



User Manual



Control Unit Module

MOD SEP 2

Product code: PW-079-A



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Remarks and reservations

-  Connection and operation of the device is allowed only after reading and understanding the contents of this document. Keep User's Manual with the device for future use.
-  The manufacturer bears no responsibility for errors, damages and failures caused by improper selection of devices and cables, improper installation or failure to understand the contents of this document.
-  Unauthorised repairs and modifications of the device are not allowed. The manufacturer bears no responsibility for the results of such interventions.
-  Excessive mechanical, electrical or environmental exposure may result in damage to the device.
-  Use of damaged or incomplete devices is not allowed.

The design of the Gas Safety System for a protected facility may involve other requirements throughout all stages of the product life.

How to use this manual?

-  The following symbols of optical indicators status are used throughout the document:






| Symbol | Interpretation |
|---|--|
|  | Optical indicator on |
|  | Optical indicator flashing |
|  | Optical indicator off |
|  | Optical indicator status not determined (depends on other factors) |

Table 1: Optical indicators status notation

-  Important parts of the text are marked as follows:



Pay special attention to information given in these fields.


-  User's Manual consists of main text and appendices. Appendices are independent documents and can exist without User's Manual. Appendices have their own page numbering independent of User's Manual page numbering. These documents can also have their own tables of contents. All documents included in the User's Manual are marked in the bottom right corner with their name (symbol) and revision (issue number).

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1 General information

1.1 Application scope

Industrial systems widely use communication systems based on the RS-485 transmission standard. The serial nature of the RS-485 bus networks is the reason that a critical failure at any location of the network may disable communication within the entire system. Since gas safety systems are very sensitive to perfect efficiency of communication, even potential, critical or probable failures of data bus lines may be really hazardous to safe operation of the system. It is why application of devices capable of isolating any defective fragment of the network, such as MOD SEP 2 modules, is beneficial and efficient.

1.2 Device features

-  Galvanic separation and extension of data transmission lines (above 1200 m).
-  Information about status of the device operation by means of optic indicators (power, transmission).
-  Communication with other remote equipment provided with the RS-485 interface.
-  Transmission secured against voltage surges on RS-485 transmission lines.
-  Protection of the device against voltage surges and short circuit faults.
-  Transmission rates from 4,800 up to 115,200 bauds.
-  Galvanic separation of internal circuits.
-  Internal termination of transmission lines and pull-up resistors.

2 Operation principle

Application of MOD SEP 2 enables galvanic separation between BUS1 and BUS2 data bus sections. In addition, the device enables isolation of a data bus section with a defective device connected to it. For instance, if a number of appliances are connected to a serial data bus, a failure of any of these device normally disables communication down the entire data bus. Installation of MOD SEP 2 units enables coping of the bus into individual sections and makes it possible to isolate only a single section of the bus when a device connected to that bus section is failed, with undisturbed communication down the remaining part of the data bus. After the defect disappears or is remedied, the MOD SEP 2 unit is again transparent for signals transmitted down the serial bus.

