MACHINE VISION FOR SAFETY AT SEA

SEA.AI

NOW YOU SEE.

# Now you see.

SEA.AI alerts crews early and reliably about objects on the surface of the water.

Using latest camera technology in combination with artificial intelligence, SEA.AI detects and classifies objects, including those that escape conventional systems such as Radar or AIS – floating objects, rafts, buoys, boats without AIS and persons overboard.

# PIONEERING TECHNOLOGY FOR MARITIME SAFETY

## BOOST SITUATIONAL AWARENESS

Intelligent, untiring 24-hour multi-purpose lookout with intelligent alarm functions, displaying safety-relevant information in an easy-to-understand way.

## SEE BETTER THAN THE HUMAN EYE

Detection, identification and monitoring of floating obstacles of any size and kind, by day and night even in the most adverse conditions.

## MAKE BETTER-INFORMED DECISIONS

On-board cameras with integrated image processing and an intuitive interface provide a complete under-standing of the vessel's surroundings on water.
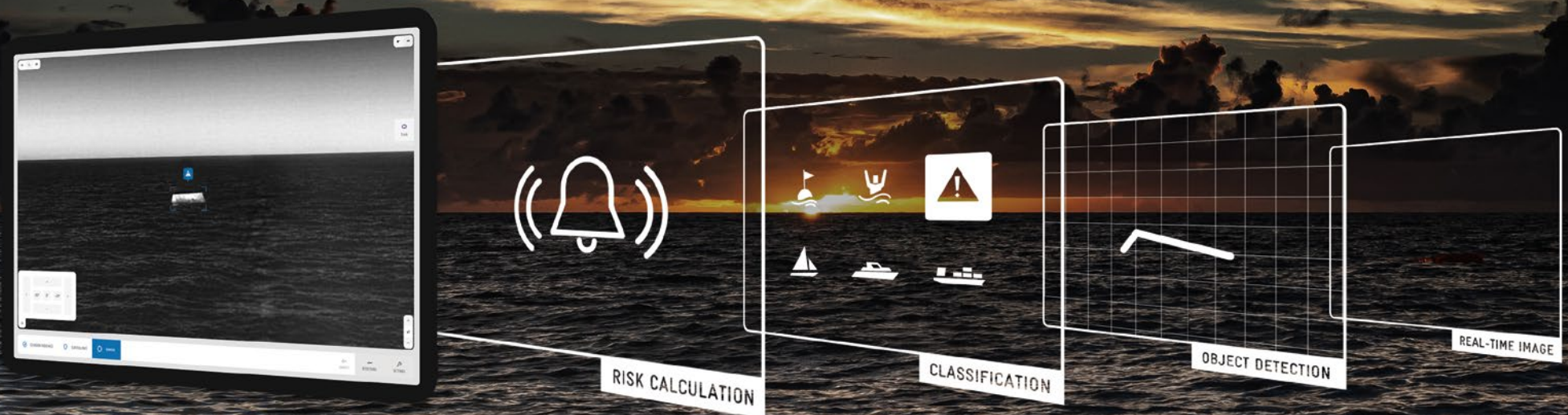
# SEA.AI BRIDGES AWARENESS GAPS

| SEA.AI vs. conventional assistance systems | AIS | RADAR | SEA.AI |
|---|---|---|---|
| Detecting land structures | – | ✓ | – |
| Detecting squalls / weather fronts | – | ✓ | – |
| Detecting ships / large boats | ✓ | ✓ | ✓ |
| Recognizing ships / large boats | ✓ | – | ✓ |
| Detecting small boats | – | – | ✓ |
| Recognizing small boats | – | – | ✓ |
| Detecting persons in water | – | – | ✓ |
| Detecting other floating obstacles | – | – | ✓ |

# How it works

SEA.AI computes input from low-light and thermal on-board cameras to paint a digital landscape of the vessel's surroundings.
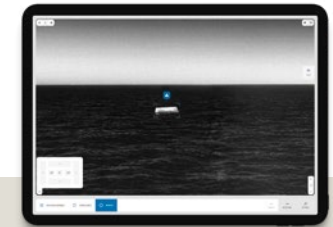
High-performance cameras record the sea non-stop from the vessel to the horizon in all directions. Artificial intelligence processes images in real-time, detects floating hazards and warns the crew.



FROM CAMERA INPUT TO ALERTS ON YOUR SCREEN

RISK CALCULATION

CLASSIFICATION

OBJECT DETECTION

REAL-TIME IMAGE

SEA.AI offers smart navigation assistance for advanced situational awareness – from direct camera input through real-time image processing to alarms on your screen.

