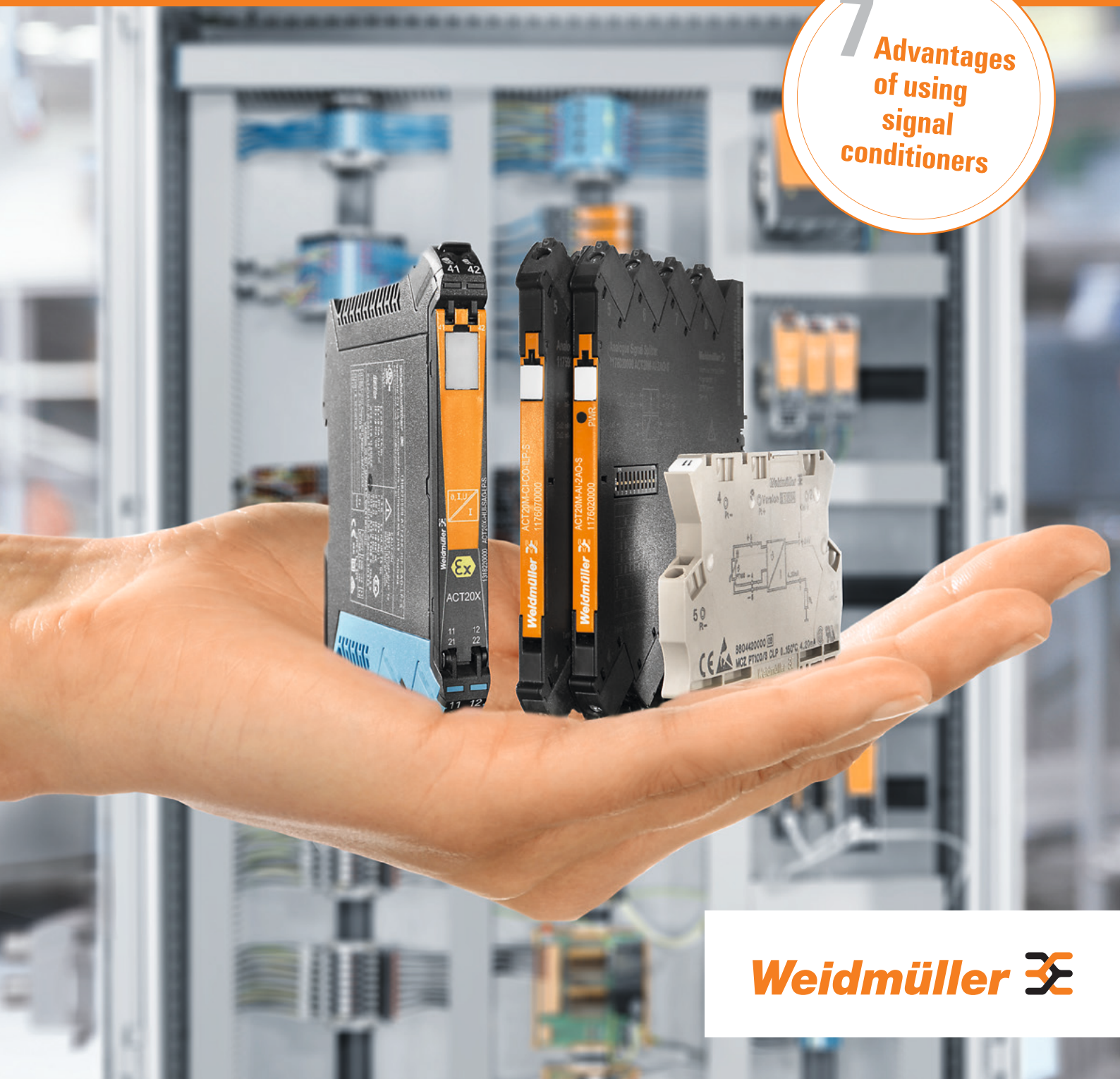
Analogue signal processing

Reliable signal processing is crucial for your systems

With us, your signals are in safe hands

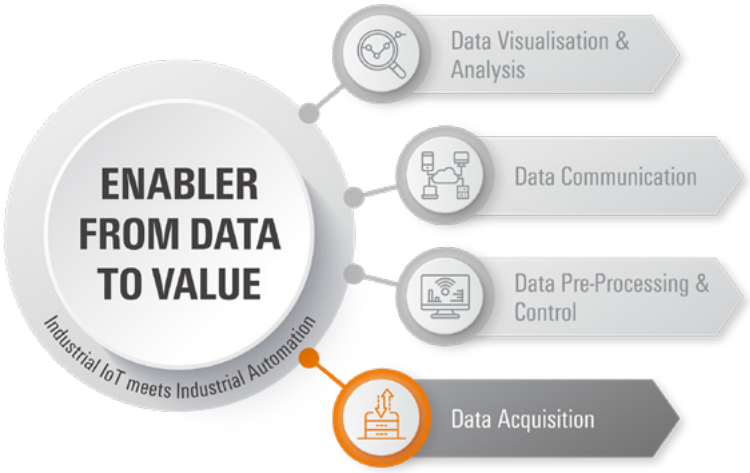


Secure and reliable transmission of analogue signals

Industrial signal conditioners from Weidmüller

Data is the key to optimising industrial processes, making important business decisions, and much more. More and more machines and systems are therefore equipped with sensors to record parameters such as temperature, pressure, filling level, flow rates, weight or speed. Signal conditioners are needed to make this analogue data reliable for use with the intended application. They enable the reliable transmission of the analogue sensor signals – the foundation of any value-added data processing.

As a partner in Industrial Connectivity, Weidmüller knows the conditions the prevail in the various industrial sectors inside out. Our signal converters are designed to ensure optimum signal transmission and conversion under all circumstances. This is ensured by selected components which, depending on the area of application, prevent influences such as temperature fluctuations, electromagnetic interference, vibrations, or corrosive or explosive atmospheres from affecting the safety and accuracy of the signal transmission. So your signal is always in safe hands. And to make sure you are well-equipped for the future, we are constantly developing our broad range of products.



Your benefits with analogue signal converters from Weidmüller

- Comprehensive range of analogue signal conditioners for every application
- Absolutely reliable signal transmission – even in hazardous environments or those with a high level of electromagnetic interference
- Simple and fast product configuration with intelligent FDT/DTM software tools
- Optimum product selection thanks to convenient online product assistant
- Wide range of complementary solutions – from sensors to the cloud
