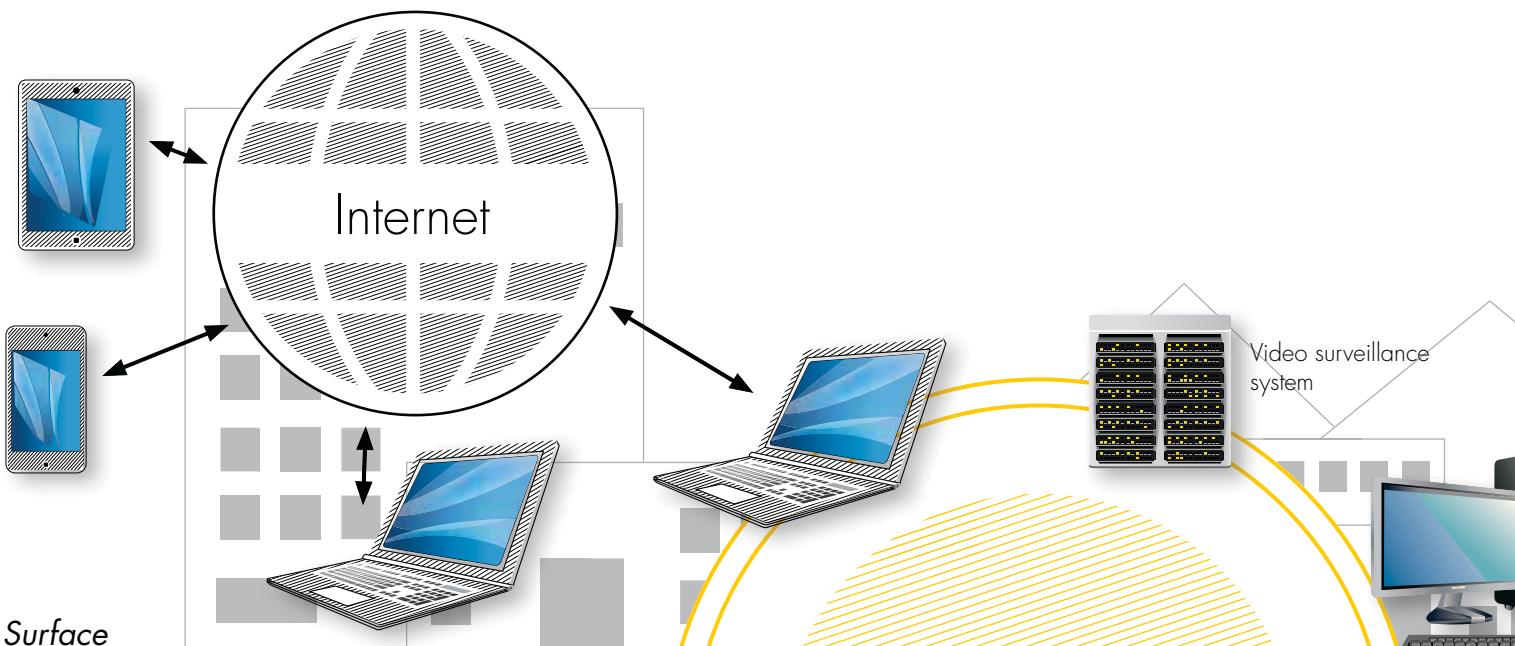


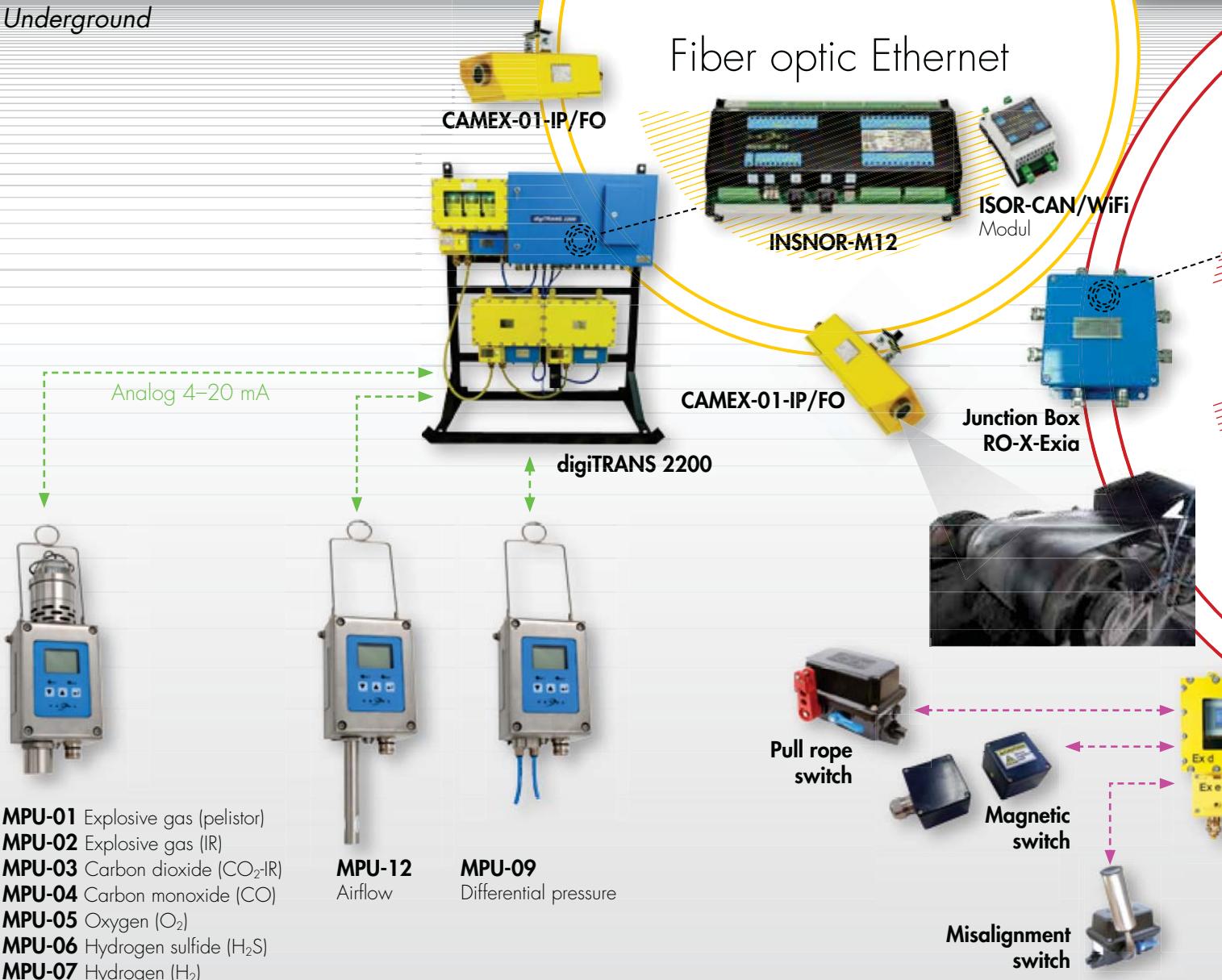


# MINING SAFETY TECHNOLOGY INFORMATION SYSTEM

- 
- **SYSTEM & CUSTOM SOLUTIONS**
  - **CONTROL UNITS**
  - **GAS DETECTORS**
  - **AUDIO/VISUAL DEVICES**
  - **JUNCTION BOXES**



