

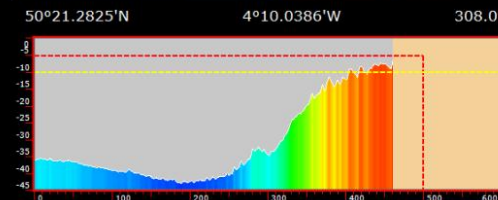
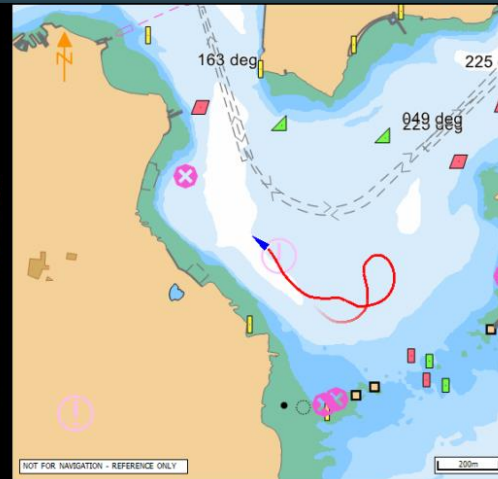
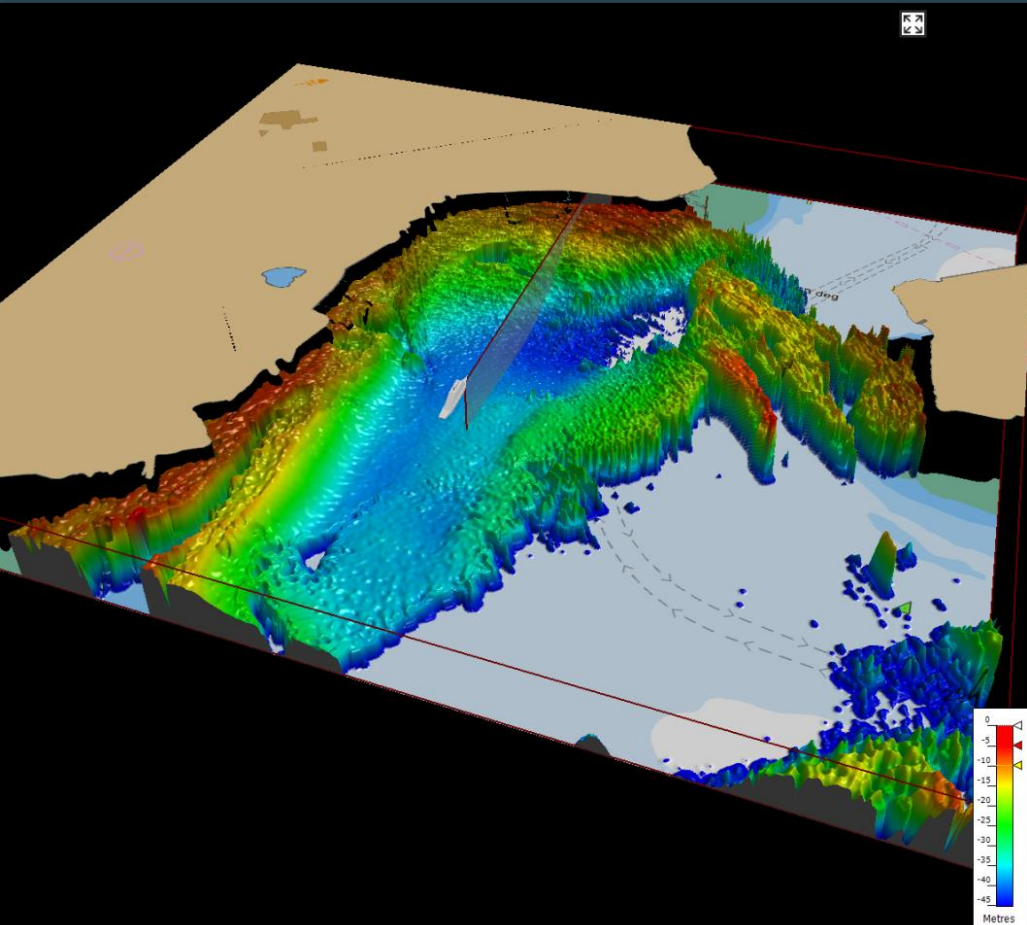
IRSO – Forward Look Sonar

Nick Swift

nick.swift@wavefront.systems

Business Development Consultant

VIGILANT



Navigation controls including a left arrow, a right arrow, a red "Warning" button, and buttons for "Sonar", "2D", and "3D".



- System
- Options
- 1500m
- 900m
- 600m
- 300m
- 150m
- 75m
- 50m
- 25m

VIGILANT – Use cases



VIGILANT – Environmental Changes



[Home](#) [News](#) [Sport](#) [Business](#) [Innovation](#) [Culture](#) [Arts](#) [Travel](#) [Earth](#) [Audio](#) [Video](#) [Live](#)

