

- ❖ 8x PUSH-PULL Transistor Outputs
- ❖ 4x 24 V Digital Inputs
- ❖ 3x 5V Digital Inputs or 10-bit Alarm Inputs
- ❖ 1x NOC 24V Relay Output
- ❖ 1x Slot for IF Module
- ❖ Operating Range -40°C to $+70^{\circ}\text{C}$
- ❖ 600 W Integrated Surge Protections



DIN35 Installation



PCB Version

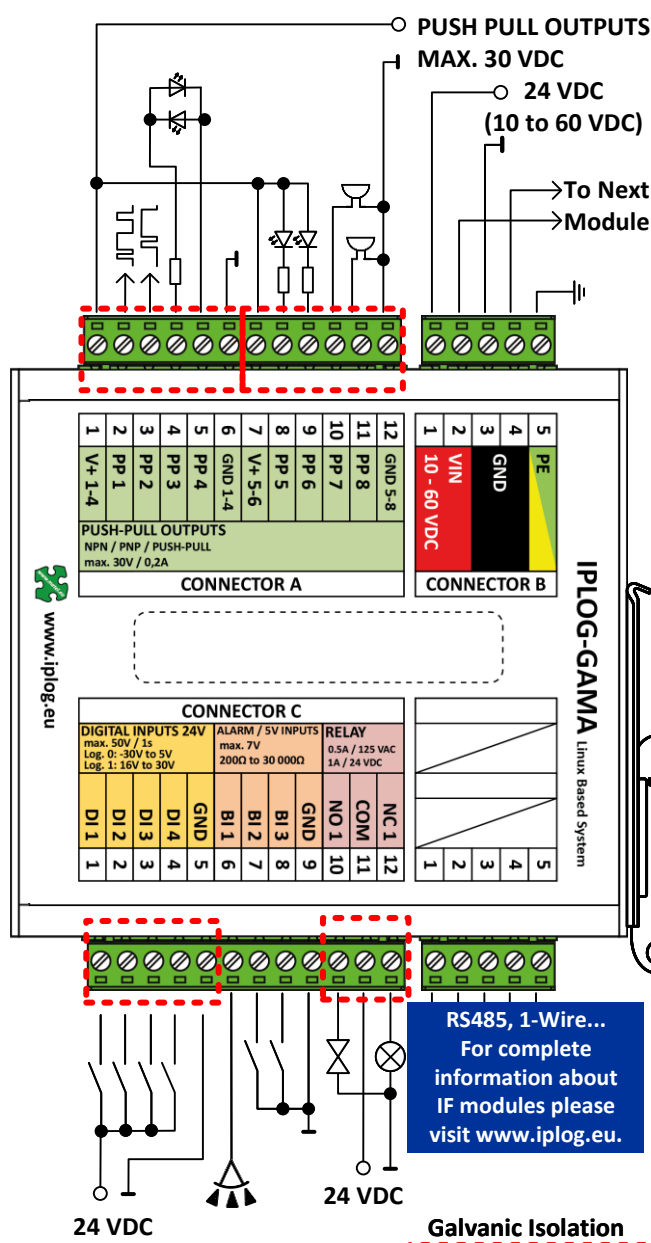
PP8.1 is an industrial module which can be easily adapted for a wide range of tasks. It can be used as IPLOG-G submodule or as standalone addressable module at MODBUS RTU bus.

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 $+70^{\circ}\text{C}$	
Storage Range	-40 to $+70^{\circ}\text{C}$	
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	

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

PRODUCT NAME	CODE	NOTE
PP8.1-01-BOX	5000-0701	2x RS485
PP8.1-01G-BOX	5000-0702	2x RS485 (isolated)
PP8.1-05-BOX	5000-0707	1x RS485, 2x ALARM IN
PP8.1-PCB	0000-0700	PCB Module
For a Full Range of Interfaces Please Visit www.iplog.eu .		