*Underground*



Internet

Analog 4–20mA

Supply circuit

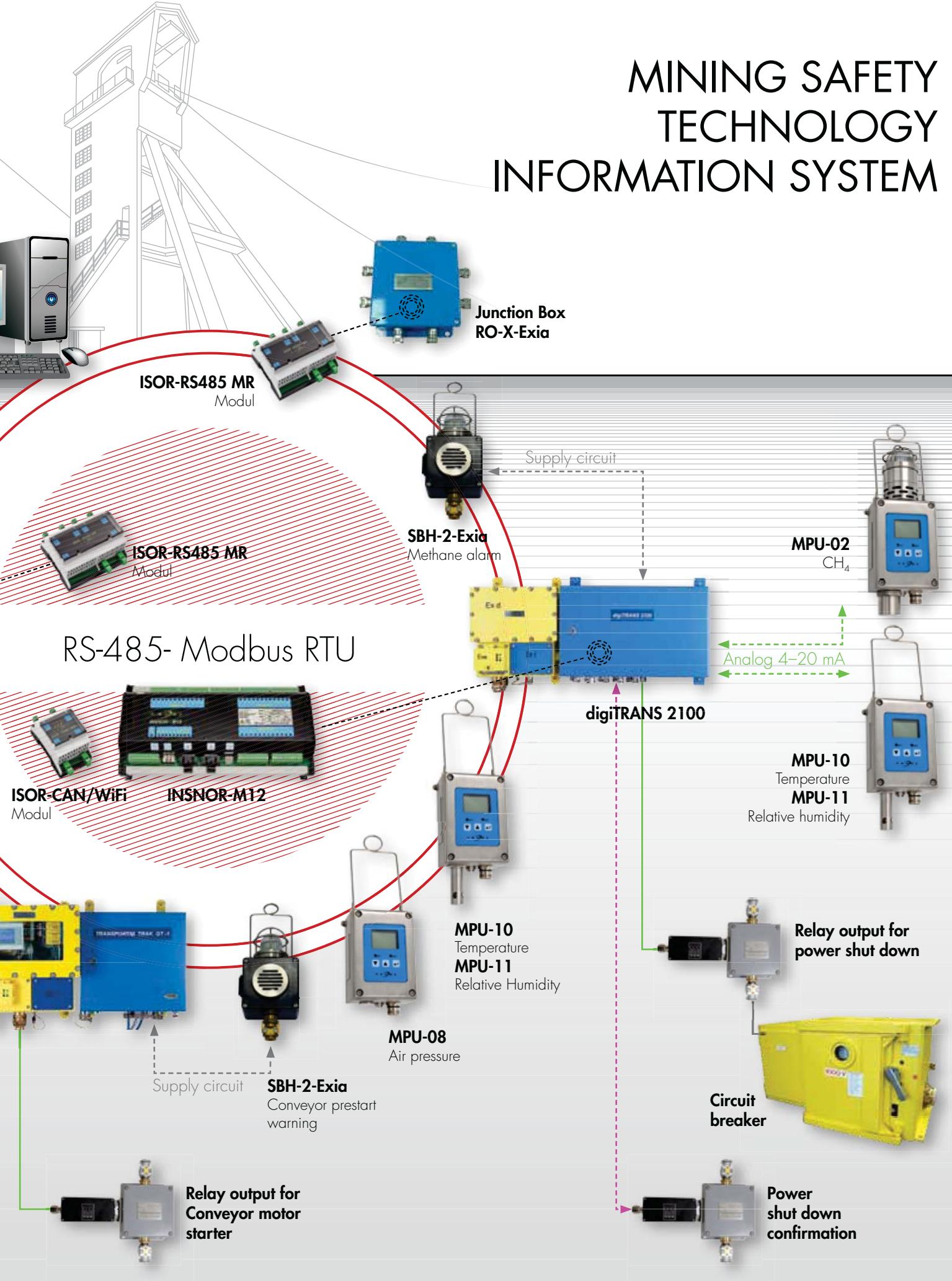
Relay output

Ethernet

RS-485- Modbus RTU

Digital input

# MINING SAFETY TECHNOLOGY INFORMATION SYSTEM

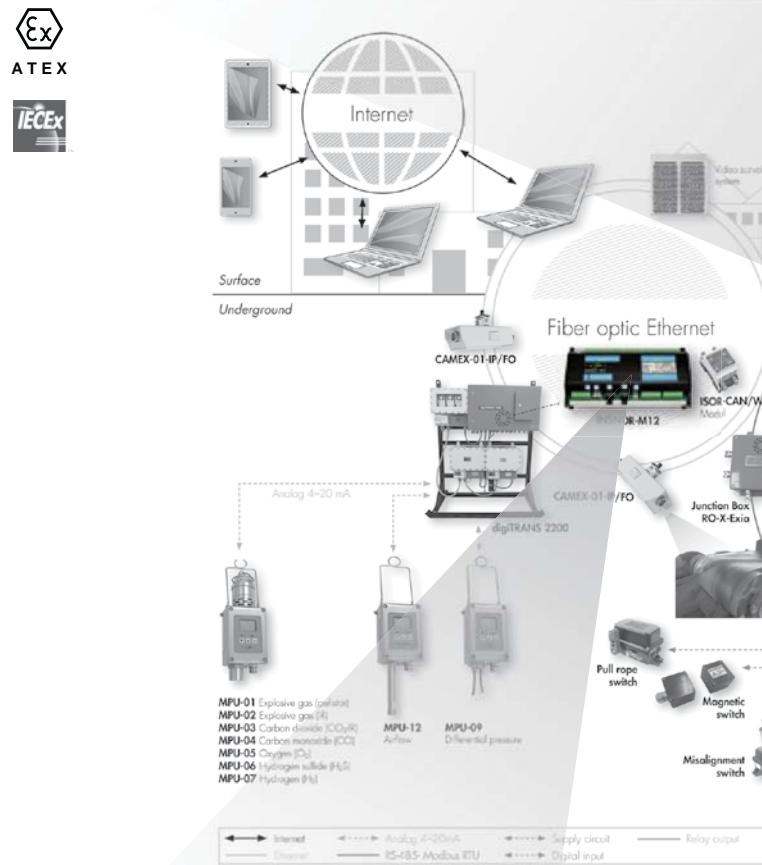


## DigiTRANS Control Unit

DigiTRANS is an underground control and alarm system, microprocessor controlled, mainly used for gas detection and automation. Different communication interfaces offer reliable communication with supervisory control and data acquisition system on the surface.



**Supply:** 230 VAC +/- 10% with 8h battery back up



## Programmable Controller type INSNOR-M12

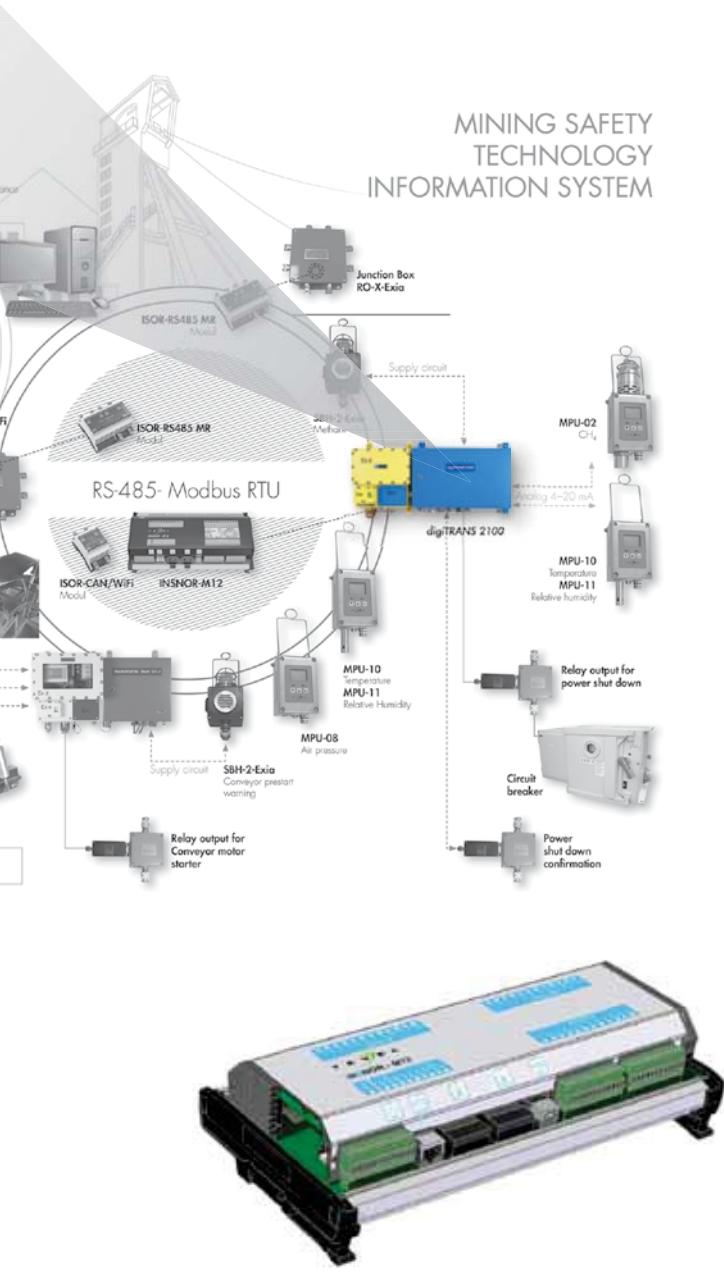
The compact programmable controller type INSNOR-M12 is designed for data acquisition, processing, control, and transmission. Data can be transmitted in real-time over long distances via various buses, e.g. to a control center where it can be pre-processed, visualized, stored, and transmitted. The controller is designed according to the standards for use in coal mines endangered by methane and coal dust.

Easy installation on standard DIN rail 35. The device must be installed in a housing with minimum Ingress Protection IP64.



INSNOR-M12 explosion marking:

