

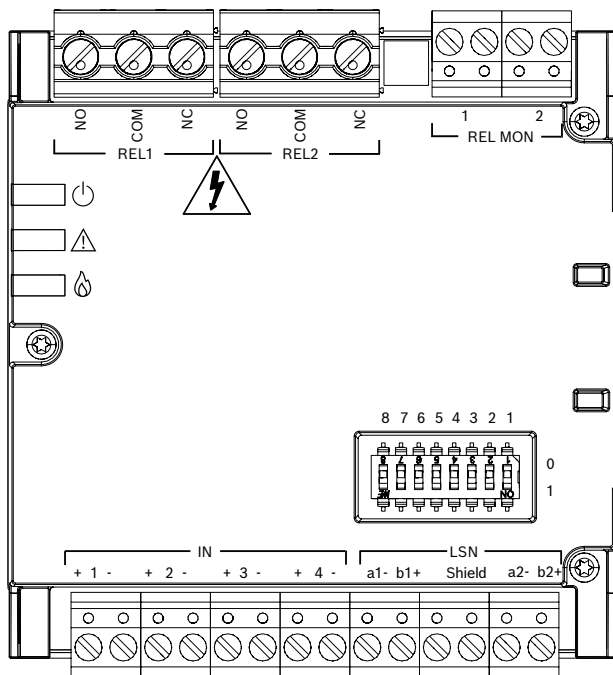
FLM-430-I4R2 Interface module 4 inputs 2 outputs

AVENAR IO module 4000



The FLM-430-I4R2 interface module has four inputs and two relay outputs. The module can be used to control 230 VAC and 24 VDC applications such as conventional 4-wire detector, fire damper, door holder or smoke control damper. It also can be used to monitor the 24 VDC line.

System overview



Description	Connector
REL1	Relay 1

- ▶ Monitoring of conventional 4-wire detectors including pre-alarm
- ▶ Control of fire protection equipment with configurable fail-safe logic and feedback lines
- ▶ Configurable outputs with relay or monitored output function
- ▶ LED display for status indication
- ▶ Diagnostic data for easier maintenance
- ▶ Surface or DIN rail mounting

Description	Connector
REL2	Relay 2
REL MON	Input for output line voltage monitoring (24 VDC rated)
IN1+ / IN1-	Input 1
IN2+ / IN2-	Input 2
IN3+ / IN3-	Input 3
IN4+ / IN4-	Input 4
a1- / b1+	LSN in
a2- / b2+	LSN out
Shield	Shield LSN

Functions

Relay output

The FLM-430-I4R2 features two changeover contact relays with potential-free outputs. The following relay behaviors can be individually configured via the programming software:

- Stand-by state
- Fail safe state
- Line monitoring

Relay monitoring input

WARNING! Do not connect mains voltages to the relay monitoring inputs!

NOTICE! The maximum continuous monitoring voltage is limited to ± 30 VDC.

Each relay output can be configured for 24 VDC line monitoring via the programming software. When enabled, the output line is continuously monitored on interruptions or short circuits through the corresponding REL MON input connectors:

- REL MON 1 monitors REL 1
- REL MON 2 monitors REL 2

The monitoring inputs are galvanically isolated from the LSN and do not influence line length calculations. Thanks to the integrated bridge rectifier, both positive and negative 24 VDC voltages can be monitored.

Output fail-safe state

The fail-safe state of the outputs can be configured in the programming software:

- Remain: output signal is kept in case of a fieldbus connection loss (e.g. conventional signaling devices, conventional fire detectors or smoke control dampers)
- Interrupt: output signal is interrupted in case of a fieldbus connection loss (e.g. fire dampers or fire doors)

In addition, the output signal is also interrupted in case of an internal watchdog fault.

Feedback of output

Each input of the FLM-430-I4R2 can be configured in the programming software as independent or feedback of output. For the feedback configuration a feedback time in a range of 3 s to 255 s is selectable to address different fire protection equipment.

