

Marine automation system

Simple installation
Reliable operation
Easy to use



Experience

We installed the first computerized machinery automation system back in 1970. Since then we have accumulated 40 years of experience in manufacturing, installing commissioning and servicing systems all over the world. The K-Chief 600 marine automation system is designed to meet the challenging demands of shipyards and ship owners.

Key features

The K-Chief 600 offers cost effective solutions that can be tailored to individual requirements. Modular design allows flexibility in configuring the system to individual requirements, covering the whole range from low

complexity alarm systems to highly integrated control and monitoring systems.

Sub-systems can include:

- Alarm and monitoring system
- Auxiliary control system
- Power management system
- Propulsion control
- Ballast automation system
- Cargo control and monitoring
- HVAC (air conditioning)
- Fire system

The K-Chief 600 is based on Kongsberg's system technology, where each ship configuration is built up using standard modules, communicating through dual redundant process buses and

networks. The system is configurable for all ship types, including oil tankers, bulk carriers, container and Ro-Ro vessels, reefers and other special purpose vessels.

The main purpose of the system is to give ship's officers all the basic alarms and status information they require in order to maintain safe and efficient operation of the machinery, cargo system with auxiliaries and other relevant equipment.

The K-Chief 600 complies with the requirements of IMO, local maritime authorities, IACS and eleven classification societies. It is designed to meet the classification societies' requirements for periodically unmanned engine room operation.

Main Building Blocks

The main building blocks of the K-Chief 600 system are the Operator Stations, Watch Calling System, Distributed Processing Units and dual redundant process bus and network.

Operation



Operator Stations

The Operator Stations are used to receive alarms and to allow monitoring and control of the system. They can display interactive process diagrams, allow control of the Watch Calling System and print various logs. They give access to the Distributed Processing Units for inspection of variables, operation of equipment, adjustment of parameters etc.

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. When a variable or state changes significantly, the Distributed Processing Unit updates the database in each Operator Station.

All data displayed at any Operator Station is always up-to-date, and



the data traffic on the process bus and local area network is kept to a minimum, giving an extremely fast data access. Any alarm or event is time-tagged with a resolution of 10 ms.

Custom made process mimics 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.

The Panels

The K-Chief 600 operator interface consists of a standard monitor and two separate, dedicated operator panels, one standard and one optional.



The standard panel contains a trackball, numeric pad, buttons for alarm handling and command transfer.



The touch screen based panel is the optional panel. It presents soft-buttons for quick selection of available functional displays, process mimics and alarm lists on the monitor. An on-screen keyboard is also available on the touch screen panel.

Human Machine Interface

The K-chief 600 monitor images are user-friendly. Being similar to other Kongsberg systems, the operator will be familiar with the layout and the main functions. The custom made images have easy-to-read information about the system.

The top bar is located at the top area of the image, holding various function buttons, like split-screen and home. System status is also shown (for example Sea Mode). There are two alarm lines in the top bar, showing the two latest alarms and the number of unacknowledged alarms.

A new concept for navigation, the interactive title line navigation, is located right beneath the top bar. This is used by the operator to see where in the file structure he is located at the moment. Each title line has a drop down menu for more information.



This way of navigating makes it easier for the operator to get quick access to all views at all levels, and helps the operator to remember the system structure.

The split-screen function which is located as a soft-button in the top bar, makes it possible for the operator to view up to four images at a time. One of the four views is active. The active view is easy to detect due to its broader frame. The different views can be altered in size if the operator



prefers this. He/she can also use the zoom functionality in the different views. The split screen function is a brilliant help for the operator in switching between images in a fast and efficient manner. It also gives a flexible and good overview of the images.

