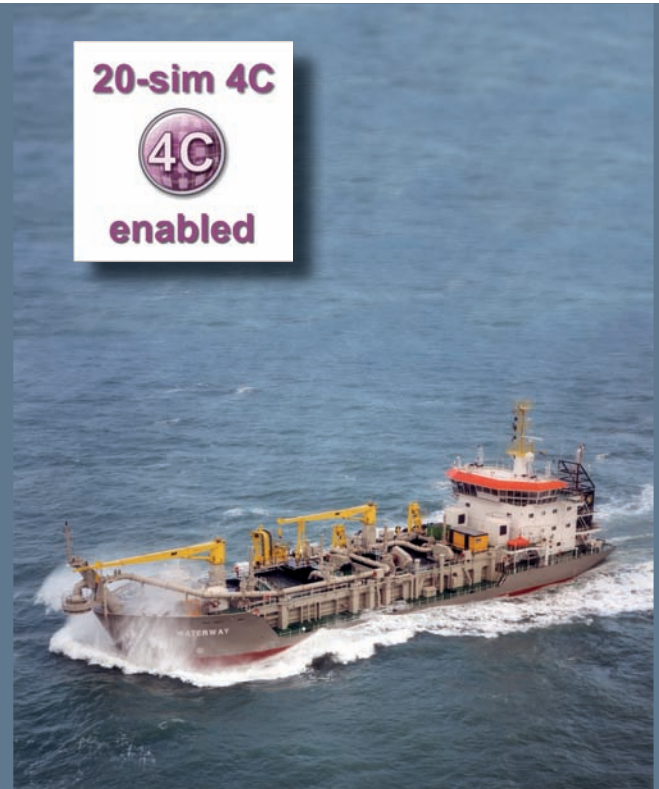


STRAIGHT TO THE TARGET

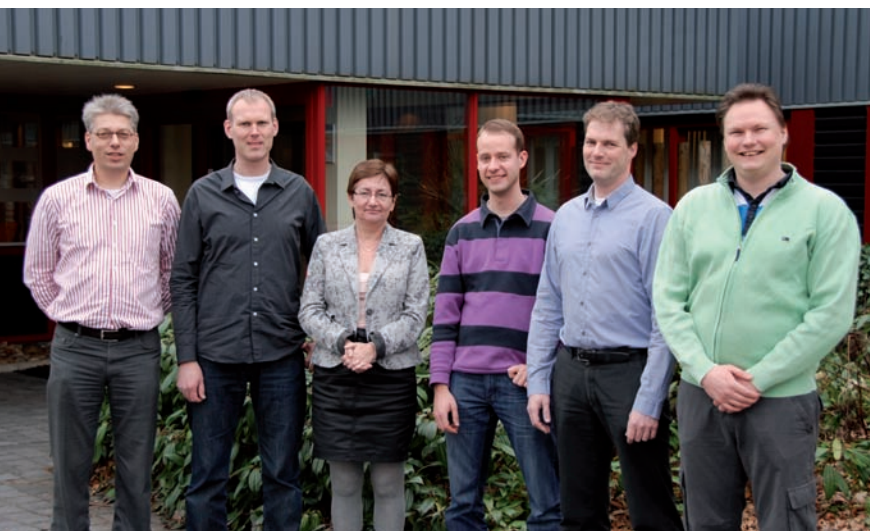
M1 system as target for 20-sim 4C

Controllab Products B.V. is a company based in Enschede, Holland, and was founded in 1995 as a spin-off of the Technical University of Twente (NL). It is a specialist in complex closed-loop control tasks. The Bachmann M1 automation system was implemented as the first industrial PLC to be the target for 20-sim 4C, the compiler environment of its 20-sim modeling and simulation program.

