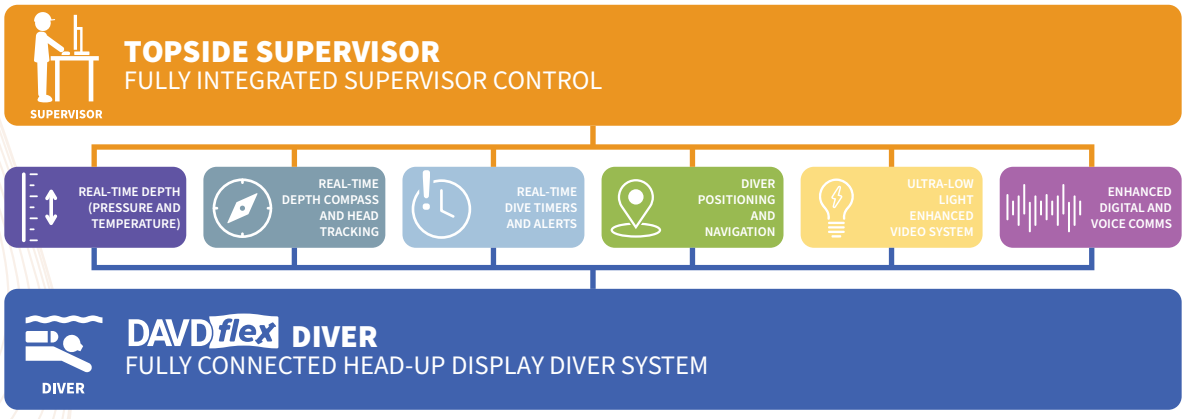
DAVD flex

Revolutionary Diver Management System

Delivering Real-Time Augmented Data and Communication to Divers through a Visor-Mounted Head-Up Display (HUD), Enhancing Safety and Mission Efficiency.

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 video and audio capabilities. The system supports both rapid deployment scenarios and detailed planning with annotated 3D maps, beneficial for salvage operations and other complex dives.



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Augmented Digital Diving Solutions

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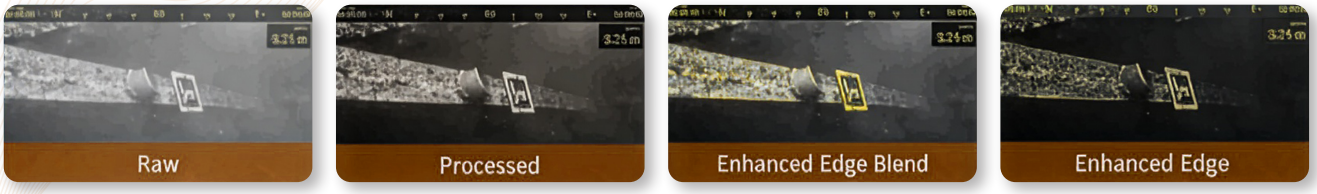
Real-Time Video Processing with Edge Enhancement

Traditionally, divers have carried video cameras to allow surface supervisors to monitor and assist with operations. However, the diver rarely benefits from this video data and often ends up functioning as a cameraman for the surface team, unable to see what the camera captures.

Underwater video recording poses significant challenges, especially in dark, sediment-filled waters where traditional illumination is ineffective. The DAVD Camera addresses these challenges with an ultra-low light HD camera module and optional illuminators, connected digitally to the DPPmax processor. The DAVD flex system transforms the traditional underwater video setup by providing the diver with high-resolution, low-latency video directly to their HUD, which is then broadcast to the dive supervisor and support staff.



Some of the innovative DAVD flex features available are:

Mixed Reality 3D Display with Real-Time Imagery in 1st or 3rd Person Perspective

DAVD flex supports numerous Hard Hat Helmets and Full-Face Masks, providing Mixed-Reality 3D Display using Live Sonar and 3D Models in a transparent High Definition HUD

Seamless Communication with Real-Time Images, Videos and Text Messages

Featuring Integrated Noise-Cancelling Digital Audio, Instant Voice and Text Communication with Automatic or Pre-Defined Messaging, and the ability to Transmit On-Demand Media to Divers, such as Images, Videos, Drawings and More to assist Live Operations

Comprehensive Diver Helmet/Full-Face Mask Compatibility

HUD Adjustable between 2D Augmented Reality, 2D Mixed Reality and 3D Mixed Reality with 1st and 3rd Person Perspectives

Integrated Camera, Navigation and IR Illumination Modules

Integrated 1st Person Ultra-Low Light Camera with Advanced Video Processing and Real-Time Edge Enhancement, with Diver Head Tracking for Accurate 3D Visualization and Compass, and an optional IR Illumination and Positioning Module

