❖ **8x 10-bit Alarm or 5 V Digital Inputs**
❖ **4x NOC 24 V Relay Outputs**
❖ **1x RS485**
❖ **Operating Range –40°C to +70°C**
❖ **600 W Integrated Surge Protections**
❖ **Mounting on DIN35 Rail**
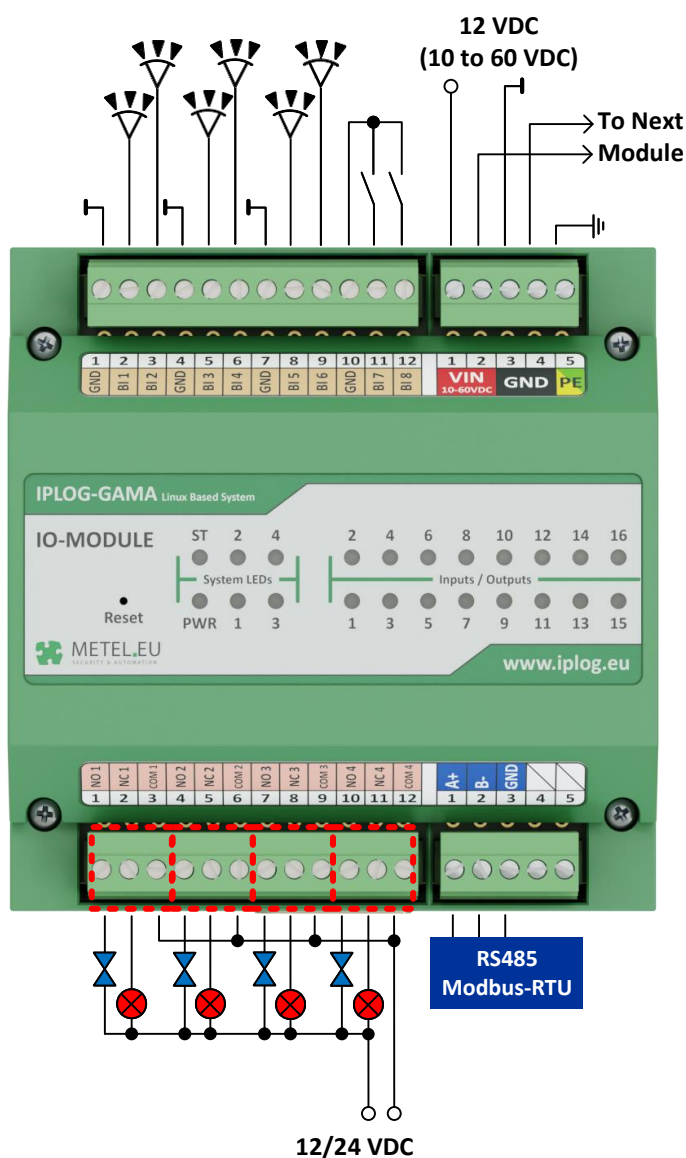❖ **Cover Made of Self-Extinguishing Material UL94 V0**

BI8.4E is an industrial IO module of the IPLOG system. The Modbus RTU communication interface allows it to be easily connected to systems from other manufacturers. The module is supplied with a plastic cover for mounting on a DIN35 rail.

DEVICE

PARAMETER	VALUES	NOTE
Power Supply	12, 24, 48 VDC	10 to 60 VDC
Consumption	Max. 1.5 W	
Surge Protection	600 W	10/1000 µs
Operating Range	–40 to +70 °C	
Storage Range	–40 to +70 °C	
Humidity	Max. 95 %	No-condensing
Dimension	120 x 123 x 49,5 mm	W x H x D
Weight	Max. 0.32 kg	
Installation	DIN35	
Device Class	I	EN 61140
Ingress Protection	IP 20	EN 60529
Cover Material	ABS UL94 V0	
Degree of pollution	II	EN 60664-1
Connections	Screw Terminals	
Conduct. cross-section	Max. 2.5 mm^2	

CPU

PARAMETER	VALUES	NOTE
Series	32-bit MCU	
Frequency	64 MHz	
Flash	512 kB	
RAM	64 kB	

12 VDC
(10 to 60 VDC)

To Next Module

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 |
| GND | BI 1 | BI 2 | GND | BI 3 | BI 4 | GND | BI 5 | BI 6 | GND | BI 7 | BI 8 | VIN 10-60VDC | | GND | | PE |

IPLOG-GAMA Linux Based System

IO-MODULE

ST 2 4   2 4 6 8 10 12 14 16

— System LEDs —   Inputs / Outputs

Reset

PWR 1 3   1 3 5 7 9 11 13 15

METEL.EU SECURITY & AUTOMATION

www.iplog.eu

| NO 1 | NC 1 | COM 1 | NO 2 | NC 2 | COM 2 | NO 3 | NC 3 | COM 3 | NO 4 | NC 4 | COM 4 | A+ | B- | GND | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 |

RS485 Modbus-RTU

12/24 VDC

Galvanic Isolation

Location and Designation of Connectors and LEDs

NOTE: The order of the terminal numbers in the table below corresponds to the order of the terminal numbers found on the device.

