

# Company portrait: Bürkert & CANopen

*This article, as the first of its kind, presents a company, which enables CANopen communication for all of its interconnectable products.*



Founded in 1946 as a family business and headquartered in Ingelfingen (Germany), Bürkert employs more than 2500 persons in 36 countries. Round about 1600 employees are working in Germany. The five system houses, providing complete system solutions and the related services, are located in Germany (3), USA (1), and China (1). The company's products are manufactured at five sites in Germany and France. Ca. 8,4 % of the staff are working in the area of R&D (research and development). The most part of the manufactured products (more than 70 %) is sold outside of Germany.

The company offers products and complete customized solutions for fluid control systems. Such systems include devices for process automation, analysis, flow, pressure, level, and temperature control, as well as for dosing, and filtration. Networking of the devices via



*Figure 1: Water analysis systems, medical and laboratory equipment, food and beverage, are only few application area examples (Source: Bürkert)*

CANopen (and other networks) enables control, monitoring, analyzation, and maintenance of the processes. Using the EDIP (efficient device integration platform) devices can be networked and operated with the Bürkert Communicator software.

The company's portfolio includes solutions for water and gas industries, as well as for industries with high hygienic requirements. Systems handling the flow in

microliters (e.g. dental chair control unit) are offered as well. Water analysis systems, medical and laboratory equipment, food and beverage, are only few application area examples.

## Philosophy

Bürkert acts according to the company's brand values: courage, experience, and closeness. The experienced experts are perpetually sharing and building their knowledge base internally. Closeness is more than just a personal cooperation while supplying a product and customer services. Closeness creates trust and builds partnerships. Courage can best emerge with the backing of solid experience and trusted individuals. The company therefore places strong emphasis on building long-term partnerships, both internally with colleagues and externally with customers. This is about looking to the future, anticipating customer needs, seeing the possibilities, and challenging the status quo.

## Q & A with the company's experts

*CAN Newsletter:* Why do you rely on CANopen?

*Ralf Schmötzer:* The CAN bus is very robust and already integrated in the most micro-controllers. In combination with the CANopen higher-layer protocol, we have a real-time capable



*Ralf Schmötzer  
(Expert Industrial  
Communication R&D,  
Ingelfingen)*







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communication network that meets all the company's requirements. These properties offer ideal conditions for connecting devices to each other and to the control systems. CANopen has established itself as the standard interface for our devices. All interconnectable Bürkert devices are equipped with a CANopen interface, which enables us to configure the devices in production but also in the field by using our configuration tool. With the Communicator tool, a central access to all device data and parameters is made possible. In addition, the values can be brought into a relation to each other with various visualization options such as a graph.

**CAN Newsletter:** How do customers network their CANopen devices?

**Ralf Schmötzer:** Many customers integrate the devices directly into their CANopen-capable PLCs (programmable logic controllers) or expansion modules. But there is also a large group of customers who rely on protocols such as Profinet, EthernetIP, ModbusTCP, CC-Link, Profibus, or Ethercat. Here we also have a solution named EDIP (efficient device integration platform). With this system, the customer forms a CANopen sub-network and only communicates the parameters and process data relevant to their application via a CANopen-to-Ethernet gateway to the higher-level PLC (programmable logic controller). The whole chain can be configured with the Communicator tool without having in-depth technical knowledge of the respective protocols. The result is a configured CANopen network and a generated device description file for the target system. In the Profinet example, this would be a GSDML file that represents all CANopen objects with the configured object names.

This procedure saves time when engineering the PLC, as all physical functions are represented by a device with application-specific names. Furthermore, the EDIP platform offers the customer the option for installation of additional functions such as displays or OPCUA (open platform communications unified architecture) communication in parallel. The modules are optionally available for the control cabinet or as IP67-protected versions for the field installation. Additional use of I/O modules enables collection of non-digital signals in the field and transmission of them to the PLC via the gateway.

**CAN Newsletter:** How can the use of the system solutions shorten machine downtimes?

**Ralf Schmötzer:** Every customer system needs maintenance at certain intervals. The trend in today's digitization progress is the predictive maintenance. Bürkert also takes up this idea and delivers CANopen-based products with the EDIP platform, which provide numerous analysis and diagnostic data. The diagnostic data can usually be transferred via SDOs (service data objects).

In addition to the data availability, machine downtime plays a decisive role in customer systems, for example in case of device defects. We offer numerous options for device replacement without having to reconfigure the

network. These options include, for example, a SIM card, a configuration client/provider function, as well as backup and restore functions.

**CAN Newsletter:** Are you planning to use CANopen FD?

**Ralf Schmötzer:** We are actively following this topic and also the availability of the chips on the market. At the moment we have not yet reached the limit of the CANopen performance with our devices. This means that we do not feel any pressure to take the next step towards CANopen FD. However, since the implementation of CANopen FD is very promising, we are always looking into the option of equipping the next generation of devices with CAN-FD-capable hardware.

**CAN Newsletter:** Which and how many departments are working on CANopen developments?

**Ralf Schmötzer:** Since CANopen is built into all of our intelligent devices, many of our developers are also in contact with the CANopen technology. This also applies to colleagues outside of development, colleagues from E&C (engineering and consulting), and the system houses that offer customized complete systems.