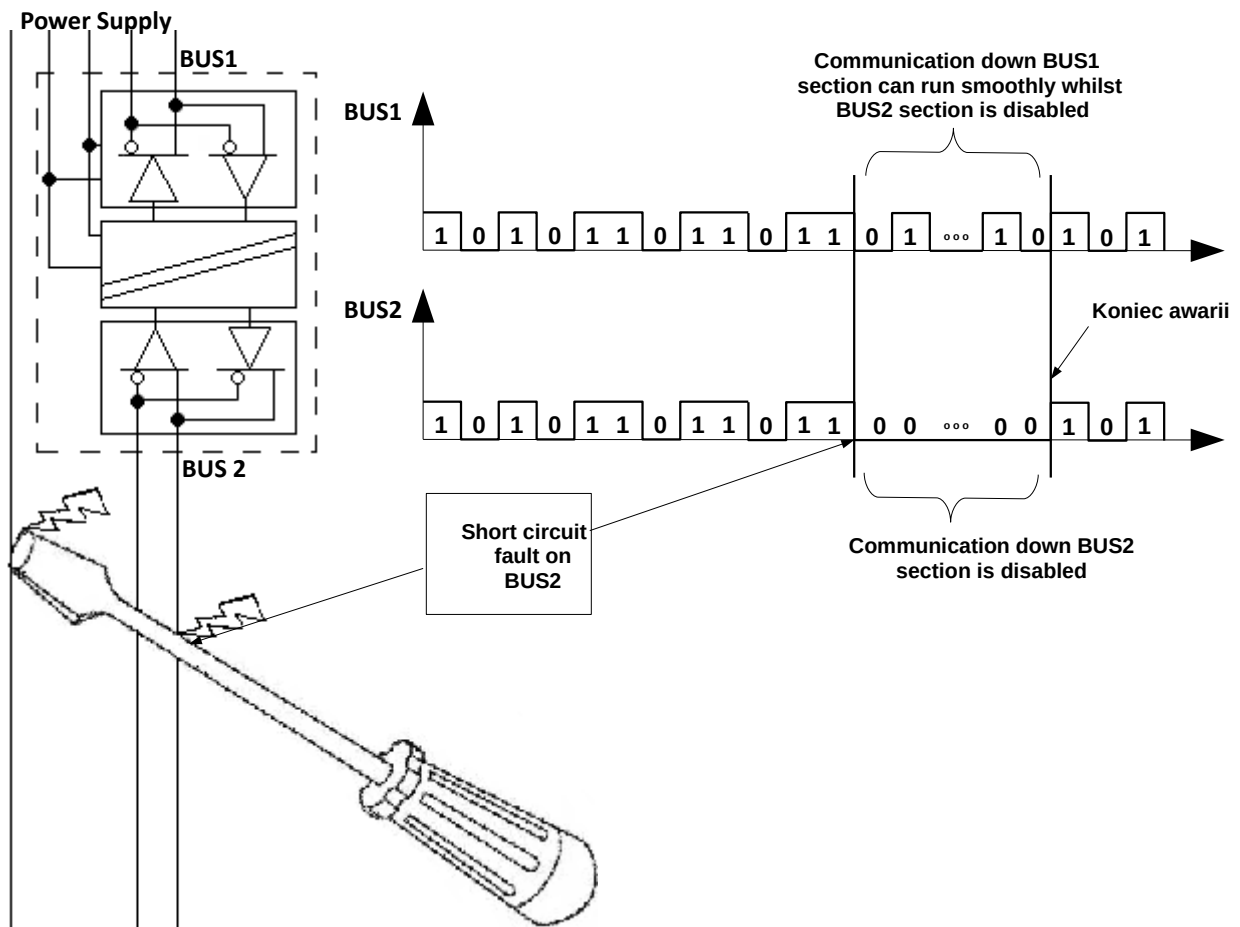


Figure 1: Short-circuit fault

3 Description of the construction

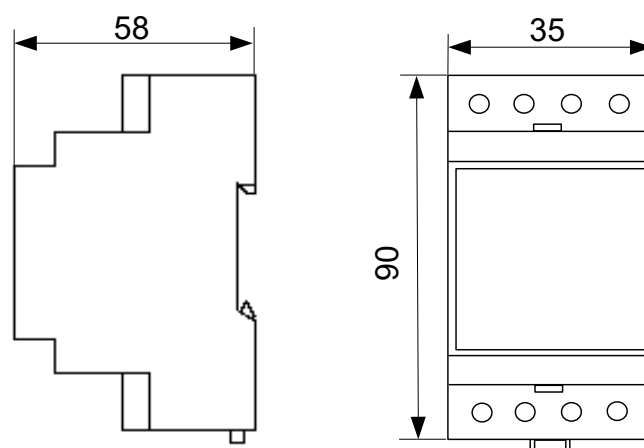


Figure 2: Dimension of the device

4 Input-output interfaces

The drawing below shows a terminal block for the MOD SEP 2 device. More details about each section of the terminal block are summarized in Table 2.