**I M1 Ex ia op is I Ma**



## The compact programmable controller INSNOR-M12 connection types

- 12 Analog inputs (0.2–1mA or 4–20mA or 5–15Hz)
- 12 Digital inputs ( $U_{in}=0V \rightarrow$ Low (0) ;  $U_{in}=3-15V \rightarrow$ High (1) ;  $F_{max}=10kHz$ )
- 12 Changeover Relays outputs ( $U_{max}=30V$  ;  $I_{max}=2A$  ;  $P_{max}=30W$ )
- Serial RS485 – Modbus RTU
- Serial CAN – open
- USB B-type
- Ethernet 10/100Mbps
- 2 Fiber Optic Transceivers (redundant mode), Duplex SC Port (up to 15km)

## Benefits

- Compact design
- Simple configuration through the Ethernet or USB interface using a PC, tablet, or smartphone
- Easy programming with advanced PoKeys software

## Technical specifications

Type: INSNOR-M12

Ex mark: I M1 Ex ia op is I Ma

Power supply voltage:  $3 \times U_n=12VDC$ ,  $I_n=300mA$

(Suitable with Tevels power supply unit NSB4/x-ia)

Digital inputs:  $U_{min}=3V$

Analog inputs (3 options):

- Current input: 0.2–1mA ( $R_{in}=2k\Omega$ )
- Current input: 4–20mA : ( $R_{in}= 180\Omega$ )
- Frequency input: 5–15Hz:  $U_{min}=3V$

Relay outputs: SPDT switching contacts

( $U_{max}=30V$ ,  $I_{max}=2A$ ,  $P_{max}=30W$ )

RS485: Modbus RTU

CAN: Can open

Ethernet (RJ45)

USB B-type

2 Fiber Optic Transceivers, Duplex SC Port:

125 MBd MMF Transceiver for Fast Ethernet

(100Base-FX)/ATM/FDDI

(up to 15km)

