- ❖ **8x 10-bit Alarm or 5 V Digital Inputs**
- ❖ **4x NOC 24 V Relay Outputs**
- ❖ **1x Slot for IF Module**
- ❖ **Operating Range –40°C to +70°C**
- ❖ **600 W Integrated Surge Protections**
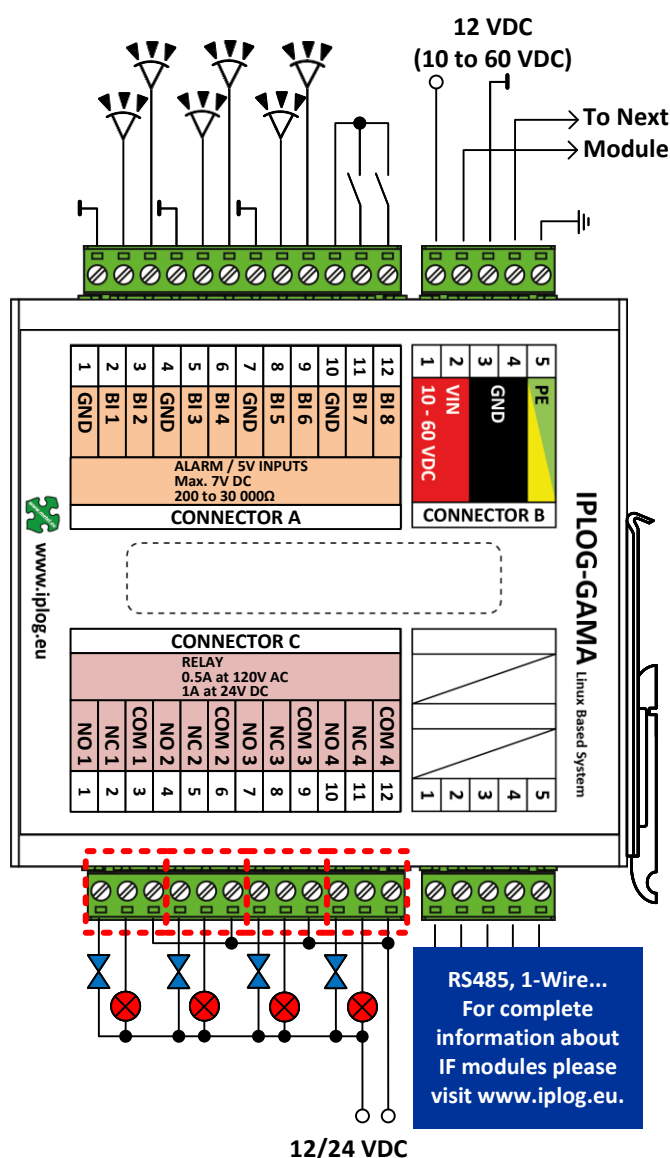
BOX Version   **PCB Version**

BI8.4 is an industrial module which can be easily adapted for a wide range of tasks. It can be used as IPLOG-Gx submodule or as standalone addressable module at MODBUS RTU bus.

ORDERING

PRODUCT NAME	CODE	NOTE
BI8.4-01-BOX	5000-1301	2x RS485
BI8.4-01G-BOX	5000-1302	2x RS485 (isolated)
BI8.4-05-BOX	5000-1307	1x RS485, 2x INPUT
BI8.4-PCB	0000-1300	PCB Module
For a Full Range of Interfaces Please Visit www.iplog.eu.		

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	35 x 110 x 119 mm	W x H x D
Weight	Max. 0.38 kg	
Installation	DIN35 or Flat Surface	
Device Class	I	EN 61140
Ingress Protection	IP 20	EN 60529
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	

Safety Precautions

If dangerous voltage is applied to the terminals, only personnel with appropriate electrical education may perform installation and servicing of the equipment. In the event of a fault, the device must be sent to the producer for repair. The device must be earthed in accordance with national standards. We recommend the manipulation of terminal blocks, only in the event they are not in the presence of dangerous voltage. Failure to comply with this recommendation may result in the risk of electrical shock.