Instant Telemetry, Information Display and Mission Planning

On-Demand Telemetry: Dive Timers, Depth, Compass, Dive Computer Data, Waypoint Range and Bearing, with the ability to Create and Transfer step-by-step Mission Instructions with Text, Video and Image Support

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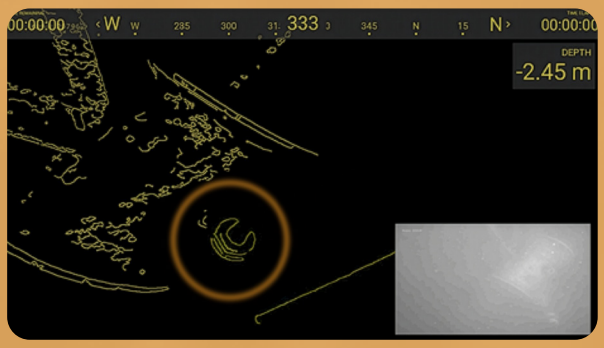
Highly Configurable Solution

The DAVD flex delivers unmatched configurability, adapting seamlessly to a range of Hard-Hat Helmets and Full-Face Masks. Built around the powerful DPP max, the system is designed to integrate the high-resolution embedded HUD-4 effortlessly with industry-leading options such as Kirby Morgan® Helmets, the Interspiro Diveator MKII, the Dräger Panorama Nova®, and the OTS Guardian. This modular design allows divers and teams to tailor their communication and display to their specific preferences—without sacrificing performance, reliability, or ease of use.

The Dive Supervisor can enhance the video by hand-annotating the scene to highlight items or objects of interest that may be difficult for the diver to see. For reference, the raw video image is displayed inset without any additional processing or enhancement.



Real-Time Digital Audio

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.

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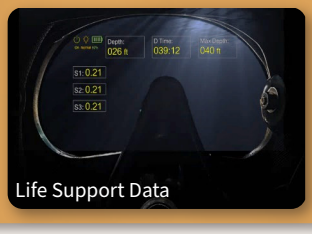
PROBLEM
Diving Challenges

Diving is regularly conducted in low to zero visibility environments in which standard visual displays, cameras and gauges are virtually useless. Even where visibility is only partially limited, situational awareness, navigation and topside communication can be problematic and very limited. The tasks the diver is expected to perform are technical in nature and often in complex hostile locations. This requires prior detailed information and instruction. Divers, depending on the water depth, have limited time on the seafloor to perform this tasks – this could be as little as 20 minutes.

SOLUTION
DAVD flex

The DAVD Flex System radically transforms the dive mask into an immersive display capable of providing everything from life support data, to live high resolution 3D Sonar Data (Echoscope®) to advanced navigation displays to 3D Augmented Reality Displays


Information


Life Support Data


3D Augmented Navigation


Project Scene Data

DAVD flex addresses critical diving challenges and uniquely places the diver in full control of his personal augmented reality display. Five core feature areas are provided effortlessly, allowing users to adapt to all levels of detail and complexity.

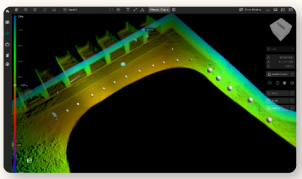
Location
Real-Time diver compass, depth and location, and navigation to dive stage, work site and identified waypoints and hazards.

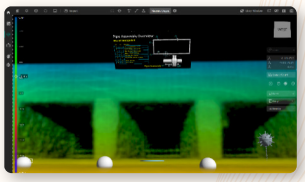
Visibility
Enhance the diver experience with real-time video, 3D sonar and augmented reality scene awareness

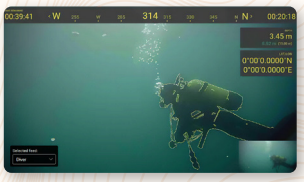
Communication
Communicate with rapid text messaging, detailed instructions and procedures, simple guidence and digital speech and audio.

Safety
Diver life support, navigation and dive timer data synchronized with supervisor in real-time to ensure safe diver monitoring.

Data
Diver and Supervisor can share and access all project data and information on-demand in real-time.







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Main Components

Diver Processing Pack (DPPmax_2)
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.

DiveVisionTracker (DVT_3)
The DiveVisionTracker is a module combining an Ultra-Low-Light Camera and AHRS unit. The unit can be used to capture real-time and high-definition video from the diver's perspective. The AHRS unit provides a Diver Heading measurement for real-time display within the HUD.

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, Dräger 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)

Single Diver PSU (SD_PSU_1)
The Single Diver PSU facilitates all power and data communications between the diver-worn DPPmax and the topside DAVD laptop. It offers AC and DC power protection, ensuring safe power handling as well as a reliable data link for video, digital audio, and 3D sonar data. For scenarios that require up to 3 divers, there is a Multi-Diver PSU Version available.

