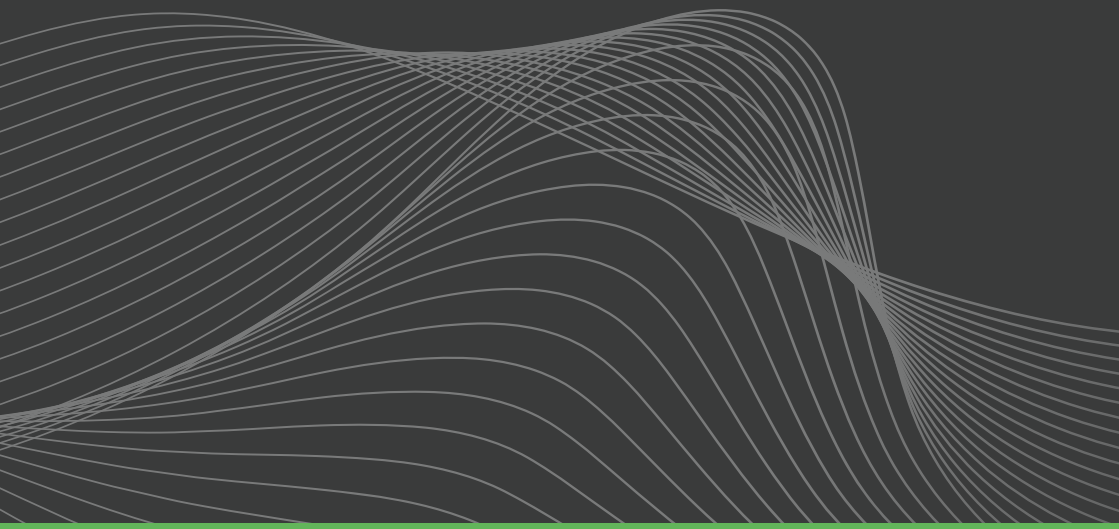
v1.3

Diagnostic- and measuringsystems

We make interlockings smart.

W&S



General Information

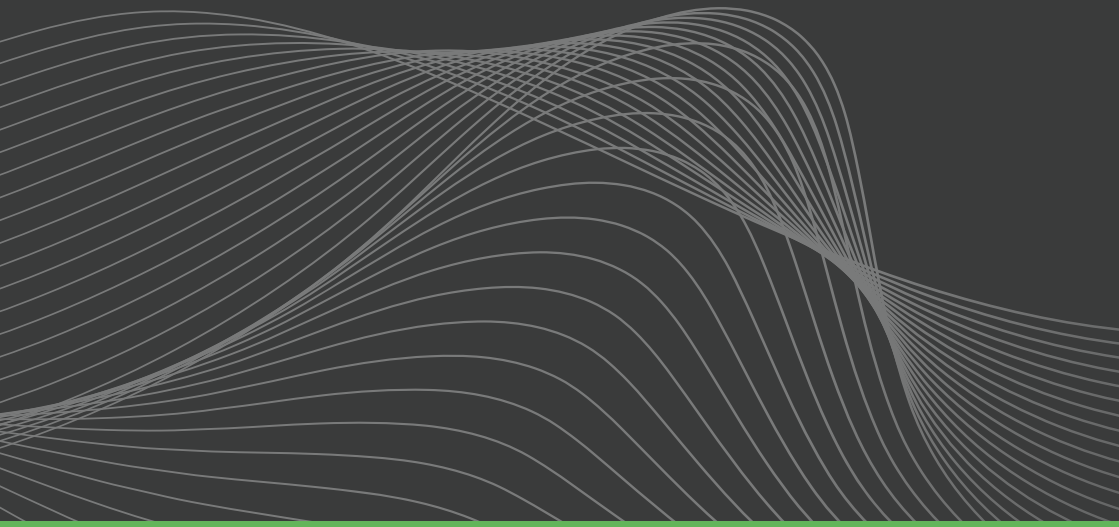
The monitoring and measuring systems of W&S Technik GmbH are specially designed for the preventive maintenance and monitoring of cable infrastructures in railway technology. We offer customised solutions that ensure efficient and and reliable monitoring of control and safety technology. Our systems are able to detect faults at an early stage before they lead to failures, thereby before they lead to failures, increasing the safety and reliability of the infrastructure.