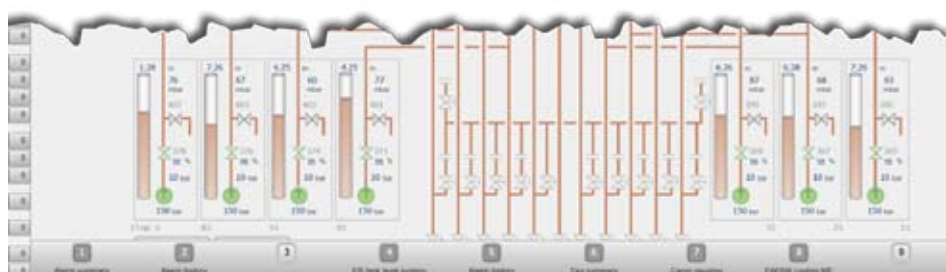
The alarm groups are clearly viewed on the left side of the image. This is a compact and expandable column with all the information the operator needs.

To make it efficient and easy to see where the alarm is residing in the mimic, the K-Chief 600 has a “go to mimic” function. By clicking on a soft-button next to the alarm status, a mimic image will be opened, and an interactive red circle will zoom in the area where the alarm belongs.

The K-Chief 600 system also includes context-sensitive help functionality. Help is accessed clicking the question mark in the dialogue boxes. The context-sensitive help provides easy and precise information about the requested topic.

Integration of third party equipment is a new and exciting feature. The operator can monitor the different equipment at the Operator Station. It is also possible to open the third party software through the K-Chief 600.

A function named “favourites” is found in the area at the bottom of the image. The operator can use favourites to decide which image he/she wants to have instantly available. After having saved favourites, the operator may also use the numeric keys at the Control Room Panel to open them.



Watch Calling System

The Watch Calling System indicates alarms on the bridge, in the cabins of the engineer and officer on duty, and in public quarters. The Watch Bridge and Watch Cabin Units are used to transfer watch responsibility to and from the bridge. Cargo watch can also be integrated in the Watch Calling System.



Midi Operator Stations

The Midi Operator Stations are used to give local access to the Distributed Processing Units.