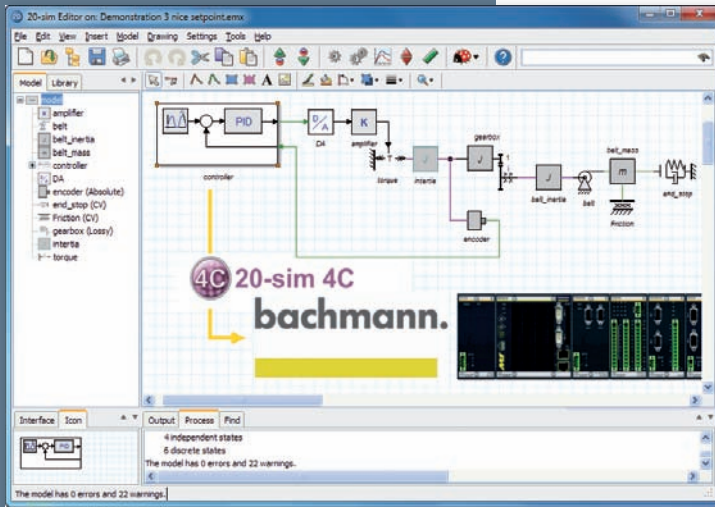


▲ The dredger "Waterway"

The 20-sim graphical modeling tool can be used to simulate dynamic electrical, mechanical or hydraulic systems or combinations of them. Open libraries that allow the equations behind the block diagram elements to be viewed and adapted, directly support the user for more efficient modeling. Different toolboxes for carrying out tests in the time and frequency range, for designing control structures or for creating three-dimensional mechanical models and their animation ensure the considerably user-friendly design and simulation of even complex systems. "This enables systems to be optimized very simply in terms of speed, vibration and robustness," emphasizes Christian Kleijn, CEO of Controllab Products B.V.



◀ **The experienced Controllab team** is continuously further developing the 20-sim software solution developed from the >Tutsim< development package. They are using it successfully in several projects in the marine and offshore sector (e.g. for controlling winches and cranes and for wave compensation), in power engineering or for movement control in machine building.



▲ **20-sim from Controllab:**
Efficient modeling and simulation with a direct connection to the M1 automation system.

FROM THE SIMULATION DIRECTLY ONTO THE PLC

20-sim 4C establishes the connection of 20-sim models with the physical system and makes it into a time and cost saving tool for rapid prototyping. Thanks to the outstanding collaboration between the development teams of Controllab and Bachmann, Bachmann's new M1com communication library can now be used to export the C code created from the 20-sim model directly to the Bachmann M1 system without any intermediate stages. The result is a success that can't be ignored. In 20-sim 4C the input and output variables of the model simulated and analyzed in 20-sim are connected directly with the channels on the corresponding M1 hardware modules. The entire configuration is then compiled and loaded onto the M1 controller. In this process, the M1com is used to automatically copy the executable *.m file onto the PLC and install the software module in the mconfig.ini file. The 20-sim 4C user interface is used to start (and stop) the application, monitor and log the relevant variables, and modify the parameters online. All parameters of the software module are also available as SVI variables and can thus, as is usually possible in the M1 system, be embedded in other tasks (M-PLC, C/C++, Simulink®, etc.) or also in user interfaces implemented with M-JVIS.

SUCCESSFUL USERS

The Dutch company Royal Boskalis Westminster N.V. is an international service company that is active worldwide in 65 countries in the field of maritime infrastructures, dredging and earth moving, as well as in terminal services. Tjeerd Heeringa, senior project engineer at the company, has been working with the 20-sim modeling



Tjeerd Heeringa,
Senior Project Engineer
Royal Boskalis Westminster N.V.



and simulation tool for over 15 years. He is particularly delighted with the possibility it offers to create bond graph models. This enables him to link electrical, mechanical and hydraulic systems in a model without having to deal with the descriptive equations behind them. "The ability to combine different systems in one model, to clearly display complex systems, and to determine the power flow directly are a great benefit when simulating controllers used on dredgers," explains Tjeerd Heeringa. He is pleased with the integration of the Bachmann M1 as a target for 20-sim 4C: "I can now copy the simulated model directly to the PLC which controls the actual installation." ■