Our monitoring systems integrate state-of-the-art hardware and software components. We develop the hardware in-house, including schematics and PCB layouts, and combine it with advanced firmware and software development. This combination enables us to create innovative monitoring solutions that offer precise data processing and analysis.

In addition, we rely on communication protocols such as Modbus RTU, CAN, I2C and SPI to ensure seamless data transfer between the various components. components. Our systems are designed to perform continuous measurements and provide precise data on the condition of the infrastructure so that preventive measures can be taken at an early stage.

We also attach great importance to strict testing and measurement procedures in order to ensure that our systems meet the highest quality requirements. Every component is intensively tested to ensure perfect functionality and durability.

MAKE IT SMART.



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The innovative cable monitoring system

MPXv3

Quality monitoring of the connected cable infrastructure

Early planning and cost-optimised Maintenance

Certification by Deutsche Bahn (PF-2021-00072)

The MPX system was developed to document, analyze, and evaluate the quality of the connected cable network. This data allows for preventive maintenance measures to be initiated for the affected cable infrastructure before a failure occurs. As a result, the system enables early and cost-optimized planning.

The system collects various data using up to 95 sensors along up to 190 kilometers of cable routes and evaluates it in the central unit. The results are displayed on a large 17-inch touchscreen, which also allows for convenient and simple input, eliminating the need for additional peripheral devices.

An important component of the MPXv3 system is the FsD 66 humidity sensor, which is used for continuous monitoring of condensation formation in the cable distribution system.

Additionally, it is possible to locate cable interruptions in individual measurement segments, allowing for targeted and efficient maintenance of the cable system.

Monitoring of up to 19 measuring lines for moisture ingress in cables and joints

Monitoring of interference voltages of up to four measuring lines

Condensation monitoring of up to 95 cable distribution systems.

LTE or WAN interface for remote diagnostics and evaluation

Documentation of local temperature, humidity and rain conditions

Touch-optimised user interface

For more information please scan the adjacent QR code or visit our website:

www.wus-technik.com

MPXv3

MPX_1.2.10 - MPX

Dimensions L x W x D:	500 mm x 500 mm x 210 mm
Operating temperature:	0 °C bis + 45 °C
Ports:	RS-485 galvanically seperated*

- Quality monitoring of the connected cable infrastructure
- Monitoring of up to 190 km of cable with up to 95 sensors
- Intuitive input via 17-inch touchscreen

* For reading the Bender EGM type: IRDH 265-265

Accessories

FsD 66 Sensor

MPX_1.2.110

Length:	720 mm
Width:	18,3 mm
Height:	10 mm

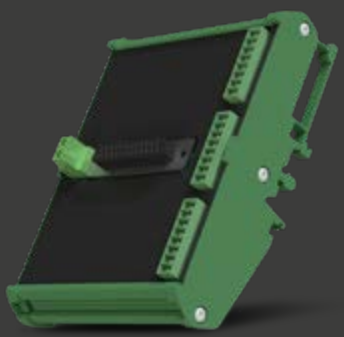
- Passive humidity sensor
- Compact construction

