PRODUCT DATASHEET

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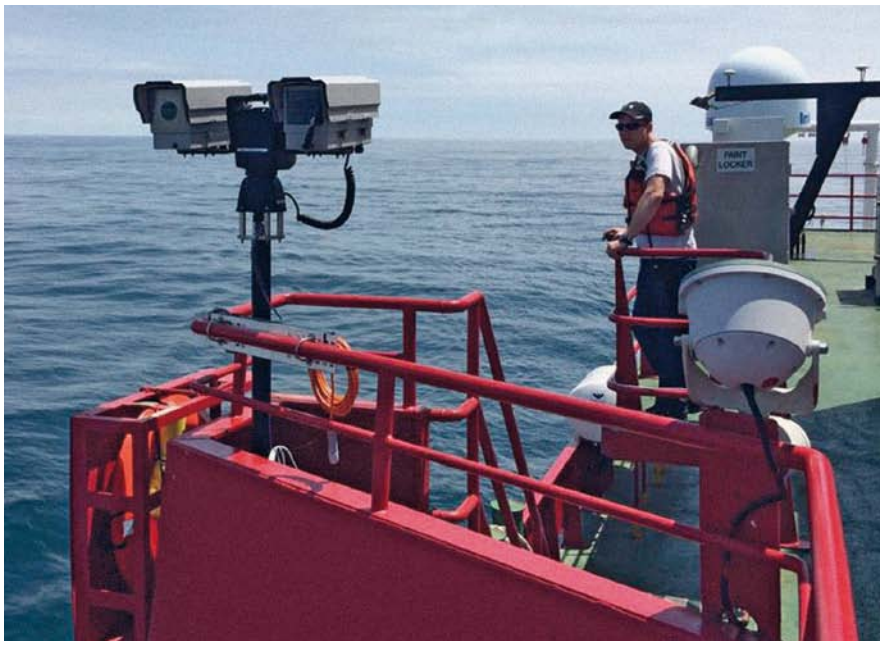
Seiche
Marine Acoustic Solutions

DUAL CAMERA SYSTEM

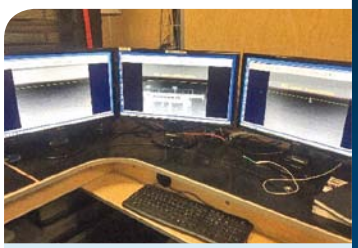


The Seiche Dual Camera System combines High Definition (HD) and Thermal Imaging technology to enable continuous real-time video coverage for maritime applications.

The system is a rugged, self-contained and low maintenance unit which has been carefully designed to offer a robust solution for surveillance at sea. Its principle application is to provide a 24-hour marine mammal monitoring tool to mitigate an exclusion perimeter zone during geophysical exploration surveys. It can detect marine mammals, such as dolphins and whales at distances over 2.5 km. However, the system is versatile and can be used in other surveillance applications.

The Dual Camera System consists of a Pan and Tilt Unit (PTU) integrated with a specialised suite of sensors including uncooled thermal imager, HD daylight camera, GPS, Barometric and Inertial sensors.

It is used in conjunction with Seiche proprietary software: RADES (Real-time Automated Distance Estimation at Sea) and ARC (Automated Recognition of Cetaceans), which are integrated into the system for accurate range finding and automated detection of marine mammals. The software uses state-of-the-art image and digital signal processing techniques to process the data, before displaying on a screen. This includes an "augmented reality" style overlay of the exclusion perimeter circle on the video stream.



APPLICATIONS

- Marine mammal mitigation
- Surveillance of small craft and vessels
- Detection of debris, ice and marine obstacles/hazards

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DEPLOYMENT METHOD

The Dual Camera Systems are usually mounted in arrays of 2-3 units per vessel to ensure optimal visual coverage of up to 360-degrees of the surrounding seas while avoiding collisions, e.g. due to vessel super structure. The integrated PTU offers ample flexibility with configurable manual control or scanning (continuous pan) operating mode and adjustable speeds. It is also capable of increased command rates, thus reducing jitters.

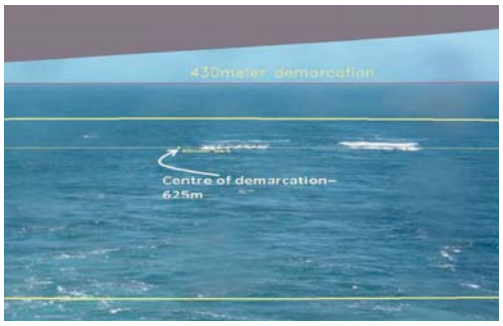
To ensure an increased level of accuracy for distance estimation, all systems are calibrated in-house prior to deployment to estimate individual camera characteristics as well as recover the relative pose that aligns the various sensors. All system communication is through ethernet networking protocol, requiring a single CAT6 cable, making the system truly remote and easy to install.

RADES SOFTWARE

RADES combines camera feeds, sensor data and PTU controls into a single intuitive user interface displaying all information required by the operator to do the job at hand; thereby greatly streamlining mitigation decisions. Images are stabilised digitally to compensate for vessel motion using image processing and horizon detection in corporation with inertial sensors data. RADES also features video recording and playback facilities, GPS output and a map overlay for plotting of detected objects. It provides an interface for configuring and controlling the PTU, enabling complete operator control for improved decision making. In addition, the Dual Camera System and RADES suite is capable of autonomous and continuous recording to an external storage stack for post processing and review.

ARC SOFTWARE

ARC software is a tool to assist operators in detecting marine mammals at the sea surface. Pattern recognising machine learning algorithms seek anomalies in the incoming images to select potential sightings. Trigger events are then tracked and assessed for likelihood as a true detection. Probable detections are highlighted and presented to the observer for examination.



Horizon detection and mitigation zone demarcation

SPECIFICATIONS

Very sensitive uncooled thermal imaging (NeDT < 30mK) – Single Field of View (12° standard) – Resolution 640 x 480
High definition day/low light camera – 30x optical zoom (defaults to ~12° FOV to match thermal image) – Resolutions of 1280 x 720 (default), 1920 x 1080
Increase PTU command rate ensures reduced jitter – Up to 50 commands per second – Configurable manual control or scanning (continuous pan) modes
Highly sensitive GPS receiver and high performance inertial sensors – 0.1° dynamic pitch/roll and 0.3° heading – Advance Kalman filtering used
Stabilisation – 2 axes mechanical stabilisation – Configurable digital image stabilisation
Network Attached Storage (NAS) for improved data integrity – Typical 4TB in Raid configuration (customisable for increased storage)
Large input voltage range 110 VAC – 240 VAC at 3.5 A max
IP67 rated enclosures