## OBJECTS DATABASE

Built and exclusively owned by SEA.AI, our database is at the core of the ongoing training of the system's artificial intelligence.

✓ Over 10 million nautical miles on-water experience around the world

✓ Over 9 million marine objects identified

✓ Continuously gathering data for enhanced detection of objects

## CAMERA UNIT

Combination of high-resolution, low-light and thermal cameras with integrated image processors

✓ High resolution images day and night

✓ Detection of temperature differences up to 0.05°C

✓ Image stabilization at pixel-level accuracy

✓ Works stand-alone, no internet connection required

## ARTIFICIAL INTELLIGENCE

Integrated image processing software, developed and owned by SEA.AI

✓ Real-time processing of the camera stream

✓ Detection and tracking of objects through proprietary algorithms

✓ Iterative software, constantly gaining competence

ⓘ With every software update the object recognition becomes ever more performing

## SITUATIONAL AWARENESS

Control the system using the SEA.AI app on the vessel's onboard multifunction displays, computers or on tablets

✓ Augmented reality video stream

✓ Intelligent alarm-based at threat level

✓ Intuitive design

SEA.AI ⊟⊟

# The future
# on open water

We pioneered the first, maritime AI–driven
anti–collision camera sensor in 2018.

AIS, radar and sonar are pillars of maritime
technology. SEA.AI goes further. It takes a bold leap
forward with the first AI–powered lookout system. No
longer confined to traditional methods, our innovation
transcends boundaries, ushering in a new era
where human and artificial intelligence collaborate
seamlessly on the bridge.

As marine mobility continues its digital
transformation, collaboration between human and
machine will play an increasingly vital role. We are a
pivotal contributor to ongoing innovation in seafaring
through artificial intelligence and machine learning.
With a proven track record, we are at the forefront of
shaping the future of maritime technology.

"Engineers know there is a solution to every
problem. On deck it's impossible to be 100%
alert 100% of the time. The sea doesn't
forgive. SEA.AI gives me peace of mind that
I will be warned of any obstacle."

Raphael Biancale
SEA.AI Founder

SEA.AI

SEA.AI compatibility
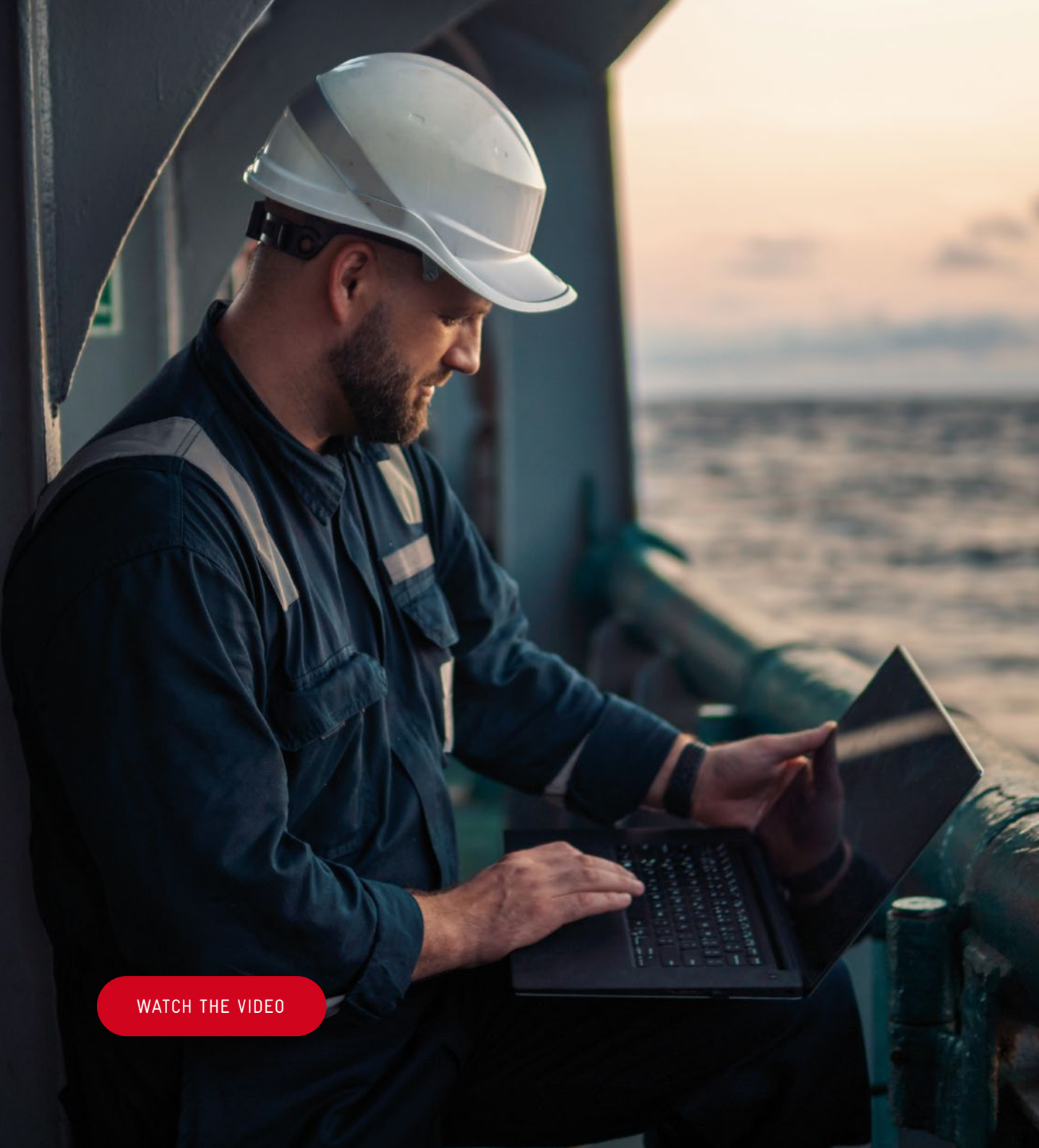
macOS     iOS     Microsoft     Android