UEM10 Sensor

MPX_1.2.120

Length:	720 mm
Width:	18,3 mm
Height:	10 mm

- Measurement limiter of a partial monitoring length
- compact construction



Transfermodule IH

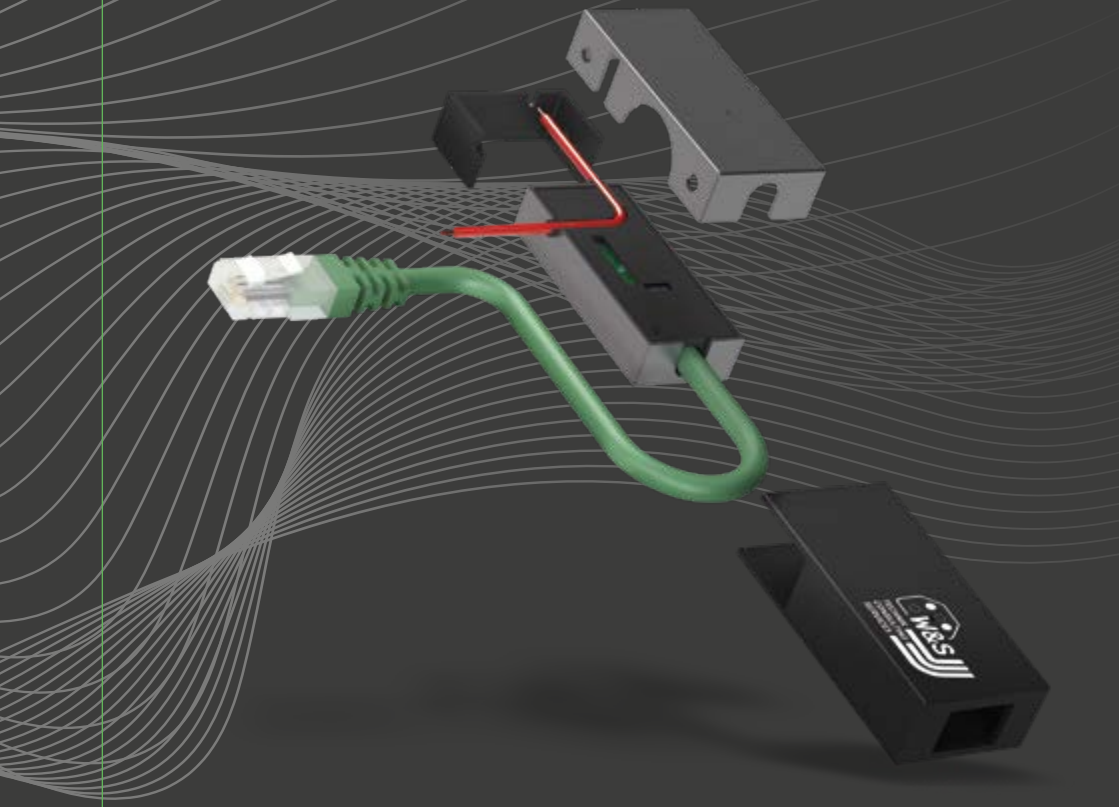
MPX_1.2.60

Height:	125 mm
Width:	91 mm
Depth:	54,7 mm

Interface from the system cabling to the cable connection

Sustainable Diagnostic Solution:

Digitalization of Relay Interlockings



The shortage of skilled workers and aging interlocking technology pose major challenges for railway operations. Traditional troubleshooting is complex and time-consuming.

Our solution: Digital monitoring of relay interlockings – fast, reliable, and without intervention in existing systems.

Your Benefits at a Glance

- **Higher availability:** Faults are detected early and resolved faster.
- **Longer service life:** Wear becomes visible in time – preventive maintenance instead of failure.
- **Less effort:** Real-time diagnostics save travel, troubleshooting, and personnel resources.
- **Investment security:** Existing systems remain in place, legal protection of installations remains unaffected.
- **Future-proof:** Relay interlockings gain diagnostic capabilities comparable to digital interlockings.

The Technology Behind It

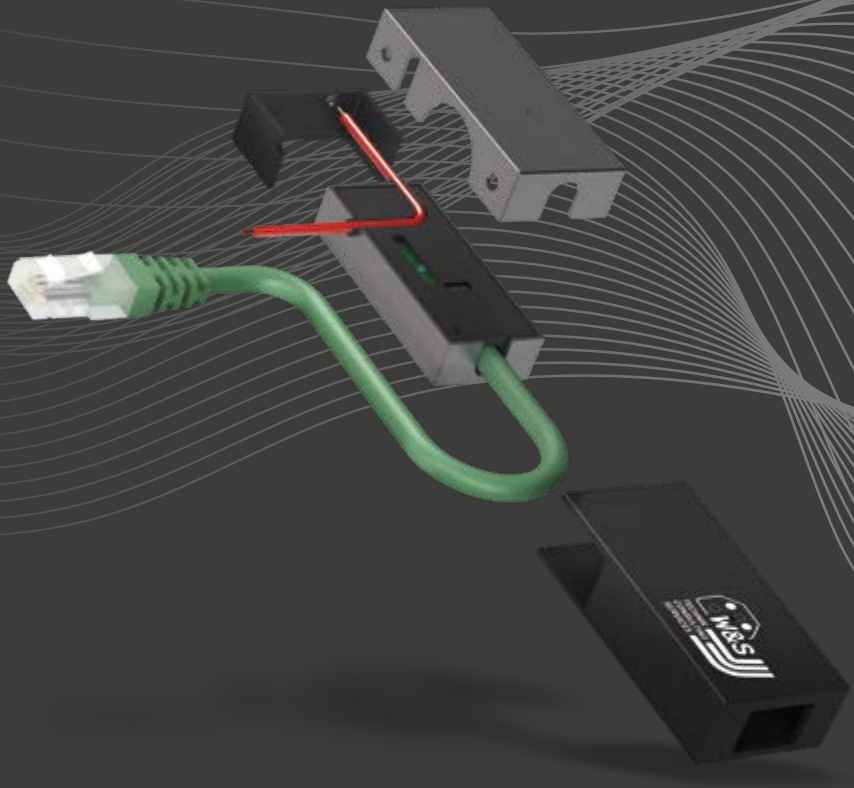
- Our patented **FSC sensor** precisely measures currents up to 2000 mA in real time – without interrupting circuits.
- **Digital evaluation** detects deviations immediately and provides clear diagnostics.
- **Network connectivity** enables centralized monitoring of multiple systems.
- Fault diagnostics in plain text, **reducing fault duration by more than 90%.**

