Components and Solutions

Product Overview for Process Automation

Stocked and Distributed by NORMAN EQUIPMENT COMPANY 800-323-2710

Your automation, our passion.
A willingness to take entrepreneurial risks, a pioneering spirit, and a firm belief in their own inventive powers – these were the assets that Walter Pepperl and Ludwig Fuchs started out with when they opened their Mannheim radio repair shop in 1945. Their invention of the proximity switch a few years later proved their strength. It was also the starting point in a successful history defined by close customer relationships as well as innovative automation technologies and procedures.

Then as now, our focus is directed squarely on the individual requirements of each customer. Whether as a pioneer in electrical explosion protection, or as a leading innovator of highly efficient sensors – the close communication with our customers is what allowed us to become the leader in automation technology. Our main objective is combining state-of-the-art technologies and comprehensive services to optimize our customers’ processes and applications.

For more information, please visit our website: [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)
# Table of Contents

**Interface Technology** 8  
Isolated Barriers for DIN Rail Mounting 10  
Isolated Barriers for Termination Boards 12  
Zener Barriers 14  
Surge Protection Barriers 15  
K-System Signal Conditioners 16  
SC-System Signal Conditioners 18  
HART Interface Solutions 20  

**WirelessHART** 22  
Remote I/O Systems 26  
LB Remote I/O Stations 28  
FB Remote I/O Stations 30  

**FieldConnex® Fieldbus Infrastructure** 32  
FieldConnex 34  
Intelligent Fieldbus 36  
DART Fieldbus 38  

**Human-Machine Interface: VisuNet** 40  
HMI for Oil and Gas Industries 42  
HMI in Life Science 44  

**Purge and Pressurization: Bebco EPS®** 46  

**Level Measurement Technology** 50  

**PS3500 Power Supplies** 54  

**Electrical Explosion Protection Equipment** 58  

**Solutions for Explosion Protection** 64  
Project Planning Process 66  
Customized Solutions 68  

**Global Reach** 70
Solutions by Pepperl+Fuchs: Turning Your Idea Into Success
For more than 60 years, the name Pepperl+Fuchs has been synonymous with high-quality products, services, and solutions for processing systems in hazardous areas and harsh industrial environments. Experience spanning decades, a high level of application expertise, and continuous dialogue with our customers form the basis of a comprehensive portfolio for every requirement.

As a reliable partner, we understand our customers’ individual processes and procedures and know their industries and requirements down to the last detail. We provide creative ideas and fresh impetus, preparing you for future tasks in ever more competitive markets. We oversee each project with a great deal of care and commitment, from the initial consultation to the commissioning stage and downstream support.

We make no compromises when it comes to quality, safety, and reliability. Only by applying the highest standards can we ensure that we are able to provide your processes with reliable protection. By applying this philosophy and by providing top-quality engineering, we set global benchmarks for technologies in the area of explosion protection. And we do so time and time again.
Reliable Processes –
Signal after Signal

Safety, transparency, flexibility – the trusted technology of point-to-point wiring is tried, tested, and globally established. The clear assignment of each signal to a terminal means the technology is easy to manage using simple resources. Since its inception, the classic interface technology from Pepperl+Fuchs has been an integral part of the process industry. From the Eurocards of the 1970s to innovations such as prewired solutions, a large number of state-of-the-art modules and systems for hazardous and for safe areas are available to provide optimum support for all our customers’ applications.

The wide variety of intrinsically safe isolated barriers within this range of products is one of the highlights. Various types of devices provide a completely reliable solution for the safe transmission of signals in hazardous areas for every requirement.

A large selection of signal conditioners protects system operators from interference in signal transmission from the field device to the process control system. A comprehensive portfolio of more than 100 modules ensures optimum signal quality and an unrivaled level of process reliability.
Flexible Solutions for all Applications

Safety for the process, safety for the plant operators, and an easy-to-implement protection method: the K-System provides a comprehensive portfolio with reliable modules, designed by the experts in intrinsic safety. For mixed applications with hazardous and nonhazardous areas, signal conditioners and isolated barriers can be combined.

Typical Applications

Providing isolated barriers for hazardous areas and signal conditioners for safe areas, the K-System offers solutions even for mixed applications.

- Oil and gas industries
- Chemical industry
- Pharmaceutical industry
- Food industry

Key Benefits

- Power Rail for drastically reduced wiring, collective error messaging for flexible installation and expansion
- Simple maintenance with integrated diagnostics and quick change of modules during operation
- Simple configuration using DIP switches or software
- Many modules available with global approvals as well as SIL 2 and SIL 3 ratings
- Simple documentation with 2-D and 3-D drawings and macros
- Horizontal and vertical mounting with no reduction in operating values
- Line fault detection for field circuits
Technical Features

- Functional variety from simple switch amplifiers to high-performance modules for temperature, frequency, and strain gauge bridges
- Compact, one-channel, 12.5 mm wide modules providing single-loop integrity
- Maximum channel density in the 20 mm housings
- Only 5 mm per channel
- HART signal transparency

Highlights

- 25 years of industry-leading experience
- Broadest portfolio of its kind

More information can be found in the Pepperl+Fuchs brochure “Reliable Signals. Interface Technology Product Overview” and online at www.pepperl-fuchs.com/k-system
Minimal Wiring Effort

Termination boards are the core of the H-system isolated intrinsic safety barriers. The internal wiring together with the control-system-specific connectors and cables keep planning and wiring to a minimum. This simplifies mounting and accelerates the commissioning process. All termination boards are tested with the original hardware of the respective control system manufacturer.

Typical Applications

The H-System is used for connecting the control systems of major control system manufacturers to field devices.