- Individual support through internationally available consulting and services

Made to meet your challenges

Our signal processing for various industries

Whether in mechanical engineering, the process industry or power engineering: no application today can do without electronics and electrical connectivity. At the same time, many factors influence the complexity of electrotechnical and electronic components. These include the advance of digitalisation, technological change and internationalisation. With our portfolio of analogue signal converters, we ensure reliable and secure signal transmission in your fields of application – with a constant eye on today's rapidly changing markets.

Mechanical engineering – precise and compact

To support signal acquisition in extreme environments, our ACT20P signal converters are the right choice here. These process and transmit analogue data with an accuracy of up to 0.05%. If maximizing space is a priority, our ACT20M series is available with up to 2 channels on a width of 6 mm. Our MCZ family of signal converters are even more compact. With a height of only 52 mm, they are currently the smallest on the market.

Process industry – communicative and safe

Our intrinsically safe ACT20X signal converters with FDT/DTM support are ideally suited for compliance with the high standards of explosion protection and functional safety. They additionally complement integrated safety systems up to a SIL level of 3.

Power – precise and functional

The reliable and precise isolation of control signals from high power levels is one of the greatest challenges in power engineering. Our signal converters of the ACT20P and ACT20M families master these tasks with flying colours and offer other useful functions, such as signal doubling or limit value determination. The signal converters of the ACT20C series also enable the continuous monitoring of device and system functions.