Cargo ship remains stuck on sandbank after tow attempt fails

5 March 2024

Share Save

Maisie Lillywhite BBC News, West of England



VIGILANT – Lack of Accurate Charts

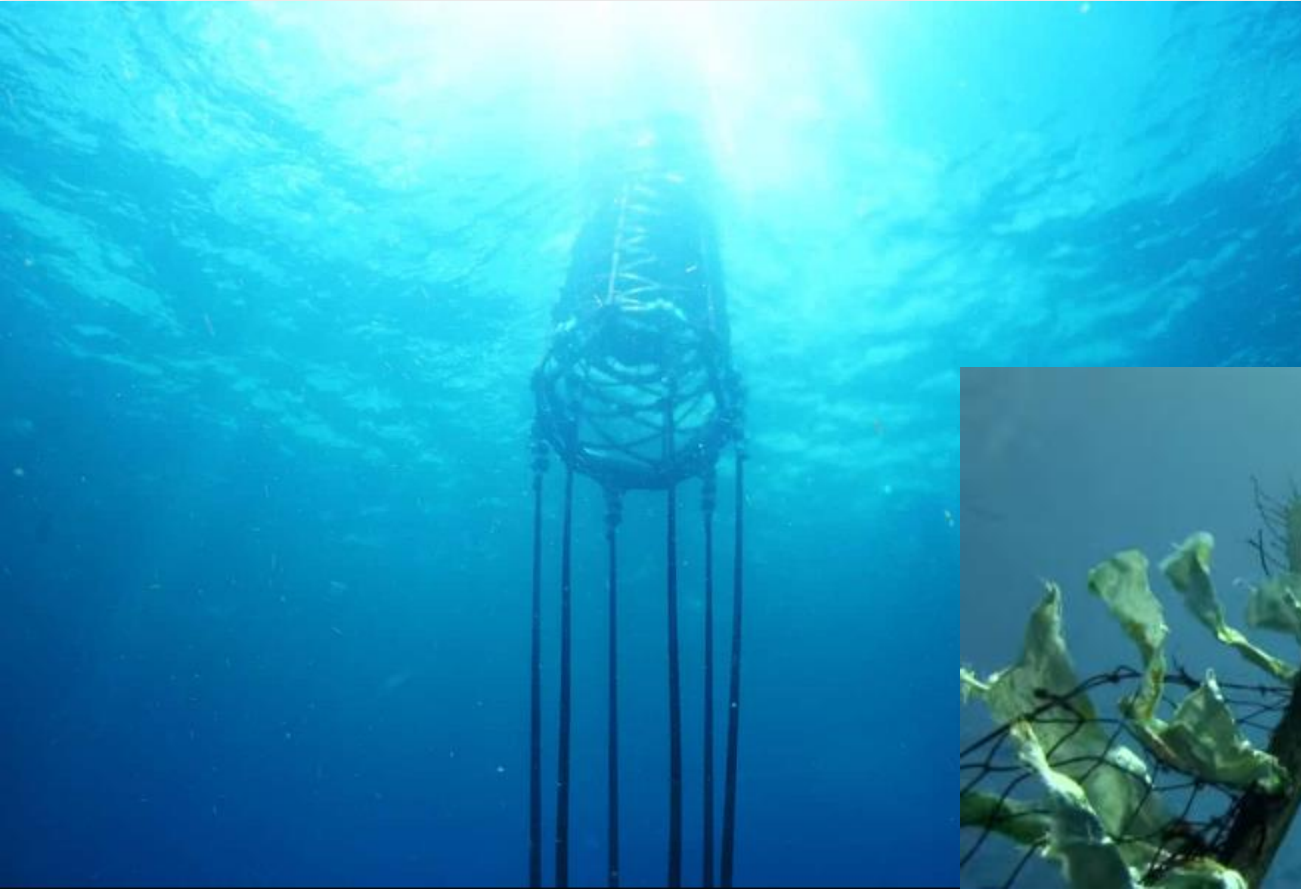


Luxury cruise ship that ran aground in Greenland freed after 3 days

By Jan M. Olsen • The Associated Press
Posted September 14, 2023 10:13 am • 3 min read



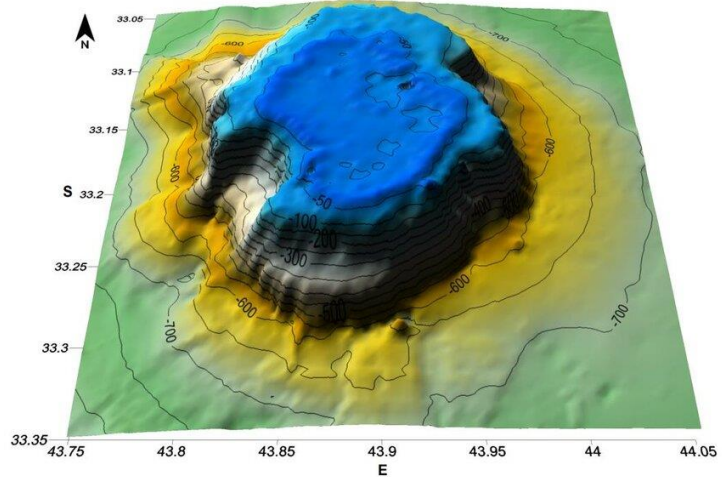
VIGILANT - In Water Obstacles



Vigilant - Autonomy



Vigilant - Exploration





“A new multi-purpose forward-look sonar for commercial and military vessels that reduces the risk of collisions”

1500M

SONAR
NAVIGATION

600M

3D
NAVIGATION



External
Interface



SURFACE
VESSEL



SDV /
SUBMARINE



ASV / AUV

VIGILANT – Forward looking sonar



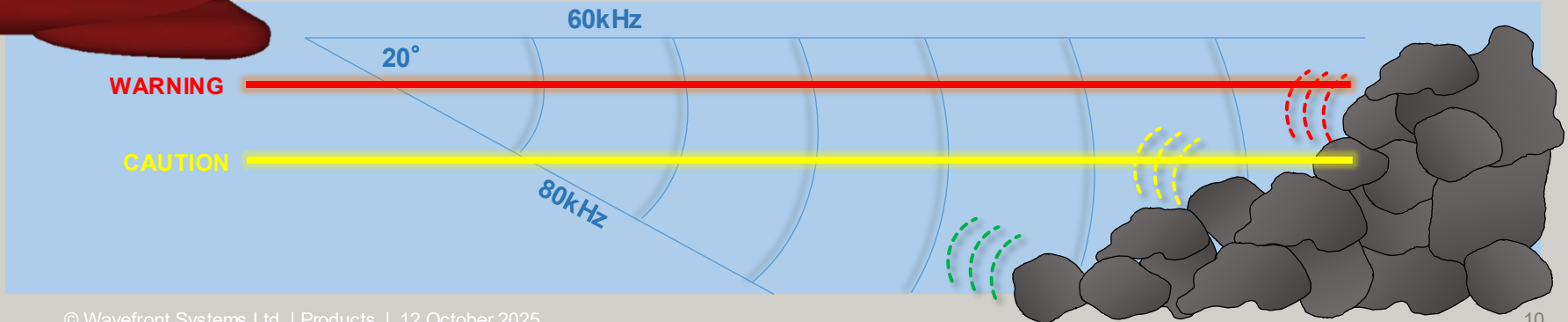
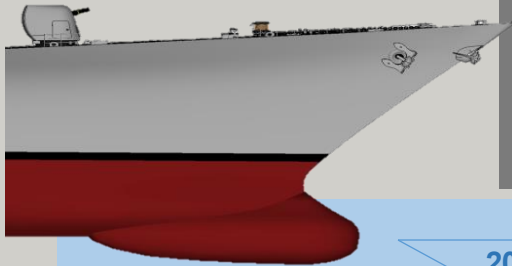
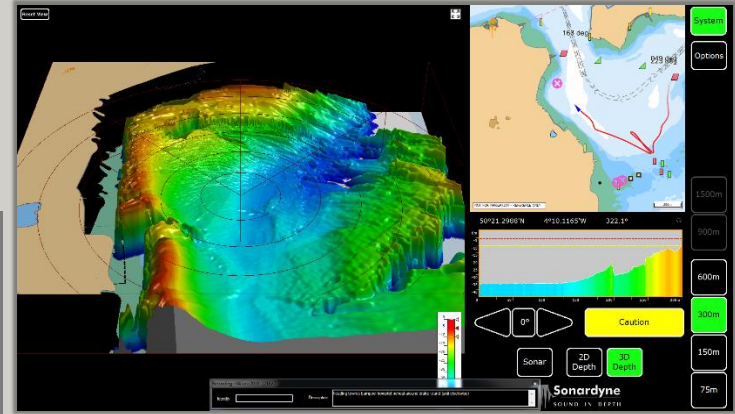
1500_M
MAX
RANGE

100_M
DEPTH

120^{deg}
AZIMUTH

70_{kHz}
OPERATING
FREQUENCY

- 3D seabed mapping ahead of the vessel up to 600m
- History of vessel passage is maintained for manoeuvring
- User definable alarms



