



Hyundai Intelligent Navigation Assistant System

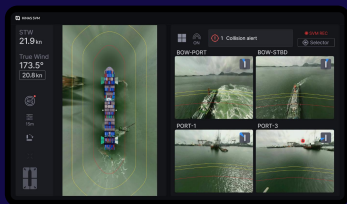
Shaping the Future of
Autonomous Navigation for
Safe and Sustainable Voyages



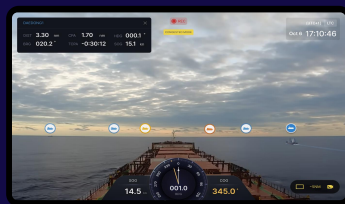
HiNAS

Hyundai intelligent Navigation Assistant System

HiNAS is the ship navigation assistance system, like automotive ADAS, enhancing safety and convenience. As a **Level 2 Autonomous System**, it supports perception, decision, and control, but the pilot has responsibility for the navigation.



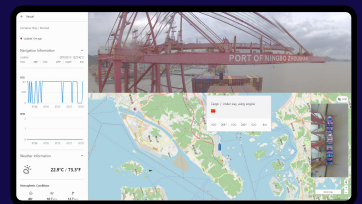
HiNAS SVM



HiNAS Navigation



HiNAS Control



HiNAS Cloud

Enhanced Situational Awareness

Autonomous Navigation

Onshore Fleet Management

HiNAS

Value Proposition

Safe

- Reduce human error with enhanced situational awareness
- Safe decision making for collision avoidance
- 360-degree surveillance for detecting hazards

Convenient

- Autonomous path tracking and collision avoidance
- High resolution on-shore fleet management
- Well organized UI/UX

Economic

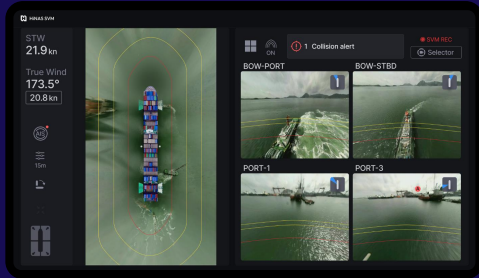
- Voyage optimization based on ship dynamics, weather, and ETA
- Automatic RPM control and steering following the optimal voyage plan
- Verification test results show fuel cost savings of 3-8%

Sustainable

- Optimizing fuel and energy consumption
- Improving crew efficiency
- Contributes to improving CII & EEXI grades