- Oil and gas industries
- Chemical industry

Key Benefits

- Reduced expenditure for wiring, mounting, commissioning, and documentation
- Simple mounting of modules without tools
- Line fault detection for field circuits
- Many modules with global approvals as well as SIL 2 and SIL 3 ratings for simple and reliable planning and documentation
Technical Features

- Functional variety from simple switch amplifiers to high-performance modules for temperature, frequency, and strain gauge bridges
- Modules mount on coded slots of the termination board
- Termination boards mount on 35 mm DIN rail in the control cabinet
- Control-system-specific preassembled cables and termination boards
- HiC module with 12.5 mm housing width for single-loop integrity
- Maximum channel density of only 4.5 mm per channel in the 18 mm housings of the HiD modules
- HART signal transparency

Highlights

- Single system for horizontal and vertical mounting across the entire temperature range with no reduction in operating values
- Termination boards are tested with controllers from leading control system manufactures
- Control-system-specific connectors guarantee a quick and reliable connection of the signals to the automation systems
- Module change during operation

More information can be found at www.pepperl-fuchs.com/h-system
Reliable Protection with Zener Barriers and Surge Protection Barriers

Zener barriers and surge protection barriers provide reliable protection and ensure a high level of plant availability: Zener diode barriers have long been a popular and cost-effective solution for providing intrinsic safety protection for circuits by limiting energy transferred to a hazardous location to safe levels. Surge protection barriers divert harmful voltage transients and surge currents to ground. They protect all measurement and control instruments inside a control room, in the field, or even in a hazardous area.

Typical Z-System Applications

Zener barriers prevent the transmission of high energy levels from the safe area to the hazardous area. They are used when galvanic isolation is not needed or has been accomplished by other means.

- Oil and gas industries
- Chemical industry

Technical Features of the Z-System

- Limitation of energy supplied in intrinsically safe circuits
- High packing density with up to 4 mm per channel
- More than 75 models for AC and DC as well as one-, two-, and three-channel modules
- No power supply required
Surge Protection Barriers

**Typical Surge Protection Applications**

Surge protection barriers ground dangerous current and voltages and protect electronic measurement and control devices.

- Prevention of subsequent coupling caused by poor wiring
- Reliable surge protection, for example, from lightning strikes or switching processes

**Types of Surge Protection Barriers**

- K-System: snap-on surge protection for K-System modules
- Field Device: screw mounting for field devices with IP20 metal housing; simple mounting in hazardous areas in a free cable gland of the field device
- AC power: plug-in surge protection for 115/230 V mains power supplies
- DIN rail: universal module for DIN rail mounting

More information can be found at [www.pepperl-fuchs.com/z-system](http://www.pepperl-fuchs.com/z-system) and [www.pepperl-fuchs.com/k-system](http://www.pepperl-fuchs.com/k-system)

**Highlights**

- Wide variety of cost-effective solutions
- Increased availability
K-System Signal Conditioners – Convenient and Versatile

Through galvanic isolation, signal conditioners protect measurement and control circuits from transient signals and dangerous surges. The conversion, standardization, and splitting of measurement and control signals are among the core functions of these modules. Signal conditioners and isolated barriers can be mounted together in a space-saving solution on the Power Rail. Equipped with all system features of the K-System isolated barriers, such as power supply and collective error messaging via Power Rail, they offer a versatile solution for a wide range of applications.

Typical Applications

- Water and sewage industry: level, flow, and temperature measurement; screw conveyor and screen control
- Food industry: temperature measurement, level measurement, and pressure monitoring
- Wind turbines: frequency measurement, rotation speed monitoring, and temperature measuring
- Hydropower plants: frequency and level measurement

Modules for Digital and Analog Signals

**Digital Signals**
- Switch amplifier for position feedback from the field
- Frequency connector for standstill and rotation speed monitoring
- Level measurement/overflow protection
- Relay modules

**Analog Signals**
- Measuring transmitter for the conversion of analog measured values to standard signals, e.g., for precise temperature measurement
- Transmitter power supplies with splitting function to provide measured values for other systems
Technical Features

- Effective protection against measurement and control errors caused by transient signals, and surge protection using high-quality galvanic isolation
- Signal conversion and splitting
- Analog outputs for adapting to sources and sinks
- Comprehensive portfolio for all signal types, including high-functioning modules
- Temperature range: -25 °C to +60 °C

Highlights

- Power Rail with power supply and collective error messaging
- Universal power supply
- Designed for functionality, versatility, and convenience
- Well suited for applications with Ex and non-Ex signals

More information can be found in the Pepperl+Fuchs brochure “Isolation. Conversion. Protection. Signal Conditioners” and online at www.pepperl-fuchs.com/signalconditioner-k-system
SC-System Signal Conditioners – Compact and Efficient

Galvanic isolation combined with practical functionality for applications in non-hazardous areas – all in a compact, space-saving housing. These strengths distinguish the SC-system signal conditioners, which are specially designed to meet the requirements of applications where hazardous areas do not play a role. Above all, they reliably protect signals, which even in non-hazardous areas can be compromised by factors such as equalizing currents in ground loops.

Typical Applications

- Water and sewage industry: level, flow, and temperature measurement
- Food industry: temperature measurement, level measurement, and pressure monitoring
- Steel and cement: temperature and level measurement, measurement of shunt signals
- Hydropower plants: level measurement

Modules for Digital and Analog Signals

- Transmitter power supply, also available in SMART and splitter versions
- Isolated amplifier for standard and +/- signals
- Passive isolator
- Temperature converter
- Switch amplifier
- Rotation speed monitor/frequency converter
Technical Features

- Installation, power supply, and collective error messages via Power Bus
- Power Bus is compatible with many systems in the signal conditioner market
- Power supply with 24 VDC
- Setup with DIP switches or software
- Temperature range: –25 °C to +70 °C

Highlights

- Extremely compact at just 6 mm wide and 97 mm high
- High-quality 3-way isolation (300 V working voltage/3 kV test voltage)
- Temperature range –25 °C to +70 °C
- Available with screw terminal or spring clamps

More information can be found in the Pepperl+Fuchs brochure “Reliability in Its Most Efficient Form. The SC-System.” and online at www.pepperl-fuchs.com/signalconditioner-sc-system
More Process Information with HART Interface Solutions

The HART digital standard has been firmly established in the process industry for decades. More than 30 million HART-compatible field devices are in use worldwide. HART interface solutions from Pepperl+Fuchs include two HART multiplexer systems and a single-channel HART loop converter.