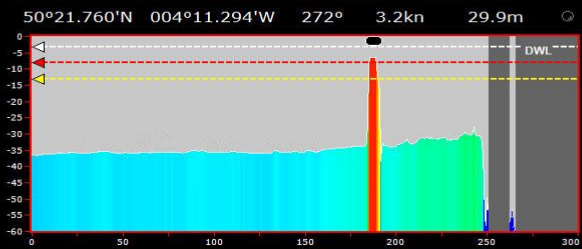
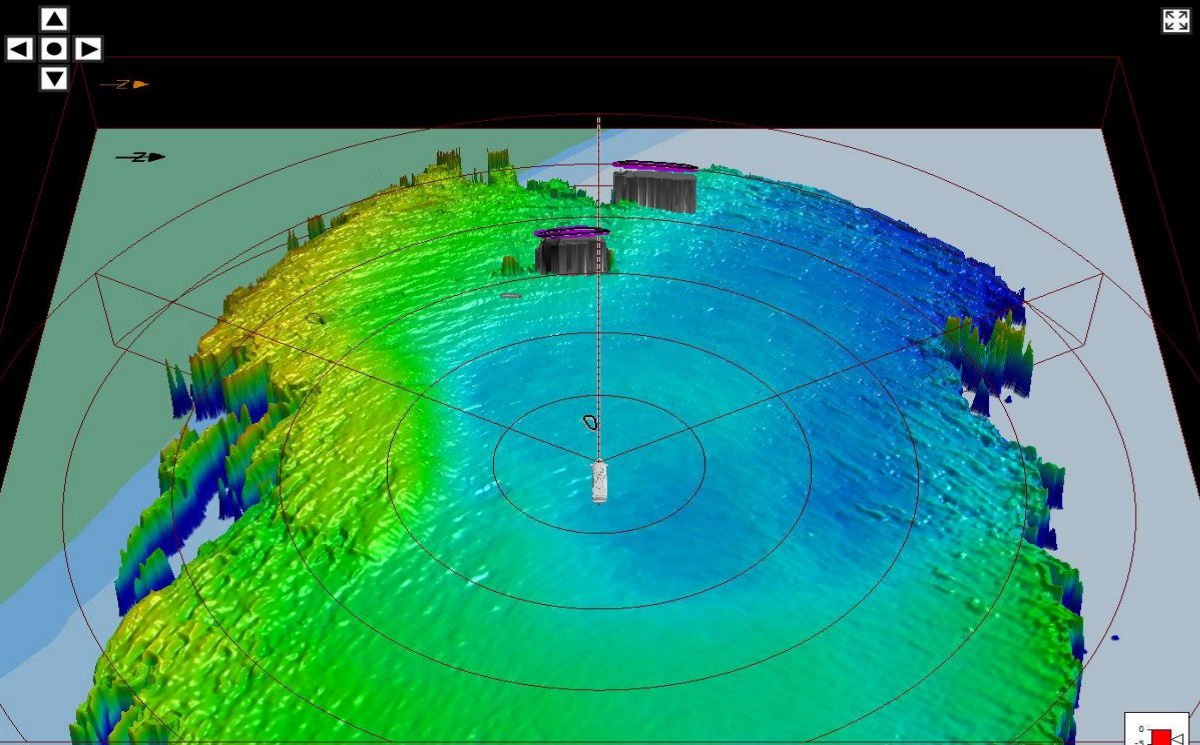
VIGILANT – Accurate, relevant and timely threat information



The interface is divided into several main sections:

- 3D Sonar View (Left):** A large 3D visualization of the sonar scan, color-coded by depth and intensity. A dashed white line indicates the vessel's heading. A "Full Screen" button is located at the top right of this view.
- 2D Map View (Top Right):** A 2D map showing the vessel's position and heading (163 deg). It includes a scale bar (100m) and a warning: "NOT FOR NAVIGATION - REFERENCE ONLY".
- Depth Profile (Bottom Right):** A 2D profile showing depth (0 to -60m) versus range (0 to 300m). A "DWL" (Depth Window Limit) is indicated at the top.
- Control Panel (Right):** A vertical column of controls including:
 - System Settings:** A button labeled "System" with a red dot.
 - Options:** A button labeled "Options" with a red dot.
 - Range Settings:** A vertical stack of buttons for "1500m", "1000m", "600m", and "300m". A red dot is positioned between the "600m" and "300m" buttons.
 - Profile Steering:** A vertical stack of buttons for "150m", "75m", and "Auto".
 - Alert Level:** A button labeled "No Alert" with a red dot.
 - Display Modes:** A vertical stack of buttons for "Sonar", "2D Depth", and "3D Depth". A red dot is positioned on the "3D Depth" button.
- Bottom Left:** A "Vessel History" label with a red line pointing to a small icon in the 3D view.
- Bottom Center:** An "Alert Thresholds" label with a red line pointing to a vertical color scale legend labeled "Metres" ranging from 0 to -60.
- Bottom Right:** The "WAVEFRONT" logo.

VIGILANT – 3D – Floating dangers



System

Options

1500m
Sonar Only

900m
Sonar Only

600m

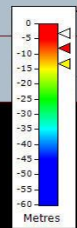
300m

150m

75m

Auto

Vigilant provides automatic water column hazard detection and alerts, including depth of hazard in the column



Navigation controls including a 'Warning' button and a heading display showing '000°'.

