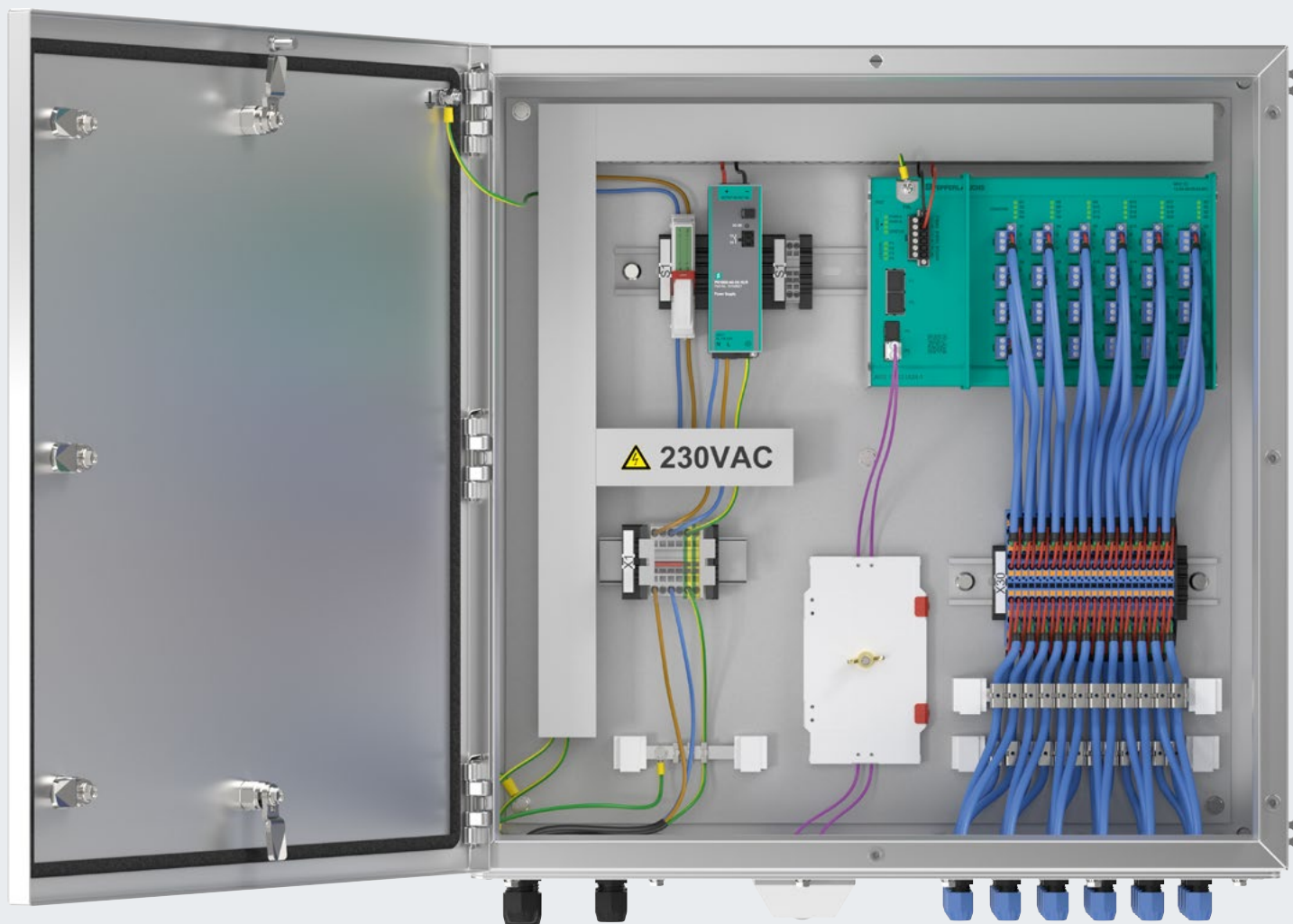


# Customized Solution for Tank Farm Modernization

Explosion-Protected Field Junction Box for Connecting all Field Signals via Ethernet-APL