ORDERING



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.

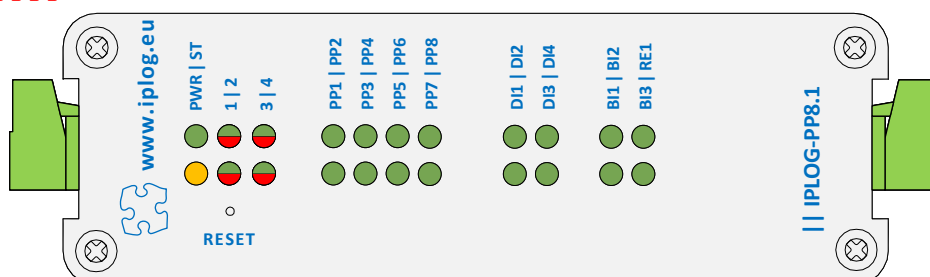
CONNECTOR A			LEDS	
12	GND 5-8	External Power - Minus Pole		
11	PP 8	Push-Pull Output	PP8	Closed = Log. 1 = Lights Mode for Each Output can be set Independently of another.
10	PP 7	Push-Pull Output	PP7	
9	PP 6	Push-Pull Output	PP6	
8	PP 5	Push-Pull Output	PP5	
7	V+ 5-6	External Power - Plus pole		
6	GND 1-4	External Power - Minus Pole		
5	PP4	Push-Pull Output	PP4	
4	PP3	Push-Pull Output	PP3	
3	PP2	Push-Pull Output	PP2	
2	PP1	Push-Pull Output	PP1	
1	V+ 1-4	External Power - Plus pole		

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

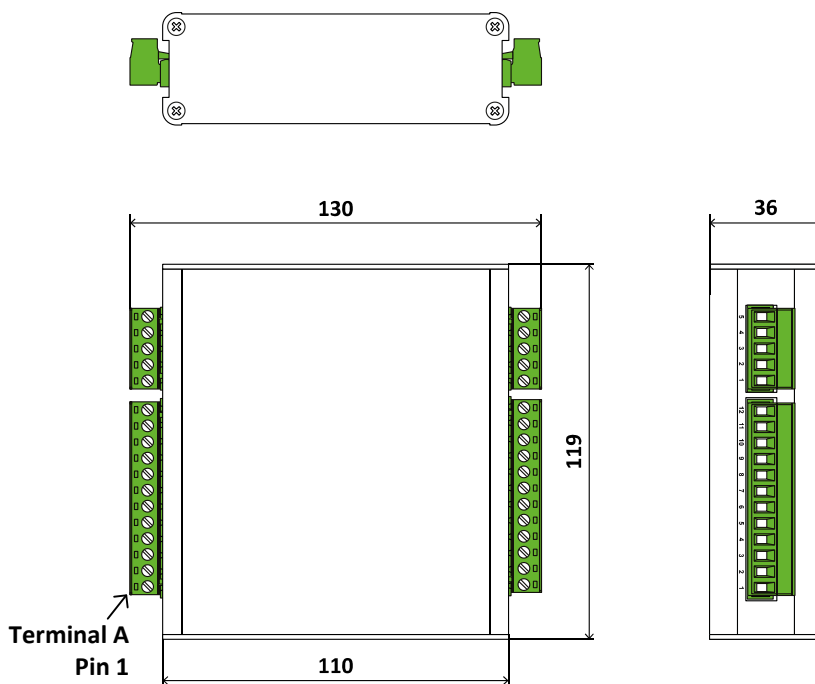
CONNECTOR C			LEDS	
12	NC 1	Normally Closed		
11	COM	Common terminal of NOC Relay		
10	NO 1	Normally Open	RE1	Closed = Log. 1 = Lights
9	GND	Ground		
8	BI 3	10-bit Alarm or Digital Input 5 V DC	BI3	Sabotage Short = Log. 1 = Lights
7	BI 2	10-bit Alarm or Digital Input 5 V DC	BI2	Sabotage Short = Log. 1 = Lights
6	BI 1	10-bit Alarm or Digital Input 5 V DC	BI1	Sabotage Short = Log. 1 = Lights
5	GND	Common Ground Terminal of Digit, Inputs 1 to 4		
4	DI 4	Digital Input 24 V - DC / AC	DI4	Log. 1 = Lights
3	DI 3	Digital Input 24 V - DC / AC	DI3	Log. 1 = Lights
2	DI 2	Digital Input 24 V - DC / AC	DI2	Log. 1 = Lights
1	DI 1	Digital Input 24 V - DC / AC	DI1	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

