- 8x NO 230V Relays
- 3x Optically Separated 230V Inputs
- 2x NOC 230V Relays
- 1x Slot for IF Module
- Operating Range –40°C to +70°C
- 600 W Integrated Surge Protections

DIN35 Installation

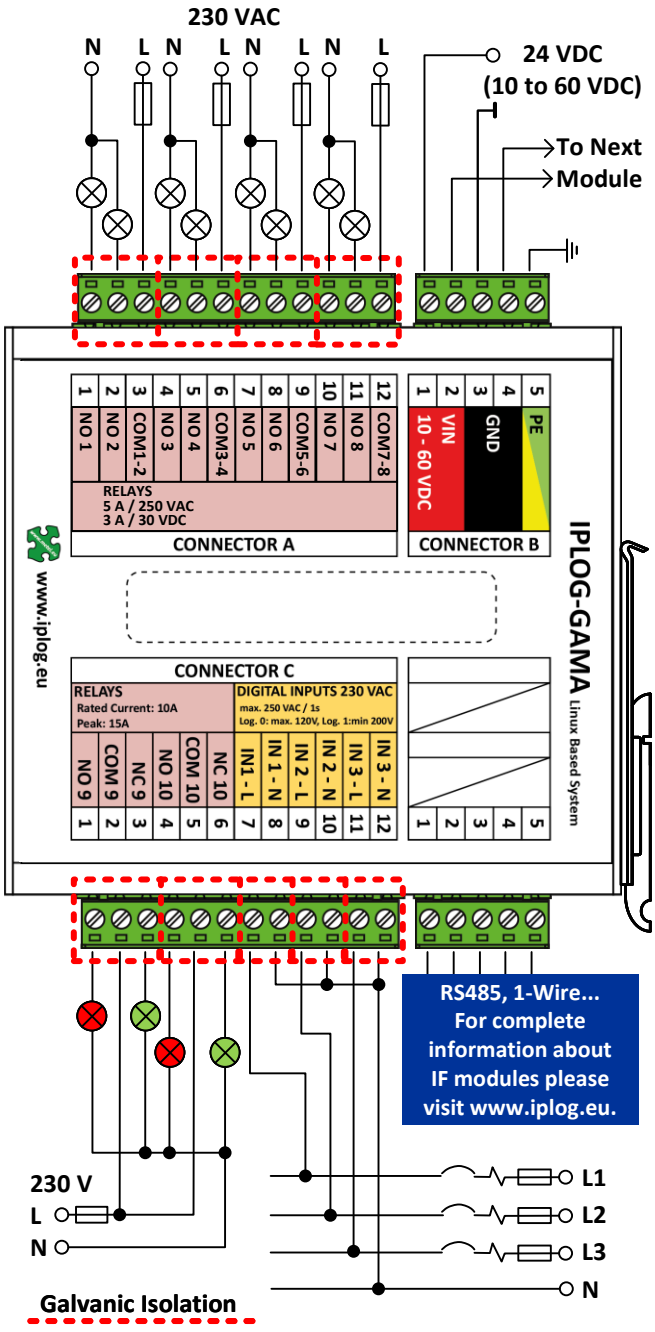
PCB Version

RE8.1 is an industrial module which can be easily adapted for a wide range of tasks. It can be used as IPLOG-G submodule or as standalone addressable module at MODBUS RTU bus.

ORDERING	PRODUCT NAME	CODE	NOTE
	RE8.1-01-BOX	5000-0501	2x RS485
	RE8.1-01G-BOX	5000-0502	2x RS485 (isolated)
	RE8.1-05-BOX	5000-0507	1x RS485, 2x ALARM IN
	RE8.1-PCB	0000-0500	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 mm²	

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.

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.

