

zam servis

SYSTEMS AND SOLUTIONS FOR SAFE OPERATION OF MINES AND MANUFACTURING PLANTS

ZAM - SERVIS s.r.o., Kristanova 1116/14, Ostrava, Czech Republic
Prepared by: Jiri Sevcik, February 2025

Where we come from?

**ZAM – SERVIS, s.r.o.,
Kristanova 1116/14, Ostrava, Czech Republic,
EUROPE**



Who we are ?

Our possibilities

ZAM - SERVIS company is a producent electric and electronic equipments for all types of mines and manufacturing plants. We have a large development, manufacturing and service base to deliver to our customers a complete service from equipment development to meet specific customer requirements to serviceing equipments.

History and Guarantee of quality

ZAM - SERVIS company were established in 1994. We gives a guarantee of quality to our customers in the form of the ISO 9001 certificate 31 years already. We are growing together with our customers.

Introduction of the offered equipments

The main features of products ZAM - SERVIS are the ability to work safely in an environment where there is a risk of methane explosion, dust, humidity, their robustness and working reliability. All products have a certificate of an authorised testing laboratory and an approval of the Directorate General of the Czech Mining Authority in Prague according to European Directive ATEX No. 2014/34/EU. We deliver except of Czech Republic, to Russia, Poland, Ukraine, Turkey, Slovakia, Zimbabwe, India, Vietnam and Slovenija.

Production portfolio

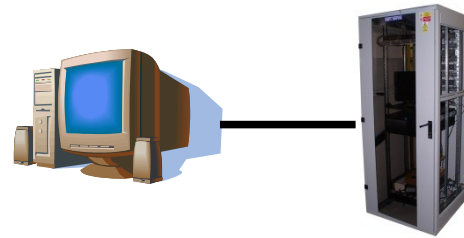
A) DPS11 transmission system

- Connection of air sensors
 - e.g. CH₄, O₂, CO, CO₂, H₂S, air velocity, temperature, humidity, pressure
- Collection of binary and analogue information
- Acoustic and visual signalling
- Connecting the components of system ISI (RFID technology)
- Reporting in SW SCADA
- Connection to LAN network
- ATEX certification for underground coal mines
- all equipments „ia“ or flameproof design

Structure of the DPS11 system – backbone components

- **Surface part**

- Switchboard RM1-DPS11 rack
- Operator workplace
- Connection to LAN network

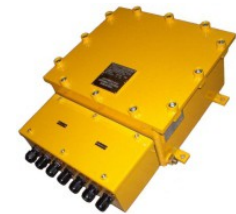


- **Transmission path**

- Metallic cable
- Optical cable

- **Underground part**

- DKD11, DKD11-IO data concentrators
- SME-02 source of intrinsically safe voltage



Production portfolio

B1) Identification ISI system (wireless technology)

- Operated on the basis on the wireless RFID technology (868 MHz)
- Identification and localization of materials
- Identification and localization of persons
- Monitoring of the number of persons in a specific area
- Control of access of authorized persons to a specific area
- Identification and localization of persons and/or materials on a conveyor belt
- Identification and localization of persons in a cave-in after an accident
- Identification and localization of mining machinery, e.g. locomotives
- Determination of the position of the mining excavator (combined cutter loaders)
- Voice communication
- SMS messaging
- Reliable functionality of the system in underground and surface too

Block diagram of the DPS11 + ISI system

Surface section consists of the following main devices:
Rm1 RACK, PC servers, switch, modems (MOXA/PKD11-M) and UPS

Underground section consists of the following main devices:
DKD11-IO mine data concentrator main
SME-02 intrinsically safe power source with backup battery

Devices designed for identification of people and material in the mine are:
EPB-01 RFID reader to detect personnel moving near a conveyor belt
RFK-02 RFID reader on cable with integrated RFID reader
TAG-ZAM-xx RFID identifier, placed in mining lamp on container
TE-01 radio station for machines
TE-02 barcode reader

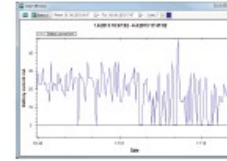
Devices designed for measuring of atmosphere in the mine are:
SC-UAN-01 stationary anemometer
SC-IR-CH4 stationary detector of methane with IR sensor
SC-IR-CO2 stationary detector of carbon dioxide with IR sensor
SC-TOX stationary detector of toxic gases
SC-CH4 stationary detector of methane

Devices designed for signaling in the mine are:
HOUK-SC horn with beacon
OS-4-6 signaling lights

Application:
- Transfer of digital and analog data
- Wireless video communication
- Remote control and monitoring of mine technology
- Monitoring of air condition in mine atmosphere
- Identification of personnel/machinery in the mine
- Management of transporting technology parts and materials in and out of the mine
- Detecting personnel in the dangerous places around the machines (conveyors, drilling machines etc.)