12 VDC (10 to 60 VDC)

To Next Module

CONNECTOR A — ALARM / 5V INPUTS Max. 7V DC 200 to 30 000Ω

1	2	3	4	5	6	7	8	9	10	11	12
GND	BI1	BI2	GND	BI3	BI4	GND	BI5	BI6	GND	BI7	BI8

CONNECTOR B

1	2	3	4	5
VIN 10 - 60 VDC	VIN 10-60 VDC	GND		PE

IPLOG-GAMA Linux Based System

CONNECTOR C — RELAY 0.5A at 120V AC 1A at 24V DC

1	2	3	4	5	6	7	8	9	10	11	12
NO 1	NC 1	COM 1	NO 2	NC 2	COM 2	NO 3	NC 3	COM 3	NO 4	NC 4	COM 4

| 1 | 2 | 3 | 4 | 5 |

12/24 VDC

RS485, 1-Wire… For complete information about IF modules please visit www.iplog.eu.

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 A			LED	
12	BI 8	10-bit Alarm or Digital Input 5 V DC	BI8	Sabotage Short = Log 1 = Lights
11	BI 7	10-bit Alarm or Digital Input 5 V DC	BI7	Sabotage Short = Log 1 = Lights
10	GND	Ground		
9	BI 6	10-bit Alarm or Digital Input 5 V DC	BI6	Sabotage Short = Log 1 = Lights
8	BI 5	10-bit Alarm or Digital Input 5 V DC	BI5	Sabotage Short = Log 1 = Lights
7	GND	Ground		
6	BI 4	10-bit Alarm or Digital Input 5 V DC	BI4	Sabotage Short = Log 1 = Lights
5	BI 3	10-bit Alarm or Digital Input 5 V DC	BI3	Sabotage Short = Log 1 = Lights
4	GND	Ground		
3	BI 2	10-bit Alarm or Digital Input 5 V DC	BI2	Sabotage Short = Log 1 = Lights
2	BI 1	10-bit Alarm or Digital Input 5 V DC	BI1	Sabotage Short = Log 1 = Lights
1	GND	Ground		

CONNECTOR B			LED	
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 C			LED	
12	COM 4	Common terminal of NOC 4 Relay		
11	NC 4	Normally Closes		
10	NO 4	Normally Open	RE4	Closed = Log. 1 = Lights
9	COM 3	Common terminal of NOC 3 Relay		
8	NC 3	Normally Closes		
7	NO 3	Normally Open	RE3	Closed = Log. 1 = Lights
6	COM 2	Common terminal of NOC 2 Relay		
5	NC 2	Normally Closes		
4	NO 2	Normally Open	RE2	Closed = Log. 1 = Lights
3	COM 1	Common terminal of NOC 1 Relay		
2	NC 1	Normally Closes		
1	NO 1	Normally Open	RE1	Closed = Log. 1 = Lights