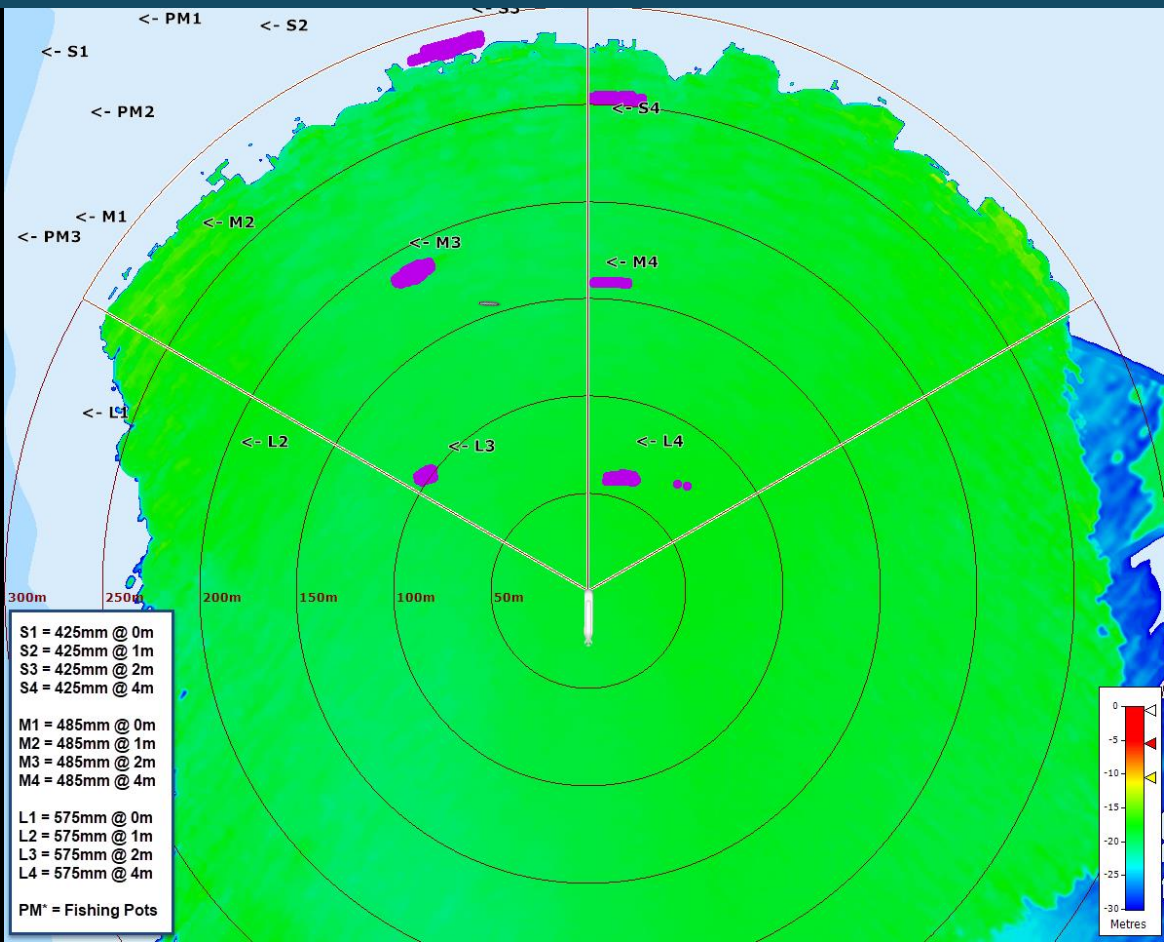
Mode selection buttons: 'Sonar', '2D Depth', and '3D Depth' (highlighted).



Vigilant FLS

Demonstration of Vigilant 1500 in 3D Mode
Tracking along a coast line

VIGILANT – 3D – Floating dangers

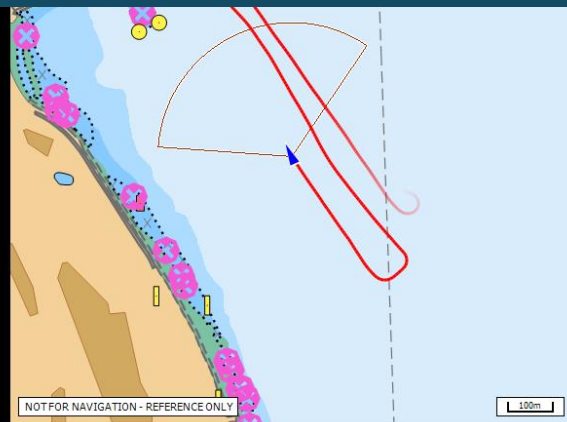


- S1 = 425mm @ 0m
- S2 = 425mm @ 1m
- S3 = 425mm @ 2m
- S4 = 425mm @ 4m

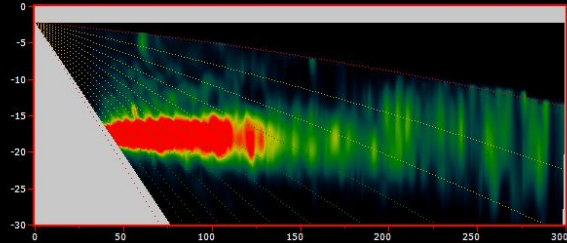
- M1 = 485mm @ 0m
- M2 = 485mm @ 1m
- M3 = 485mm @ 2m
- M4 = 485mm @ 4m