Operating temperature range: -20°C to +50°C

Relative humidity: 15–90% Rh (without condensation)

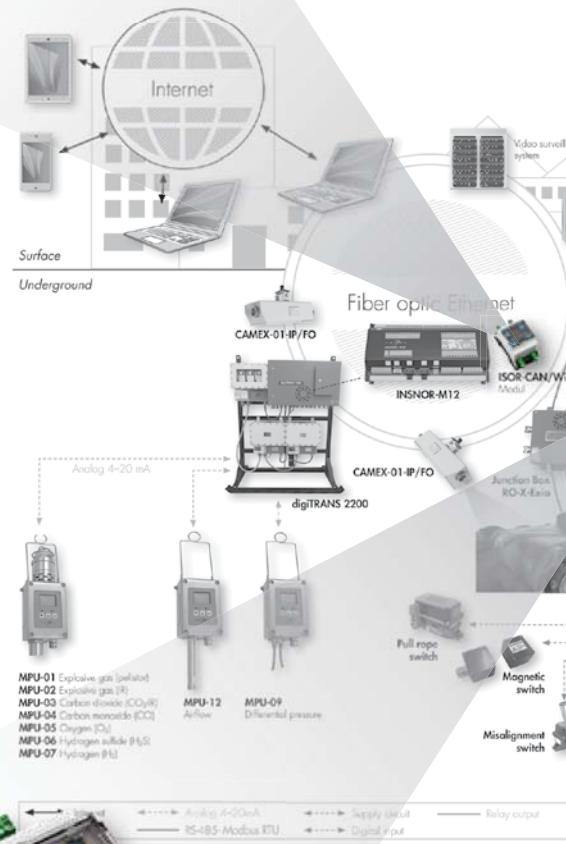
Dimension: 275 x 143 x 71 (L x H x W in mm)

Weight: < 1kg

## Modul ISOR-CAN/WiFi

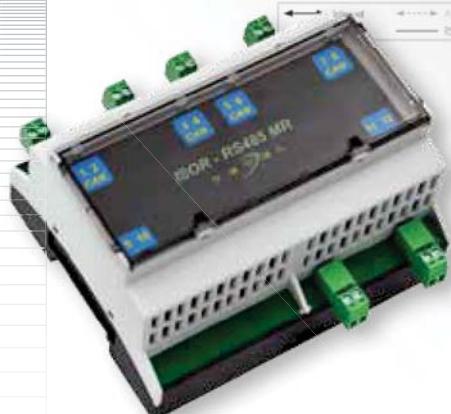
ISOR-CAN/WiFi (interface)

The module serves for wireless (WiFi) communication between (master) INSNOR-M12 and a smart WiFi device such as: PC, tablet or smartphone.



## Multichannel Repeater RS485 type ISOR-RS485 MR

Multichannel Repeater RS485 type ISOR-RS485 MR is universal serial line isolator.



- 4 port RS485 hub (multidirection)
- Extend the distance of one single RS485 communications line

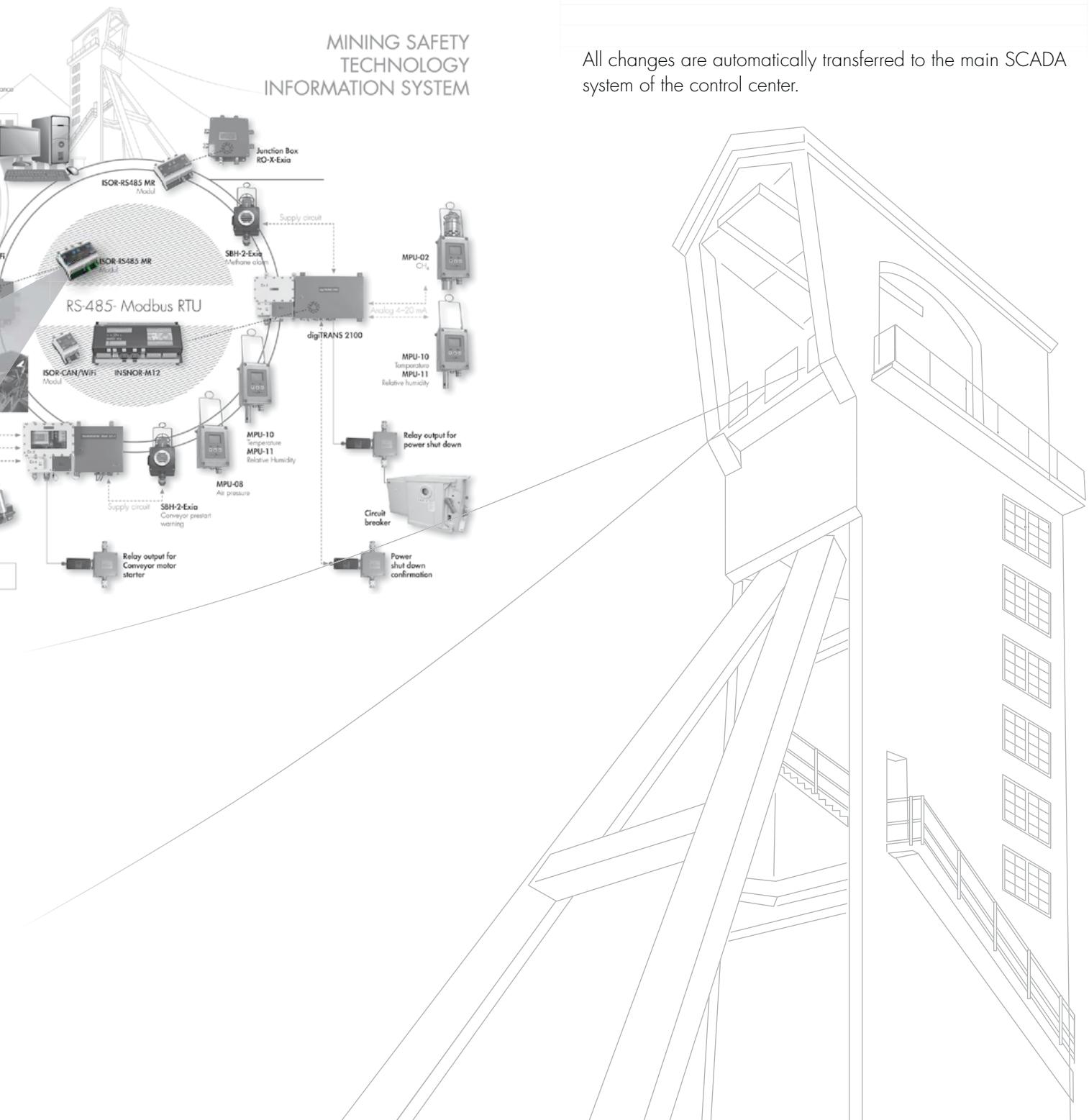


## Status overview and parameterization

The user can monitor and manage the system with the help of a phone/tablet/pc directly in the endangered area:

- Setting alarm levels
- Selection of relay outputs
- Selection of digital inputs
- Changing the measuring heads...