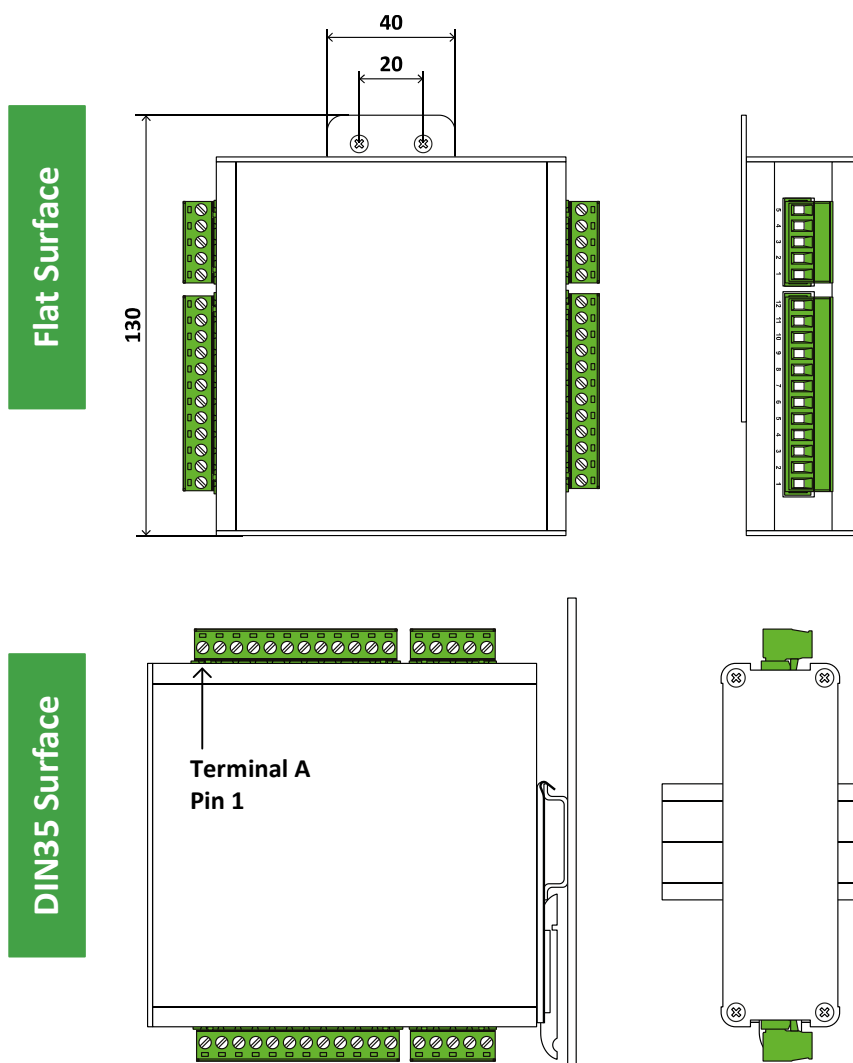
Galvanic Isolation



BOX Version Dimensions



BOX Version Installation



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

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
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	3033
	Balanced Input 2 _{BIN}	DI#34	bit	R	1 = active	3034
	Balanced Input 1	AI#33	u16	R	1000 = 1000 Ω	5033
	Balanced Input 2	AI#34	u16	R	0 = 0 Ω	5034