- L1 = 575mm @ 0m
- L2 = 575mm @ 1m
- L3 = 575mm @ 2m
- L4 = 575mm @ 4m

- PM* = Fishing Pots



50°33.868'N 002°25.178'W 334° 4.5kn 19.2m



000°

Warning

Hazard Alerts Disabled

Sonar 2D Depth 3D Depth

System

Options

1500m
Sonar Only

1000m
Sonar Only

600m

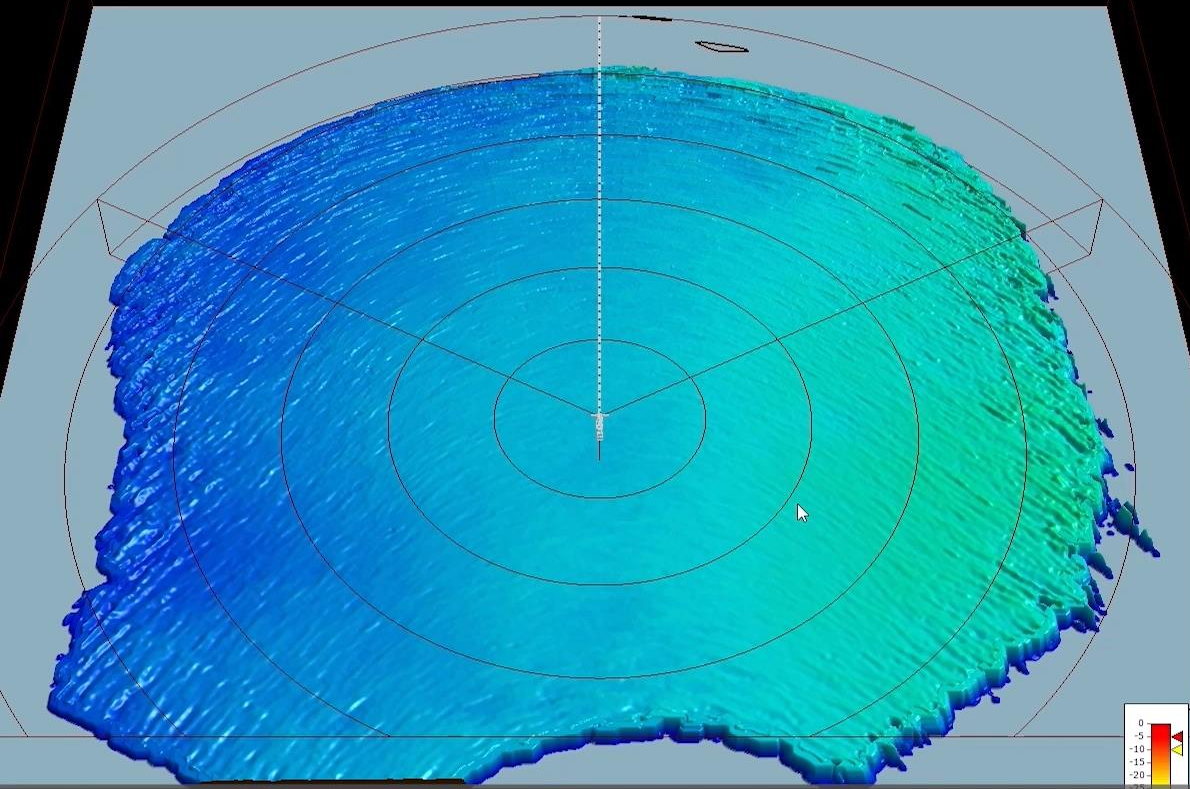
300m

150m

75m

Auto

View



System

Options

1500m
Sonar Only

1000m
Sonar Only

600m

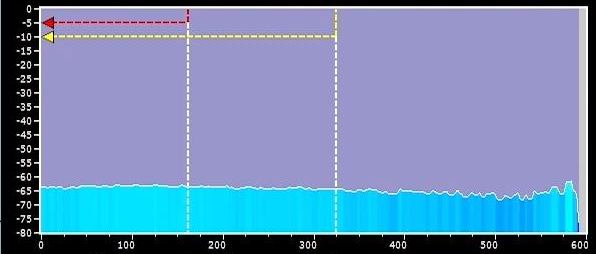
300m

150m

NOT FOR NAVIGATION - REFERENCE ONLY

200m

000° 5.4kn 63.7m



000° No Alert

Sonar

2D Depth

3D Depth

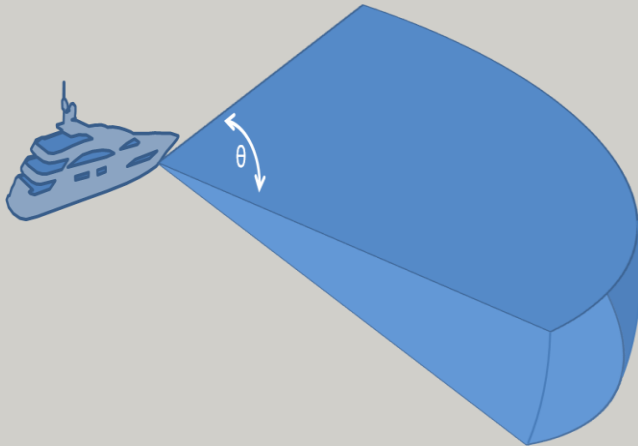
Vigilant FLS[®]

Detection of Fish Aggregation Devices (FADS)

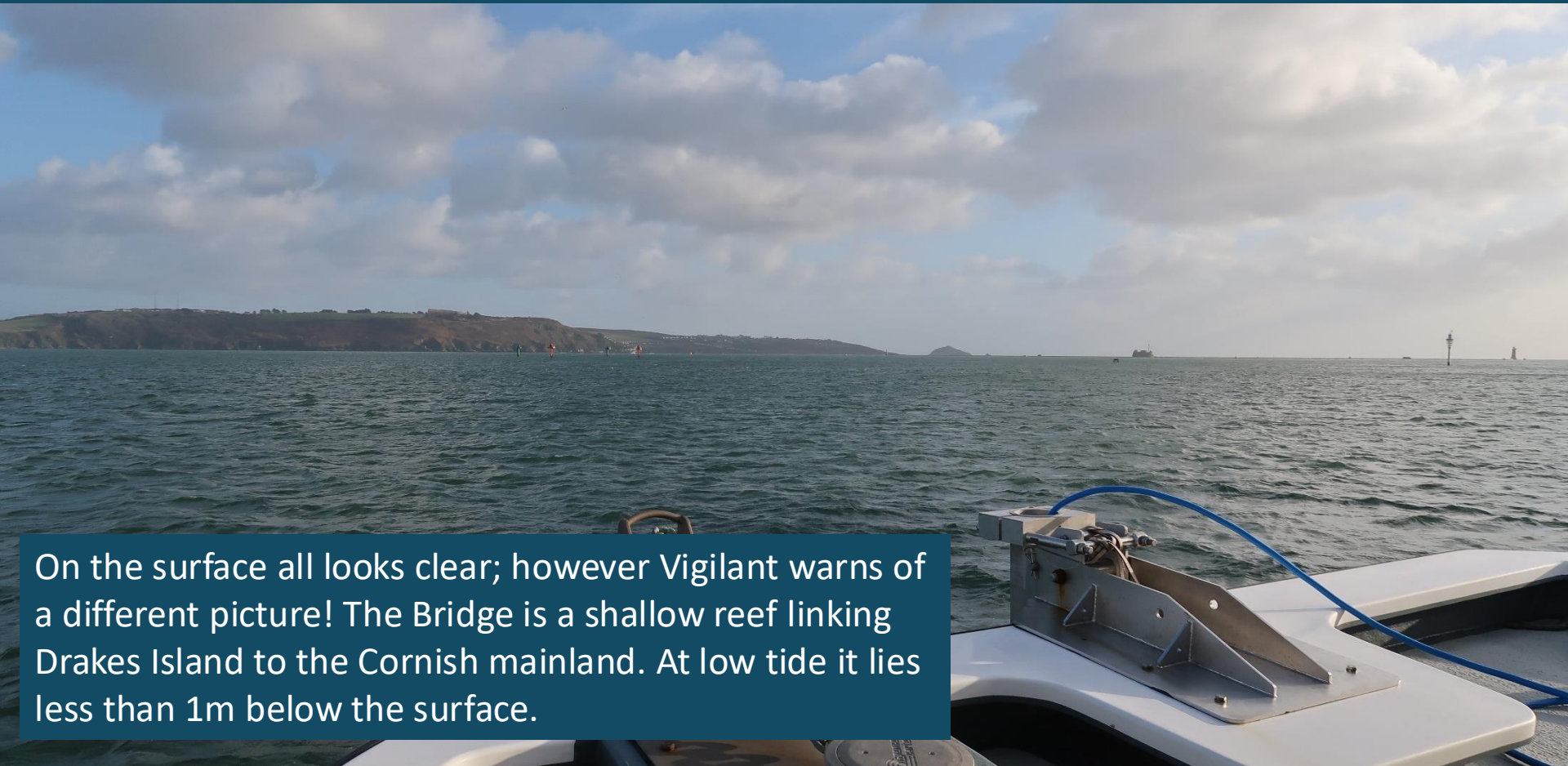




Depth mode operation:



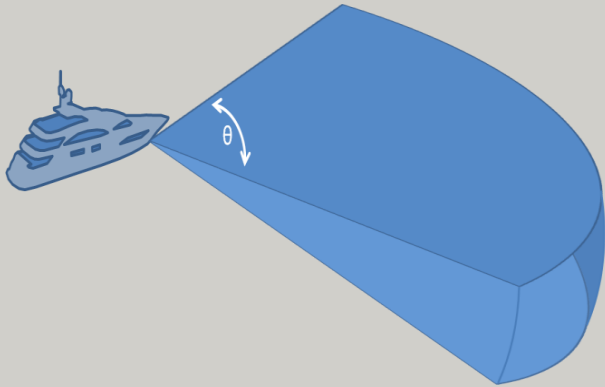
- Scans a fan of azimuth beams for 3D information
- Determines the bathymetry of the seabed and depth of objects in the water column.
- The display shows depth. This depth information may be displayed in either a plan view (2D DEPTH) or a rotatable 3D view (3D DEPTH).
- The image is built up using a proprietary process called 'Altitude Confidence Filtering' (ACF) which creates an accurate and stable display.



