



Coda Octopus:3D
Real-Time Sonar Solutions

/Echoscope® Diver Survey Sled NANO

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The World's Most Advanced Real-Time 3D Sonars



The Echoscope® Diver Survey Sled NANO (EDSS NANO) is a new variant of our neutrally buoyant and highly maneuverable survey sled, which benefits from the reduced form factor of the Echoscope PIPE NANO Gen Series® sonar, and a completely re-designed tactical buoyancy set, making it easier than ever to handle underwater.

At the heart of the platform sits out cutting-edge real-time 3D imaging sonar, the Echoscope PIPE NANO Gen Series®, which generates high-resolution real-time 3D images of its environment. These are georeferenced using a customer-selectable subsea Inertial Navigation System, enabling it to produce accurate models and maps which are available to the user immediately. Its easily adjustable mounting plate allows it to switch from generating detailed imagery of ships' hulls to providing IHO-grade surveys of the seabed, making it a highly flexible multi-application package.



Just like the standard EDSS, the EDSS NANO has a built-in Diver Control Unit (DCU) which acts as an integrated computer with subsea display, allowing the diver to utilise our 4G USE® DAVD Flex software to acquire sonar and navigation data and display crisp, easily interpreted imagery of the 3D scene in real time.

Echoscope PIPE NANO Gen Series® is our AI-ready, ultra-compact family of real-time 3D volumetric imaging and perception sonars — purpose-built for the next generation of underwater vehicles, diver wearable systems, and robotic platforms. Equipped with AI-enabled perception and autonomy capabilities, it converts real-time 3D acoustic data into navigational awareness and intelligent system response. Its reduced form factor and minimal weight make it ideally suited for diver controlled deployments, delivering exceptional underwater spatial awareness and bulletproof performance in zero-visibility conditions. The result is greater operator confidence, enhanced mission effectiveness, and reliable performance in the most challenging subsea environments.



PROBLEM

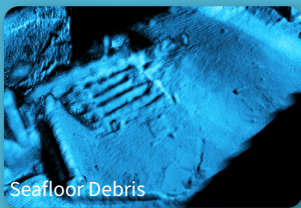
Underwater Salvage

Divers involved in salvage operations have to tackle complex, unstable and frequently changing environments, often with severely limited visibility. They face hazards such as entanglement, disorientation or entrapment, and work on target structures that are likely to be unsound and inherently dangerous. Even areas which have been surveyed or inspected before can present unknown challenges as seabed sediment or the target structure itself shifts over time.

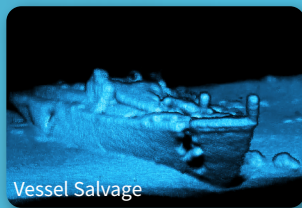
SOLUTION

/Echoscope® Diver Survey Sled NANO

The easily maneuverable EDSS NANO allows divers to approach a structure safely and build a 3D model of its current state in real time. It can be moved freely allowing structures to be viewed from all angles for complete scene awareness. Information is available in real time to the diver and also on the surface, allowing for rapid decision making and safe operations.



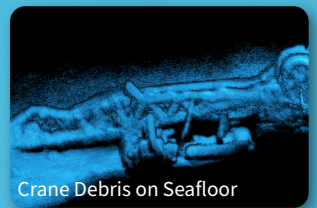
Seafloor Debris



Vessel Salvage



Francis Scott Key Bridge Salvage Operation



Crane Debris on Seafloor

PROBLEM

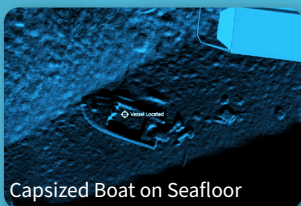
Search & Rescue

Law enforcement agencies around the world are often faced with the task of finding and recovering objects underwater in a wide range of circumstances, from criminal investigations to humanitarian disaster relief. Performing manual fingertip searching is time-consuming and both physically and mentally fatiguing; the logistics of tracking exactly where has been searched, and whether any areas were missed, presents an additional challenge.

