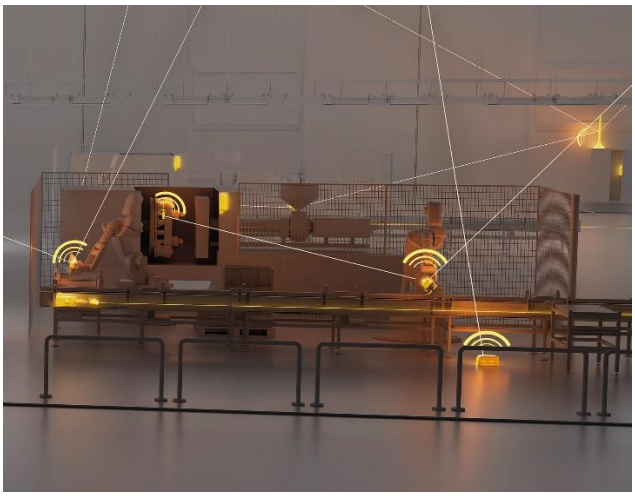
Technical article, published in: A&D (11/2025)

New generation of wireless sensors with optimised power consumption and installation flexibility

Sensors now smart and wireless

Cabled sensors reach their limits in many applications involving robotics, toolmaking, mould design or handling technology. Wireless sensors can provide a flexible alternative – especially when they are self-calibrating with minimum energy input. A new sensor generation shows how this technology has developed, and which application fields it is opening up.

steute Technologies
GmbH & Co. KG
Brückenstr. 91
32584 Löhne, Germany
Phone: + 49 5731 745-0
Fax: + 49 5731 745-200
info@steute.com
www.steute.com



Wireless switching devices provide many benefits, especially in the field of robotics

For some machine components and constructions, power and signalling cables to switches and sensors are quite simply in the way. This is true for the detection of workpieces or tools on rotating robot grippers, for example, or the position monitoring of components on turntables. Here – using cabled communication – it would be necessary to take slip rings or cable drag chains susceptible to wear and tear.

Wireless as an alternative to cables

In these – and many other – cases, it is advisable to find an alternative to cabled sensors. The answer is wireless sensors, such as those in the steute Controltec product range. They are powered by battery via a separate module – to which multiple sensors can be connected – and the module also communicates bidirectionally and wirelessly with the receiver unit. The sWave wireless technology developed specifically for such applications is available for different frequencies (868, 915, 917 and 922 MHz) and thus suitable for use in many different countries. Continuous power supply via a lithium battery permits additional functions, such as monitoring the switching device via a status signal, as well as managing signal transmission in conjunction with potential interference through LBT ("listen before talk") technology.

Example: position monitoring on rotating robot gripper

The concrete benefit of wireless sensors in automated plants is well illustrated in a foundry by a robot gripper able to rotate 360°. After it has grabbed a rack containing a cluster, this rack must be bolted to the gripper before it is moved three-dimensionally inside a basin. In the past, the gripper bolt sometimes did not engage fully with the rack, and this was not detected by the system. The consequence: the cluster swung from side to side and could become damaged or collide with machine components.

A wireless inductive sensor from steute is the answer. It detects whether the bolt has engaged with the rack and sends a corresponding remote signal to the control system. And still cables to the gripper head are not required. This solution has been such a success that the foundry has successively equipped additional robots with wireless inductive sensors from the RF IS series.

New generation of wireless inductive sensors

This steute series has undergone a thorough updating in the past few months, the results of which will be presented at the SPS 2025. The re-design was focused on two goals. Firstly: the

steute Technologies GmbH & Co. KG
Brückenstr. 91
32584 Löhne, Germany
Phone: + 49 5731 745-0
Fax: + 49 5731 745-200
info@steute.com
www.steute.com

Wireless inductive sensors in the RF IS series with RF 96 ST radio module (black) and receiver unit (white)

cylindrical sensors in diameters M 8, M 12, M 18 and M 30 are now also suitable for flush mounting. This was previously not the case because inductive sensors with a fixed switching point detected the surrounding metal and switched accordingly. This made them impossible to use in some applications – e.g. the detection of workpieces in machine tools or assembly and handling units.

Digital autocalibration

This additional application field has been made possible through autocalibration. The inductive sensors do not – as in the past – have a fixed switching point, but adapt their switching point automatically and dynamically to the situation in question. This includes distinguishing between flush and non-flush mounting. The sensors can even adapt to dynamic changes such as increasing contamination. This means that the sensors are always ready to go, and that they only switch when the situation or operator requires them to do so.

Wireless sensors with minimised energy consumption

The second goal – reduced energy consumption – could also be achieved. Multiple constructive measures now ensure considerably longer battery lifetimes in the universal radio modules, suitable for connection of up to four RF IS FL. Overall, the energy requirement compared to the predecessor model could be reduced by about 80%.

steute will be presenting its new wireless sensor series at the SPS 2025 for the first time. Typical application fields for the RF IS FL series will include tool and mould construction, as well as robotics or assembly and handling technology. In all of these sectors, sensors detect e.g. the presence of workpieces in tools, or the presence or position of metal parts in automated assembly lines.

Author:

Sascha Elsner
Product Specialist Wireless
steute Technologies

Images: steute Technologies GmbH & Co. KG

steute Technologies GmbH & Co. KG
Brückenstr. 91
32584 Löhne, Germany
Phone: + 49 5731 745-0
Fax: + 49 5731 745-200
info@steute.com
www.steute.com