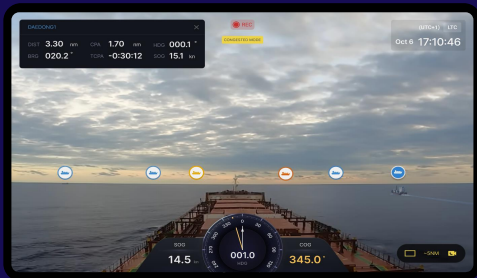
HiNAS

Product Line



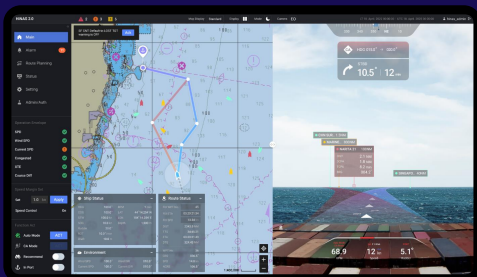
HiNAS SVM

360-degree Surround View Monitoring



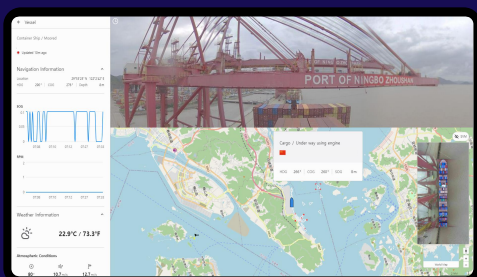
HiNAS Navigation

Enhanced Situational Awareness with Sensor Fusion



HiNAS Control

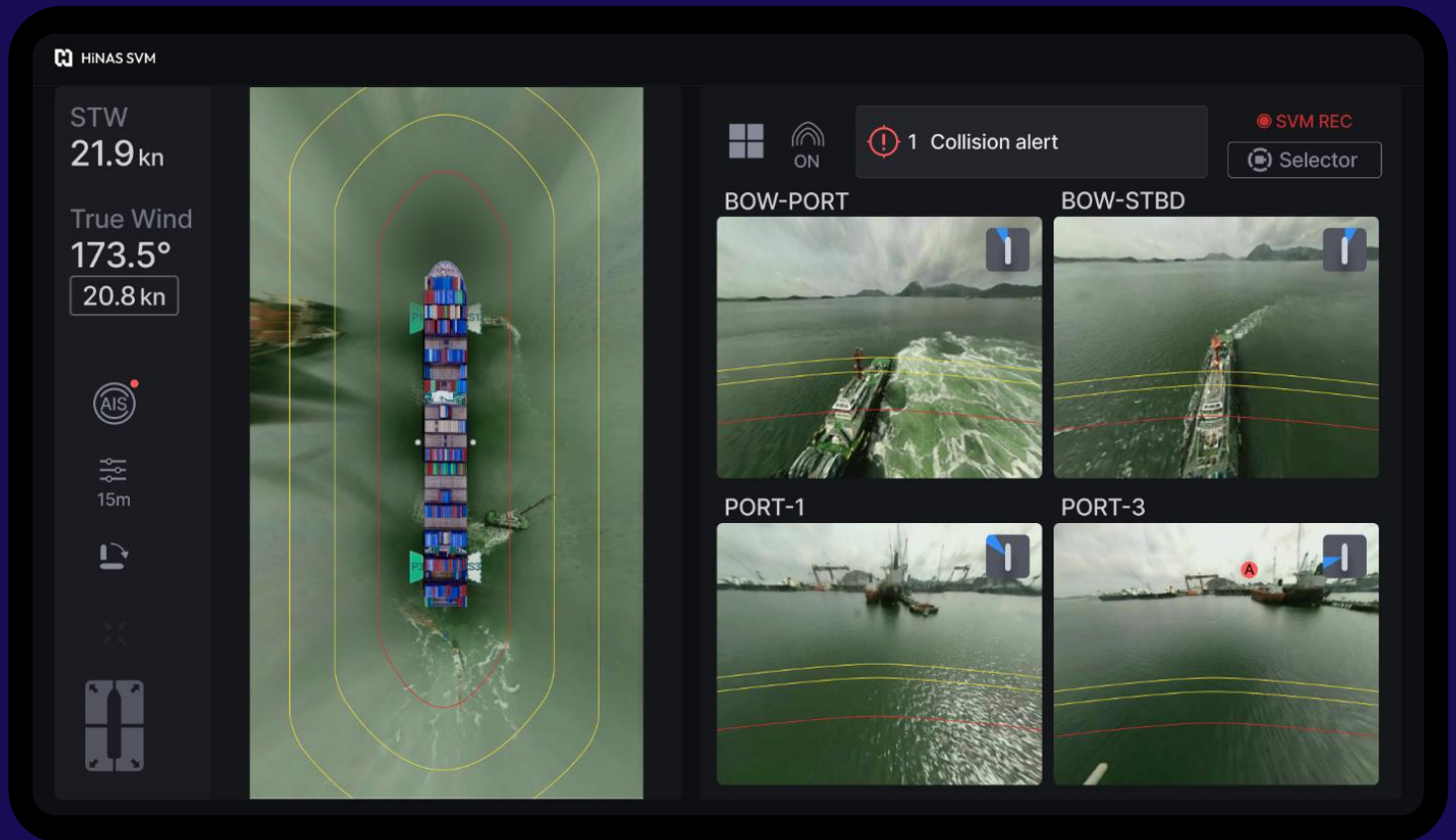
Optimized Level 2 Autonomous Voyage



HiNAS Cloud

On-shore Fleet Management

HiNAS SVM

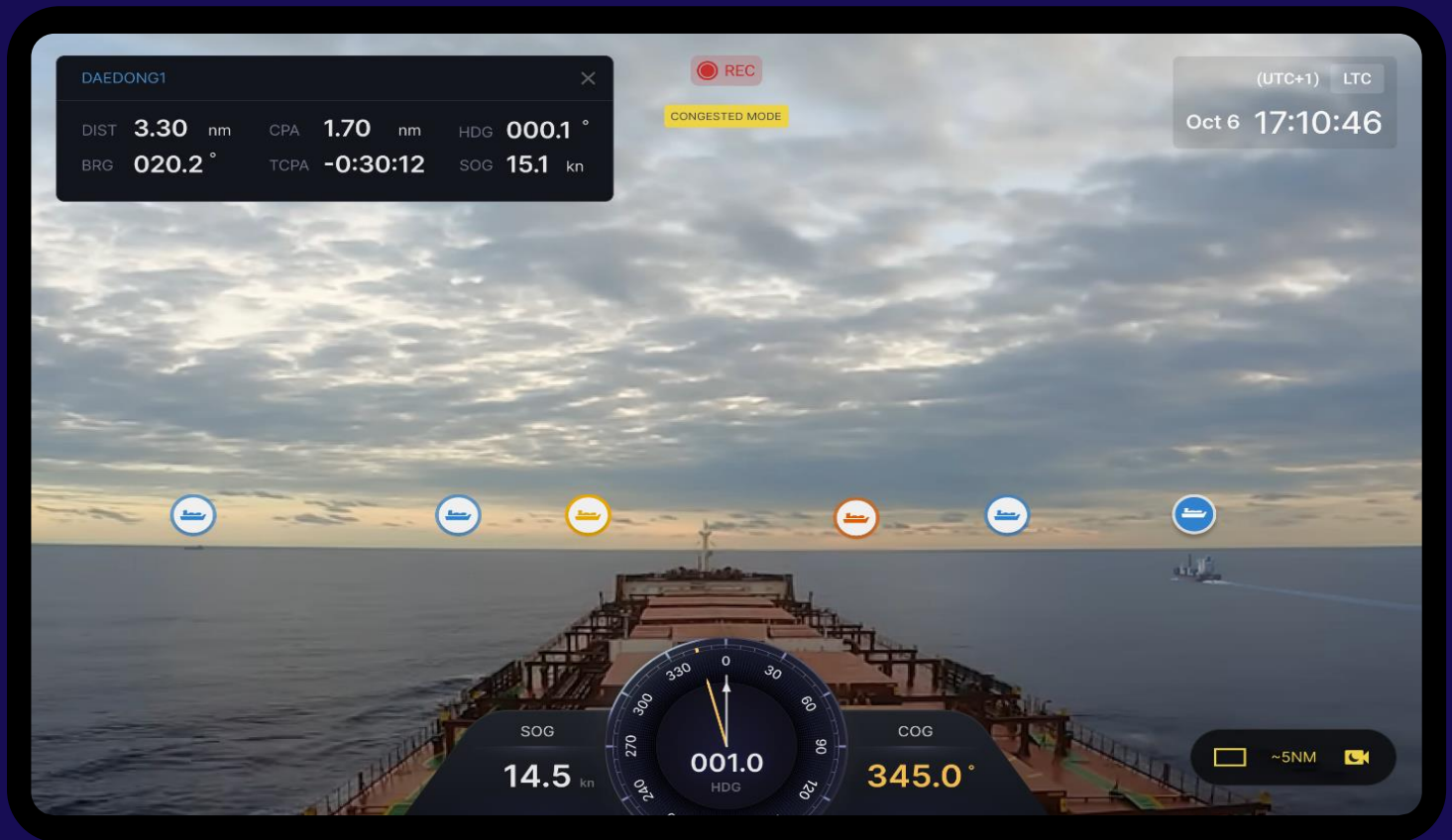


HiNAS SVM (Surround View Monitoring) is a sophisticated system designed to enhance safety and operational efficiency during berthing and harbor navigation. By providing a real-time 360-degree view around the vessel, it enables crew members to make well-informed decisions based on comprehensive visual data. HiNAS SVM stitches multiple high-definition camera feeds into a seamless top-view image, allowing for precise navigation in confined spaces. The system also incorporates advanced features such as augmented reality-based distance guides, object recognition, and AIS/ARPA visualization, ensuring a safe and efficient berthing process.

Key value propositions of HiNAS SVM:

- **360-Degree Real-Time View:** Provides a stitched, full-screen surround view across the monitor, offering an uninterrupted, real-time top-view image of the vessel's surroundings.
- **Zoom-In/Out Functionality:** Allows operators to zoom in and out on areas of interest within the surround view for enhanced detail and precision during maneuvers.
- **Distance Guide:** User-configurable AR-based distance guides (red/yellow/green) with equidistance lines help monitor the distance between the vessel and surrounding objects.
- **Individual Camera View:** Offers intuitive, selectable individual camera views, with a four-screen selection customizable to user preferences.
- **Video Recording:** Stores up to 30 days of recorded video for training, incident reporting, or review.
- **Object Recognition:** Detects and identifies objects such as land, other vessels, and obstacles in both the surround and individual camera views.
- **AIS/ARPA Visualization:** Displays AIS/ARPA data on a visual map, showing the risk of collision and providing crucial locational information for safe navigation.

