

Sensors featuring hygienic design with IO-Link provide advantages in the food industry

Completely hygienic thanks to IO-Link

Producing food and beverages is primarily about hygienically safe production so consumer health is not jeopardized in any way. Baumer has developed numerous hygienic sensor solutions in compliance with the industry's various common standards. With these EHEDG-certified sensors and respective fitting accessories, the sensor manufacturer is able to offer a complete solution for hygienic applications. The icing on the cake: operating the sensors remotely via IO-Link guarantees complete hygiene and long-term impermeability.

Reducing potential risk by complying with hygiene regulations

During processing, exposed food ingredients are easily susceptible to being contaminated by various impurities or cleaning agent residue and then becoming spoiled. Food remnants pose a particular danger when, for example, they get stuck on sensors and then release dangerous microorganism contaminants back into the production. It is therefore essential that machines used for food processing and packaging as per standard EN 1672-2:2005, among others, only have smooth, continuous or sealed surfaces, corrosion-resistant materials and detachable connection fittings that are flush and hygienic. The strict specifications are primarily intended to eliminate or reduce the risk of infection, contagion or harm that could come from foods.

To satisfy these requirements, Baumer's hygienic sensors are encapsulated in a smooth, groove-free V4A stainless steel housing. There are thus no places where substances could stick to them, and they can be easily incorporated in the hygienic design of the system. Furthermore, they are exceptionally durable and corrosion-free, and can even withstand the harshest cleaning agents and processes. The sensors are EHEDG-certified, and thanks to the proTect+ impermeability concept, they are able to meet the requirements of protection class IP 68/IP 69K over the long term even under harsh conditions.

This hygienic conformity should also be maintained by sensors with adjustable measuring or sensing distance. For this reason, Baumer has been consistent in not putting a teach button on the sensor itself. Doing so would create crevices and dead spaces where food remnants could collect. Instead,



Baumer relies on IO-Link for sensors in the food industry.



Optical sensor in hygienic design



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Baumer uses IO-Link for its hygienic versions of distance-measuring photoelectric sensors, SmartReflect light barriers and diffuse sensors with background suppression.

Benefits of the IO-Link in food-processing equipment

Using the communication standard IO-Link provides many advantages in the food industry. First, it means we can eliminate the teach button on the sensor. The sensor can be easily and hygienically configured from the computer or the control system. Furthermore, the same setting can be transmitted to various sensors with the push of a button. Sensor parameters can even be set during the process without causing any machine downtime.

Second, it means that the sensor is also able to communicate with the control system through the IO-Link. The sensor can thus report errors or even how they developed. For example, if it transmits a signal that is too weak, the control system is able to determine that there is an issue possibly due to soiling. It is precisely this diagnostic information that gives the user a high degree of added value. It indicates to the user whether the process and/or sensor are running stable. This then gives a person the opportunity to quickly react to the issue and take appropriate action. Process safety and thus system availability and productivity are efficiently increased.

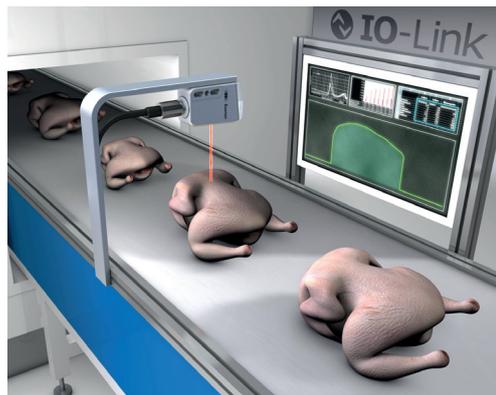
Communication standard IO-Link

IO-Link is a pure point-to-point connection between master and sensor on the field level. This connection makes it possible to use the IO-Link mode to transmit parameters, process data and diagnostic data without any additional effort. A wide variety of additional data can thus be exchanged between master and sensor. Primarily parameter data is transmitted from master to sensor. Going the opposite direction, cyclical process data and, if necessary, service and diagnostic data is transmitted to the master. All parameters can be saved in the control system. If a defective sensor needs to be replaced while the equipment is running, the sensor is recognized based on an ID number and the control system can automatically transfer the respective parameters to the new sensor. IO-Link thus reduces the amount of effort necessary to integrate and set up the sensors, while simultaneously increasing the efficiency of the production process.

Conclusion

Hygienic safety is the determining factor in food and pharma production. At the same time, automation in these industries keeps steadily advancing. Special and reliable sensor solutions can provide essential added value in matters of process safety and productivity.

This is where high-tech and hygiene meet. The EHDG certification of the sensors guarantees that these components of the automation processes can be excluded as a hygienic risk factor. This also includes a respectively robust design that is able to withstand the, to some extent, harsh cleaning agents that are constantly being used on the equipment. Configuring and setting up the sensors via the communication standard IO-Link ultimately complete the high requirements placed on sensors in the hygienic area.



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proTect+ – impermeability plus

Baumer developed the unique proTect+ impermeability concept to be able to offer durable sensor solutions even in applications with demanding ambient conditions such as in the food industry. Optimized mechanical interfaces and manufacturing processes such as the unique structural design and the selection of high-quality materials ensure exceptional durability and long-term impermeability for the sensors. In particular vigorous shock test procedures, the sensors are subjected to various temperature cycles in air and water, and tested for the IP protection class required for the application.

The hygienic sensors thus also still meet the requirements of protection class IP68/IP69K even after various temperature cycles. Consequently, the proTect+ impermeability concept guarantees the utmost reliability and service life of the sensors even when they subjected to constant temperature changes, harsh cleaning agents or high-pressure/jets of water.