Input line and contact monitoring

The 4 inputs of the FLM-430-I4R2 can be configured in the programming software as independent, or feedback of output.

The input line can be used to monitor potential-free contacts.

A compatibility mode is provided for the legacy alarm and End of line resistors 820 Ω and 3.9 k Ω .

In the programming software the line monitoring is configured individually for each input:

- Contact monitoring (NC/NO)
- Contact monitoring with End of line resistor 3.3 k Ω in case of line interruption or short circuit
- Double resistor line monitoring with 680 Ω and 3.3 k Ω resistors in case of line interruption and short circuit
- Double resistor line monitoring with 680 Ω and 3.3 k Ω in case of line interruption and short circuit including creeping according to VdS 2543
- In case of configuring the input for fire, smoke or heat e.g., for conventional fire detectors: Triple resistor/detector line monitoring with 680 Ω , 2.7 k Ω and 3.3 k Ω resistors in case of line interruption and short circuit for detector pre-alarm, alarm and fault
- In case of configuring the input as feedback of output e.g., for type C fire protection equipment like fire dampers: Triple resistor line monitoring

for two potential-free contacts with 680 Ω , 2.7 k Ω and 3.3 k Ω in case of line interruption and short circuit for damper closed position, open position, and in between position.

For reliable detection, the potential-free contact must be in a stable position for at least 500 ms.

Examples:

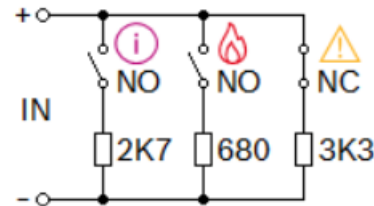


Fig. 1: EN 54 conventional fire detector monitoring via triple resistors

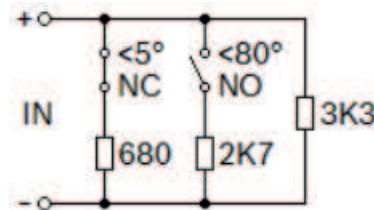


Fig. 2: Fire damper position monitoring via triple resistors

Status display

The status of FLM-430-I4R2 is shown by the flashing of up to three LEDs:

- Green: the interface module is operational (configurable in programming software)
- Yellow: at least one fault was detected on the output or input lines
- Red:
 - normal: the output line is activated
 - fast: the Interface module is located via the programming software RPS

Diagnostic data

The following diagnostic data are provided by FLM-430-I4R2 and can be retrieved via the fire panel diagnostic screens:

- Status: status of the interface module, each output and input
- ID number
- Software version
- Hardware version
- Input resistance value
- Min./ max. history of input analog resistance values
- Min./ max. history of input EMC values

Features of LSN improved version

The interface module FLM-430-I4R2 offers all the features of improved LSN technology:

- Flexible network structures including T-tapping without additional elements

- Up to 254 LSN improved elements per loop or stub line
- Unshielded cable can be used

Installation/configuration notes

- Can be connected to the fire panels AVENAR panel 2000 and AVENAR panel 8000.
- National standards and guidelines must be considered during the planning stage.
- In some target markets, applicable standards and regulations may not permit the connection of certain fire protection devices. This applies, for example, to devices for controlling smoke dampers or door holders.
- **WARNING!** If the relays are used to switch mains voltage, a risk of electrical shock exists. Install the module in a lockable housing (e.g., FLM-430-SMB) requiring a tool for access.
- Manual call points must not be connected to the inputs of FLM-430-I4R2.
- The maximum cable length of all inputs connected to the loop or stub is 500 m in total. Additionally, all outputs which are not electrically isolated from LSN must be included in the total line length calculation (e.g. peripherals connected via C points).
- For operating the fire alarm system according to VdS 2543 the input monitoring must be configured to double resistors extended.
- For EN 54-13 transmission paths each input or output line must have a dedicated cable.
- Can be installed near or in some distance from the application.
- Must be surface-mounted with FLM-430-SMB or mounted in an electrical cabinet onto a DIN rail with FLM-430-CLIP.

