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ISI - Information system for identification of the mine

Application

The Information System for Identification (ISI system) is used to identify and locate people, equipment or material in the mine. The ISI system is based on RFID technology (868 MHz) and consists of two parts, comprising several devices. It involves the SME-ISI communications cabinet, A71-02 equipment with RFID reader, RM1-ISI-P surface switchboard, OS-ia-6 signaling device and TAG-ZAM-xx (transmitter) identification device, located for example in a mining lamp. The ISI system includes a computer designed for processing, evaluating and visualizing information from A71-02 readers. The PC is installed with software designed specifically for the ISI system, which can be modified according to need.

Two readers form a gate that defines the boundaries of the monitored area and can distinguish the direction of movement in the area. If the reader detects the presence of a TAG, the information is sent to the SME-ISI, which then conveys it via a modem to the PC. The software then evaluates the received data and can also control the relay located in the SME-ISI. The A71-02 readers are built in 1 M1 Ex ia 1 Ma, meaning they can work in an area with the permanent presence of methane. The SME-ISI communications cabinet is built in I M2(M1) Ex de [ia Ma] I Mb.

Description

The ISI system is divided into two parts, mine and surface, see the block diagram of the ISI system. The mine part consists of:

● SME-ISI communications cabinet. The device is composed of Ex d space instrumentation and Ex e space terminals. It provides power and communications with the A71-02 and connection with the surface part of the system.

● Equipment A71-02. The device is equipped with an RFID tag reader and an Ex ia source with Ex ia battery to power the reader. The maximum distance of the TAG-ZAM-xx and the A71-02 equipment providing the wireless communication is 50 meters under ideal conditions.

● Equipment OS-ia-6. The device is used to provide an optical alarm, such as prohibiting entrance, and can only be connected to intrinsically safe circuits.

● TAG-ZAM-xx device. This device is an active RFID element that communicates with the A71-02 at a frequency of approximately 868 MHz. To identify and locate people in the mine, the TAG-ZAM-xx is installed in mine lamps. However, it can also be put in other devices, tools, vehicles, containers, etc.

The surface part consists of:

● RM1-ISI-P equipment. The RM1-ISI-P switchboard comes in a cabinet (option 1) or in a steel rack design (option 2). Option 1 is the version that contains the communications and power elements, as well as a server in the RACK 19" design. Option 2 contains communications and power elements. The server consists of a desktop PC located outside the switchboard.

● Client PC. It is installed with software for processing and visualizing information from mining equipment.

ISI system equipment

● A71-02 reader

● TAG-ZAM-01 and TAG-ZAM-02 devices

● SME-ISI communications cabinet

● OS-ia-6 signalization

The catalogue has only those selected important parameters for your final decision. For project designs always ask for the user's guide for this product and any engineering consultation about possible uses.

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Specifications of SME-ISI-P:

Design	Normal area
Voltage	Max. 264VAC/50Hz/TN-S
Operating voltage	Max. 24VDC/SELV
Option	1 (2)
Power	800VA (500VA)
Case	IP30 (IP54)
Dimensions	1000 x 800 x 2200mm (order)
Weight	100kg (30kg)
Ambient temperature	-20°C to +40°C
Relative humidity	95% max. without condensation
ZD 130-01 source	
Input voltage	120VDC/SELV
Output voltage	1A

Specifications of OS-ia-6:

Design	I M1 Ex ia I Ma
Voltage	Max. 30VDC
Current	Max. 150mA
Power	0.175W
Ambient temperature	-20°C to +40°C
Relative humidity	95% max. without condensation
Case	IP 65
Dimensions	119 x 83 x 40mm
Weight	2kg

Specifications of TAG-ZAM-xx:

Design	I M1 Ex ia I Ma
Voltage	Max. 8VDC
Current	Max. 30mA
Power	240mW
Ambient temperature	0°C to +40°C
Relative humidity	95% max. without condensation
Casing for locating in mine lamp	IP 67
Dimensions	95 x 25 x 10mm
Weight	0.01kg

