



Sentinel 2 IDS

Intruder Detection Sonar



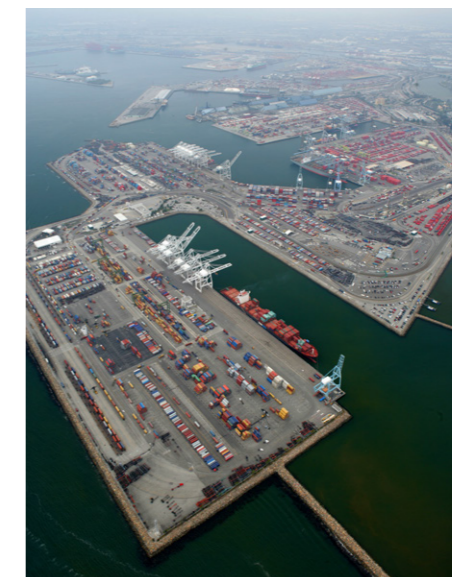
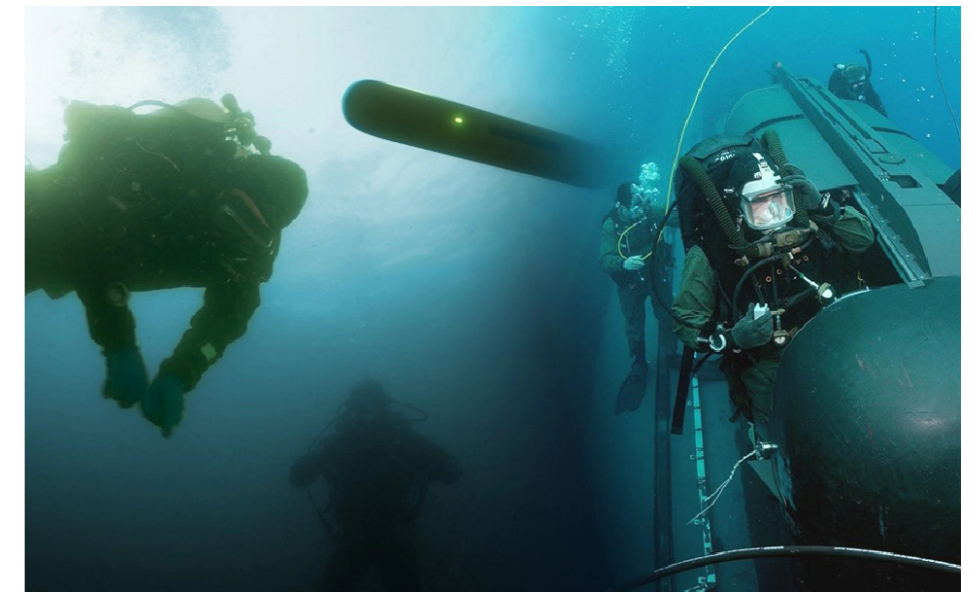
Wavefront apply engineering excellence to the problems of underwater detection, imaging and navigation. Our operationally proven market-leading sonar systems are reliable, easy to use and designed to provide real-world solutions.

Our sonar technology allows us to make the underwater world visible.

