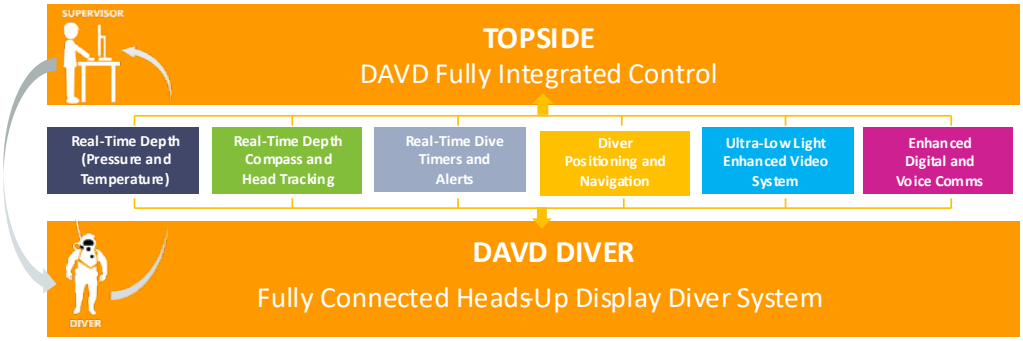
Coda Octopus:DIVE
Augmented Digital Diving Solutions

/DAVD CE Gen 4.0

Revolutionary Diver Management System

Diver Augmented Vision Display (DAVD)

The Diver Augmented Vision Display (DAVD) 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® DAVD 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.



DAVD 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.
- HUD adjustable between 2D and 3D modes with 1st and 3rd person perspectives.

Comprehensive Diver Helmet/Full-face Mask Compatibility

- Supports various diver helmets and full-face masks: Kirby Morgan KM37, KM37SS, KM97, SL17, Interspiro Divator MK II, OTS Guardian, and Dräger Panorama Nova Dive.

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, drawings and more to assist in live operations.

Head tracking and Low-light HD Camera for Understanding Diver's Motion and Orientation

- Integrated 1st person low-light camera with advanced video processing and real-time edge enhancement.
- 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.

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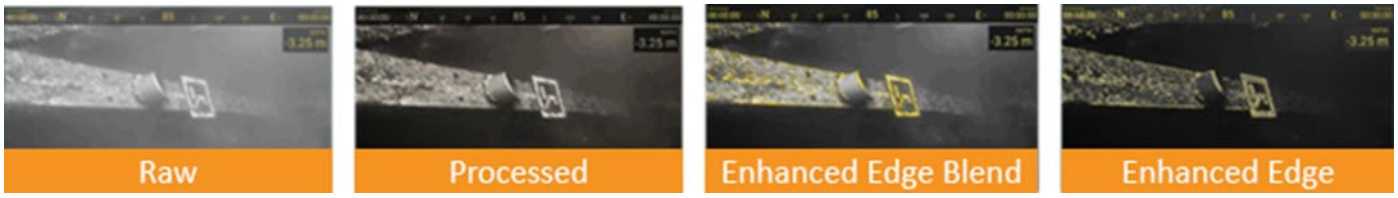
Highlighted Features

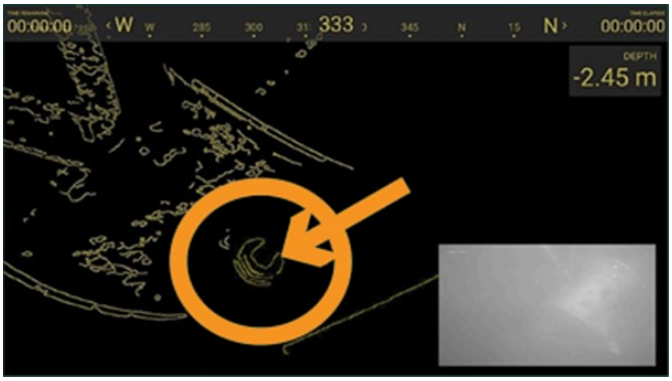
- **Real-Time Video Processing with Edge Enhancement**

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 DAVD DPP processor. The DAVD Gen 4.0 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 Gen 4.0 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 DAVD DPP on the diver in crystal clear audio.

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Main Components

1. Control Panel (DAVD-CP)

- The Control Panel facilitates all power and data communications between the diver-worn DPP 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.

2. Diver Processing Pack (DAVD-DPP)

- The DPP 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.

3. DAVD Camera and DMU (DAVD-CAM & DMU)

- The DAVD-CAM & DMU unit delivers ultra-low-light video data and full-motion head tracking for the diver.

4. Head-Up Display (DAVD-HUD)

- The HUD serves as the primary diver display interface within the DAVD System. It is a completely waterproof and depth-rated Augmented Reality display system that employs waveguide optics.

  (Patent Notice: US10877282)

5. 4G USE® DAVD 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.

