



Ethernet-Based PROFINET Integration of Field Instruments in the Water and Waste Water Industry

- One cable for all – continuous communication from the control room to field level
- Simultaneous transmission of process and diagnostic data such as flow conductivity, flow speed, temperature etc. using one cable
- Less downtime by simply swapping instruments
- No additional costs for fieldbus hardware or analogue signal transmission technology

Background:

In the water and waste water industry a large volume of process data is still transmitted from the field via conventional point-to-point wiring, such as the measured flow value of an electromagnetic flowmeter (EMF). One process value can be transferred for each pair of wires, e.g. over a 4...20 mA signal.

The demands of operators have steadily changed over past years. External influences, such as changing maintenance concepts and energy efficiency measures, have led to an increased demand for information from field level. There is no economically efficient way of achieving this with conventional point-to-point wiring.

One alternative for plant operators is to use fieldbus protocols such as Modbus® or PROFIBUS®, which allow the transmission of several process values over one cable. However, this type of communication requires additional hardware in the form of special cable or fieldbus-couplers (e.g. PROFIBUS® Master). These are highly complex communication channels and present huge challenges to operating staff.

Communication between the control system and a bus-controlled field instrument, via PROFIBUS® for example, requires Ethernet-based

communication from the control system to the automation level (PLC, programmable logic controller). Information is sent from the programmable controller (PLC) to the field instrument over a PROFIBUS® protocol via PROFIBUS® Master.

Real-life challenge:

In an effort to make processes and services more and more effective and cheaper, cost-cutting is on the increase with regard to staff at the plants. Fewer staff who are unfamiliar with the remit are thus faced with increasingly complex technology. They are dependent upon highly customised, integrated systems as they cannot handle the individual components in depth.

One of the key demands is, therefore, that the field instruments be simply integrated into the process control system to allow independent handling.

Another focal point is the cost-optimised transmission of advanced maintenance and process information from the field instrument.

A typical example from the wastewater industry is an integrated conductivity measurement in a flowmeter. Electrical conductivity is one

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