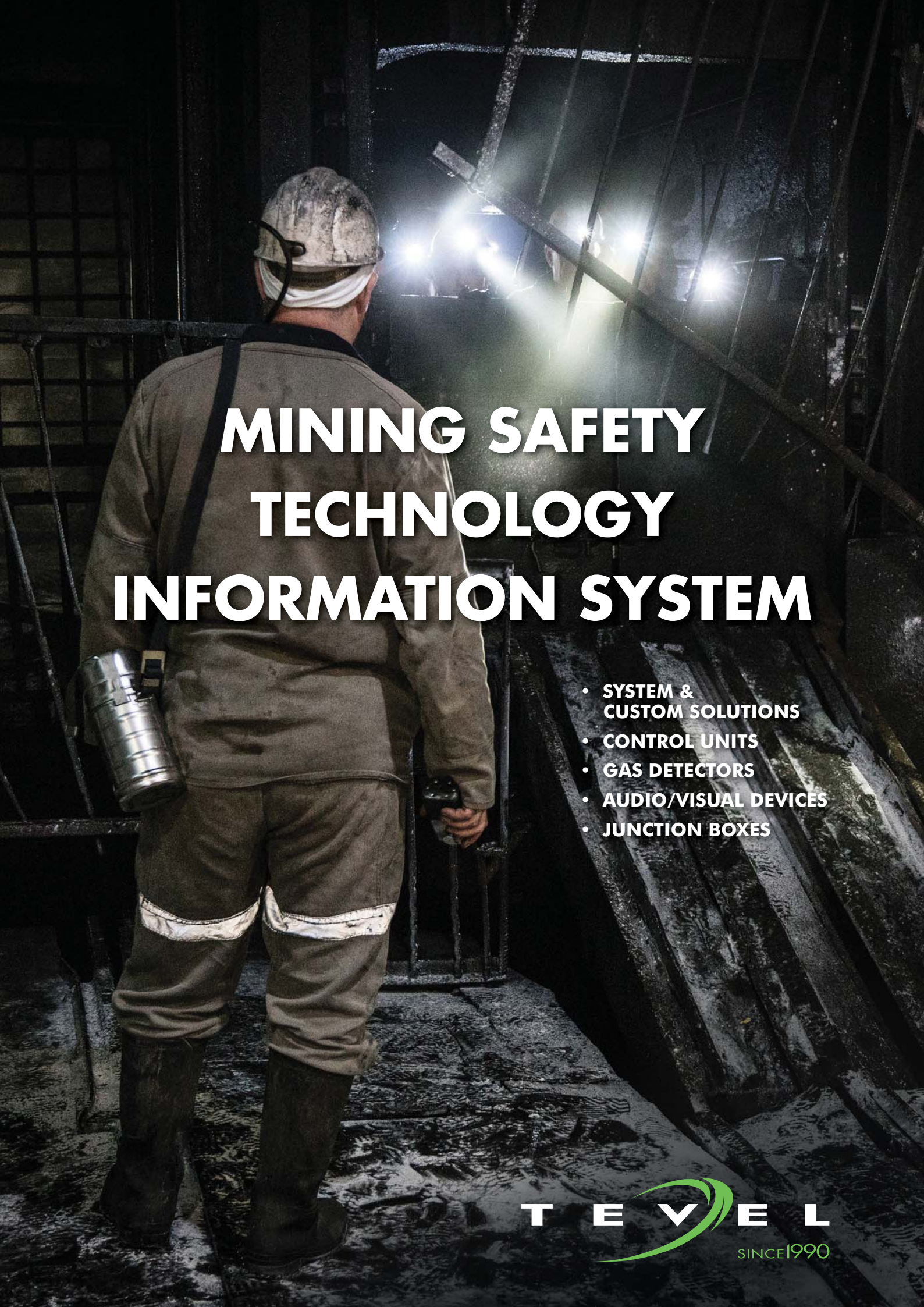

MINING SAFETY TECHNOLOGY INFORMATION SYSTEM

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

TEVEL

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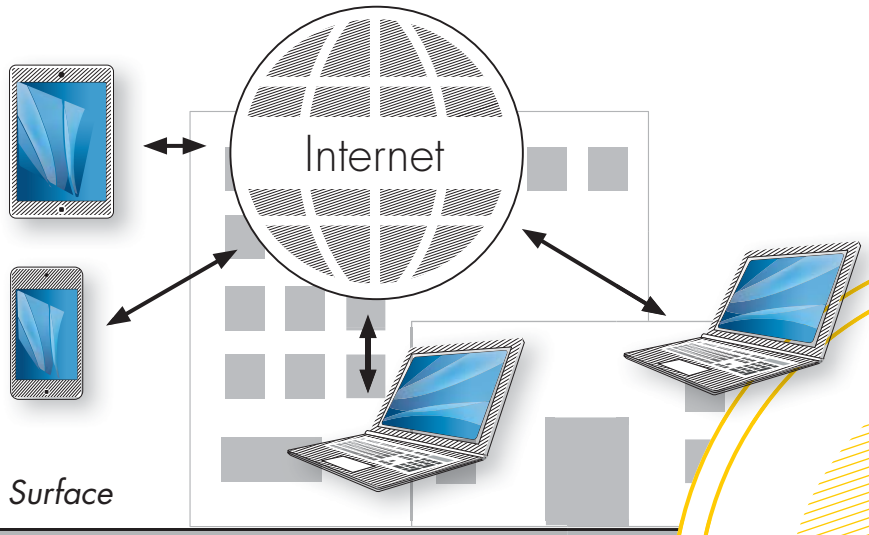
TEVEL
SINCE 1990




Video surveillance system

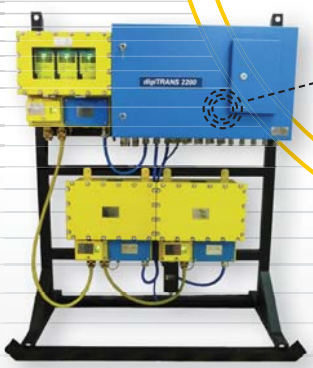
NSB4

Fiber optic Ethernet

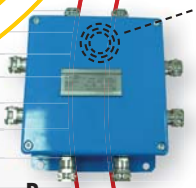

CAMEX-01-IP/FO


INSNOR-M12

ISOR-CAN/WiFi
Modul


digiTRANS


CAMEX-01-IP/FO


Junction Box
RO-X-Exia

Analog 4–20 mA

MPU-01 Explosive gas (pelistor)
MPU-02 Explosive gas (IR)
MPU-03 Carbon dioxide (CO_2-IR)
MPU-04 Carbon monoxide (CO)
MPU-05 Oxygen (O_2)
MPU-06 Hydrogen sulfide (H_2S)
MPU-07 Hydrogen (H_2)


MPU-12
Airflow


MPU-09
Differential pressure


MPU-13
2-wire, 3-wire or 4-wire
Resistance Temperature
Detector (RTD)
Thermocouples (TC)

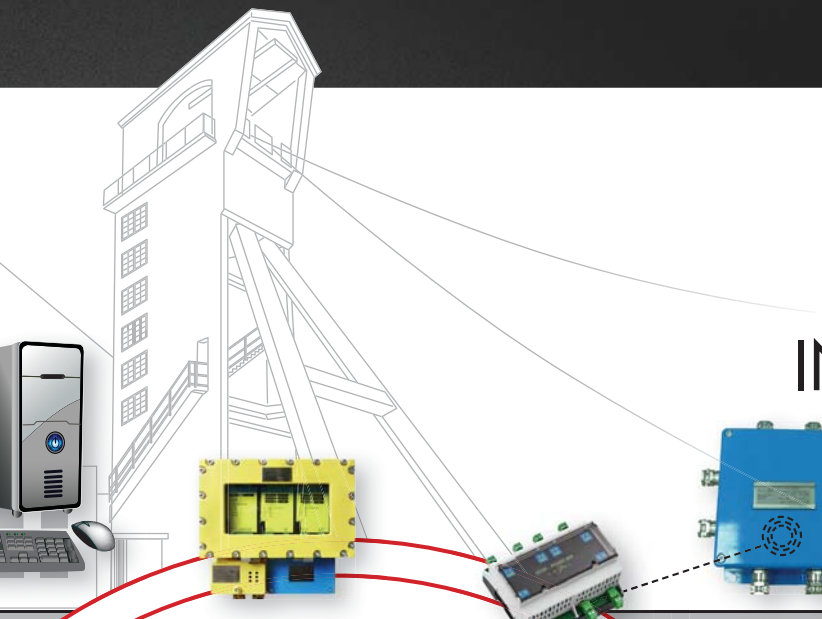

Pull rope switch


Magnetic switch

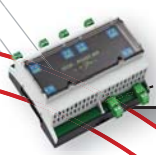

Misalignment switch

Internet
Ethernet
Analog 4–20mA
RS-485- Modbus RTU
Supply circuit
Digital input
Relay output

