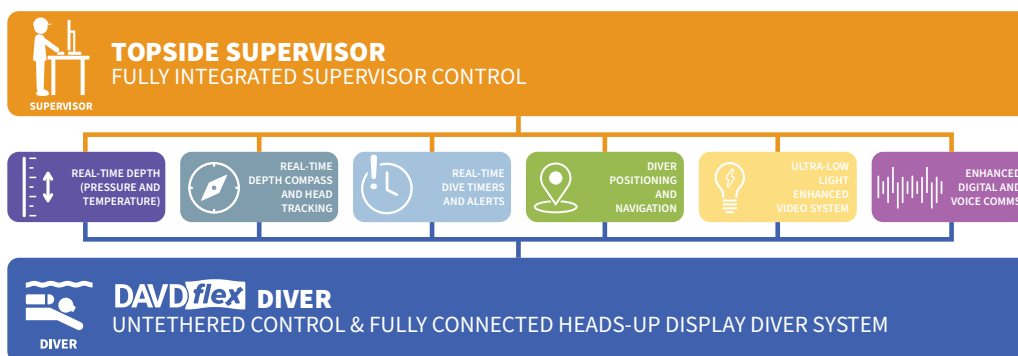


Revolutionary Diver Management System

DAVDflex



The **DAVDflex** 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. Supervisors use the Coda Octopus 4G USE® **DAVDflex** 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.



DAVDflex Features

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

- Transparent High-Definition HUD
- Mixed-Reality 3D Display using Live Sonar and 3D Models
- Supports various Kirby Morgan Hard-Hat Helmets & Full-Face masks including the Interspiro Diveator MKII, OTS Guardian, Dräger Panorama Nova® and Diveways PR Full-Face Mask.

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

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

- Integrated Noise-Cancelling Digital Audio
- Instant Voice and Text Communication with Automatic or Pre-Defined Messaging
- Transmit On-Demand Media to Diver: Images, Videos, Drawing and More to assist in Live Operations

Integrated Camera, Navigation and IR-Illumination Modules

- Integrated 1st Person Low-Light Camera with Advanced Video Processing, Real-Time Edge Enhancement and Built-in Navigation
- Diver Head Tracking for Accurate 3D Visualization and Positioning Support

Instant Telemetry, Information Display and Mission Planning

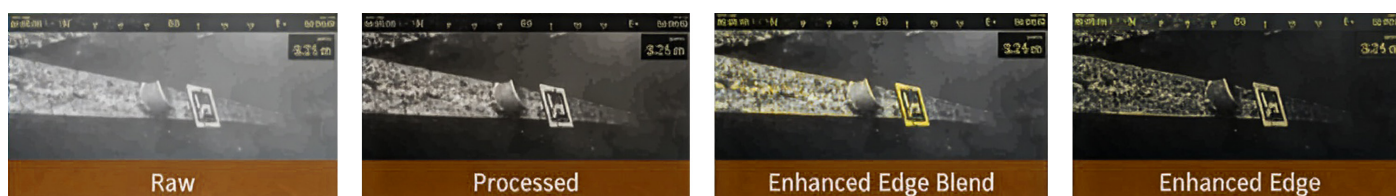
- On-Demand Telemetry: Dive Timers, Depth, Compass, Live Position, Dive Computer Data, Waypoint Range and Bearing
- Create and Transfer step-by-step Mission Instructions with Text, Video and Image Support

Highlighted Features

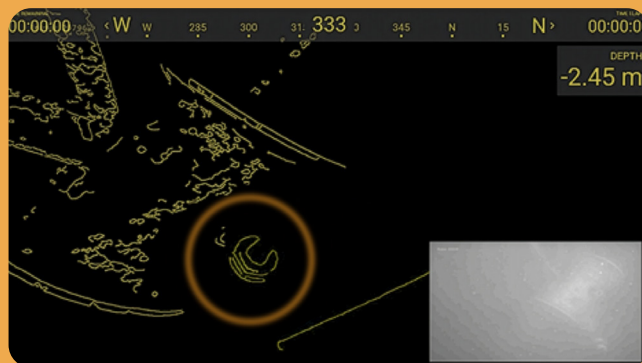
Real-Time Video Processing with Edge Enhancement

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 DPP max 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.



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 and is the only and 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 DPP max on the diver in crystal clear audio.



Why DAVDflex Revolutionizes Diving?

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 in somewhat visible environments, 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

DAVDflex

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



Benefits

The **DAVDflex** addresses critical diving challenges and uniquely places the diver in full control of his personal augmented reality display. Five core features 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 Guidance and Digital Speech and Audio



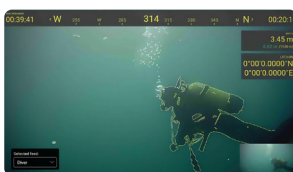
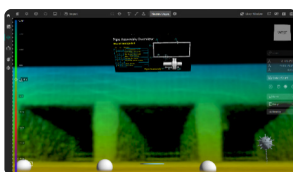
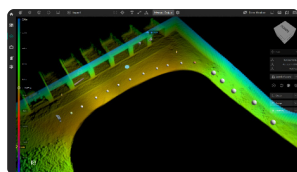
Safety

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.



