THE STRONGEST LINK.

STAHL

NETWORK TECHNOLOGY

Explosion protection for the industrial Ethernet

NETWORK SOLUTIONS – UNLIMITED OPTIONS IN HAZARDOUS AREAS

The search for new and more efficient solutions is becoming increasingly important in process automation, too.

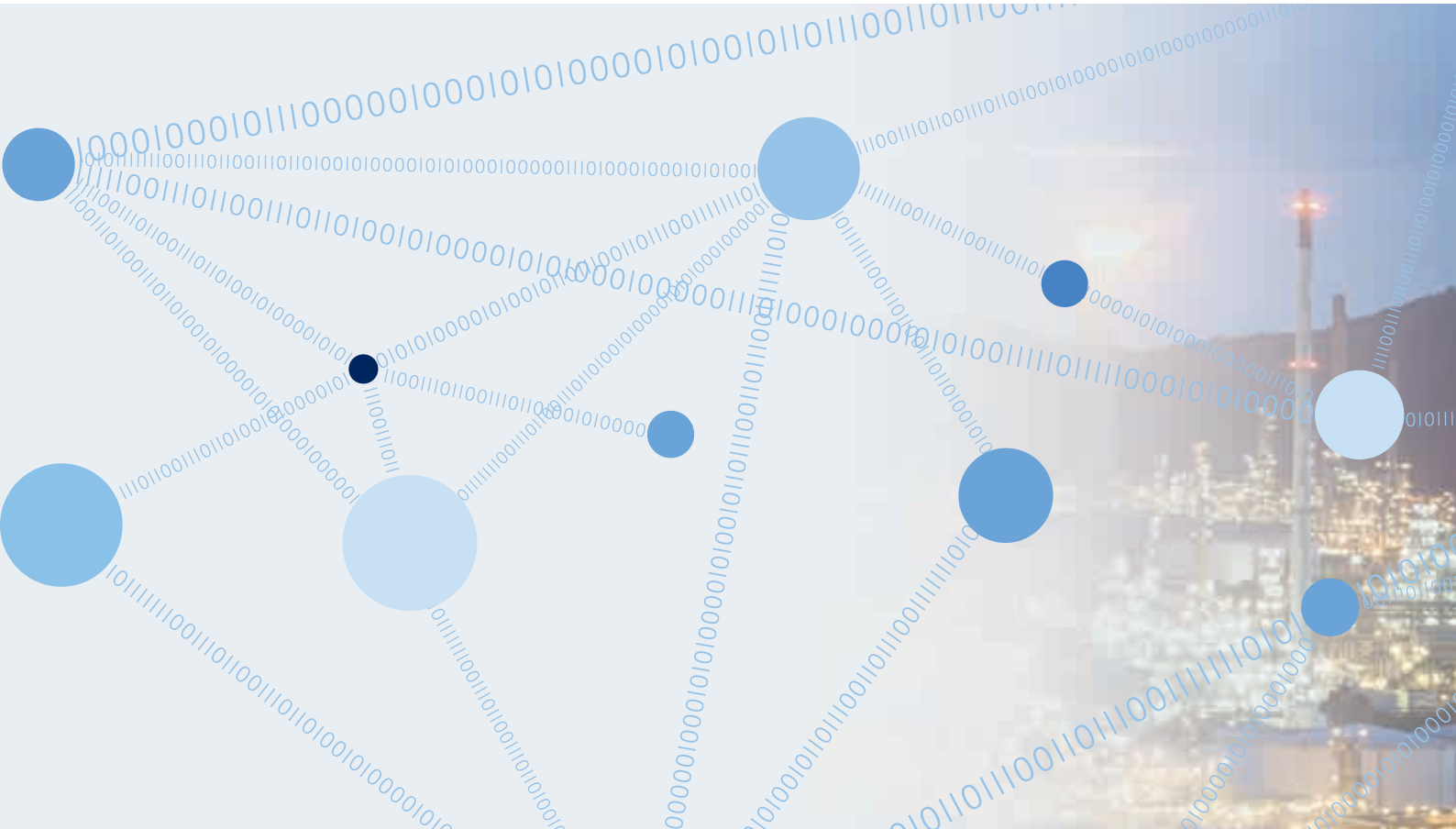
Whether under the term ‚Digital Oilfield' or in working groups on the topic of ‚Modular Automation' – a connection to the ‚Industrial Internet of Things' and the productive use of ‚Big Data' for process optimisation play a major role in all industry sectors.