Typical Applications

HART enables additional functions to be incorporated in available topologies, allowing access to information such as the error diagnostics and other measurements.

- Retrofitting existing plants
- Reconfiguring field devices in batch processes
- Activation and feedback of emergency valves
- Reading status information from field devices

Key Benefits

- Access to additional information such as configuration and diagnostics data and measurements
- High operability due to early error messages
- Affordable solution for upgrading
HART Interface Solutions

HART Multiplexer

A multiplexer works similarly to a gateway that extracts the digital HART signal without disturbing or compromising the communication between the field devices and the DCS or PLC. It provides an ideal solution for existing control system installations that do not support HART-capable I/O.

- K-System HART multiplexer supports up to 256 field devices
- H-System multiplexer termination board supports up to 32 field devices

HART Loop Converter

The K-System HART loop converter is a single-channel isolated barrier for intrinsically safe applications. It uses up to four measurements as HART variables and relays them as analog output signals.

- Passive input for connecting to existing field loops without affecting the safety parameter
- Active input for transmitter supply
- Three outputs

More information can be found in the Pepperl+Fuchs brochure “HART Interface Solutions” and online at www.pepperl-fuchs.com/hart-interface
Minimum Expenditure for HART-Based Systems

WirelessHART brings wireless communication to the field with all the benefits of HART technology. Particularly for extensive plants or plants with difficult-to-access measurement points, this technology offers minimum expenditure and maximum convenience. The mesh network uses wireless adapters both as routers and repeaters and is independent of a central gateway. This enables the development of extensive network structures in which any transmission failures can be compensated for automatically — a valuable benefit that increases plant availability.

WirelessHART technology from Pepperl+Fuchs is a cost-effective solution with perfectly coordinated components that simplify every process step. From planning using 3-D simulation software and the intelligent gateway to the conversion of measurement values, our portfolio offers an impressive price/performance ratio.
The Simple Wireless Network

Ready for operation, fault-free, and safe – WirelessHART offers a level of simplicity and convenience almost unrivaled by other technologies during installation, maintenance, and operation. It is resistant to environmental influences and provides reliable information in all ambient conditions. It is a cost-effective alternative to time-consuming cable installations.

Typical Applications

WirelessHART is the perfect choice to install new measurement points or upgrade existing field devices to measure temperature, level, pressure, and more. This enables greater process optimization, flexibility in installation, and improves asset management as it reveals the information needed for preventive maintenance.

Key Benefits

- High-performance DTM for the WirelessHART gateway and web interface
- Wide range of supportable devices
- Hazardous-rated adapters and gateways
- Quick and easy commissioning
- Simple network diagnostics
- Complete flexibility in the selection of the control system manufacturer
- Our gateways have native communications for MODBUS TCP, RS-485, and EtherNet/IP.
Technical Features

- WINC 3-D simulation software allows seamless planning of the plant network
- WirelessHART gateway with redundant power supply and integrated network manager
- Adapters available in battery-powered or loop-powered models or with local/direct power option for use up to Zone 0, Class I and Div. 1
- Explosion-proof BULLET
- WirelessHART Adapter for connecting conventional HART and 4 ... 20 mA devices
- Aluminum adapter for harsh industrial environments
- WirelessHART temperature converter for the conversion of measurements into measured values and the transmission of data to the network

More information can be found in the Pepperl+Fuchs brochure “Wireless Sensing with WirelessHART” and online at www.pepperl-fuchs.com/wirelesshart
The successful use of remote I/O demonstrates that the benefits of traditional technology cannot only be combined with advanced technology but can also offer plant operators a whole host of advantages. The advantage of the clear assignment of a signal to a terminal is maintained, while existing nonsmart instruments can be easily integrated without additional wiring. Investment costs can be reduced significantly through the modernization or expansion of existing plants. At the same time, wiring is reduced, the need for space decreases, and new diagnostics information via the HART connection makes the process more transparent. This is the ideal and by far the most cost-effective way to modify plants and make them more competitive.

Pepperl+Fuchs identified and developed the potential of remote I/O technology at an early stage. Our product family today includes sophisticated components with the most compact housing design in process automation for Zone 2, allowing for optimal use of available space. Our systems for use in Zones 1 and 2 and Div. 1 and 2 also allow users to simplify planning and maintenance by keeping the topology of the LB and FB systems the same across the process control level.
Greater Performance and Reduced Installation Space

Maximum performance for installations in hazardous areas in the smallest spaces – this is the key feature of the LB product line. The capacity for more channels per module than any other technology makes the LB remote I/O system the most compact and efficient system in process automation. The decentralized installation also reduces wiring and enables monitoring, configuration, and parameterization via the control system.

Typical Applications

In any process automation installation, the versatile LB system is perfect for collecting any measurement signal such as temperatures, pressures, levels, or any digital inputs for status reports and for controlling any outputs such as proportional valves, solenoids, or indicators via a fieldbus. The LB remote I/O system can be installed in Zone 2, Class I/Div. 2 environments.

Key Benefits

- Compatible with the digital communication protocols FOUNDATION fieldbus, PROFIBUS, MODBUS, and HART
- Compact system with minimum space requirements
- Maintenance of wiring and field devices at field level
- Maximum packing density
- Combination of Ex i and non-Ex components
Technical Features

- Backplane mounts on standard DIN rail
- Plug-in modules have removable terminals and are hot swappable
- Free combination of I/O modules for non-Ex and Ex i field connections in the same backplane
- Combination of single-channel and multichannel modules for the highest possible packing density
- Redundant gateway and power supply
- Backplane with shutdown groups for safety shutdown

More information can be found in the Pepperl+Fuchs brochure “The Gateway between Two Technological Worlds. Remote I/O” and online at www.pepperl-fuchs.com/rio
FB Remote I/O Stations

Robust Technology for Zone 1 Installations

The robust FB remote I/O system modules are ideal for harsh industrial environments and for use in Zone 1. The modules are based on the same engineering as the LB remote I/O system, meaning less work, easier planning, and significantly reduced costs for the plant operator. Depending on the application, the FB system is available in different housing styles.
Typical Applications

The FB system is used for the same applications as the LB system for installations in Zone 1.