HiNAS Navigation



HiNAS Navigation is an advanced situational awareness system designed to enhance safety, efficiency, and decision-making in maritime operations. It addresses critical challenges such as crew fatigue and adverse weather conditions, contributing to a reduction in maritime accidents. While not a fully autonomous system, HiNAS Navigation plays a key role in supporting autonomous technologies and meets the industry's evolving demands. Utilizing cutting-edge technologies such as computer vision, sensor fusion, and deep learning, it provides reliable situational awareness in a variety of challenging conditions.

Key value propositions of HiNAS Navigation:

- **Enhanced Safety:** Detects target ships and objects through integrated camera, radar, and AIS, providing early warnings of collision risks.
- **Improved Efficiency:** Reduces crew fatigue by delivering consistent situational awareness, particularly in adverse conditions and low visibility.
- **Innovative Technology:** Offers a panoramic AR view with a 180-degree wide-angle display, using augmented reality to present critical navigational information intuitively.
- **Comprehensive Monitoring:** Enables remote monitoring from any location onboard using portable devices, ensuring continuous operational oversight.
- **Night Vision Capability:** Equipped with IR camera-based target detection for improved visibility during nighttime or restricted visibility conditions.
- **Incident Recording:** Provides video recording functionality for both accident prevention and incident data analysis.

HiDOM (HiNAS Navigation Option)

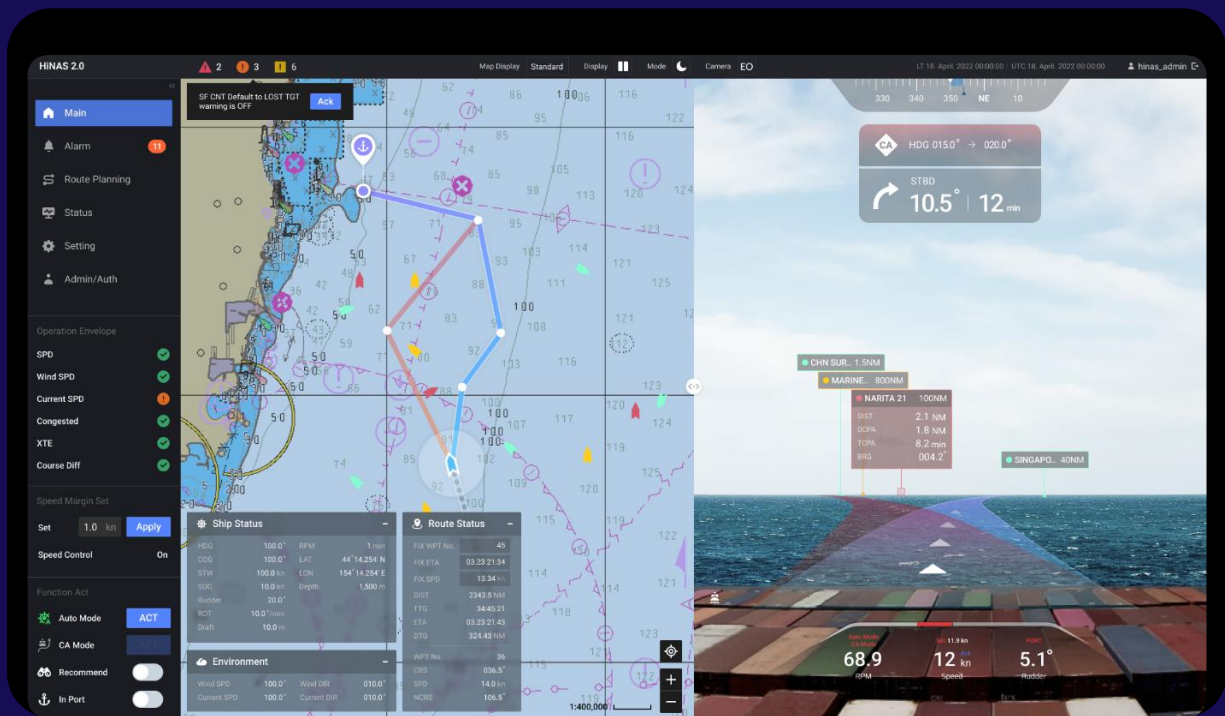


HiDOM (Hyundai Intelligent Digital Overhead Monitor) is an optional component that enhances the functionality of HiNAS Navigation by providing an integrated and customizable display solution. It replaces traditional analog indicators with a modern, digital interface, allowing for greater flexibility and visibility in maritime operations. HiDOM consolidates critical navigational data into a single 32:9 widescreen format, with multiple modes tailored for different operational conditions, such as day, night, or restricted visibility. This system supports crew decision-making by offering real-time situational awareness and customizable indicators that can be monitored both on the overhead display and remotely via portable devices.