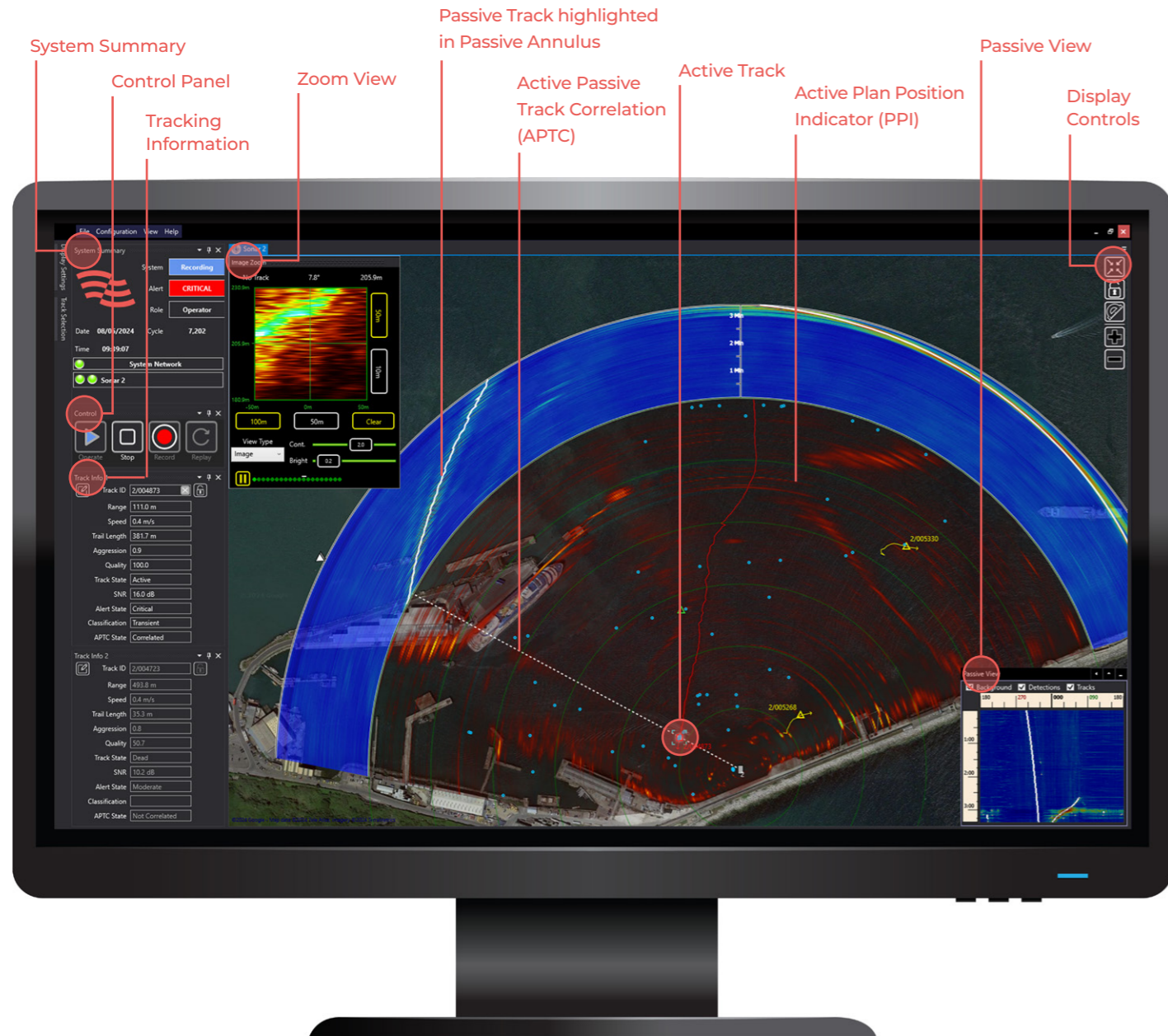
Sentinel 2 IDS

The world's most deployed Intruder Detection Sonar

Sentinel has protected our customers' assets for the past two decades. Sentinel 2 builds on this unique heritage as the most capable and trusted underwater intruder detection system available. To our customers, Sentinel delivers continued 'peace of mind' in an increasingly hostile subsea world.



Sentinel 2 IDS



Sentinel 2 Intruder Detection Sonar (IDS) detects, classifies and tracks subsea threats such as divers, swimmer delivery vehicles or unmanned drones which are approaching your protected area or asset. In an industry first, Sentinel 2 uses patented Simultaneous In-band Active and Passive Sonar (SiNAPS®) capability to identify and protect, ranging up to 1500m for mini-sub and 1000m for divers.

Sentinel 2 IDS has an intuitive user interface that is capable of automatically informing an operator of any potential threat without the need for any specific sonar knowledge or training.

Depending on your application, Sentinel 2 can be supplied as either a portable or expeditionary system for rapid deployment where temporary security is required or as a permanently installed solution for continuous protection of a known asset or perimeter.

Your underwater security covered
Sentinel 2 IDS is used globally to protect critical national infrastructure, ports and harbours, military operations and ports, private and commercial yachts, cruise vessels and waterside properties.

Sentinel 2 offers a flexible networked solution capable of providing a

subsea security perimeter for even the most complex environments that require multiple sonars to prevent dead zones. It can operate either as a standalone solution or as an integrated part of a wider Command and Control (C2) system.

As the world's most deployed Intruder Detection Sonar, Sentinel has protected our customers' critical assets around the globe for the past two decades. Sentinel 2 builds on this unique heritage as the most capable and trusted underwater intruder detection system currently available. To our customers, Sentinel 2 IDS delivers continued 'peace of mind' in an increasingly hostile subsea world.

Sentinel 2 IDS












Design
Designed specifically for underwater intruder detection, Sentinel combines deeply integrated proprietary tracking software with purpose-built sonar hardware for unrivalled performance.