Key Benefits

- Robust design for harsh environments
- Preservation of field-level wiring
- Maximum packing density
- Combination of Ex i and Ex e components

Technical Features

- Completely certified solution including backplane, housing, and modules, engineered by Pepperl+Fuchs
- Plug-in modules with removable terminals
- Free combination of I/O modules for Ex e and Ex i field connections in the same backplane
- Combination of single-channel and multichannel modules for the highest possible packing density
- Maintenance without hot work permit
- Backplane supports power and communication gateway redundancy
- Ex e connections as removal protection (IP30)

More information can be found in the Pepperl+Fuchs brochure "The Gateway between Two Technological Worlds. Remote I/O" and online at [www.pepperl-fuchs.com/rio](http://www.pepperl-fuchs.com/rio)
The Ultimate in Transparency: FieldConnex® from Pepperl+Fuchs

Where processes require the highest level of transparency, and maximum availability is crucial for success, there is no alternative to fieldbus technology. FieldConnex products are high-performance components for fieldbus installations and infrastructure. They make the connection between the process control technology and field devices transparent – and therefore manageable. Sophisticated, intelligent diagnostic functions immediately recognize any undesired deviations, while state-of-the-art electronics isolate and prevent faults before they occur or can take effect. This system makes processes safer, more available, and more efficient than ever before.

Pepperl+Fuchs has always been active in the area of fieldbus technology and has made key contributions to the development of this technology linking fieldbus and explosion protection. FieldConnex provides an innovative product portfolio with unique functions, ensuring maximum reliability and availability for any fieldbus infrastructure. The latest development is intelligent fieldbus. This includes diagnostic-enabled components with self-monitoring and fault detection, which are unique in the market and bring fault diagnostics and fault protection into the field for the very first time. No other technology offers greater safety or availability.

Innovations such as these provide the entire process industry with new opportunities time and again – and this progress continues.
Continuous Diagnostics to Ensure Maximum Availability

Achieving 100% availability – this objective is the basis for all technological developments in FieldConnex fieldbus technology. The key to maximum availability is seamless and continuous monitoring and diagnostics of the entire fieldbus installation. At the core of this technology is FieldConnex Advanced Diagnostics, which provides a high level of transparency and reliability. For the first time, FieldConnex enables an Ethernet-based connection to higher-level control systems via PROFINET. Consistency in communication protects the investment and provides the greatest transparency.

Typical Applications

FieldConnex is certified in accordance with all global standards and is used worldwide wherever flammable materials are processed or potentially hazardous atmospheres can arise.

- Oil and gas industry: high availability including all methods of ignition protection relevant for fieldbus and diagnostic-enabled components providing high reliability
- Chemical industry: all FieldConnex components meet strict safety requirements and comply with environmental regulations
- Offshore and marine industry: specially certified components for extreme environmental conditions
- Water, wastewater, and desalination: remote monitoring, configuration, and diagnosis of the automation system

Key Benefits

- Clear and consistent communication for best access to diagnostic data of the instrumentation
- Shortened commissioning and efficient troubleshooting via diagnostic tools
- Maximum safety with no power limitations
- Ideal for widespread plants with long cable runs and many devices
- Investment protection for existing instruments with retrofits
**Technical Features**

- Components for **FOUNDATION** Fieldbus H1 and PROFIBUS PA bus systems
- FieldBarrier and Segment Protector: intrinsically safe connection to the high-power trunk with intelligent fault protection
- Power Hubs: power supply with integrated fieldbus diagnostics
- Basic power supply and Segment Coupler for small plants and the most compact installation
- Advanced Diagnostics: diagnostic module on the Power Hub, also optional integration as **FOUNDATION** fieldbus H1 nodes via EDDL device description

More information can be found in the Pepperl+Fuchs brochure “Product Overview FieldConnex® Fieldbus Infrastructure” and online at [www.pepperl-fuchs.com/fieldconnex](http://www.pepperl-fuchs.com/fieldconnex)
Intelligent Fieldbus

The First Fieldbus Infrastructure with Diagnostic Capability in the Field

Identifying, preventing, and isolating faults – these functions best characterize FieldConnex components equipped with features capable of performing diagnostics. An alarm message reports the unwanted condition immediately and faults are efficiently and reliably isolated directly in the field. This user-oriented, state-of-the-art technology sets a new benchmark for plant safety and availability.

Diagnostic Gateway
- Reliable monitoring of the control cabinet
- Integrated, easy-to-configure I/O

FieldBarrier and Segment Protector
- Self-monitoring FieldBarrier
- Excellent fault detection and isolation well beyond simple short circuits
- Integrated diagnostics of physical layer at each output
- Extremely compact housing
- Supports up to 31 nodes in any hazardous area

Surge Protection
- Self-monitoring lightning protection
- Alarm indication prior to module failure
- Immediate alarm message on-site and in the control room with location information

Enclosure Leakage Sensor ELS-1
- Protection against even the smallest amount of penetrating moisture
- Immediate alarm signal to the control room
- Can be used in a junction box, field device, or control cabinet
Intelligent Fieldbus

More information can be found in the Pepperl+Fuchs brochure “Intelligent Fieldbus – Keeps Your Process Running” and online at www.pepperl-fuchs.com/intelligent-fieldbus

Highlights

- Maximum protection from the control room to the field device and all critical points in-between
- Seamless diagnostics and monitoring in the
  - Field device
  - Field junction box
  - Control cabinet
- Diagnostic manager software
  - Intelligent monitoring without configuration
  - Optimal communication quality established during plant startup

Surge Protector Trunk

Surge Protector Spur

Enclosure Leakage Sensor
The Intrinsically Safe High-Power Trunk

DART technology is an innovation from Pepperl+Fuchs. What makes it unique is its ability to transmit large amounts of power while maintaining intrinsic safety. This ensures maximum protection, with cable lengths of up to 1000 m and 10 or more instruments on one segment.