6. DAVD Umbilical

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

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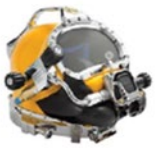
Compatible Diver Accessories

Kirby Morgan® Helmets


KM97


KM37


KM37SS


SL17


Diamond

Face Masks


Dräger Panorama Nova Dive


Interspiro Divator MKII


KM Band Mask


Diveways Mask


OTS Guardian

The Head-Up Display (HUD) unit is directly compatible with standard Kirby Morgan® KM 37, KM 37SS, SL17, and KM 97 dive helmets through the use of a modified KM face port and a modified KM communications module. Additionally, a full-face mask HUD is available with adapters for Interspiro Divator MK II, OTS Guardian, and Dräger Panorama Nova Dive full-face masks.

The DAVD product allows for the simple and quick conversion of any standard KM 37, KM 37SS, SL17, or KM 97 helmet into a DAVD-Ready HUD helmet. Please Note that the KM 37 and SL17 helmets, due to internal tolerances of the fiberglass shell, require the new US Navy-approved compact air train assembly to accommodate the HUD assembly. This assembly is included as part of the DAVD product and is class certified as part of the DAVD System (Ref: DL-545-016AB, Coda PN: HW0000766).

No modifications are required for the KM 37SS or KM 97 helmets, as they are directly compatible with the HUD assembly. Please note that helmets or face masks are not supplied with the DAVD System.

▲ Kirby Morgan® KM97 Helmet equipped with DAVD's HUD

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Technical Specifications

DAVD-CP (Control Panel)	
Dimensions	525 x 435 x 216 mm approx. (20.67 x 17.13 x 8.50 in approx.)
Weight	9.94 kg approx. (21.91 lb approx.)
Power Input	110-220V AC
Display	Full HD 1920 x 1080
Interface	HDMI / Ethernet / USB (to Laptop) Ethernet / power (to DAVD-UMB-3) HDMI / Ethernet / USB (to Peripherals)
Connectors	1 x IEC male (AC Input) 2 x IEC female (AC Output) SubConn® MCIL6F (to DAVD-UMB-3)
Laptop Connectors	1 x USB In 1 x RJ45 Ethernet In 1 x HDMI In
Peripheral Connectors	2 x HDMI 3 x USB (Peripherals / Screen) 2 x RJ45 Ethernet (Output)
Part Number	DAVD-CP 3
DAVD-HUD (HUD and CA0000504 Cable Assembly)	
Dimensions	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, 2 x Speakers
Power	5V DC
Interface	Custom HDMI/USB
Resolution	720p (1280 x 720)
Connectors	Glenair® Aquamouse 19-pin Marsh Marine 4-pin (for Audio)
Depth Rating	100 m
Part Number	DAVD-HUD-4
DAVD-DPP (Diver Processing Pack)	
Dimensions	210 x 80 OD mm approx. (8.27 x 3.15 OD in approx.)
Weight	1.36 kg approx. (3.00 lbs approx.)
Processor	Arm CPU + GPU
Power	24V DC
Interfaces	Ethernet, USB
Sensors	Pressure sensor
Connectors	SubConn® MCOM6M (Power + Ethernet), SubConn® MCOM8F (DAVD-CAM&DMU-3) Subconn® MCOM6F (Audio) Glenair® Aquamouse (DAVD-HUD-4)
Depth Rating	100 m
Part Number	DAVD-DPP-3

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Technical Specifications

DAVD-CAM & DMU (Diver Motion Unit)	
Dimensions	73 x 64 OD mm approx. (2.87 x 2.52 OD in approx.)
Weight	0.37 kg approx. (0.82 lbs approx.)
Camera	Low light, 2MP, IR Capable
Power	5V
Interface	2 x USB
Monitor Sensors	AHRS 1° Heading, 0.2° Roll / Pitch
Connector	SubConn® MCOM8M
Depth Rating	100 m
Part Number	DAVD-CAM-DMU-3
DAVD-REEL (300ft Umbilical on Open Frame Reel)	
Dimensions	520 x 340 x 550 mm (20.47 x 13.39 x 21.65 in)
Weight	22.28 kg Approx. (49.12 lbs Approx.)
Cable Length	100 m
Connections	Ethernet, 24V DC Power
Connectors	SubConn® MCIL6M (from DAVD-CP-3) SubConn® MCIL6F (to DAVD-DPP-3)
Depth Rating	100 m

Depth and Pressure Ratings

	Depth Rating	Pressure Rating
DAVD System	100m / 328ft	10 Bar
HUD Glasses	100m / 328ft	10 Bar
DPP	100m / 328ft	10 Bar
CAM (including DMU)	100m / 328ft	10 Bar
Cable CA0000500	100m / 328ft	10 Bar
Cable CA0000504	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 5895-99-397-2331.
CE Marking Compliant.

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Version

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