4.1 Electric interface

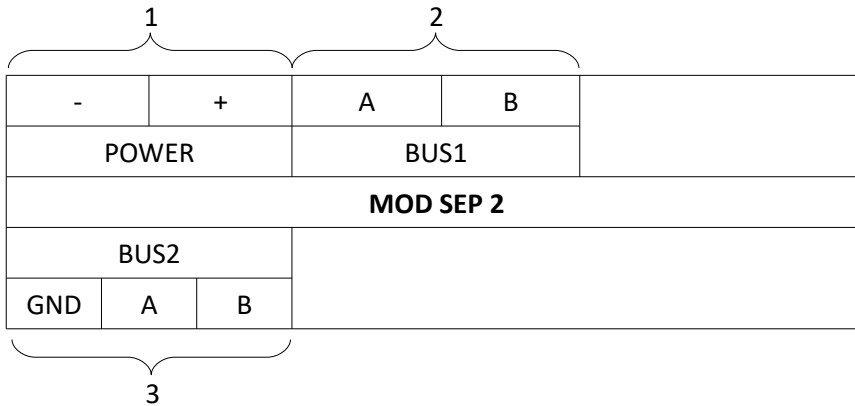


Figure 3: Electric interface description

| No. | Name | Terminal | Description |
|-----|-------|------------------|--|
| 1 | POWER | | Power supply port for the device. Parameters – see section 6 |
| | | - | Negative |
| | | + | Positive |
| 2 | BUS1 | | Communication port |
| | | A | Signal line A |
| | | B | Signal line B |
| 3 | BUS2 | | Communication port |
| | | A | Signal line A |
| | | B | Signal line B |
| | | GND ¹ | Common neutral |

Table 2: Electric interface description



It is recommended to provide local earthing of the GND contact.

¹ The GND terminal is isolated from the Power supply and BUS1 ports.

5 User interface

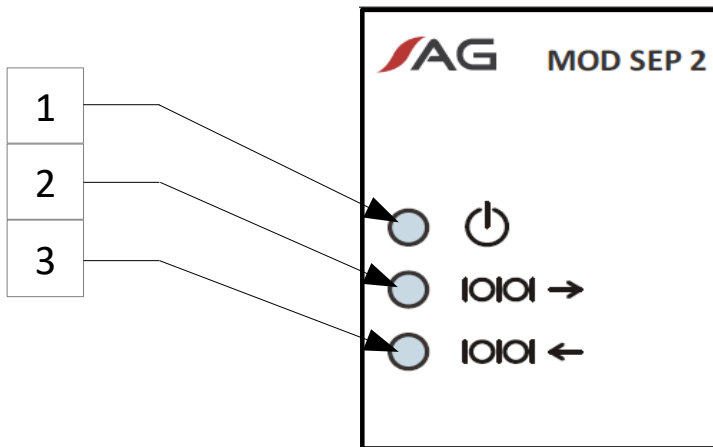


Figure 4: Front panel










| Function | | | | |
|----------|---|-------|---|--|
| 1 |  | Green |  | Indicating LED is on – power voltage is supplied to the device |
| | | |  | Indicating LED is off – power voltage is not supplied to the device |
| 2 |  | Green |  | Indicating LED is blinking – data flow from BUS1 section to BUS2 section is pending |
| | | |  | Indicating LED is continuously on or off – transmission line is defective or no transmission at the moment |
| 3 |  | Green |  | Indicating LED is blinking – data flow from BUS2 section to BUS1 section is pending |
| | | |  | Indicating LED is continuously on or off – transmission line is defective or no transmission at the moment |