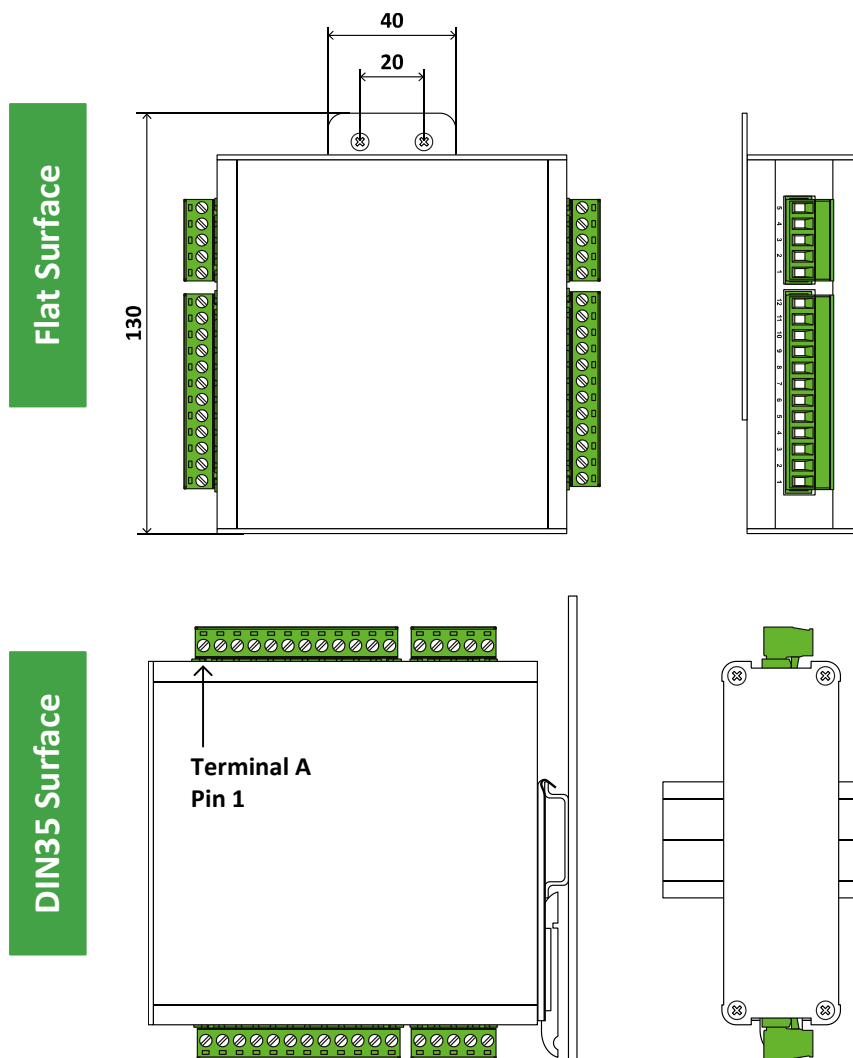| LED		LED	
1	BUS 1 (Tx = Red / Rx = Green)	3	IF05 Input BI2 Connected to Ground = Lights
2	BUS 2 (Tx = Red / Rx = Green)	4	IF05 Input BI2 Connected to Ground = Lights

Galvanic Isolation
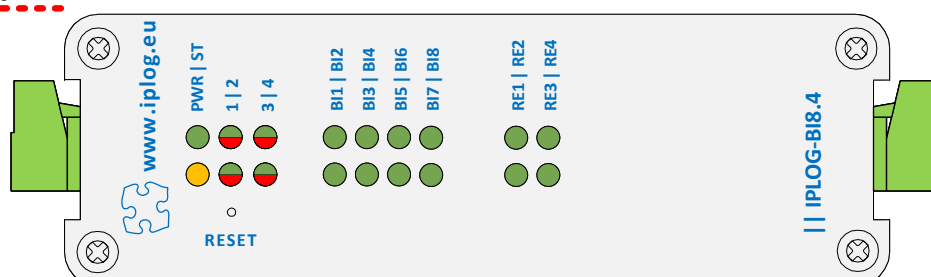
BOX Version Dimensions

Terminal A
Pin 1
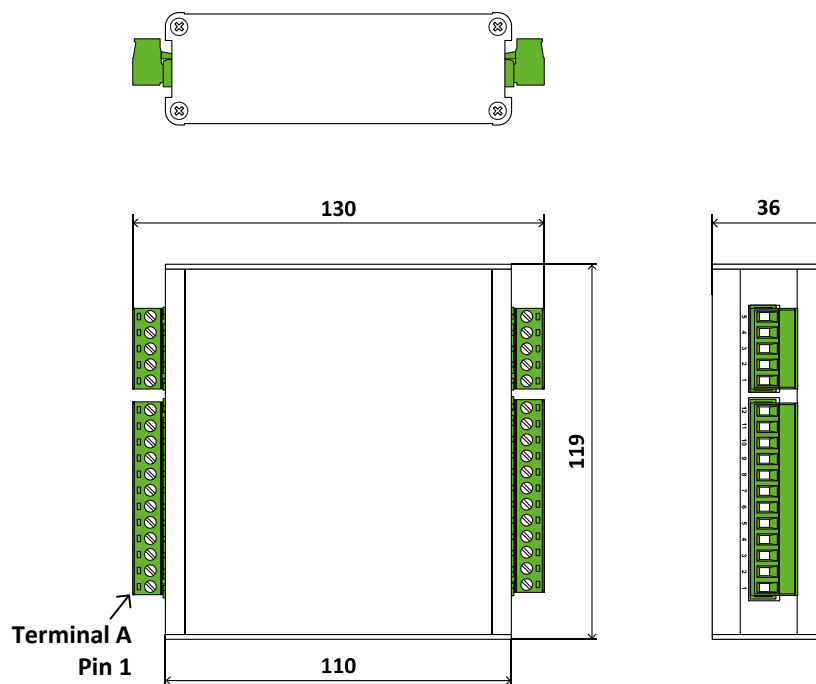
BOX Version Installation