Seven good reasons for using signal conditioners

Our analogue signal converters in your applications

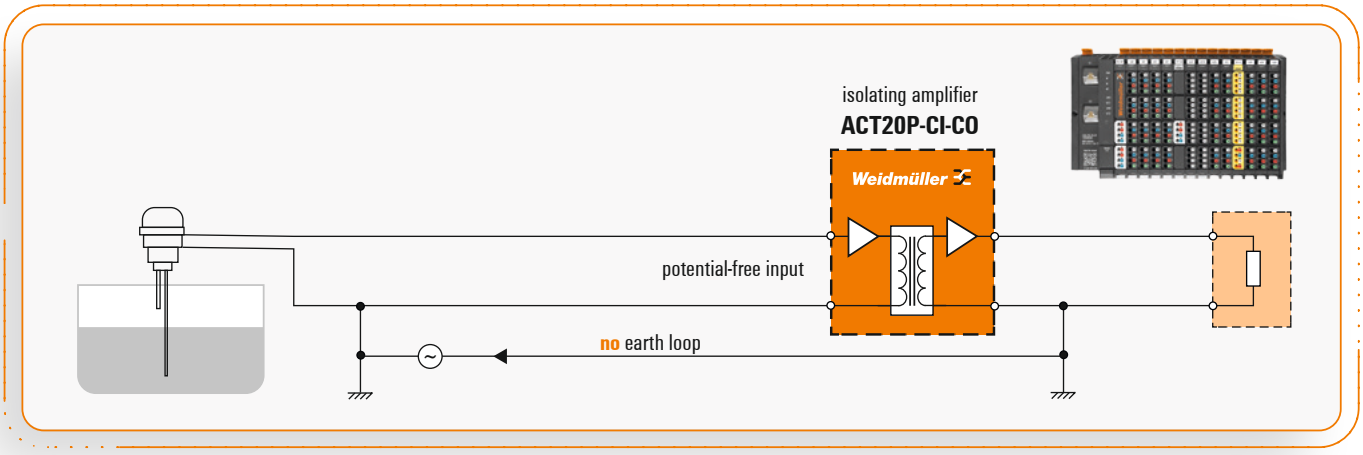
1 Isolation to prevent earth loops

THE CHALLENGE

If a signal loop is earthed on both sides, the potential differences between the two earthing points result in what is referred to as an “earth loop”. The currents flowing in the earth loop interfere with the transmission of process signals – especially if an analogue signal is fed in from a separate power supply or if the sensor device itself is earthed.

OUR SOLUTION – SIGNAL ISOLATORS

A signal isolator interrupts the earth loop. This makes the installation of field devices independent of the earthing and shielding concepts of the installed PLC/DCS system.