CONNECTOR			Inputs / Outputs LED	
12	BI 8	10-bit Alarm or Digital Input 5 V DC	8	Sabotage Short = Log 1 = Lights
11	BI 7	10-bit Alarm or Digital Input 5 V DC	7	Sabotage Short = Log 1 = Lights
10	GND	Ground		
9	BI 6	10-bit Alarm or Digital Input 5 V DC	6	Sabotage Short = Log 1 = Lights
8	BI 5	10-bit Alarm or Digital Input 5 V DC	5	Sabotage Short = Log 1 = Lights
7	GND	Ground		
6	BI 4	10-bit Alarm or Digital Input 5 V DC	4	Sabotage Short = Log 1 = Lights
5	BI 3	10-bit Alarm or Digital Input 5 V DC	3	Sabotage Short = Log 1 = Lights
4	GND	Ground		
3	BI 2	10-bit Alarm or Digital Input 5 V DC	2	Sabotage Short = Log 1 = Lights
2	BI 1	10-bit Alarm or Digital Input 5 V DC	1	Sabotage Short = Log 1 = Lights
1	GND	Ground		

CONNECTOR			System LEDs	
5	PE	Earthing Terminal		
4	GND	Power Input – Minus Terminals		
3		Terminals are Internally Interconnected	PWR	Power is Connected, LED Lights Up.
2	VIN	Power Input – Plus Terminals		
1	10-60 V DC	Terminals are Internally Interconnected		

CONNECTOR			Inputs / Outputs LED	
12	COM 4	Common terminal of NOC 4 Relay		
11	NC 4	Normally Closes		
10	NO 4	Normally Open	14	Closed = Log. 1 = Lights
9	COM 3	Common terminal of NOC 3 Relay		
8	NC 3	Normally Closes		
7	NO 3	Normally Open	13	Closed = Log. 1 = Lights
6	COM 2	Common terminal of NOC 2 Relay		
5	NC 2	Normally Closes		
4	NO 2	Normally Open	12	Closed = Log. 1 = Lights
3	COM 1	Common terminal of NOC 1 Relay		
2	NC 1	Normally Closes		
1	NO 1	Normally Open	11	Closed = Log. 1 = Lights

System LEDs		Inputs / Outputs LED	
1	BUS 1 (Tx = Red / Rx = Green)	9-10	Not used (planned as IEC programmable)
2-4	Not used (planned as IEC programmable)	15-16	Not used (planned as IEC programmable)
ST	Not used (planned as IEC programmable)		
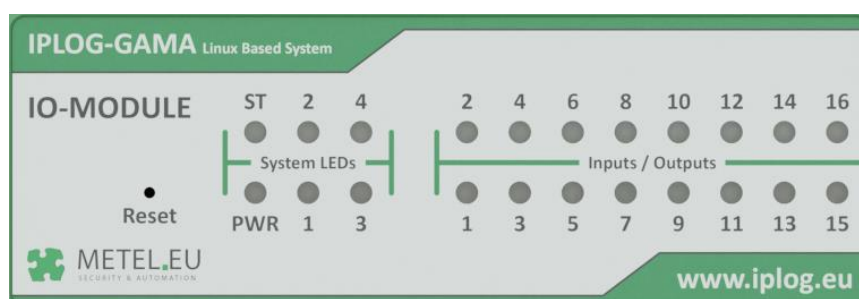
Galvanické oddělení