DART Power Hub
- Intrinsically safe redundant power supplies
- Host interfaces adapted to the process control system
- Optional Diagnostic Module for monitoring the physical layer

DART Segment Protector
- Integrated short-circuit protection at the spur
- Spur length up to 200 m
- Installation in Zone 1
- Connect up to four Segment Protectors to a cable length of up to 1000 m
DART Segment Coupler 3

- Flexibility in plant design
- Transparent coupling to PROFIBUS DP

More information can be found at www.dart-fieldbus.com
Insightful Solutions

The complexity of modern processes and high-tech machinery requires HMI systems and components directly in the process area. Adding to this complexity are processes with hazardous areas. Typically, these HMIs are subject to moisture, extreme temperature shifts, and the use and abuse of daily operations. To ensure process availability, a high level of engineering expertise and experience is required of your HMI supplier.

With VisuNet, Pepperl+Fuchs has developed HMI systems and components that draw on decades of experience and expertise in hazardous locations. This product range satisfies even the most demanding requirements for process visualization and is used worldwide in oil and gas exploration, refineries, life sciences, and chemical production facilities – from a panel PC in a drilling console monitoring the drilling process on a platform, to an operator workstation automating batch processes, or formulation in a pharmaceutical facility. Every day, operators around the world rely on the quality and protection provided by our continuous-duty HMI products.
HMI Solutions

Your automation, our passion.

PEPPERL+FUCHS
Rugged HMI for the Oil and Gas Industries

Demanding industrial applications such as the extraction of fossil fuels bring visualization systems to the limits of endurance. VisuNet HMI workstations and panel components were developed for such extreme conditions in continuous-duty operations. They are guaranteed to withstand the rugged conditions common to each stage of oil and gas exploration, refining, and transportation.

Typical Applications
- Petrochemical production
- Blending processes
- Compressor and pumping stations
- Tank and terminal storage
- Tanker filling stations
- Gas plants/fractionation plants
- LNG production

Key Benefits
- Extremely robust design provides product longevity
- Reliable performance under adverse environmental conditions
- Globally certified for ATEX, IECEx, and NEC
- Field-maintainable HMI units

Technical Features
- Durable enclosures
- Wide range of operating temperatures
- Sunlight-readable displays
VisuNet XT Highlights

In fossil fuel exploration, harsh conditions can be extremely problematic for drilling equipment as well as for the control and monitoring of equipment. To increase efficiency, rugged panel PC and software applications have replaced many hydraulic gauges, recorders, and counters used for drilling wells. This requires an HMI solution properly engineered to deliver shear strength and processing speed. Applications for VisuNet XT are:

- Driller monitors
- Compressor controls
- Mud logging
- Safety systems
- Choke controls

More information can be found in the Pepperl+Fuchs brochure “VisuNet Solutions. Rugged HMI Solutions for the Oil and Gas Industries” and online at www.pepperl-fuchs.com/hmi
HMI for Life Science Industries

High-Tech Components for Life Science Applications

Applications in regulated industries such as the pharmaceutical and food and beverage industries are determined by current international GMP guidelines. The VisuNet portfolio meets all GMP requirements both in form and function. The materials selected, design of the surfaces, and architecture of the overall system prevents the accumulation of fluids and dirt and enable easy maintenance and cleaning.

Typical Applications

- Batch and dosing control
- Tablet and filling machines in the
  - Pharmaceutical industry
  - Food industry
  - Cosmetics industry
- Production of perfumes and flavorings

Key Benefits

- Designed in line with common GMP requirements
- Ideal for clean room and hygienic applications
- Focused products that solve the environmental challenges and obstacles presented by taking HMIs into hazardous areas
- Innovative RM Shell for easy integration and management of virtualization architectures

Technical Features

- Sleek, smooth housings and continuous glass front displays to support optimal cleaning
- Multi-touch displays
- Resistant to chemicals and detergents
- Globally certified units for Zone 1, Zone 2, and Class I, Div. 1 and 2
**Highlights VisuNet RM Shell 4.1**

- Next-generation firmware for Pepperl+Fuchs VisuNet thin clients
- Replaces Windows Explorer and restricts operators from system access
- Simplified, touch-optimized user interface
- Full compatibility with PC-based and virtualized process control systems
- Ensures secure and reliable connectivity
- Developed within the Microsoft® Windows Embedded Standard 7 framework to support IT compliance

More information can be found at [www.pepperl-fuchs.com/hmi](http://www.pepperl-fuchs.com/hmi)
Purge and pressurization is the most flexible Ex protection method, because it allows the use of non-Ex electrical equipment in hazardous areas. Standard components are easily installed in an Ex p enclosure. Flammable gas collected inside the enclosure is removed, and the accumulation of gases or ignitable dust within the pressurized enclosure is prevented. Establishing and maintaining an overpressure with air or inert gas prevents an explosive atmosphere from entering the enclosure.

Pepperl+Fuchs Bebco EPS systems form a comprehensive portfolio suitable for all requirements and are a safe and economical solution. Many of the units are globally certified, which makes specification, installation, and operation easier. User-friendly interfaces and menu-driven programming guarantee simple operation.

For special requirements, the design engineers in our Solution Engineering Centers (SEC) in the U.S., Europe, and Asia will design and manufacture a custom, certified enclosure assembled to your specifications – including all the necessary system approvals and certificates.
Purging Solutions for Every Demand

Fully automatic systems with many functions or standard programs for simple implementation – the Bebco EPS product range offers solutions for every application. Each system has been designed and engineered with a user-friendly programming interface and standard configurations to simplify implementation, and all components and solutions are supplied with certificates and system approvals.