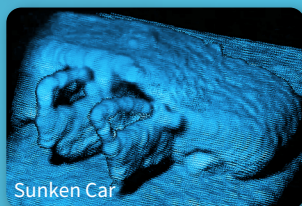
SOLUTION

/Echoscope® Diver Survey Sled NANO

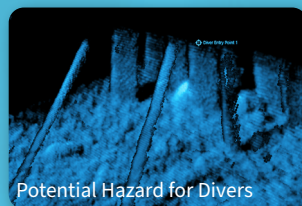
By combining accurate position and attitude navigation with the Echoscope PIPE NANO Gen Series® sonar imagery, the EDSS NANO allows a diver to produce accurate, detailed and reliable models of wide areas. Complete coverage is assured, and data can reviewed and processed in our 4G USE® software, allowing imagery, measurements and 3D point cloud data to be exported for reporting purposes.



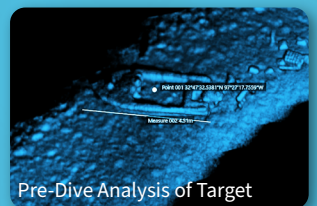
Capsized Boat on Seafloor



Sunken Car



Potential Hazard for Divers



Pre-Dive Analysis of Target

PROBLEM

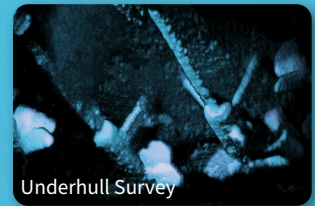
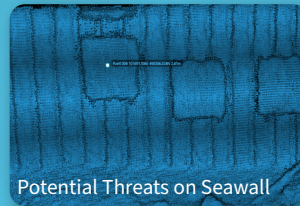
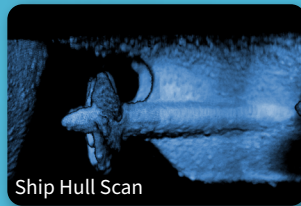
Ship Hull Scanning

Across the globe, port authorities and law enforcement agencies shoulder the vital task of detecting contraband hidden on mule vessels and uncovering parasitic packages attached to larger ships. In challenging underwater environments, where visibility is often murky or nonexistent, inspections typically rely on cameras followed by manual diver checks of the hull. This approach not only increases the risk of missed threats but also places divers in hazardous situations, requiring direct contact with potentially dangerous targets.

SOLUTION

/Echoscope® Diver Survey Sled NANO

The EDSS NANO is a compact and ergonomic, diver controlled solution that provides fully geo-referenced, high definition real-time 3D imagery allowing full environmental awareness in all water conditions, including zero visibility. This portable solution allows for quick deployment and accurate data collection in a variety of applications including underhull ship scanning to identify parasitic packages or potential threats.



All-in-One Solution

- Provides direct diver visualization of real-time 3D sonar data
- Integrated computer, display and software modules for subsea mission planning and scanning
- Built-in inertial navigation system with pressure sensor offering high-precision diver navigation and positioning



Echoscope PIPE NANO Gen Series®

- Excellent performance in capturing high-resolution real-time 3D data
- Extensive range of frequency and operating parameters to optimize ship hull scanning, seabed survey and structural inspections
- Can be used in tethered mode, with data available on the surface in real-time, or on battery for complete diver independence.



Neutrally Buoyant

- Integrated buoyancy makes the whole platform neutrally buoyant in water
- Long term use made effortless



Adjustable Angles

- Sonar mounting angle can be adjusted in increments to look upwards, forwards or downwards
- Allows fast and easy change from ship hull visualization to inspection or survey operations
- Quick-Release pins allow easy tilt angle adjustment - trouble free to perform underwater



Practical Handling

- Front handles allow easier scanning operation and uninterrupted access to the Diver Control Unit during a dive
- Tool-free attachments for buoyancy and components allow for fast deployment and packing
- Frame allows unit to be set down while protecting the sonar and INS system in harsh environments

Main Components



1. Platform Frame

The Platform Frame accommodates the Echoscope PIPE NANO Gen Series®, Navigation and Sensor Package, Diver Control Unit and Detachable Storage. Its integral sonar pivot allows for manual adjustments from forward looking to upward looking for ship hull scans with quick Echoscope® Mounting and Unmounting, and provides neutral buoyancy with an even list/trim.



