved precision, ruggedness, better software and easier handling like the one-man-automatic-mode. The port of Emden was the first customer who purchased and still uses this device with great success.

Conclusion

A lot of maintenance costs can be saved by an intelligent dregding management. Investigations in recent years have shown, that ships can navigate safely through fluid mud layers up to a density of 1.15kg/dm³ at the port of Emden. This 1.15kg/dm³ horizon is often much deeper than the 200kHz horizon of an echo sounder. Thus, there is 'more water' under the keel with less dredging.

admodus®MARITIME DEVICES is a brand of Synergetik GmbH - Am Nusskopf 20 – 66578 Schiffweiler, Germany
Phone: +49 6821 40172-0 - Fax: +49 6821 40172-11 - E-mail: info@admodus.de

Meet...

Federico de Francesco
Mechanical Engineer

Date of birth?
Born on January 10th, 1985, in Rome, I enjoy spending my birthday preferably with my family, and then concluding the evening with my wife and my dear longtime friends. A casual dinner or some fun activities are more than enough; the important thing is to enjoy the time, good food, and pleasant company.

Single, in a relationship or married?
I'm married.

Any hobbies?
I'm passionate about food, particularly Italian cuisine and pizza. I enjoy cooking traditional recipes and experimenting with new dishes. When I have free time, I also dabble in 3D modeling. Additionally, I'm a fan of Formula 1 and MotoGP.

Fast food, bistro or Michelin starred restaurant?
I am someone with simple yet definite tastes. I find fast food convenient in certain situations, while the bistro offers a cuisine sometimes oriented towards experimentation and the future. Lastly, the Michelin-starred restaurant strives for perfection. I enjoy trying new things but am also deeply attached to traditional cuisine.

Netflix or the cinema? And what is your favourite TV-series or movie?
I love cinema, but the convenience of having a wide selection of different content right on your couch, honestly, is a great advantage. A couple of my favorite series are Breaking Bad and Sons of Anarchy.

What kind of job did you want growing up?
I think I'm doing exactly what I wanted. I love brainstorming, designing, and experimenting. I adore customizing everything. I began using technical drawing programs before I turned 10, starting with a simple line and progressing to complete projects after years of continual improvement.

What is it you like most about your current job?
The most important thing for me is the freedom to choose the type of system to modify or implement at a mechanical level. At Seabed, I found trust and carte blanche in how to manage projects, and all the challenges that arise every day are faced with a different spirit.

What do you learn from your colleagues?
It's nice to see how my team and I face successes and failures together, with a positive and improvement-oriented mindset. Through these experiences, we have all developed resilience and found new solutions. Learning from our mistakes is what makes us a great team with enormous potential.

If you would win the lottery, what would your life look like?
Wow, what an exciting adventure! Just imagine all the possibilities! Yes, I could start with some crazy purchases for a lot of fun and then calmly plan for the future. It's like being on the merry-go-round of life, ready to enjoy every ride!

Skilltrade Hydrographic **Survey Online Training**

Since 2001 Skilltrade has been sharing hydrographic knowledge and experience. We started with a two-day Introduction to Hydrography course and evolved into specific courses like Multibeam echosounder, DGPS, RTK, Side Scan Sonar, Sub-bottom Profiler and Tides. Hundreds of people have been trained on these short courses to date.

Since 2008 we also offer a **full Hydrographic Survey Category B curriculum** as defined by the FIG/IHO/ICA International Advisory Board on Standards of Competence for Hydrographic Surveyors (IBSC). All theoretical lessons are delivered in a practical combination of online instructor-led training and guided self-study on our e-learning platform. The exams are given online with the use of a platform for online proctoring. After successful completion of the exams, the students are welcomed in the Netherlands for 6 weeks workshops and completion of their Comprehensive Final Field Project, all in line with IBSC regulations. Subjects from our Cat B course can also be followed independently, like our short courses, to demonstrate an ongoing commitment to Continuing Professional Development (CPD), necessary to obtain or retain hydrographic certification.

Skilltrade offers various **short courses**, including our two day Introduction to Hydrography that we run several times a year. On request for a quotation these courses can be adjusted to specific training requirements and be given at any desired location (in-class or online).

E-learning modules: Underwater Acoustics, Bathymetric Systems, Land Surveying, Coordinate Reference Systems (Geodesy), GNSS operations and Positioning.

