

## PIU-A

### Universal interface for occupancy sensors

The PIU-A is a universal interface for occupancy sensors, with a switch-on and switch-off delay function.

The PIU-A is used in air conditioning systems in conjunction with the Cerberus IR210 passive infra-red sensor (or other standard sensor) and various controllers to establish whether or not a room is occupied.



**PIU-A**

#### Technical data

Supply voltage	12 ... 16 VDC
Current consumption	5 mA
Output terminals 3-1:	
Sink current	OC* 20 mA max. @ 28 VDC max.
Voltage	OC* 28 VDC max. @ 20 mA max.
Output resistance	22 Ω
Input signal	Relay, e.g. from IR210 occupancy sensor
Interference immunity	Class 2**
Connection	Two 3-wire connections
Ambient temperature:	
Transport	0 ... 50 °C
Storage	-20 ... 70 °C
Ambient humidity	max. 95 % RH, non-condensing
Input load (Terminals 1+2)	100 mA (max. three IR210B sensors)

\* Open collector

\*\* "Stringent requirements" class

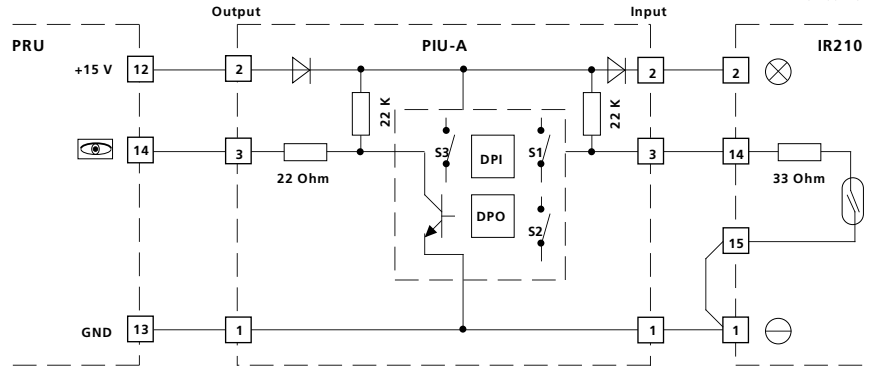
#### Principle of operation

The PIU-A is the interface between a controller (e.g. PRONTO PRU, PRBB, BCB1 and control modules in the INTEGRAL RS range) and one or more occupancy sensors, such as the Cerberus IR210B (without memory function). The output relay of the IR210B supplies the input signal to the PIU-A interface. The relay contact is closed when the room signal is "Unoccupied".

The output signal from the PIU-A is a static, open collector occupancy signal, which can be inverted by means of a switch. Additional switches (two each) allow individual switch-on and switch-off delays to be set.

#### Construction

- Plastic housing
- PCB with electronic components



Block diagram

PIU-A connected to IR210B occupancy sensor and PRU controller

**Switches**

Three switches need to be set on the PIU-A interface:

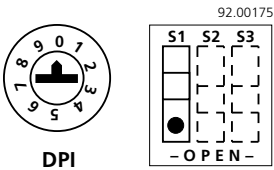
- Rotary switch 'DPI' (10-position) for switch-on delay
- Rotary switch 'DPO' (10-position) for switch-off delay
- DIP-switches 'S1', 'S2', 'S3' (under housing cover).

Factory settings:

- Switches 'DPI' and 'DPO' set to 0
- All DIP switches set to OPEN.

**Setting the switch-on delay**

The switch-on delay is set with the rotary switch marked 'DPI' (Delay Present Input) and DIP switch 'S1' (see table).



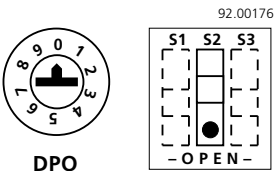
Rotary switch 'DPI' and DIP switch 'S1'

DPI rotary switch settings	0	1	2	3	4	5	6	7	8	9	DIP switch 'S1'
Delay in minutes	0	1	2	3	4	5	6	7	8	9	OPEN
Delay in seconds	0	10	20	30	40	50	60	70	80	90	CLOSED

**Setting the switch-off delay**

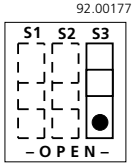
The switch-off delay is set with the rotary switch marked 'DPO' (Delay Present Output) and DIP switch 'S2' (see table below).