Table 3: Operation of indicators on the front panel of MOP SEP 2 unit

6 Layout options of systems comprising the MOP SEP 2 unit

6.1 Galvanic separation for RS-485 port

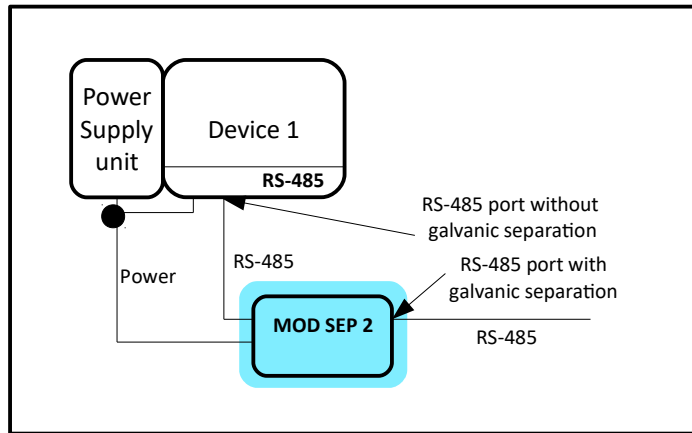


Figure 5: Galvanic separation for RS-485 transmission line

6.2 Isolation of defective sections of the network

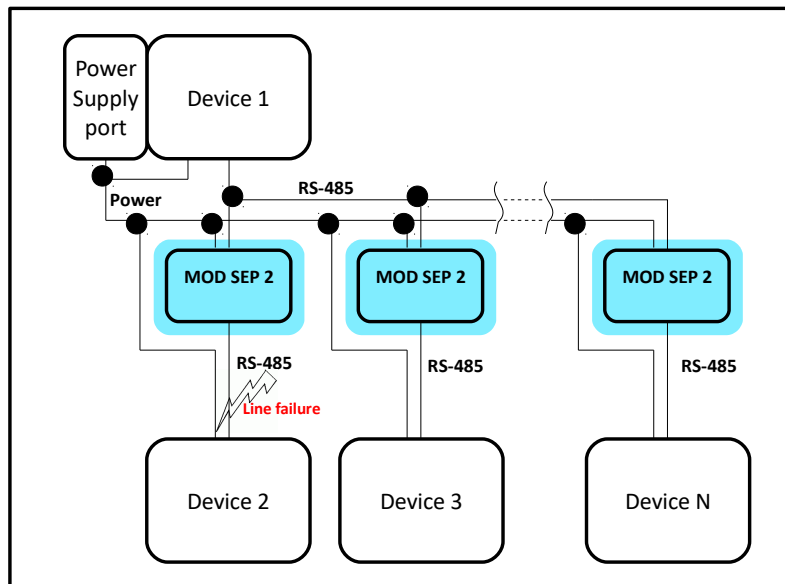


Figure 6: Network layout with isolation of defective connections by means of MOD SEP 2 units

In a network arranged according to the foregoing drawing a failure of connection between device No. 1 and No. 2 is not destructive for communication between other network devices within the system and data transmission between other devices is preserved. Unlikely, such a line failure in a system without MOD SEP 2 separators would lead to interruption of communication within the entire system.

7 Life cycle

7.1 Installation

MOD SEP 2 mount in the control cabinet on the DIN 35 rail or place in the junction box in a place accessible to authorized operators, however, if possible, in such a way as to make it difficult for unauthorized persons to access it.

All cables and conductors connected to terminals of the control unit must be terminated with female sleeves of proper size.

7.2 Start-up

The device is ready for operation after supply of power voltage and appropriate configuration.

7.3 Device / system configuration

Configuration of the MOD SEP 2 device includes selection of the transmission rate (see Table 4) and terminating resistors for the BUS2 section (see Table 5). To change configuration settings remove gently the protecting cover for the terminals and set microswitches to desired positions.

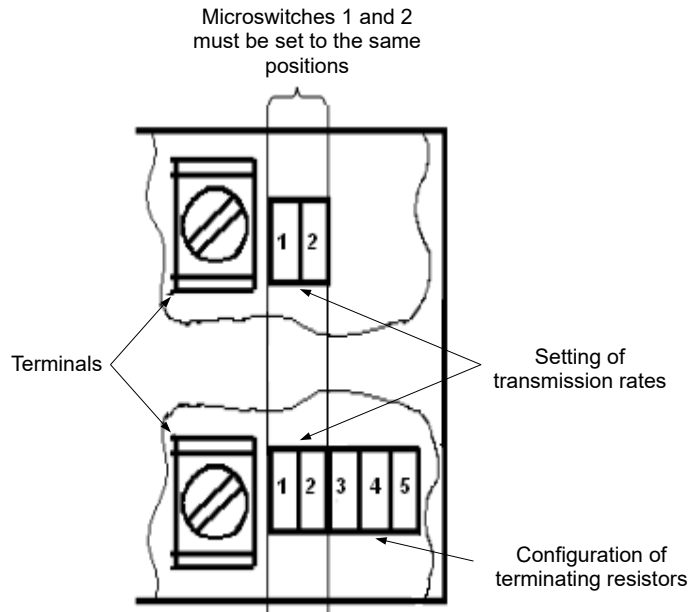


Figure 7: Configuration of terminating resistors and transmission rates




| Positions of micro-switches 1 2 | Transmission rates |
|---|-------------------------------------|
|  | 4800 – 9600 b/s |
|  | 19200 – 38400 b/s (default setting) |
|  | 57600 – 115200 b/s |