Ethernet and wireless technology will play a decisive role in the implementation of the Internet of Things in the process industry. Its main applications are data transmission for mobile operator interfaces, monitoring of processes as well as sensor and actuator integration.

The technical challenge here consists of meeting the requirements of both digital transmission technologies on the one hand and explosion protection on the other.

R. STAHL aims to provide products and solutions that combine reliable explosion protection and easy handling.

In the area of network technology, R. STAHL's current portfolio includes products for installing Ethernet networks or Wi-Fi and WirelessHART solutions. We also see ourselves as your partner when it comes to designing networks in hazardous areas using devices and technologies of your choice.



IT MEETS EXPLOSION PROTECTION

The use of Ethernet in the process industry gives rise to an aspect that for most IT experts is absolutely new – explosion protection.

Protective regulations in the form of laws, decrees and standards have been developed across the world to prevent explosions. The first, obvious goal is to prevent the formation of an explosive atmosphere. However, in the production areas of the process industry this is not always possible.

Measures are therefore required that prevent the ignition of such an atmosphere.

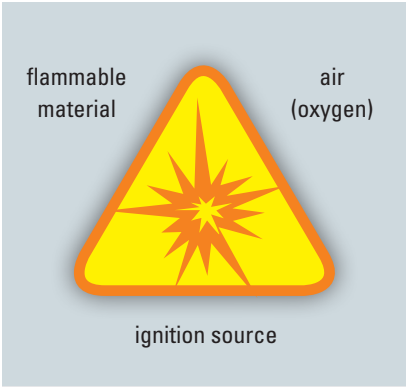
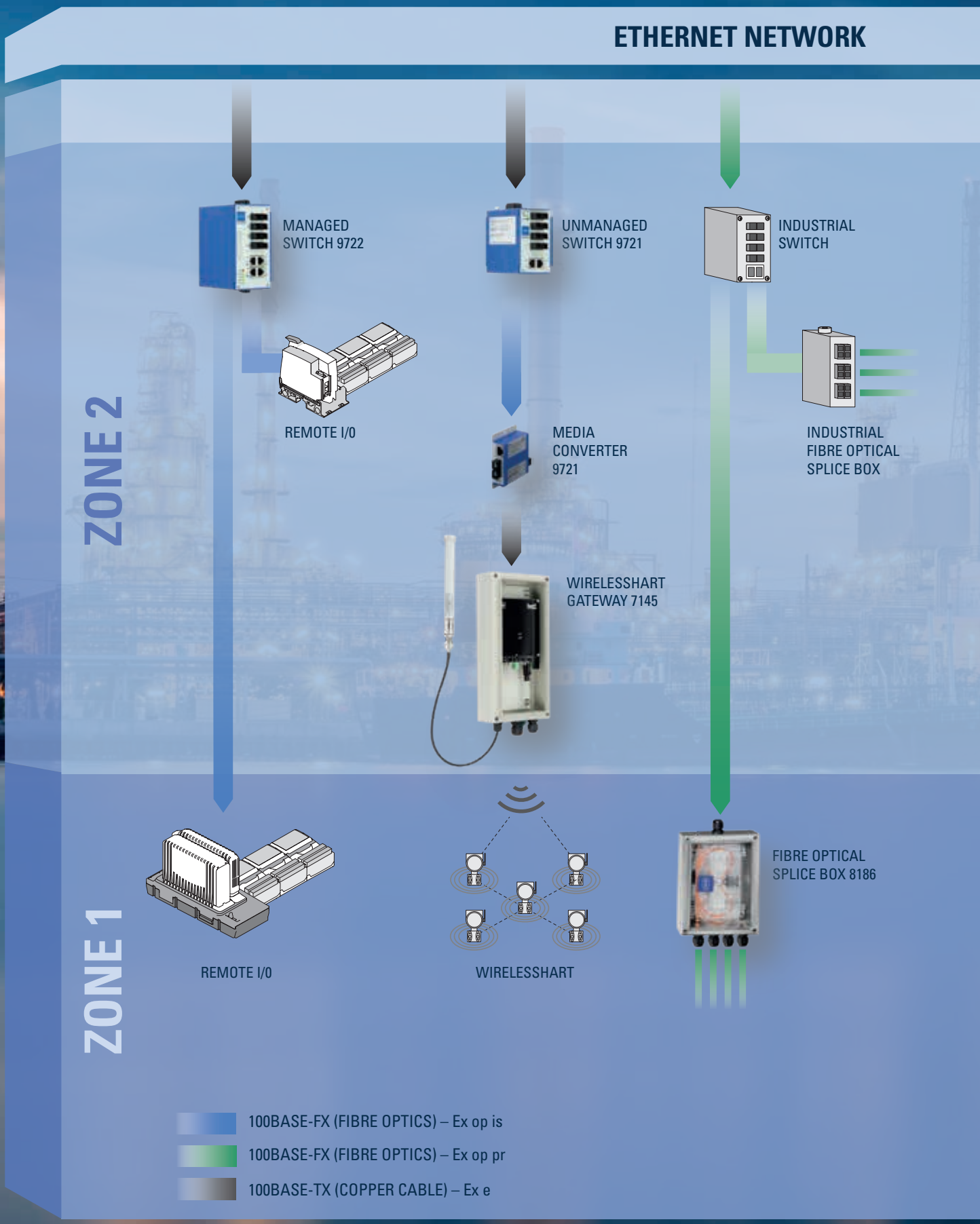