SCADA
VISUALIZATION

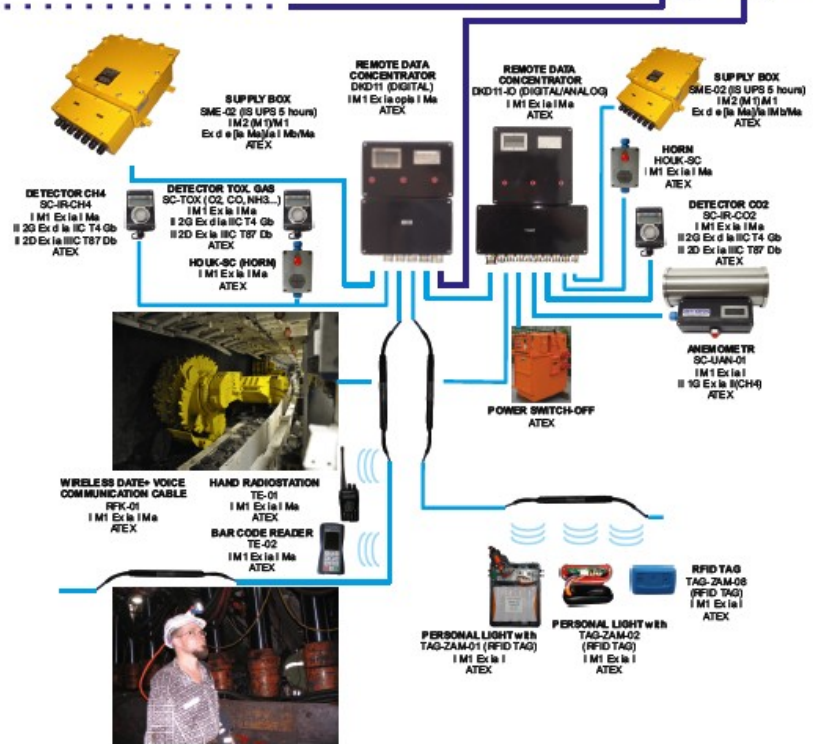
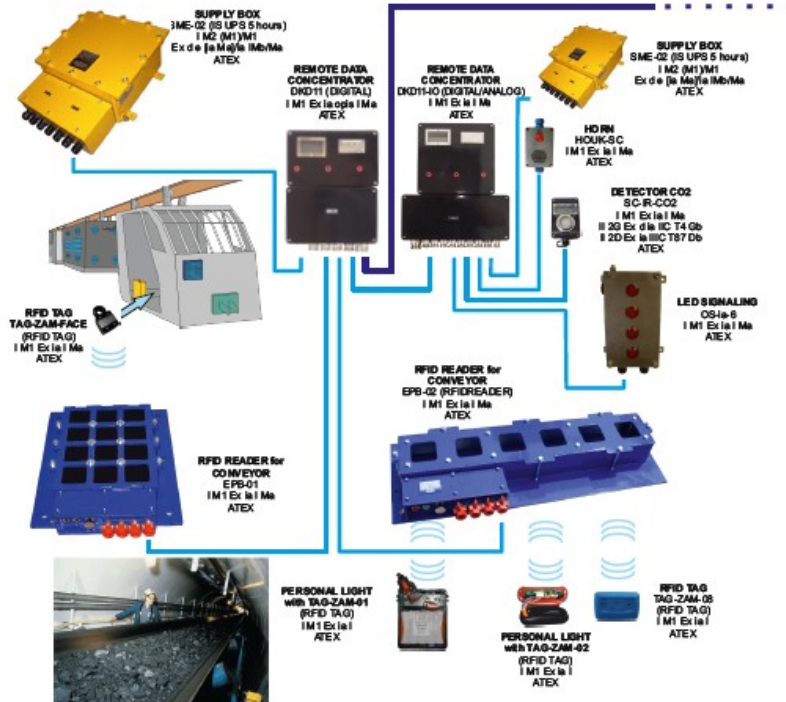
FW CIS