Subject	Channel	Type	R/W	Value	Offset
States of Digital Inputs and Relay Output	Digital Input 1	DI#01	bit	R	3001
	Digital Input 2	DI#02	bit	R	3002
	Digital Input 3	DI#03	bit	R	3003
	Digital Input 4	DI#04	bit	R	3004
	Balanced Input 1 _{BIN}	DI#05	bit	R	3005
	Balanced Input 2 _{BIN}	DI#06	bit	R	3006
	Balanced Input 3 _{BIN}	DI#07	bit	R	3007
	COIL Relay 1	DI#08	bit	R	3008
	Inputs	DI#16 - DI#01	u16	R	0x0000 - 0x00FF
States of Balanced Inputs	Balanced Input 1	AI#05	u16	R	5005
	Balanced Input 2	AI#06	u16	R	5006
	Balanced Input 3	AI#07	u16	R	5007

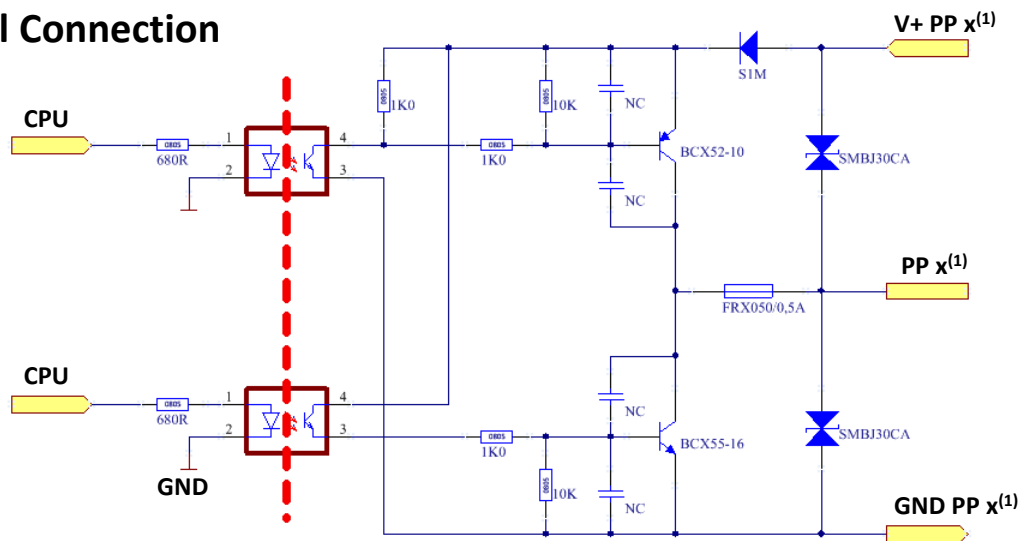
Subject	Channel	Type	R/W	Value	Offset
Input Mode	Digital Input 1	DI#01 mode	u16	RW	0 = None ⁽¹⁾
	Digital Input 2	DI#02 mode	u16	RW	1 = Falling Edge
	Digital Input 3	DI#03 mode	u16	RW	2 = Rising Edge
	Digital Input 4	DI#04 mode	u16	RW	3 = Change Edge
	Balanced Input 1	DI#05 mode	u16	RW	⁽¹⁾ Default
	Balanced Input 2	DI#06 mode	u16	RW	
	Balanced Input 3	DI#07 mode	u16	RW	
Counter	Digital Input 1	DI#01 counter	u16	RW	3201 - 02
	Digital Input 2	DI#02 counter	u16	RW	3203 - 04
	Digital Input 3	DI#03 counter	u16	RW	3205 - 06
	Digital Input 4	DI#04 counter	u16	RW	3207 - 08
	Balanced Input 1	DI#05 counter	u16	RW	3209 - 10
	Balanced Input 2	DI#06 counter	u16	RW	3211 - 12
	Balanced Input 3	DI#07 counter	u16	RW	3213 - 14