Dip switches

The dip switch integrated in the interface module can be used to select between automatic or manual addressing with or without auto detection.

Termination resistors

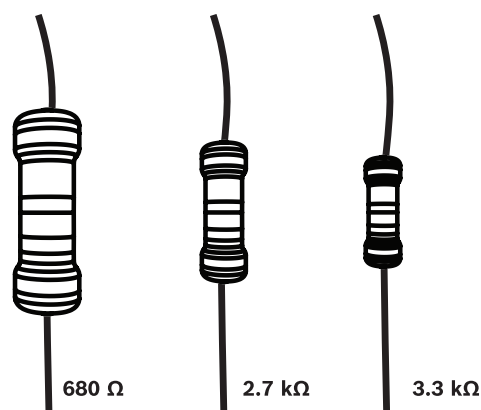


Fig. 3: Termination resistors for inputs

Parts included

Quantity	Component
1	FLM-430-I4R2 Interface Module
4	3.3 kOhm $\pm 1\%$ 0.4 W
4	2.7 kOhm $\pm 1\%$ 0.6 W
4	680 Ohm $\pm 1\%$ 1 W

For surface-mount, FLM-430-SMB must be ordered separately.

For mounting in an electrical cabinet onto a DIN rail, FLM-430-CLIP must be ordered separately.

Technical specifications

Electrical

LSN

Operating voltage (VDC)	15 VDC – 33 VDC
Current consumption (mA)	4.47 mA

Relay output

Switching voltage	min. 12 V max. 30 VDC / 250 VAC
Switching current	min. 10 mA max. 4 A (inductive) max. 8 A (resistive)
Breaking capacity	max. 2000 VA (at 250 VAC)
Bounce time	max. 10 ms
Fail-safe state	Interrupt, Remain

Feedback time	3 s - 255 s
Line resistance	max. 50 Ω
Line length	max. 1000 m
Capacitive load	max. 3 mF
Inductive load	max. 10 mH

Input

Monitoring voltage	max. 10 VDC
Monitoring current	max. 10 mA
Terminating resistors	3.3 kΩ, 2.7 kΩ, 680 Ω (default) 3.9 kΩ, 820 Ω (compatibility mode)
Line resistance	max. 20 Ω
Line length	max. 30 m
Galvanic isolation to LSN	No

Relay monitoring input

Operating voltage	-30 V to +30 VDC
Current consumption	max. 4.5 mA
NORMAL voltage range	+15 V to +30 V and -30 V to -15 V
Galvanic isolation to LSN	yes

Mechanical

LED color	Red; Yellow; Green (Fire alarm; Fault; Operation)
LSN/Address setting	8 DIP switches
Connections	9 pluggable screw type connectors and 6 screw terminals
Conductor cross section	0.34 mm ² - 2.5 mm ²
Color (RAL)	White, similar to RAL 9003
Dimensions (H x W x D) (mm)	96 mm x 87.5 mm x 35 mm
Weight (g)	170 g

Environmental

Operating temperature (°C)	-20 °C – 50 °C
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Storage temperature (°C)	-25 °C – 70 °C
IP rating	IP30
IP rating FLM-430-SMB	IP54
Class of equipment (IEC 62368-1)	II
Operating relative humidity, non-condensing (%)	< 76%
Installation attitude	max. 2000 m above sea level
Environmental class (EN 12101-10)	1
Reliability class	Re 1000DP

Ordering information

FLM-430-I4R2 Interface module 4 inputs 2 outputs
Interface module with 4 inputs and 2 relay outputs
Order number **FLM-430-I4R2**

Accessories

FLM-430-CABLE Cable kit for interface module
Set of 5 cables for LSN loop-through for DIN-rail installations
Order number **FLM-430-CABLE**

FLM-430-CLIP DIN clip for interface module
Set of 5 CLIP adapters for horizontal and vertical installation of interface modules on DIN-rail
Order number **FLM-430-CLIP**

FLM-430-SMB Surface mount box
Surface mount box for interface modules
Order number **FLM-430-SMB**



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