All changes are automatically transferred to the main SCADA system of the control center.



**MPU-01 or MPU-01/SBH  
 MPU-02 or MPU-02/SBH  
 MPU-03 or MPU-03/SBH  
 MPU-04 or MPU-04/SBH  
 MPU-05 or MPU-05/SBH  
 MPU-06 or MPU-06/SBH  
 MPU-07 or MPU-07/SBH**

Gas Detectors

Different signal outputs

Optional RS 485 Modbus RTU or CAN communication

Intrinsically safe device

Optional connection via cable gland

Equipped with local display

Easy operation and maintenance

Wide range of sensors

Corrosion resistant stainless steel housing

**Gases Detected:**

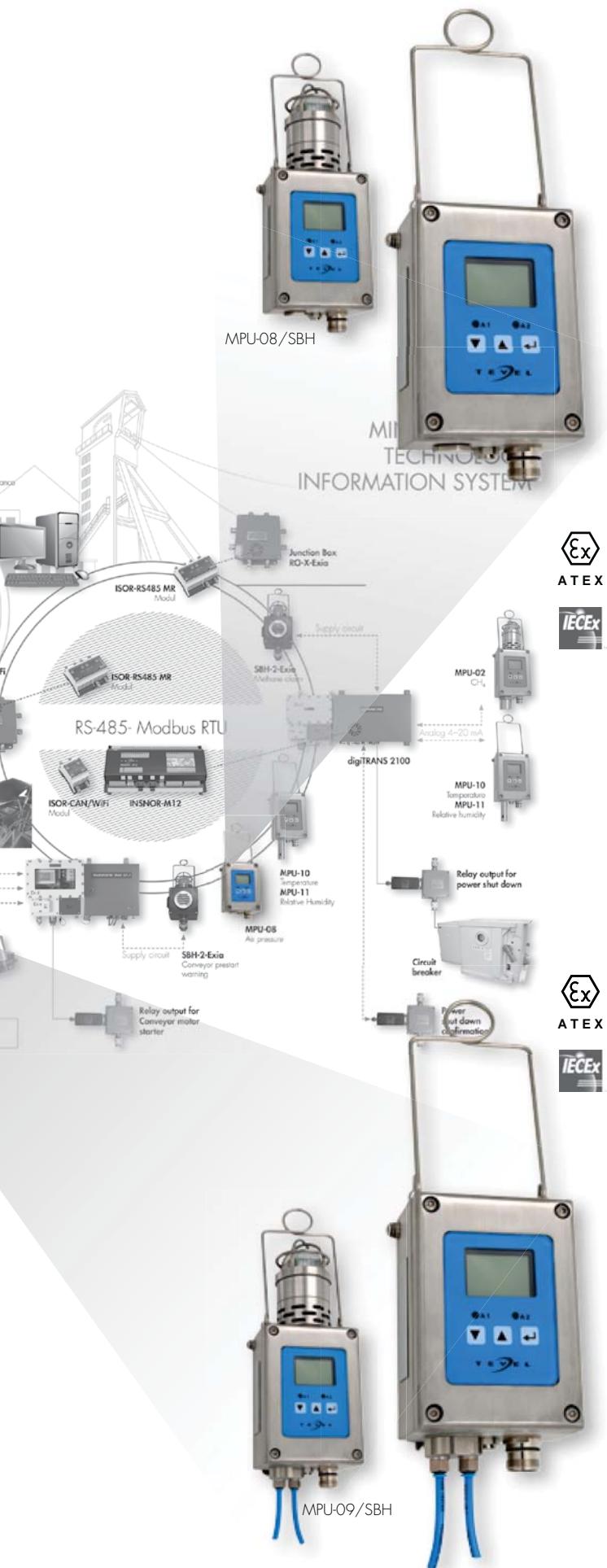
- 01/ Methane ( $\text{CH}_4$ -PEL)
- 02/ Methane ( $\text{CH}_4$ -IR)
- 03/ Carbon dioxide ( $\text{CO}_2$ -IR)
- 04/ Carbon monoxide (CO)
- 05/ Oxygen ( $\text{O}_2$ )
- 06/ Hydrogen sulfide ( $\text{H}_2\text{S}$ )
- 07/ Hydrogen ( $\text{H}_2$ )

**Sensor Technologies:** infrared (IR), catalytic, electrochemical

**Power In/Output:** 9–15 VDC I.S./4–20 mA, 0.2–1mA,

1–5 V, 5–15 Hz





## MPU-08 or MPU-08/SBH

Absolute pressure detector  
Different signal outputs  
Optional RS 485 Modbus RTU or CAN communication  
Intrinsically safe device  
Optional connection via cable gland

Equipped with local display  
Easy operation and maintenance  
Corrosion resistant stainless steel housing

**Detection:** Air pressure ( $p$ )

**Sensor Technologies:** Piezoresistive

**Power In/Output:** 9–15 VDC I.S./4–20 mA, 0.2–1mA,  
1–5 V, 5–15 Hz

## MPU-09 or MPU-09/SBH

Differential pressure detector  
Different signal outputs  
Optional RS 485 Modbus RTU or CAN communication  
Intrinsically safe device  
Optional connection via cable gland

Equipped with local display  
Easy operation and maintenance  
Wide range of sensors  
Corrosion resistant stainless steel housing

**Detection:** Differential pressure ( $\Delta p$ )

**Sensor Technologies:** piezoresistive sensor

**Power In/Output:** 9–15 VDC I.S./4–20 mA, 0.2–1mA,  
1–5 V, 5–15 Hz

## MPU-10 or MPU-10/SBH MPU-11 or MPU-11/SBH

Temperature or Relative Humidity Detector

Different signal outputs

Optional RS 485 Modbus RTU or CAN communication

Intrinsically safe device

Optional connection via cable gland

Equipped with local display

Easy operation and maintenance

Corrosion resistant stainless steel housing

### Detection:

10 / Temperature (T)