**CAN Newsletter:** Which role does CANopen play in your product strategy?

**Nandini Mungee:** CANopen has proven to be a reliable and robust technology in various industrial environments for many of our customers. Our goal with the device platform EDIP has been to strike a balance between complexity and acceptance. We have managed to implement CANopen in a way that, the user does not need any in-depth knowledge of the protocol to be able to work with our devices. In short, it plays a very vital role and holds everything together!



**Nandini Mungee**  
Product Manager  
Industrial  
Communication,  
Ingelfingen

**CAN Newsletter:** How does Bürkert position CANopen alongside growing number of IoT solutions and Ethernet-based technologies?

**Nandini Mungee:** Over the last decade, we have seen different kinds of automation concepts at the customer sites. As a device manufacturer, we need to be flexible and place our customer's needs before anything else. With the EDIP platform, we are able to provide a solution for every kind of automation concept. Often, we offer solutions with CANopen as a sub-network with another Ethernet-based protocol on top. I do not think "one-size-for-all" kind of a solution fits in such diverse industrial scenarios. We want to make the best out of the diversity.

*CAN Newsletter:* Which advantages offers the CANopen platform EDIP for digitalization of customer systems?

*Alexej Iwaschkin:* The aim of Industry 4.0 and the associated digitalization is to optimize processes. This also applies to development of individual solutions and products for various process technology areas. As a rule for fluid process technology, liquids and gases need to be measured, mixed, and the processes have to be controlled. New ideas are often made possible through cross-sector thinking and the networking or digitalization of development and manufacturing processes. For this reason, the CANopen platform EDIP enables connection with customer applications and digitalization of these applications with various system solutions. The idea of plug-and-play or plug-and-produce is always in the foreground. Thus, numerous company-patented functions are available, especially with the Communicator software.

The Communicator enables installation of a customer system, which usually includes the following steps:



*Alexej Iwaschkin*  
System Engineering,  
System House  
Criesbach

- ◆ Parameterization of the connected CANopen devices: The automatic device addressing enables the connection to a CANopen network at the same time. Manual addressing is not required. The clear network participant naming in connection with the Namur LED makes it easier to find devices in the customer application during the subsequent maintenance work.
- ◆ Gateway configuration and mapping: The gateway configuration can be adapted automatically or with the help of product catalogs to customer requirements or to the customer application without additional effort. This means that the PLC programming or the interpretation of the configured values for the PLC programmer becomes easier. Also, the mapping of the configured values in the gateway is no longer in the responsibility of the customer.

To sum up: The CANopen platform offers an advantage for the system development. System solutions with different kind of product types can be flexibly set up, simulated, configured, and thus adapted to customer requirements. Furthermore, only one tool has to be used for parameterization, configuration, and analysis. This avoids additional license costs and trainings, also for our customers.

Olga Fischer (CAN Newsletter)

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## Products for process automation

The ME43 is a gateway and control unit consisting of a fieldbus coupler and based on the EDIP platform. It transmits the data of the networked CANopen devices (valves, sensors, mass flow controllers, displays, etc.) to Ethernet-based networks (e.g. EthernetIP, Profinet, and Ethercat). Using a graphical programming, CANopen sub-systems can be automated according to the customer's requirements, for example, controlled mixing of gases, error monitoring via limit value switches, and time switches.

The ME63 CANopen-to-Ethernet gateway and control unit offers IP65, IP67, or IP69K degree of protection. It enables connection of up to eight end devices or junction box modules via the eight M12 ports. Thus, connection of up to 126 devices on the CANopen site is possible. Also included is an Ethernet switch. A central configuration management via EDIP enables a simplified device replacement.

The stainless-steel Flowave Type 8098 flowmeter is based on the SAW (surface acoustic waves) technology and is designed for applications with high hygienic demands. The device includes a display showing the measured flow value. Optimal measurement results can be achieved with homogeneous liquids, free of air and solid particles.



*Figure 2:*  
CANopen-to-  
Ethernet gateways  
ME43 and ME63  
(Source: Bürkert)

CANopen communication, parameterization via the Communicator, and the Wi-Fi connectivity are given. An Atex certification for explosive environments is available as an option.

The valve island Type 8653 Airline Field is developed for applications in process automation. Diagnostic functions can be visualized on the LCD display in clear text and as symbols. This facilitates assignment of the displayed messages and helps to save time during the start-up and in the maintenance phase. The diagnostic messages are also available in the controller, which enables an overview of the plant status. For the CANopen connection, the circular 5-pin M12 connector is used. The device can be programmed by means of the Communicator software.

The ME61 is a 3,5-inch process view display for process parameters. The device provides a CANopen interface via the M12 connector. Up to four process parameter and status information fields can be displayed. The device can be set up to display the required information using the GUI-based Configurator tool. Integration and combination with other devices are possible using in the EDIP platform. Mounting options for DIN rail clip, pipe mounting, and wall mounting with a magnetic holder are offered.



*Figure 2:* CANopen-to-Ethernet gateways ME43 and ME63 (Source: Bürkert)



*Figure 3:* Flowave  
Type 8098  
SAW flowmeter  
(Source: Bürkert)



*Figure 5:* ME61  
process view  
display (Source:  
Bürkert)