When the switch-on delay period has elapsed, the switch-off delay will start. If the input signal becomes active again during this period, the switch-off delay period starts again.



Rotary switch 'DPO' and DIP switch 'S2'

DPO rotary switch settings	0	1	2	3	4	5	6	7	8	9	DIP switch 'S2'
Delay in minutes	0	10	20	30	40	50	60	70	80	90	OPEN
	0	1	2	3	4	5	6	7	8	9	CLOSED



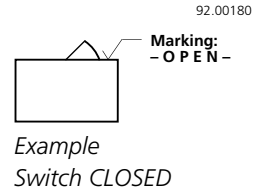
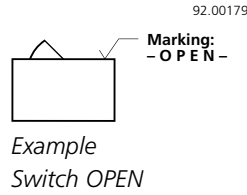
DIP switch 'S3'

### Inverting the output signal

The output signal of the PIU-A can be inverted using DIP switch 'S3'

Output signal level:

S3 open:	Room occupied	→	Output HI
	Room unoccupied	→	Output LO
S3 closed:	Room occupied	→	Output LO
	Room unoccupied	→	Output HI



### Important note

In principle, a number of occupancy sensors and PIU-A interfaces may be connected in parallel or serially (see application examples). When connecting two or more occupancy sensors or PIU-A interfaces to a Landis & Staefa controller, however, it is important to ensure that the maximum load on the 15 VDC supply voltage is not exceeded.

- The total load is calculated as the sum of all devices using the 15 VDC supply voltage.

Examples:

a)	1 IR210B (with LED)*	1 x 31 mA = 31 mA
	1 PIU-A	1 x 5 mA = 5 mA
		<u>Total = 36 mA</u>

b)	2 IR210B (without LED)*	2 x 20 mA = 40 mA
	1 PIU-A	1 x 5 mA = 5 mA
		<u>Total = 45 mA</u>

#### Note

If the 15 VDC supply voltage is also used by other peripheral devices (such as room control units or room temperature sensors), these loads must be included in the calculation.

#### \* LED:

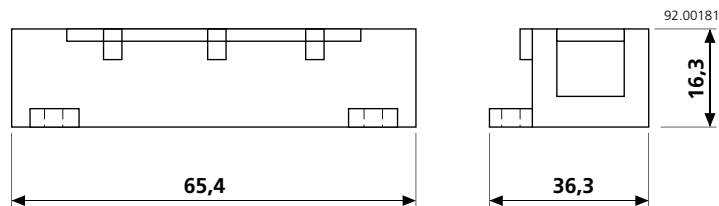
Operation of the LED indicator can be disabled from a link /switch located beneath the sensor cover.

- A maximum of 5 PIU-A interfaces may be connected in parallel.
- The maximum input load (Terminals 1 + 2) for one PIU-A is 100 mA (max. 3 IR210B sensors connected to one PIU-A).
- If several PIU-A interfaces are connected in parallel, the setting for DIP switch S3 (used to invert the input signal) must be the same for all of them. However, the switch-on and switch-off delays may be set individually.

### Mounting

The PIU-A interface can be mounted with two screws (M3) on any base.

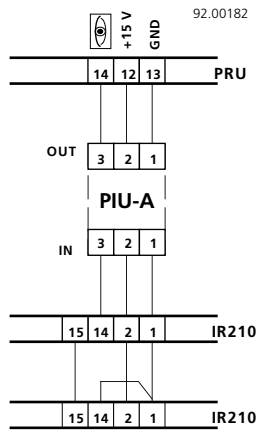
To avoid EMC problems, the PIU-A should be sited as close as possible to the PRONTO PRU controller.



Dimensions [mm]

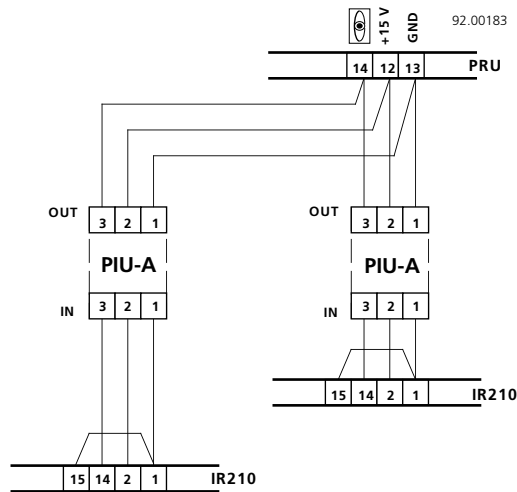
## Application examples with the PRU controller

A maximum of 2 IR210B sensors (*without* LED) or 1 IR210B (*with* LED) may be connected to the +15 V supply voltage of the PRONTO PRU controller:  
 $I_{\max} = 60 \text{ mA}$ .