Flat Surface

📖 **For installation we recommend using M3 screws and a flat surface holder from accessories.**

DIN35 Surface

Terminal A
Pin 1

📖 **For installation we recommend using M3 screws and DIN35 holder from accessories.**

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
IF-05 Inputs	Balanced Input 1 BIN	DI#33	bit	R	0 = inactive	3033
	Balanced Input 2 BIN	DI#34	bit	R	1 = active	3034

The inputs on the IF-05 in combination with the BI8.4 module work only as digital inputs.

	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
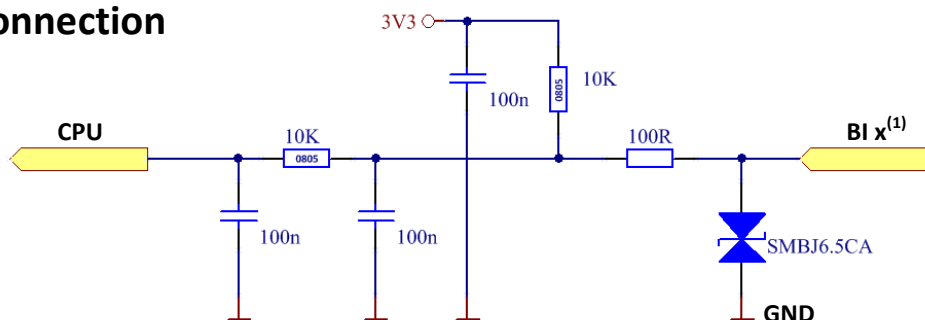
Examples of Connections

Digital Dry Contact Schematic

Input Connected with GND = log. 1.
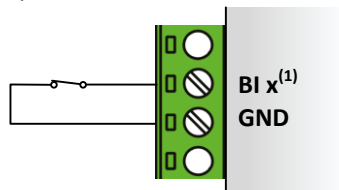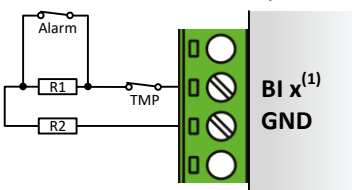

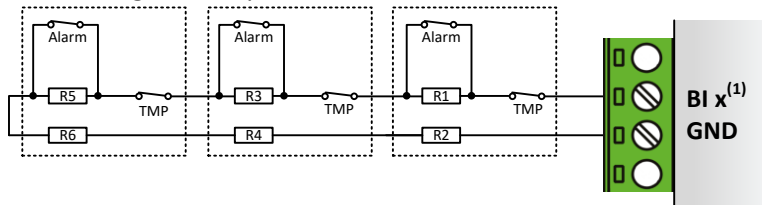Input Disconnected from GND = log. 0.
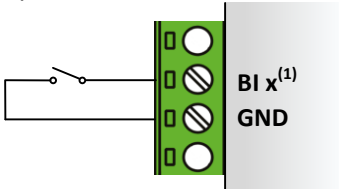
Alarm Contact Schematic

Single Balanced Loop
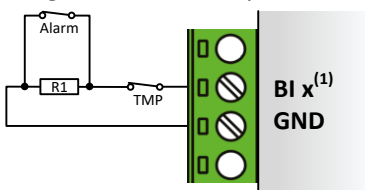
Double Balanced Loop