DISTRIBUTION BOX
RM1 (UPS, RACK, SERVERS, SWITCH, MODEM)



INPUT MODEMS
MOXA/PKD11-M (MODEM)
I (M) Ex ia I Ma
ATEX

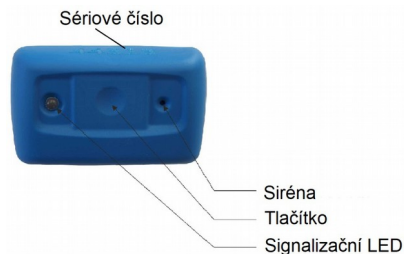


Production portfolio

B2) Identification ISI-P system (wireless technology)

- Zone localization system based on the principle of measuring and comparing radio signal strength (RFID 868 MHz)
- It is used to identify people and determine their location.
- The system consists of distributed reading points (Gateway), which constantly receive the signal from the identification tags.
- The ISI-P Tag is the personnel unit of the system that communicates with the Gateway.
- Based on the strength of the received signal from each Gateway, it is possible to determine where the tag is located.
- The ISI-P system enables the transfer of basic data and has the possibility of an alarm (eg when a person falls to the floor).
- The ISI-P Gateway communicates with the Tags, and sends the acquired signal information to the data concentrator.
- It can also be made for areas with potentially explosive atmospheres.