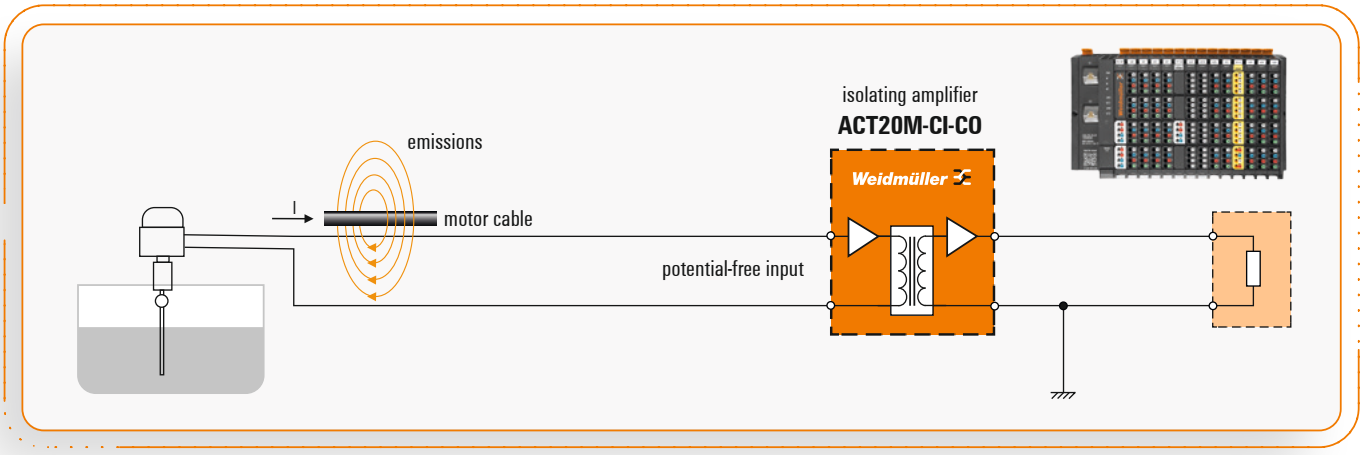
2 Protection against EMC interference

THE CHALLENGE

Electromagnetic interference can be caused by electrical cables or high-frequency pulses, such as those generated by load changes of inverter drive motors. Electromagnetic interference often feeds into process signal lines in the form of common-mode interference.

OUR SOLUTION – INPUT FILTERS

With the input filter of a signal conditioner, electromagnetic interference can be blocked very effectively. This allows the desired process values can be determined free of interference.



3

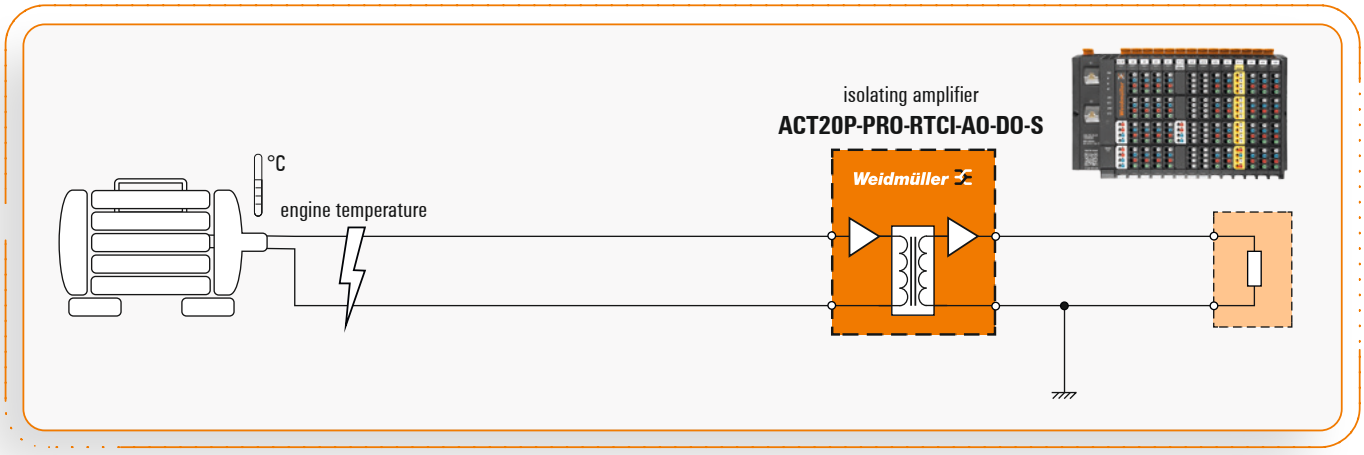
Protection against dangerous AC voltages and electric shock

THE CHALLENGE

On AC-powered devices, measurement by means of integrated sensors can be dangerous. Isolation problems may subsequently occur that, for example, potentially induce dangerous voltages that can damage device components and even result in life-threatening electric shocks.

OUR SOLUTION – ISOLATING AMPLIFIERS

Suitable isolating amplifiers ensure reliable isolation in the event of a fault. Our isolating amplifiers meet the high requirements of IEC 61010-1 and provide a secure galvanic isolation between inputs, outputs, and 300 V power supply connections.



