Technical article, published in: konstruktions praxis (04/2018)

Wireless is nothing to be afraid of

Wireless switching devices represent an alternative to cabled devices. Which applications are they suited to and what should engineers remember when using them? Andreas Schenk, Product Manager Wireless at steute Schaltgeräte GmbH & Co KG provides the answers.

Is it correct to say that there are typical mechanical engineering applications for wireless switching devices?
Certainly. Several manufacturers use wireless multifunctional door handle switches to control the large sliding guard doors of their machines, for example. They enable signal transmission components susceptible to wear and tear, such as trailing cable installations, to be eliminated. Another typical application is safety wireless foot switches, e.g. on forming machines such as press brakes. Here operators actuate the press stroke with their foot and can position the foot switch freely, without any attention to cable length. This is particularly practical when machines such as press brakes cover a large work area.

That is a safety-related application – also possible with wireless?
It is possible using our sWave-Safe protocol, yes. At the moment only in

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combination with foot switches, but we shall be expanding this switchgear series - developed especially for presses - over the coming months and integrating some new functions. These wireless switching devices can be used up to PL d according to EN 13849 or SIL 3 according to EN 61508.

Is it necessary to have an approval for "normal", i.e. non-safety-related wireless switching devices?
No, an approval is not required. Our wireless technologies work on the licence-free frequencies 868 MHz (for other countries: 915 MHz and 922 MHz) and 2.4 GHz. Users therefore require no approvals. But they should take into account some special characteristics of wireless technology – for example they should remember that the nominal range can be strongly reduced by the radiant emittance typically found in industrial environments.

Can this be a problem in practice?
Not in machine tool applications where the ranges are generally short. But in large process plants where wireless switching devices monitor e.g. the position of valves, this can be a problem. However, we have various solutions on hand, such as repeaters.

What else should engineers pay attention to?
We offer different wireless standards – e.g. with or without confirmation, uni- or bidirectional, with different data rates, with different ranges. There are also differences regarding fault liability, transmission path availability and power consumption when active. Engineers should look carefully to see which wireless technology suits their application best in each case.

You just mentioned power consumption – how are wireless devices powered?
Most wireless switches and sensors are powered using longlife batteries. The current battery status can be queried and transmitted by remote control. We also offer self-sufficient switchgear with electrodynamic energy generators – a fascinating technology which does not, however, include every single feature, e.g. bidirectional signal transmission.

Have you got any more practical tips for engineers considering wireless switchgear?
It is fundamentally important that the principle of economic efficiency does not fall by the wayside. Engineers must think about what they actually need. One example: if you wish to transmit signals to a rotating component, it is not necessary to monitor the rotation every millisecond. Here larger intervals are sufficient. If you adhere to this principle, you will save money and still get a practicable solution.

Which extra costs are to be expected when exchanging cabled devices for wireless ones?
If you only take the cost of the switch itself, then the wireless solution is of course more expensive. But if you take the total cost, including installation and maybe additional components such as slip rings etc., then the calculation quickly becomes another one.

You mentioned door handle switches and foot switches. Are there any other wireless applications which can be used in metalworking plants?
A leading manufacturer of press brakes has realised a truly innovative solution

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using our wireless technology. Bystronic has a "mobile bending cell" for its press brakes. Here a mobile robot cell is connected to the press and operates it during a manpower-free shift. A wireless microswitch senses whether the part for bending is flush with the rear stopper and then transmits a corresponding signal to the robot cell. The two systems – press brake and mobile six-axis robot – are thus connected at signal level.

Are there any disadvantages to using wireless switchgear?
If you are looking for an alternative to cabled switchgear, for example in order to increase flexibility or to realise dynamic work processes, then there are only advantages. But a 1:1 conversion to wireless just for the sake of it is usually not a good idea: then a conventional solution can be more expedient.

How will your range of wireless switching devices and technologies develop further, and which projects are your engineers currently working on?
About two years ago, we presented the first generation of our wireless network sWave.NET, in which hundreds of wireless switching devices can be flexibly integrated. Here we were aiming less at machine tool building and far more at intralogistics, e.g. at AGV fleets and E-Kanban racks. Now an upgrade of our wireless technology, regarding both the number of devices and the infrastructure, is very interesting for users: in the latest generation, with the aid of a "sensor bridge", we have created an uninterrupted IT infrastructure from switching device to ERP or warehouse mangement system.

Thank you very much, Mr. Schenk.

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