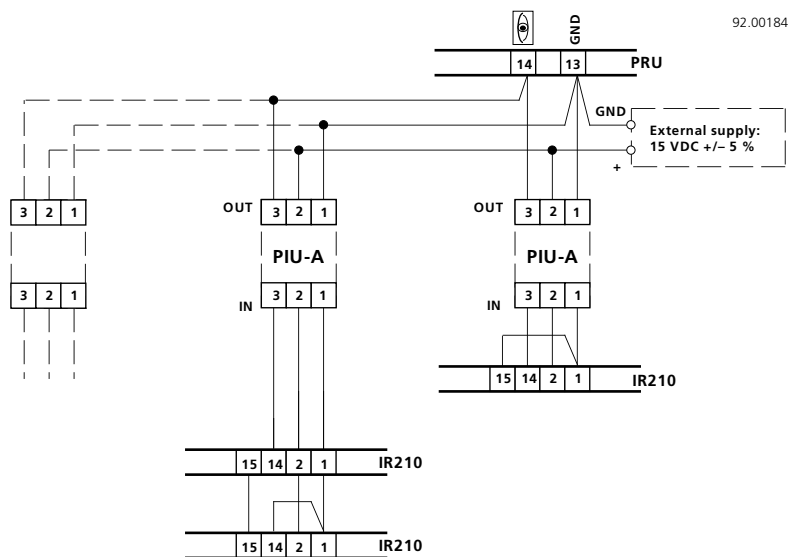
Example 1

Series connection to PRONTO PRU internal supply voltage



Example 2

Parallel connection to PRONTO PRU internal supply voltage

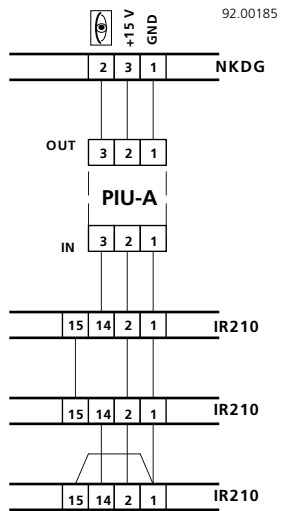


Example 3

Parallel and series connection to external supply voltage

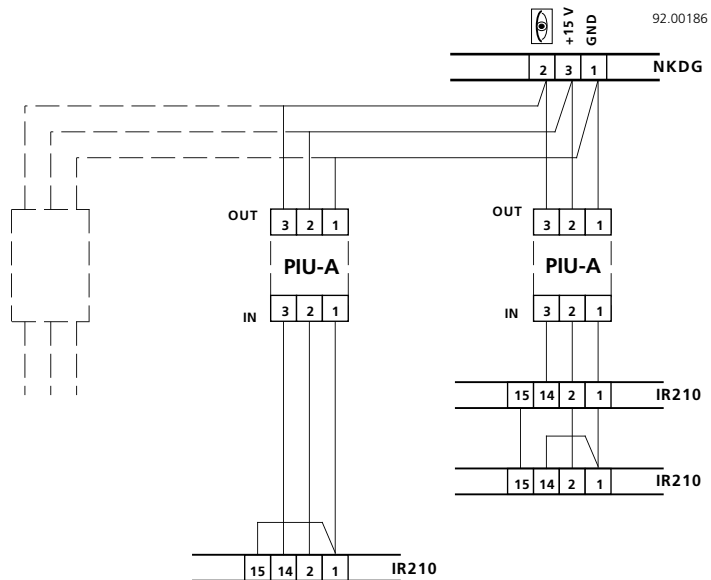
### Application examples with *staefa integral AS1000*

A maximum external load of 500 mA (total for all connected peripheral devices including the terminal modules) may be connected to the 15 VDC supply from the INTEGRAL RS modules.



