

K-CHIEF



VESSEL AUTOMATION SYSTEM

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- Installation friendly
- Reliable Operation
- Intuitive use
- Powerful control algorithms
- Built-in configuration system
- Approved for safety applications

Our latest generation K-Chief Automation System builds on 50 years of experience in making safe, reliable and user friendly automation systems focused on marine usage. K-Chief vessel automation offers the simplicity and robustness of our merchant range coupled with the flexibility of our offshore range ensuring a system suited for the challenging demands of shipyards, ship owners and professional users world wide.

K-Chief vessel automation system is fully integrated with other K-Line products enabling a unified user experience, open inter-communication and reduced cost of ownership.

Increased redundancy, performance and responsiveness, efficient operations and reduced maintenance are some of the other benefits.

The built-in configuration tools enables system modifications, expansions and upgrades throughout the life-time of the vessels.

Key features

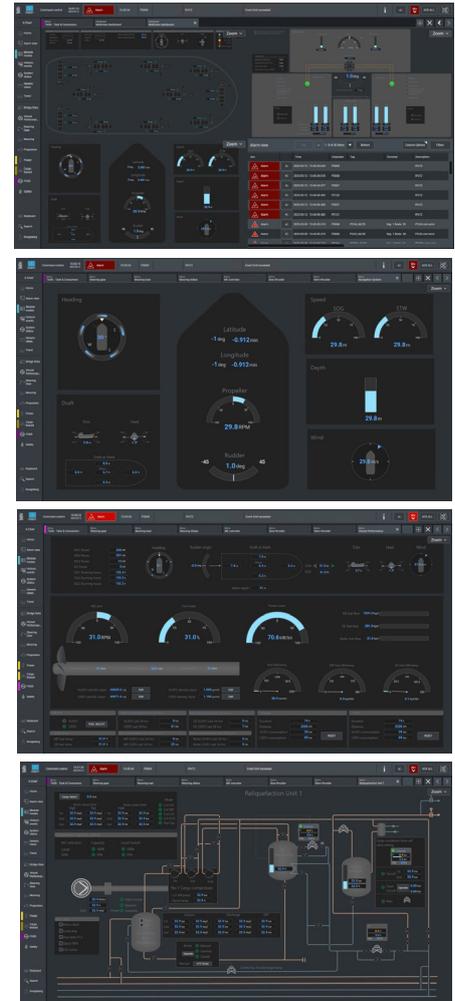
K-Chief offers cost effective standard solutions with the possibility of tailoring to individual requirements. Modular design allows flexibility in configuring the system, covering the whole range from low complexity alarm systems to highly integrated control and monitoring systems

The K-Chief system covers all important functions on-board avessel, and is configurable for all ship types, including oil/LPG/LNG tankers, bulk carriers, container ships, cruise and ferries, yachts, offshore vessels, drilling rigs and other special purpose vessels.

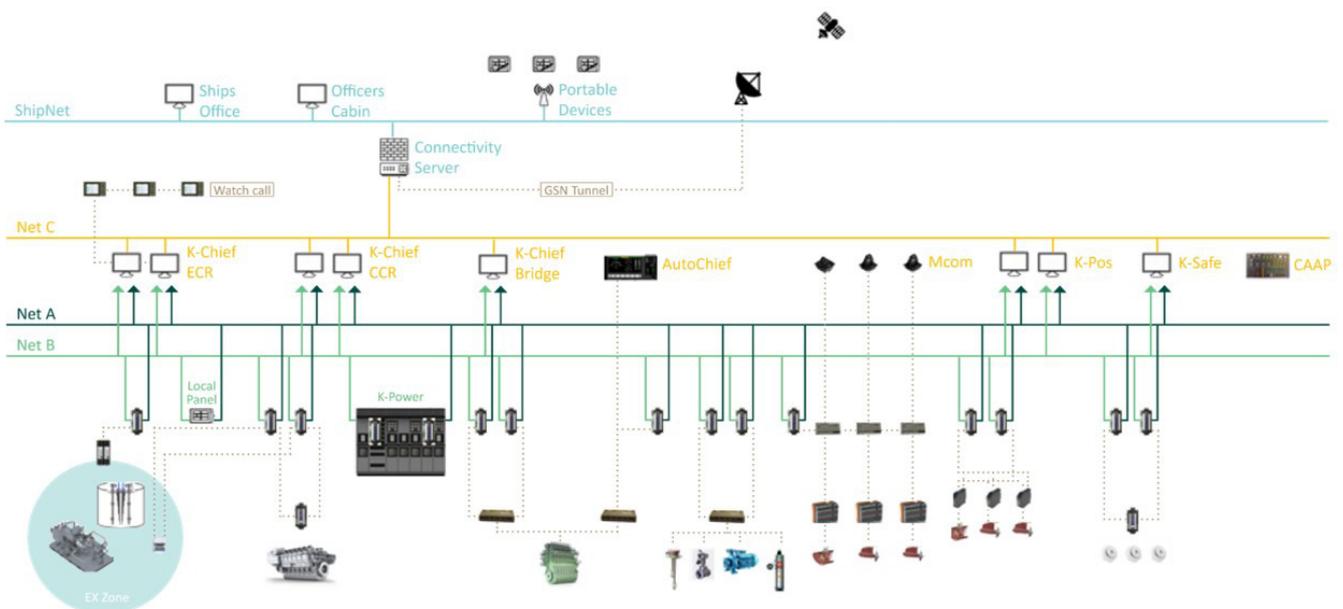
Typical sub-systems are:

- Alarm and monitoring system
- Power management system/Energy control system
- Propulsion and thruster control
- Auxiliary control system and ship service systems
- Gas management system
- Fuel gas control system
- Ballast control system
- Cargo control system
- Heating, Ventilation and Air Conditioning
- Fire monitoring and suppression system (K-Safe)
- Emergency Shutdown System (K-Safe)

The K-Chief complies with the requirements of IMO, local maritime authorities, IACS and holds type approval for major classification societies.