4

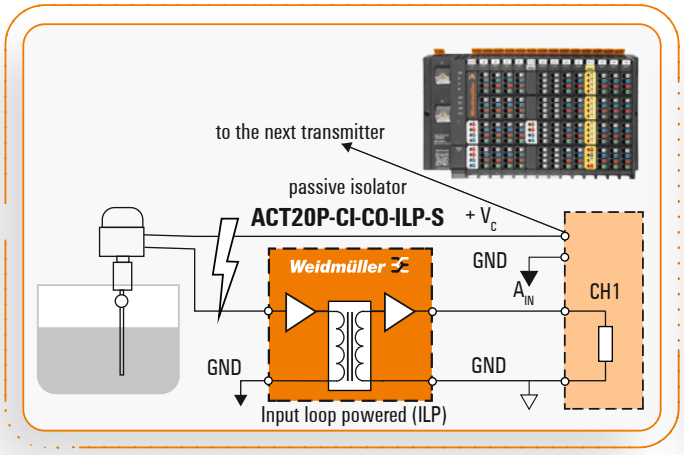
Protection against short circuits in signal wiring

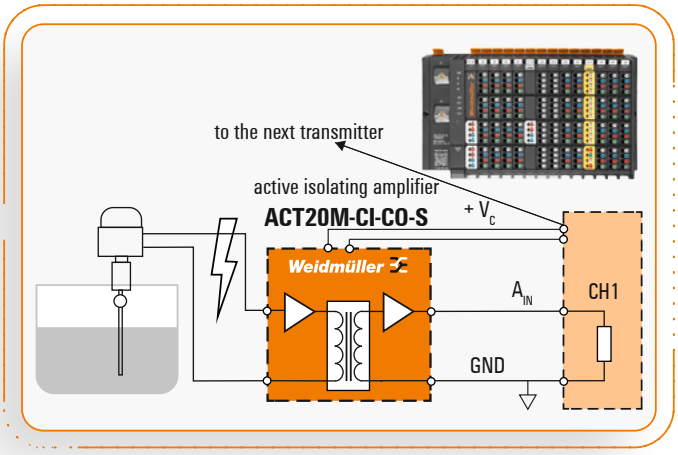
THE CHALLENGE

Short circuits can occur repeatedly in field wiring. This can damage both the cabling and the receiving system. In addition, if several input channels share the same power supply and signal ground, loop integrity cannot be guaranteed. A short circuit in the field can therefore also affect neighbouring signal loops.

OUR SOLUTION –
ACTIVE AND PASSIVE ISOLATING AMPLIFIERS

A passive isolator isolates the input channel from the measuring transducer. Alternatively, if an active isolator is used, additional loop integrity is established for each individual electric circuit. A short circuit within one signal circuit now no longer has any effect on neighbouring circuits.





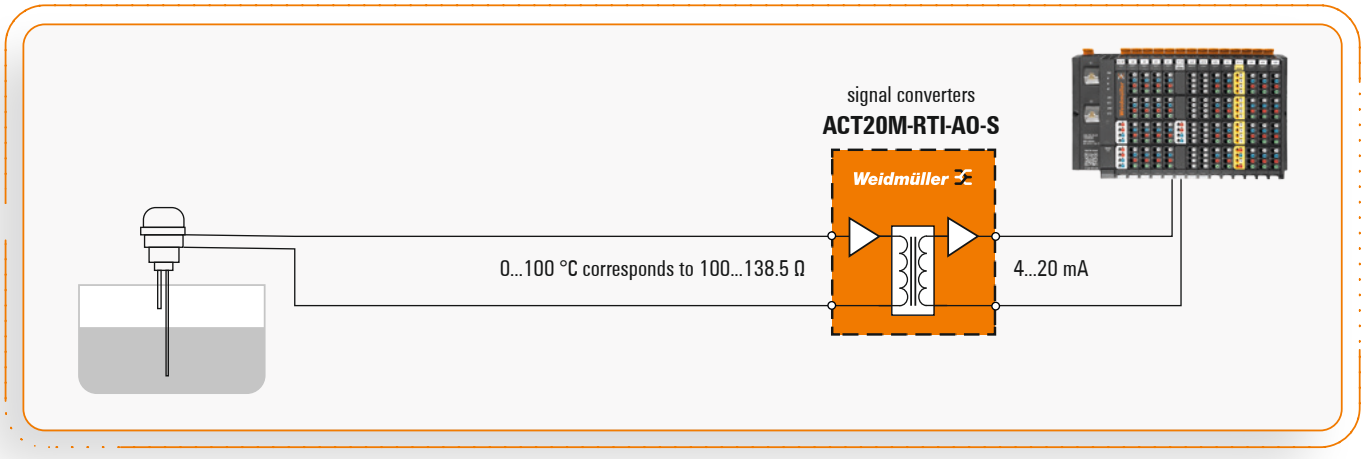
5 Conversion of signals into standard signals