Performance
Simultaneous In-band Active and Passive Sonar (SiNAPS®) capabilities deliver up to 1500m mini-sub and 1000m diver detection ranges.

Operation
Automatically informs the user of any potential threats with a low false alarm rate.

A 2-head system tracking an Open-Circuit Diver actively on both heads and passively on one of the heads. The target data on Heads 1 and 2 are integrated to show a single track. Super-Inheritance® ensures that all the track data from each sonar target is passed between sonars so that threat level, metrics and classification are continuously reported.

-  **Identifies and classifies threats at up to 1500m**
-  **SiNAPS® combines the detection and tracking capabilities of active and passive sonar**
-  **Simultaneous Multiple Target Tracking (MTT)**
-  **Target zoom view processing capabilities for lower false alarm rates**
-  **Historical tracking data for enhanced threat evaluation using track replay feature**

-  **Response times reduced by rapidly elevating track alert levels using automated Active Passive Track Correlation (APTC)™**
-  **Comprehensively updated Graphical Display Processor (GDP)**
-  **Options for rapid overboard, permanent or floating deployment**
-  **Simple integration into Command and Control (C2) systems for above and below water protection**

Sentinel 2 IDS



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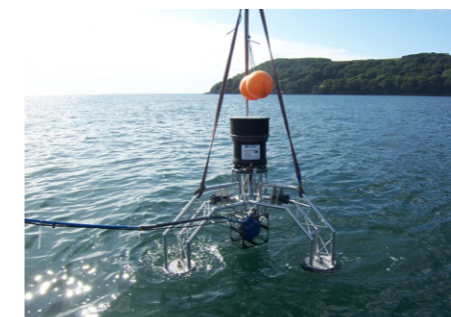
1. The Zoom View (top left) shows a full-resolution active sonar image automatically centred on the target. This is shown with range as the vertical axis and bearing as the horizontal axis. The zoom can be used to help the operator to classify the target; in this case groups of bubbles from the diver's breathing can clearly be seen, confirming it is an Open Circuit Diver (OCD). 2. The overview option in the Sentinel Graphical Display Processor (GDP) can display a multi-head view of up to 10

heads, in either a single window or as a series of tiled head images as shown below. The user can drag and zoom the displays to optimise views in any window. 3. The Sentinel GDP allows for easy set-up of the sonar positions relative to the background images – the operator can move and rotate the sonar location in real-time and make point-to-point measurements from any area of the GDP screen.

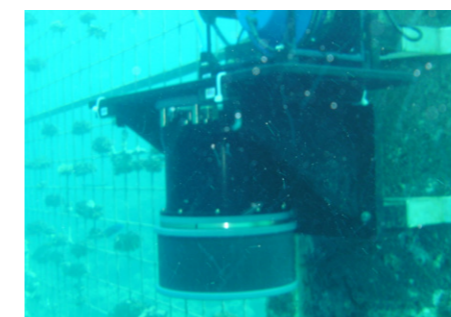


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Using experience gained over 20 years installing intruder detection sonar systems globally, Wavefront are able to offer expert installation advice for a wide variety



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of scenarios. Installation type is usually determined after an engineer site visit to assess the perimeter that requires protection and understand the end-user

requirement. 1. Expeditionary or temporary deployment of the Sentinel sonar via seabed frame. 2. A fixed bracket is a practical, cost effective solution to deploy the



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sonar from piles and other suitable structures. 3. A seabed stand provides an optimum sonar deployment method for permanently protecting open

areas of water. 4. Deployment Raft enables mobilisation where no suitable infrastructure exists or rapid deployment is critical. 5. The Rapid

Deployment System is designed for ship, choke point or event protection where no power or communications is available.

6. Compact and portable for ease of deployment, the Sentinel sonar head weighs just 35kg with dimensions of 43 x 33cm.



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Why invest?