Key value propositions of HiDOM:

- **Integrated Display:** Replaces traditional analog indicators with a digital overhead display, consolidating key navigation data into a single widescreen interface.
- **Multiple Modes:** Offers four customizable wide-view modes, including day and night settings, ensuring visibility in all conditions.
- **Customizable Indicators:** Allows for personalized selection and arrangement of up to six gauge-type and three text-type indicators to meet specific operational needs.
- **Enhanced Visibility:** Provides real-time target and ship information using EO/IR cameras, ensuring high visibility even in adverse conditions.
- **Remote Monitoring:** Enables remote monitoring of indicators through tablet integration, allowing for greater flexibility and oversight.
- **Incident Recording:** Features video recording capabilities with a 30-day storage for improved accident prevention and data analysis.

HiNAS Control



HiNAS Control is the pinnacle of ship automation technology, representing a leap forward in autonomous navigation. It is designed to meet the growing demand for safer, more efficient maritime operations by integrating cutting-edge sensors and advanced algorithms. HiNAS Control autonomously detects target ships and objects using a combination of cameras, ENC, radar, and AIS. It controls the vessel's autopilot system and bridge maneuvering system (BMS), offering real-time collision detection, collision avoidance, and optimal speed management based on dynamic conditions. While the system is partially autonomous, it dramatically reduces crew workload and human error, empowering certified crews to focus on higher-level decision-making.

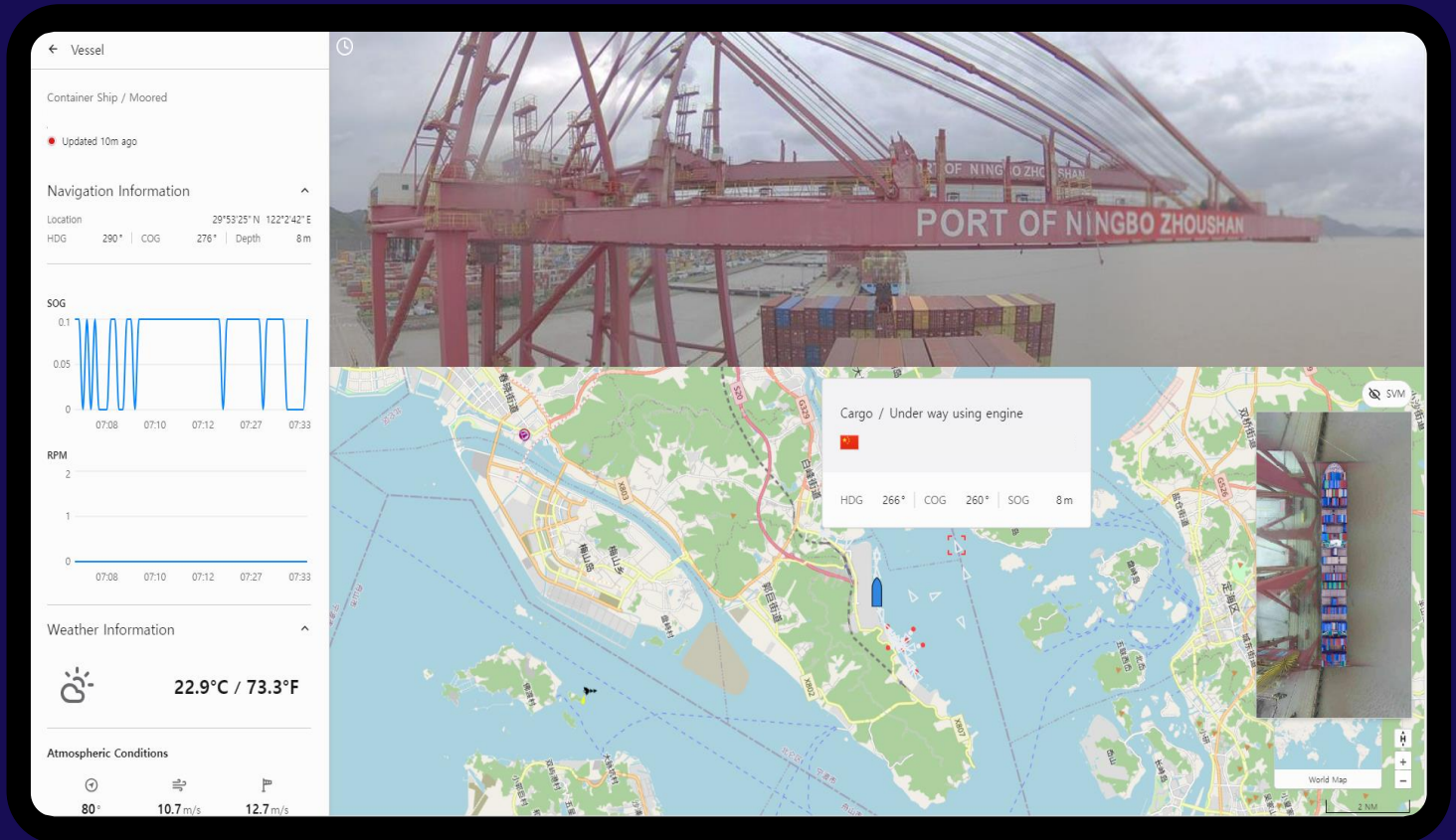
HiNAS Control sets a new industry standard by incorporating deep learning and the expertise of seasoned captains into its algorithms. With its ability to autonomously follow optimal speed based on weather and ship dynamics, HiNAS Control ensures fuel efficiency and seamless operations, giving ship owners a competitive edge in today's fast-evolving maritime landscape.