Dimensions and Installation of DIN Version

49,5

123

123

120

130
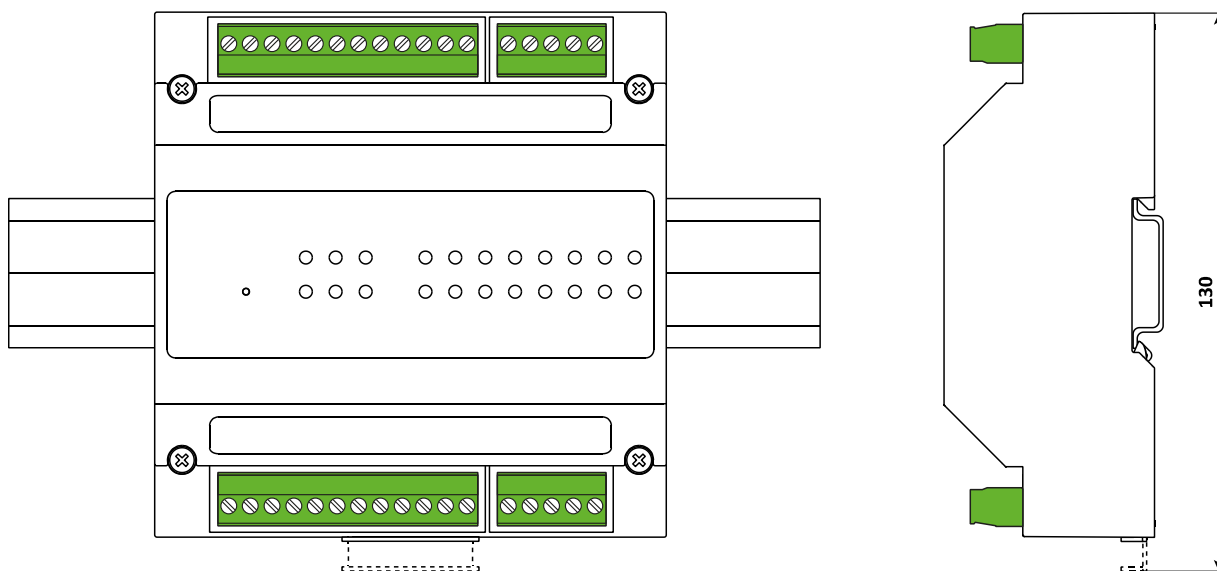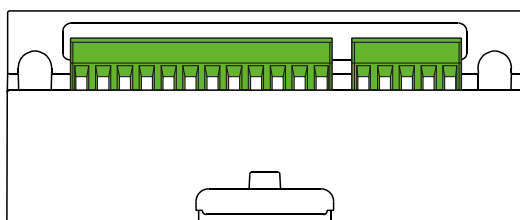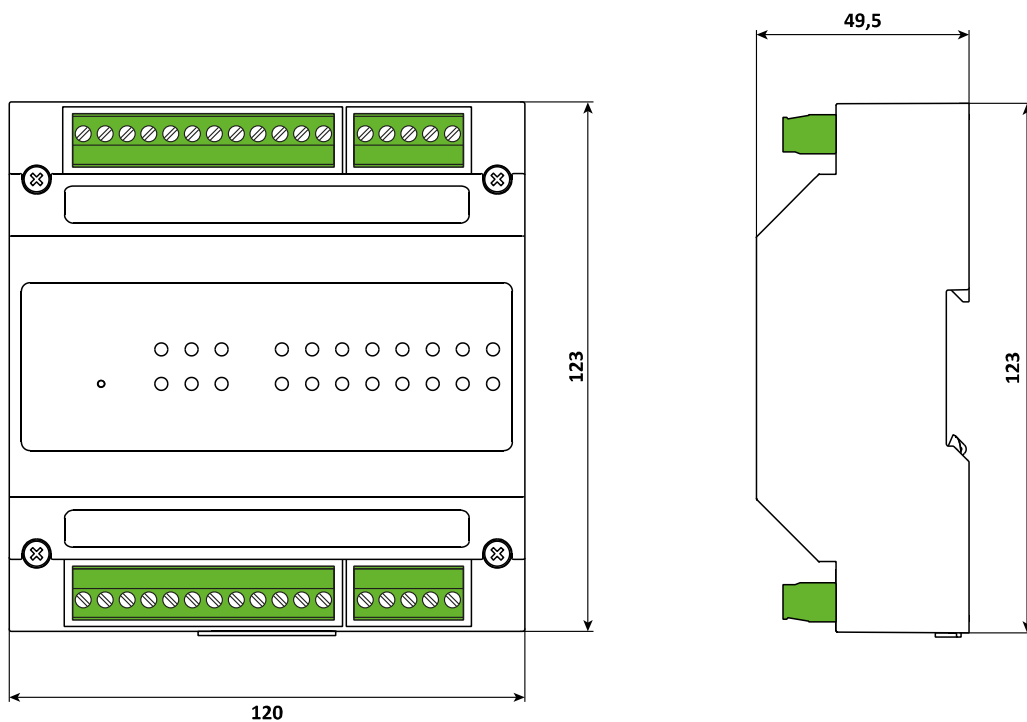
Default Settings of MODBUS Communication