Specifications of A71-02:

Design	I M1 Ex ia I Ma
Voltage	Max. 19VDC
Current	Max. 170mA
Power	Max. 2.4W
Battery lifetime	2 years
Battery design	I M1 Ex ia I Ma
Battery capacity	2200mAh
Battery voltage	Max. 8.4V
Ambient temperature	-20°C to +40°C
Relative humidity	95% max. without condensation
Case	IP 65
Dimensions	196 x 260 x 91mm
Weight	3.3kg

ISI block diagram – Surface
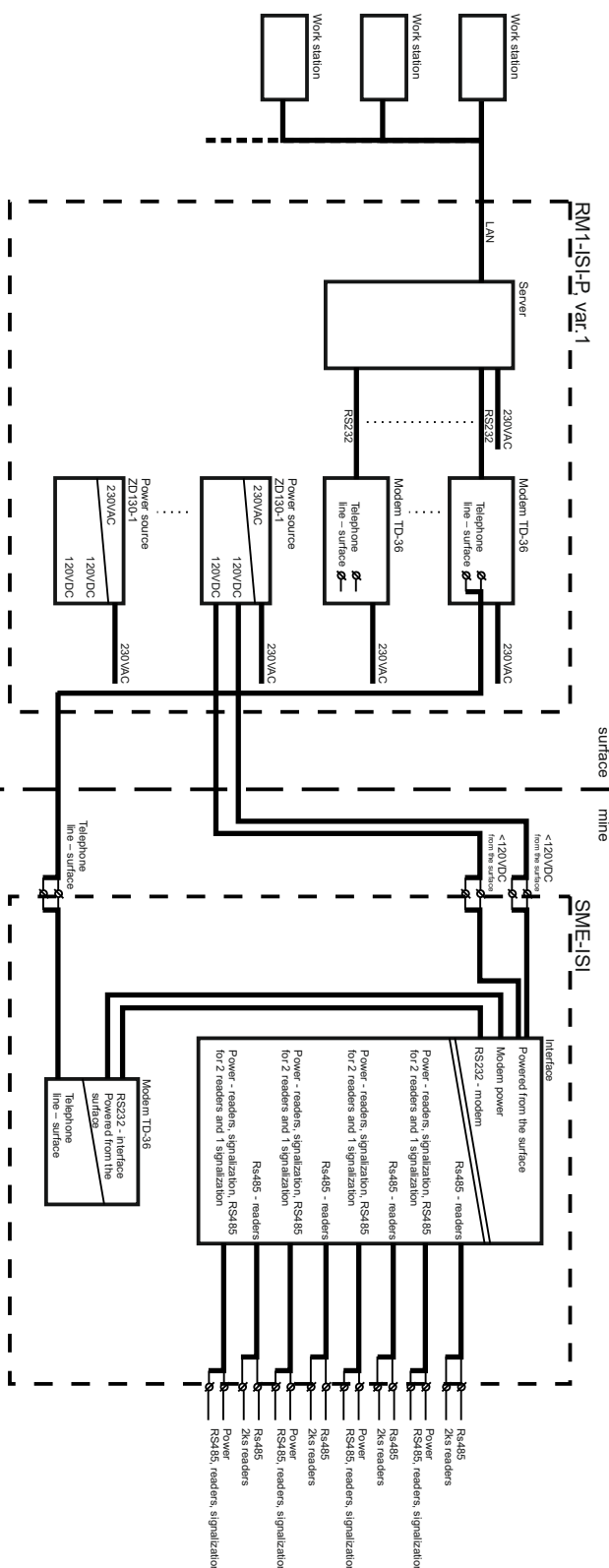
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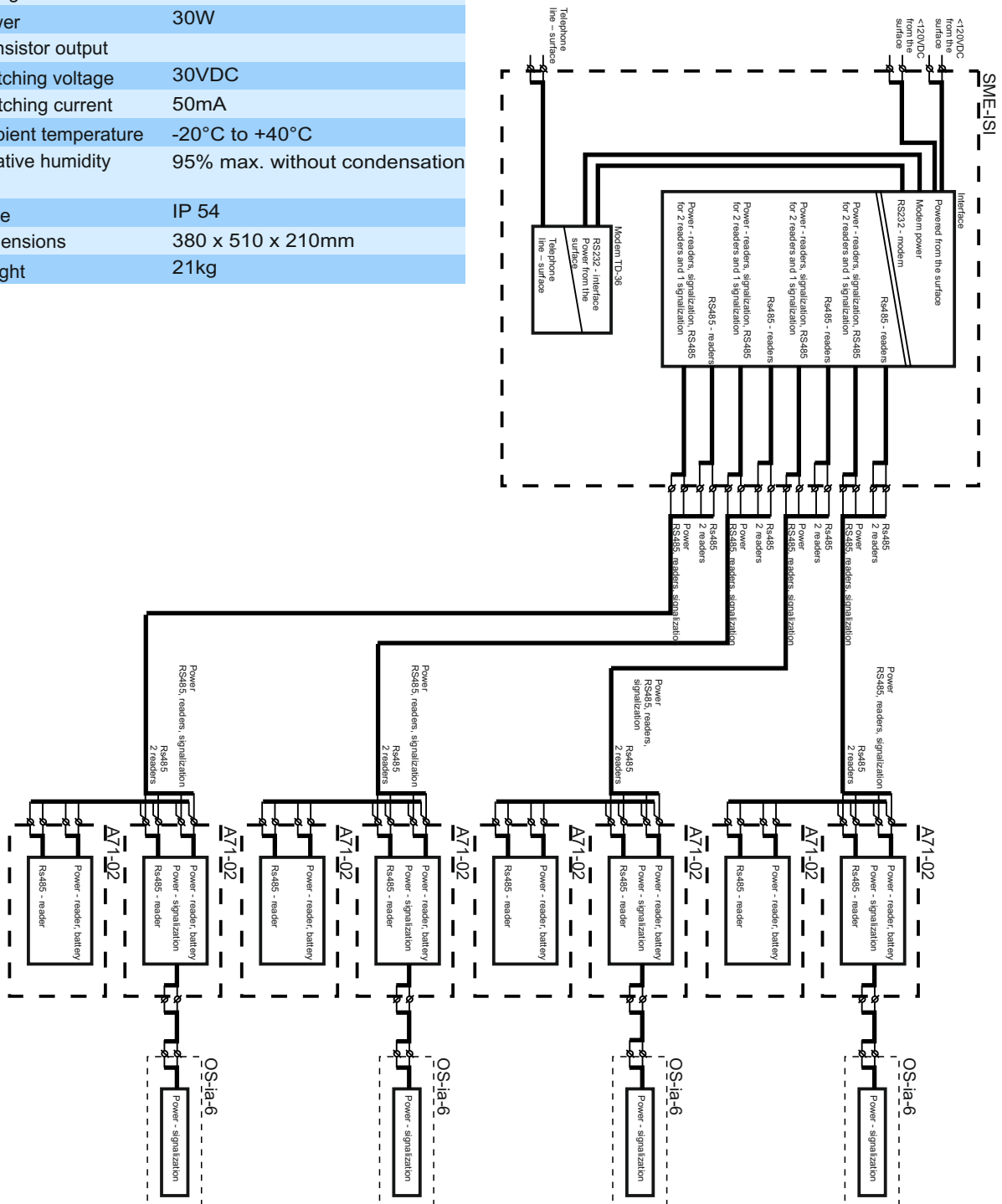
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Specifications of SME-ISI:

Design	I M2(M1) Ex de [Ex ia Ma] I Mb
Voltage	Max. 120VDC/SELV
Power	30W
Transistor output	
Switching voltage	30VDC
Switching current	50mA
Ambient temperature	-20°C to +40°C
Relative humidity	95% max. without condensation
Case	IP 54
Dimensions	380 x 510 x 210mm
Weight	21kg

ISI block diagram - Mine

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