- The world's most deployed Intruder Detection Sonar
- Patented technology delivers unique intruder detection capabilities
- Unmatched 20 years' experience installing systems globally to safeguard your vessels, oil platforms, waterside facilities and national infrastructure
- Dedicated R&D team ensures Sentinel IDS® develops in response to evolving threats

Key Features

- Simultaneous In-band Active and Passive Sonar (SinAPS®) leaving intruders nowhere to hide
- Advanced track behavioural filters deliver fast, accurate threat identification with low false alarm rates
- Simultaneous Multiple Target Tracking (MTT)
- Contiguous inter-head wide area surveillance using Super-Inheritance®

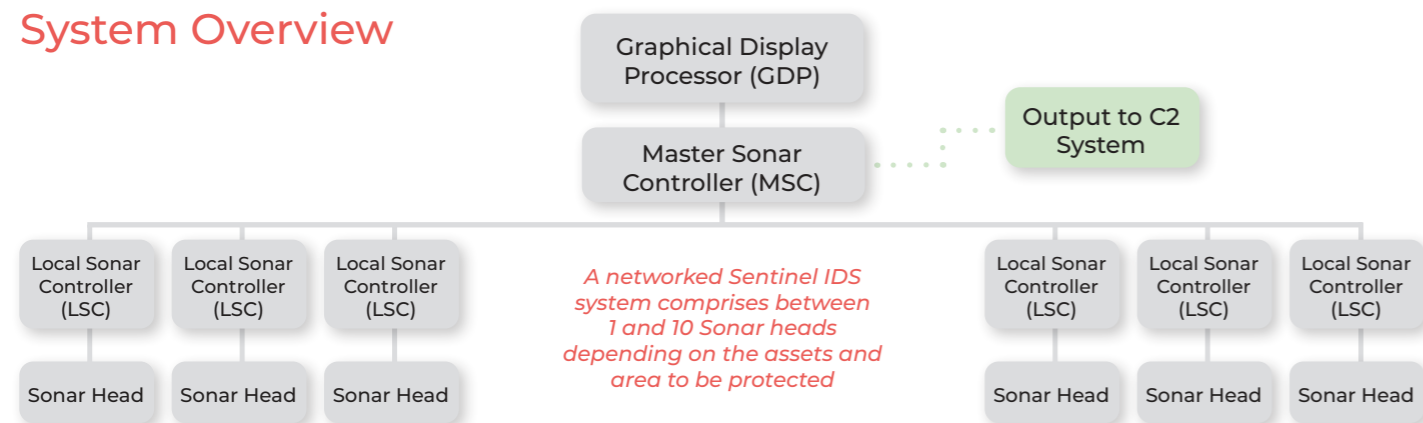
Support

- Free 24/7, 365-day support service for our valued customer base
- Access to our engineering team to remedy any issues remotely
- Extended warranty and maintenance support available
- Flexible and modular design to facilitate any installation scenario and potential future expansion

Specifications

		Expeditionary Model	Standard Model
Acoustic	Operational Frequency	70 kHz	70 kHz
	Bandwidth	20 kHz	20 kHz
	Source Level (dB re 1 µPa @1m)	206dB	206dB
	Pulse Length	40ms	40ms
	Receive Beams	256	256
	Acoustic Cover	360°	360°
	Target Bearing Accuracy	Down to 0.35°	Down to 0.35°
Electrical	Target Position Accuracy	<1 m at 150 m range	<1 m at 150 m range
	Voltage	55-0-55 V ac	55-0-55 V ac
Communication	Power	Maximum 70 W	Maximum 70 W
	Cat6 Ethernet	Cat6 Ethernet	Cat6 Ethernet
Material		Aluminium	SD Stainless Steel
Dimensions (L x D)		432 x 330 mm (17 x 12")	432 x 330 mm (17 x 12")
Weight in Air/Water		35/6 kg (77/13.5 lb)	45.5/18 kg (100/40 lb)

Sentinel 2 IDS System Overview



Command and Deployment Options

Where fixed infrastructure is either not available or not suitable, Sentinel can be supplied with Expeditionary Trailers or Crewed Command Centres to enable deployment in any circumstance.

Each Expeditionary Trailer contains a Sonar head, Local Sonar Controller (LSC) and the capability to contain a Master Sonar Controller (MSC) allowing any trailer to be the central command point for a network of sonar heads.

Only one MSC is operational at any one time but multiple 'standby' MSCs, one in each trailer, allows for maximum flexibility and redundancy. Up to 10 Expeditionary Trailers can be networked together to deliver a 10 Sonar Head deployment. Additionally, up to 10 Expeditionary Trailers can be used in conjunction with a Crewed Command Centre where this suits the scenario.

