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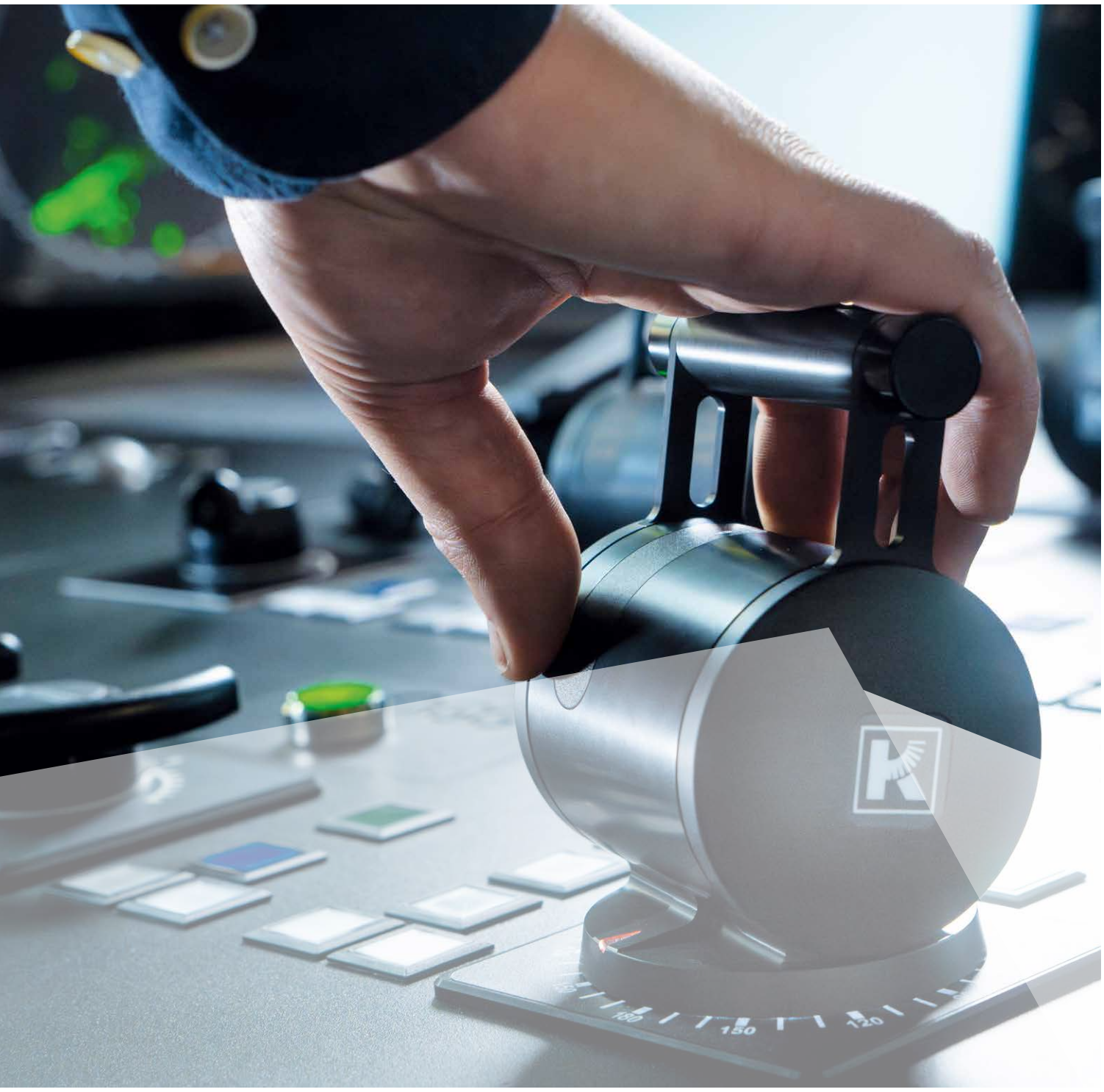
Rapid Prototyping