System topology



Common technology

The use of common technology in the Kongsberg portfolio has allowed us to develop modular products. The benefits of modularity are passed on to our customers through:

- Identical basic software platform in the K-Line systems
- Free flow of information between the K-Line systems (K-Chief, K-Safe, K-Power, K-Pos, K-Thrust, K-Bridge & K-Gauge)
- Well-proven solutions that focus on the complete vessel operation
- Operational consistency
- Reduced spare part and training requirements

The information management system may be integrated to K-Chief via the administrative network, allowing the user to define trend displays and create tailored reports.

System architecture

The K-Chief system architecture has a modular design, and builds on Operator Stations and I/O modules interconnected by local data networks. This allows us to meet individual ship owner's requirements using standard modules. Different selections of these units are used to configure each individual system.

The K-Chief is decentralized with redundant controllers for each segment for availability, but operation is centralized using the Operator Stations. Each I/O module has a specific role and is configured to match the operational requirements of the specific process area. Due to this flexible architecture, the K-Chief system can connect more I/O modules in the network later on. This may be done to control additional process areas, or to extend the functionality. Vendor's equipment, such as valve control systems, fire alarm systems and level gauging, can be interfaced on communication lines connected directly to the process network.

Operator stations

The Operator Stations are used to receive alarms and to allow monitoring and control of the system. They display status pages and interactive process diagrams. They also give access to the I/O Units for inspection of variables, operation of equipment and adjustment of parameters. Changing limits or parameters in one Operator Station will automatically update all other stations. All operator actions such as the starting or stopping of pumps or changing alarm limits, are logged and time tagged. Process views contain easy to read information about the engine and surrounding equipment. Control of different process plants and machinery is done directly from any Operator Station. Full monitoring and alarm facilities are provided in both the machinery space and in the control rooms. All changes in alarm and measuring points from the I/Os are logged and time stamped.

Data are stored in all Operator Stations for 28 days. They can be displayed in the Event and Trend history view. Extended logging of data is included in our information management system.



Optimised designs

- Shared technology
- Common hardware components
- Efficient access to spare parts
- Reduced need for on-board spare parts



Installation benefits

- Time-efficient commissioning and sea trial/testing
- Small modifications to main software required when adding new functions/sub-systems
- One point of contact/service engineer for the entire installation



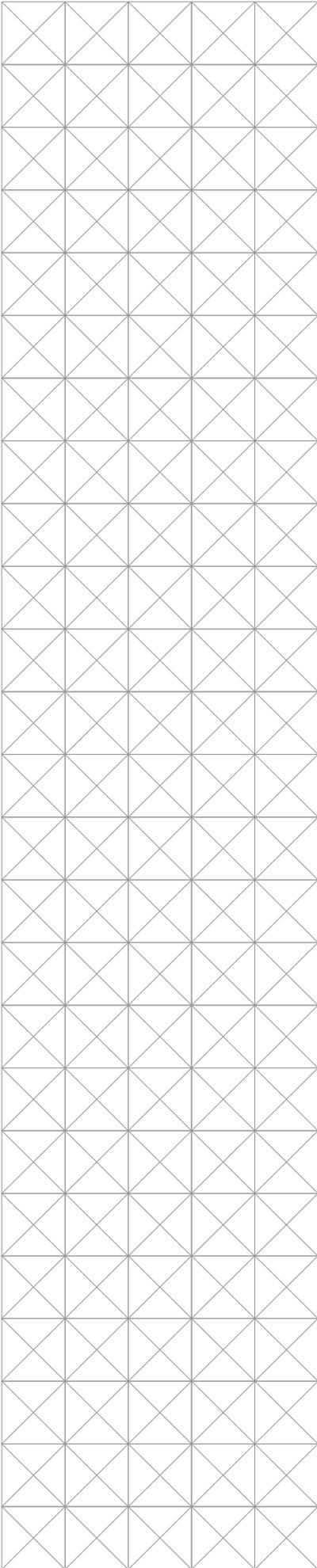
Ease of operations

- Common point of operation
- Reduced need for additional crew training due to common interface and uniformity across the system
- Simplified maintenance for crew through remote solutions (online SW update, remote support)



Economical outcomes

- All these reductions in time spent, maintenance, installation and training requirements generate significant economical benefits



Energy Control System

The K-Chief Automation System is tightly integrated with Kongsberg's K-Power solutions for AC and DC electric grids. Direct access to generator protection units, drives and converters ensure smooth and optimal control of the vessels electric plant.

Information management and remote connection

Through the information management system a wide variety of tools for operator efficiency are available, like the ability to monitor the system from crew cabins. Computers connected to the ship network are able to access the information management system to use a range of analysis tools to monitor vessel performance.

Historical storage of data, data export and powerful reporting tools are available.

The information management system allows for secure connection to the outside world for exchange of information with the shore organization and remote support from Kongsberg premises through a dedicated global secure network.



K-CHIEF TECHNICAL DATA

Scalable	10-50 000 IO points alarm & monitoring to advanced automated control.
Type approval	The K-Chief system is designed in accordance with the requirements of DNV, LRS, BV, GL, ABS, KR, and CCS.