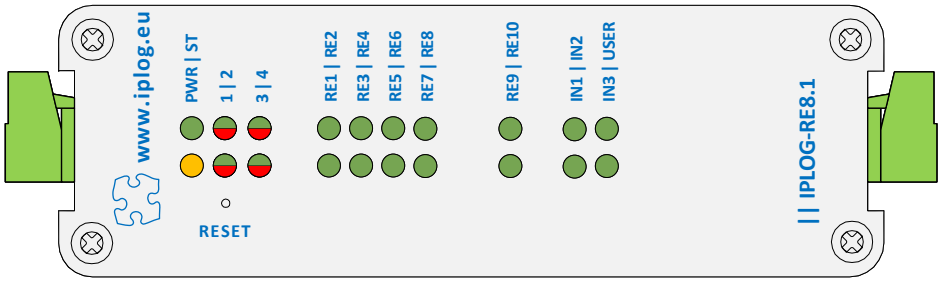
CONNECTOR A			LED	
12	COM 7-8	Common terminal of NO Relays 7 - 8		
11	NO 8	Normally Open High Voltage Relay	RE8	Closed = Log. 1 = Lights
10	NO 7	Normally Open High Voltage Relay	RE7	Closed = Log. 1 = Lights
9	COM 5-6	Common terminal of NO Relays 5 - 6		
8	NO 6	Normally Open High Voltage Relay	RE6	Closed = Log. 1 = Lights
7	NO 5	Normally Open High Voltage Relay	RE5	Closed = Log. 1 = Lights
6	COM 3-4	Common terminal of NO Relays 3 - 4		
5	NO 4	Normally Open High Voltage Relay	RE4	Closed = Log. 1 = Lights
4	NO 3	Normally Open High Voltage Relay	RE3	Closed = Log. 1 = Lightsv
3	COM 1-2	Common terminal of NO Relays 1 - 2		
2	NO 2	Normally Open High Voltage Relay	RE2	Closed = Log. 1 = Lights
1	NO 1	Normally Open High Voltage Relay	RE1	Closed = Log. 1 = Lights

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

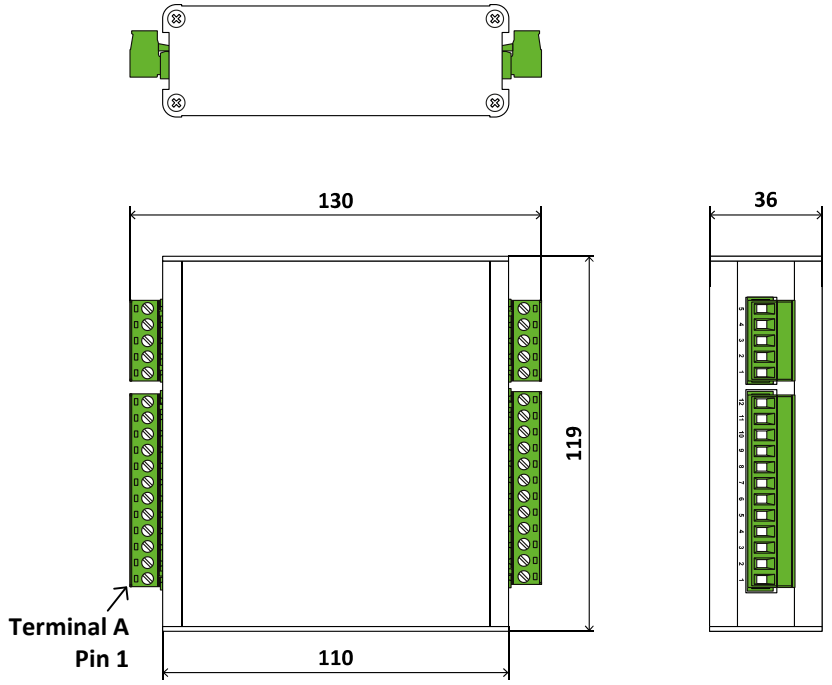
CONNECTOR C			LED	
12	IN3-N	Digital Input IN3, 230 VAC, Neutral Conductor		
11	IN3-L	Digital Input IN3, 230 VAC, Phase Conductor	IN3	Log. 1 = Lights
10	IN2-N	Digital Input IN2, 230 VAC, Neutral Conductor		
9	IN2-L	Digital Input IN2, 230 VAC, Phase Conductor	IN2	Log. 1 = Lights
8	IN1-N	Digital Input IN1, 230 VAC, Neutral Conductor		
7	IN1-L	Digital Input IN1, 230 VAC, Phase Conductor	IN1	Log. 1 = Lights
6	NC 10	Normally Close High Voltage Relay		
5	COM 10	Common terminal of NOC Relay 10		
4	NO 10	Normally Open High Voltage Relay	RE10	Closed = Log. 1 = Lights
3	NC 9	Normally Close High Voltage Relay		
2	COM 9	Common terminal of NOC Relay 9		
1	NO 9	Normally Open High Voltage Relay	RE9	Closed = Log. 1 = Lights