B&G          FURUNO          GARMIN

Raymarine          SIMRAD
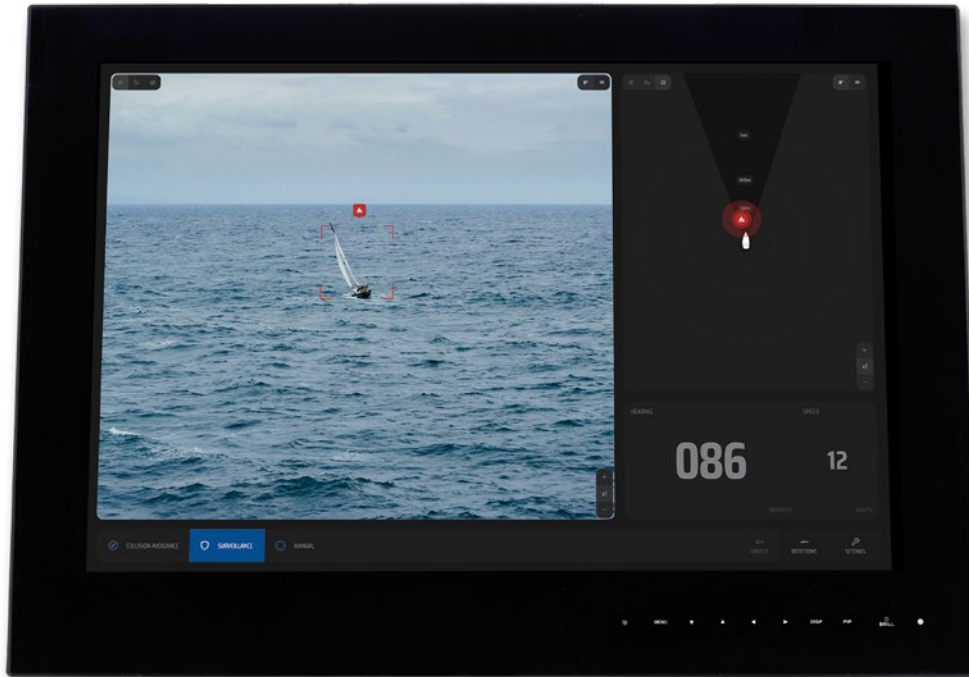
Established partners in more than 60 countries

# Always on deck

Safe operations on repair missions, offshore platforms and any sea operation. SEA.AI aboard work boats and crew-transfer vessels supports safety, avoids collisions, detects persons overboard and monitors 360°.

Safety is goal one. SEA.AI enhances situational awareness with intelligent object detection, day and night under any condition.

