

Wireless Level Monitoring of Intermediate Bulk Containers (IBCs)

Autonomous IoT Sensor WILSEN.sonic Transmits Measurement Data for Efficient Processes

At a Glance

- Reliable monitoring of fill levels in IBCs
- Quick and easy installation via two-inch thread and preset measuring range
- Energy-efficient communication via LoRaWAN®
- Secure data transmission with end-to-end encryption
- Battery lifetime of up to 10 years
- Additional leak monitoring possible via WILSEN.node wireless sensor node

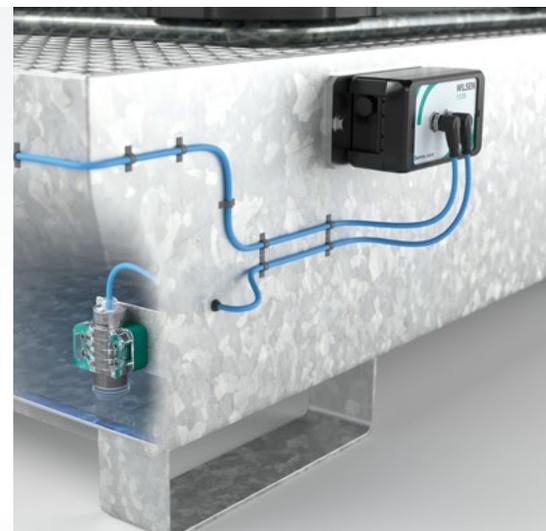


The Application

Intermediate bulk containers (IBCs) are standardized, mobile transport and storage units with a capacity of 1,000 liters. They typically consist of a plastic tank enclosed in a metal cage and are mounted on stackable pallets. IBCs are used across various industries, both indoors and outdoors, to supply, collect, or store liquid or free-flowing media. Examples include supplying adhesives in the packaging industry, collecting condensate, providing process materials, and storing extinguishing agents.

The Goal

To enable timely replacement of an IBC, precise and automated level detection in the IBC is crucial. The technology used must be able to withstand harsh weather conditions and operate without wired power or network connection. To avoid complex configuration changes, the typical measuring range should already be preset in the sensor. The connection of additional inlet or outlet lines at the IBC lid must not be obstructed. If required, the solution should also allow geolocation (tracking) of individual IBCs.



The Solution

The battery-powered WILSEN.sonic wireless ultrasonic sensor (IBC version) measures the fill level with millimeter precision and transmits the data via LoRaWAN® as a percentage value. The device can be quickly, easily, and securely screwed into any IBC lid with a standard two-inch thread, without the need for cables. On lids with two screw-in openings, the unused one remains available for supply lines or other attachments. The sensor's measuring range is preconfigured, so no parameterization is required. When an IBC is replaced, the sensor remains in the lid and can be reused without re-registering it in the LoRaWAN® network. This means only one device is needed per measuring point, regardless of the number of IBCs in use. The sensor also remains intact when an IBC is disposed of.

The WILSEN.node wireless sensor node can additionally be used to detect leaks and maximum fill levels in collection trays beneath the IBCs. It allows wireless connection of capacitive sensors or vibration limit switches, both well suited for this detection task.

The Benefits

Due to its robust ultrasonic technology, the WILSEN.sonic reliably detects the fill level at all times, regardless of the color or properties of the medium. The data transmitted via LoRaWAN® also includes information such as ambient temperature and battery status. Additional measurement data (e.g., sensor location via GPS) can be activated as required. A replaceable high-performance battery provides maintenance-free operation for up to 10 years.

The IP66/67-rated sensor housing is highly durable and designed for outdoor use. With the WILSEN app (available for Android and iOS), the device can be easily registered and configured via Bluetooth within the energy-efficient, encrypted LoRaWAN® radio network. The LoRaWAN® downlink channel also enables remote parameterization and parameter value queries.

Technical Features

- Robust ultrasonic measurement with millimeter-precise resolution
- Easy installation via standard two-inch thread in the IBC lid
- Replaceable high-performance battery (3.6 V, 13,000 mAh)
- LoRaWAN interface including downlink channel for remote access
- Bluetooth interface for easy commissioning and parameterization via WILSEN app (iOS and Android)
- Degree of protection: IP66/67
- Temperature range: -25 ... +70 °C
- Optional additional leak detection possible via WILSEN.node wireless sensor node

