Increasing security.
Saving space.
Gaining flexibility.

Signal Conditioners for Industrial Automation

Your automation, our passion.

PEPPERL+FUCHS

The SC-System: Interference-Free Signals, Maximum Performance

The SC-System from Pepperl+Fuchs offers highly compact (6 mm) and powerful signal conditioners that allow completely interference-free communication between the control level and the field, ensuring a smooth and efficient process.

Clear Signals from the Field

The SC-System ensures efficient signal transmission between the field level and the control level at all times. Interference of measuring signals is a potential problem, particularly in large plants with long transmission paths. There are many reasons for interference, such as the use of powerful, grounded components like pumps and motors or wireless coupling through communication equipment. These scenarios are typical in the following industries:

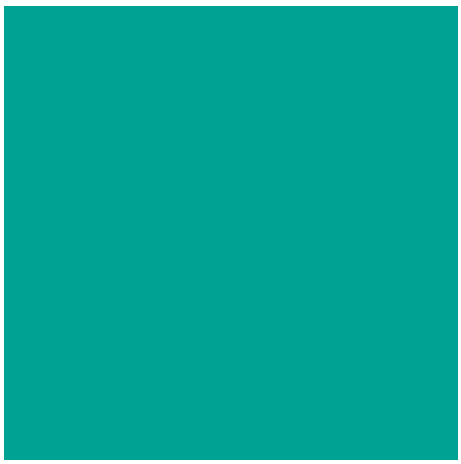
- Energy production
- Steel industry and metal processing
- Cement industry
- Water/wastewater
- Paper industry
- Food industry
- Building automation
- Packaging industry
- Testing facilities
- Applications that span multiple industries

A System as Versatile as Its Applications

The range of applications in these industries is wide, which means that the requirements placed on the SC-System are too. For instance, the need to transport materials or store bulk goods is typical of industrial production. The transportation of solid substances via conveyor belts or fluids through piping must be monitored just as closely as the storage of goods in containers.

In addition, these industries use chemical processes in which substances are converted under defined pressure and temperature conditions. Not only process speed, material consumption, and yield depend on accurate temperature measurements—having reliable data also determines the life span of machines and plant availability.

During power generation, kinetic energy is converted to electrical energy via rotors or turbines, rotating drive shafts, and generators. This energy is supplied either directly via wind or water currents, or it is generated via combustion and steam circuits. A series of measurements must be made and transmitted without interference—whether they refer to position feedback, rotational speed, frequency, pressure, temperature, or fill level. Gathering this data is the only way to ensure a smooth process that contributes to maximum plant availability.



Discrete Signals: The Appropriate Solution for Every Measured Value

Discrete field signals are required for numerous measurement, regulation, and control tasks. These signals show whether linear and swivel movements are being performed correctly, as well as being vital for reliably monitoring quantities, rotational speeds, and flow rates. Developed to meet these requirements, the SC-System from Pepperl+Fuchs offers great flexibility and the appropriate solution for each signal.

Precise Position Monitoring

Discrete sensors are used to provide reliable position feedback for rotating shafts and machines that make linear movements. Switch amplifiers with various output functions analyze these digital signals—for quick fault detection and increased process efficiency.

Reliable Monitoring of Frequency and Rotational Speed

Signal conditioners are used as frequency converters and rotation speed monitors to allow precise monitoring of frequency and rotational speed. The frequencies are recorded accurately using frequency converters and the principle of frequency-to-current conversion. For speed monitoring, the actual measured value is compared to default speed data, and any values that exceed or fall below the default values are reliably reported. This allows faults to be detected early for increased availability.

Analog Signals: Continuous, Precise Data

Temperature sensors, potentiometers, force transducers, and resistance bridges all record analog data that delivers important process information. Converting this data into standard signals or signal duplication is often a necessary part of safe, efficient processes.

Simple Measurements for Standard Signals

Signal converters convert analog data into standard signals, supply the sensor with power, and report sensor or line faults that can occur in harsh ambient conditions. Converting to a standard 4–20 mA signal can reduce the number of input cards in the control panel, making it possible to use a smaller PLC that processes only a few signal types.