11 / Relative humidity (Rh)

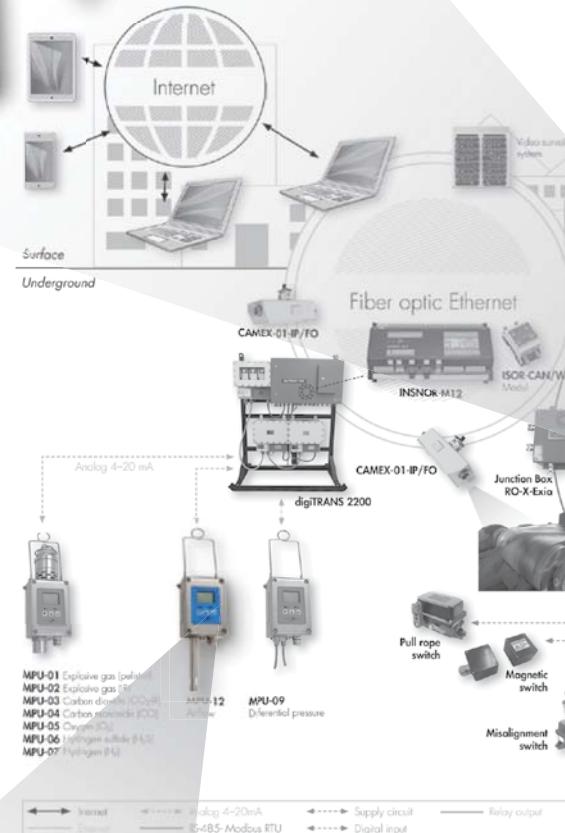
Sensor Technologies: Temperature: band-gap sensor

Relative Humidity: capacitive sensor

Power In/Output: 9–15 VDC I.S./4–20 mA, 0.2–1mA,  
1–5 V, 5–15 Hz



MPU-10/SBH  
MPU-11/SBH



## MPU-12 or MPU-12/SBH

Air Velocity Detector

Different signal outputs

Optional RS 485 Modbus RTU or CAN communication

Intrinsically safe device

Optional connection via cable gland

Equipped with local display

Easy operation and maintenance

Corrosion resistant stainless steel housing

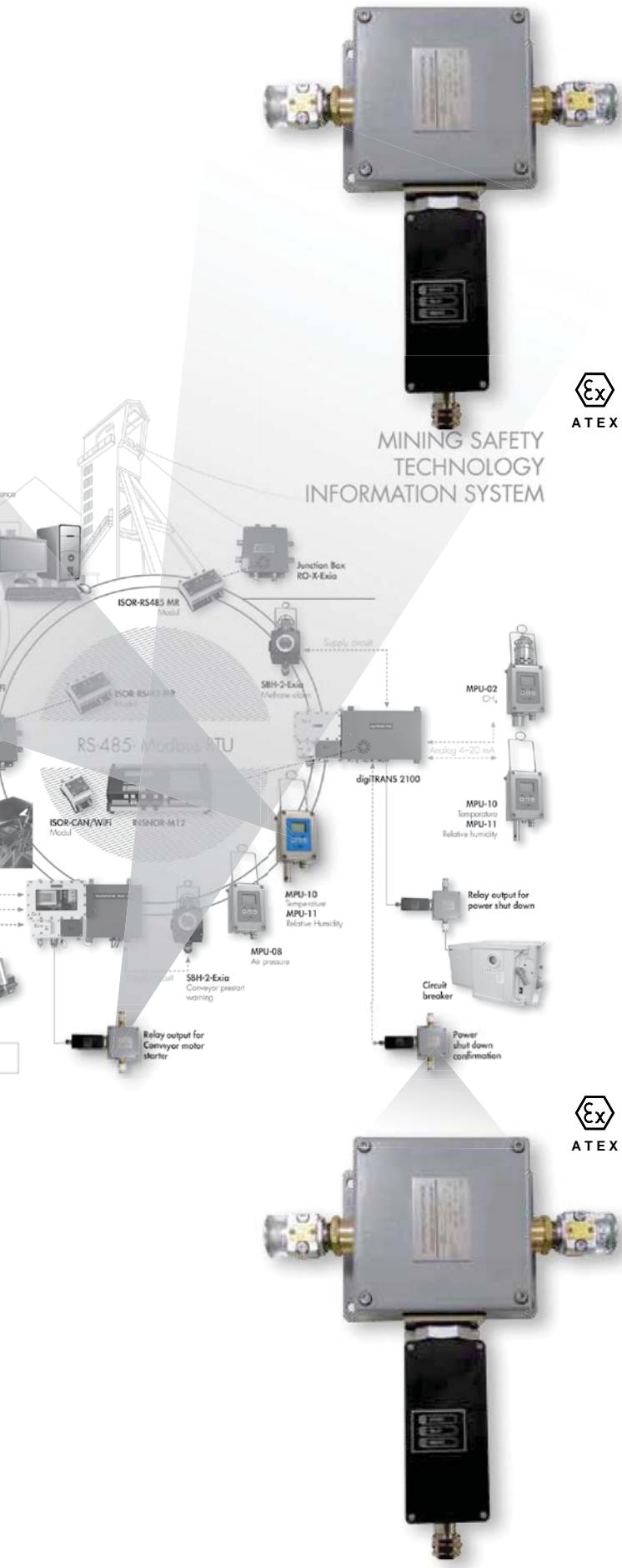
Detection: Air flow rate (v), m/s

Sensor Technologies: thermal conductivity

Power In/Output: 9–15 VDC I.S./4–20 mA, 0.2–1mA,  
1–5 V, 5–15 Hz



MPU-12/SBH



## KLV-230-PEx / RO-01

Control separation element  
Direct connection to Ex d or Ex e housings  
Line monitoring available

Status LED lights  
Easy operation and maintenance  
Reinforced polyester housing

**Switching capacity:** 2 relay outputs (max. 250 VAC/10A)

**Power In:**

- 24 VAC
- 42 VAC
- 115 VAC
- 230 VAC

## PLV-230-PEx / RO-01

Data separation element  
Direct connection to Ex d or Ex e housings  
Line monitoring available

Status LED lights  
Easy operation and maintenance  
Reinforced polyester housing