Conclusion

With our **Universal Diagnostic System,** you actively counter the shortage of skilled workers while increasing operational **safety, efficiency, and profitability.**

Invest now in the digital future of your interlockings!

FSC-Sensor



22-118-UDS-FSCS

Dimensions L x W x D:	57,55 mm x 28,90 mm x 15 mm
Digital inerfaces:	RS-485
Analogue interface:	up to 36 V and up to 300 mA

- compact construction
- Faster fault clearance and shorter fault clearance times
- Early detection of wear on relays
- Preservation of inventory protection through indirect measurements

UDS-Hub

22-118-UDS-HUB

Dimensions L x W x D: 166 mm x 91 mm x 26,10 mm

- UDS-Bus distribution
- Power supply for the sensors
- Analogue interface of the sensors

Contact displacement setting device

23-00136-KWE

- Wireless transmission
- Adjustable channel selection
- Lighter than the wired one

Basic Set (23-136-KWE-Basis-Set):

Contact displacement setting device

Contact displacement setting device for magnetic rail contacts or double magnetic rail contacts of the Siemens design. Measures the correct contact travel length and provides the adjustment values for magnetic or double magnetic rail contacts.

Scope of delivery:

- Adjustment device type 23-136-KWE for setting the contact travel (pre-coded)
- Connector "Black" type 23-136-KWE-SS for measuring magnetic inserts
- Robust, orange hard-shell case

Expansion Set 1 (23-136-KWE-Erweiterungsset):

Handheld Unit + Magnetic Contact Test Gauge

CDSD expansion set for the basic set.

Scope of delivery:

- Handheld unit type 23-136-KWE-MT for additional audiovisual signaling
- Magnetic Contact Test Gauge type 24-122-MKPL
- Tool set for adjusting magnetic track contact/ double magnetic track contact

Expansion Set 2 (23-136-KWE-SR):

Contact Travel Adjustment Device Transmitter Red

Additional transmitter for the contact travel adjustment device for calibration of electronic contacts.

MAKE IT SMART

For many years, the MPX system has successfully monitored thousands of kilometers of cable across Germany, helping to make the maintenance of the connected infrastructure more efficient. This includes planned maintenance of deteriorating cable systems, more efficient use of personnel during times of skilled labor shortages, and resource-conserving material management for forward-thinking sustainability.

With the UDS system and the accompanying FSC sensor, we are taking it a step further and making relay interlockings smart: faster troubleshooting and shorter outage times through targeted fault localization and early detection of relay wear. This means that while others are still searching for the fault, your maintenance team is already prepared for the next task. And the best part: compliance with existing infrastructure regulations is maintained, as our FSC sensor collects data through indirect measurements.

With our innovations, we strive for strong efficiency, making maintenance smarter: our soldering iron for adjustment work on magnetic rail contacts stands out for its easy handling and quick readiness. Thanks to wireless transmission and audiovisual notifications of contact distance, rapid deployment is no longer a challenge.

We are aware that the digitalization of the German railway infrastructure cannot be implemented overnight. That's why, with our products and services, we create more room for efficiency to shape the future of Germany's digital railway infrastructure, step by step.