## FEATURES

✓ Works day and night

✓ Object detection from nearfield to horizon

✓ Highly-intuitive interface with 3 viewing modes. Daylight view, thermal view, map view

✓ 3 operation modes including manual control with 8x zoom, 360° panning and +/- 20° tilt

✓ Detection of persons, buoys and small objects in water up to 700m

✓ Detection of dinghies, RIBs, inflatables up to 3,000m

✓ Detection of motorboats and sailboats up to 7,500m

✓ Stand-alone solution

✓ Compatible with computers, iPads and MFDs that support HDMI input

✓ Constantly gaining performance with each software update

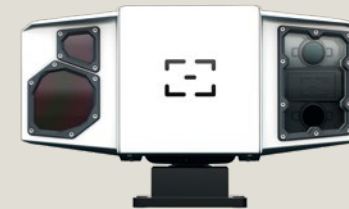System alarms

360° perimeter monitoring

Range of detected objects

## Protect the safety of crews, passengers and entire fleets

✓ See always what's in the vessel's path. SEA.AI detects objects in light and pitch-black

✓ Alert the crew. Long distance detection ranges inform the crew early for immediate action

✓ Stand-alone system, performing 24/7. Smart lookout with high-performance thermal cameras and intelligent object detection

## PRODUCT RECOMMENDATION

SEA.AI SENTRY
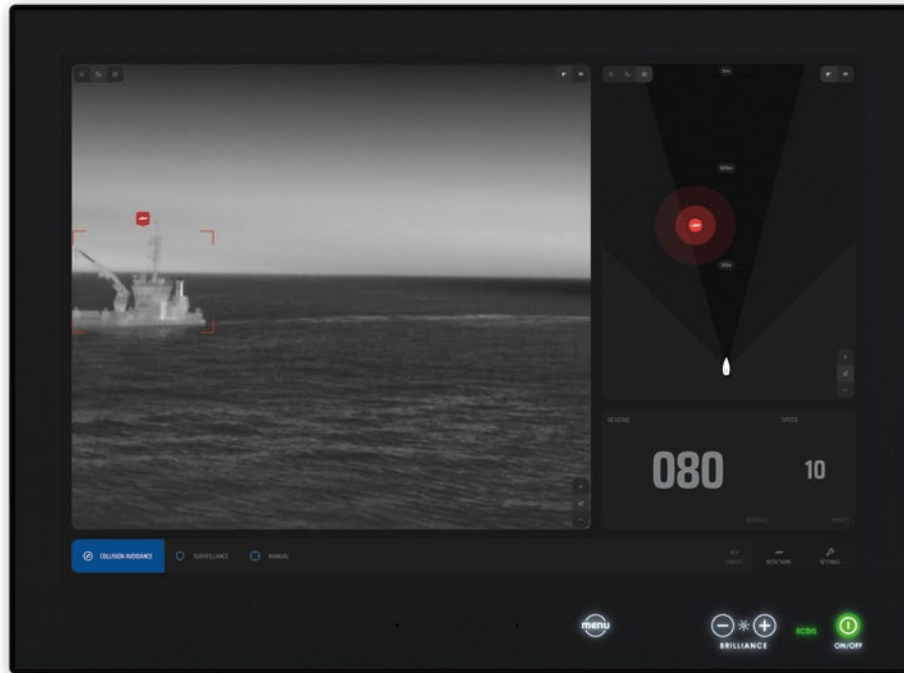
The anti-collision alert system for work boats

# Safer navigation in bustling waters

Unlocking enhanced situational awareness is the cornerstone of safe navigation for shipping around the globe.

SEA.AI systems are engineered to seamlessly bridge awareness gaps on maps and minimize the ever-increasing risk of unexpected encounters with small boats without AIS that can seemingly vanish from the bridge's view.

GET IN TOUCH

## FEATURES

✓ Object detection from nearfield to horizon

✓ Works day and night

✓ Person in water detection up to 700m

✓ Individual alarm settings

✓ Highly-intuitive interface with 3 viewing modes. Daylight view, thermal view, map view

✓ 360° field of view by night and day

✓ High-detection frequency

✓ Stand-alone solution

✓ Compatible with computers, iPads and MFDs that support HDMI input

✓ Constantly gaining performance with each software update

System alarms
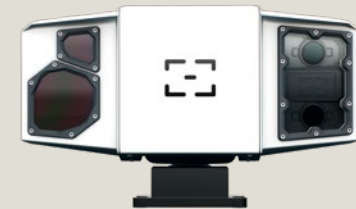
360° perimeter monitoring

Range of detected objects

# Enhanced safety around cargo vessels with SEA.AI, an AI-enabled anti-collision system for implementation on ships of any size

✓ **See what's in the vessel's path.** The system can be installed on any spot of the vessel to accommodate the best line of sight

✓ **Intelligent alarms to alert the crew.** Integrated alarm functions allow crew to act immediately and avoid collisions

✓ **Stand-alone system**

## PRODUCT RECOMMENDATION

**SEA.AI SENTRY**

**The anti-collision alert system for cargo ships**

# Life-saving support

SEA.AI is the first system to detect persons in water. Whether night or otherwise challenging conditions. SEA.AI's built-in thermal cameras precisely detect objects by temperature differences as small as 0.05°C.