Device ID: **1** | Speed: **115 200** | Parity: **None** | Data bits: **8** | Stop bits: **1**

Modbus registers

	Subject	Type	R/W	Value	Offset
Device Identifica-tion	Product Type	u8[3]	R		1002–04
	Serial Number	u32	R		1005–06
	PCB Version	u32	R		1007–08
	PCB Revision	u16	R		1009
	FW Version Major	u16	R		1010
	FW Version Minor	u16	R		1011
	FW Version - Revision	u32	R		1012–13
	IF#01 Slot State	u16	R	0 = N/A 1 = IF#01 not Inserted 2 = IF#01 Inserted, CRC error 3 = IF#01 Inserted, CRC OK	1021
	IF#01 Product Type	u8[3]	R		1022–24
	IF#01 Serial Number	u32	R		1025–26
	IF#01 PCB Version	u32	R		1027–28
	IF#01 PCB Revision	u16	R		1029
Device Control	Reset	u16	RW	55203 = To Reboot	1201
	Bootloader / Application	u16	R	0x00A – Application, 0x00B – Bootloader	1203
	Restart to Bootloader [1]	u16	RW	617 = To Bootloader else = deactivate bootloader	1204
Device Status	Board Power Voltage	u16	R	105 = 10,5V	1311
	Board Temperature	s16	R	-200 = -20,0°C 250 = 25,0°C	1321

[1] **To activate the bootloader, it is necessary to write a value of 617 in the registry and restart the device. To reactivate the application, enter any value other than 617 in the appropriate registry and restart the device. If the device is in the bootloader, the LED 1 will flash red.**

	Subject	Type	R/W	Value	Offset
BUS 1 Settings	Baudrate	u16	RW	192 = 19 200 bps 1152 = 115 200 bps 9216 = 921 600 bps 10000 = 1 000 000 bps	2110
	Databits	u16	RW	8 = 8b, 9 = 9b	2111
	Parity	u16	RW	78 = None 69 = Even 79 = Odd	2112
	Stopbits	u16	RW	10=1, 20=2, 15=1,5	2113
	MODBUS address	u16	RW	1 - 247	2120

	Subject	Channel	Type	R/W	Value	Offset
States of Balanced Inputs	Balanced Input 1	AI#01	u16	R	1000 = 1000 Ω 0 = 0 Ω	5001
	Balanced Input 2	AI#02	u16	R		5002
	Balanced Input 3	AI#03	u16	R		5003
	Balanced Input 4	AI#04	u16	R		5004
	Balanced Input 5	AI#05	u16	R		5005
	Balanced Input 6	AI#06	u16	R		5006
	Balanced Input 7	AI#07	u16	R		5007
	Balanced Input 8	AI#08	u16	R		5008

	Subject	Channel	Type	R/W	Value	Offset
States of Inputs and Relay Output	Balanced Input 1 BIN	DI#01	bit	R	0 = inactive 1 = active	3001
	Balanced Input 2 BIN	DI#02	bit	R		3002
	Balanced Input 3 BIN	DI#03	bit	R		3003
	Balanced Input 4 BIN	DI#04	bit	R		3004
	Balanced Input 5 BIN	DI#05	bit	R		3005
	Balanced Input 6 BIN	DI#06	bit	R		3006
	Balanced Input 7 BIN	DI#07	bit	R		3007
	Balanced Input 8 BIN	DI#08	bit	R		3008
	COIL Relay 1	DI#09	bit	R		3009
	COIL Relay 2	DI#10	bit	R		3010
	COIL Relay 3	DI#11	bit	R		3011
	COIL Relay 4	DI#12	bit	R		3012
	Inputs	DI#16 - DI#01	u16	R	0x0000 - 0x0FFF	3001

|	Subject	Channel	Type	R/W	Value	Offset
Relay Outputs	Relay Output 1	DO#01	bit	RW	0 = inactive 1 = active	4001
	Relay Output 2	DO#02	bit	RW		4002
	Relay Output 2	DO#03	bit	RW		4003
	Relay Output 4	DO#04	bit	RW		4004
	Outputs	DI#16 - DI#01	u16	RW	0x0000 - 0x0007	4001

REVIZE: 202111 - Default

❖ In alarm mode there is an input measuring the loop resistance which allows connections of PIR, MW and other alarm sensors. Inputs are therefore capable of distinguishing a normal state, alarm, sabotage, masking, failure, low or high resistance as required by the EN 50131-1 standard.