Our solutions are designed to make existing systems future-proof without requiring extensive modifications or costly investments. Through continuous innovation and close collaboration with our customers, we lay the foundation for a sustainable and digital railway world. This is how we move Germany onto the tracks of the future **– safe, efficient, and reliable.**

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W&S Technik GmbH

Herner Strasse 130
44575 Castrop-Rauxel
Germany

T +49 2305 419 07 01
info@wus-technik.com

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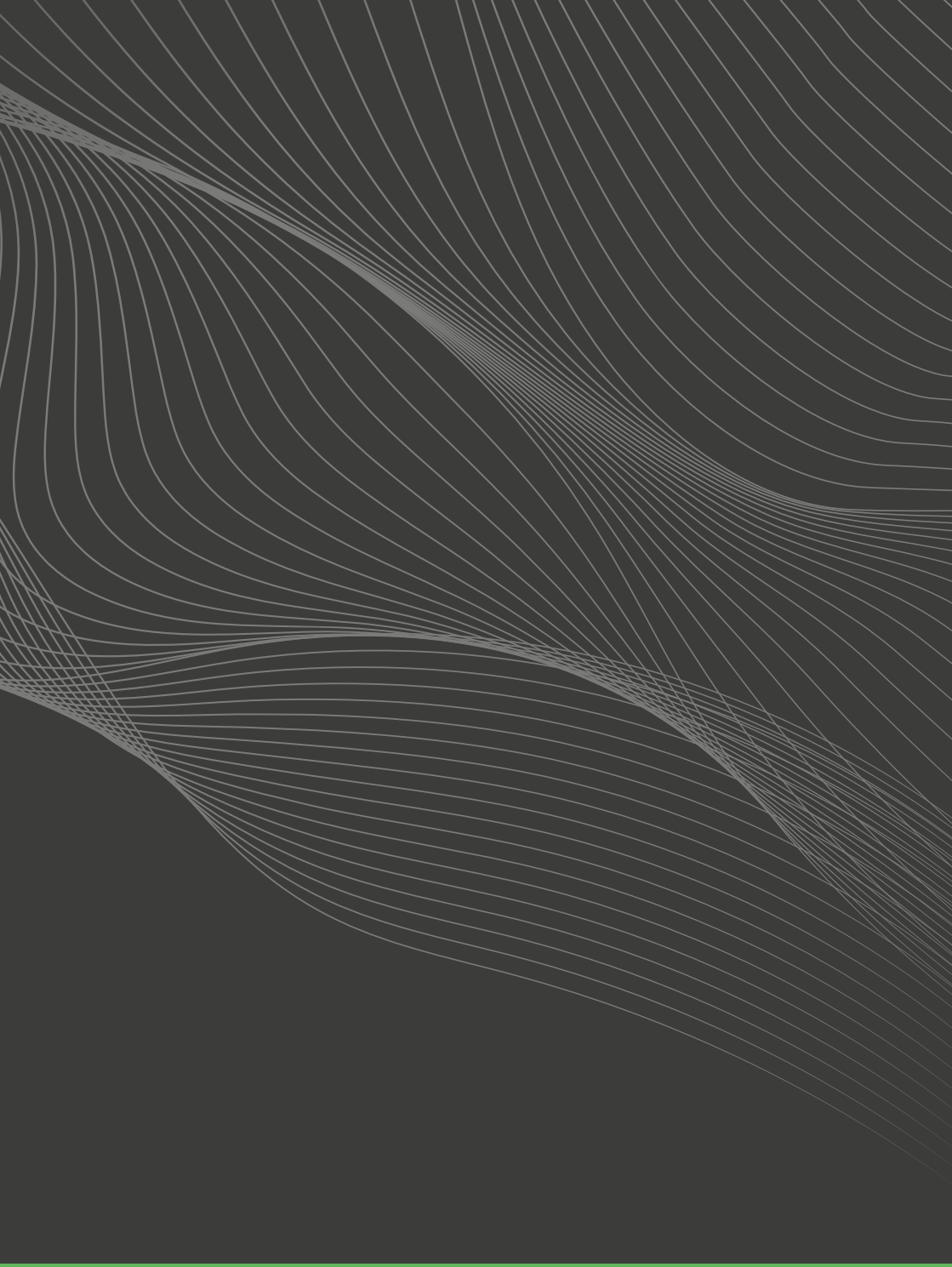

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