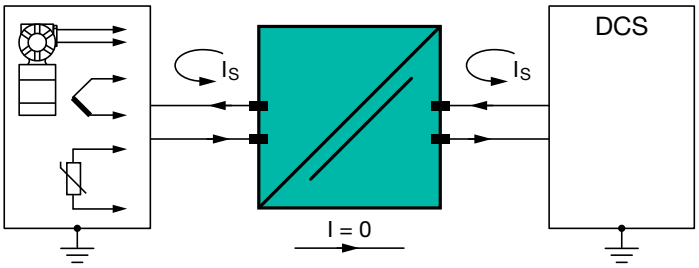
Another key advantage is the fact that measuring and control engineers can access easy-to-measure signals that are compatible with all manufacturers, saving time and money during commissioning and maintenance. In addition, standard analog 4–20 mA signals allow the transfer of digital HART signals for simple, efficient parameterization of field devices.

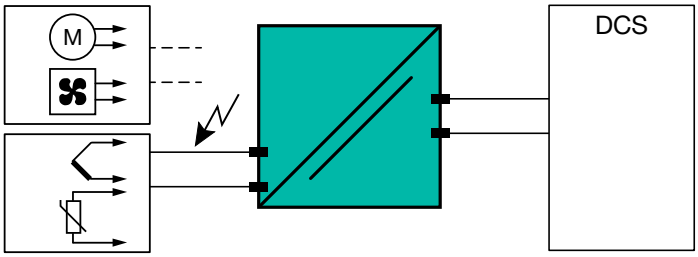
Split Signals to Increase Availability

Interface modules with a splitting function are used anywhere that data must be available to both the control system and other systems. The modules divide the field signal between two parallel, galvanically isolated outputs. Even if one of these channels is interrupted, reliable transmission to the other system is guaranteed, resulting in maximum availability.

Precise Temperature Data for Safe Processes

Resistance thermometers and thermocouples record a multitude of important data in the field that is converted into standard signals or switch commands by temperature converters. Recording temperatures precisely is a key requirement for efficient and reliable processes.





Secure Communication in the Plant

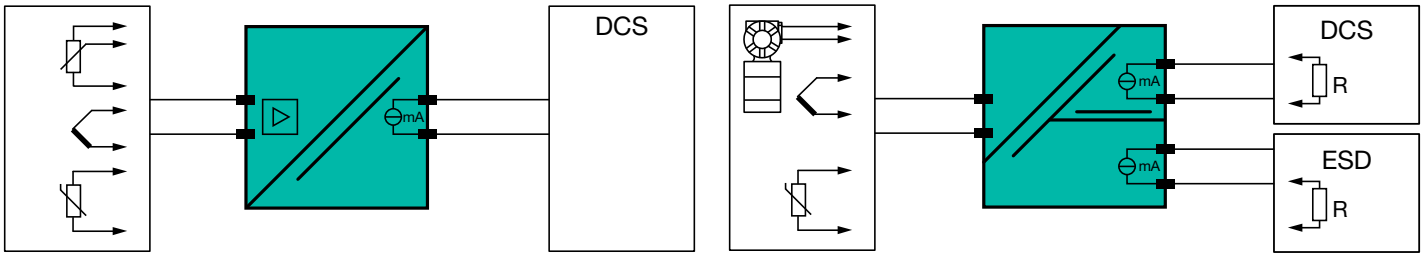
Galvanic isolation prevents transmission and control errors caused by equalizing currents in ground loops. Input filters are integrated to provide protection against common mode noise caused by electrical drives with frequency converters. The input filters prevent faults from reaching the control system and distorting the measuring signals.

Protection against Short Circuits and Surge Voltages

Signal conditioners from Pepperl+Fuchs offer protection against short circuits for each individual current circuit. In the event of a line fault, the relevant output on the control side is switched to a safe state. This setup protects personnel and equipment from dangerously high voltages.

High Signal Quality and a Wide Range of Application Options

Signal conditioners use galvanic isolation to provide seamless communication between field and control levels and protect personnel and equipment from dangerously high voltages.