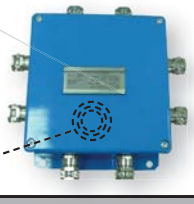
MINING SAFETY TECHNOLOGY INFORMATION SYSTEM



NSB3



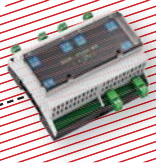
ISOR-RS485 MR
Modul



Junction Box
RO-X-Exia

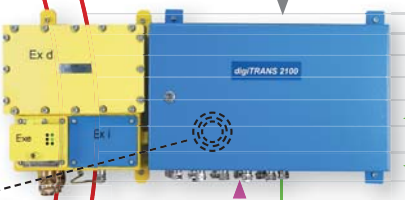
Supply circuit

SBH-2-Exia
Methane alarm



ISOR-RS485 MR
Modul

RS-485- Modbus RTU

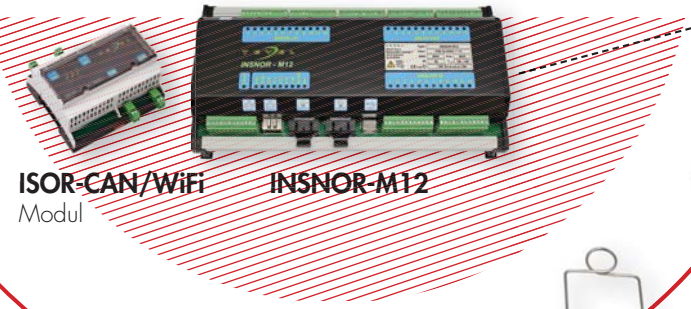


digiTRANS

MPU-02
CH_4

Analog 4–20 mA

MPU-10
Temperature
MPU-11
Relative humidity



ISOR-CAN/WiFi
Modul

INSNOR-M12

MPU-10
Temperature
MPU-11
Relative Humidity

MPU-08
Air pressure

Supply circuit

SBH-2-Exia
Conveyor prestart warning

Relay output for power shut down

Circuit breaker

Relay output for Conveyor motor starter

Power shut down confirmation

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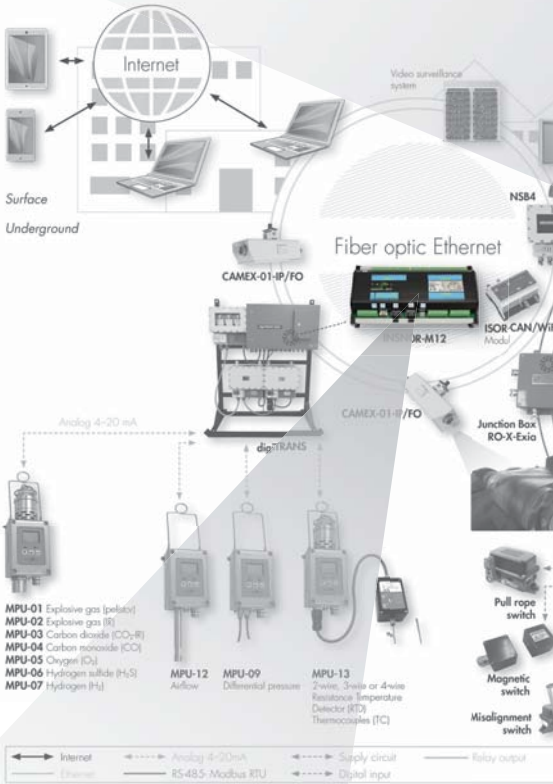
DigiTRANS Control Unit

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

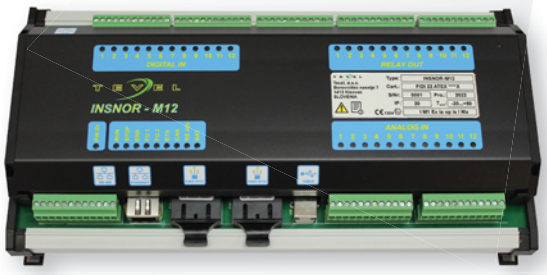
Supply: 230 VAC +/- 10% with 8h battery back up

ATEX



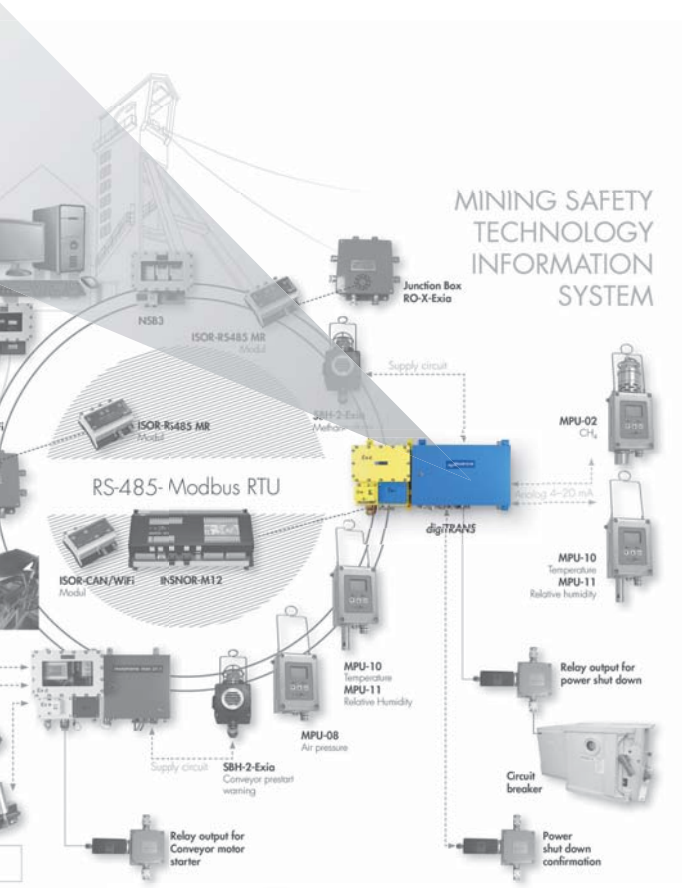
Programmable Controller type INSNOR-M12

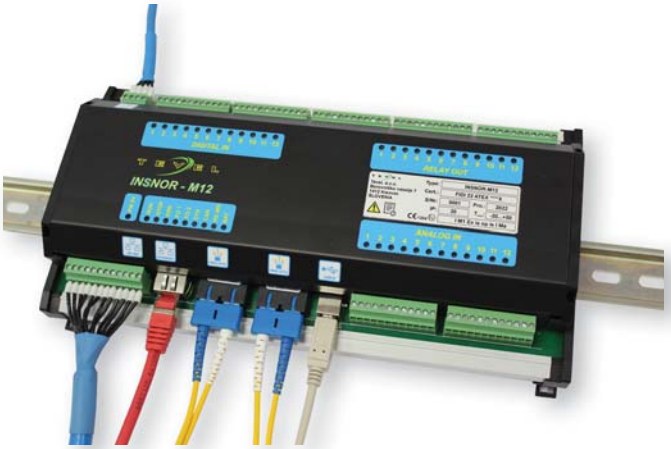
The compact programmable controller type INSNOR-M12 is designed for data acquisition, processing, control, and transmission. Data can be transmitted in real-time over long distances via various buses, e.g. to a control center where it can be pre-processed, visualized, stored, and transmitted. The controller 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 IP54.

Ex 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→Low (0) ; U_{in}=3–15V→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 x 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}=2kΩ)
- Current input: 4–20mA : (R_{in}= 180Ω)
- 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

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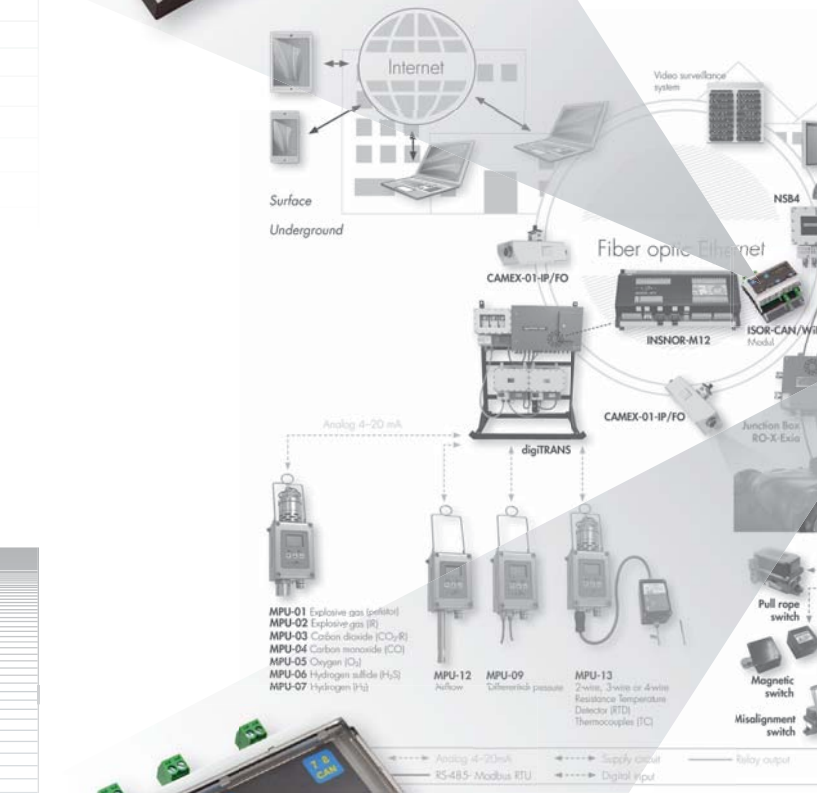
Modul ISOR-CAN/WiFi

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.