Subject	Channel	Type	R/W	Value	Offset
Push-Pull and Relay Outputs	Push-Pull Output 1	DO#01	bit	RW	4001
	Push-Pull Output 2	DO#02	bit	RW	4002
	Push-Pull Output 3	DO#03	bit	RW	4003
	Push-Pull Output 4	DO#04	bit	RW	4004
	Push-Pull Output 5	DO#05	bit	RW	4005
	Push-Pull Output 6	DO#06	bit	RW	4006
	Push-Pull Output 7	DO#07	bit	RW	4007
	Push-Pull Output 8	DO#08	bit	RW	4008
	Relay Output 1	DO#09	bit	RW	4009
	Outputs	DO#16 - DO#01	u16	RW	0x0000 - 0x01FF
Modes of Outputs	Push-Pull Output 1	DO#01 mode	u16	RW	4101
	Push-Pull Output 2	DO#02 mode	u16	RW	4102
	Push-Pull Output 3	DO#03 mode	u16	RW	4103
	Push-Pull Output 4	DO#04 mode	u16	RW	4104
	Push-Pull Output 5	DO#05 mode	u16	RW	4105
	Push-Pull Output 6	DO#06 mode	u16	RW	4106
	Push-Pull Output 7	DO#07 mode	u16	RW	4107
	Push-Pull Output 8	DO#08 mode	u16	RW	4108

REVISION: 201807 - Default
 201912 - Extension of modbus registers
 202111 - Updated list of IF modules
 202510 - Correction of modbus register

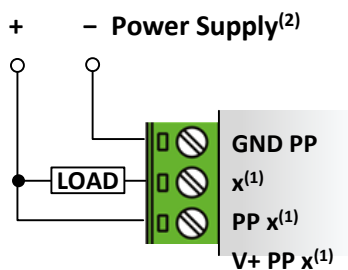
Outputs are capable of switching low DC voltage loads. Outputs can be programmed as open PNP sourcing, NPN sinking outputs or as a push-pull sink / source outputs if alternately switching output transistors. To each output is assigned a LED diode. Outputs are optically isolated which makes it easier to protect the system from the occurrence of ground loops. For this purpose an external isolated source must be used, otherwise the outputs can be powered from the IO module power supply