THE CHALLENGE

Typical analogue inputs are designed for standard signals – for example 4–20 mA, 0–20 mA or 0–10 V. This means that many signals from the field must be converted, linearised or mapped to standard signals in order to be further processed. This applies, for example, to signals from thermocouples, potentiometers or frequencies.

OUR SOLUTION – SIGNAL CONVERTERS

A signal converter converts or amplifies the physical input signal. It ensures any necessary linearisation and maps the sensor signal to a standard signal.



6

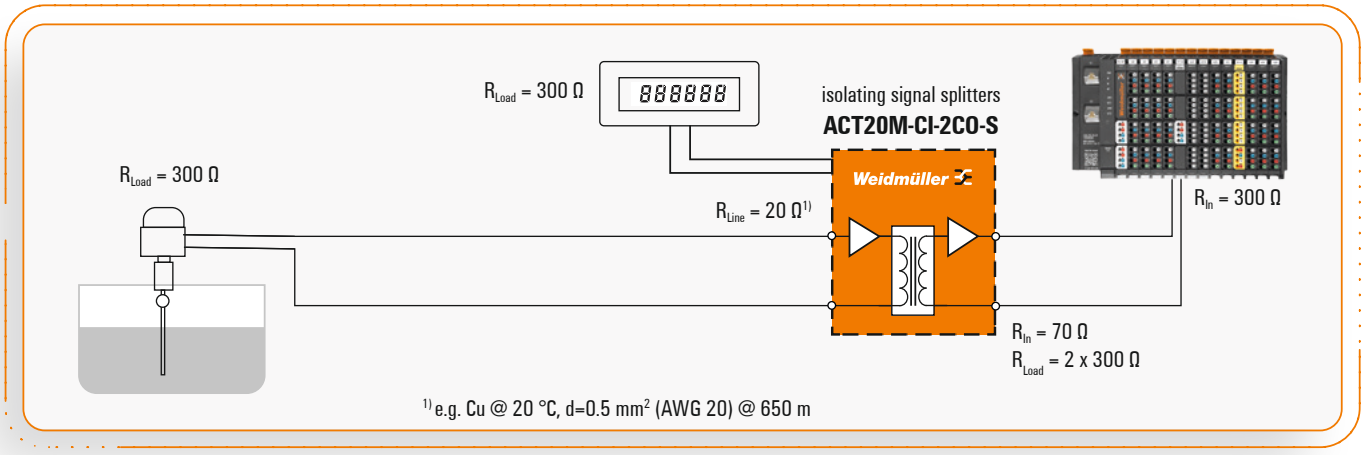
Splitting signals between two or more receivers

THE CHALLENGE

If an input signal is split by connecting two receivers in series, this can lead to problems. If the sensor is not designed to handle the load of both receivers and the cable, this will result in faulty input signals. In addition, if the connection to one of the two receivers is interrupted, the other receiver will also lose the signal due to the series connection.

OUR SOLUTION – ISOLATING SIGNAL SPLITTERS

When using an insulating signal splitter, the sensor is decoupled from the load of the two receivers. For this purpose, the two receivers are controlled by the signal splitter via a separate current loop for each. This prevents the sensor from being overloaded.