Ex marking: I M1 Ex ia I Ma

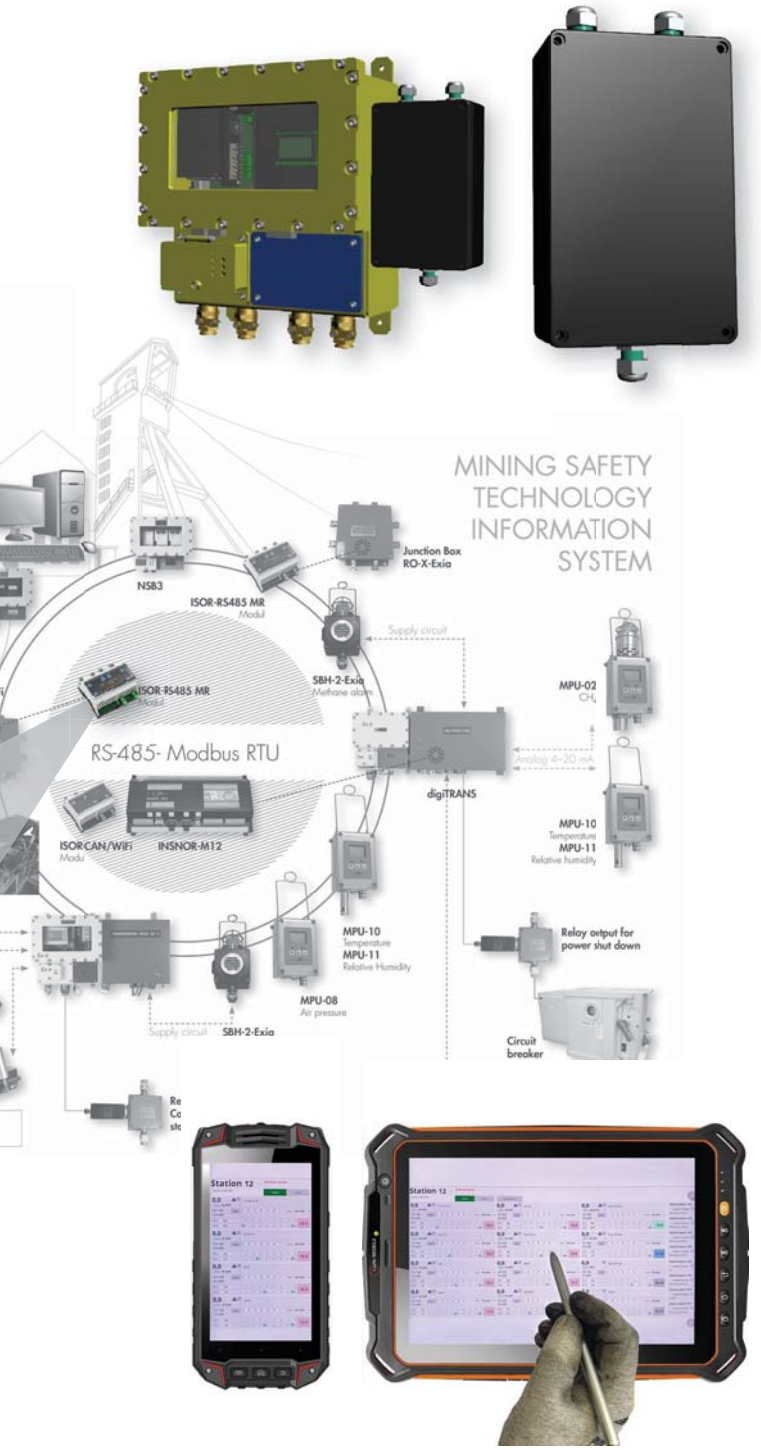


Multichannel Repeater RS485 type ISOR-RS485 MR

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

Ex marking: I M1 Ex ia I Ma



ISOR-RS485 communication interface in an IP 65 housing

- RS485 line extension up to 1 km (ISOR-RS485 interface)

Status overview and parameterization

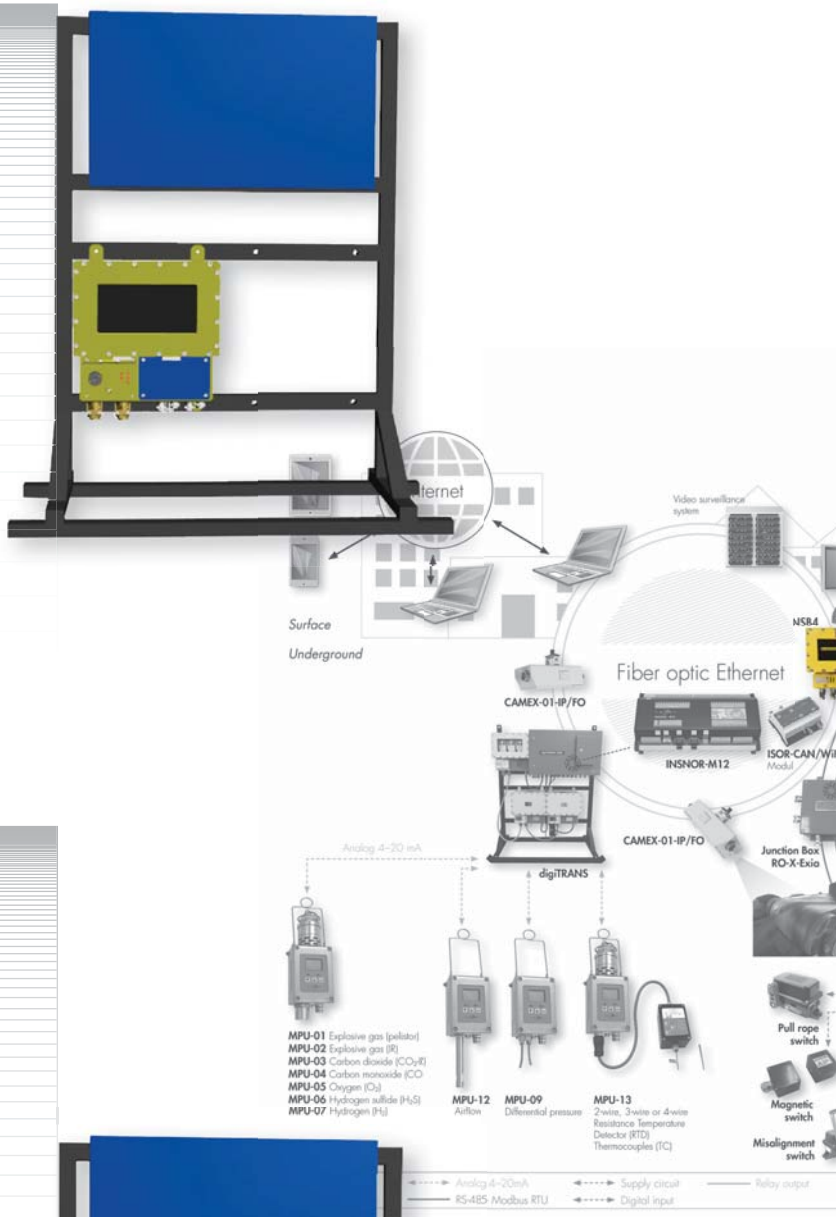
The user can monitor and manage the system with the help of a phone/tablet/pc directly in the endangered area:

- 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.

