

Happily Wireless!

Wireless measuring technology offers versatile application options

Even if the early beginnings of wireless data transmission can be traced back to the 40s of the previous century, the WLAN boom only really started around 15 years ago. The cause here lies mainly in the increasing popularity of the Internet. As early as 2011, around 70 percent of households had access to wireless Internet. The technology gained additional traction through the increasingly widespread use of mobile devices. By now, 55 percent of all Germans own a smartphone.

Wireless transmission technologies are used more and more in the industrial sector as well. The increasing interconnectivity of all areas within a company entails a growing need for control measures. An increasing number of sites must be measured, controlled, or automated.

JUMO GmbH & Co. KG serves as an example of this development. In 2007, the company brought the first devices for wireless temperature measurement on the market. As a result, JUMO acquired experience with wireless measurement technology early on and consistently applied it to additional measurands in the years to follow. The next product was a programmable head transmitter with wireless transmission. Since 2013, a device for wireless pressure measurement has been available. In 2014, a combination measuring device for temperature, humidity, and CO₂ content came on the market.

Implementation options in the food industry

The range of applications for wireless pressure and temperature measurement in the food and pharmaceutical industry is very varied. Fundamentally, the devices can be used wherever traditional, hard-wired products are also used. This technology offers particular advantages when used in difficult-to-access areas, mobile systems, or even on moving and rotating components.

The JUMO Wtrans T, the insertion variation of the Wtrans series, is particularly suitable for calculating the core temperature. For example, in the meat-processing industry the temperatures of the cooking and smoking chamber as well as the core temperature of the product are continuously recorded. However, a cable is disruptive in continuous cooking and smoking chambers. "Continuous" means that the trolley carrying the product automatically moves from the cooking chamber into the smoking chamber.

When using temperature sensors with a cable, faults and failures can frequently occur if the cable is bent or even torn off. To guarantee a constant high product quality and maximum process reliability, the JUMO Wtrans system offers new possibilities.



Fig. 1: Wtrans transmitter / temperature

The devices are also used in other areas of the food industry. One example is for manufacturing baby food using spray drying. Spray drying takes place in high spray towers. Installing temperature probes with cables in these towers requires considerable effort. JUMO Wtrans T Ex with ATEX approval is ideally suited for temperature measurement here. The device can be operated directly in a potentially explosive area which is the case in the spray tower. The corresponding receiver is installed outside the actual Ex zone. The wireless technology allows the user to transmit measured temperature values from the Ex area without elaborate zone implementations for cable.

Wirelessly detecting levels

A classic application example for wireless pressure measurement with the JUMO Wtrans p is level measurement via hydrostatic pressure.



Fig. 2: Wtrans transmitter / pressure

The measurement can be implemented in ventilated tanks with one device as well as in closed tanks with two devices via differential pressure. Levels in the food and pharmaceutical industry are measured in very many applications. The JUMO Wtrans p provides advantages, particularly for performing level measurements in closed tanks because one device is installed on the floor and a second device in the top part of the tank (above the liquid level) for the differential pressure measurement. High tanks require many meters of cable to be laid which is unnecessary when using the JUMO Wtrans p.

Use in composting plants

According to data from the German Federal Statistics Office, in 2011 around 14 million tonnes of biogenic waste was composted or fermented in biogas plants and subsequently re-used on soil in Germany. Here, more than 1,000 composting plants exist for this purpose.

The correct handling of biodegradable waste destined for composting is stipulated in Germany by the so-called German Biowaste Ordinance (*Bioabfallverordnung*). It stipulates that the specified temperatures for all batches of a composting system must be documented. Proof is necessary because dangerous microorganisms are reliably eliminated as a result of the temperature in the material.

During composting, a temperature of more than +55 °C must act upon the entire mixture for, if possible, a consecutive period of two weeks, or +65 °C over one week. The treatment temperature must be measured and documented at regular intervals.

Often, this temperature check is carried out manually by the operators of composting plants. The costs for personnel are correspondingly high. An operator in Lüneburg, Germany has chosen the JUMO mTRON T automation system and JUMO Wtrans B wireless temperature probes. As a result, the process is monitored completely automatically and documented in a tamper-proof way.

By building up the heap (pile for composting), the batch recording is started. The temperature probes, which are 1600 mm in length, are inserted directly into the heap for measurement. These are equipped with a JUMO Wtrans wireless temperature system in which the transmitter is located in the probe handle and is protected by watertight housing. The used radio frequencies are largely impervious to external interference and allow transmission even in harsh environments.

The probe contains a platinum chip resistor as its sensing element. On the transmitter side, a temperature measuring range of -30 to +85 °C is achieved. Up to 16 JUMO Wtrans transmitters can be managed per receiver.

The entire process of temperature monitoring and documentation is now much simpler for GfA Lüneburg thanks to the implemented solution. The data no longer has to be recorded manually with a lot of effort, but instead is automatically documented and logged for the hygiene certification. In addition, the use of individual data loggers is no longer required. A particularly great advantage has proven to be the minimal effort required for programming and on-site installation.



Fig. 3: Wireless temperature measurement in composting plants with an automation system

Contact:

Dipl.-Ing. Christina Scheer
Market Segment Manager Pharma and Food

JUMO GmbH & Co. KG, Fulda, Germany

Phone: +49 661 6003 9384

Fax: +49 661 6003 862

christina.scheer@jumo.net

www.jumo.net