Meticulously designed to bridge awareness gaps left by unsignalling objects effectively bypassing AIS and radar signals, SEA.AI supports efficient rescue and surveillance missions. SEA.AI equips crews with a comprehensive view from a secure vantage point, day and night, allowing for ideal operational speed with unwavering confidence.

GET IN TOUCH

## FEATURES

✓ Object detection from nearfield to horizon

✓ Works day and night

✓ Person in water detection up to 700m

✓ Automated object tracking

✓ Manual control with 360° panning, +/- 20° tilt and 8x zoom

✓ Highly intuitive interface with 3 viewing modes. Daylight view, thermal view, map view

✓ High detection frequency

✓ Image stabilization

✓ Stand-alone solution

✓ Runs simultaneously on multiple devices, compatible with computers, iPads and MFDs that support HDMI input

✓ Constantly gaining performance with each software update

Detect persons overboard

System alarms

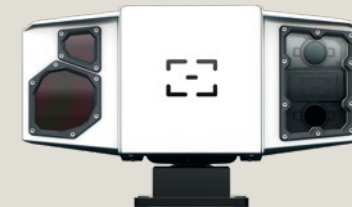360° perimeter monitoring

Range of detected objects

## Enhance operational safety and efficiency with AI-powered detection of objects and persons overboard

✓ **Detect humans and animals.** Enabled by AI-driven thermal image processing, with powerful detection ability day and night, when human eyes face limitations

✓ **Target tracking.** Use the system's object tracking mode for rescue

✓ **Crew alerts.** Alarm alerts when attention is diverted to rescue activities

✓ **Stand-alone system.** Autonomous

## PRODUCT RECOMMENDATION

**SEA.AI SENTRY**

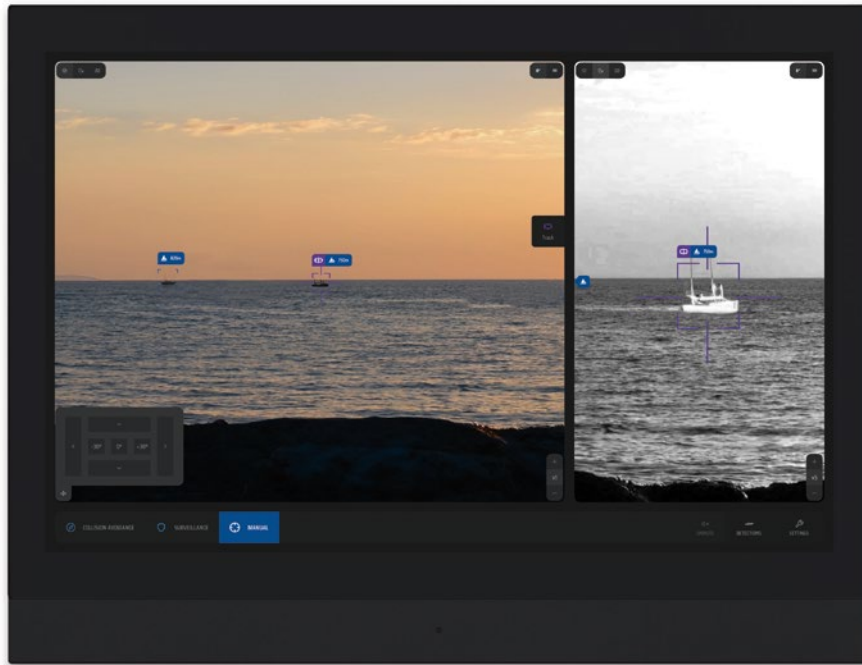**The first choice for SAR and institutions with coastal monitoring and life-saving duties.**

# Detect, act, protect

Safeguarding sensitive waters and coastlines, overseeing restricted sea and lake zones or protecting offshore platforms and installations. SEA.AI systems are designed to vigilantly monitor high-risk areas 24/7, using our proprietary AI technology that commands unparalleled object detection day and night.

