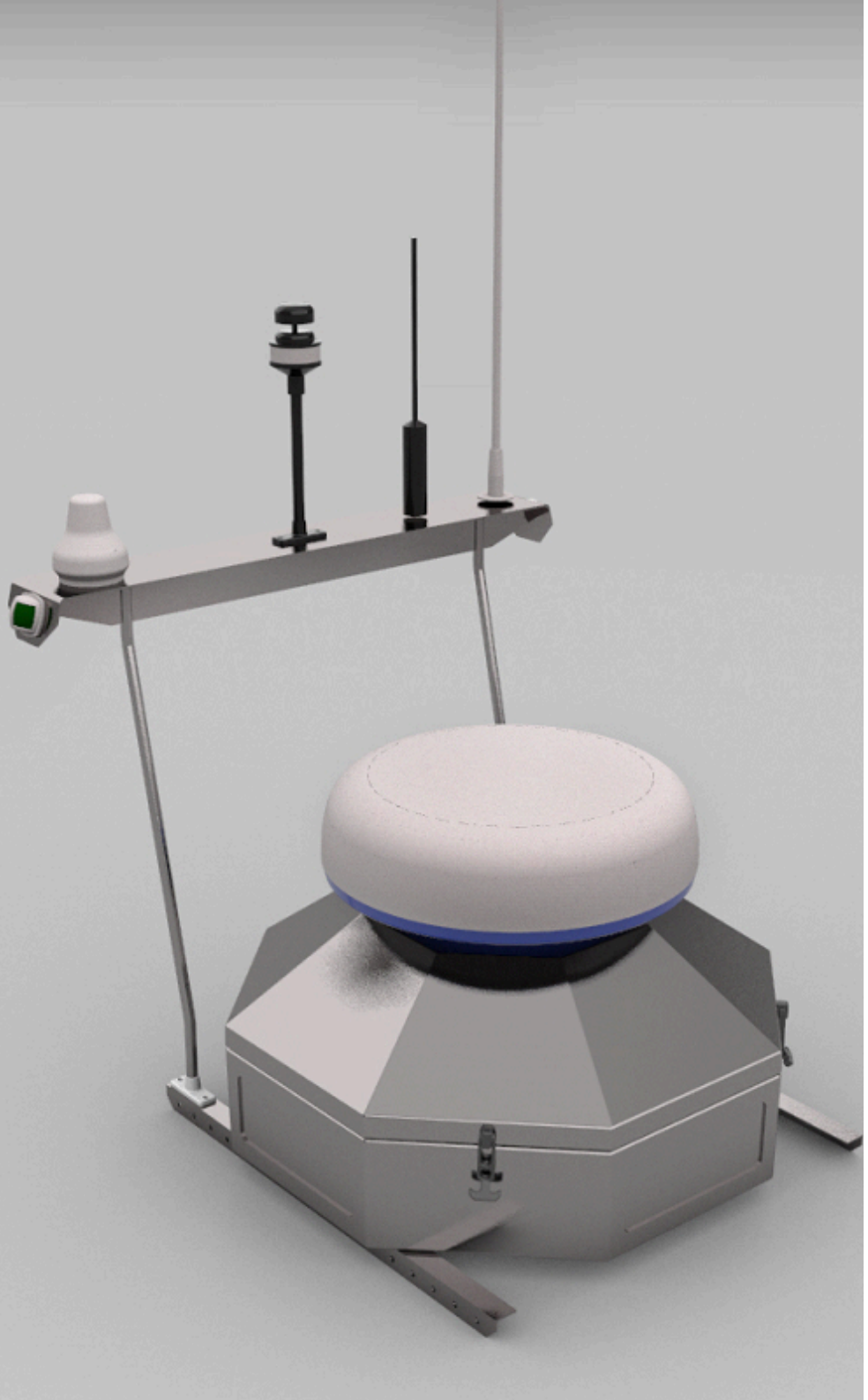

MindChip

Artificial Captain

Intelligent Navigation & Situational Awareness for Autonomous and Manned Vessels

MindChip provides modular control and autonomy solutions for unmanned and remotely operated vessels. The Artificial Captain product family enables customers to start with reliable remote operation with MindChip **Remote Pilot** and upgrade seamlessly to full autonomous capability with MindChip **Full Autonomy** as operational needs grow. By integrating radar, AIS, and camera data, it detects and tracks objects with precision, ensuring safe navigation.