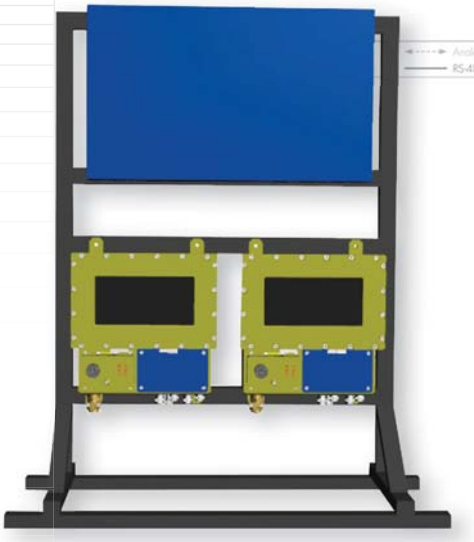
Substation DigiTrans 2400/1

- 4 analog inputs (Measuring heads type MPU-**)
- 12 digital inputs
- 12 relay outputs
- Serial RS485 (Modbus RTU)
- Serial CAN
- USB
- Ethernet
- 2 Fiber Optic Transceivers (single mode up to 20km)
- ISOR-CAN/WiFi interface



Substation DigiTrans 2400/2

- 12 analog inputs (Measuring heads type MPU-**)
- 12 digital inputs
- 12 relay outputs
- Serial RS485 (Modbus RTU)
- Serial CAN
- USB
- Ethernet
- 2 Fiber Optic Transceivers (single mode up to 20km)
- ISOR-CAN/WiFi interface



NSB3-xxx/5Via

Power supply type NSB3-xxx/5Via is intended for use in mining applications. It converts an ac supply voltage into a stabilized and regulated intrinsically safe source for supplying power to approved electronic control devices. NSB3-xxx/5Via provides two 5VDC outputs, capable to source up to 1200 mA. NSB3-xxx/5Via also provide 4–20 mA output signal to monitor battery state of charge and potential-free relay to indicate mains fuse failure for each output channel. In the case of power supply failure, automatic battery backup is provided with capacity of 8000 mAh.

Ex marking:
I M2(M1) Ex db eb ia [ia Ma] I Mb
I M1 Ex db eb ia [ia] mb I Ma

NSB4/x-ia

Intrinsically Safe Power Supply NSB4/x-ia is intended for use in mining applications. It converts an AC supply voltage into a stabilazed and regulated intrinsically safe source for supplying power to approved electronic control devices. NSB4/x-ia provides eight I.S. outputs with different I.S. parametres. NSB4/x-ia also provides 4–20 mA or 0,2–1mA output signal to monitor battery capacity and potential-free relay to indicate mains fuse failure for each output channel. In the case of power supply failure, automatic battery backup is provided with capacity of 8000 mAh. On the built-in display, we can monitor the status of I.S. outputs (voltage, current consumption) and battery capacity.

Configuration of NSB4/x-ia:

- NSB4/1-ia: 8x13V
- NSB4/2-ia: 7x13V / 1x12V
- NSB4/4-ia: 6x13V / 2x12V

Ex marking:
I M2(M1) Ex db eb ia [ia Ma] I Mb
I M1 Ex db eb ia [ia] mb I Ma

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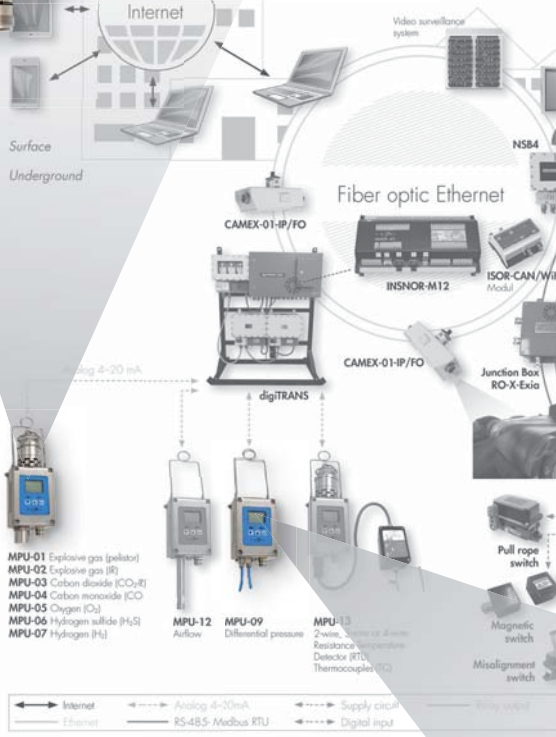
MPU-01 or MPU-01/SBH
MPU-02 or MPU-02/SBH
MPU-03 or MPU-03/SBH
MPU-04 or MPU-04/SBH
MPU-05 or MPU-05/SBH
MPU-06 or MPU-06/SBH
MPU-07 or MPU-07/SBH

Gas Detectors
Different signal outputs
Optional RS 485 Modbus RTU or CAN communication
Intrisically safe device
Optional connection via cable gland

ATEX

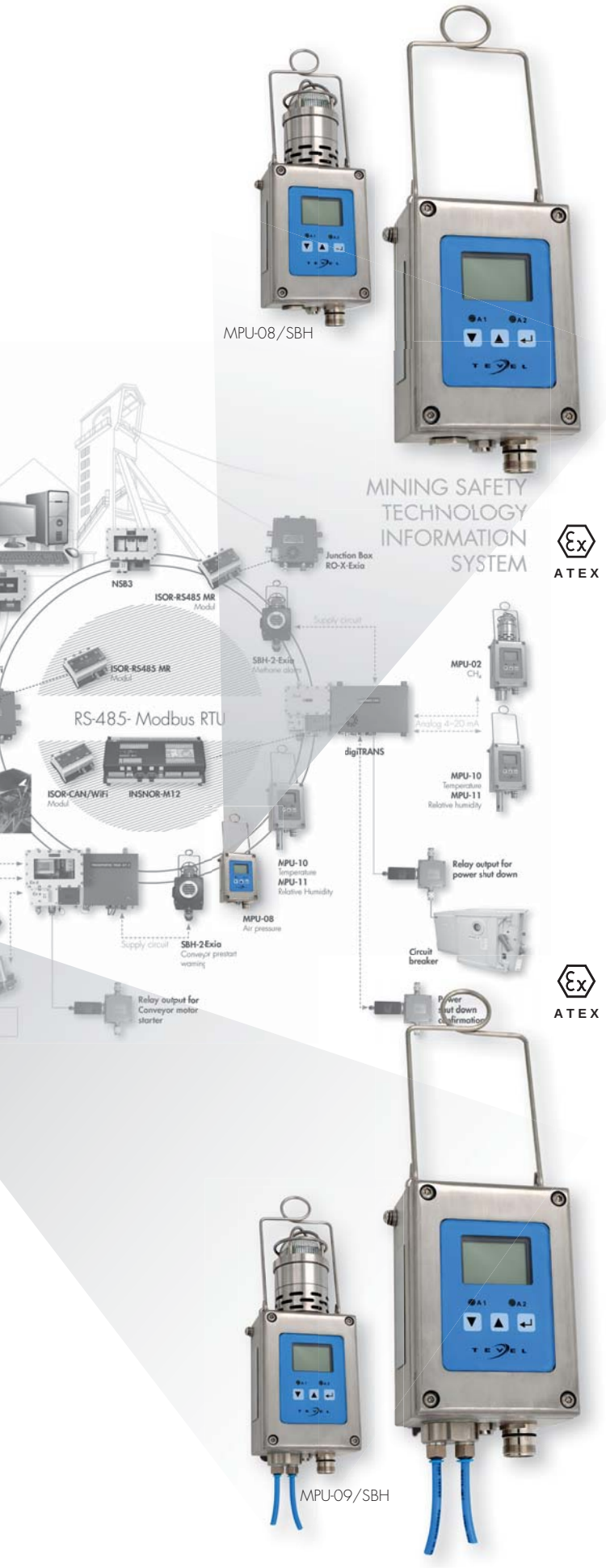


Equipped with local display
Easy operation and maintenance
Wide range of sensors
Corrosion resistant stainless steel housing

Gases Detected:
01/ Methane (CH_4-PEL)
02/ Methane (CH_4-IR)
03/ Carbon dioxide (CO_2-IR)
04/ Carbon monoxide (CO)
05/ Oxygen (O_2)
06/ Hydrogen sulfide (H_2S)
07/ Hydrogen (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

Ex marking: I M1 Ex ia I Ma



MPU-08 or **MPU-08/SBH**

Absolute pressure detector
Different signal outputs
Optional RS 485 Modbus RTU or CAN communication
Intrisically 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

Ex marking: I M1 Ex ia I Ma

MPU-09 or **MPU-09/SBH**

Differential pressure detector
Different signal outputs
Optional RS 485 Modbus RTU or CAN communication
Intrisically 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 (Δp)
Sensor Technologies: piezoresistive sensor
Power In/Output: 9–15 VDC I.S./4–20 mA, 0.2–1mA, 1–5 V, 5–15 Hz

