

**Industry: Shipbuilding**

**Product: Modular controllers**

# Modular Automation for Inland Vessels

Most automation systems used in ships are still developed individually for each type of vessel, which makes them very inflexible. A new system that combines modular controllers with a new software solution designed specifically for ship operation opens up new possibilities for shipbuilders.

The Futura Carrier class is currently regarded as the most advanced line of inland waterway vessels in the world. Developed by New Logistics in Kiel, the Futura Carrier design concept is fully modular, making it possible to build bulk carriers, container carriers or tankers. Both the hull and the technical modules allow flexible variation for different sizes and cargo types. The modular design enables shipyards to build ships of this class without additional planning, development and project scheduling overheads. Other benefits compared to conventional inland vessels include significantly lower fuel consumption and very effective exhaust emissions purification systems.



Safety was also a top priority in the Futura Carrier design. The guidance systems and the displays and controls on the bridge all have a redundant architecture and the ship has a state-of-the-art alarm, monitoring and control system.

Automation systems on board Futura Carrier vessels are also modularised, just like the rest of the ship. Conventional automation systems for inland vessels are specially-developed specialised solutions for each ship type, with functions for energy distribution, machinery control and systems monitoring. The new control system solution is called "Incontrol" and it was developed by Claus-D. Christophel Mess- und Regeltechnik in Hamburg. The Christophel company, which was recently acquired by the German subsidiary of the Finnish ship engine and power plant manufacturer Wärtsilä Corporation in Helsinki, has over thirty years of experience in the field of ship engineering and automation.

Incontrol successfully integrates all the all the main ship operation functions in a single software package, which is combined with a modular controller system. The company opted for the MELSEC System Q automation platform from Mitsubishi Electric,

a high-performance modular controller system that can integrate up to four CPU modules for different functions on a single backplane. Two of these controller systems are installed on each Futura Carrier vessel to provide the failsafe redundancy needed for maximum reliability. The two systems are connected by a redundant MELSECNET/H network system from Mitsubishi Electric, using fibre-optics cabling. Other Mitsubishi Electric compo-



nents in the ship automation system include digital and analog I/O modules for on-board data acquisition, interface modules for acquiring the data from the ship's main drives and a visualisation and display system for the one-man bridge.

The automation solution keeps the skipper informed of the current status of all shipboard systems at all times. The modern, ergonomically-designed bridge is fitted out with the latest technology and conforms to all relevant regulations and standards (LR, SUK, VDE). The main control and display unit is a robust MicroClient industrial PC from the IPC1000 series, running Mitsubishi Electric's MX4 process visualisation software package. The MicroClient PC has a touchscreen display and aggregates all data and sensor information – covering everything from the alarm sensors and the serial interfaces to the ship's engines and its two generators.

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**Incontrol has all the functions needed for inland vessels and it is significantly more flexible than existing solutions. That is a major advantage for the operator.**

**Olaf Ratschow, Technical director,  
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