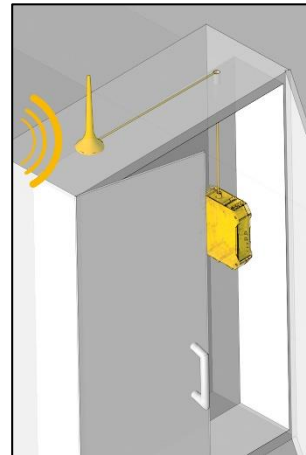
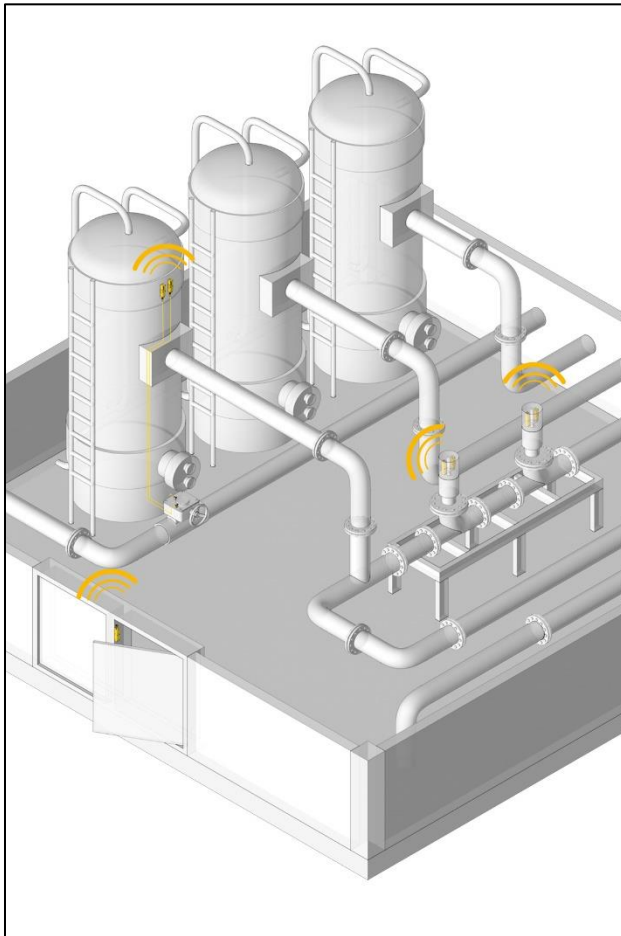
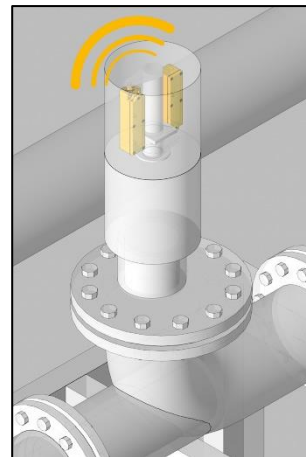


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Left: The oil & gas industry has many different applications for wireless switches and sensors.

Top right: When Wireless-Ex switching devices transmit from inside the Ex zone to the outside, there is no need for receiver units to comply with Ex regulations.



Bottom right: Valve positions can also be monitored remotely.

Switchgear for the oil & gas industry

Spark-free wireless transmission

Wireless switching devices are not yet widespread within the oil & gas industry. And yet wireless technology offers this sector some particular advantages – provided that explosion protection is guaranteed.

Risk of explosion, corrosive surroundings, vibrations, high levels of mechanical wear and tear: these are the typical ambient conditions for switching devices used in the oil & gas industry, and especially in offshore plants or supply vessels. Here only switches and sensors

which have been developed especially for such extreme requirements can meet the demands made of them.

Wireless technology increasingly popular

These switching devices – like all industrial switches and sensors – are nearly always

cabled. In other industrial application fields, however, wireless switching devices which transmit their signals via radio waves are becoming increasingly popular. In the oil & gas industry, only a few first applications using such a solution can be found, partly due to the fact that (gas) explosion protection requirements usually have to be met on top, raising the bar for safe signal exchange even higher.