## At a Glance

- Complete solution for the comprehensive modernization and digitalization of control technology in tank farms
- Increased availability and reduced maintenance costs due to successful turnaround
- Cost-effective integration of existing discrete and analog instrumentation
- Fast commissioning via pre-assembled components and simple instrument recognition
- Close support throughout the entire process—from engineering and project support to the design phase and product acceptance



## The Application

The sustainable use of resources and comprehensive environmental protection are among the most pressing global challenges of our time. Companies that specialize in efficient waste management and the recycling of resources play a central role in tackling this task. In order to ensure the smooth and safe operation of their plants, not only must processes be constantly optimized, but explosion protection regulations must also be complied with.

This task was also faced by a company that called in Pepperl+Fuchs as a solution provider to adapt the control technology in its tank farm for waste management and treatment. The aim of the project was to convert the existing PROFIBUS PA installation to digital communication with the help of the experts for electrical explosion protection. The reason for this was that some of the instrumentation was not classified for ATEX/IECEx Zone 2 and aluminum field junction boxes without short-circuit protection. In addition, moisture ingress and corresponding contact corrosion were occurring more and more frequently, meaning that entire fieldbus segments were at risk of failure and time-consuming and costly shutdowns were repeatedly occurring within the tank farm.

## The Goal

The conversion of the control technology to digital communication was to be accompanied by enhanced fault protection, advanced asset management, and state-of-the-art diagnostic options to enable highly reliable monitoring of the system and prevent future failures. The aim was to connect various signal types such as static pressure gauges for level measurement, vibration forks for overflow and idle warnings, temperature sensors, proximity sensors, and various flow and analysis devices to the control technology securely and cost-effectively. As the tank farm is classified as ATEX/IECEx Zone 2, the entire solution also had to be delivered fully certified and ready for use.



## The Solution

After a comprehensive live demonstration at the customer's premises by the Pepperl+Fuchs sales team, the customer opted for digital communication based on the Ethernet-APL rail field switch from Pepperl+Fuchs. This was especially convincing due to its simple design and setup, the extensive diagnostic functions, and the possibility of connecting the PROFIBUS PA signals already used in the tank farm to the control system effectively and with minimal susceptibility to errors. The solution expertise of Pepperl+Fuchs proved to be decisive here: the experts for electrical explosion protection in the company's own Solution Engineering Centers (SECs) developed tailor-made, pre-wired stainless steel enclosure solutions certified according to ATEX/IECEX standards for Zone 2 and based on the "one-stop shopping principle". These include either the TM-I (temperature multi-input) for temperature sensors or analog sensors or the MIO (multi-input/output) for up to 24 discrete inputs and outputs in a field junction box for efficient acquisition of field signals for the Ethernet backbone.

To ensure reliable sealing against moisture, high-quality cable glands and breather glands were installed in accordance with customer specifications. The development, manufacture, and delivery of this solution was carried out in close cooperation with the customer at all times to ensure that it met their exact requirements and provided a comprehensive overall package.

## The Advantages

With this project, Pepperl+Fuchs underlined its position as a partner that offers not only components and technologies, but also sophisticated and customized complete solutions. Customers receive fully certified and explosion-protected plug-and-go solutions that can be installed immediately. The implementation of the complete solution developed here resulted in significant cost savings for the customer, rapid commissioning, and a reduction in complexity and risk. Durable stainless-steel solutions with integrated segment protectors (MIO or TM-I) and power supplies replace the previously used aluminum field junction boxes, which were prone to faults and corrosion. All system signals are integrated into a fully digitalized control architecture via the Ethernet-APL rail field switch, creating comprehensive options for simple asset management and end-to-end diagnostics. This allows the customer to concentrate on the core processes of their system without having to constantly deal with electrical explosion protection and signal transmission.

### Technical Features

- All components are certified for use in ATEX/IECEX Zone 2
- Fully certified field junction box solutions made of stainless steel 316 L
- Ethernet-APL rail field switch for easy connection of all field signals to the control system
- Simple asset management and consistent diagnostics via Ethernet backbone
- Up to 24 inputs and outputs per field junction box