Table 4: Configuration of transmission rates




| Positions of micro-switches 3 4 5 | Operation option | Schematics |
|---|---|---|
|  | No terminating resistor for BUS2 port | A ————— B ————— |
|  | Terminating resistor for BUS2 port included | A ————— 120 Ω B ————— |
|  | Terminating and pull-up resistors included | ○ +5V 560 Ω A ————— 120 Ω B ————— 560 Ω ────┬─── ────┴─── |

Table 5: Configuration of terminating resistors for transmission lines of BUS2 port

7.4 Troubleshooting

Test of the MOD SEP 2 units can be carried out only in combination with tests of the entire system where the separators are incorporated.

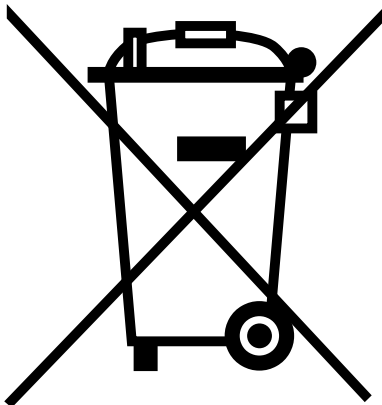
7.5 Periodical operations

Scheduled inspections are combined with inspections of the entire system

7.6 Maintenance

No maintenance operations are necessary for the device.

7.7 Utilization



This symbol on a product or on its packaging indicates that the product must not be disposed of with other household waste. Instead, it is the user's responsibility to ensure disposal of waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The proper recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. Information about relevant designated collection points can be obtained from the Local Authority, waste disposal companies and in the place of purchase. The equipment can also be returned to the manufacturer.

8 Technical specification

| | |
|--|---|
| Power supply | |
| <ul style="list-style-type: none"> • V_{CC} • Power consumption | 10 – 30 V $\overline{\text{AC}}$ 1.5 W |
| Environment: | |
| <ul style="list-style-type: none"> • Ambient temperatures • Humidity • Pressure | -10 – +55°C 0 – 100% long-term, non-condensing 1013 \pm 10% hPa |
| IP | IP20 |
| Digital communication parameters | |
| <ul style="list-style-type: none"> • Electric standard • Baud rates | RS-485 4800 – 115200 b/s |
| Integrated signalling equipment (visual) | Indicating LEDs |
| Isolation strength of galvanic separation | 1000 V |
| Protection class | III |
| Dimension | See figure 2 |
| Acceptable cables | 0.2 – 2 mm ² |
| Enclosure material | Self-extinguishing PPO |
| Weight | 60 g |
| Mounting | DIN-35/TS35 |

Table 6: Technical specification

9 Product marking

| Product code | Device |
|--------------|-------------------------------|
| PW-079-A | MOD SEP 2 Control Unit Module |

Table 7: Method of product's marking

10 Appendices




- [1] DEZG090-ENG – EU Declaration of Conformity – MOD SEP 2

EU Declaration of Conformity

Atest Gaz A. M. Pachole sp. j. declares with full responsibility, that the product:

| | | |
|---|----------------------------------|--|
| (Product description) Control Unit Module | (Trade name) MOD SEP 2 | (Type identifier or Product code) PW-079 |
|---|----------------------------------|--|

complies with the following Directives and Standards:

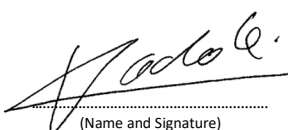
-  in relation to Directive 2014/30/EU – on the harmonisation of the laws of the Member States relating to electromagnetic compatibility:
 - EN 50270:2015
-  in relation to Directive 2014/35/EU – on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits:
 - EN 60335-1:2012
-  in relation to directive 2011/65/EU – on the restriction of the use of certain hazardous substances in electrical and electronic equipment
 - EN 50581:2012

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Purpose and scope of use: product is intended for use in gas detection systems for residential, commercial and industrial environment.

This EU Declaration of Conformity becomes not valid in case of product change or rebuild without manufacturer's permission.

Gliwice, 29.04.2020



(Name and Signature)

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