2. /Echoscope PIPE

/// NANO Gen Series
Echoscope PIPE NANO Gen Series® is our AI-ready, ultra-compact family of real-time 3D volumetric imaging and perception sonars — purpose-built for the next generation of underwater vehicles, diver wearable systems, and robotic platforms. It converts real-time 3D acoustic data into navigational awareness and intelligent system response, delivering exceptional underwater spatial awareness and performance in zero-visibility conditions.



3. Diver Control Unit (DCU)

Housed in a waterproof metal housing, the Diver Control Unit facilitates diver interactions through the two banks of 4 buttons either side of the display. The DCU runs Microsoft Windows® 11 and Coda Octopus Custom Software to perform all surveying, data recording, navigation and sensor information, visualized through a 10.3” full-HUD resolution display, with waterproof connectors for power/ethernet, external storage, navigation, and sonar.



4. Detachable External Storage Drive

The detachable Storage Drive allows all data to be stored to a 1TB SSD, connected to the EDSS NANO through a waterproof USB-3 interface in the DCU. With clips and a thumb screw, the Detachable Storage Drive features a quick release, and includes a cable to allow the SSD to be plugged into a regular USB port on a PC for post-processing topside.



5. Navigation and Positioning Sensor

The EDSS NANO is designed to work with a Doppler Velocity Logger-aided Inertial Navigation System, which combines gyroscopes, accelerometers with pressure and acoustic data to provide accurate and reliable position and attitude information, which is merged with the 3D sonar data to create detailed, geo-referenced models.



6. Sled GPS

The Sled GPS is a waterproof, depth-rated GPS antenna fitted onto the Platform Frame, providing the INS with absolute drift-free position while at surface to seed position and enhance overall navigation accuracy.

Optional Components



1. DPPmax

The DPPmax is a high-performance, rugged computer system worn by the diver. It manages, acquires, and processes data from all diver-worn sensors, displaying the data on the Diver HUD. This includes digital audio, digital video, diver depth, full head tracking (and temperature), external sensors, and processed real-time 3D sonar data.



2. Diver Head-Up Display (GEN_4 HUD)

The HUD is used as a data display portal and is compatible with numerous helmets and face masks including those from Kirby Morgan, Interspiro, Draeger and OTS. The HUD is supplied in the visor and is removable. It is a completely waterproof and depth-rated Augmented Reality display system. (Patent Notice: US10877282)

DAVD Flex Integration

By integrating the high-performance, ruggedized DPPmax, operators can integrate DAVD *Flex* functionalities directly into their EDSS NANO configuration through a Head-Up Display integrated into the Diver's helmet or face mask.

The DAVD *Flex* integrates topside control, a Head-Up Display (HUD), and digital communications for divers, facilitating seamless real-time information exchange between divers and supervisors via augmented reality displays in the diver's helmet or mask. Supervisors use the Coda Octopus 4G USE® DAVD *Flex* Edition software to manage the HUD, displaying real-time 3D imagery and communicating with divers through images, videos, technical drawings, and messages. Divers access critical technical data and support from surface teams, optimizing mission outcomes with features like real-time depth, compass, head tracking, dive timers, alerts, positioning, navigation, and enhanced audio capabilities.

Traditional diver audio communications can be challenging in the best of conditions, but are the primary form of communication between the diver and the supervisor. DAVD *Flex* opens the gateway to a new era of digital diver communications with the surface, providing a number of critical features including auto-noise cancellation and background noise suppression. These functions provide clear audio communications even with background noise at either the diver or on the surface. Recorded speech, videos with audio tracks and automated computer speech instruction are output digitally from the DPPmax on the diver in crystal clear audio.