Handbook of **Offshore Surveying**

The series **Handbook of Offshore Surveying Volume I, II and III** is an encompassing series that is unmissable for the modern day hydrographer. This complete set of books should be on the desks of every hydrographic survey company and the professionals working for them, while it can be used as reference book for daily practice in offshore surveying in the fields of projects, preparation & processing, positioning & tides and acquisition sensors.

Please visit **www.skilltrade.nl/bookstore** for further information or to purchase them on-line.

Price: € 242,- per 3 volume set
(excluding shipping).

Interested?
Visit our website **www.skilltrade.nl**
or contact us at **office@skilltrade.nl**

SKILLTRADE

Skilltrade e-learning

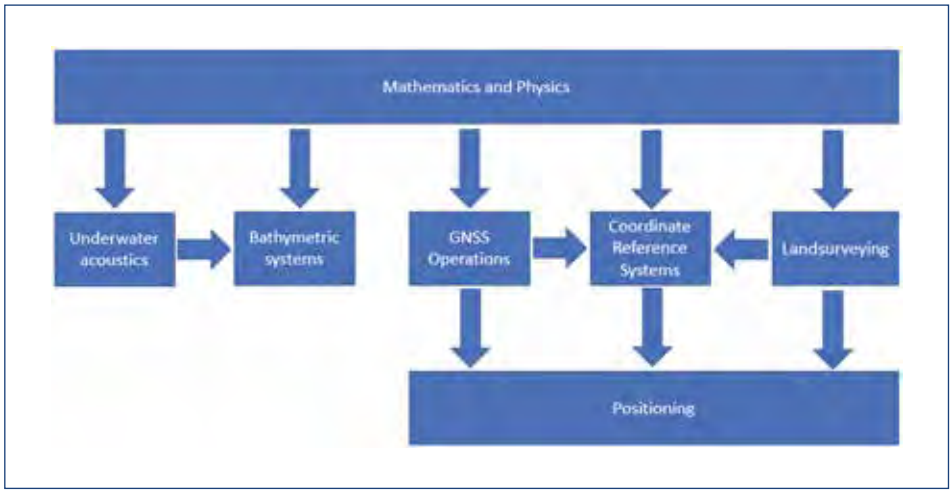
Skilltrade wanted to offer easier access to Hydrography Training and therefore developed several interactive on-line structured e-learning courses. These modules can be followed separately but are also part of the Hydrographic Survey Category B Course.

Skilltrade offers the following, hydrography and geodesy related E-learning:

- Underwater Acoustics
- Bathymetric systems
- Land Surveying
- Coordinate Reference Systems (Geodesy)
- GNSS Operations
- Positioning
- Mathematics self-test as a precursor to the Cat-B mathematics
- Physics self-test as precursor to the Cat-B physics

You can access the modules online through most browsers where the course adapts to the available type of device and screen lay-out where possible, but also offline through the Moodle Mobile app on your mobile device. Each module is accompanied by background material; which are from the Handbook of Offshore surveying.

The Mathematics and Physics modules are designed to test the students' knowledge of these subjects as required at the entry level for the Skilltrade Hydrographic Survey Category B Course. On the theory slides the student can also find links to specific modules from the worldwide renowned Khan Academy to enhance their knowledge. The other 6 modules are presented as a Power Point video with an overlay of spoken instructions. The study load is approximately 40-50 hours per module.