Crewed Command Centre Provides a central command centre for multiple Expeditionary Trailers

- Range includes rapidly deployed trailer variant and expandable 20ft ISO container
- Contains MSC and GDP
- Climate controlled
- Independent power and communications allow the Crewed Command Centre to be situated away from deployment locations



Expeditionary Trailer

Expeditionary Trailer

Enables deployment of Sentinel IDS to places where no suitable infrastructure exists or rapid deployment is essential

- Contains MSC, LSC, Sonar Head, seabed frame and operator interface via pull out/drop down monitor
- Integrated diesel generator for fully remote deployment
- GNSS
- Equipment climate conditioning for all environments
- Wireless networking of up to 10 Expeditionary Trailers for wide area coverage
- Wired connection to Sonar Head
- Capable of relocation using Land Rover sized vehicle



Crewed Command Centre

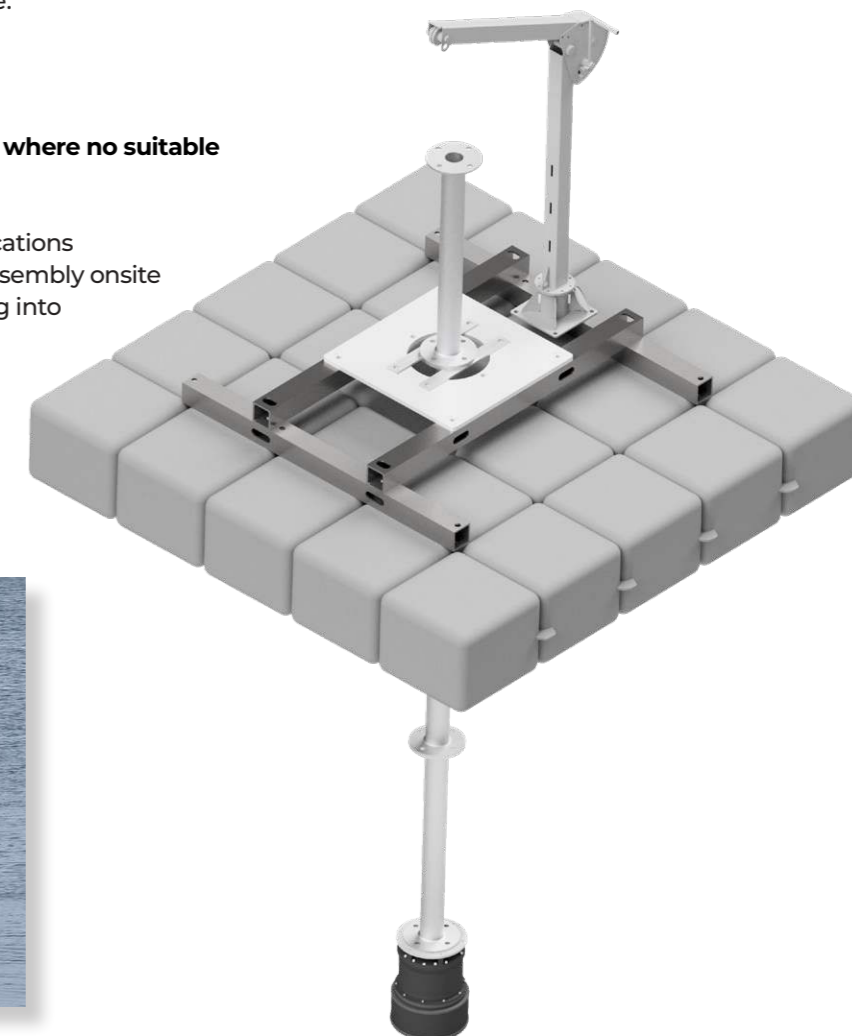
Sentinel 2 IDS Floating Deployment Options

In addition to traditional deployment options including expeditionary seabed tripod, fixed seabed frame, structure mounted frames or through hull deployments, a range of floating deployment systems is now available.

Deployment Raft

Designed to enable Sentinel IDS mobilisation where no suitable infrastructure exists

- Cable connected for power and communications
- Lightweight and easily transported with assembly onsite
- Launch from jetty or slipway before floating into position
- Anchored or tied up alongside
- Deployment machine capable of deployment from 1m to 5m depths



Rapid Deployment System

Designed for ship, choke point or event protection where no power or communications is available

- Simple deployment via ship's davit and towed into position via RIB
- Independent power supply capable of 72 hours unattended operation
- Onboard LSC with wireless communications back to MSC
- Available as a containerised solution with a command station including Command & Display console and one or more Rapid Deployment Sentinel IDS systems



Rapid Deployment Development Platform



Making the underwater world visible
We apply engineering excellence
to the problems of underwater
detection, imaging and navigation.
Our operationally proven world-
leading sonar systems are reliable,
easy to use and designed to provide
real-world solutions.

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