Dual redundant process bus

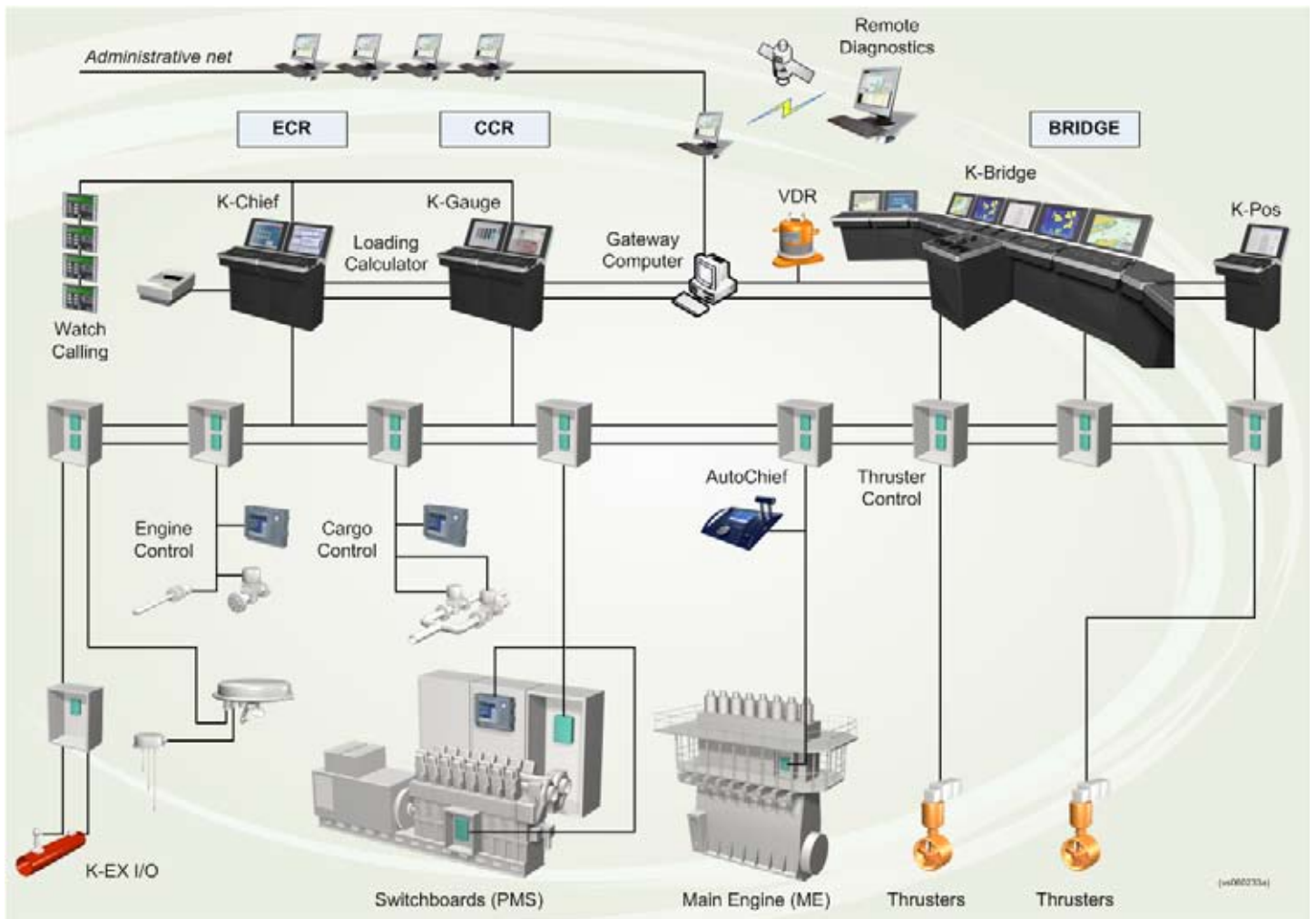
The dual redundant process bus utilizes CAN bus (Controller Area Network) technology. It is used for communication between the Distributed Processing Units. Each unit is connected to two completely separate buses for maximum redundancy.

Dual redundant process network

The dual redundant process network utilizes standard LAN (Local Area Network) or Ethernet technology. It is used for communication between the Operator Stations and other PC-based equipment. Each Operator Station is connected to two completely separate networks for maximum redundancy.

Distributed Processing Units

The Distributed Processing Units (DPU) are used to monitor analogue or digital sensors, and to provide analogue and digital output to other devices. A number of different Distributed Processing Units are available to meet specific control and monitoring applications.



System architecture

The heart of the system is our family of intelligent Distributed Processing Units. These communicate with each other on a redundant high capacity process bus. All monitoring and automation functions are carried out by the Distributed Processing Units, while the centralised Operator Stations provide the human machine interface.

To configure the tasks for a specific Distributed Processing Unit, parameters are loaded into the unit. This allows it to perform alarm functions, control functions, safety or any combination of these, and makes it easy to separate system functions.

The communication between Distributed Processing Units is done on the Controller Area Network (CAN) bus. The CAN bus has a very high reliability. If a unit fails, the power source, communication bus or sensors are not affected. Our Built In System Test (BIST) detects failures to the Distributed Processing Units, process bus, cabling and connected sensors. The operator will receive a warning on any fault detected.

The K-Gauge cargo, ballast control and monitoring system may be integrated via the dual redundant LAN network.

The FleetMaster information

management system may be integrated to K-Chief via the administrative network, allowing for user defined trend displays and tailored reports.

Vendor's equipment, as valve control systems, fire alarm systems and level gauging, can be interfaced on serial lines connected directly to the Operator Stations or via the process network.

Type approval

The K-Chief 600 system is designed in accordance with the requirements of DNV, LRS, BV, GL, RINA, NKK, ABS, KR, PRS, CRS (Croatia), MRS (Russia), ZC (China).

Note!

This datasheet is subject to change without prior notice.

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