Echoscope® Diver Survey Sled NANO Technical Specifications

Overall

Dimensions (L x W x D)	548mm x 455mm x 328mm (21.57" x 17.91" x 12.91" in.)
Weight in Air	18kg (39.68lbs.)
Depth Rating	50m

Platform Frame (Including Foam)

Dimensions (L x W x D)	431mm x 367mm x 250mm (16.96" x 14.44" x 0.98" in.)
Depth Rating	50m

Diver Control Unit (DCU)

Dimensions (L x W x D)	460mm x 284mm x 78mm (18.11" x 11.18" x 3.07" in.)
Power Input	24 - 30V DC
Depth Rating	50m (164ft)
Pressure Rating	5 BARS
Display Size	256mm (10.1" in.)
Resolution	1920 x 1200
Brightness (cd/m ²)	320
Processor	11th Gen Intel® Core™ i7-1185G7E
RAM	32 GB
Operating System	Microsoft Windows® 11

Mains Power-in Cable (From Power Supply to DCU)

Connectors	Deutsch to SubConn® MCIL8F
Length	100m (330ft)

Sled GPS

Dimensions (L x W x D)	51mm x 51mm x 96mm (2" x 2" x 3.77" in.)
Power Input	5V DC

Echoscope® Diver Survey Sled NANO Technical Specifications (cont.)

/Echoscope PIPE <small>NANO Gen Series</small>	Dual Frequency	Triple Frequency
Acoustic Projectors	Mid-Frequency (500kHz) High-Frequency (840kHz)	XD Low-Frequency (375kHz) Mid-Frequency (500 kHz) High-Frequency (840kHz)
Adaptive Frequency Band	500kHz: 420kHz – 550kHz 630kHz: 550kHz – 700kHz	375kHz: 320kHz – 400kHz 500kHz: 420kHz – 550kHz 840kHz: 700kHz – 920kHz
Number of Beams (Density)	Up to 256 x 256	Up to 256 x 256
Number of Values Per Beam	5,500 (Dependent on Features Purchased)	5,500 (Dependent on Features Purchased)
Maximum Range*	60m (197ft) at 500 kHz 50m (164ft) at 840 kHz	120m (394 ft) at 375 kHz 60m (197ft) at 500 kHz 50m (164ft) at 840 kHz
Minimum Range*	0.5m (1.64ft)	0.5m (1.64ft)
Range Resolution	2cm (0.7")	2cm (0.7")
Update Rate (Ping Rate)	Up to 50Hz	Up to 50Hz
Imaging Field of View (User Selectable)	420kHz – 550kHz: 54°x54° – 46°x46° 700kHz – 920kHz: 33°x33° – 23°x23°	320kHz – 400kHz: 90°x45° – 45°x22° 420kHz – 550kHz: 54°x54° – 46°x46° 700kHz – 920kHz: 33°x33° – 23°x23°
Beam Density (Spacing)	420kHz – 550kHz: 0.21°x0.21° – 0.18°x0.18° 700kHz – 920kHz: 0.13°x0.13° – 0.09°x0.09°	320kHz – 400kHz: 0.35°x0.18° – 0.18°x0.09° 420kHz – 550kHz: 0.21°x0.21° – 0.18°x0.18° 700kHz – 920kHz: 0.13°x0.13° – 0.09°x0.09°

*The actual working range will depend on the target's size, reflectivity, and the level of detail required for the application

Physical

Dimensions (h x w x d)	218mm x 182mm x 149mm (8.6" x 7.2" x 5.9")
Weight in Air	4.8kg (10.6lbs)
Power Consumption	2 – 5 A at 24 V DC
Depth Rating	Rated up to 50m (164ft)

Echoscope® Diver Survey Sled NANO Technical Specifications (Optional)

DPPmax

Dimensions (L x W x D)	178mm x 114mm x 52mm approx. (7" x 4.48" x 2.04" in approx)
Weight	1.2kg (2.20lbs approx.)
Power	18 - 48V DC
Sensors	Pressure Sensor
Connectors	SubConn® MCoM6M (Power + Ethernet) Cobalt 10-Pin (DAVD I/O) SubConn® MCoM6F (Audio) Glenair® Aquamouse (DAVD-HUD-4)
Depth Rating	100m

GEN 4.0 HUD

Dimensions (L x W x D)	114mm x 60.5mm x 24mm (4.48" x 2.38" x 0.94" in)
Weight	0.105kg approx. (0.23lbs approx.)
Display	Dual Optical Engines, (R+L Eye)
Audio	1 x MIC, 2x Speakers
Power	5V DC
Interface	Custom HDMI/USB
Resolution	1080p (1920 x 1080)
Connectors	Glenair® Aquamouse 19-pin Marsh Marine 4-pin (for audio)
Depth Rating	100m

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