❖ In digital mode there are inputs used as 5 V Digital Dry Inputs.

All inputs are accessible from METEL IEC 61131-3 IDE or directly from Linux scripts and can be configured independently of each other. Logic state of each input is signalized by a relevant LED diode on the front panel. For details please see the table „Location and Designation of Connectors and LEDs ".

Default programmable LEDs settings is as follows:

❖ Alarm Mode: LED On => Balanced loop input BI < 7.5 kΩ.

❖ Digital Mode: LED On => Input active, input terminal grounded to GND

LED Off => Input not active, input terminal is open and internally Pull-Up to 3V3
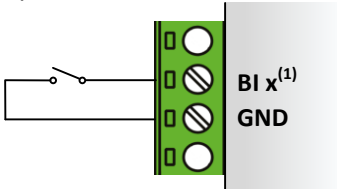
Internal Connection
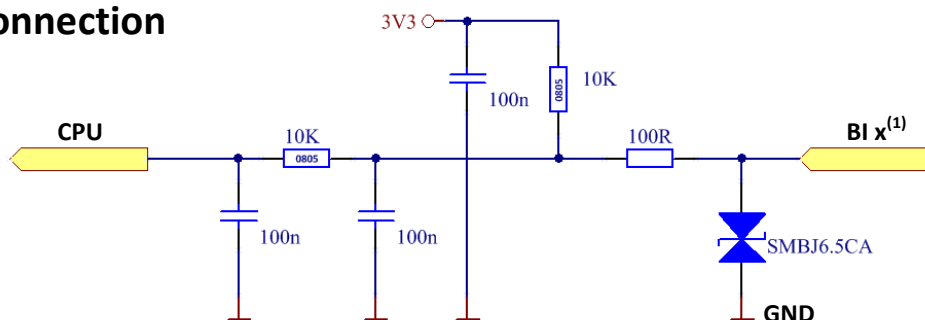
Examples of Connections

Digital Dry Contact Schematic
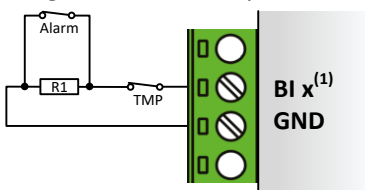
Input Connected with GND = log. 1.
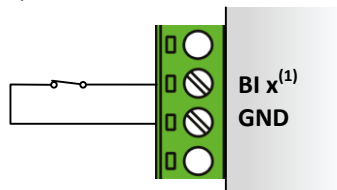
Input Disconnected from GND = log. 0.

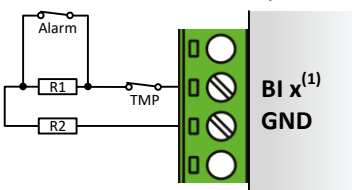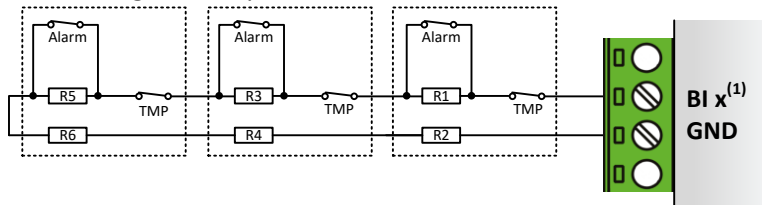### Alarm Contact Schematic

Single Balanced Loop   Double Balanced Loop


Connecting of Multiple Detectors to One Line

Technical Parameters

| Parameter	Value	Note
Input Voltage	Max. 7 V DC	
Input Current	0.3 mA at 5 V DC	
Surge Protection	600 W	10 / 1000 μs
Alarm Mode		
Range	From 10 to 30.000 Ω	10-bit resolution
Levels	8	Normal, Alarm, Failure, Masking,
		Sabot. short/open, Low/High Res.
Digital Mode:		
Dry Contact Schematic	Log. 0: Open	
	Log. 1: Close to Ground	

(1) The letter „x" replaces the input number.

The relay output is capable of switching loads with either AC or DC voltage. The Relay output is accessible from METEL IEC 61131-3 IDE or directly from Linux scripts and can be configured independently of each other. Logic state of each output is signalized by a relevant LED diode on the front panel. For details please see the table „Location and Designation of Connectors and LEDs ".