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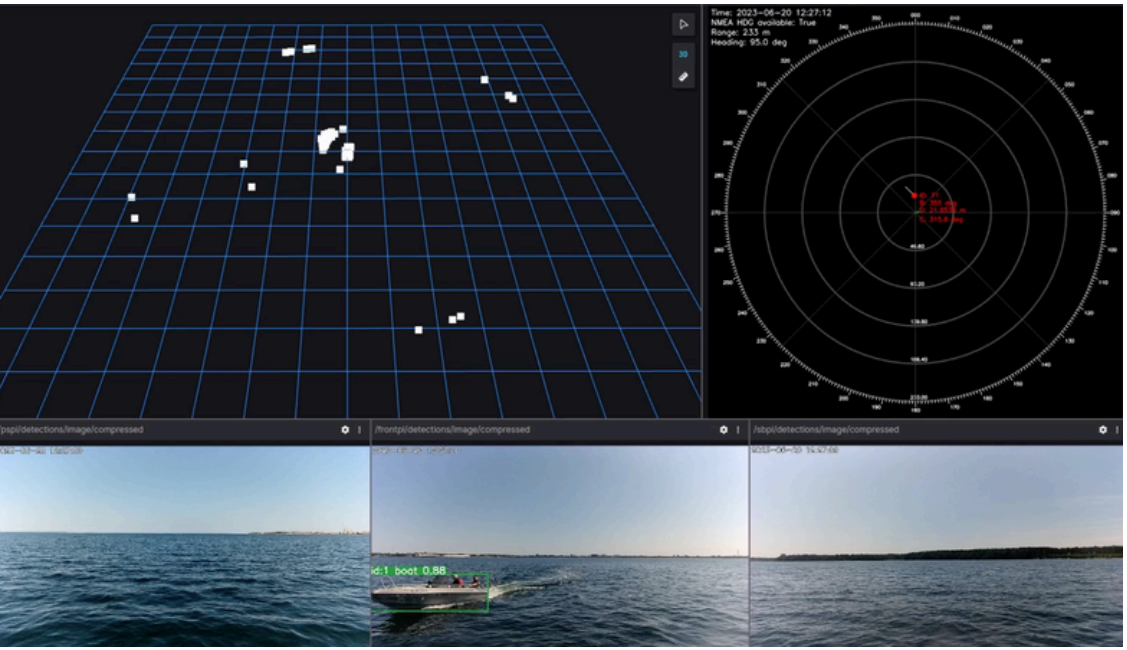


Situational Awareness

Available in Full Autonomy

Baseline capability achieved through sensor fusion of:

- X-band Radar (up to 36 nm range)
- Machine Vision
- mmWave Radar (up to 100 m range)
- AIS (class B)

Provides reliable detection of surrounding vessels and obstacles in standard operational conditions

Optional extended capability through advanced sensorics for complex environments and low-visibility conditions.