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
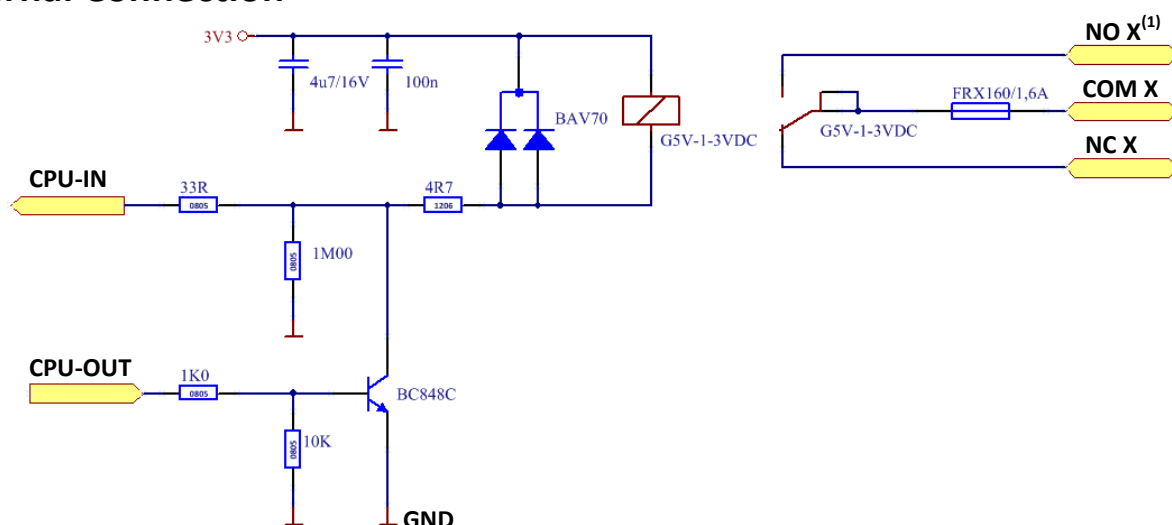
Examples of Connections
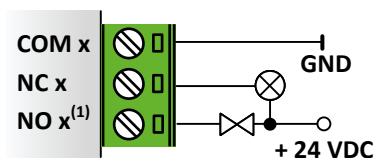
Relay NOC (Changeover) output has a common terminal COM. Two state relay can switch both AC and DC voltages to load. In the non-voltage state are relay terminals NO x[1] - COM disconnected and NC x[1] – COM connected. The relay is turned on when the program set logic 1 at its coil. When the relay is 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

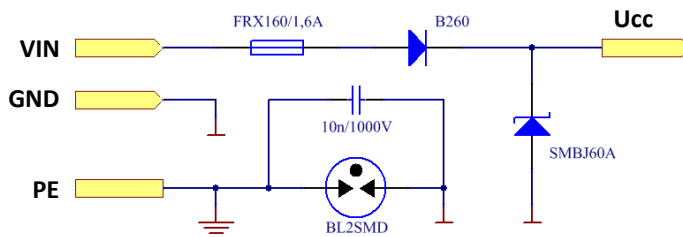| Parameter	Value	Note
Contact Type	NOC	Changeover Relay
Number of Poles	1	
Max. Load	0.5 A / 120 VAC	Resistive Load
	1 A / 24 VDC	Resistive Load
Electrical Lifetime	3,000,000 Operations	
Isolation Voltage	1.000 Vrms / 1 min.	Terminals to Electronic or Case

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

The PE terminal must be earthed according to the applicable standards in the country of installation. Correct grounding protects personnel against electric shock and improves device immunity from interferences. If dangerous voltage is applied to the terminals, only personnel with appropriate electrical education may perform installation and servicing of the equipment. Before any manipulation with the device, including disconnecting and connecting the terminals, the dangerous voltage must be disconnected.