LED		LED	
1	BUS 1 (Tx = Red / Rx = Green)	3	IF05 Input BI1 Sabotage Short = Log. 1 = Lights
2	BUS 2 (Tx = Red / Rx = Green)	4	IF05 Input BI2 Sabotage Short = Log. 1 = Lights

Galvanic Isolation

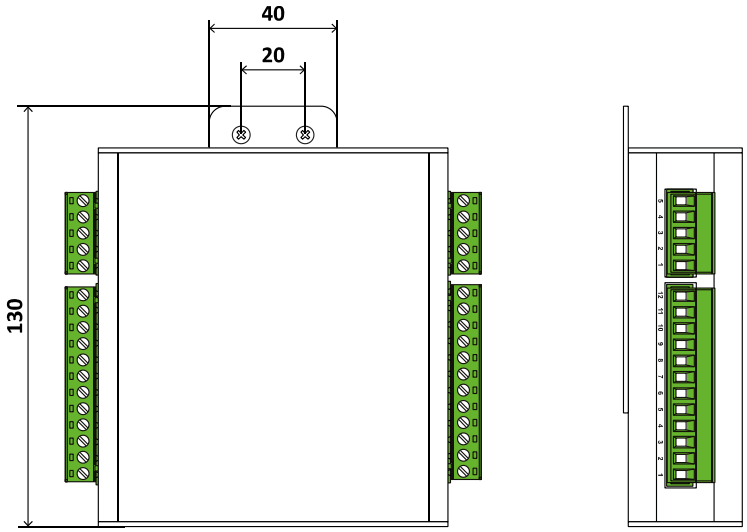


BOX Version Dimensions



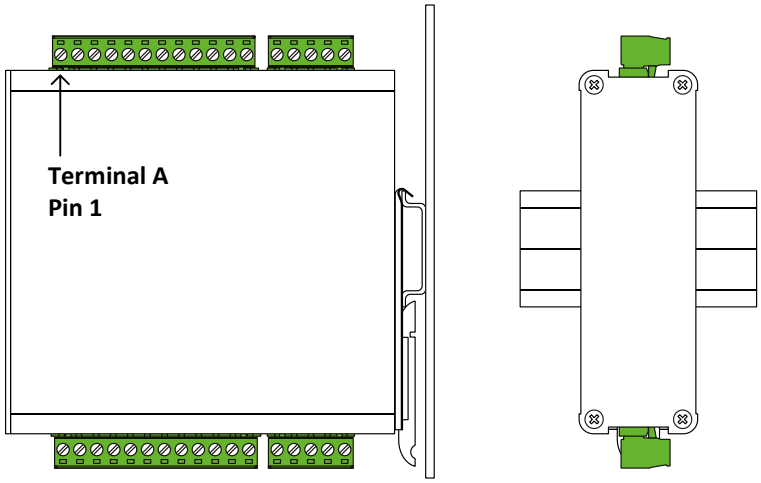
BOX Version Installation

Flat Surface



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

DIN35 Surface



📖 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 Identification	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 States of Inputs	Balanced Input 1 $_{BIN}$	DI#33	bit	R	0 = inactive 1 = active	3033
	Balanced Input 2 $_{BIN}$	DI#34	bit	R		3034
	Balanced Input 1	AI#33	u16	R	1000 = 1000 Ω 0 = 0 Ω	5033
	Balanced Input 2	AI#34	u16	R		5034

	Subject	Channel	Type	R/W	Value	Offset
States of Digital Inputs and Relay Outputs	Digital Input 1, 230 V	DI#01	bit	R	0 = inactive 1 = active	3001
	Digital Input 2, 230 V	DI#02	bit	R		3002
	Digital Input 3, 230 V	DI#03	bit	R		3003
	COIL Relay 1	DI#04	bit	R		3004
	COIL Relay 2	DI#05	bit	R		3005
	COIL Relay 3	DI#06	bit	R		3006
	COIL Relay 4	DI#07	bit	R		3007
	COIL Relay 5	DI#08	bit	R		3008
	COIL Relay 6	DI#09	bit	R		3009
	COIL Relay 7	DI#10	bit	R		3010
	COIL Relay 8	DI#11	bit	R		3011
	COIL Relay 9	DI#12	bit	R		3012
	COIL Relay 10	DI#13	bit	R		3013
	Inputs	DI#16 - DI#01	u16	R	0x0000 - 0x1FFF	3001

