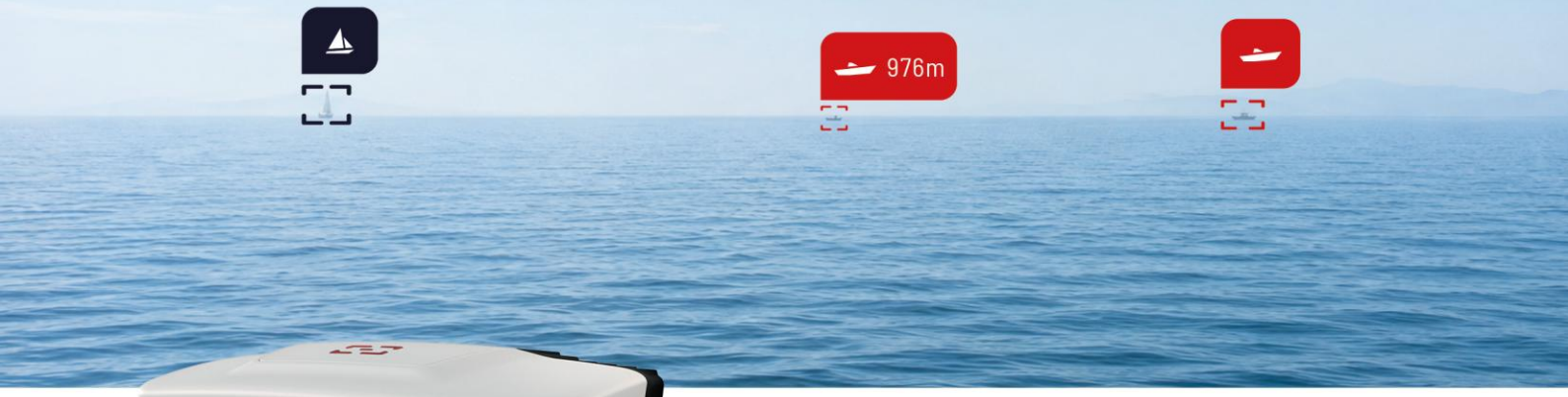
SEA.AI

MACHINE VISION FOR SAFETY & SECURITY AT SEA





WATCHKEEPER
SAILING SERIES

WATCHKEEPER combines thermal and daylight imaging with onboard AI to detect and classify boats, people and objects on the water in real time. Compact, solid state and drawing under 27W, it supports safer watchkeeping during coastal cruising, offshore passages and anchoring. Designed for sailing yachts and multihulls, it helps the crew maintain awareness when visibility, fatigue or busy waters make lookout more demanding.





Watchkeeper Detects

- Boats, RIBs and small craft that may present a collision risk
- Buoys, navigation marks and other small surface targets
- People in the water and marine mammals
- Vessels not transmitting AIS
- Growlers, floating debris and semi submerged obstacles

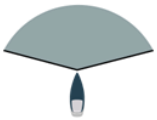
Key Capabilities

- Real time detection and classification of boats, people and floating obstacles
- Daylight and thermal imaging for safe navigation on the water
- Supports the crew during coastal cruising, offshore passages and anchoring
- Alerts help to maintain a safer watch, integrated in most common MFDs
- Compact, low power design suited to sailing yachts and multihulls

Product Specification SEA.AI Watchkeeper for Sailing Yachts

Fixed-mount AI camera system for situational awareness and safe navigation — Watchkeeper 1024S / 640S / 320S / Lite.

IMAGING SENSORS

Parameter	WK 1024S	WK 640S	WK 320S	WK Lite
				
Thermal (IR) Sensors	2× LWIR 2×512×640 (=1024x640)	1× LWIR 640×512	1× LWIR 320×256	–
NEDT	≤ 30 mK			–
IR FoV (H×V)	50° × 34° (2×14 mm)	50° × 40° (8.7 mm)	34° × 25° (6.3 mm)	–
EO Sensor	4K low-light HDR at 3840×2160			
EO FoV (H×V)	130° × 65°			

DETECTION RANGE PERFORMANCE

Type of Object	WK 1024S	WK 640S	WK 320S	WK Lite
Large Vessel	up to horizon	up to horizon	up to horizon	up to horizon
Motorboat, Sailboat	up to 2,000 m	up to 1,200 m	up to 900 m	up to 900 m
Dinghy, RIB, Inflatable	up to 750 m	up to 460 m	up to 350 m	up to 350 m
Buoy / Person in Water	up to 170 m	up to 100 m	up to 80 m	up to 65 m

Detection ranges are based on optical sensor performance under ideal conditions. Actual detection range depends on environmental conditions — weather, sea state, visibility and target contrast. [1] WK Lite has no thermal sensor — RGB daylight detection only.

SYSTEM SPECIFICATIONS

Parameter	All Watchkeeper Motor models
IMU	9 DoF — heading, pitch, roll, acceleration
Digital Stabilization	IR + EO — high-frequency vibration & shock compensation
AI Processing	NVIDIA® Jetson Orin NX — 1024-core Ampere™ GPU, 6-core ARM® Cortex®-A78AE (v8.2)
AI Detection Rate	Thermal and EO — 8 FPS
Object Classes	Unknown Hazard, Vessel, Motorboat, Sailing boat, Buoy, MOB
Passive Ranging	Camera-only distance estimation — no active emitter (SEA.AI Patent)
Pan / Tilt	Fixed mount - digital pan function

AI detection requires an active AI Subscription. Check sea.ai for subscription options.

MECHANICAL & ELECTRICAL

Parameter	WK 1024S	WK 640S	WK 320S	WK Lite
Dimensions	110 × 163 × 86 mm			
Weight	1023 g	975 g	951 g	935 g
Power Supply	12–36 V DC*, 29.3 W max			
Temperature Rating	–25 °C to +55 °C (operating) +70 °C (storage) IEC 60945			
IP Rating	IP67 (IEC 60529)			
Shock Resistance	Tested per MIL-STD-810H, Method 516.8 — half-sine 20 G, 23 ms, 3 shocks/direction, 6 directions (X/-X/Y/-Y/Z/-Z)			
Connectivity	Ethernet, GPS, LTE			

*Minimal power supply voltage depends on mast-cable length. 24V DC for >20m; 36V DC >70m

Parameter	All Watchkeeper Motor models
EMC Directive	EU 2014/30/EU — Electromagnetic Compatibility
EMC Emissions & Immunity	EN 60945:2002 (Maritime navigation & radiocommunication equipment)
RoHS	2011/65/EU — Restriction of Hazardous Substances
CE Declaration	SEA.AI GmbH — DoC Watchkeeper_V1, 10 July 2025
Interfaces	Ethernet | NMEA 2000 via ShipModule-3e-N2K
API: Video & Data Output	Standard API & Extended API | RTSP video (H.264/H.265) | WebSocket image stream | WebRTC | TTM/TLL target output (Ethernet)