MindChip

Obstacle Avoidance

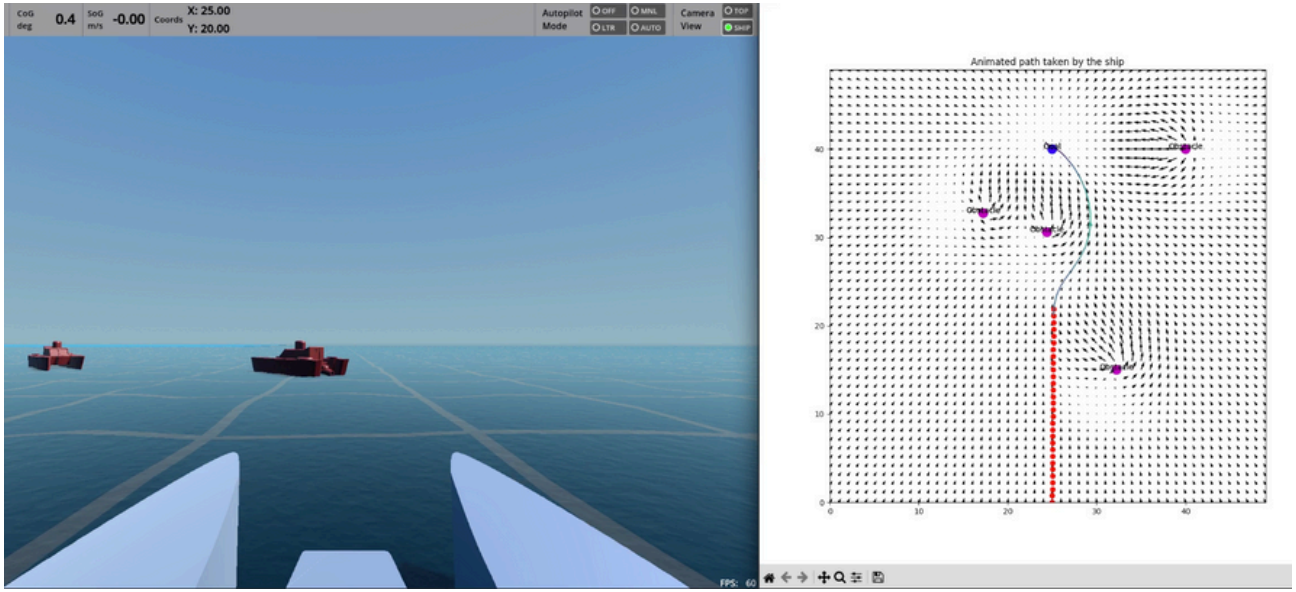
Available in Full Autonomy

Utilizes situational awareness data to:

- Autonomously detect obstacles
- Execute collision avoidance manoeuvers

Designed to comply with COLREG requirements

- Rules 13 to 17



Over-the-Horizon Control

Available in Remote Pilot & Full Autonomy

The MindChip web-based user interface provides real-time situational awareness through fused data from digital charts, AIS, radar, and EO/IR sensors, combined with live telemetry, comprehensive vessel diagnostics, and continuous fault monitoring. Designed for operational flexibility, it supports multi-screen configurations and immersive 360° live camera streaming.

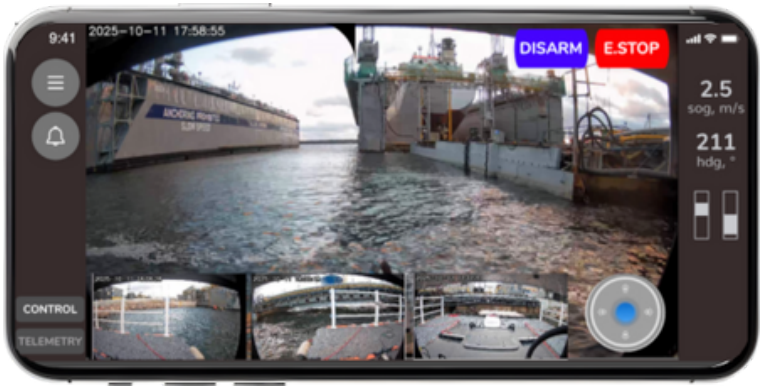
The platform enables advanced mission management, including patrol operations, precise waypoint navigation, and rapid mission tasking. Operators can seamlessly control payloads and auxiliary onboard systems from a single, unified interface.

MindChip

Portable Control

Available in Remote Pilot & Full Autonomy

The operator can control the robotic vessel using a mobile- or tablet-based application, which enables remote vessel control via an on-screen joystick, while simultaneously maintaining real-time situational awareness through live camera streams of the vessel's surroundings. Application is available for both iOS and Android operating systems.



Artificial Captain Product Family

Remote Pilot

Enables remote vessel operation with autopilot, mission management, live video, telemetry, and redundant communications. The vessel follows waypoints autonomously, but situational awareness, obstacle avoidance, and collision avoidance remain the responsibility of the remote operator.

- Dimensions: 30 x 25 x 15 cm
- Weight: 10 kg
- 12 V power
- IP 65 housing

Full Autonomy

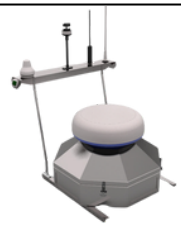
In addition to Remote Pilot functionality, Full Autonomy provides onboard perception, sensor fusion, autonomous decision-making, collision avoidance, and safe operation during degraded or lost communications. The vessel can independently assess the environment, plan trajectories, and execute manoeuvres according to COLREG rules.

- Support for list of various advanced situational awareness sensors
- Dimensions and weight depend on selected sensor set
- 12 V power
- IP 65 housing