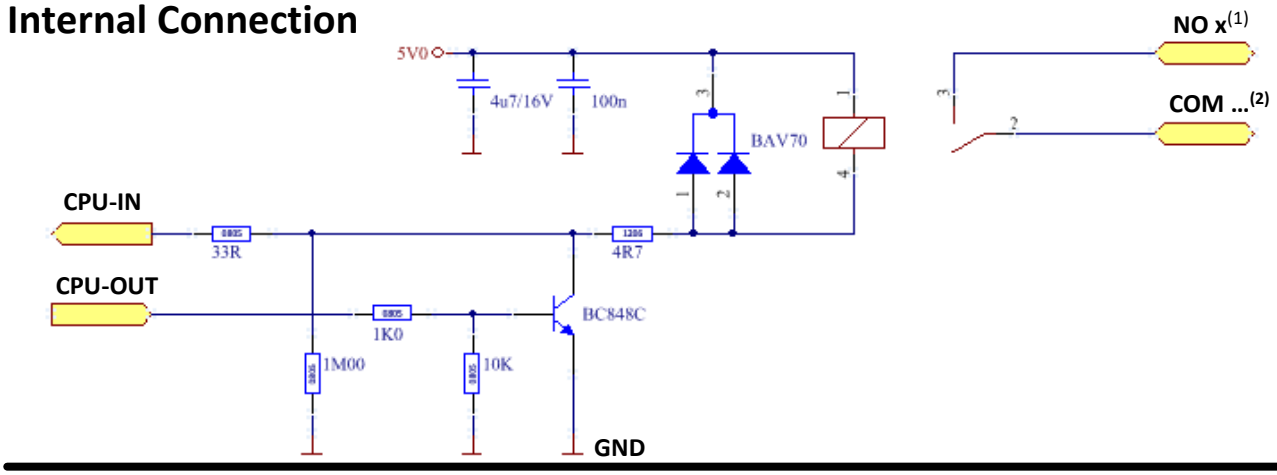
	Subject	Channel	Type	R/W	Value	Offset
Relay Outputs	Relay Output 1	DO#01	bit	RW	0 = inactive 1 = active	4001
	Relay Output 2	DO#02	bit	RW		4002
	Relay Output 3	DO#03	bit	RW		4003
	Relay Output 4	DO#04	bit	RW		4004
	Relay Output 5	DO#05	bit	RW		4005
	Relay Output 6	DO#06	bit	RW		4006
	Relay Output 7	DO#07	bit	RW		4007
	Relay Output 8	DO#08	bit	RW		4008
	Relay Output 9	DO#09	bit	RW		4009
	Relay Output 10	DO#10	bit	RW		4010
	Outputs	DO#16 - DO#01	u16	RW	0x0000 - 0x03FF	4001

REVISION: 201807 - Default
201912 - Extension of modbus registers
202111 - Updated list of IF modules
202601 - Change of COM terminal blocks for NO relays

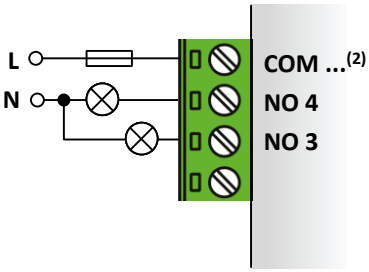
Relay outputs are capable of switching loads with either AC or DC voltage.

🕮 **In case of inductive load switching, it is recommended to use external snubber protection circuits**

Internal Connection



Examples of Connections



Relay NO (Normally Open) outputs NO 1 to NO 2 have a common terminal COM 1-2, outputs NO 3 to NO 4 have a common terminal COM 3-4, outputs NO 5 to NO 6 have a common terminal COM 5-6, outputs NO 7 to NO 8 have a common terminal COM 7-8. Two state relays can switch both AC and DC voltages to load. In the non-voltage state are relay terminals NO x(1) - COM...(2) disconnected. 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 lights up.