Ex marking: I M1 Ex ia I Ma

TEVEL SINCE 1990

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

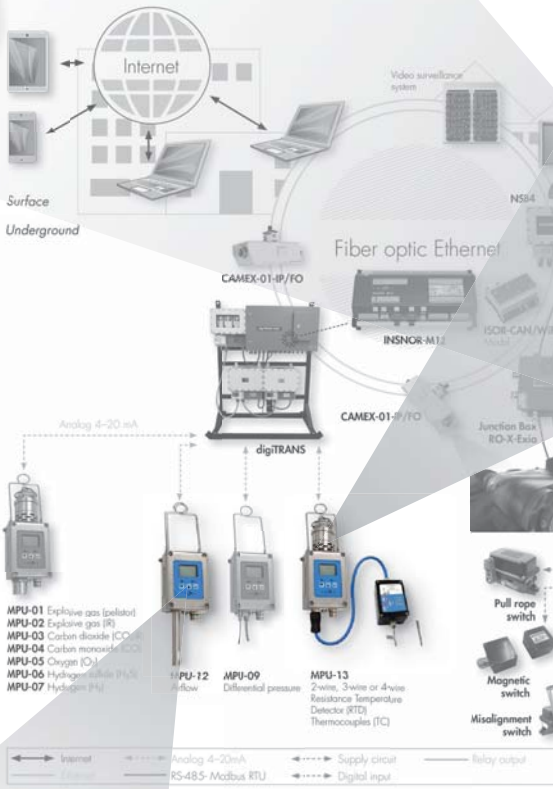
Temperature or Relative Humidity Detector
Different signal outputs
Optional RS 485 Modbus RTU or CAN communication
Intrisically safe device
Optional connection via cable gland

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

Ex marking: I M1 Ex ia I Ma

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
Intrisically 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

Ex marking: I M1 Ex ia I Ma

MPU-12/SBH

ATEX

MPU-13 - iRTD

Temperature measurement

Interface iRTD is an extension unit for MPU-** device for connecting ATEX-certified RTD sensors to MPU-** device. Interface is dislocated unit (dislocated measuring head) with dedicated cable connector, which is connected to MPU_** device.

RTD sensor connection to iRTD-13/**.1 interface

The extension iRTD-13/**.1 interface allows connecting ATEX-certified 2-wire, 3-wire, and 4-wire RTD sensors to MPU_** device. Connect the RTD sensor according to the diagram and picture below. The DIP switch shall be also set correctly.

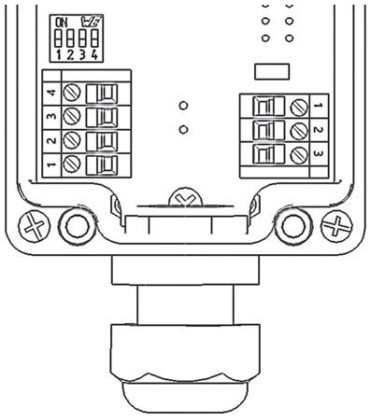
Possible connections:

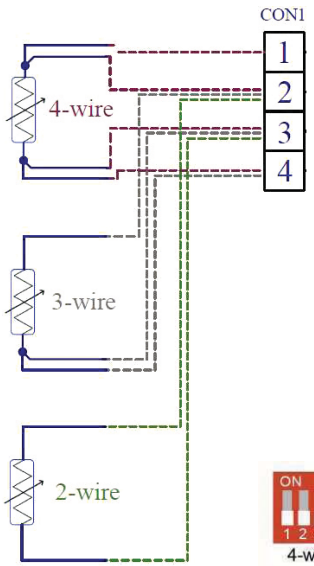
- RTD (Resistance Temperature Detector) Pt100, Pt1000, PT xxxx
- Thermocouple connection

Possible applications:

- Measurements of temperature in coil layers
- Measurements of temperature in water
- Measurements of temperature on motors or water pumps

Ex marking: I M1 Ex ia I Ma





DIP switch settings

TEVEL
SINCE 1990

KLV-230-PEx / RO-01

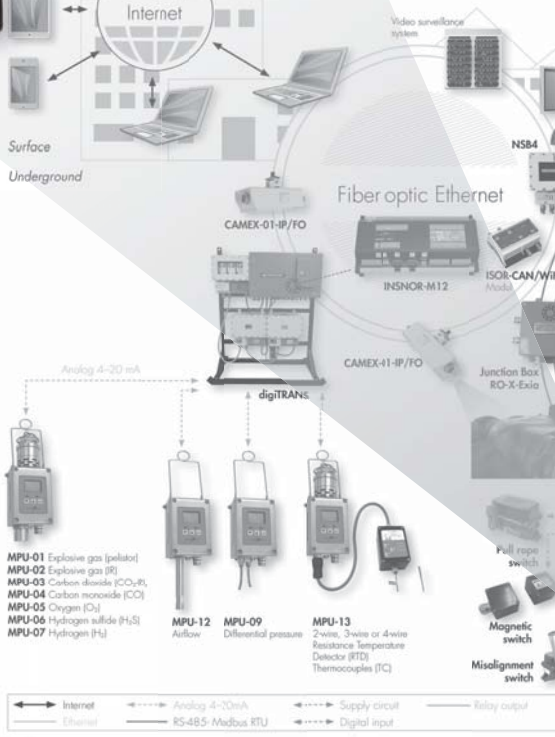
Control separation element
Line monitoring avalible

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

ATEX



PLV-230-PEx / RO-01

Data separation element
Line monitoring avalible

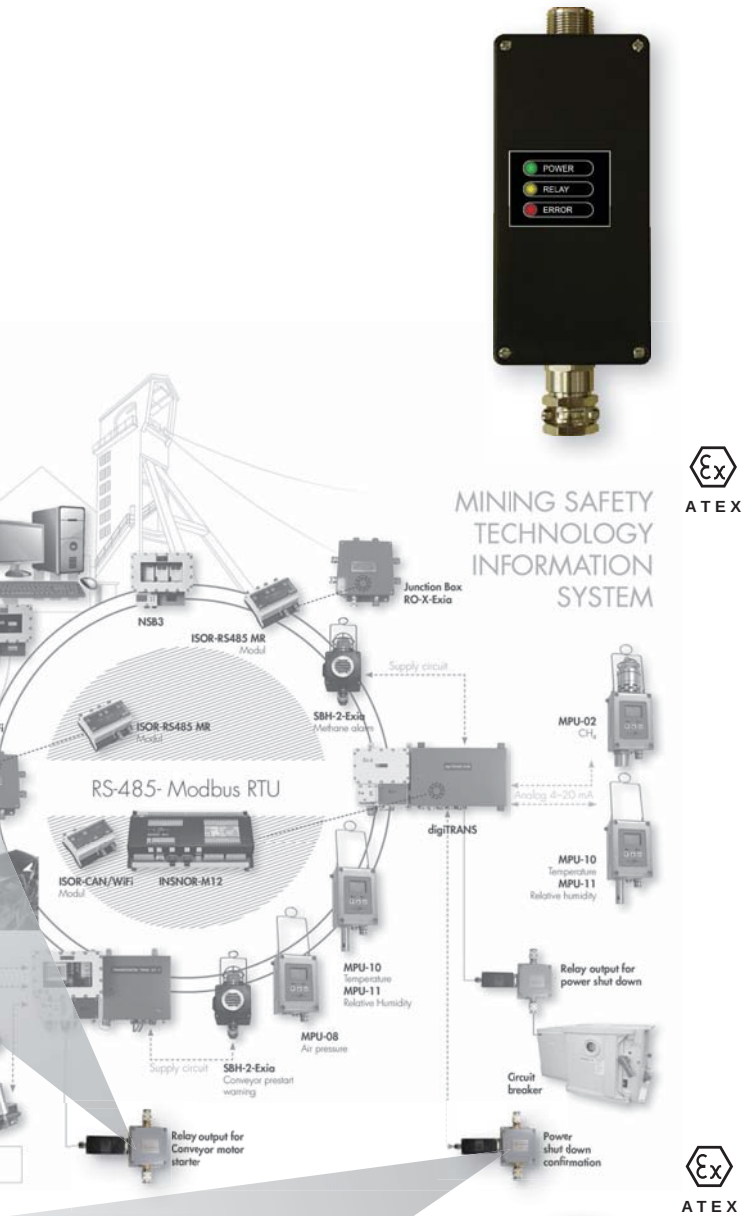
Status LED lights
Easy operation and maintenance
Reinforced polyester housing

Intrisically safe relay output

Power In:

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

ATEX



ATEX

KLV-230

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

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

Ex marking: I M2(M1) Ex mb [ia Ma] i Mb

ATEX

PLV-230

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

Status LED lights
Easy operation and maintenance
Reinforced polyester housing

Intrisically safe relay output

Power In:

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

Ex marking: I M2(M1) Ex mb [ia Ma] i Mb

TEVEL
SINCE 1990

SBH-2-Exia

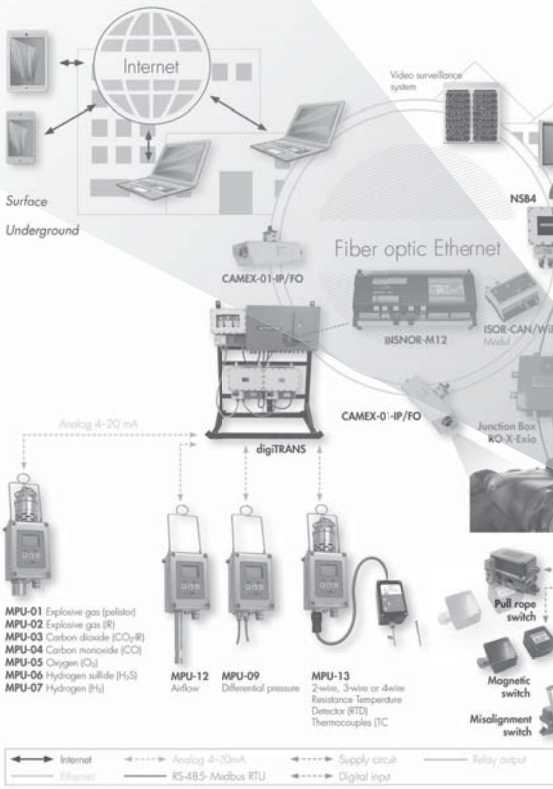
Signal flash Light with Alarm Horn
Intrisically safe device
Optional connection via connector
Optional test button

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.