INTUITIVE MANEUVERS



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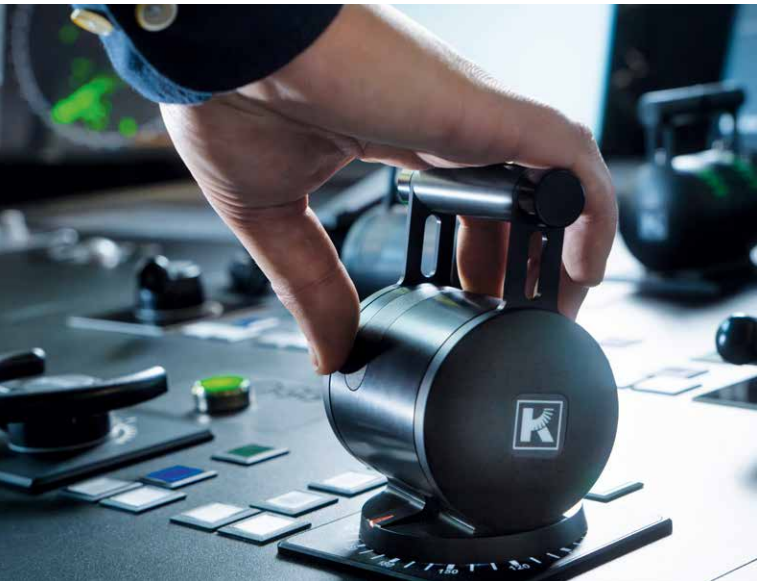
Rapid Prototyping

INTUITIVE MANEUVERS

Kwant Controls, based in Sneek, Netherlands, was voted Frisian Company of the Year 2025. Thanks to its strong innovative process, the maritime propulsion, control, and steering systems manufacturer prevailed against larger regional contenders. This is also high praise for Bachmann: Kwant Controls has relied on efficient software and hardware solutions from Feldkirch for over 15 years.



Kwant Controls uses a rapid prototyping platform, based on the M200 control system, to develop complex algorithms for haptic feedback from control levers.

Kwant Controls also uses the M200 control system from Bachmann for its "CAESAR" platform. This platform is a complete control solution for the propulsion, steering, thrusters, and stabilizers of vessels.

Kwant Controls was one of Bachmann's first customers in the maritime sector, selecting its control systems back in 2009. "Bachmann was much less known in the industry back then. But, in addition to both companies being family-owned, we recognized another major similarity: Our core values are innovation and quality," says Coen de Keijzer, Managing Director and Owner at Kwant Controls.

Reliable control systems

With its CAESAR platform, Kwant Controls offers a comprehensive control solution for ship propulsion, steering, auxiliary thrusters, and stabilizers. The platform regulates yawing, rolling, heaving, and pitching, thus ensuring higher performance, fuel efficiency, and operational safety.

Kwant Controls uses Bachmann's robust M200 control system for the CAESAR platform. In addition to the MX207 and MX213 processors, the individually configured control cabinets contain CM202 CAN interfaces, as well as various analog and digital input and output modules. Redundant installation ensures maximum reliability.

Future-proof investment

Kwant Controls uses commercially available hardware in its solutions. This secures independence for customers and

guarantees a quick supply of spare parts. Coen de Keijzer recalls software engineers' frustration in the pre-Bachmann era: "When the manufacturer updated the control systems in the past, we sometimes had to rewrite the entire software program. That was really time-consuming. With the Bachmann control system, however, our software engineering efforts have decreased significantly because this solution is completely backward-compatible. We can guarantee our customers fast software upgrades and excellent support for future performance requirements."

Rapid embedded board prototyping

Kwant Controls relies on Bachmann to develop complex algorithms for its latest generation of haptic-feedback control levers. Kwant Controls uses a rapid prototyping platform based on the M200 control system to develop these elements. The control algorithm is simulated in Controllab 20-sim using an approximate physical model, which is measured for validation and optimization. Finally, the algorithm is loaded onto the target via Controllab's 20-sim4C and calibrated. "The more complicated the control algorithm, the more finely tuned it has to be," explains de Keijzer. "The Bachmann control system is ideal. With a conventional software implementation on an embedded board, these processes would take up to four times longer." Once the final parameter set has been correctly configured, it can be immediately reloaded into the model, and the control algorithm finalized with the parameters.

Specialists from Kwant are impressed by more than just time saved: They can now also develop embedded firmware for new microcontrollers while creating the control algorithms. With conventional development methods, however, the firmware requirements would first have to be finalized.

In future, Kwant Controls plans to integrate additional systems into the haptic feedback of the control lever, which will enable more intuitive ship maneuvers. "We are considering additional cameras or proximity sensors, for example. But we have to be careful not to integrate too much haptic feedback. Otherwise, there is a risk that operators will be distracted by or misinterpret the signals. That can be dangerous," says de Keijzer. With the rapid prototyping platform and M200 control system, Kwant Controls has an optimal solution for quickly and accurately developing feedback functions as much as they require.

»Thanks to Bachmann, our systems are future-proof. Backward compatibility allows us to guarantee our customers quick and easy software upgrades to meet future requirements.«

Coen de Keijzer
Managing Director and Owner of Kwant Controls B.V.

KWANT CONTROLS

– Headquartered in Sneek (Netherlands)

– Developing solutions for propulsion, steering, thrusters, and stabilizers for all vessel types since 1937

– Solutions represented in 60% of all seagoing vessels

www.kwantcontrols.com

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