On the surface all looks clear; however Vigilant warns of a different picture! The Bridge is a shallow reef linking Drakes Island to the Cornish mainland. At low tide it lies less than 1m below the surface.



Sonar mode operation:



- Fan of azimuth beams to image the underwater scene ahead
- Shows the strength of the seabed and objects in water column
- Target echoes on an intensity coded single-hue display, colours showing target strengths

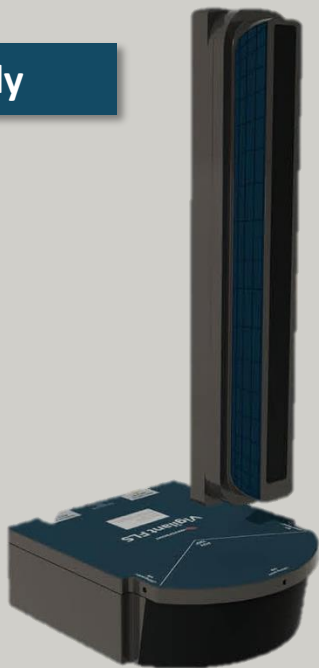
VIGILANT – Sonar Mode - Surface markers CAD 'Drake's Island'



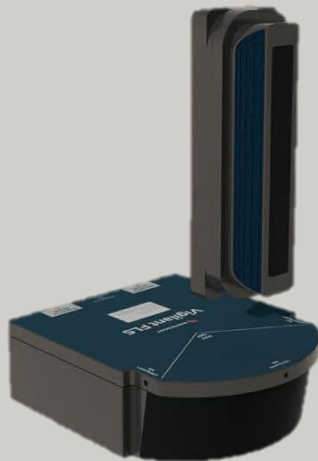
Long range Sonar detections warning the skipper of potential surface and subsurface threats as the vessel navigates around Drake's Island, UK.



Vigilant Family



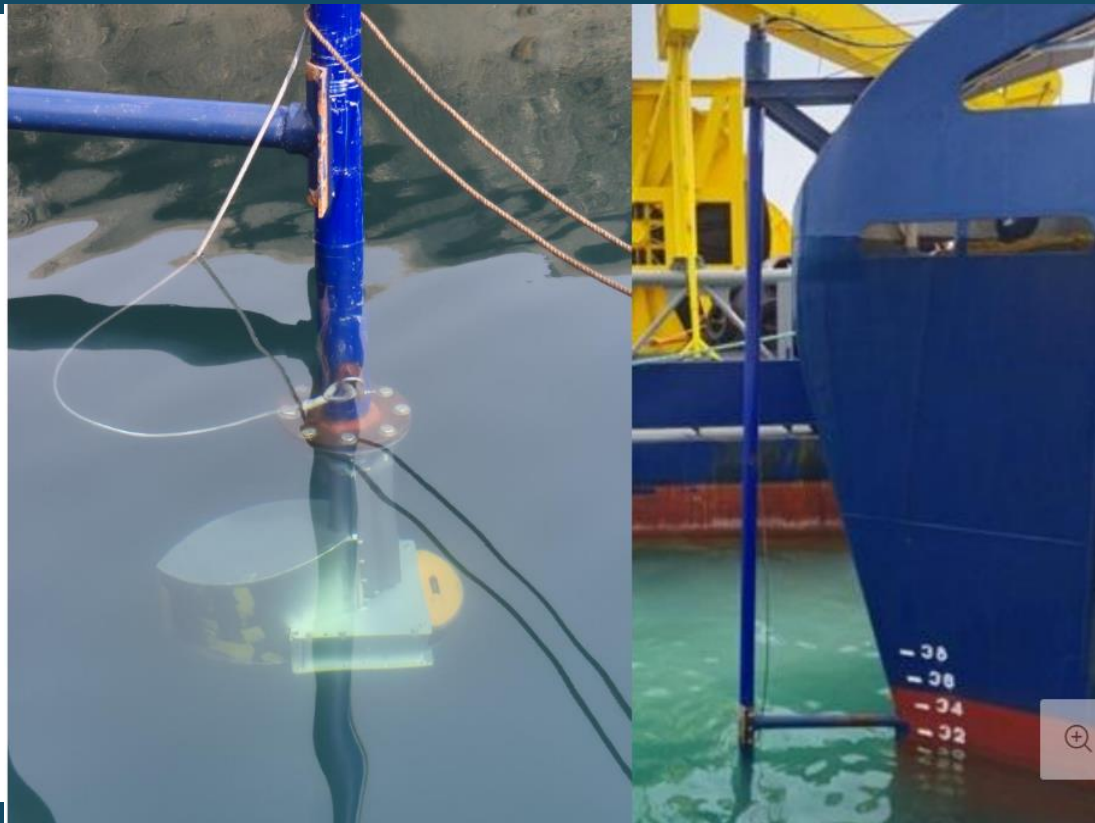
Vigilant 1500



Vigilant 1000



Vigilant 600





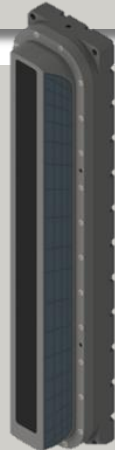
Vigilant Receiver Array

- 42 Elements
- 120° FoV
- Weight in Air: 14kg
- Weight in Water: 2.5kg
- External Interface



Vigilant 3D Projector

- 32 Elements
- Pitch & Roll Stabilisation +/- 20°
- Weight in Air: 7kg
- Weight in Water: 2kg
- Can be mounted remotely from the Receiver Array



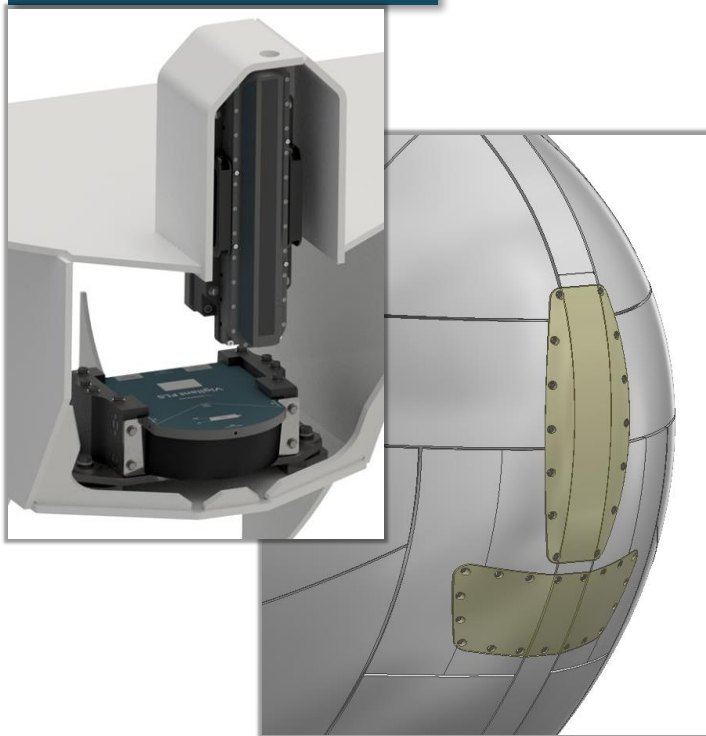
Vessel Mounting

- Suitable for new-build and retro-fit installations
- Surface and subsurface vessel versions
- Receiver Array and 3D Projector can be supplied pre-mounted for ease of installation
- Acoustic windows can be supplied to preserve the bow shape
- Wavefront's highly experienced team can work with owners to design bespoke mounting arrangements

