

More Transparency and System Availability

First Steps Towards the Digitalization of a Recycling Plant

At a Glance

- Consulting, service, and support for the entire system from a single source
- Investment protection through the use of existing instrumentation and cabling
- Ethernet-APL field switch in combination with Multi-Input/Output (MIO) for digital signals
- Increased transparency of the configuration and status of all field devices
- Increased system availability due to watertight and robust infrastructure



The Application

The application involves the technical upgrade of an existing process plant in the Netherlands. The plant recycles liquid waste. For this purpose, the delivered waste is first stored in tanks and then fed into various treatment processes. In a first step, certain reusable materials are extracted. The remaining residues are then processed and disposed of in an environmentally friendly manner.

Fermentation processes occur in the tanks, during which alcohol is released. The entire recycling plant is therefore classified as a Zone 2, equivalent to Division 2 hazardous area. However, some of the installed field devices did not meet the explosion protection requirements.

The PROFIBUS PA installation was based on fieldbus distributors without short-circuit protection and 7/8-inch connector plugs. However, it had become apparent that moisture inside the distribution boxes repeatedly led to unstable operation due to corrosion on the contacts. Each time, the segment was completely disconnected from the communication, which in turn disrupted the function of the entire tank system.

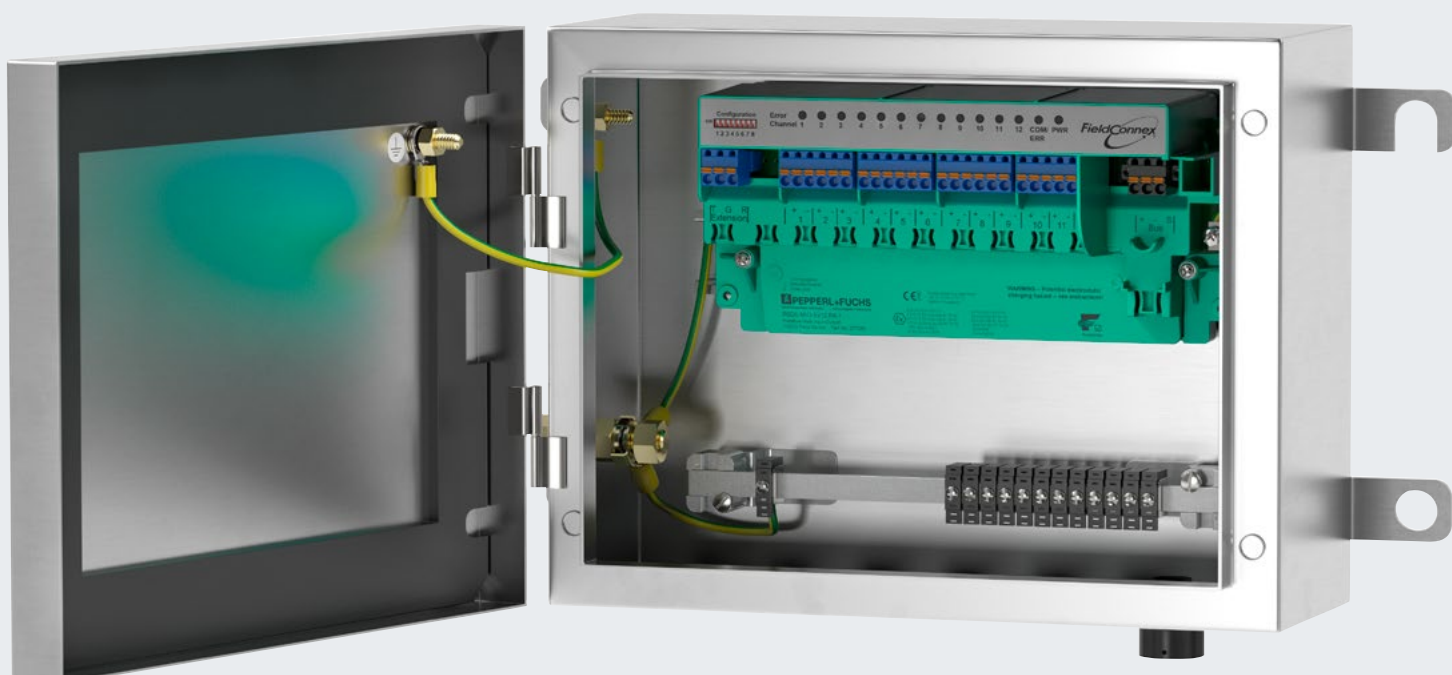
The Goal

On the one hand, the operator wished to gain better insight into the status and behavior of the installed field devices and, on the other, be equipped for future developments with Ethernet-APL. The main objective of the plant modernization was to significantly increase plant availability. This was to be achieved by eliminating issues with the communication infrastructure. In addition, the system infrastructure for PROFIBUS PA was to be supplemented for instrumentation with Ethernet-APL.

The Solution

Contrary to the recommendation of the system vendor, the customer decided to further expand the digital communication on the advice of Pepperl+Fuchs. To this end, the field distributors were equipped with Ethernet-APL rail field switches. This protected the investment in the installed base of the instrumentation.

During the consultation, the specialists demonstrated the device detection and diagnostic functions of the APL rail field switch from FieldConnex. This convinced the decision-makers of the simplicity of monitoring the infrastructure and instrumentation as well as detecting and resolving quality issues.



The web interface not only displays all connected devices, it also provides device information such as supported configurations and profiles. It is now also possible to diagnose the physical level of each device connection.

In addition, the FieldConnex Multi-Input/Output (MIO) was used, which allows the digital detection and control of up to 12 proximity sensors and up to four valves with position feedback. The switches and MIOs can be installed in Zone 2, Division 2 hazardous areas. As they were installed in the immediate vicinity of the tanks, the existing installations and cable connections could be reused.

To counter corrosion issues, Pepperl+Fuchs proposed field distributors made of type 316L stainless steel with cable glands. They are characterized by their high resistance to chemical influences and can be placed in close proximity of the application.

The Advantages

All field devices and MIOs are connected to the switch via point-to-point connections. This prevents any crosstalk between the devices. This means that the failure of a field device does not affect the functionality and communication of other devices or the overall system. The project costs are within the range of a solution with native PROFIBUS PA components.

Storing the configuration data directly in the control system reduces the complexity, maintenance effort and risks of the system. For example, not only the field devices but also a switch can be replaced in future without having to adapt the engineering of the system.

For more information, visit: pepperl-fuchs.com/px-apl