HiNAS Control includes all the features of HiNAS Navigation. This seamless transition allows ship owners to enhance their existing navigation systems with advanced autonomous capabilities, ensuring a scalable and future-proof solution for modern maritime operations.

Key value propositions of HiNAS Control:

- **Advanced Autonomous Navigation:** Provides autonomous navigation, maneuvering, collision detection, and avoidance using integrated vision sensors, radar, and AIS for real-time decision-making.
- **Collision Avoidance Control:** Mimics human navigation processes and integrates the expertise of seasoned captains, ensuring safe and reliable operations based on COLREGs.
- **Optimal Speed Management:** Delivers real-time, fuel-efficient speed optimization, considering factors such as weather conditions and ship dynamics to enhance operational efficiency.
- **Automatic Route and Speed Tracking:** Autonomously follows pre-planned routes and adjusts speed for fuel efficiency while ensuring safety in complex marine environments.
- **Enhanced Situational Awareness:** Detects and tracks surrounding vessels and obstacles in real-time, reducing human error and enhancing overall safety.
- **Crew Efficiency:** Reduces the workload of certified crew members, allowing them to focus on strategic decision-making while maintaining responsibility for overall navigation.

HiNAS Cloud



HiNAS Cloud is a cutting-edge, cloud-based platform designed to enhance real-time decision-making and fleet management in the maritime industry. It offers vessel operators a powerful tool to monitor their fleet and make informed decisions from anywhere, providing comprehensive visibility and control. Seamlessly integrated with HiNAS Navigation, HiNAS Control, and HiNAS SVM, HiNAS Cloud ensures that vessels equipped with these systems benefit from real-time monitoring and playback of recorded data. It is the default cloud platform for both HiNAS Navigation and HiNAS Control, providing critical insights that improve both safety and operational efficiency.

Key value propositions of HiNAS Cloud:

- **Real-Time Observability:** Delivers live streaming with minimal delay, allowing for near real-time monitoring of vessel operations. This ensures immediate situational awareness and proactive risk management.
- **Playback Functionality:** Offers the ability to review recorded events, enabling users to replay and analyze critical moments, which is invaluable for incident investigation, training, and performance optimization.
- **Operational Efficiency:** Features a dashboard for tracking key events and trends, providing statistical data that helps streamline fleet management and improve operational safety.
- **Seamless Integration:** Works seamlessly with HiNAS Navigation, HiNAS Control, and HiNAS SVM, allowing for easy adoption and use across different systems, with real-time data available instantly.
- **Scalable and Customizable:** Provides flexible solutions tailored to the specific needs of individual vessels or entire fleets, ensuring it can adapt to varying operational demands.
- **Low-Bandwidth Solution:** Ensures efficient data transmission, even with minimal bandwidth, while maintaining robust real-time monitoring and playback capabilities