

ALWAYS ONE STEP AHEAD OF MACHINE BREAKDOWNS



Unexpected power outages on a ship are expensive. The costs associated can sometimes reach six-digit amounts per day in Euros. If impending defects are detected early, then it becomes much easier to plan their targeted repair. Schottel, a global leader in drives and control systems for ships, has developed a system to reduce downtimes as much as possible. And it doesn't stop there.

The Schottel IoT Gateway MariHub systematically records condition data for the ship's drives and evaluates them for specific criteria. The measured values recorded are processed, archived, and regularly analyzed for trends. If an irregularity occurs in the drive train, it will be signaled to the crew via a warning or alarm notification. Then the crew will decide together whether to order a replacement early or prepare to repair it. "The added value of condition-based maintenance lies in the fact that the intervals between the prescribed inspections at the dock can be extended. This is arranged with the relevant classification society," explains Jan Glas, Sales Director of Automation and Digital Products at Schottel.

Standardized – but a perfect fit

MariHub uses Bachmann's M1 system as its base. The GIO212 module is used to record temperatures, pressures, and flow rates (fuel consumption). Vibrations on the drive train are recorded with up to 51.2 kHz using the AIC206 or the AIC214. System configuration is modular and can be set up in a variety of ways, allowing it to be adapted to the ship type and its various drive train models in just a few steps.

Controls – programmed in a different way

Because ships are often in transit for

days and weeks at a time, the signals recorded are evaluated directly on the ship. The specialists at Schottel programmed the algorithms required to do this with MATLAB®/Simulink®. M1 hardware blocks are a central component of the Simulink® model. With them, vibrations in the drive train can be recorded synchronously and then delivered to the subsequent analysis based on a frame. The AIC206 and AIC214 blocks are used for this, and they are now part of the M1 hardware library of M-Target for Simulink®.

"The M1 hardware is optimally integrated into Simulink®, which allows applications to be created in Simulink®. This approach saves considerable time in software development, because external functions and modules don't have to be integrated as additions," says Dirk Neumann, Development Engineer at Schottel. A team made up of Schottel experts certified by internationally recognized standards supports ship operators in evaluating the data recorded.

Central data collection

Schottel sees the refined damage early detection system as just the beginning, says Jan Glas. "The support for various communication protocols makes it possible to record numerous data from external components and correlate it, in addition to current operating data from drives. This includes, for example,

the ship's speed, it's position, and the performance or consumption of the drives." This expanded database enables new services and business models that go beyond classic condition monitoring.

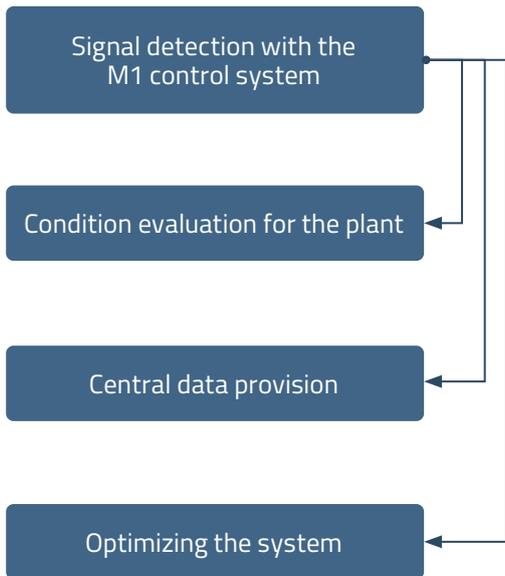
Basic data service

For the operator on land, the continuous availability of ship data in the office often involves a great deal of effort. Even for data that should be simple, like drive operating hours, the processes usually have to be performed manually. In contrast, data collected through the existing M1 control system and transmitted to the internet can be accessed by the operator directly as history. Operating hours, consumption, and pressures are thus conveniently available for further analysis in the web-based Schottel portal MariNet.

Future: a superior view

Data is the gold of the 21st century. However, it must first be converted into usable information before it can fulfil this role. This allows the analysis of a ship propulsion's operation profile to lead to optimized operation with lower fuel consumption. Even within an entire fleet, it's important to tap into optimization potential in order to use the right ship for a specific task. This results in financial added value for the customer, which can also be directly quantified.

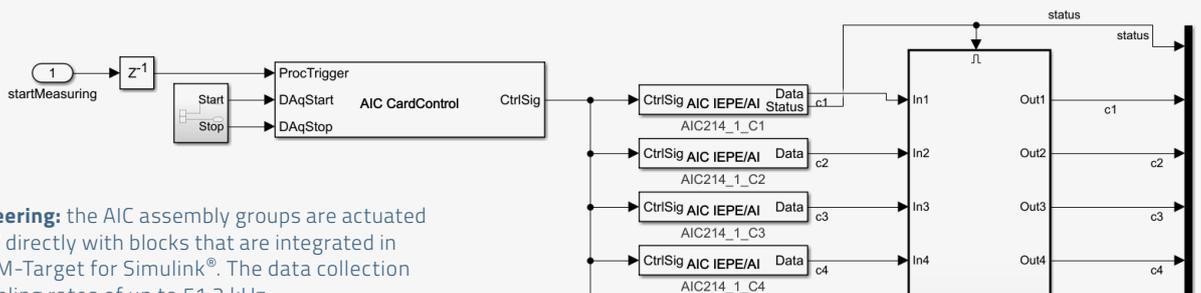
Machine data is centrally recorded via the M1 control system. This data forms the basis for new digital services to offer.



SCHOTTEL GROUP

- Headquarters in Spay am Rhein (Germany)
- Founded in 1921
- Employs over 1,300 employees at around 100 sales and service locations worldwide
- Global leading manufacturer of drives and control systems for ships and offshore applications

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Lean Engineering: the AIC assembly groups are actuated in Simulink® directly with blocks that are integrated in Bachmann M-Target for Simulink®. The data collection allows sampling rates of up to 51.2 kHz.

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