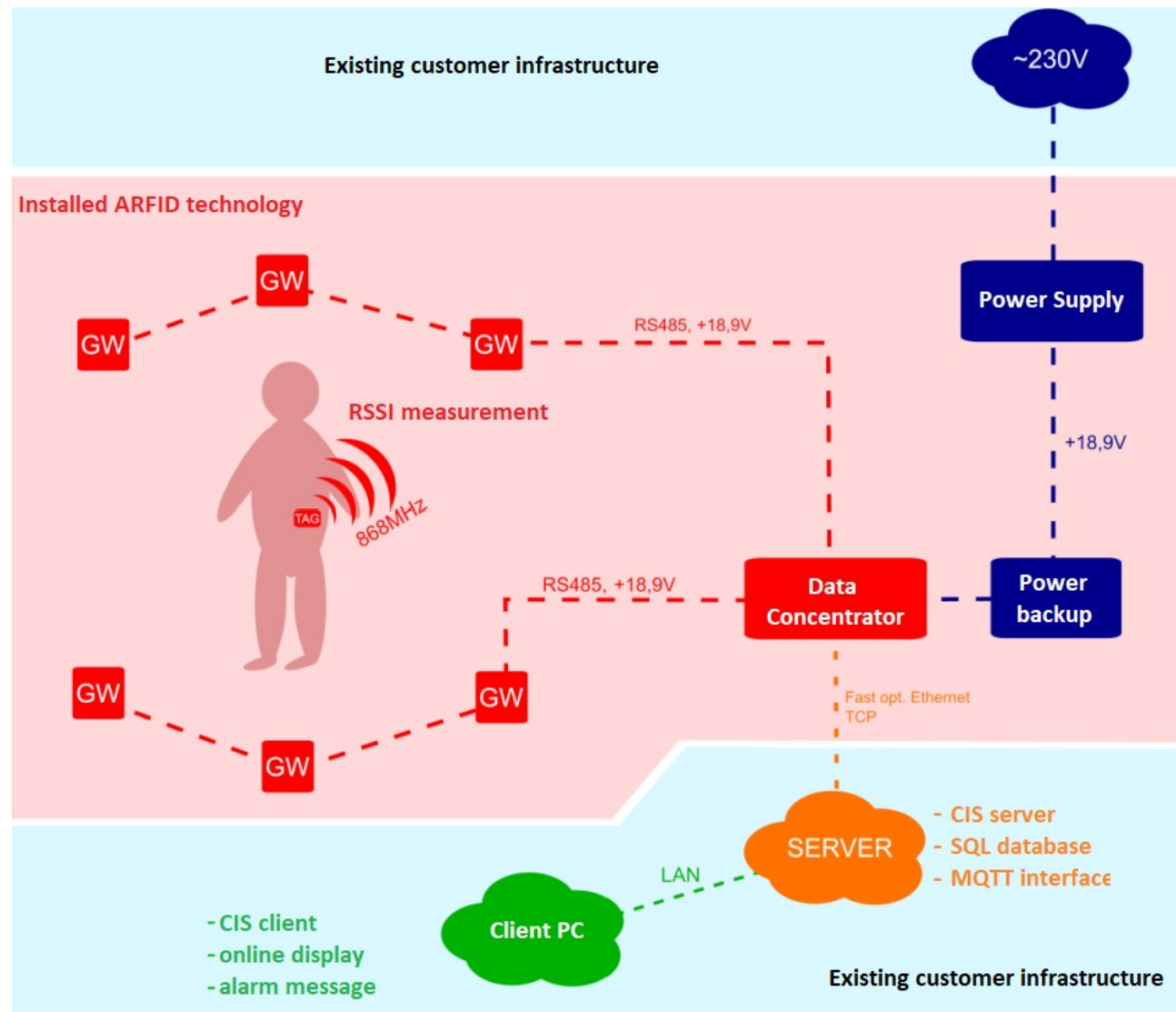
ISI-P Tag



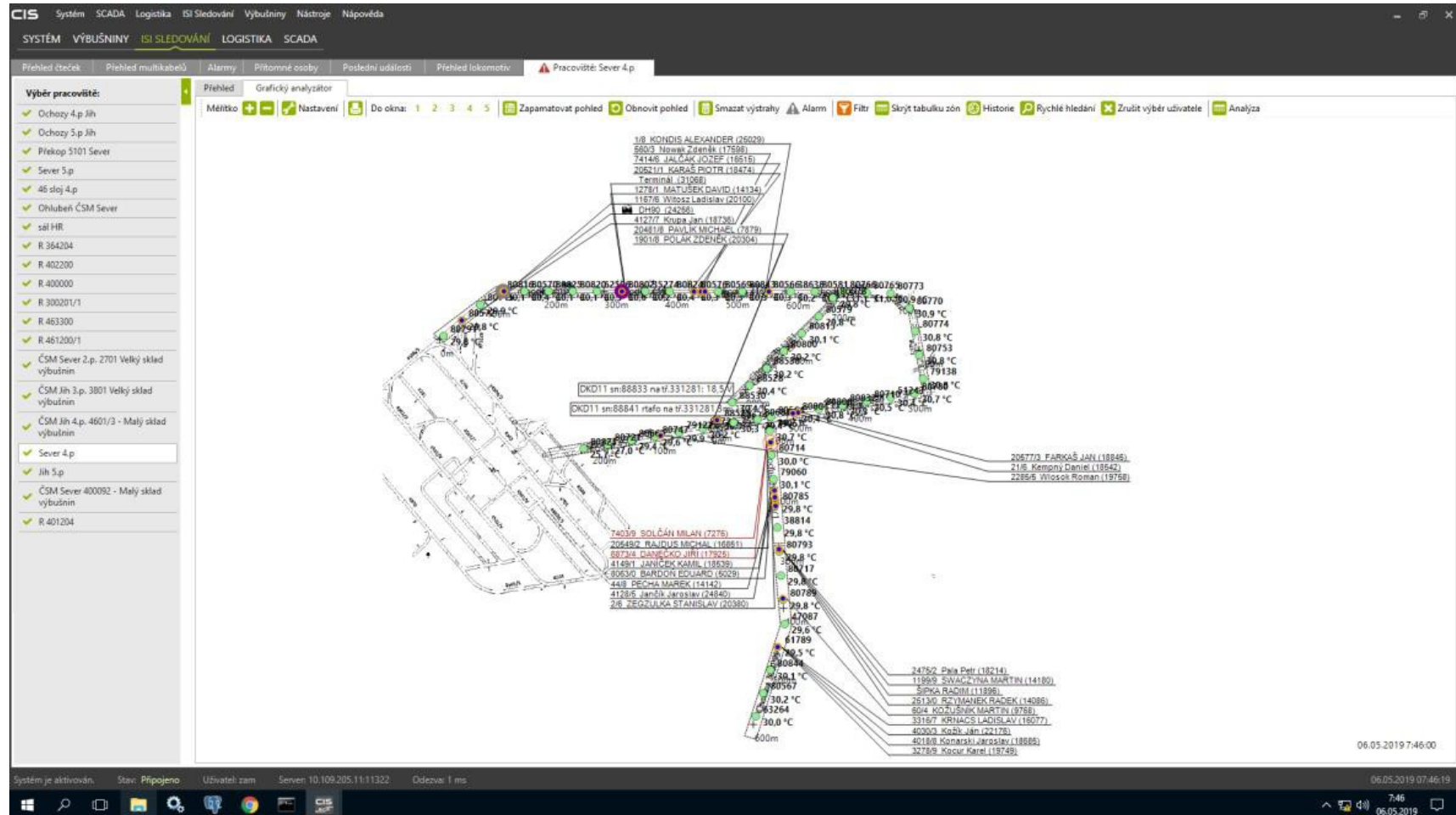
ISI-P Gateway



Block diagram of the ISI-P system



Monitoring of the number of persons in a specific area, access control of authorized persons to a specific area



Production portfolio

C) Anti - collision RFID system ISI-V in underground gas-explosive mines, on surface heavy and explosive areas

Operated on the basis on the wireless RFID technology (868 MHz)

- ✓ A system designed to detect and warn people in areas where their lives or health could be endangered
- ✓ It helps to increase the safety of workers in hazardous operations, such as construction sites
- ✓ It creates two levels of safety zones around a machine, vehicle or other technology
- ✓ It alerts the worker and the machine operator to the crossing of the zone boundary and the entry into the danger area by a sound, light and vibration signal
- ✓ The standard reaction time of the system is 1 second with 10 machines and 20 workers in one area
- ✓ Distance measurement accuracy is better than 1 meter



Production portfolio

ISI-V: Reader and ISI-V: TAG Personal Unit

- ✓ ISI-V Reader is a device that defines the dangerous area in the vicinity.
- ✓ ISI-V Reader can be installed temporarily without invasive interventions in the technology.
- ✓ ISI-V TAG is a personnel unit of the system that communicates with the reader via radio signals.
- ✓ ISI-V Tag is designed to be worn on a helmet or shoulder and alerts the wearer to enter a hazardous area.

ISI-V TAG



ISI-V Reader



Production portfolio

D) Video and Communication equipments in underground gas-explosive mines, on surface heavy and explosive areas