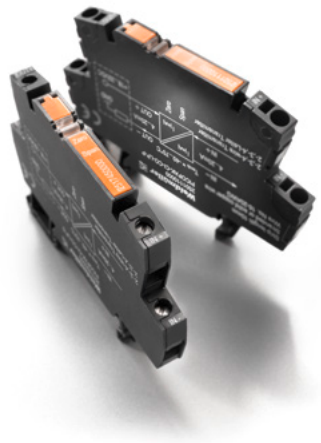


7

Matching current sources to inputs

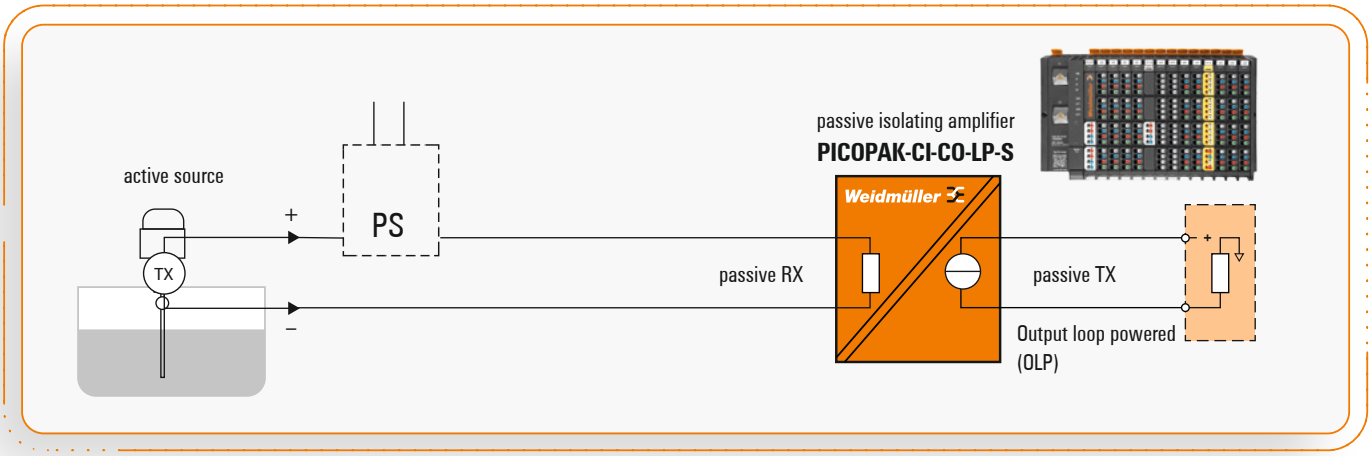
THE CHALLENGE

Only one active component is allowed in a 4–20 mA current loop. In this case, this means that if a sensor with an active output is connected to a PCL or DCS system that also feeds current into the loop via an active input, the current loop will not function.



OUR SOLUTION – ISOLATING AMPLIFIERS

A passive isolating amplifier matches the active output to the active input. Moreover, with an output loop powered isolating amplifier (OLP), no additional power supply is required.



You have individual requirements

We have a flexible product range

No matter what your requirements are: Our ACT20 series analogue signal converters ensure secure and precise signal conversion and isolation. To ensure use in a wide variety of applications, they offer many specific properties, such as communication capability, particularly compact dimensions and software configurability. Thanks to all these benefits, your analogue signal is always in safe hands.

ACT20C: The connective solution

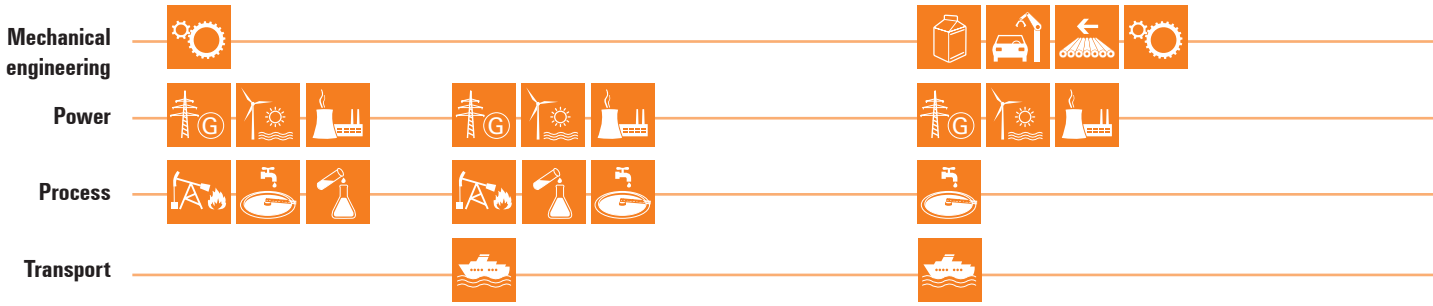
- Communication-enabled interface for status monitoring and diagnostics
- FDT/DTM software for configuration via Ethernet – local or remote access
- Can be used as a communication-enabled station with Plug and Produce function