And yet at the same time, deployment of wireless switches and sensors in this sector really makes sense. Wherever high levels of mechanical wear and tear are to be expected, there is always a risk of cable damage. And when Ex-compatible cable glands can be eliminated, installation inside an Ex zone becomes simpler. The switching devices can transmit from within the Ex zone to the outside, with the added advantage that the receiver units do not have to comply with explosion protection requirements.

Furthermore, of course, the general advantages of wireless switching devices also apply: quick installation and versatile mounting. This is especially true for

Professional guide	
Branch of industry	
Plant engineering	●
Chemicals	●●●
Pharmaceuticals	●
Equipment suppliers	●
Function	
Planners	●●●
Operators	●●●
Purchasers	●●
Managers	●●

applications involving long distances (for example the position monitoring of hand-operated valves inside pipelines), poorly accessible areas or moving/rotating plant components.

Wireless technology for Ex zones

A prerequisite for the deployment of such devices is, however, use of an industry-compatible wireless technology approved for use in hazardous zones.

In order to achieve this goal, steute has



The "Wireless-Ex" range includes inductive sensors with a universal transmitter which also powers the devices.

taken its own sWave wireless technology already established in industrial applications and upgraded it - as "Wireless-Ex" - for use in hazardous zones. Because this certified wireless system is low-energy, there is no risk of sparks or explosions. In addition, the transmission technology is less sensitive to other wireless networks, as well as to the often unfavourable ambient conditions of industrial plants.

The maximum range of the wireless signal is 40 m indoors and 450 m outdoors. The industry-compatible wireless technology is based on bidirectional communication. The regular status signal function is adjustable. The switching devices are powered by primary lithium thionyl chloride (Li-SOCl₂) batteries, which are approved for use in Ex zones. It is no problem to change the battery inside the Ex zone.

The switches and sensors not only meet the demands of the European Atex directive and IECEx, but also other national standards such as EAC (Russia), Inmetro (Brazil) and cCSAus (North America). This means that the Ex switching devices can be used in all producing nations and markets crucial to the oil & gas industry.

Different devices for different applications

Available Wireless-Ex devices include the Ex RF 96 wireless position switch in a slim rectangular design, as well as the Ex RF IS wireless inductive sensor in a cylindrical design. They are suitable

for wireless applications in combination with the Ex RF ST universal transmitter and are also powered by this transmitter unit.

The product range is continually expanding. Its latest additions are the Ex RF MC magnetic switches, which also work in combination with the Ex RF ST universal transmitter.

All switching devices with Wireless-Ex technology are categorised as having "intrinsically safe" ignition protection and are in safety class "ib" to EN 60097-11. This means that they comply to the standards for gas Ex zones 1 and 2, as well as dust Ex zones 21 and 22.

Typical applications within the oil & gas industry

One of the very first application fields for Wireless-Ex technology in the oil & gas industry was the position monitoring of valves in gas pipelines. There is often no power supply near these valves, meaning long cables. The effort of installation for battery-powered Ex devices without cables is therefore considerably reduced. Other application fields are to be found offshore: multiple suppliers of equipment to oil rigs use wireless switches and sensors from the steute Extreme range, for example to monitor the position of moving tools on drilling rods or linkage positions. On-shore applications for Wireless-Ex switches and sensors include the monitoring of fuel tank access doors.

Facts to aid the decision-making process

- *Wireless switches and sensors are particularly suited to the adverse ambient conditions of the oil & gas industry.*
- *Nevertheless, only a few application cases exist to date, partly due to the requirements of (gas) explosion protection.*
- *With the right Wireless-Ex technology, the potential waiting to be unleashed is huge.*

Switches and sensors are also available for other extreme conditions which can occur in industrial oil & gas plants. Examples are offshore exploration, as well as oil and natural gas tankers (salt water

resistance), onshore exploration (impact of wide-ranging temperatures and weather conditions) and refineries and processing plants (high IP classes).

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Images: steute Technologies GmbH & Co. KG