Typical Applications
- Process control cabinets
- Indoor or outdoor control panels
- Hazardous location HMIs
- Gas analyzers
- Motors, filing, and weighing systems

Key Benefits
- Controls the temperature inside the enclosure
- Prevents moisture and dust accumulation
- Requires little maintenance and provides easy access to equipment
- Customized certified solutions with all the necessary certificates
- Extends the life of expensive electronics

Technical Features: 6500 Series
- Compact systems designed for Zone 1 and 21 locations
- Reduces classification within the protected enclosure from Zone 1 and 21 to nonhazardous
- RS-485 with HART communication port and Bluetooth compatible for remote diagnostics
- Continuous flow functionality for dilution applications
Technical Features: 6000 Series
- Fully automatic and field-configurable system
- Reduces classification inside enclosure from Zone 1/Div. 1 to nonhazardous
- Automatic Rapid Exchange® for temperature control and leak compensation
- Globally certified for ATEX, IECEx, and NFPA 496 standards

Technical Features: 5500 Series
- Small and compact system
- Reduces the classification within the protected enclosure from Zone 2/Div. 2 to nonhazardous
- The unit is field configurable, making it easy for users to select the program for their application using the menus on the display screen

Technical Features: 3000 Series
- Reduces the classification within the protected enclosure from Zone 1/Div. 2 to nonhazardous
- Supports differential pressure switch and alarm outputs
- Component kit and various mounting options
- Simple pneumatic system with effective, well-proven design

More information can be found in the Pepperl+Fuchs brochure “Purge and Pressurization Systems. The Leaders in Purging Technology” and online at www.pepperl-fuchs.com/purge
The Highest Level of Precision for All Measurement Tasks

The reliable monitoring of limit levels and highly precise data on levels and consumption are essential for efficient plant management. This monitoring requires solutions that are perfectly tailored to the measurement requirements. Additionally, they must also optimally support the most demanding customer processes. The large number of measurement tasks, which also require a wide range of products, presents a major challenge.

The Pepperl+Fuchs product portfolio provides users with almost unlimited options. Whether it is the housing, material, or coating – the measurement technology can be tailored precisely to all specific customer requirements and can be used universally, regardless of medium and even under the most difficult measuring conditions.

Technology that can be used at every location worldwide is a matter of efficiency for international companies. Our portfolio also meets this requirement: Pepperl+Fuchs measurement technology is equipped with all common process connections and meets all technical requirements defined by national and international standards.
Level Measurement Technology
The Method Is What Matters: Reliable Measurements in Any Medium

Precise, self-monitoring, reliable, and robust – level measurement technology from Pepperl+Fuchs guarantees the greatest possible process reliability for every device. Which solution perfectly meets the individual requirement depends primarily on the right measurement process and the appropriate measuring principle. Pressure, vibration, ultrasonic, float – the range of measuring methods is extensive and the right sensor is also selected based on the consistency of the medium.

Typical Applications

Whether in the oil and gas industry or for pharmaceuticals, the chemical industry, or water and wastewater – level measurement technology is used throughout modern process facilities. Levels are commonly monitored in a number of areas, ranging from bulk goods to pastes and liquids in tanks, filling stations, silos, and transportable containers.

Limit Value Detection

- Overflow safety device
- Minimum/maximum controls
- Overflow and dry-run protection

Continual Measurement

- Consumption determination
- Loss control
- Balancing
- Stocking
- Storage capacity
### Key Benefits
- Maximum precision
- Self-monitoring sensors
- Sensor technology for all measurement processes and measurement principles
- Reliable measurement results regardless of medium
- Maximum process reliability

<table>
<thead>
<tr>
<th>Limit Level Measurement</th>
<th>Continual Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fixed</strong></td>
<td><strong>Fixed</strong></td>
</tr>
<tr>
<td>Vibration S</td>
<td>Ultrasonic</td>
</tr>
<tr>
<td>Capacitive trip amplifier</td>
<td>Pulscon</td>
</tr>
<tr>
<td><strong>Liquid</strong></td>
<td></td>
</tr>
<tr>
<td>Vibration</td>
<td>Ultrasonic</td>
</tr>
<tr>
<td>Conductive electrodes</td>
<td>Pulscon</td>
</tr>
<tr>
<td>Magnetic immersion probe</td>
<td>Magnetic immersion probe</td>
</tr>
<tr>
<td>Floating switches</td>
<td>Level sensor</td>
</tr>
<tr>
<td></td>
<td>Pressure transmitters</td>
</tr>
</tbody>
</table>

More information can be found in the Pepperl+Fuchs brochure “Level Measurement Product Overview” and online at [www.pepperl-fuchs.com/level](http://www.pepperl-fuchs.com/level)
**Improving Operational Integrity**

Digital networks operate in some of the most demanding industrial environments. Process safety valves and control systems typically depend on low-cost, industrial-grade power supplies not designed for 24/7 operation. A single power supply failure can have a catastrophic effect at continuous-process facilities, resulting in tremendous revenue loss.

Monitoring power, not unlike a traditional process variable, means transparency and added protection for critical loops. Power redundancy and detailed diagnostics guarantee that system functionality continues even during a supply failure. Reducing the probability of failure and improving safety is a decisive step toward system integrity.
Power Supplies

Designed for 24/7 Operation: Reliable Technology with Integrated Diagnostics

Redundancy, diagnostics, high immunity, and industry-leading efficiency for demanding environments – the PS3500 power supplies provide performance at the highest level for all process industries. All modules are configurable and allow full N+1 or N+N redundancy for critical system power requirements.