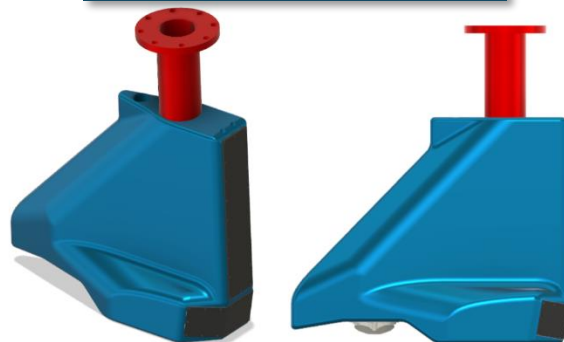




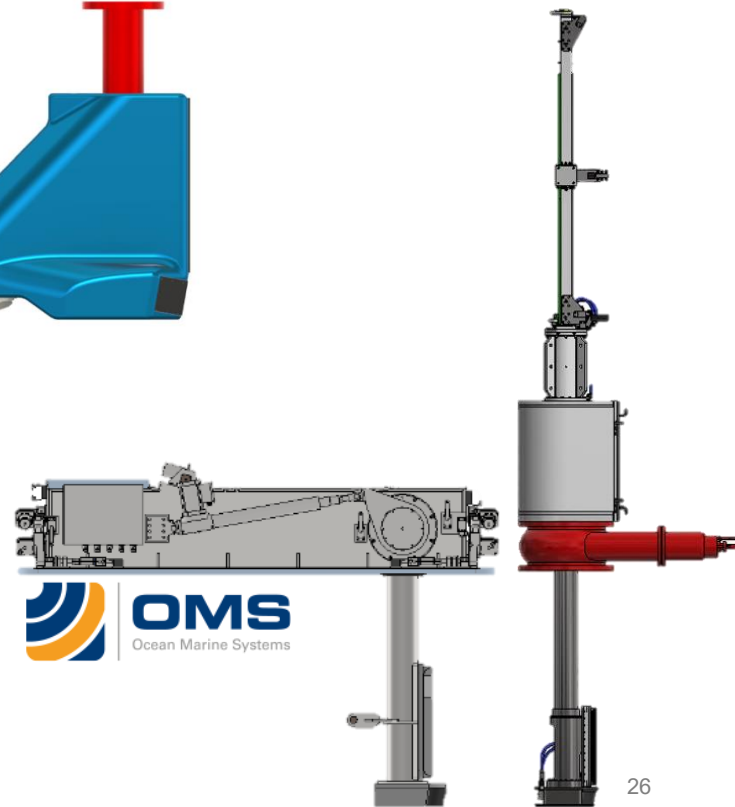
Vessel Bow Mounting



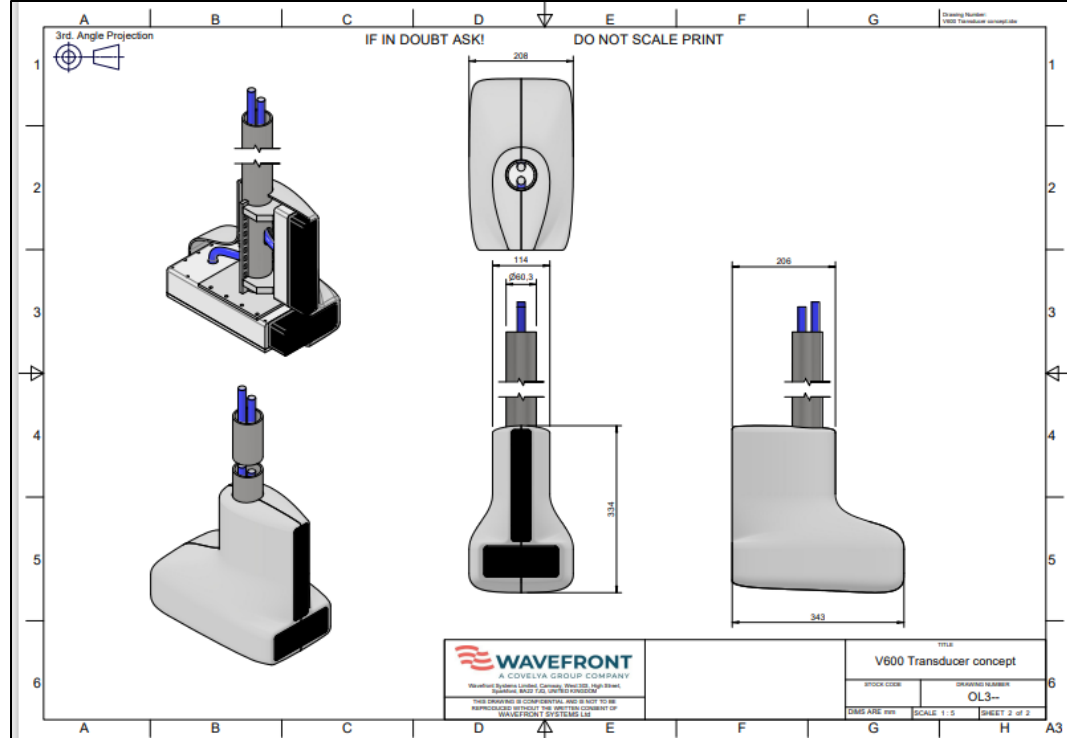
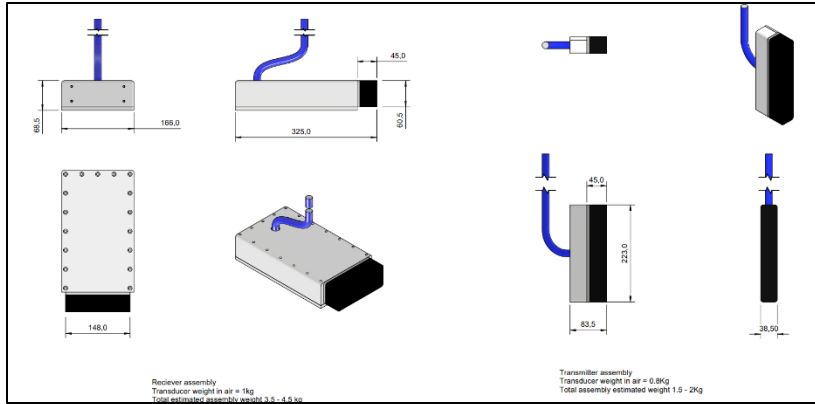
Pole Mounting