Fig. 1: For an explosion to take place, these three factors need to be present at the same time

A number of ignition protection measures are available for the protection of network technology. Some are based on the principle of encapsulating the devices so that the explosive atmosphere cannot reach them. Other types of protection limit the energy of the potential source of ignition to render it harmless.

Although is quite a challenge to meet the requirements of both worlds, our experience of more than 50 years in the field of explosion protection and own products that communicate via Ethernet make R. STAHL your ideal partner for network solutions.

R. STAHL – SOLUTIONS FOR DIGITAL NETWORKS



CCTV CONTROL

WI-FI ACCESS POINT 7145

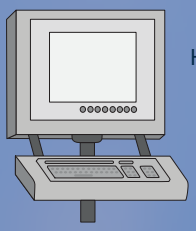
UNMANAGED SWITCH 9721

MEDIA CONVERTER 9721

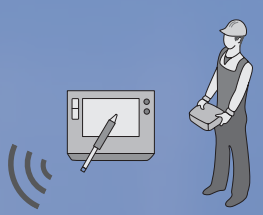
HMI

MEDIA CONVERTER 9721

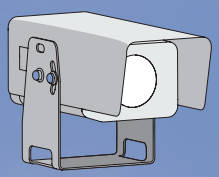
ETHERNET TERMINAL 8187



HMI



MOBILE HMI



CCTV

WI-FI ACCESS POINT 8265

MEDIA CONVERTER, UNMANAGED UND MANAGED SWITCHES

Ethernet data transmission via copper cables is limited to a distance of about 100 m. This is frequently not enough for the large production sites in the process industry. Also, data transmission via copper cables can be affected by electromagnetic interference.

In both cases, data transmission via optical fibre is a suitable alternative.

R. STAHL's media converters and switches work on the basis of explosion-protected laser sources, making installation and operation very simple.

Type of protection „op is"
Laser sources, which are used for the transmission of signals via fibre optic, are considered as potential sources of ignition.

The „op is" type of protection is based on limiting energy to a safe level, and is described in IEC EN 60079-28.

9721 media converter

The 9721 series media converter converts electrical signals into optically inherently safe „op is" signals, allowing installation and maintenance work to be conducted on fibre optics in Zones 0, 1 and 2 without the need for downtime (hot swap/hot work). It is particularly suitable for the IS1+ Ethernet Remote I/O System.