Internal Connection
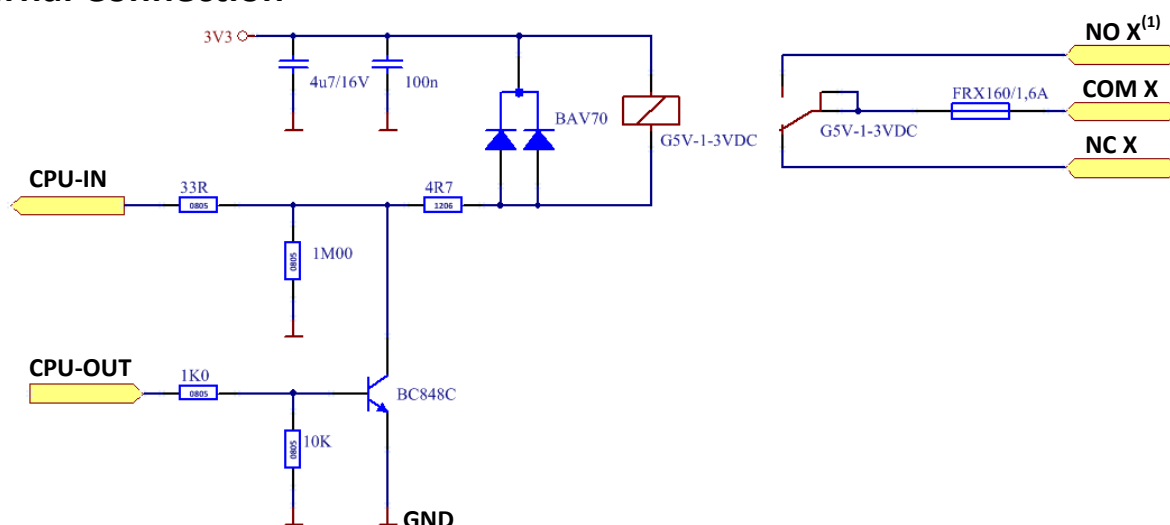
Examples of Connections
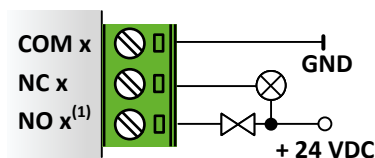
Relay NOC (Changeover) output has a common terminal COM. Two state relay can switch both AC and DC voltages to load. In the non-voltage state are relay terminals NO x[1] - COM disconnected and NC x[1] – COM connected. The relay is turned on when the program set logic 1 at its coil. When the relay is turned on, corresponding REx[1] LED diode on the front side light up (in default configuration).

Relay terminals must be protected with an external circuit breaker or fuse to prevent the rated current of the terminal or the load being exceeded. When switching inductive load it is recommended to protect relay outputs with an appropriate external component (e.g. varistor, RC circuit, or diode).

Technical Parameters

Parameter	Value	Note
Contact Type	NOC	Changeover Relay
Number of Poles	1	
Max. Load	0.5 A / 120 VAC	Resistive Load
	1 A / 24 VDC	Resistive Load
Electrical Lifetime	3,000,000 Operations	
Isolation Voltage	1.000 Vrms / 1 min.	Terminals to Electronic or Case

(1) The letter „x" replaces the input number.

POWER INPUT

The supply voltage is connected to VIN and GND terminals. The terminals are doubled for easier connection between the modules installed side by side.

Internal Connection of POWER INPUT
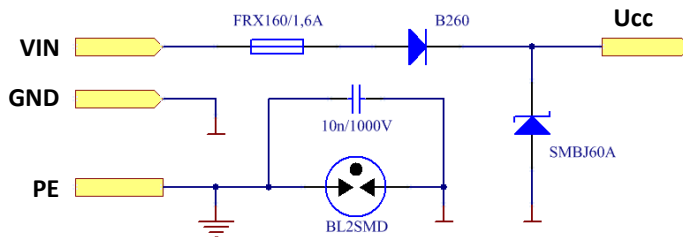
📖 **The electronic circuits of the IO module are galvanically separated from the PE, which is connected to the GND by a lightning arrester. The PE and GND department enables reliable operation of the system even in applications with differences in ground potentials.**

Parameter	Value	Note
Input Voltage Range	10 to 60 VDC	
Surge Protection	600 W	10 / 1000 µs
Short Circuit Protection	Polyswitch	
Reverse Polarity Protection	Diode	