ACT20X: The intrinsically safe solution

- A wide range of functions for separation and conditioning of intrinsically safe signals
- Compliance with strict process industry standards – approved for Ex zones and with SIL capability
- Simple configuration via FDT/DTM software

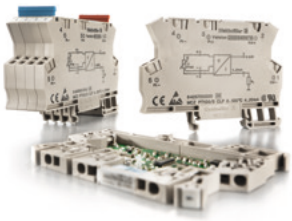
ACT20P: The flexible solution

- Precise and highly functional signal converter series
- Easy configuration with display, FDT/DTM software or DIP switches (depending on the version)
- Convenient release lever for uncomplicated handling
- Space-saving design with widths from 12.5 mm for two channels



ACT20M: The slim solution

- Safe isolation and conversion with a width of only 6 mm
- Direct power supply via CH20M mounting rail bus
- Easy configuration via DIP switches or FDT/DTM software
- Extensive approvals, such as ATEX, IECEX, GL, DNV
- Particularly robust and insensitive to interference



MCZ: The smallest solution

- Currently the smallest terminal block-sized analogue signal converter on the market
- Maximum space savings due to compact design with width of 6 mm
- Reliable conversion of analogue signals
- Quick and easy wiring via pluggable cross-connectors

Process value indicators

- Easy-to-read four-digit LED or LCD displays
- Large 1/8″ display according to DIN standard
- Weather-resistant front panel with a degree of protection of IP65
- Integrated signal converter and limit switch

Exploit all the possibilities offered by our products

Our Support Center offers you comprehensive personal assistance

To ensure that you get genuine added value from using our products, we offer you a comprehensive range of services. In our new Support Center, we provide you with a wide range of application notes, product information, video tutorials and software downloads for our products. Learn quickly and easily how to can get optimum use of our products in your applications.

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Digital Engineering – intuitive, uncomplicated, fast
The Weidmüller Configurator

Digital engineering can be so easy! Create your own configuration from over 10,000 digital Weidmüller products.

As a software solution, the Weidmüller Configurator not only supports you in individual work steps, but also builds a bridge from planning to operation and treats panel building as a single seamless process.

Your benefits at a glance:

- Provision of intelligent item data
- Simple and secure ordering process
- Always the right configuration
- Fast and simple product enquiry

The easy way from data to value
Our industrial IoT portfolio

The way to Industrial IoT does not have to be complicated. Whether you need access to valuable data or want to offer new data-driven services – we pave the way for our customers to go from data to value.
Our extensive and future-oriented IIoT portfolio is suitable for both greenfield and brownfield applications. We offer components and solutions ranging from data acquisition and pre-processing to data communication and data analysis.

Your benefits at a glance:

- Simple and fast retrofitting of IoT solutions
- Open and web-based engineering
- For a competitive edge for the future

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Weidmüller – Your partner in Smart Industrial Connectivity

As experienced experts we support our customers and partners around the world with products, solutions and services in the industrial environment of power, signal and data. We are at home in their industries and markets and know the technological challenges of tomorrow. We are therefore continuously developing innovative, sustainable and useful solutions for their individual needs. Together we set standards in Smart Industrial Connectivity.

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Made in Germany

Weidmüller Interface GmbH & Co. KG
Klingenbergstraße 26
32758 Detmold, Germany
T +49 5231 14-0
F +49 5231 14-292083
www.weidmueller.com

Personal support can
be found on our website:
www.weidmueller.com/contact

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