- Transmission rate 100 Mbit/s.
- Transmission range up to 5 km (multi mode) or up to 30 km (single mode).
- Extended temperature range of -30 °C ... +75 °C.
- Suitable for installation in Zone 2.

9721 unmanaged switch

The 9721 switch is used for linking electrical Ethernet networks with optical 100 Mbit/s Ethernet networks. The 4 FO ports are designed for operation in the hazardous areas with the „op is“ type of protection. This way, conventional fibre optic cables can also be used in hazardous areas and may be connected and disconnected during operation (hot-swap).

- Transmission rate 100 Mbit/s.
- Transmission range up to 5 km (multi- mode). or up to 30 km (single mode).
- Extended temperature range -30 °C ... +70 °C.
- Suitable for installation in Zone 2.

9722 managed switch

The series 9722 managed 100 Mbit/s switches are specifically designed for use in PROFINET networks. They feature ring functionality based on the Media Redundancy Protocol. The 4 FO ports are designed with the „op is“ type of protection, making maintenance of the devices in Zones 0, 1 and 2 easy (hot swap, hot plug).

- Robust industrial design.
- Suitable for PROFINET.
- Extended temperature range of -40 °C ... +70 °C.
- Suitable for installation in Zone 2.

INSTALLATION TECHNOLOGY FOR CABLES AND FIBRE OPTICS

The installation of Ethernet in hazardous areas is a balancing act between the requirements of explosion protection and those of digital signal transmission.

Whilst minimum distances and separate circuits are required on the one hand, parallel wiring may on the other hand result in interference.

R. STAHL provides unique solutions that combine both worlds, while at the same time making installation simple and fast.

Type of protection "e"
Special measures are taken for this type of protection to prevent excessively high temperatures and the generation of sparks within or outside of electric equipment. For this type of protection to work, there must be no sources of ignition during normal operations.

Type of protection "op pr"
Laser sources, which are used for the transmission of signals via fibre optic, are considered as potential sources of ignition.
The „op pr" type of protection is based on the safe encapsulation of the optic radiation within the fibre optic and the connection technology.

8187 Ethernet terminal

The Ethernet terminal 8187 is used to connect CAT5/6/7 cables with transmission rates of up to 1 GBit/s in hazardous areas. In this case, the usual connection technology using RJ45 connectors cannot be used.

A unique feature of the Ethernet terminal is the fact that it combines simple handling and optimum transmission performance.

8186 fibre optics splice cassette

The fibre optics splice cassette with type of protection “op pr” is used for the correct and fast connection of 6 or 12 fibre optic cables in hazardous areas.

The cassettes are fitted with 1 or 2 splice protection holders, and the fibre optics cables can be fed in at all four sides.

