

Automated sewer cleaning with CANopen

Components used in municipal vehicles are exposed to extreme temperatures, humidity, dust, dirt, and vibrations. With the Ecomatmobile series, ifm offers CANopen-capable automation products for these harsh environmental conditions. Bucher Municipal uses them for its sewer cleaning vehicles.



A sewer cleaning vehicle of the company Bucher Municipal with the uncoiled jetting and suction pump for sewer cleaning (Source: ifm)

The [complete article](#) is published in the [December issue](#) of the CAN Newsletter magazine 2021. This is just an excerpt.

Bucher Municipal is a global supplier of special vehicles such as refuse collection vehicles, sweepers, and winter maintenance equipment. In the Danish city of Silkeborg, the company manufactures sewer cleaning vehicles. Brian Munk Andersen, R&D Manager at Bucher in Denmark, explained the structure and function of this vehicle type: "Sewer cleaning units from Bucher feature two pump systems. The jetting pump cleans sewers and tanks. With the vacuum pump, we can suck sludge and industrial waste into the tank mounted on the vehicle."

With two ifm control units for mobile applications installed outside the vehicle, the vehicle operator can perform a variety of work steps: rotate the boom, unwind, and rewind the hose, switch the pumps or empty the sewage water tank. The displays of the dialog modules show the relevant system parameters and process values and assist the user in performing the work steps. A control unit inside the vehicle – also supplied by ifm – ensures that the individual processes run smoothly. "The intelligent control of our sewer vehicles ensures efficient processes and enables maximum focus on the task, guaranteeing the highest possible added value for our end users," said Andersen.

Ifm as a partner

For several years now, the automation specialist ifm has been supporting Bucher Municipal as a partner for sensor components and control technology. Brian Munk Andersen: "At Bucher, we have a constant focus on innovation and development. That's why we use automated and intelligent solutions. When we entered into a cooperation with ifm in 2016, we were looking for a reliable supplier of control solutions. Ifm offers a wide range of components for our product – from sensors to displays and I/O systems to controllers.

Throughout the development phase, we worked closely with ifm to develop a solution and choose the ideal products. Our vehicles have to operate reliably in very varied conditions such as cold, heat, dust, and dirt. This places particularly high demands on the components. Together with ifm, we have created a good and reliable solution with many automated features that offers the operator high quality and safety standards when our machines are on the road."

The central CAN products in detail

The core element of the system is the Ecomatcontroller CR711S, a robust PLC (programmable logic controller) for mobile applications. What makes it so special is that it has two independent internal PLCs – one of them a certified safety controller. Powerful integrated multi-core processors allow even complex control functions to be processed quickly. The application programs can be divided between the two internal PLCs if necessary. Consequently, the safe program part can be executed without interference from the general program execution. This ensures reliable operation even with complex control functions. The controller can be used in safety-related applications up to ISO 13849 PL d and IEC 62061 SIL CL 2.

In addition to its many multifunctional inputs and outputs with diagnostic capabilities, the Ecomatcontroller features four CAN interfaces and two Ethernet ports. The CAN interfaces support all important protocols such as classic CANopen, CANopen Safety, and J1939 as well as the transparent and preprocessed data exchange. The CiA 301 CANopen application layer and communication profile version 4.2 as well as CiA 401 device profile for generic I/O modules version 1.4 are supported. The control functions are easily integrated into the application program thanks to Codesys programming (version 3.5).

At Bucher, the controller is additionally connected to a GSM (global system for mobile communications) radio module. Andersen: "In many cases, our remote connection allows us to solve issues while the vehicle is still on the road. This saves our customers a lot of time. Only in cases where remote troubleshooting is not possible the municipal vehicle needs to be checked at one of our many service centers."

If you would like to read the full article, you can [download](#) it free of charge or you [download the entire magazine](#).



The robust 12-inch display CR1200 installed in the external control cabinet of the vehicle for visualization and setting of all machine parameters (Source: ifm)



The Basicdisplay CR0451 indicates the most important parameters on the control panel (Source: ifm)