Typical Applications
- Redundancy for 24 V power to instrumentation
- Vibration monitoring systems
- Bulk power for control system cabinets

Typical Applications for N+1 redundancy
- Continuous process facilities – refineries
- Emergency shutdown systems/SIL 3
- Offshore platforms
- Fieldbus projects

PS3500 Diagnostics Module

The PS3500 power supply has a new diagnostic module. It plugs directly into the backplane for real-time system diagnostics and features a local display for immediate feedback on primary- and secondary-side operating parameters. The simple-to-understand information will easily integrate into plant asset-management software and will complement the existing FieldConnex Diagnostic Module. This mission-critical information will help improve maintenance functions and prevent unplanned shutdowns.

- Monitors operating parameters and sets warning and alarms for negative shifts in input/output voltages, current, and temperature
- Two-way indication – Diagnostic Module LEDs and Asset Management System (DTM, HART, and EDDL)
- The diagnostic module is transparent to the system, and the communications are galvanically isolated
Key Benefits

- Improved operational integrity
- Monitors power like any other control variable
- Additional protection in critical loops
- Reduced failure probability

Technical Features

- Simple hot-swappable removal of a module without causing system shutdown
- Operates at 91% efficiency, allowing higher ambient temperature conditions
- Active load sharing and high system reliability (no internal fans)
- Universal AC or DC input and 22.5 to 30 VDC adjustable output

More information can be found in the Pepperl+Fuchs brochure "Unrelenting Current. Powering Availability with PS3500 Power Supplies" and online at www.pepperl-fuchs.com/ps3500
All Angles Covered: A Flexible Portfolio for a Variety of Applications

The variety of applications in hazardous locations is almost unlimited, and even common applications can entail a wide range of requirements depending on the type of protection, the industry, or country-specific guidelines. To meet all these requirements, customers need a wide range of flexible and adjustable products and systems.

The range of electrical components and systems offered by Pepperl+Fuchs for explosion protection is specially tailored to this range of requirements. All functions required for installation and operation are available, ranging from terminal boxes and local control stations to comprehensive complex control systems. The various product lines are based on high-quality enclosures and components of increased safety, intrinsic safety, and flameproof types of protection. They are available in a wide range of functions, sizes, and materials. No matter how specific the requirements are, we deliver optimal flexibility for any application.
Remarkably Diverse: Functions for Every Application

Signaling, monitoring, control, and distribution are the key tasks of the components and systems for explosion protection. Pepperl+Fuchs products allow for quick installation and commissioning and offer the user an unrivaled selection of functionalities and configurations.

Typical Applications

All products offer a high degree of protection for electrical installation – including in difficult environmental conditions. The products are suitable for installation in:

- Production plants with hazardous areas
- Production areas with high levels of dust generation
- Aggressive environments commonly found in marine and offshore applications
- Areas with strict hygiene guidelines (e.g. pharmaceuticals, food and beverage)

Key Benefits

The portfolio offers a high level of flexibility that reliably meets every conceivable customer requirement.

- Wide variety of cable glands
- Freely selectable number and type of terminals with terminal and junction boxes
- Large selection of control and monitoring functions with a combination of operating elements
- Robust enclosures for all environmental conditions
- High surface quality with resistance to aggressive media
- Large selection of enclosures sizes and styles
Technical Features

- Ex d, Ex e, Ex i, Ex tb certifications
- Various enclosure materials: glass fiber reinforced plastic (GRP), aluminum, stainless steel, and cast iron
- Electropolished, shot-peened, or epoxy-coated surfaces
- Extensive range of installation components and accessories

Highlights

- Unlimited flexibility: control stations and local control units can be equipped with a broad range of control functions and allow installation of more than 50 operating elements in a single enclosure
- The highest degree of protection for all applications: various enclosure styles in different types of protection and materials ensure the right solution for every application

More information can be found in the Pepperl+Fuchs brochure “Explosion Protection Equipment” and online at www.explosionprotection.com
Maximum Protection in the Harshest Conditions

Switching, monitoring, and distribution solutions are important components for controlling processes. An explosion-protected design is often not available, and many times the safe area is too far away from the sensors and actuators. Flameproof systems offer an efficient solution.

Typical Applications

Flameproof control and distribution systems are used whenever electrical installations and automated production operations need to be safely protected from explosions and environmental influences.

- Control systems on drilling rigs
- Operations with high dust exposure
- Operations with aggressive and corrosive media
- Oil and gas processing

Key Benefits

- Protected switching of drives and power circuits in hazardous zones
- Cost savings with the use of non-Ex components in hazardous areas
- Increased efficiency with configurations tailored to your specifications
- Simple and quick installation of Ex de combination solutions
- Lower maintenance and servicing expenditure due to protection against environmental influences
Technical Features

- Flameproof enclosures Ex d IIB or IIC
- Customer-specific installation of non-Ex components
- Enclosure materials: aluminum, stainless steel, and cast iron
- Large selection of enclosure sizes and styles
- Wide variety of certified operating elements and accessories

Highlights

Solutions with combined Ex d/Ex e types of protection offer plant operators significant benefits during installation and operation. The Ex d housing incorporates all the non-Ex components and is delivered as a complete certified solution.

All connection work required during installation and commissioning takes place in the Ex e terminal compartment, along with the operating components. This makes it easier to modify the solutions at a later time.

More information can be found in the Pepperl+Fuchs brochure “Explosion Protection Equipment” and online at www.explosionprotection.com
60 Years of Experience – The Foundation for a Perfect Solution

The more complex the application, the more important the engineering – this holds true especially when you are challenged with creating custom solutions in hazardous areas. Such solutions must provide reliable protection and include all certifications, in addition to meeting the exact requirements and specifications of your application. In our seven worldwide Solution Engineering Centers (SEC), Pepperl+Fuchs brings together unmatched engineering expertise and decades of proven experience to offer the best possible solution and satisfy our customers’ needs on their terms.