WIRELESS ETHERNET – CUSTOMISED WI-FI SOLUTIONS

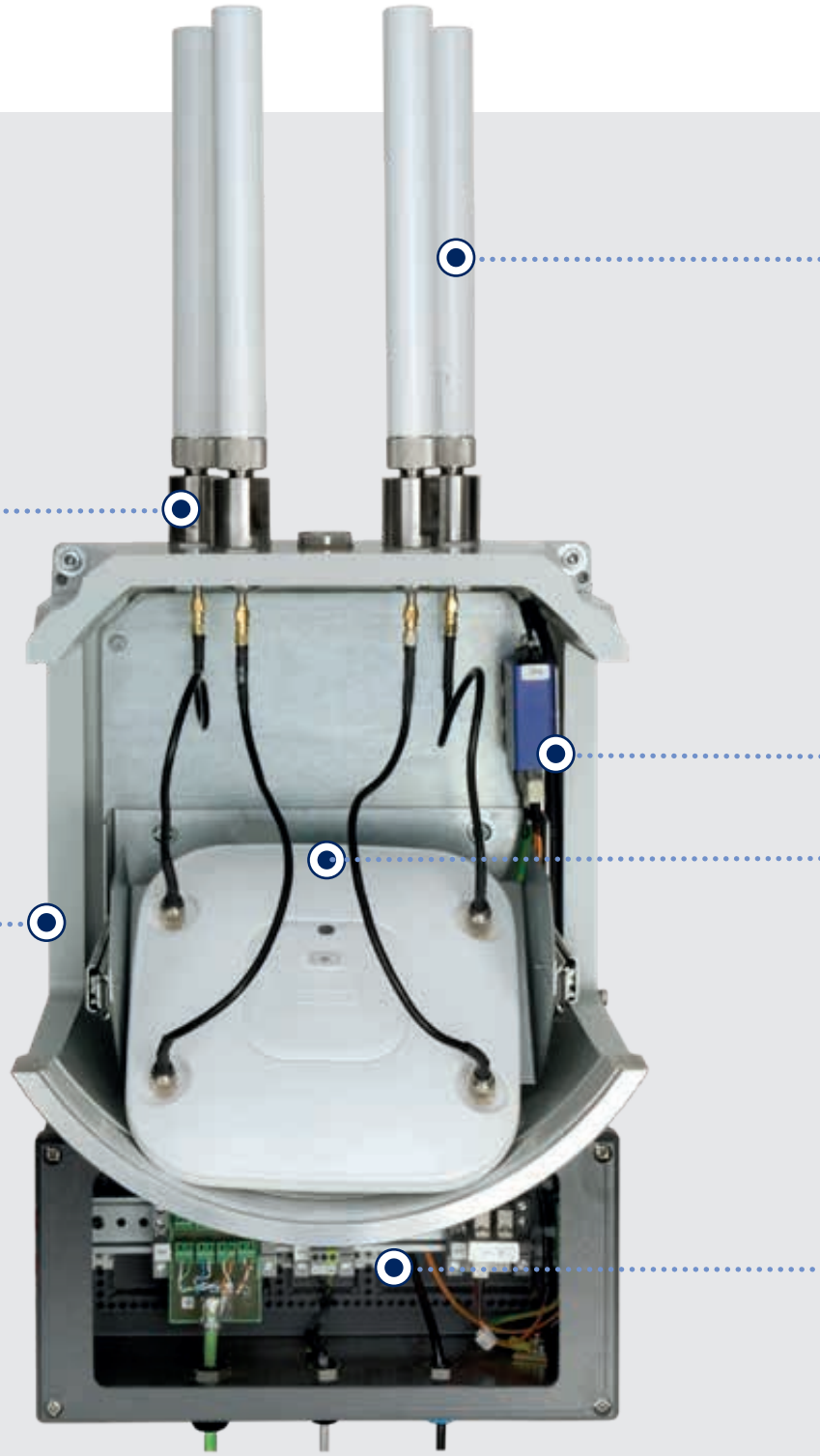
R. STAHL enables you to operate a Wi-Fi access point of your choice in hazardous areas. Your network remains homogenous across the company and can be centrally managed. We are happy to accommodate individual requirements and regional specifics.

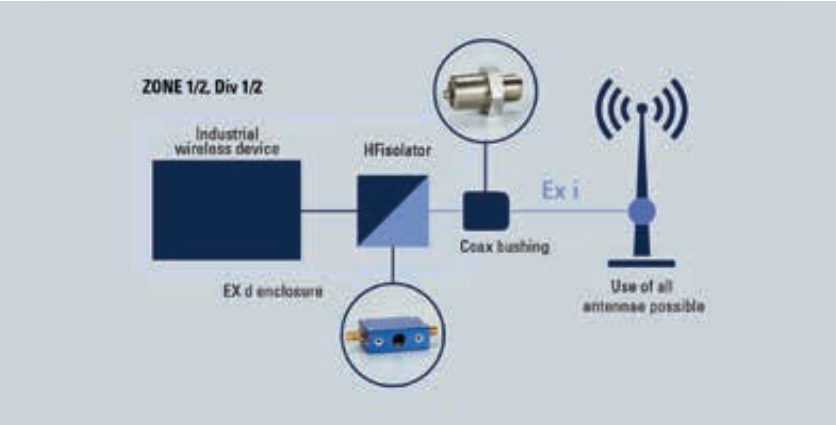
9730 HFISOLATOR

The HFisolator converts wireless signals into explosion-protected wireless signals. By converting a signal in this way, all benefits of intrinsic safety “i” apply: the use of the full range of antennae and standard co-axial connectors, as well as connection and disconnection of these connectors in hazardous areas.