Main Components



1. Diver Processing Pack Max (DPP max)

- The DPP max is a high-performance, rugged computer system worn by the diver. It manages, acquires, and processes 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. Module of Camera and AHRS (DiveVisionTracker)

- The DiveVisionTracker is a unit combining a 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.



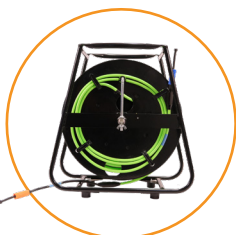
3. Diver Heads-Up Display (HUD)

- The HUD is used as a data display portal and is compatible with several helmets and face masks including Interspiro, Draeger and OTS Guardian. The HUD is supplied in the visor and is removable. It is a completely waterproof and depth-rated Augmented Reality display system that employs waveguide optics. (Patent Notice: US10877282)



4. Single Diver Power Supply Unit (SD_PSU_1)

- The Control Panel facilitates all power and data communications between the diver-worn DPP max and the topside DAVD laptop. It offers AC and DC power protection, ensuring 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.



5. DAVD Umbilical Cable (CA0000480)

- The DAVD umbilical cable serves as a single tether, supplying low voltage DC power (<24V DC) to the diver-worn DPP max and facilitating a full 100Mb Ethernet data link between the diver and the supervisor topside.



6. 4G USE® DAVDflex 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.

Compatible Diver Accessories

The Heads-Up Display (HUD) Unit is widely compatible and supports a range of different Full-Face Masks, including:



Interspiro Divator MKII



**Drager Panorama
Nova® Dive**



OTS Guardian



Diveways PR



SL17K



SL27



KM37



KM37ss



KM47



KM57



KM77ss



KM97ss



Diamond®



KM BandMask®

The Head-Up Display (HUD) unit is compatible with the following dive equipment:

Helmets

Kirby Morgan®	Diamond®, SuperLite®17, KM37, KM37ss, KM97
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Full-Face Masks

Diveways	FFM
Drager	Panorama Nova® Dive
Interspiro	Divator MKII
Kirby Morgan®	BandMask®
Ocean Technology Systems	Guardian

*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® Diamond® Helmet
equipped with DAVID HUD-4

Technical Specifications

SD_PSU_1

Dimensions (h x w x d)	270mm x 246mm x 174mm approx. (10.62 x 9.68 x 6.85 in approx.)
Weight	3.5kg approx. (7.71 lbs approx.)
Power Input	110-240Vac, 10A
DAVD FLEX Interface	Ethernet / Power (to DAVD-UMB-3)
Connectors	1 x IEC Male (AC Input) SubConn® MCIL6F (to DAVD-UMB-3)
Ethernet Connectors	2 x RJ45 Ethernet (Laptop and 3D Sonar)

GEN 4.0 HUD Assembly (HUD and CA0000504 Assembly)

Dimensions (h x w x d)	114 x 60.5 x 24 mm approx. (4.48 x 2.38 x 0.94 in approx.)
Weight	0.105 kg approx. (0.23 lbs 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

DAVD-DPP max

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), Glenair® Aquamouse (DVT-2) SubConn® MCOM6F (Audio) Glenair® Aquamouse (DAVD-HUD-4)
Depth Rating	100m

Module of Camera and AHRS (DiveVisionTracker)

Dimensions (h x w x d)	50 x 50 x 94mm (1.97 x 1.97 x 3.7 in)
Weight	0.194kg Approx (0.42 lbs Approx)
Camera	Ultra Low Light 2 MP
Power	5V DC, 2W
Monitor Sensors	AHRS 1° Heading, 0.2° Roll / Pitch
Connector	Cobalt Series Bulkhead Connector
Depth Rating	100m
Part Number	DVT-2

DAVD-REEL (300ft Umbilical on Open Frame Reel)	
Dimensions (h x w x d)	270mm x 246mm x 174mm approx. (10.62 x 9.68 x 6.85 in approx.)
Weight	22.28kg Approx. (49.12 lbs Approx.)
Cable Length	100m
Connections	Ethernet, 24V DC Power
Connectors	SubConn® MCIL6M (from SD_PSU_1) SubConn® MCIL6F (to DAVD-DPP max)
Depth Rating	100m
DAVDflex Composition Shipping Case	
Dimensions (h x w x d)	524 x 428 x 206 mm Approx (20.62 x 16.85 x 8.11 in approx.)

Depth and Pressure Ratings

The **DAVDflex** is qualified for operation at 328ft/100m and 10 bars. Each system component and their respective qualified depths and pressure of operation are listed below:

	Depth Rating	Pressure Rating
DAVD System	100m / 328ft	10 Bar
HUD-4 Glasses	100m / 328ft	10 Bar
DPP max	100m / 328ft	10 Bar
DiveVisionTracker	100m / 328ft	10 Bar

Certifications

The DAVD is an Approved Navy Use Item and is included on the US ANU List.
DAVD Nato Stock Number 5895-99-367-2331.
CE Marking Compliant