#### Example 4

Series connection to internal supply voltage from INTEGRAL RS module

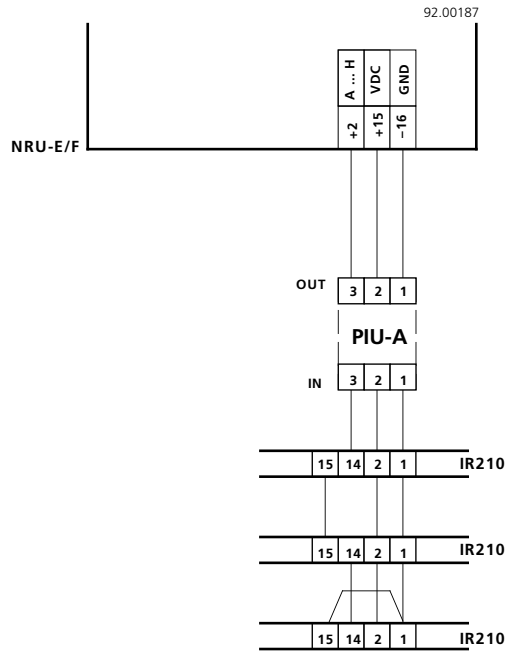


#### Example 5

Parallel and series connection to internal supply voltage from INTEGRAL RS module

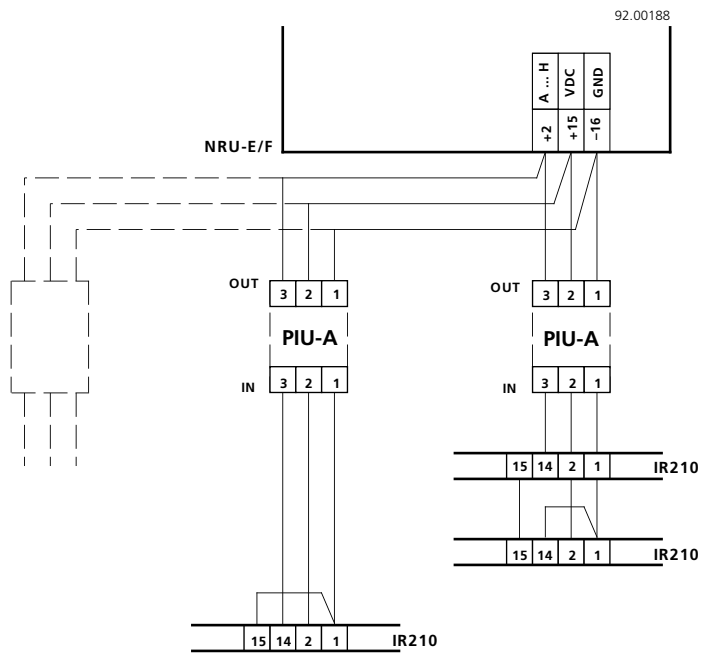
## Application examples with INTEGRAL RS COMPACT modules

A maximum external load of 300 mA may be connected to the internal 15 VDC supply voltage of the INTEGRAL RS COMPACT module.



Example 6

Series connection to internal supply voltage from INTEGRAL RS COMPACT

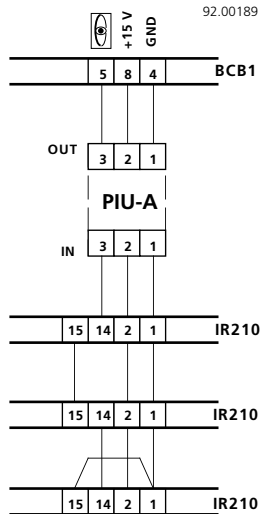


Example 7

Parallel and series connection to internal supply voltage from INTEGRAL RS COMPACT