ATEX

Ex marking: I M1 Ex ia I Ma



SB-X-Exia

Signal LED flashing light

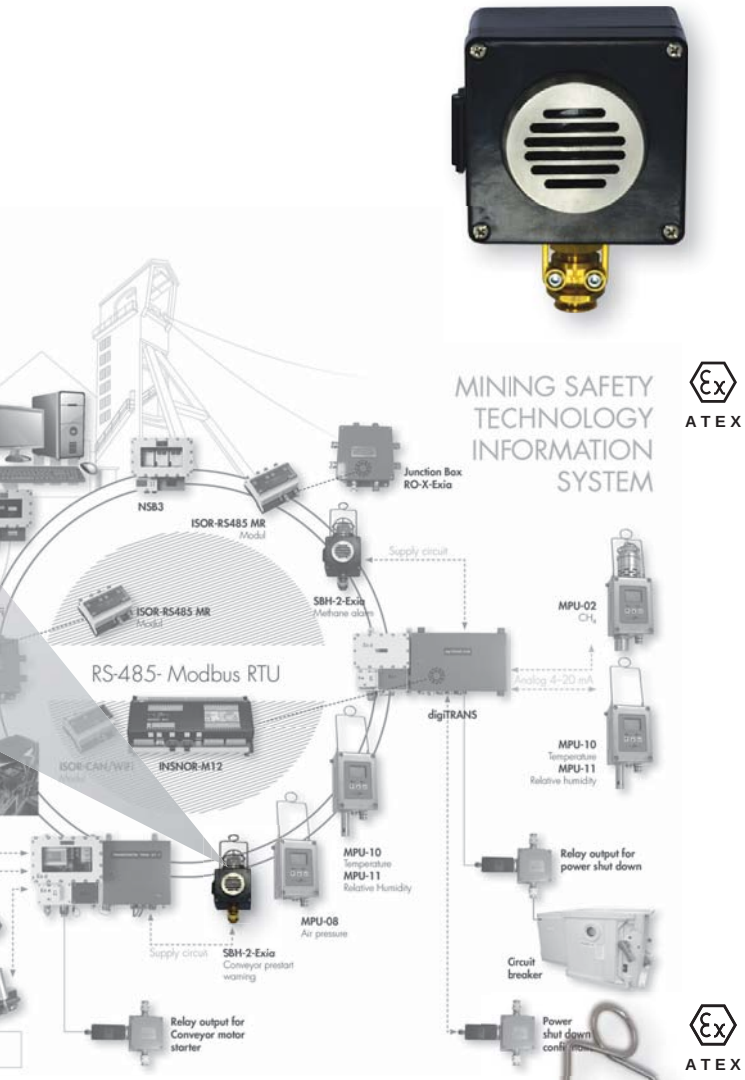
ATEX

Intrinsic safe signal horn type SH-1- Exia is intended for acoustic signalization of different alarm states or any other especial events. It is designed for use in applications of underground mines (M1).

Features

- IP 66
- Selectable 4 different modes of operation
- 5 different signaling colors
- Power supply: 9–16 VDC (cat. ia)
- Power consumption: max. 60 mA

Ex marking: I M1 Ex ia I Ma



SH-1-Exia

Signal horn

Intrinsic safe signal horn type SH-1-Exia is intended for acoustic signalization of different alarm states or any other especial events. It is designed for use in applications of underground mines (M1).

Features

- IP 66
- Selectable 4 different modes of operation
- TEST/MUTE key (Optional)
- Power supply: 9–16 VDC (cat. ia)
- Power consumption: 15–25 mA
- Acoustic signal: 92–100 dB

Ex marking: I M1 Ex ia I Ma

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

Ex marking: I M1 Ex ia I Ma

TEVEL
SINCE 1990

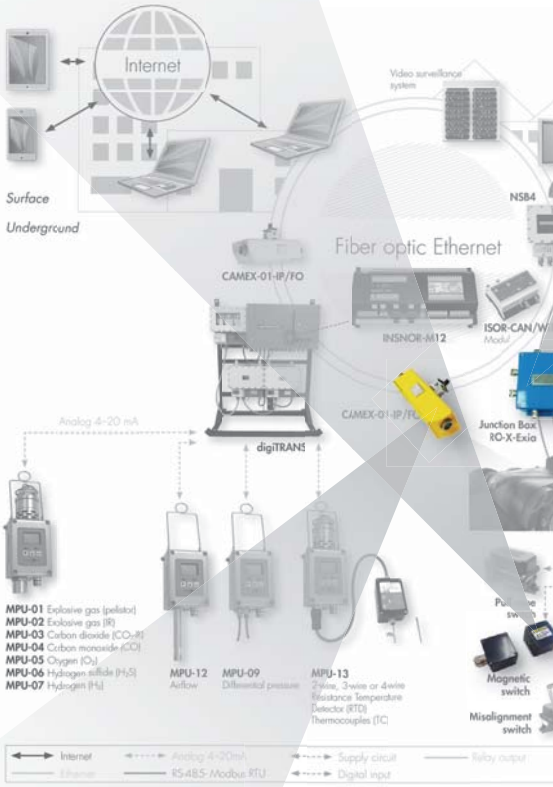
Magnetic switch

Fixed Magnetic switch
Changeover output
Intrisically 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: intrisically safe: max. 30 VDC/ 660 mA

CE



CAMEX-01-IP/FO

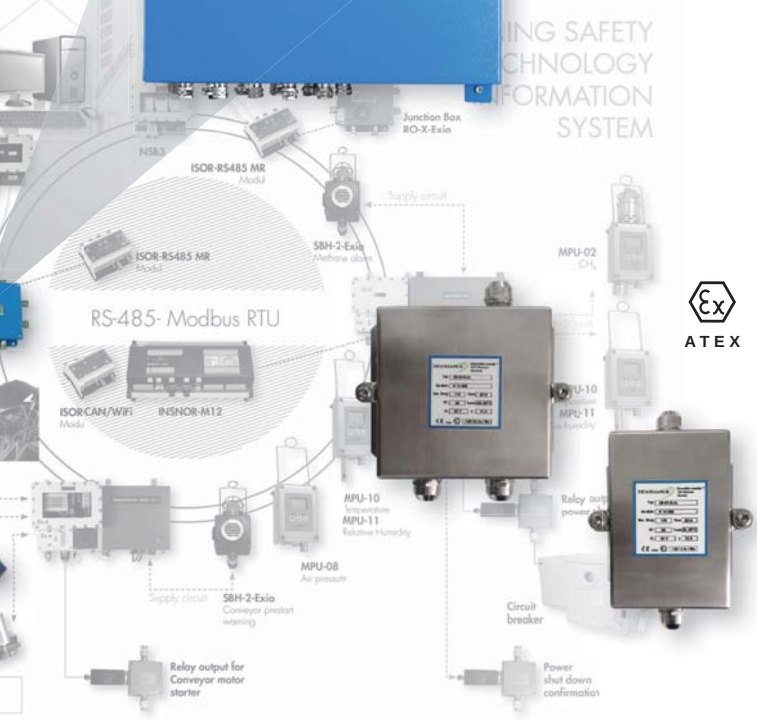
IP camera
Fiber optic connection (single mode, E2000 connection)
Main housing Ex d, Connection chamber Ex e, Signal output Ex op is

Easy operation and maintenance
Remote managing
Robust housing

Picture transmittion range > 15 km
Resolution: 2 MPixel
Supply voltage: 230 VAC, 50 Hz