Level

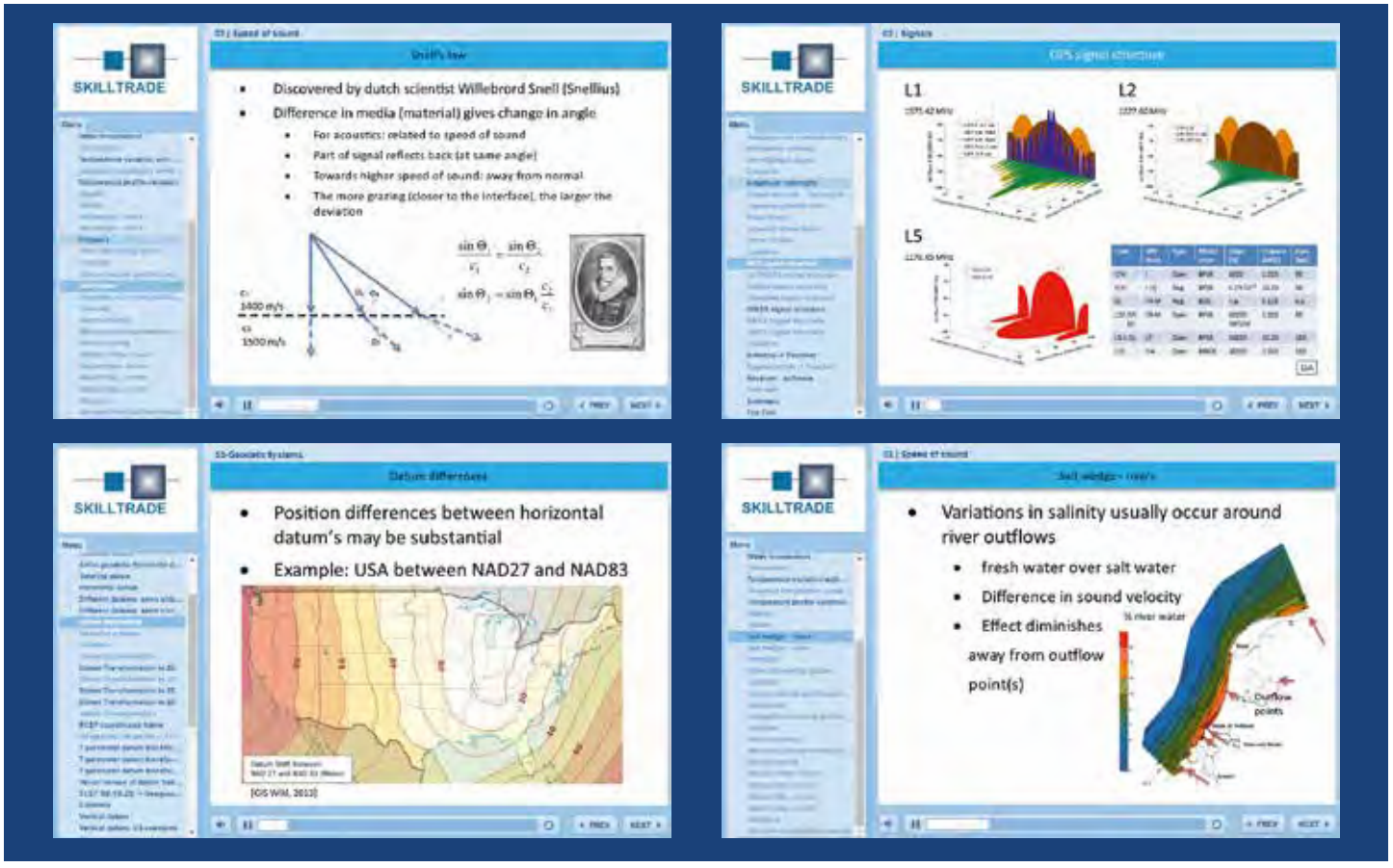
Mr Huibert-Jan Lekkerkerk, sr. lecturer and developer of the Skilltrade e-learning modules: "The theory that is presented in these e-learning modules is actually a little bit above Cat B level. As we include slightly more complicated computations that could have been part of a Cat A level course. We have done this to allow these modules also to be used for continuous professional development or to gain the required theoretical knowledge for a professional assessment scheme. The theory covers the subjects according to selected competencies from the Standards Of Competence For Hydrographic Surveyors S5(B). Here and there it is extended to include certain additional topics we found useful from a practical perspective. Each of these theoretical modules is accompanied by a self-assessment the student can do in his or her own time."

Advantages of e-learning

E-learning has boomed over recent years to become a very popular method of learning. This makes sense: E-learning is convenient and flexible. As long as the student owns a computer and has at least once an internet connection, it doesn't matter in which part of the world he or she is and what time it is or with our modules even whether the student has online access when they wish to study. The Skilltrade modules are also followed offline available through an app on a mobile device once downloaded initially with the exception of the assessment modules which required an internet connection to pass the results to the learning management system.

This way learning can be done on the train, on a plane or during downtimes at work. Whilst a student used to be confined to the classroom, the whole world, including any offshore survey vessel or remote dredging project, can now be their classroom. A student will be able to immediately apply the new knowledge on the job, he will be able to make connections and learn more effectively.

Another advantage is that the training is tailored to the student: If a student feels he or she already knows a particular area well and doesn't need to spend an hour on it again, then they can skim over it and concentrate that time on something they feel they need to work more at. This way everyone is able to learn at their own pace.