KS-03 Camera System



TIG, PST Telephones, VOIP



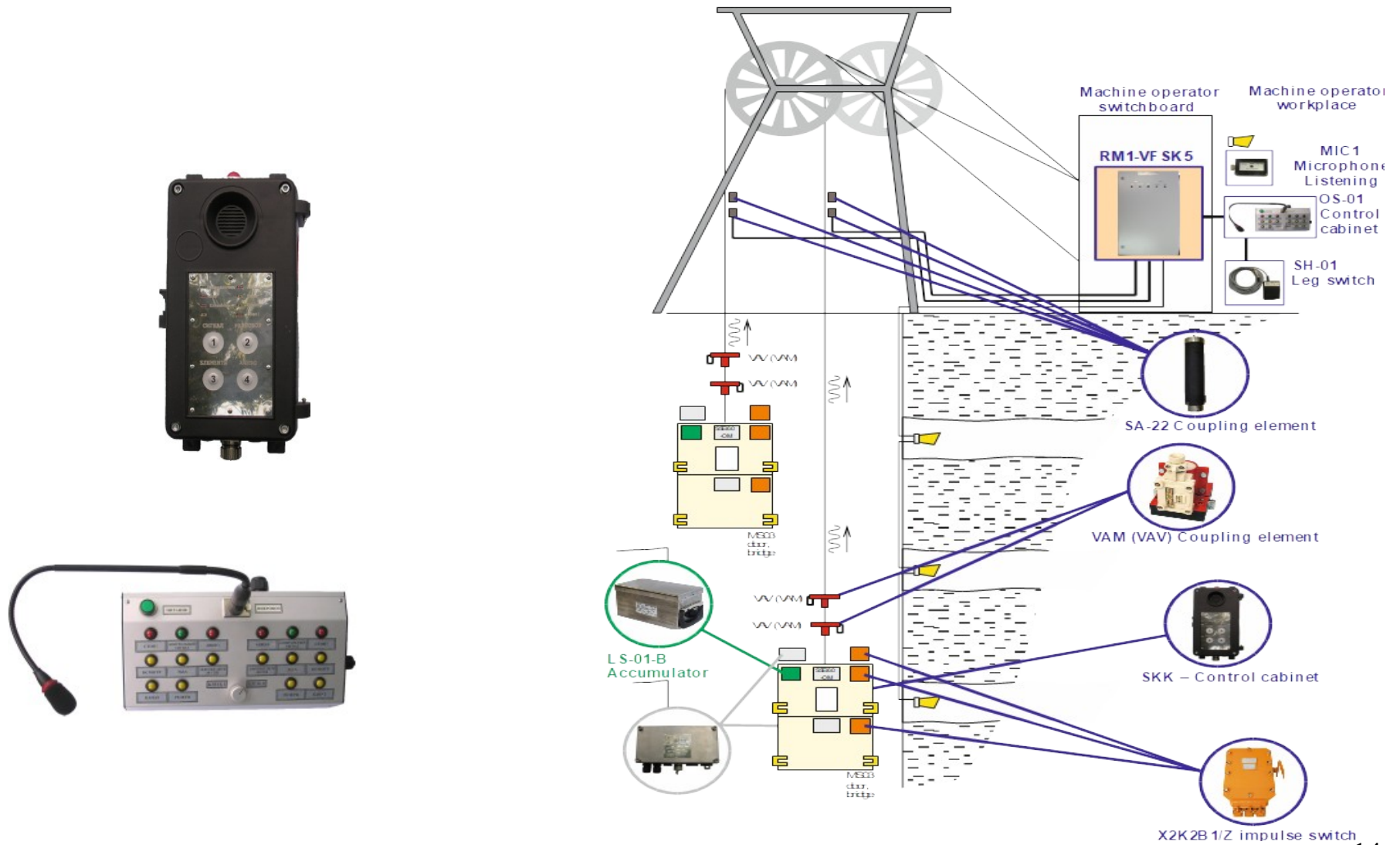
LELAS Communication System



Systems and solutions

Production portfolio

E) VFSK 5 Signaling and Communication Device in mine shaft



Production portfolio

F) Optical net equipments in underground gas-explosive mines, on surface heavy and explosive areas

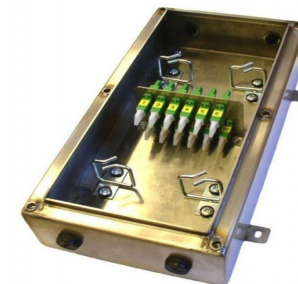
DOR-01 Data Optical Cabinet



DOR-02-X Data Optical Converter

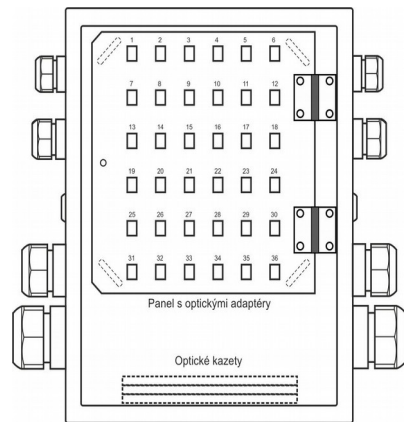


POK-01-C Preconnected Optical Cable **POK-01-BS Preconnected Optical Cable Connecting Cabinet for 12 pigtailed**



Production portfolio

**POK-01-BM Fiber Optic Cabinet
for 36 pigtails**



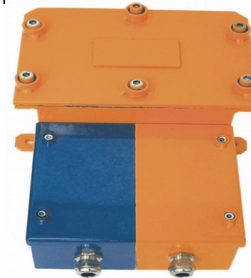
**POK-01-BM Fiber Optic Cabinet
for 72 pigtails**



Production portfolio

G) Measurement in underground gas-explosive mines

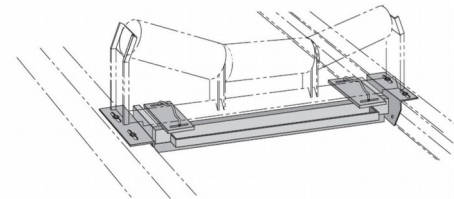
JBP-BOS, BOS-21 Point resistance level meter