Conversion to Standard Signals

Field devices often send different signal standards that cannot simply be processed at the control level. Even when field devices send standard signals, they cannot always be processed because small PLCs in particular can only handle a few signal types. The signal conversion function of the signal conditioner converts analog signals into 0/4–20 mA or 0–10 V signals. This ensures that expensive input cards for the control panel are no longer necessary.

Signal Splitting—Multiple Use of Signals

Signal conditioners with a splitting function transmit the measured signal via parallel, galvanically isolated outputs on the control side. This ensures reliable forwarding of the signal if faults occur and avoids the disadvantages of serial wiring.

Interference-Free Combination of Sources and Drains

The SC-System's signal conditioners ensure that a measuring channel still operates if power drains on the field side are combined with power drains on the control side.

The Modules: Extra Slim and Powerful

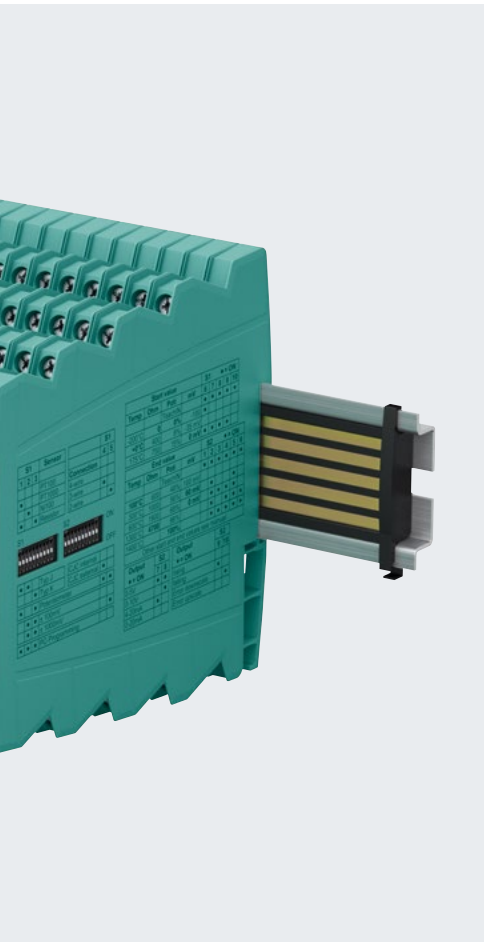
A high standard of isolation quality, an extended temperature range, and an extremely compact design. The modules of the SC-System offer a unique combination of powerful features.

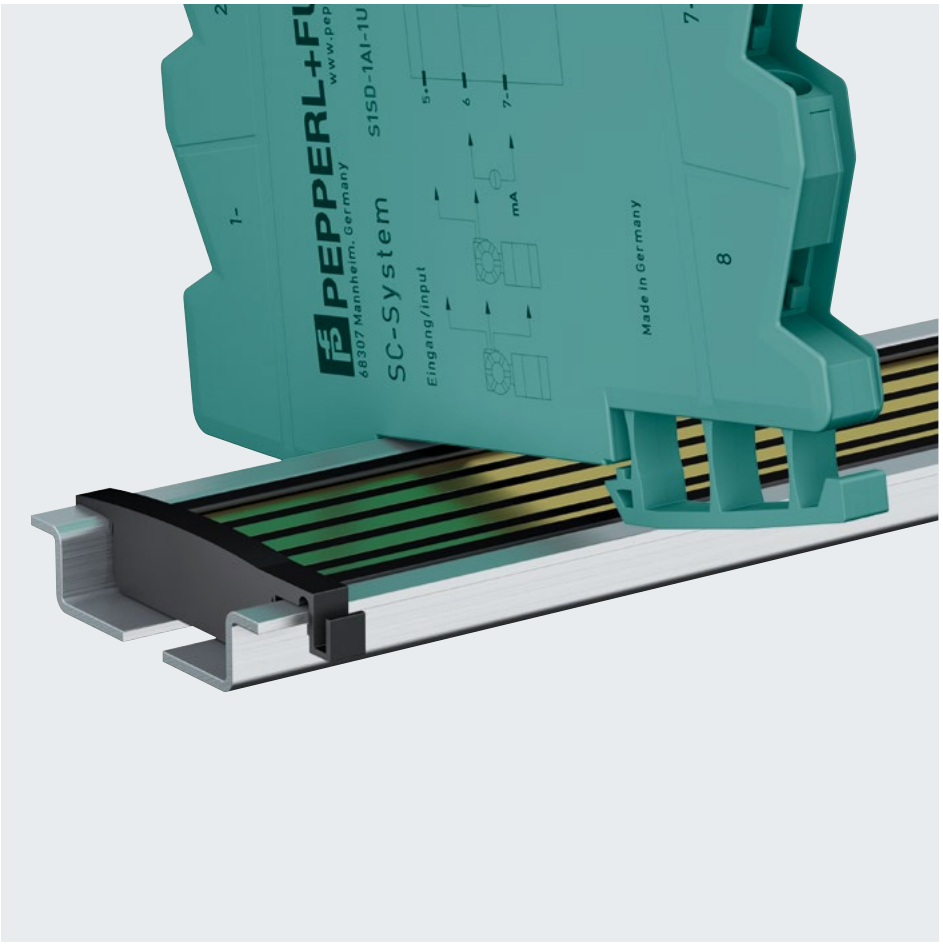
High-Quality Isolation for Optimum Protection