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 cover of the device is galvanically connected to the PE terminal which is galvanically isolated from the device electronic. It allows the user to use the device even in systems with a grounded + pole.
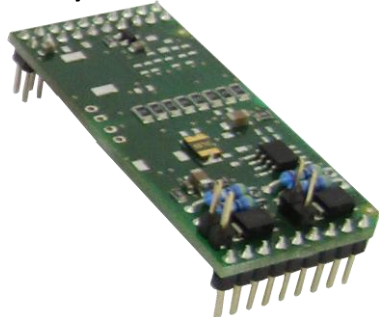
| Parameter	Value	Note
Input Voltage Range	10 to 60 VDC	
Surge Protection	600 W	10 / 1000 µs
Short Circuit Protection	Polyswitch	
Reverse Polarity Protection	Diode	

IO modules include one IF slot which can be used for IF modules. The main purposes of the IF modules are to provide:

❖ RS485 connectivity if the IO module board is used in the standalone addressable IO module communicating with PLC via the RS485 bus

❖ Provides serial interfaces for communication with other systems

❖ Additional inputs and outputs into system

Samostatný IF modul	**IF modul osazený na IO modulu**
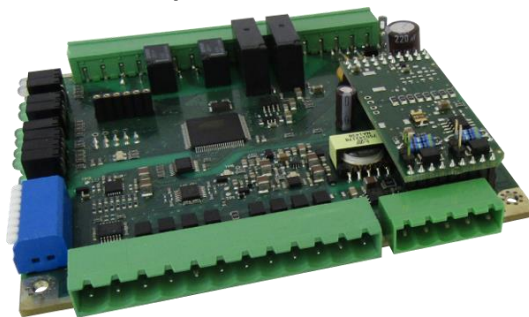
📖 **IF modules must be plugged into the IF slot when the power is turned off. After, the power is turned on the new IF module is automatically detected.**

📖 **When ordering, we recommend using the online configurator available at www.iplog.eu.**

Overview Table of IF Modules

ORDERING		CONNECTOR D				
NAME	**DESCRIPTION**	**1**	**2**	**3**	**4**	**5**
IF-01	2x RS485	A1+	B1-	GND	B2-	A2+
IF-01G	2x RS485 ISO	A1+	B1-	GND-ISO	B2-	A2+
IF-02	2x RS232	Rx1	Tx1	GND	Rx2	Tx2
IF-02G	2x RS232 ISO	Rx1	Tx1	GND-ISO	Rx2	Tx2
IF-04G	RS485 ISO, DALI	A+	B-	GND-ISO	-D BUS	+D BUS
IF-05	RS485, 2x INPUTS[1]	A+	B-	GND	BI 2	BI 1
IF-06	AUDIO	OUT R	OUT L	GND	IN R	IN L
IF-07G	RS485 ISO, 1-Wire	A+	B-	GND-ISO	1-Wire	5V0-ISO
IF-09	RS485, M-Bus	A+	B-	GND	M-Bus+	M-Bus-
IF-10	KNX	BUS+	BUS+	NC	BUS-	BUS-
IF-11	Wiegand, 2x INPUTS[1]	Data 0	Data 1	GND	BI 2	BI 1
IF-12	4x INPUTS[1]	BI 4	BI 3	GND	BI 2	BI 1
IF-13	RS232 (CTS, RTS, Rx, Tx)	CTS	RTS	GND	Rx	Tx
IF-13G	RS232 (CTS, RTS, Rx, Tx) ISO	CTS	RTS	GND-ISO	Rx	Tx
IF-14G	4x DIGITAL INPUTS (24V)	ISO DI 4	ISO DI 3	GND-ISO	ISO DI 2	ISO DI 1
IF-15	4x OC (NPN) OUTPUTS	OC 4	OC 3	GND	OC 2	OC 1
IF-15G	4x OC (NPN) OUTPUTS ISO	ISO OC 4	ISO OC 3	GND-ISO	ISO OC 2	ISO OC 1
IF-17G	1x RS485, 1x RS232	A+	B-	GND-ISO	Rx	Tx
IF-18G	1x LORA-EP1, 1x RS485	A+	B-	GND-ISO	Tx/Rx	VCC
IF-21	2x INPUTS[1], 1x RELAY	COM	NO	GND	BI 2	BI 1
IF-22G	2x DI. INPUTS 24V, 1x RELAY	COM	NO	GND-ISO	ISO DI 2	ISO DI 1

[1] Alarm / 5V Digital Inputs. It does not apply to combination with the BI8.1 and BI8.4 module, where they only work as digital.

IF-	That way labeled IF modules are suitable for standalone IO modules. They are always connected to a PLC or LAN-RING switch via the RS485 bus.