Relay terminals must be protected with an external circuit breaker 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

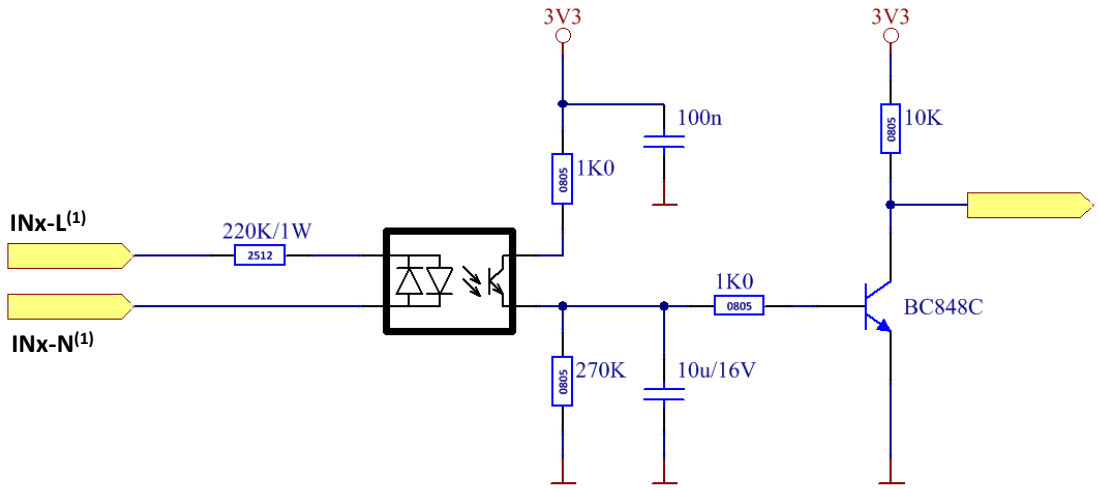
Parameter	Value	Note
Contact Type	NO	Normally Open
Number of Poles	1	
Max. Load	5 A / 250 VAC	Resistive Load
	3 A / 30 VDC	Resistive Load
Common Terminal Current	10 A	COM 1-2, COM 3-4, COM 5-6
		COM 7-8
Electrical Lifetime	100,000 Operations	At 250 VAC / 5A
Isolation Voltage	2.500 Vrms / 1 min.	Terminals to Electronic or Case

(1) The letter „x“ replaces the output number.

(2) Common ground terminal is shared by group of relay outputs. „...“ replaces the output numbers.

The galvanically isolated 230 V inputs can be connected to a phase voltage of 230 V AC and can be used, for example, to detect the presence / failure of the phase voltage. Inputs are accessible from METEL IEC 61131-3 IDE or directly from Linux scripts. 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 “.

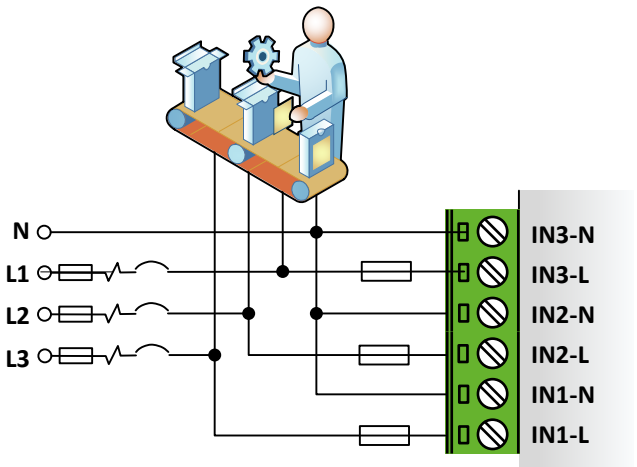
Internal Connection



Example of Connection

Power failure detection

The 230 V inputs monitor the presence of voltage at the inlet to the production line. Any outage may be signaled in many ways. Sending of warning messages, turning on the warning light or eventually displaying the fault status in SCADA software. Of course, the PLC allows the individual types of signaling to be combined, repeatedly used, or require confirmation of their reception. For example, if the sent SMS is not confirmed within the set interval, another is sent to another number.