Heightened protection through situational awareness with machine vision technology. SEA.AI systems detect objects with unmatched accuracy and immediately alert responsible personnel, enabling swift and decisive action.

GET IN TOUCH

## FEATURES

✓ Automated surveillance mode with smart alarms

✓ Automated object tracking

✓ Manual control with 360° panning, +/- 20° tilt and 8x zoom

✓ Detection of small objects and persons in water up to 700m

✓ Detection of dinghies, RIBs, inflatables up to 3,000m

✓ Detection of motorboats and sailboats up to 7,500m

✓ Runs simultaneously on multiple devices

✓ Working on all browser-based systems, ready for integration into control room via API

✓ Constantly gaining performance with each software update

System alarms

360° perimeter monitoring

Range of detected objects

## Employ SEA.AI as additional safeguard in remote monitoring settings

✓ Environmental Monitoring

✓ Offshore Infrastructure Monitoring

✓ Maritime Security

## PRODUCT RECOMMENDATION

**SEA.AI SENTRY**

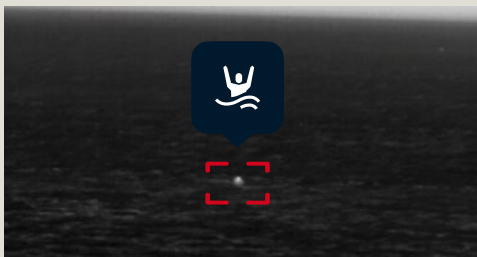**The first choice for maritime monitoring.**

# SEA.AI SENTRY

Superior 360° situational awareness for motor yachts and surveilled maritime areas – day and night. Comprehensive optical and thermal camera setup, complemented with a powerful processing unit.
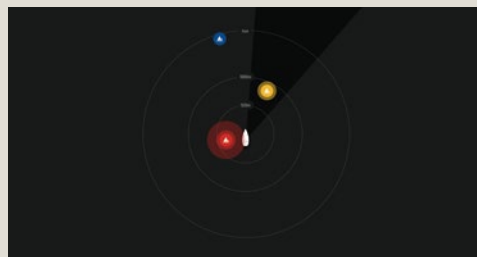
AWARD WINNER 2021 / INNOVATION AWARDS

## TARGET TRACKING

Keep selected object center-screen, e.g. monitoring a person overboard or tracking a tender.

## PERIMETER SURVEILLANCE

360° scanning of the surroundings on water. Intelligent alerts of approaching objects entering a selected perimeter.

## MANUAL CONTROL

Investigate areas and objects of interest using 8x electronic zoom.

ZOOM 8X

## COLLISION AVOIDANCE

Forward panning. Intelligent alarm alerts of impending collision risk with objects in the vessel's path.

| MODEL FEATURES | SENTRY |
|---|---|
| DETECTION ANGLE DAYLIGHT & TWILIGHT | 360° |
| DETECTION ANGLE NIGHT | 360° |
| DETECTION FREQUENCY | 10/sec |
| RESOLUTION | 2x thermal: 640 x 512 px<br>2x low-light: 2592 x 1944 px |
| IMAGE STABILIZATION | yes (gyro + digital) |
| PAN | 360° |
| TILT | +/- 20° |
| WEIGHT | 5.4 kg |



## DETECT PERSONS OVERBOARD

Built-in thermal cameras measure temperature differences as small as 0.05°C for detection of persons overboard.

## DETECTION RANGES

Detection range varies depending on weather conditions.

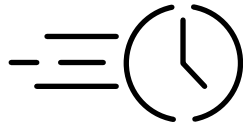| | up to 700 m | up to 3,000 m | up to 7,500 m | horizon |
|---|---|---|---|---|
| | BUOY, PERSON IN WATER, ETC. | DINGHY, RIB, INFLATABLE | MOTORBOAT, SAILBOAT | LARGE VESSEL |

## INSTALLATION SUPPORT

For professional installation of SEA.AI units and ongoing support, please find your nearest dealer on www.sea.ai

## UPDATES AND PERFORMANCE IMPROVEMENTS

SEA.AI detection excellence draws from an ever-growing database and updated algorithms. Regular software updates constantly enhance the system.

## REMOTE SOFTWARE SERVICE SUPPORT

Remote support wherever your SEA.AI system is headed or stationed – including the most remote corners of the planet.

SEA.AI

Find us on

www.sea.ai