Intrinsically safe relay output

**Power In:**

- 24 VAC
- 42 VAC
- 115 VAC
- 230 VAC

## SBH-2-Exia

Signal flash Light with Alarm Horn

Intrinsically safe device

Optional connection via connector

Optional test button

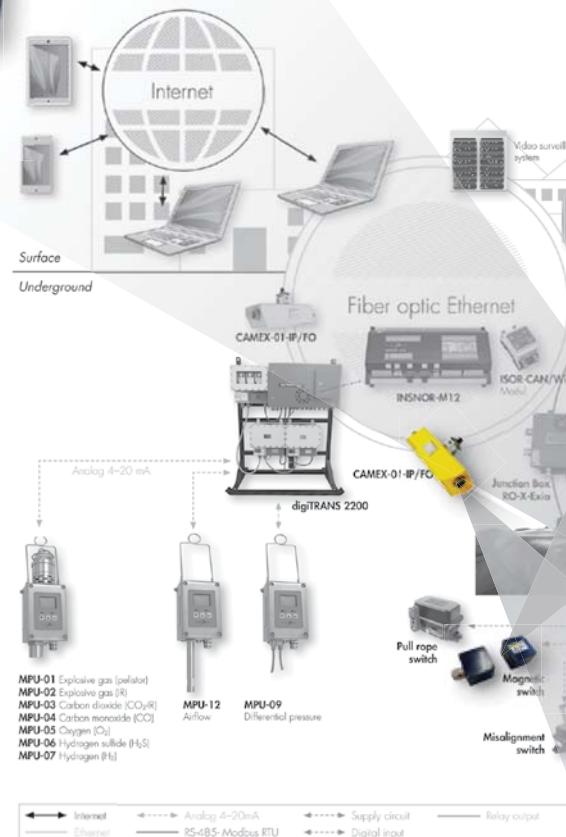
Easy operation and maintenance

Reinforced polyester housing

Flash light: LED (red, green, white, blue, yellow)

Buzzer: Piezzo 105 dB

Power In: 9–16 VDC I.S.



## SBH-ia/PV

Signal flashing light with horn

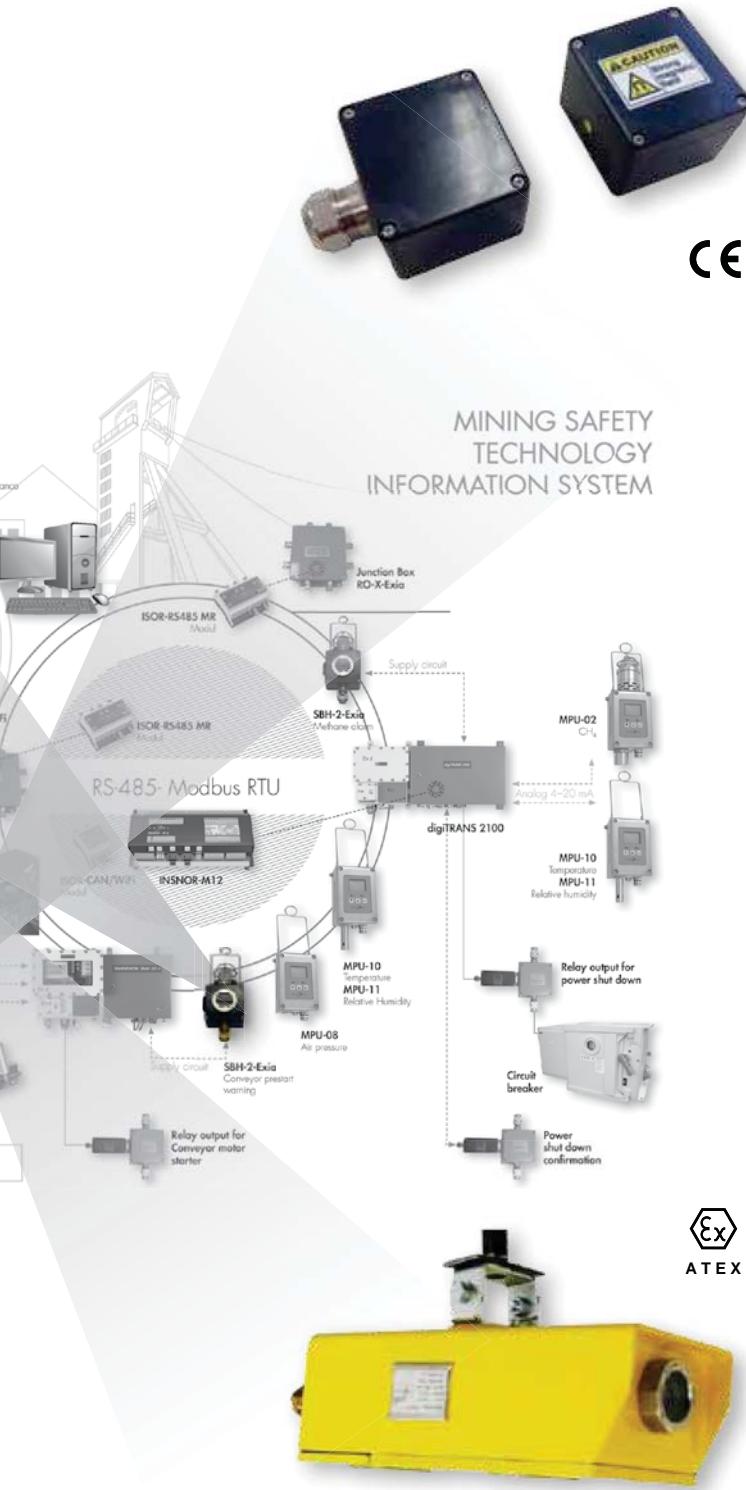
Signal flash light with horn SBH-ia/PV is intended for use in mining applications. It is used as audio-visual warning device in case of danger. SBH-ia/PV is made of certificated intrinsically safe flashlight with horn SBH-ia/MPS, which is mounted in inox enclosure IP55.

