

MAXIMUM TRANSPARENCY IN THE CLEANING PROCESS

How FrieslandCampina uses IO-Link to ensure the performance of its CIP system

In the food industry, high hygiene standards are part of everyday practice. At the same time, it is essential to minimise the cleaning phases between production processes as much as possible in order to maintain high plant productivity. The mandatory cleaning processes must therefore be carried out efficiently.

For FrieslandCampina, one of the world's largest dairy cooperatives, the modernisation of a CIP (Cleaning in Place) system at its Aalter site in Belgium was therefore also an economic and strategic project: maintenance of the CIP system needed to be simplified to minimise downtime. At the same time, the CIP process needed to be made more transparent to ensure both the quality of the cleaning and that of the dairy products.

A flagship of milk processing

FrieslandCampina Aalter is one of 50 production plants belonging to the Dutch dairy cooperative and is regarded as a strategic hub for long-life consumer products. *"Here in Aalter, we process around one billion litres of milk annually,"* explains plant manager **Jo Lavaerts**. The scale is impressive: around 1,000 farms with some 100,000 cows deliver fresh milk daily. Within a maximum of three days, the milk is processed into classic UHT milk, chocolate milk, drinking yoghurts, iced coffee, high-protein drinks and various cream products.

Faster response times, shorter downtime

With such a wide variety of products, nothing works without a reliable CIP system. Tanks, pipes and process equipment must be cleaned regularly and thoroughly to ensure product quality across changing production processes. The CIP systems previously used in Aalter were getting on in years, and the automation technology was still based on conventional analogue technology.

From all eight cleaning lines, the SM Foodmag flow meter, the LDL200 conductivity sensor and the TCC temperature sensor transmit the relevant values via IO-Link.



"The CIP system is essentially in use every hour," emphasises **Didier Hooreweghe**, Technical Project Manager at FrieslandCampina. *"In the event of a failure, we need to be able to react extremely quickly so that production is interrupted for as short a time as possible."* The old systems only met this requirement to a limited extent: sensor changes required time-consuming calibrations, data acquisition was cumbersome and the cabling was complex.

End-to-end digitalisation with IO-Link

FrieslandCampina therefore decided to invest in future-proofing: the two outdated CIP systems were to be replaced by a modern, fully digitalised system – with IO-Link as a central component. The company chose ifm as its technology partner. It was a conscious decision, as several factors played a decisive role in the selection of the sensor technology: the components naturally had to be food-grade and, to ensure the consistent implementation of the digitalisation strategy, support the industrial communication standard IO-Link. *"We approached various suppliers, but only ifm was able to offer all the required sensors with IO-Link,"* says **Hooreweghe**.

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>
> *Stijn van Paemelen, Operations Manager at Penco*



The measured values transmitted via IO-Link, as well as further sensor information, can be viewed centrally in the control room.

Sensors and displays for maximum process transparency

The plant therefore utilises the SM Foodmag magnetic-inductive flow meter the inductive conductivity sensor, the TCC temperature sensor and the PM15 pressure sensor. The advantage of the IO-Link sensors is that they transmit not only the primary values but also additional information, such as the status of the sensor itself. This simplifies troubleshooting should a failure occur.

In addition to the current flow rate, the SM Foodmag also transmits information on the total volume and the flow direction and detects whether a medium is present in the pipe. This is generally referred to as liquid detection or empty pipe detection. The sensor also records the conductivity and temperature of the medium as secondary values, which can be used in the CIP process for trend detection or data comparison.

The LDL200 conductivity sensor measures the conductivity of the medium between 100 and 1,000,000 microsiemens with a maximum accuracy of one microsiemens. When installed at the inlet and outlet of the CIP circuit, the sensor enables the cleaning steps to be precisely controlled and cleaning agents to be efficiently dosed.

The TCC temperature sensor automatically detects when the drift of its sensing element leaves the freely definable tolerance range and signals this via IO-Link as well as via the clearly visible LED colour display.

The PM15 pressure sensor, with its G1/2 process connection, is also suitable for small pipes and ensures maximum hygienic safety in the process thanks to its flush-mounted seal and robust ceramic measuring cell.

The IO-Link display E30391, which is also installed directly on the system, displays up to four process values along with associated information and messages. This allows direct insight into the process flow on site at any time. Commands can also be sent to the controller via the buttons.

Tangible benefits from commissioning through to day-to-day operation

FrieslandCampina commissioned the Belgian system integrator Penco, which specialises in turnkey systems for the food and beverage industry, to implement the project. *"We have installed a CIP system with eight parallel cleaning lines in Aalter,"* says **Stijn van Paemelen**, Operations Manager at Penco. "This allows eight units to be cleaned simultaneously."

The decision to use IO-Link paid off even during the installation. *"Thanks to IO-Link, we were able to save a lot of time during the installation, cabling and commissioning of the automation system,"* reports **Stijn van Paemelen**. "All data is available immediately once the sensors are connected. This really helped us get the CIP system up and running in no time."



E30391 displays show the most important values on site.

Sensor replacement? No problem with IO-Link

The biggest advantage, however, becomes apparent in day-to-day operation, particularly during maintenance. *"If a sensor fails, we take one from the spare parts stock, plug it in, and it works just like the previous one,"* says **Hooreweghe**, describing the simplified process. *"No reconfiguration of the automation system is required, no on-site calibration, and no laptop is needed. The parameter data for each sensor is stored on the IO-Link master, so the newly installed sensor is configured automatically immediately after installation."*

For a business that relies on functioning cleaning systems around the clock, this means a significant reduction in downtime. *"Should the CIP system come to a standstill, the time required for maintenance and recommissioning is reduced to a minimum. We can resume operations very quickly,"* summarises **Hooreweghe**. Cabling has also been considerably simplified. *„With IO-Link, there is now just one cable for power supply and data communication. This makes the system more organised and also significantly easier to maintain."*

Partnership on equal terms

The successful implementation of the project is based on a trusting collaboration between all parties involved. *"Penco has been working with ifm for many years,"* reports **van Paemelen**. *"The ifm staff are available whenever technical questions arise, and they have the expertise to support us as an integrator for food and beverage systems."*

Also FrieslandCampina values the partnership-based collaboration: *"The advice, training and support provided by ifm during the introduction of IO-Link at our plant were comprehensive and the entire project went completely smoothly. Just as you would hope,"* says **Hooreweghe**.

CONCLUSION

With the new CIP system, FrieslandCampina in Aalter has taken an important step towards Industry 4.0. End-to-end digitalisation using ifm's IO-Link technology offers tangible benefits: faster commissioning, simplified maintenance, minimised downtime and a future-proof infrastructure.

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