The SC-System from Pepperl+Fuchs stands out with an exceptionally high isolation standard of 3 kV test voltage and 300 V working voltage. The system takes into account the increased demand for noise immunity during day-to-day operations and guarantees optimal protection for personnel and equipment.

Extended Temperature Range for Maximum Flexibility

The SC-System can be used at ambient temperatures of –25 °C to +70 °C. This extended temperature range allows maximum flexibility in any application. Since the components of the SC-System are designed for such a high load, their life span is increased and costs are saved—even when the components are used at less-extreme temperatures.





Compact Design Minimizes Space Requirements

At just 97 mm high and 6 mm wide, the modules are among the most compact on the market. The low height of these user-friendly components ensures that they can be fitted between narrow-seated cable ducts, saving valuable space in the switch cabinet.

Mechanical Stability for Trouble-Free Operation

If used in the vicinity of piston engines or crushing plants, signal conditioners must be able to withstand high levels of vibration. The high mechanical stability of the SC-System ensures that the plant operates without any problems.

Power Bus for Optimal Supply

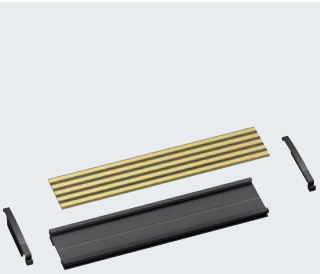
A power is an insert for DIN rails that provides conductors for supply via power feed modules and enables collective error messages. As a result, the wiring costs associated with more complex applications can be significantly reduced. The power bus is compatible with all common products, making it perfect for retrofitting plants.