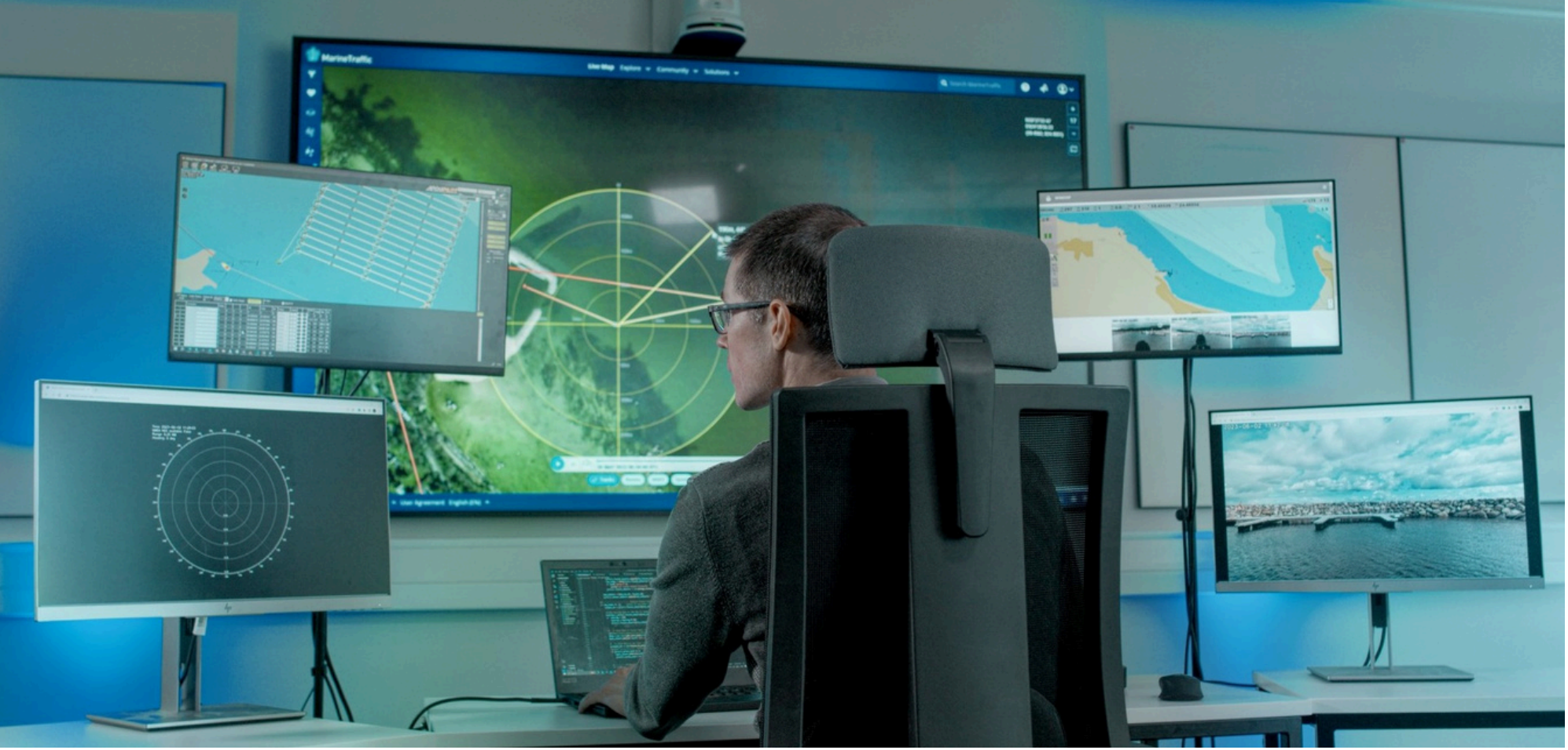
MindChip

Feature	Remote Pilot	Full Autonomy
Autonomy Level		
IMO Degree Level	3	4
Communication Dependeny	Continuous operator communication required	Can operate safely with limited or lost communication
Navigation & Motion Control		
Triple IMU	Included	Included
Compass	Included	Included
GNSS-based Navigation	Waypoint navigation and mission execution	Adaptive waypoint navigation and mission execution
Mission Management	Included	Included
Anti-jam GNSS System	Optional	Optional
Situational Awareness & Perception		
360° Camera View	Included	Included
Situational Awareness	Operator responsibility via 360° view cameras	Automatic (based on sensor fusion)
AIS, Class B	x	Included
X-Band Marine Radar	x	Included
Machine Vision	x	Included
Obstacle Detection	Operator responsibility	Automatic

Feature	Remote Pilot	Full Autonomy
Decision-making & Safety		
Collision Avoidance	Operator responsibility	Automatic
Fail-Safe & Emergency Behaviour	Operator-defined procedures, auto stop on communication loss	Autonomy safe-state and return-to-home behaviour
Operator Control & User Interface		
Web-based UI	Included	Included
Rugged Tablet-based UI	Included	Included
Real-time Vessel Telemetry and Payload Control	Included	Included
Communication & Connectivity		
4G with Dual SIM	Included	Included
Local Radio (2.4 GHz, 500m LoS)	Included	Included
Starlink Satellite Comms	Optional	Optional
VHF Radio, Mirrored	Optional	Optional



MindChip



MindChip

General Specification

- Rugged housing suitable for marine environments, IP65
- Modular extensible system architecture
- Integration options with CAN bus, NMEA, MAVLink, ROS and MindChip REST / WebSocket APIs
- MindChip Cloud or on-premises installation

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