Smart Position Feedback from Hand Lever Valves

WILSEN.valve Wireless IoT Sensor Solution Provides Measurement and Status Data Wirelessly

At a Glance

- Autonomous sensor unit for smart communication with hand lever fittings
- LoRaWAN® wireless standard with long detection range and good penetration of building structures
- Virtually maintenance-free due to high energy efficiency and a long battery life
- Rugged overall solution with a high degree of protection (IP66/IP67) for outdoor use
- All components from a single source

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The Application

In many process plants, simple 90° hand lever valves are used as emergency discharge valves for diverting circuits or for the supply of media. They are often found in the outdoor area of extensive plants or at outlets of mobile tanks and containers (IBCs). Typically, these valves are rarely actuated and are not connected to the control room. Without remote monitoring of the valve position, however, the control room lacks important information for advanced process monitoring and process optimization (M+O = monitoring and optimization). The risk of waste of product or process heat due to accidentally opened valves can only be ruled out with time-consuming and labor-intensive inspections.

The Goal

The process control system should have information about the current position of such manual valves at all times. At the same time, regular in-person inspections, which are expensive and require skilled staff, must be avoided. However, the effort and costs for cabling would be disproportionately high in the case of larger plants or decentralized assets, and it is generally not possible in the case of mobile containers. The solution used should function independently of the model, size, and installation situation of the valves and allow for the connection of various sensors.

The Solution

The WILSEN.valve central unit uses LoRaWAN wireless technology to establish the connection between the valve and the IoT platform used. The central unit has two M12 plugin connections, each of which can be connected to a dual inductive sensor. This means that a WILSEN.valve detects the position of up to two valves at the same time. In addition, the device also transmits diagnostic data and reports fault states of the connected sensors, such as a short circuit or lead breakage.

Using the free WILSEN app, the WILSEN.valve can be easily commissioned and intuitively parameterized on-site via Bluetooth® LE. Alternatively, the downlink channel provides remote access to the parameter settings in the sensor after integration into the LoRaWAN network.

The valve position is recorded and transmitted regularly at defined intervals. They can be set to do so on an as-needed basis and as infrequently as possible to maximize battery life. For regular transmission, intervals between ten minutes and 24 hours can be selected. If required, an additional event-dependent monitoring function can be activated to check the statuses of the connected sensors at adjustable intervals of between one minute and 24 hours. These are reported directly via LoRaWAN only in the event of status changes—regardless of the set control interval.

The sensors can be selected to match the valve and can be easily installed with ready-made mounting kits. Detection and transmission are not affected by external influences such as magnetic fields, vibrations, etc. The replaceable high-power battery enables a useful working period of up to ten years.

The Benefits

Remote and previously unmonitored valves are integrated into bidirectional communication with the process control system with minimal effort and at very low costs. The system therefore provides important additional information for extended process monitoring and process optimization within the plant (M+O sensor technology). The rugged housing with IP66/67 degree of protection enables use in harsh conditions and outdoor areas. Pepperl+Fuchs offers all the necessary hardware components from a single source: the central unit, suitable inductive dual sensors, actuators, and installation components. Wireless transmission via LoRaWAN is based on a standard, is manufacturer-independent, globally available, and takes place in license-free ISM frequency bands. LoRaWAN enables easy device integration, secure data transfer with authentication and end-to-end encryption, high energy efficiency, and highly cost-effective network setup and operation.

Technical Features

- M12 plug connection for low-power 2-wire DC or NAMUR dual sensors
- Monitors up to two valves
- Energy-efficient operation
- Reliable and long-range data transmission via LoRaWAN
- Battery life up to ten years
- Integrated GPS receiver for positioning
- Mechanical components for mounting the box and sensors on the valve in accordance with EN-ISO 5211 are available for many valve versions

For more information, visit: **pepperl-fuchs.com/px-wilsen-valve**