Vessel Hull Mounting

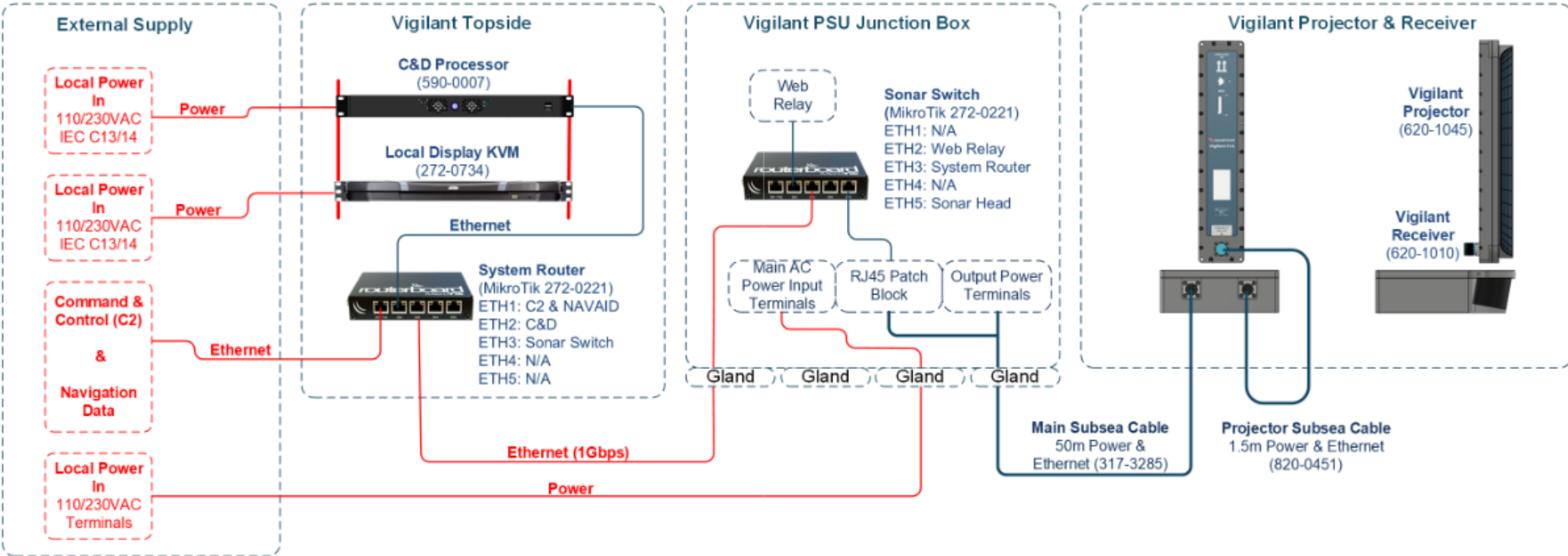


VIGILANT – Mounting options

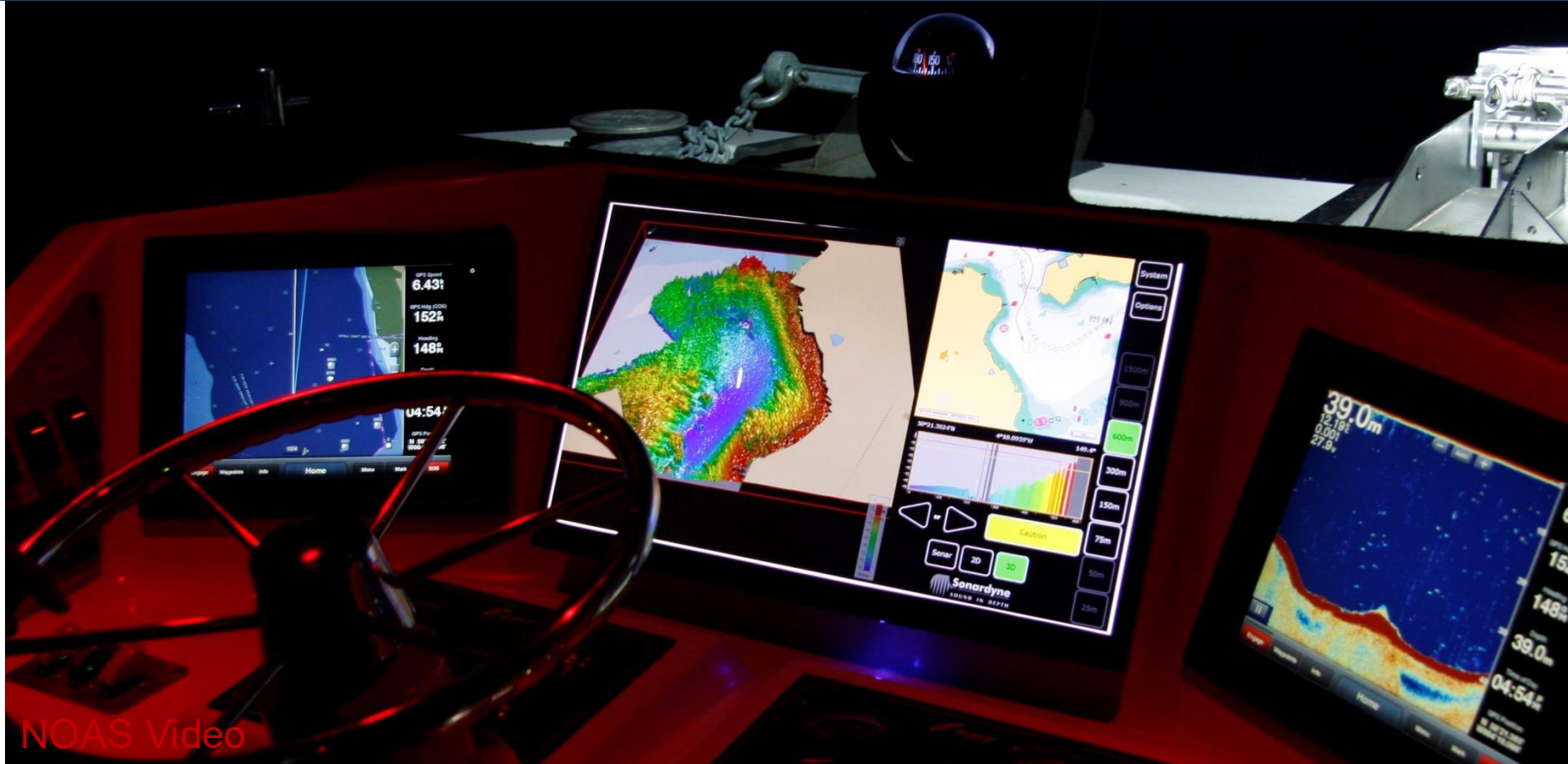


300mm

VIGILANT – System diagram



VIGILANT – Integrated bridge display





nick.swift@wavefront.systems

Business Development Consultant

T +44 1935 815600

E enquiries@wavefront.systems

W www.wavefront.systems

Camway, West 303, High Street,
Sparkford, Yeovil, BA22 7JQ

Making the Underwater World Visible