Internal Connection

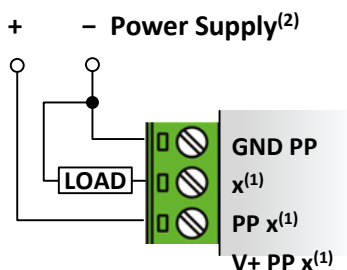


Examples of Connections

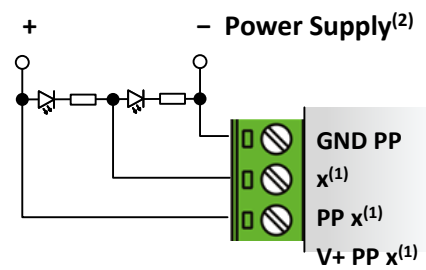
NPN Open Collector



PNP Open Collector



Push-Pull Output



Technical Parameters

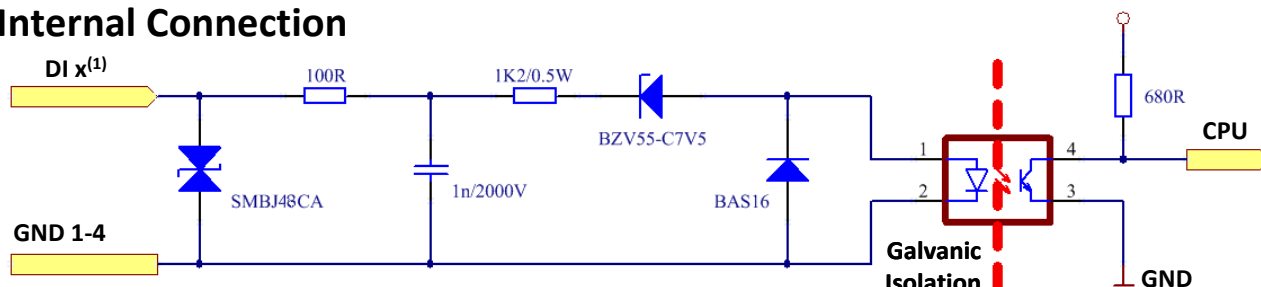
Parameter	Value	Note
Output Type	Open Collector NPN or PNP	Software Selectable
	Push-Pull	
Galvanic Isolation	2.500 V _{RMS}	PP x ⁽¹⁾ Output / CPU
Shortcut Protection	Yes	Polyswitch
Maximum Load	30 V / 0.25 A	
Switching Frequency	Max. 10 kHz	
Surge Protection	600 W	10 / 1000 μs

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

(2) For applications requiring galvanic isolation, use an isolated source, otherwise the IO module power supply can be used.

Optically isolated inputs are optimised for 24V DC/AC levels. They can be connected to external devices such as sensors, switches, buttons, door contacts etc. Each input serves also to counter functions where local CPU count pulses into the internal memory accessible from METEL IEC 61131-3 IDE or directly from Linux scripts. Inputs are divided into groups with common GND terminals. For details please see the table „Location and Designation of Connectors and LEDs “. Logic state 1 of each input is signaled by a relevant LED diode on the front panel.

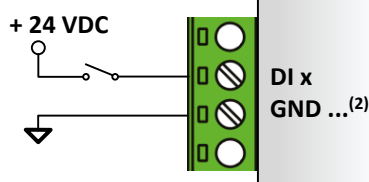
Internal Connection



Examples of Connections

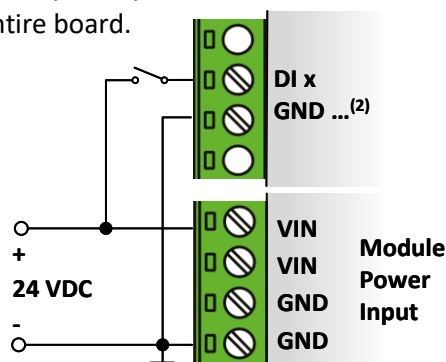
Optically Isolated Sinking Input

The input is powered from an external optically isolated power source. This wiring protects the system from the occurrence of ground loops.



Non-isolated DI Sinking Input

The input is powered from the same source as the entire board.



Technical Parameters

Parameter	Value	Note
Input Voltage DC / AC	Log. 0: -30 V to 5 V	
	Log. 1: +15 V to 30 V	Max. 50 V / 1 s
Digital Input Type	2 (24 VDC)	IEC 61131-2
Input Current	12 mA at 24 VDC	
Galvanic Isolation	2.500 V _{RMS}	Dlx / CPU
Surge Protection	600 W	10 / 1000 µs
Max. Counting Frequency	20 kHz	Duty Cycle 1:1

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

(2) Common ground terminal is shared by group of digital inputs. „...“ replaces the input numbers.