DAVD Lightweight Umbilical Cable (CA0000832)
The DAVD umbilical cable serves as a single tether, supplying low voltage DC power (<24V DC) to the diver-worn DPPmax and facilitating an Ethernet data link between the diver and the supervisor topside.

4G USE® DAVD flex Edition Software
The software enables the supervisor to manage all information displayed to the diver, including real-time 3D imagery of the diver's environment in 1st or 3rd person perspective, regardless of water visibility conditions.

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The Head-Up Display (HUD) Unit is widely compatible and supports a range of helmets and full-face masks, including:

Helmets
Kirby Morgan® SL17K
Kirby Morgan® SL27
Kirby Morgan® KM37
Kirby Morgan® KM37SS
Kirby Morgan® KM47
Kirby Morgan® KM57
Kirby Morgan® KM77SS
Kirby Morgan® KM97SS
Kirby Morgan® Diamond®

Full Face Masks
Dräger Panorama Nova®
Interspiro Divator MKII
Ocean Technology Systems Guardian
Diveways FFM
Kirby Morgan® MOD-48
Kirby Morgan® KM Bandmask®

*Please note that helmets and masks are not supplied with the DAVD Flex. Installation Guides are provided for installation of the HUD into your existing equipment. We continue to expand the range of compatible dive equipment, so please contact us if your preferred equipment is not shown on the list.


Kirby Morgan® KM97


Kirby Morgan® KM37 Superlite


Dräger Panorama Nova®


Interspiro Divator MKII


OTS Guardian


Diveways FFM

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Configuration Shipping Case	
Dimensions (h x w x d)	114mm x 60.6 mm x 24 mm approx. (4.48" x 2.38" x 0.94" approx.)
GEN_4 HUD	
Dimensions (h x w x d)	114mm x 60.6 mm x 24 mm approx. (4.48" x 2.38" x 0.94" approx.)
Weight	0.105 kg approx. (0.23 lbs approx.)
Display	Dual Optical Engines (R + L Eye)
Audio	1x Mic, 2x Speakers
Power	5 V DC
Interface	Custom HDMI/USB
Resolution	1080p (1920 x 1080)
Connectors	Glenair® Aquamouse 19-pin Marsh Marine 4-pin (For Audio)
Depth Rating	100 m
DPPmax	
Dimensions (h x w x d)	178mm x 114mm x 52mm approx. (7.00 x 4.48 x 2.04 in approx)
Weight	1.2kg (2.20 lbs approx.)
Power	18 - 48V
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

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DiveVisionTracker	
Dimensions (h x w x d)	50 mm x 50 mm x 94 mm (1.97" x 1.97" x 3.7")
Weight	0.194 kg approx. (0.42 lbs approx.)
Camera	Ultra Low Light 2 MP
Power	5 V DC, 2 W
Monitor Sensors	AHRS 1° Heading, 0.2° Roll / Pitch
Connector	Cobalt Series Bulkhead Connector
Depth Rating	100 m
Single Diver PSU	
Dimensions (h x w x d)	270 mm x 246 mm x 174 mm approx. (10.62" x 9.68" x 6.85" approx.)
Weight	3.5 kg approx. (7.71 lbs approx.)
Power Input	110-250 V AC 10 A
DAVD Flex Interface	Ethernet / Power (to Lightweight Umbilical Cable)
Connectors	1x IEC Male (AC Input) SubConn® MCIL6F (to Lightweight Umbilical Cable)
Ethernet Connectors	2x RJ45 Ethernet (Laptop and 3D Sonar)
Lightweight Umbilical Cable (CA0000832)	
Dimensions (h x w x d)	345 mm x 225 mm x 375 mm approx. 10.62" x 9.68" x 6.85" approx.
Weight	16.5 kg approx. (36.37 lbs approx.)
Cable Length	100 m
Connections	Ethernet, 24 V DC Power
Connectors	MCIL6M/E (from Single Diver PSU) MCIL6F/E (to DPPmax)
Depth Rating	100m

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4G USE® DAVD Flex Edition PC Requirements	
Processor	Intel i7 or AMD Ryzen 7 Processor
Graphics Card	nVidia GeoForce RTX4070 or Better
Computer Memory (RAM)	16GB RAM
Storage Requirements	500 GB (100 mb for Installation)
Screen Resolution	1920 x 1080p
Ports	Ethernet Adaptor USB Ports for Peripherals
Operating System	Windows® 11

	Depth Rating	Pressure Rating
DAVD System	100 m (328 ft)	10 Bar
GEN_4 HUD	100 m (328 ft)	10 Bar
DPPmax	100 m (328 ft)	10 Bar
DiveVisionTracker	100 m (328 ft)	10 Bar

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