### Features

- IP55
- Supply Voltage: 12–16 VDC (I.S.)
- Current Consumption: 30 mA
- Control Current Consumption: 2–4 mA

Explosion protection: I M1 Ex ia op is I Ma





## Magnetic switch

Fixed Magnetic switch  
Changeover output  
Intrinsically safe device  
Optional connection via connector

Easy operation and maintenance  
Reinforced polyester housing

**Detection:** status of mechanical devices (air doors)

**Sensor Technologies:** reed relay

**Switching capacity:** intrinsically safe: max. 30 VDC/ 660 mA

## CAMEX-01-IP/FO

IP camera  
Fiber optic connection (single mode, E2000 connection)  
Main housing Ex d, Connection chamber Ex e, Signal output Ex op is

Easy operation and maintenance  
Remote managing  
Robust housing

Picture transmission range > 15 km

**Resolution:** 2 MPixel

**Supply voltage:** 230 VAC, 50 Hz

# INSTALLATION COMPONENTS

**Junction Box RO-x-Exia/  
Junction Box JB-0x-Exia**

Sheet steel enclosure/Stainless steel enclosure  
Ex ia certified  
4 enclosure size options  
Customizable configuration of terminals, cable entries and cable gland types



**ATEX**

**Junction Box RO-x-Exe**

Sheet steel enclosure  
Ex e certified  
2 enclosure size options  
Customizable configuration of terminals, cable entries and cable gland types



**ATEX**

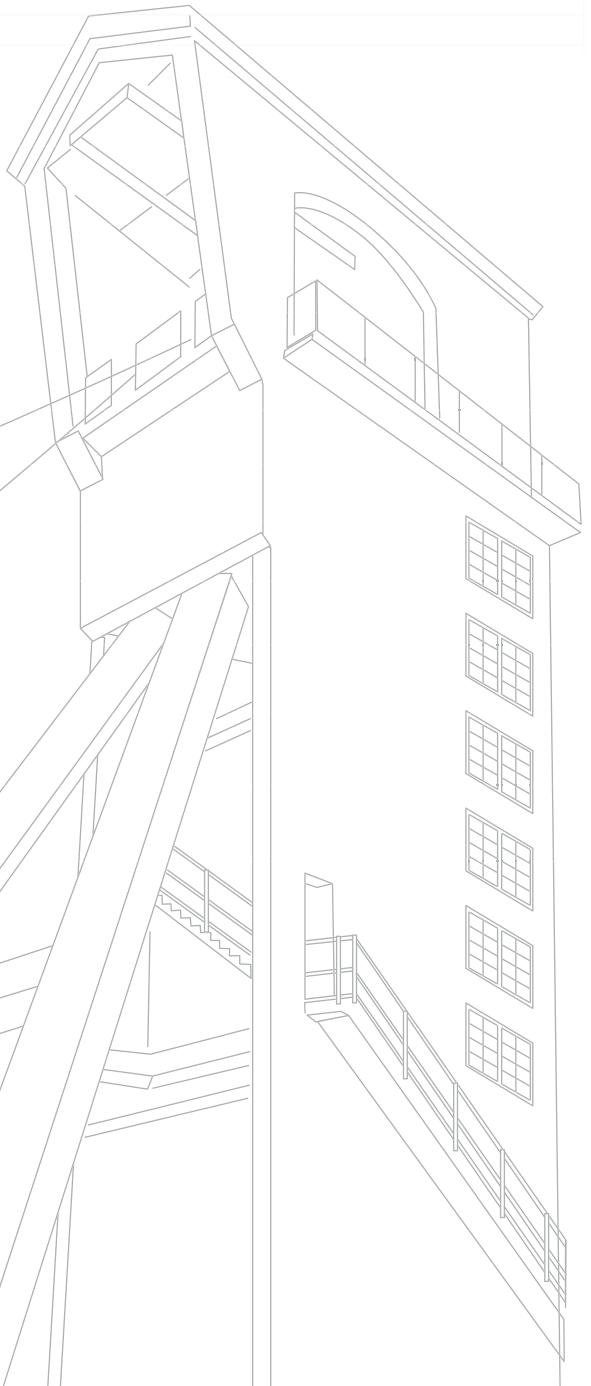
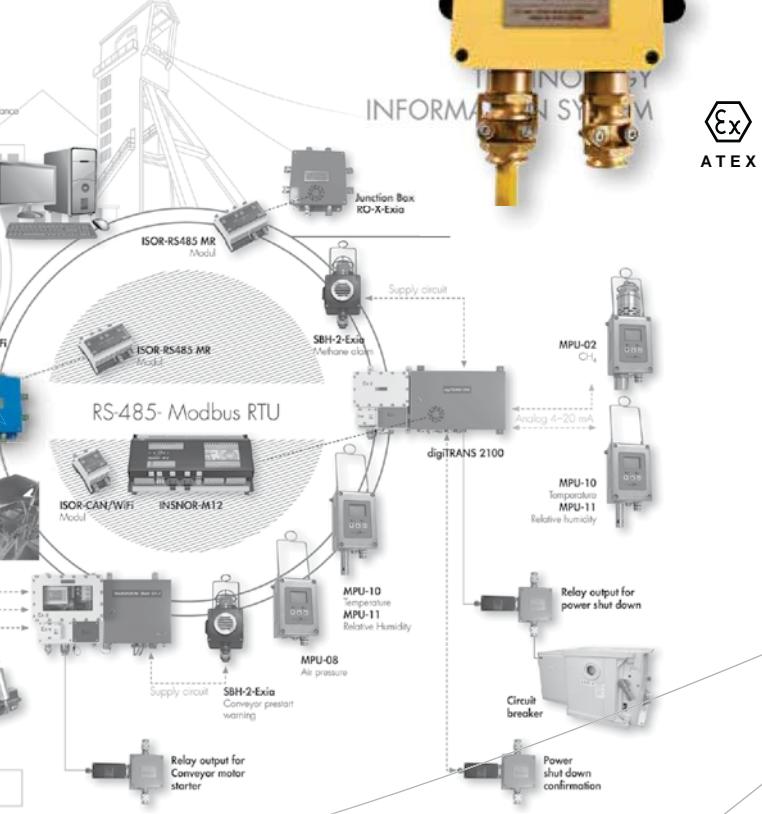
**MPU-01** Explosive gas (pellet)  
**MPU-02** Explosive gas (I)  
**MPU-03** Carbon dioxide (CO<sub>2</sub>)  
**MPU-04** Carbon monoxide (CO)  
**MPU-05** Oxygen (O<sub>2</sub>)  
**MPU-06** Hydrogen sulfide (H<sub>2</sub>S)  
**MPU-07** Hydrogen (H<sub>2</sub>)  
**MPU-09** Differential pressure  
**MPU-12** Airflow

# LIGHTING



## Explosion proof floodlight LUX-xx-L/x.x

Utilizes latest LED technology lamp type  
High quality LED module  
In excess of 50.000 hours LED life  
Wide supply voltage range  
Different colour temperatures available





**OUR QUALITY – YOUR SAFETY**



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