RSH-02 The kit of the level radar detector



KPV – 02 Conveyor scale



Production portfolio

H) Switching equipments in underground gas-explosive mines

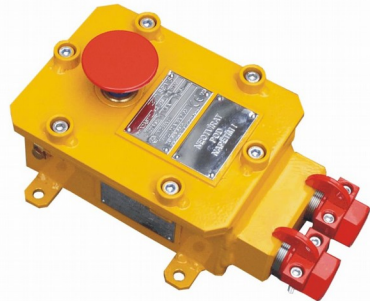
NRS 5 Non-explosive Contactor System



**Rotary Switches SDO-02
Double Pole / Triple Pole**



X2AST/Z Emergency Stop Pushbutton

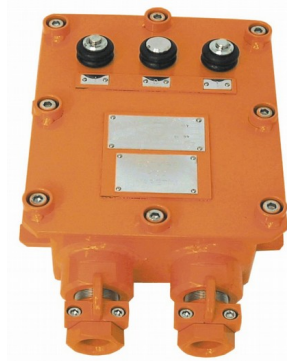


**SDO-02 Non-explosive Double
Pushbutton Control Cabinet
with LED Signalisation**



Production portfolio

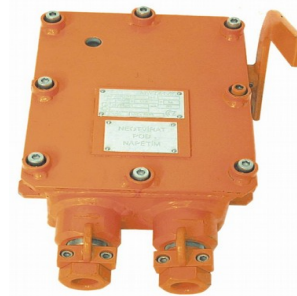
SDO-02 Non-explosive Triple Pushbutton Control Cabinet



OS-ia-2, OS-ia-3 Pushbutton Case with the maximum of 8 Pushbuttons and Rotary Controls



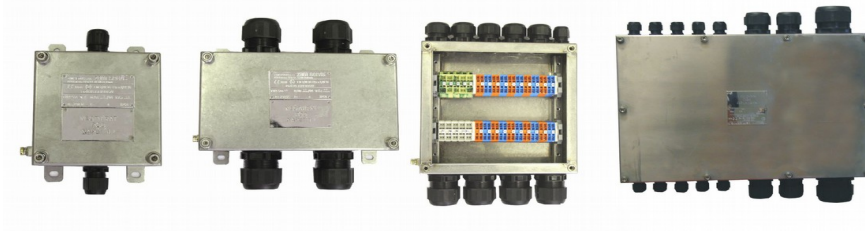
SDO-02 End Lever Switch



Production portfolio

I) Connection Boxes in underground gas-explosive mines and surface explosive areas

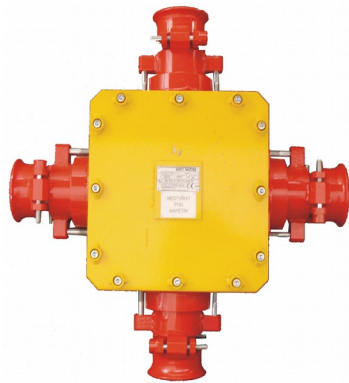
✓ SSEi 10, 30, 60, 280 – Secured Terminal Block Cabinets



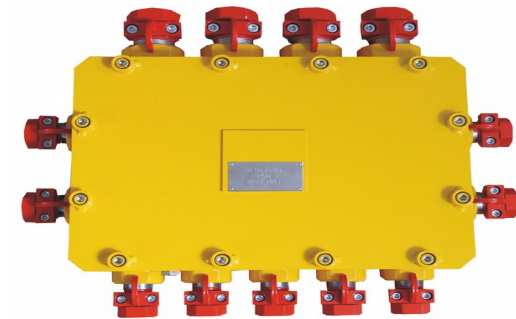
✓ X1D3F1/Z2 – Terminal Block Cabinets



✓ X1D3T1/Z – Terminal Block Cabinet



✓ XD 60 – Terminal Block Cabinet with the Maximum of 60 Terminals 500 V / 25 A / AC



Production portfolio

J) Signaling equipments in underground gas-explosive mines

HOUK Intrinsically Safe Horn



HOUK – SC Horn for Potentially Explosive Atmospheres



NHD-02 Mine Horn



FL-01 Intrinsically Safe Beacon (flash)



Production portfolio

K) Emergency switches of conveyor in underground gas-explosive mines, surface mines and power plants