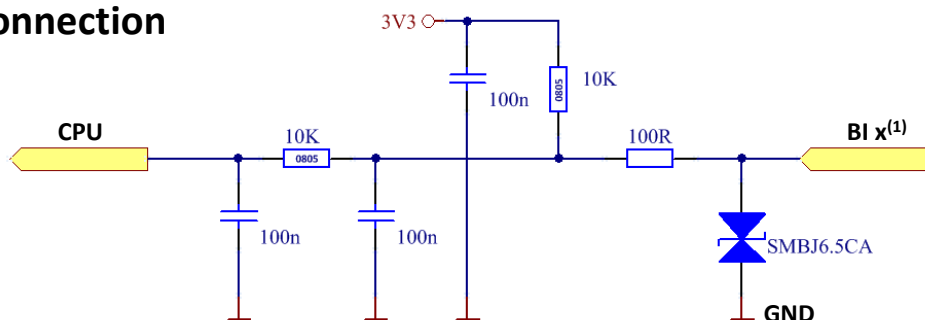
- ❖ In alarm mode there is an input measuring the loop resistance which allows connection of PIR, MW and other alarm sensors. Inputs are therefore capable of distinguishing a normal state, alarm, sabotage, masking, failure, low or high resistance as required by the EN 50131-1 standard.
- ❖ In digital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

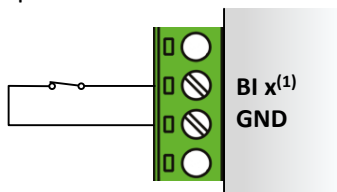
Internal Connection



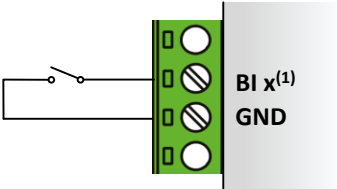
Examples of Connections

Digital Dry Contact Schematic

Input Connected with GND = log. 1.

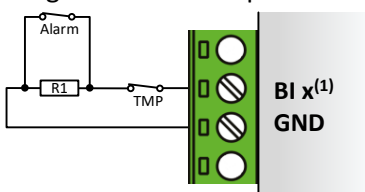


Input Disconnected from GND = log. 0.