Interaction

A potential limitation of online learning is that it may feel like a solo act. The e-learning platform is not a one way road, Skilltrade has added interaction and made it more personal. The student can connect with the experts through e-mail. Huibert-Jan Lekkerkerk: "Not every student likes to do self-study alone. Sometimes they have questions which they cannot solve for themselves. To prevent that a student gets stuck in a module, we offer e-mail support. On a daily basis our teachers check the e-mail box and they try to answer the question a student has". The student can also connect with his or her fellow students from all over the world. Both the student and the trainer can monitor progress through the E-learning system. As each E-learning lecture is accompanied by an interactive assessment, after answering the questions the results is immediately available from the E-learning system.

Cat-B as blended learning

The Skilltrade Hydrographic Survey Category B Course was first recognized by the FIG/IHO/ICA International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC) in 2008. Since then Skilltrade has trained over 270 individuals from various countries around the world. In 2020 the pandemic forced Skilltrade to review how the course was delivered. With

approval from the IBSC Skilltrade included online instruction. After two years of positive experience with online teaching, Skilltrade has chosen to continue working according to this blended learning curriculum. All lessons that can be given on-line will be taught using digital formats and for a large part through the e-learning described before. The student not only studies through e-learning but also joins online instructor-led training. With the lectures rotating from a two week online to a two week e-learning schedule, the student is relatively free to study at his or her own pace. If a student was unable to attend a lecture, they can review the lecture afterwards. Any formal course requires exams. For the Category B Course, the exams will be given online with the use of a platform for online proctoring. Online proctoring allows students to sit their exams anywhere and without risk of fraud.

Hydrography is an applied discipline and supervised training should follow the theoretical portion of the Category B programme. Workshops, practical instruction and assignments are held in The Netherlands for a period of 6 weeks. A part of this practical period is the Comprehensive Final Field Project (CFFP). The student will perform the required tasks from the start to the end of a hydrographic survey project in a tightly controlled environment while being supervised and assessed. Students who pass the CFFP are awarded the FIG/IHO/ICA Certificate of Programme Completion.

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SEABED
END OF SUMMER DEMO DAYS 2024

After the succesful Demo Days last year, Seabed will again open it's doors on Wednesday 11th and Thursday 12th of September 2024. We will demonstrate the newest products of our partners and ourselves while serving up delicious food and drinks. Our beautiful location is the same as last year: Restaurant het Bosch at the Nieuwe Meer in the south of Amsterdam.

Looking Forward to see you! Please sign in via rsvp@seabed.nl

www.seabed.nl

Seabed Electric Vibrocoror (SVC) series

The SVC-series have a long track record and are successfully being used by our clients world wide on various types of soil including soils containing gravel. The Seabed vibrocorer has been designed to obtain cylindricalcores in soft, cohesive soils at a maximum water depth of 200 meters.

SEABED

Shark week in Alabama

Make them laugh

Puzzle

S	C	U	B	A	D	I	V	I	N	G	H
G	V	E	E	C	A	F	R	U	S	Y	R
M	T	I	T	D	O	I	N	N	D	G	E
M	A	T	B	M	E	A	O	R	P	T	T
A	H	E	E	R	E	B	O	E	O	R	A
R	M	D	B	C	O	G	A	B	R	O	W
I	R	O	O	I	R	C	T	E	T	S	R
T	A	T	O	A	T	R	O	M	S	N	E
I	L	O	P	F	I	L	O	R	T	E	D
M	A	H	F	I	S	H	U	C	E	S	N
E	I	L	E	S	S	E	V	M	K	R	U
C	G	N	I	N	O	I	T	I	S	O	P

ALARM
DEMO
FISH
HYDROGRAPHIC
MARITIME
MULTIBEAM
OCEAN
PORT
POSITIONING
ROCK
SCUBADIVING
SEABED
SENSOR
SURFACE
UNDERWATER
VESSEL
VIBROCORER

The object of the puzzle is to find the listed hidden words. The words may be hidden in any direction: horizontally, vertically, diagonally, forwards and backwards. The letters that remain make up a well know pay-off.

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Seabed Winch

The Seabed Winch is a fully automated Winch, useable for a wide number of applications. With its stainless-steel AISI 316 frame, the Winch can be placed on the rear of the vessel, on a buoy, or on a quayside, or any other location the Winch can be used to monitor the environment. And to make the Winch even more versatile deployable, the setup can be powered by a solar panel.

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Getting to the bottom of things