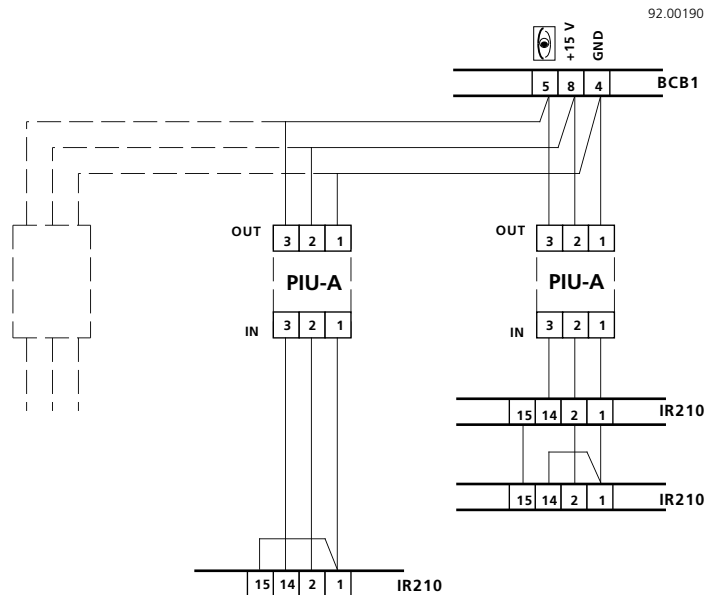
**Application examples with the KLIMO BCB1 controller** (manufactured after 1 January 92)

A maximum external load of 200 mA may be connected to the 15 VDC supply voltage of the BCB1.



*Example 8*

*Series connection to KLIMO BCB1 internal supply voltage*



*Example 9*

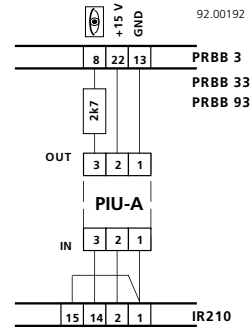
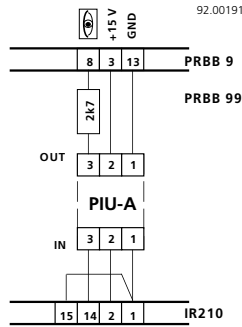
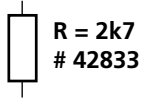
*Parallel and series connections to KLIMO BCB1 internal supply voltage*

### Application examples with type PRONTO PRBB.. controllers

A maximum of 1 IR210B (without LED – see note) may be connected to the 15 V DC supply voltage of the PRBB :  $I_{max} = 30 \text{ mA}$

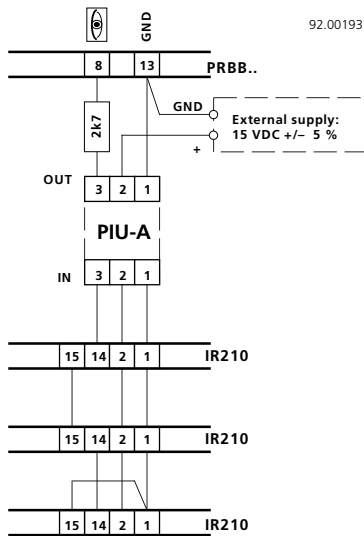
**Note:**

When using the IR210B with type PRBB.. controllers, the LED indicator *must* be disabled (see p. 3).



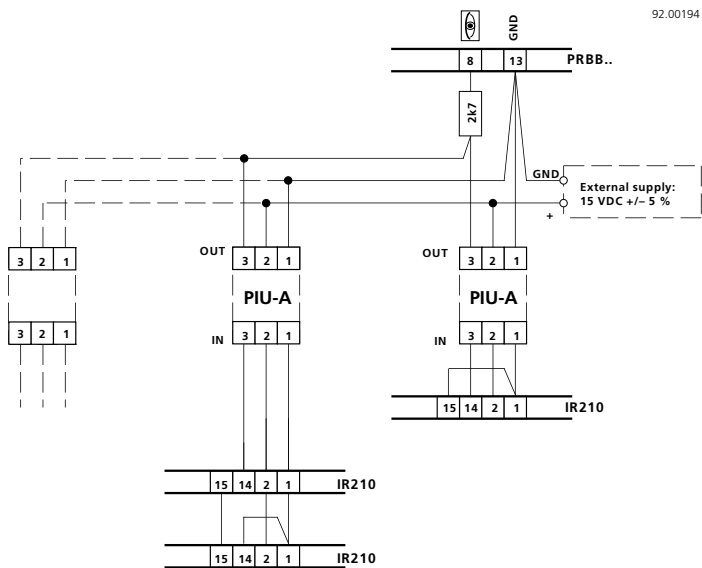
**Example 10**

Maximum of one IR210B (without LED) connected to PRBB.. internal supply voltage



**Example 11**

Series connection to external supply voltage



**Example 12**

Parallel and series connection to external supply voltage