8265 GUBOX EX D ENCLOSURE SYSTEM

The enclosure system with type of explosion protection “d” can be used for the project-specific design of encapsulation solutions for standard Ethernet devices such as a Wi-Fi access point. International certificates allow installation worldwide. A project-specific solution can be devised within a few short weeks.





The HFisolator makes the use of the complete range of industrial antennae in hazardous areas possible. In combination with the wide range of Ex d or Ex p enclosures, a solution can be found for any kind of wireless technology.

SELECTION OF ANTENNA

The antenna is a key factor in how powerful communication is. Although the HFisolator means that the choice of antennae is unlimited, their suitability for installation in hazardous areas must be taken into account. R. STAHL has such antennae in its portfolio.

9721 MEDIA CONVERTER

The media converter is used to convert electrical Ethernet signals (TX) into optical Ethernet signals (FX). The optical Ethernet signals have “op is” type of protection. This way, conventional fibre optic cables can also be used in hazardous areas and may be connected and disconnected during operation (hot-swap).

ACCESS POINT INSTALLATION

Wi-Fi is an exceedingly dynamic technology. Sooner or later, the innovation cycles and increasing user requirements will mean that the Wi-Fi access point must be replaced by the latest generation. Our design featuring a sliding antenna shelf facilitates comfortable replacement and is thus future-proof. This creates space for future expansions such as LoRa or WirelessHART.

8189 ETHERNET TERMINAL AND EX E TERMINAL BOX

This terminal is designed for connection of Ethernet cables in hazardous areas. It is suitable for 100BaseTX signals as well as 1GigE and has passed the relevant tests. When connecting the cable in the Ex e connection box, using the terminal means that the cable can be connected as usual, without the need for special Ex d cable glands.

WI-FI ACCESS POINT FOR ZONE 2

7145/5 Wi-Fi access point Zone 2

Many areas of the process industry are subject to harsh ambient conditions. One example of many is the production and transport of oil and gas. These areas require solutions specifically designed for these harsh conditions.

R. STAHL's portfolio includes devices suitable for a wide temperature range and requiring very little space. Together with our unique enclosure technology, Wi-Fi solutions can be designed for small to medium-sized networks that are also suitable for the transmission of Modbus TCP.

Highlights

- Supports 802.11 a, b, g, n.
- Compact design.
- Wide temperature range -40 °C ... +65 °C.
- Intuitive configuration via web server.

WIRELESSHART GATEWAY

7145/5 WirelessHART Gateway

WirelessHART is the established technology in process automation for transmitting signals from field devices. It combines great robustness, simple communication and low energy consumption.

R. STAHL's portfolio includes a gateway that sets up the WirelessHART network and establishes communication with the automation systems.

Highlights

- Redundancy for increased availability.
- Robust stainless-steel enclosure.
- Wide temperature range: -40 °C ... +60 °C.
- Individual solutions on request.

WirelessHART

R. STAHL: YOUR PARTNER FOR EXPLOSION PROTECTION WORLDWIDE

Engineering

In addition to components, R. STAHL can also provide project-specific solutions. Our experienced engineers work with you to design the ideal solution for your application fast.

Production

From an Ethernet terminal to an HMI with Wi-Fi access point - our production facilities will construct your solution safely, on time and with certified quality according to ATEX, IECEx or NEC.

Factory Acceptance Test (FAT)

Visit us at our spacious production facility for the inspection and acceptance of your solutions. Should you require any changes our production team will be immediately available.

Support

Our cooperation certainly does not end with the delivery of your system. Our support team is available during the initial on-site commissioning and over the entire operating life.

Our products and systems ensure the safety of staff, machines and the environment in hazardous areas. We provide our clients with customised, reliable and innovative solutions.

Our technology is always state-of-the-art. You can be sure that you have selected a modern and sustainable solution. Trust our know-how, our extensive product and service portfolio, our system expertise, our high quality and our reliability when it comes to certifications.

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STAHL

R. STAHL
Am Bahnhof 30
74638 Waldenburg, Germany
T +49 7942 943-0
F +49 7942 943-4333
r-stahl.com