Ex marking: I M2 Ex db eb [op is] IMb

ATEX



INSTALLATION COMPONENTS

Junction Box RO-x-Exia

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

Ex marking: I M1 Ex ia I Ma

Junction Box JB-0x-Exia

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

Ex marking: I M1 Ex ia I Ma

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

Ex marking: I M2 Ex eb I Mb

TEVEL SINCE 1990

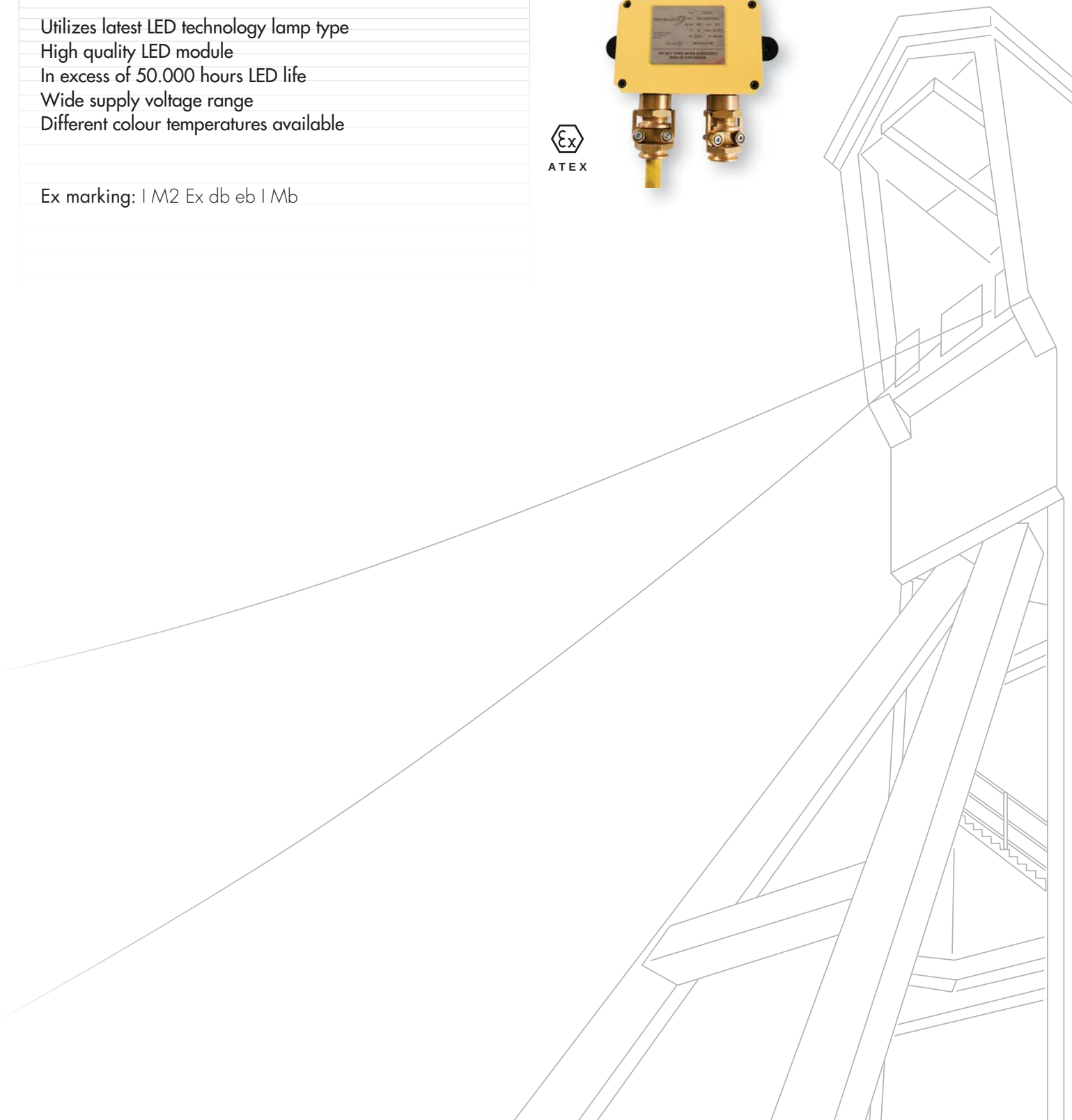
LIGHTING

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

ATEX

- 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

Ex marking: I M2 Ex db eb I Mb



A DEALER FOR THE EATON FHF MINING EQUIPMENT

EATON
Powering Business Worldwide"

FHF Bergbautechnik GmbH & Co. KG · Po. 14 01 66 · 45441 Mülheim a. d. Ruhr

TEVEL d.o.o.
Borovnisko naselje
7 SLO - 1412 Kisovec

Our Sign	Agent /Telephone -extention	Date
FHF-BT-Ja	Jach -363	14.06.2023

Dealer Certificate

Dear Sir or Madam,

we hereby confirm that

FHF Bergbautechnik GmbH & Co. KG
Gewerbeallee 15-19
45478 Mülheim an der Ruhr

authorizes

TEVEL d.o.o.
Borovnisko naselje
7 SLO - 1412 Kisovec

to distribute our explosion proof – safe products for underground mines on the territory of Slovenia, Serbia, Croatia, Bosnia Herzegovina, Turkey, Bulgaria

Yours sincerely,

FHF Bergbautechnik GmbH & Co. KG

Graham Ashley
Sales Director EMEA Systems – HAC & MTL
Global Energy infrastructure Solutions Eaton

Gewerbeallee 15-19 · 45478 Mülheim an der Ruhr · Tel: +49 208 8268-0 · Fax: +49 208 8268-364 · http://www.fhf-bt.de · e-mail: info@fhf-bt.de
Deutsche Bank AG Wuppertal · Konto-Nr.: 442 088 100 · BLZ: 330 700 90 · IBAN: DE54330700900442088100 · BIC: DEUTDEDW300
Kommanditgesellschaft · Sitz der Gesellschaft: Mülheim/Ruhr · Registergericht: Duisburg HRA 11894 · Ust.-Id.-Nr. DE 813 157 732 · WEEE-Reg.Nr. DE 41486022
Persönlich haftende Gesellschafterin · Funke + Huster GmbH, Mülheim an der Ruhr · Registergericht: Duisburg HRB 19901 · Geschäftsführer: Christian Fingler, Simon James Matthieson, Sven Teelds