Everything from a single source. Following this principle, we offer a clear advantage to customers by controlling the entire supply chain and ensuring that components are manufactured according to the most rigorous quality standards. Efficient manufacturing allows us to meet your demands with speed and flexibility. The options are almost unlimited: based on a large selection of enclosure types and sizes, systems are configured to meet your exact requirements and specifications. All interfaces are installed and all peripherals are integrated by Pepperl+Fuchs, and we have the expertise to combine multiple types of protection methods into one sophisticated engineered solution. These are just some of the many benefits that come with 60 years of experience in explosion protection.
Steps to a Successful Project

The development of your customized solution begins with the selection of your personal contact partner who is familiar with your industry, application, and specific requirements. They provide you with support from the outset, during each step of the project process, and are an available resource to provide advice and assistance throughout the entire process.

- Local support from system and application specialists
- Evaluation of customer requirements and specifications
- Definition of project objectives and scope of services

- Budget proposal
- Listing of scope of services with description of system components
- Creation of detailed draft solutions
- Project schedule
- Presentation of possible alternative solutions
- Solution specification with the customer and final decision

- Definition of project specification
- Detailed engineering support: creation of parts lists, production documents, and customer approval drawings
- Project schedule planning taking account of supply-chain procurement times
- Detailed costs calculations
- Customer approval for production
Manufacture
- Procurement of purchased parts
- Mounting and assembly
- Global production sites with ISO 9000 certification
- Continual quality control

Inspection, Acceptance, and Logistics
- Internal inspection and functional test of all components
- Test and acceptance by the customer (FAT)
- Appropriate packaging and delivery

Certification and Documentation
- Complete certification
- Creation of project documentation by engineers
- Where necessary, preparation of all project documents for transfer into the customer’s documentation system
- Documentation of all purchased parts
- Creation of test reports and acceptance certificates

More information can be found at [www.pepperl-fuchs.com/solution-engineering](http://www.pepperl-fuchs.com/solution-engineering)
Customized Solutions

Optimal Integration for Every Application

A large selection of field enclosures with different designs and materials means a wide range of options for individual customer solutions. From small boxes with one single component to fully equipped large control cabinets, the optimal solution that saves the most space for every application will be designed.

Fieldbus Junction Boxes
FieldConnex FieldBarrier in stainless steel enclosure, ready for commissioning in Zone 1/Div. 2

Remote I/O Field Units
Remote I/O LB in stainless steel enclosure, ready for commissioning in Zone 2/Div.2

Control and Distribution Panels
Control panel with intrinsic safety barriers in flameproof enclosure Ex d IIB for Zone 1/Div. 1

Fieldbus Junction Boxes
- Intrinsically safe connection of several field devices to a trunk using FieldConnex FieldBarriers or Segment Protectors
- Multifunction terminal available for live disconnect and hot swap of fieldbus components
- Integrated lightning protection module
- Simple connection and marshalling of field devices

Remote I/O Field Units
- Installation in stainless steel and GRP enclosures
- Reliable protection of all components and accessories from environmental influences
- Suitable for use in areas with stringent hygiene requirements
- Simple installation of the system, which is delivered ready for operation, using freely configurable terminals and cable glands

Control and Distribution Panels
- Any type of installation and automation components in dangerous and harsh ambient conditions using flameproof enclosures and certified operating elements
- Activation of intrinsically safe sensors and actuators via integrated interface modules
- Monitoring of processes using indicators visible through window
- Ready for connection and completely certified by delivery
Hazardous Location HMIs
- Development, design, manufacturing, and testing of complete HMI solutions by SEC specialists
- ATEX- and UL 508-certified panel shops for hazardous areas (NNNY and 698A)
- Modular concept with customized components based on standard hardware
- Integration of components from all manufacturers

Purge Solutions
- Simple, cost-effective protection for the installation of non-explosion-protected electrical apparatus in hazardous areas
- Solutions in accordance with ATEX, IECEx, NEC, and CEC

Interface Cabinet Solutions
- Planning, installation, and ready-for-connection delivery of interface modules for a wide range of functions in accordance with customer specifications
- Arrangement of all required components, such as fans, power supplies, circuit breakers, and cabinet lighting for an optimal solution
- Integration of components from every manufacturer according to the customer’s specifications

More information can be found at www.pepperl-fuchs.com/solution-engineering
Staying in touch. The world over.

Good customer relationships need care and attention. They are an indication of genuine interest, trust, and a cooperative spirit: the foundation of Pepperl+Fuchs’ strengths. No matter where you might be, we are always nearby. And we speak your language – in more than 140 countries the world over.

At home on all continents

Our customers are at the center of all our activities. Our worldwide network ensures that we provide them with the best possible service and support. Our world headquarters in Mannheim services Europe through a network of more than 40 affiliates. Asia is handled by our office in Singapore, with more than 1,000 employees in manufacturing, service, and sales. And our North American headquarters in Twinsburg, Ohio, is responsible for a comprehensive network of offices and sales partners in the USA, Canada, and Mexico.

No matter where in the world you may be, Pepperl+Fuchs is right nearby – and always there for you.
Your automation, our passion.

Explosion Protection
- Intrinsically Safe Barriers
- Signal Conditioners
- Fieldbus Infrastructure
- Remote I/O Systems
- HART Interface Solutions
- Wireless Solutions
- Level Measurement
- Purge and Pressurization Systems
- Industrial Monitors and HMI Solutions
- Electrical Explosion Protection Equipment
- Solutions for Explosion Protection

Industrial Sensors
- Proximity Sensors
- Photoelectric Sensors
- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- AS-Interface
- Identification Systems
- Logic Control Units
- Connectivity

Stocked and Distributed by
NORMAN EQUIPMENT COMPANY  800-323-2710

North/Central America Headquarters
Pepperl+Fuchs Inc.
Twinsburg · Ohio · USA
Tel. +1 330 486 0002
E-Mail: pa-info@us.pepperl-fuchs.com

www.pepperl-fuchs.com
Subject to modifications · © Pepperl+Fuchs
Printed in USA · Part. No. 909885  12/16  07