Features Overview

	Switch Amplifier S1SD-1DI-1R	Speed Monitor S1SD-1FI-1R	Frequency Converter S1SD-1FI-1U	Transmitter Power Supply S1SD-1AI-1U	Smart Transmitter Power Supply S1SD-1AI-1C.H	Transmitter Power Supply/Splitter S1SD-1AI-2C	Passive Isolators S1SL-1AI-1C	Passive Isolators S1SL-2AI-2C	Isolating Amplifier S1SD-1AI-1U.1	Isolating Amplifier/Splitter S1SD-1AI-2U	Isolating Amplifier S1SD-1AI-1U.2	mV Converter S1SD-1AI-1U.3	Universal Temperature Converter S1SD-1TI-1U	Trip Amplifier S1SD-1AI-1R
Number of Channels	1	1	1	1	1	1	1	2	1	1	1	1	1	1
Field-Side Signals														
Digital Signals														
Namur, SN sensor (EN 60947-5-6)	■	■	■											
Two-wire DC sensor (IEC/EN 60947-5-2)	■	■	■											
Mechanical contact	■	■	■											
S0 sensor (EN62053-31)	■	■	■											
NPN, PNP, push-pull (IEC/EN 60947-5-2)	■	■	■											
AC sources, magnetic sensors	■	■	■											
Analog Signals														
2-wire-transmitter				■	■	■				■				■
3-wire-transmitter				■	■									
0/4 mA–20 mA (source)				■	■		■	2	■	■	■			■
±10 mA; ±20 mA											■			
±5 V; ±10 V											■			
0/1–5 V											■			■
0/2–10 V									■	■	■			■
±60 mV												■		
±100 mV												■	■	
±150 mV, ±250 mV, ±300 mV, ±500 mV												■		
±1000 mV												■	■	
RTD (resistance thermometer)													■	
TC (thermocouple thermometer)													■	
PTC (temperature sensor)													■	
Potentiometer/resistor													■	
Control-Side Signals														
0/2–10 V			■	■					■	2	■		■	
0/4 mA–20 mA (active)			■	■	■	2	■	2	■	2	■	■	■	
±10 mA; ±20 mA											■	■		
±5 V; ±10 V											■	■		
Relay	■	■												■
Special Features														
Timer (on/off-delay, wipe)	■													
HART					■									
Splitter						■				■				
Startup override/restart inhibit		■	■											■
Power Supply														
24 V DC + Power Bus	■	■	■	■	■	■			■	■	■	■	■	■
Loop powered							■	■						
Setup														
DIP switches	■	■	■	■					■	■	■	■	■	
PC software		■	■										■	■
Front sided potis for fine tuning											■			
Teach-in button													■	
Approvals														
UL/Class I/Div. 2/Zone 2				■	■	■	■	■	■	■	■	■	■	

Accessories

A wide range of accessories help you to efficiently install, power and and calibrate your SC-System of signal conditioners.



Power bus set

POWERBUS-SETL5.250
(Height: 7.5 mm)
POWERBUS-SETH5.250
(Height: 15.0 mm)
Also as POWERBUS-SETx5.500

Power bus set for low and high DIN mounting rails

- Bus, and bus carrier
- End caps
- Length: 250 mm, 500 mm
- End caps for securely attaching the power bus to the DIN mounting rail and for protecting the bus ends are also available separately

Cover

POWERBUS-COV.250

Cover for empty slots on the power bus in the DIN mounting rail

- For high and low DIN mounting rails
- Packaging unit: 5 items
- Length: 250 mm

Power feed module

S1SD-2PF

For supplying power to the power bus

- Redundant power supply via decoupling diodes
- Current up to 3 A
- LED indicator
- For supplying power to up to 75 modules

Adapter with USB interface

S-ADP-USB

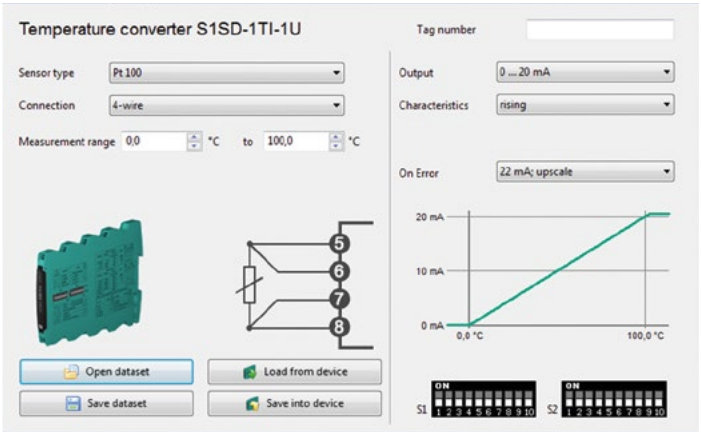
Programming device for parameterization using PC software

- Potential-free USB interface cable
- Used with SC-System devices
- Configurable via PC
- Possible to supply devices with power via the USB interface

SC-Config Configuration Software—Convenient Parameterization of Modules via PC

- Intuitive user navigation delivers fast results
- Simulation of various scenarios—facilitates commissioning
- Interactive display—facilitates optimum configuration

Free download under
www.pepperl-fuchs.com/SC-Config



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
- Fieldbus Modules
- AS-Interface
- Identification Systems
- Displays and Signal Processing
- Connectivity

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