Technical Parameters

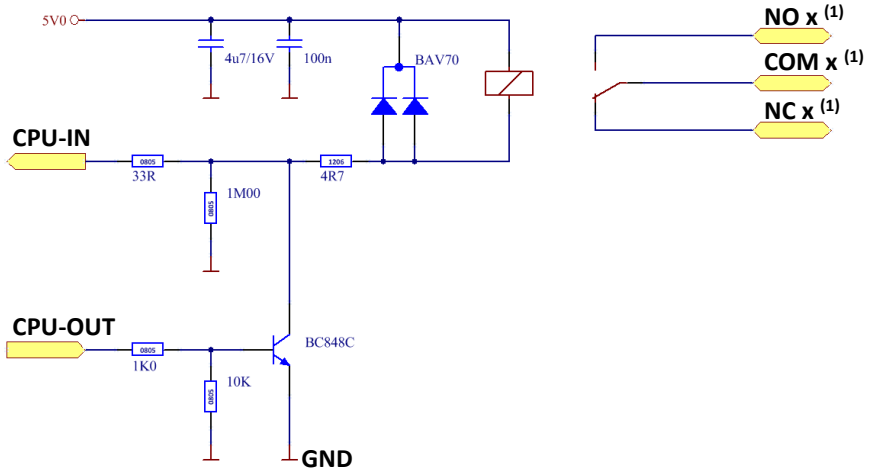
Parameter	Value	Note
Input Voltage AC	Log. 0: 0 VAC to 120 VAC	
	Log. 1: 200 VAC to 250 VAC	Max. 250 VAC / 1 s
Input Current	1 mA at 230VAC	IN x(1)
Isolation Voltage	2.500 V_{RMS}	IN x(1) / CPU
	1.000 V_{RMS}	Between IN x(1) Inputs

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

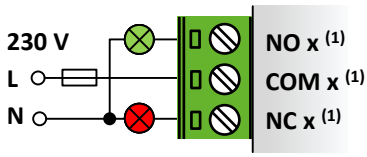
Relay outputs are capable for switching loads with either AC or DC voltage.

🕮 **In case of inductive load switching, it is recommended to use external snubber protection circuits**

Internal Connection



Examples of Connections



In the non-voltage state are relays terminals NO x(1) - COM x(1) disconnected and NC x(1) – COM x(1) 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 lights up.

Relay terminals must be protected with an external circuit breaker 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	
Number of Poles	1	
Max. Load	10 A / 250 VAC	Resistive Load, Peak 15 A
Electrical Lifetime	50.000 Operations	Minimal Value
Isolation Voltage	2.500 Vrms / 1 min.	Terminals to Electronic or Case

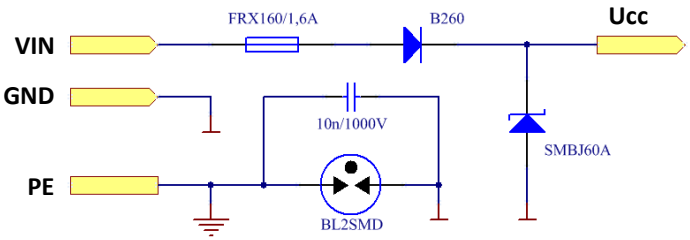
(1) The letter „x“ replaces the output number.

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



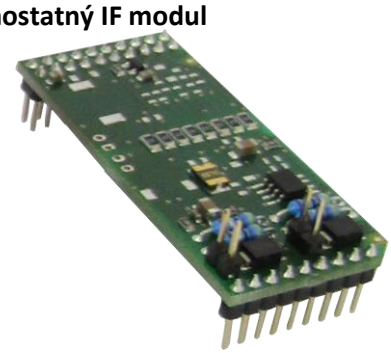
🕮 **The cover of the device is galvanically connected to the PE terminal which is galvanically isolated from the device electronic. It allows the user to use the device even in systems with a grounded + pole.**

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	

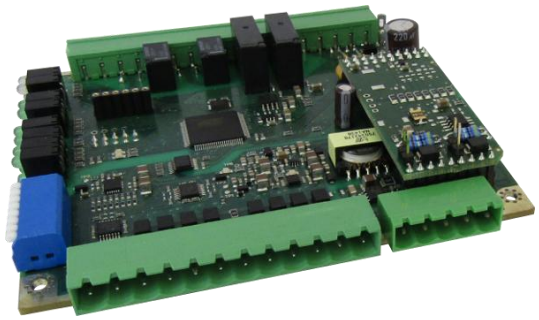
IO modules include one IF slot which can be used for IF modules. The main purposes of the IF modules are to provide:

- ❖ 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.