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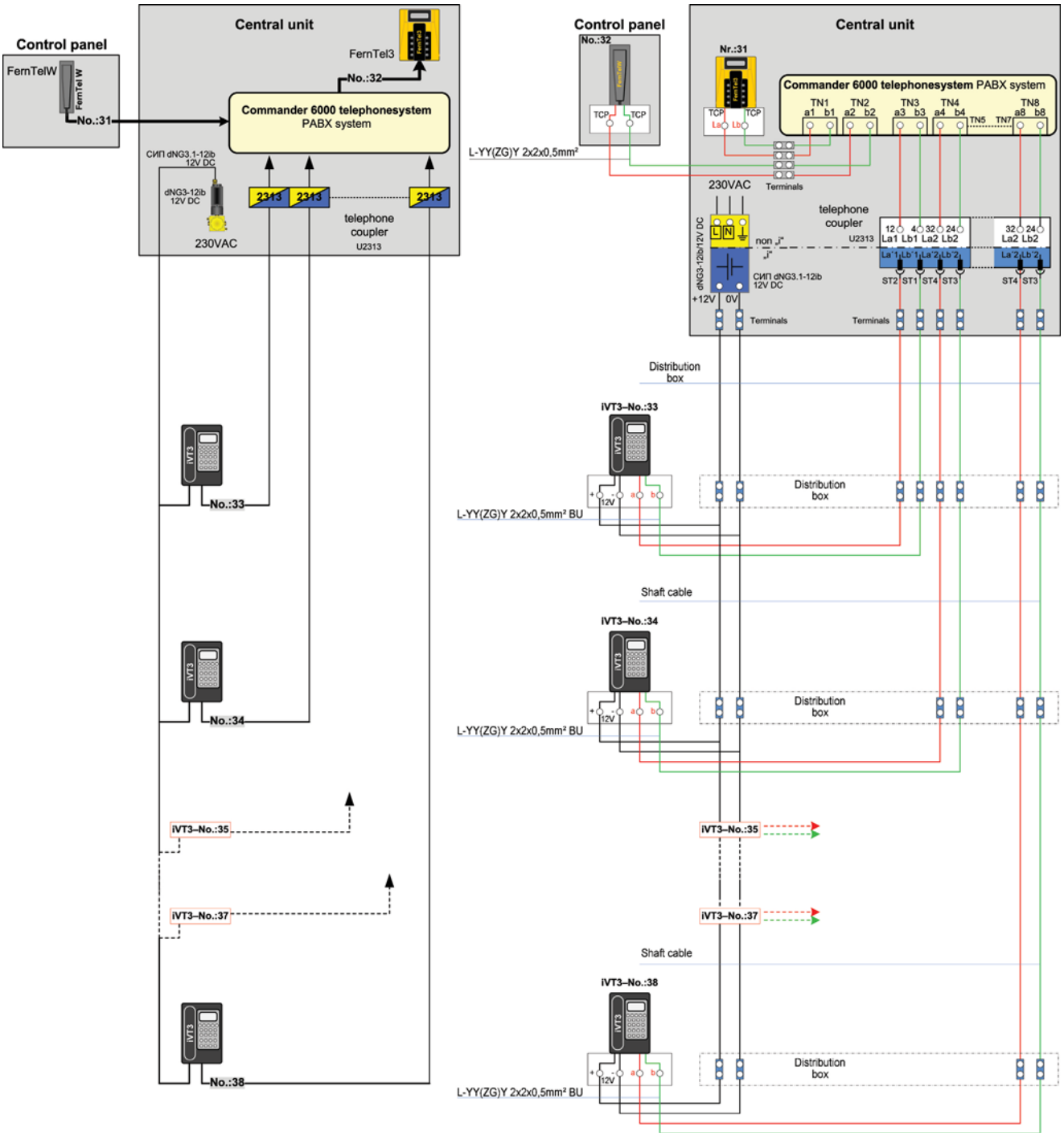
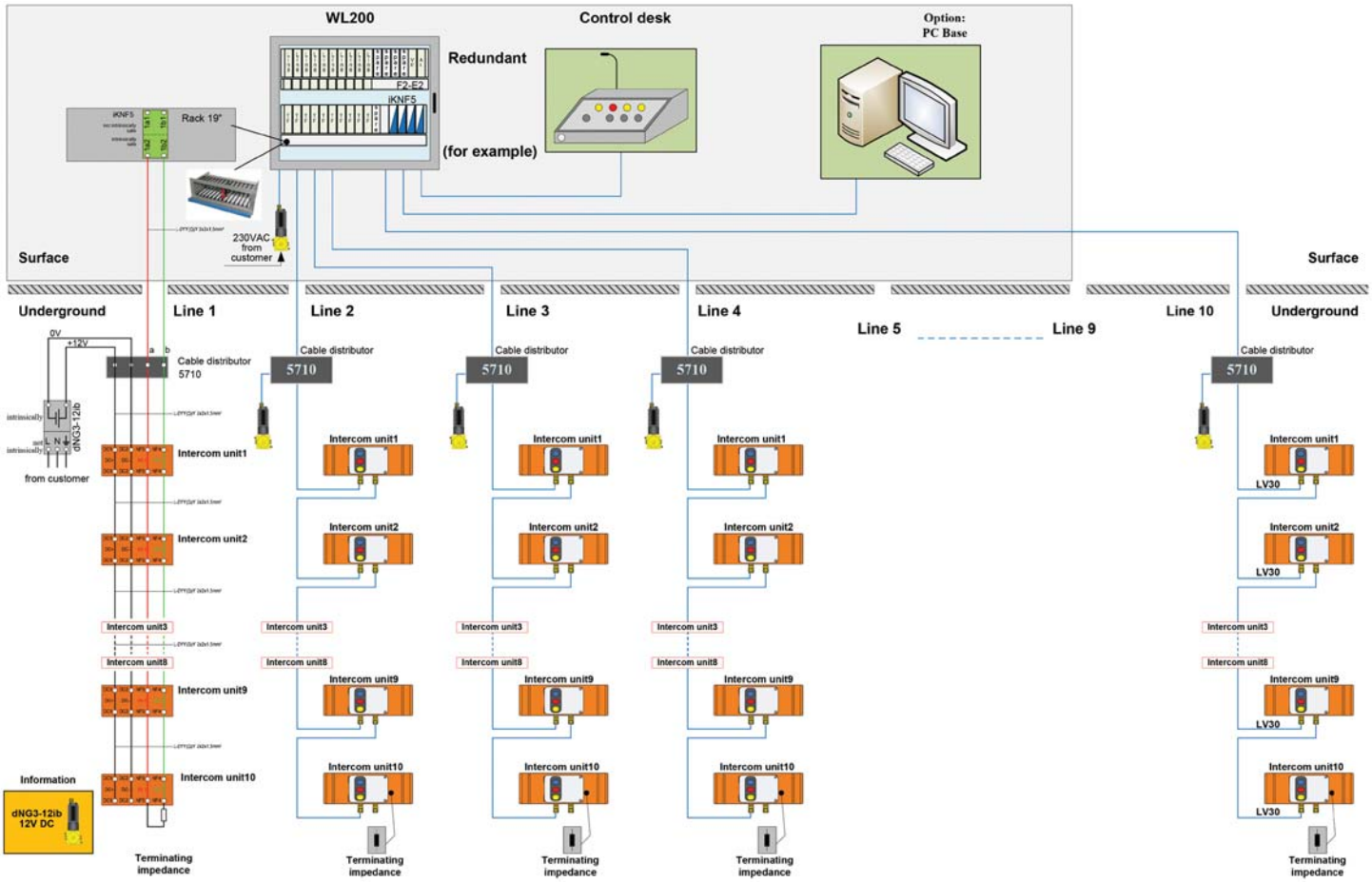
TELEPHONE SYSTEM



WL200 SYSTEM



Bulkhead light fitting 0403.24

Certificate:
FIDI 19 ATEX 0035X
EAC RU C-HR.HB07.B.00273/20

Apparatus category:
II 2GD I M2

Ex marking:
Ex db eb IIC T3-T2 Gb
Ex tb IIIC T130° Db
Ex d e I Mb

Fluorescent light fitting PSF

Certificate:
FIDI 19 ATEX 0025,EAC RU C-HR.HB07.B.00276/20
FIDI 19 ATEX 0007X (type PSF 218)

Apparatus category:
II 2GD
I M2 (type PSF 218)

Ex marking:
Ex db eb mb IIC T4 Gb
Ex tb IIIA/IIIC T80°C Db
Ex db eb mb I Mb

Control units SKX 12 ... SKX 15

Certificate:
FIDI 19 ATEX 0051X
EAC RU C-HR.HB07.B.00269/20

Apparatus category:
II 2GD
I M2

Ex marking:
Ex db eb ia/ib mb IIC T6 Gb
Ex tb IIIC T80°C Db
Ex db eb ia/ib mb I Mb

Distribution cabinets R3002 ... R3006

Certificate:
FIDI 19 ATEX 0058X ,
RU C-HR.HB07.B.00272/20

Apparatus category:
II 2(1)GD
I M2 (M1)

Ex marking:
Ex db eb [ib] [ia Ga] ia/ib IIC T6 Gb
Ex tb IIIC T80°C Db
Ex db eb [ib] [ia Ma] ia/ib I Mb

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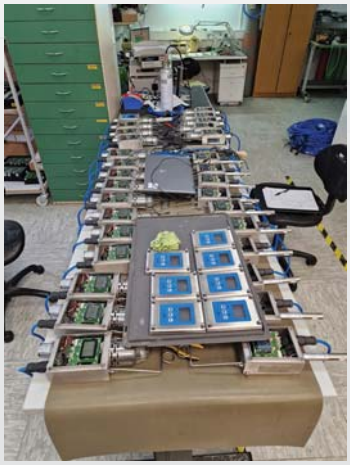
PRODUCTION

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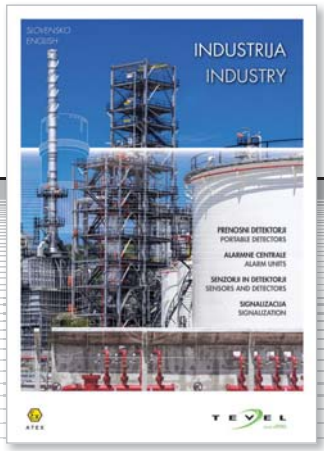

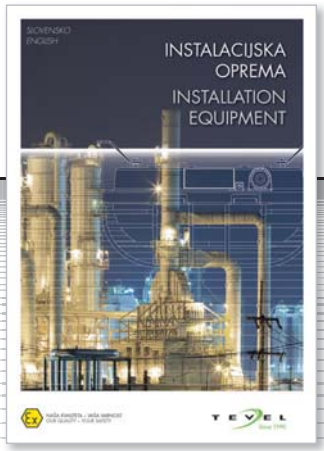

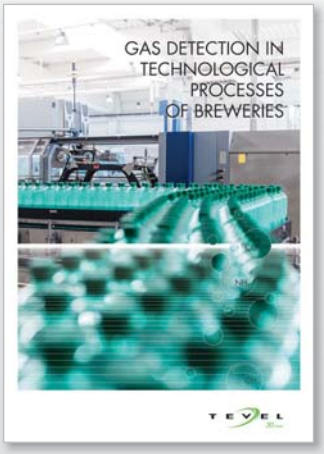

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