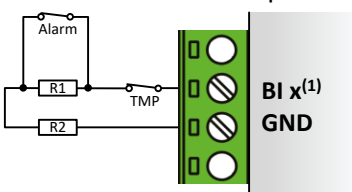


Alarm Contact Schematic

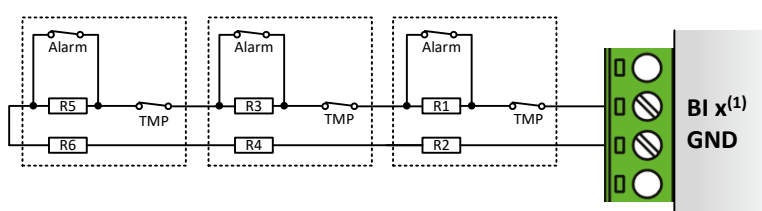
Single Balanced Loop



Double Balanced Loop



Connecting of Multiple Detectors to One Line

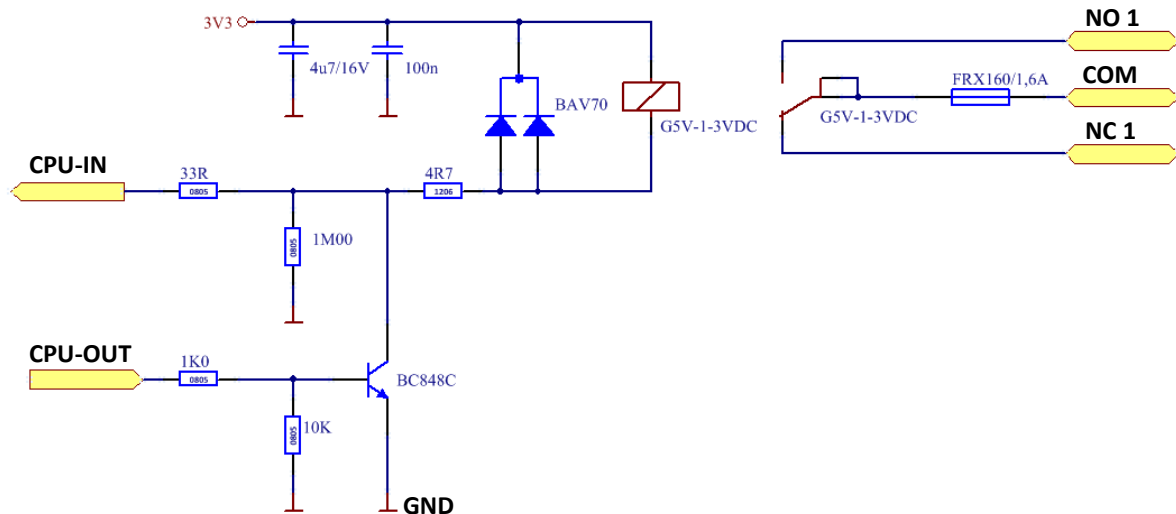


Parameter	Value	Note
Input Voltage	Max. 7 V DC	
Input Current	0.3 mA at 5 V DC	
Surge Protection	600 W	10 / 1000 μs
Alarm Mode		
Range	From 10 to 30.000 Ω	10-bit resolution
Levels	8	Normal, Alarm, Failure, Masking, Sabot. short/open, Low/High Res.
Digital Mode:		
Dry Contact Schematic	Log. 0: Open Log.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

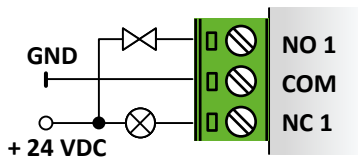
(1) The letter „x“ replaces the input number.

Relay output is capable of switching loads with either AC or DC voltage. 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 signaled 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 1 - COM disconnected and NC 1 – COM connected. The relay is turned on when the program set logic 1 at its coil. When the relay is turned on, corresponding RE1 LED diode on the front side lights 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

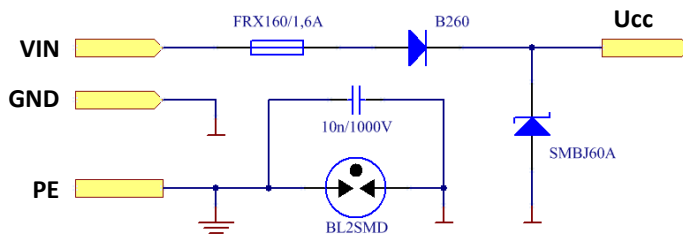


The PE terminal must be earthed according to the applicable standards in the country of installation. Correct grounding protects personnel against electric shock and improves device immunity from interferences. If dangerous voltage is applied to the terminals, only personnel with appropriate electrical 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



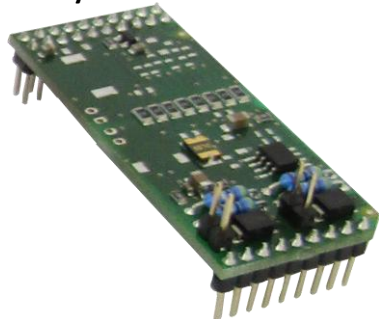
 The cover of the device is galvanically connected to the PE terminal which is galvanically isolated from the device electronic. It allows the user to use the device even in systems with a grounded + pole.

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

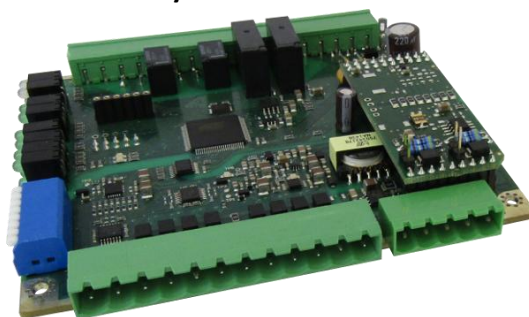
IO modules include one IF slot which can be used for IF modules. The main purposes of the IF modules are to provide:

- ❖ 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 NAME	DESCRIPTION	CONNECTOR D				
		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.