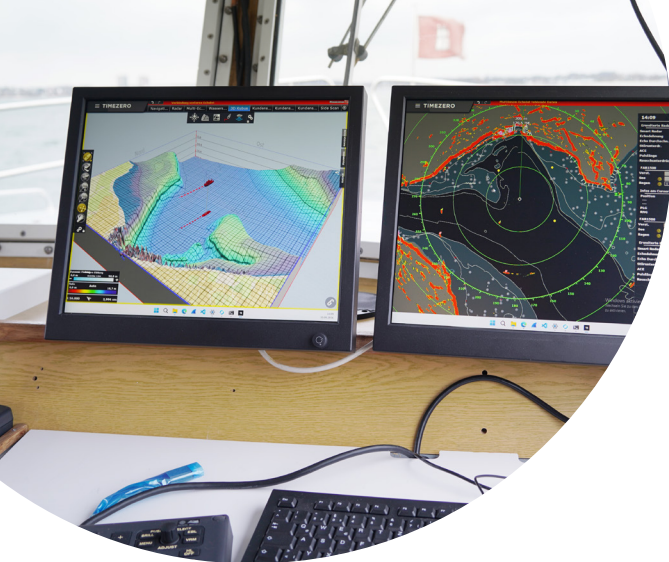




The Vektor's working deck, equipped with state-of-the-art sensors and technology for maritime research missions.

Technical Specifications and Features

Vessel Data

- Length approx. 12.50 meters
- Width approx. 4.10 meters
- Engine power > 400 hp
- Seaworthy special hull for stable operations

Capacity & Workstations

- A total of seven research workstations
 - Three on the bridge, four below deck

Research & Lifting Technology

- Lowerable stern with integrated crane
 - Lifting capacity: up to 250 kg
- Suitable for, among other things:
 - Underwater robots
 - Multibeam sonar systems
- Large work deck for materials and equipment
- Nautical systems similar to those on a cargo ship
- Night-ready with a powerful searchlight

Working for You – The Key Benefits of the Vektor at a Glance

- A mobile and flexible research platform for maritime testing, measurement campaigns, and scientific studies conducted directly in the relevant operational area
- Opportunity to test and further develop new technologies, systems, and processes under real-world maritime conditions
- Conducting test runs, validations, and data collection in inland and coastal waters
- Flexible integration of research and demonstration projects in the fields of sensor technology, automation, navigation, and maritime digitalization
- Provision and processing of measurement, environmental, and operational data for analysis, evaluation, and scientific use

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The latest technologies for more digitalization and safety on board

Research Vessel Vektor

The Research Vessel Vektor as a Maritime Test Platform

The Vektor is a versatile research vessel designed for maritime innovation. It serves as a mobile platform for sensor technology, drones, and AI-powered analytics to enhance the safety, efficiency, and resilience of critical infrastructure.

Platform for Research and Development

The Vektor is undergoing continuous technical upgrades to serve as a flexible test and development platform. Additional installations for modern communication and navigation technologies are planned. A particular focus is on the development and testing of autonomous maritime systems.

In addition, the ship serves as a central platform for the deployment of surface and underwater drones, as well as for data collection via a wide variety of sensor systems. Fraunhofer CML uses this infrastructure to test innovative solutions under real-world conditions in collaboration with industry partners.

Mobile Sensors for Safe Maritime Routes

Mobile sensor platforms on land, known as “Cells on Wheels,” are a key component of the research. These contribute to the safety of maritime traffic in the North Sea and the Baltic Sea—two of Europe’s busiest shipping regions. They collect traffic data in compliance with strict data protection regulations and enable the early detection of potential hazards.

The sensors operate passively, emit no radiation, and do not interfere with the environment. Instead, they receive only technical signals for navigation and positioning, without processing any personal data. This provides a precise picture of the shipping situation.



Radar and vector technology for collecting traffic data and analyzing maritime safety systems.

Critical Infrastructure Protection: The DIEB Project

In the DIEB project, Vektor is being used to research new security solutions for critical maritime infrastructure. This includes LNG terminals, offshore wind farms, and submarine cables, which are increasingly becoming targets of cyberattacks, sabotage, and espionage.

The goal is to detect threats early, evaluate them automatically, and quickly notify relevant authorities. At the core of the project is a modular security situation overview that integrates various sensor data and evaluates it in real time using AI-supported analyses. In addition, a decision support and alerting system ensures the structured dissemination of information. Fraunhofer CML is responsible for technical management and is developing innovative methods for data integration, pattern recognition, and risk assessment. Field tests are conducted under realistic conditions—including with the Vektor itself.

Learn more about the
DIEB Project on the
Fraunhofer CML website:



The research vessel Vektor in action.

AI-powered Systems and the KIRMES Project

Another key focus is the KIRMES project, which is developing an AI-based security system for maritime infrastructure. This involves connecting mobile sensor platforms—both on land and at sea—into a flexible network. The collected data is aggregated and analyzed in real time to identify complex threats. Sensors such as radar, radio direction finders, AIS and ADS-B receivers, as well as systems for detecting GNSS jamming, provide the necessary information.

Combining this data creates a comprehensive situational picture that is continuously monitored for anomalies using artificial intelligence. The results are presented clearly so that decision-makers can respond quickly and effectively.

Learn more about the
KIRMES Project on the
Fraunhofer CML website:



Future Prospects for Maritime Security

With its versatile capabilities and its role as a mobile research platform, the Vektor makes a significant contribution to the advancement of maritime technologies. It combines practical testing with scientific innovation and lays the foundation for safe, efficient, and resilient maritime infrastructure.