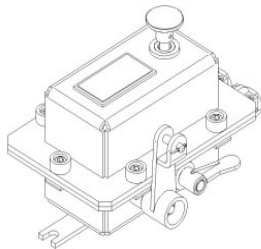
LHPE conveyor stop switch



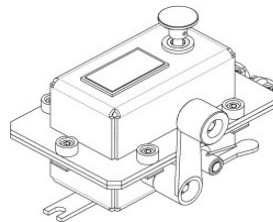
LHPE conveyor stop switch



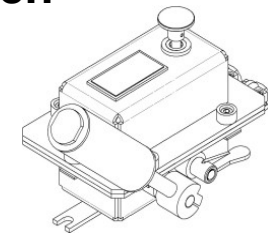
NS-01 conveyor non-explosive stop switch



Cable switch NS-01-L



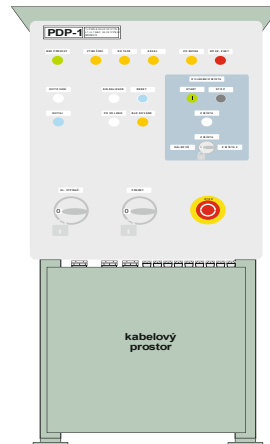
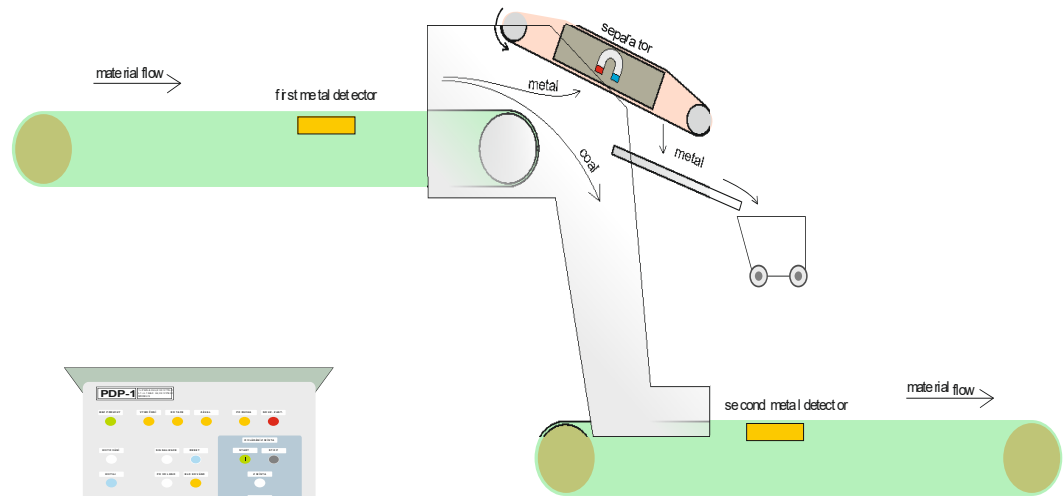
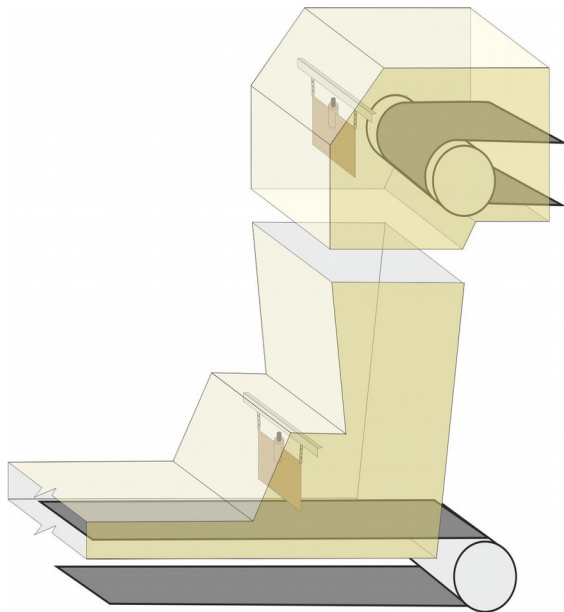
Lever end switch NS-01-K



Swing-away switch NS-01-V

Production portfolio

L) Automation, safety devices, metal detector and separator of conveyor in surface mines and power plants



zam servis

**Thank you very much for your
attention !!!**

ZAM - SERVIS s.r.o., Kristanova 1116/14, 702 00 Ostrava - Privoz, Czech Republic

For others, please see our web sites: www.zam.cz or call us: +420/ 556 685 111 or send e-mail:
zam@zam.cz