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Hardware manual

Dual pushbutton-Interface

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Version SW: 1.0
Version DOK: 1.1

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THORMANN

1. Safety rules

Caution, electrical hazard !

To maintain continued safety, the following issues have to be observed strictly:

The box must not be used in other ways than described here:

- *Installation and implementation are subject to trained electricians.*
- *The used power supply has to meet all national standards regarding electrical safety (SELV)*
- *Positioning of power and signal lines is critical. Maintain at least 20 cm distance between them.*
- *The relay contacts inside the box are not intended to drive fans, pumps and so on directly. They are designed to be used for control applications only (eg. driving motor starters and power contactors)*
- *Keep the wires inside the box as short as possible and always separate power lines from signal lines.*
- *Wrong connection will destroy pushbutton or box.*
- *Always consider the electrical limits as described later on.*

Caution, no user replaceable parts inside

The box must not be opened except for installation an adjusting purpose by a trained electrician.

There may be hazardous voltages present, even if the power supply is unplugged.

2. Intended use

The box is used to serve as a 'stand alone controller' for 2 WELLKEY® sensor-keys.
In addition it may be used as an interface between the 2 pushbuttons and a PLC when used in larger (e.g. public) applications.
These two versions are available separately and must be specified order-time!

2.2 Overview

- Safe supply of pushbuttons with 12V generated by DC/DC converter out of the 24V rack supply
- Inputs for 2 independent pushbuttons
- Stand-alone or PLC mode of operation
- Optical feedback (flashing) when channel is in operation
- Adjustable runtime for both channels approx.. 1 to 30 minutes
- Avoidance of short switching intervals (threshold time)
- Isolated relay contacts to control power switching equipment
- 2 universal inputs to remotely control the lamps in the pushbuttons when connected to a PLC (PLC version only)

3. „stand-alone-operation“

This mode is specified at order-time and indicated on the label outside: SOLO

3.1. Pushbutton 1

In the non-operative state, the relay K1 is switched off (pins 1 and 2 at the connector are open)
The LED in the pushbutton is on (=pilot light)
Pressing pushbutton 1 (connected to connector pins 9-11) initiates the following actions:

- Relay K1 is switched on (pins 1+2 are closing)
- The LED in the pushbutton starts flashing (=signalling the operation).
- The “children threshold” is activated (pushing the button again and again in the next 3 seconds has no effect)
- After that time, another keystroke stops the cycle, relay K1 opens its contacts.
- If no keystroke happens, the security interval counter stops that channel after a time, adjustable with pot P1 (0,1 to 30 minutes).
- The LED in the pushbutton returns to continuous operation

3.2. Pushbutton 2

In the non-operative state, the relay K2 is switched off (pins 3 and 4 at the connector are open)
The LED in the pushbutton is on (=pilot light)
Pressing Pushbutton 2 (connected to connector pins 13-16) initiates the following actions:

- Relay K2 is switched on (pins 3+4 are closing)
- The LED in the pushbutton starts flashing (=signalling the operation).
- The “children threshold” is activated (pushing the button again and again in the next 3 seconds has no effect)
- After that time, another keystroke stops the cycle, relay K2 opens its contacts.
- If no keystroke happens, the security interval counter stops that channel after a time, adjustable with pot P2 (0,1 to 30 minutes).
- The LED in the pushbutton returns to continuous operation

Both channels are working independently !

4. PLC operation mode

That mode is operational if the label is marked “SPS”. (specified at order-time) Now the box is working as an interface to PLC controllers, the whole internal logic for both pushbutton channels is disabled.
Sensing the keystrokes and switching the LED is now accomplished by an external controller (most times a PLC)
Therefore all signals are converted to standard 0/24V dc levels

4.1. Pushbutton 1

Normally K1 is inactive (pins 1+2 at the connector are open)
The LED inside the pushbutton is controlled by an external voltage at connector pin 6 with 24V dc and the GND at pin 8.
No internal logic is involved now!
That input is optically isolated from the rest of the circuit to maintain continued safety.
Pushing the button results in the following actions:

- Relay K1 closes its contacts (pins 1+2) for approx. 0,5 seconds and so acts as a monoflop converter for the PLC. Regardless of the behaviour of the user, a well defined signal is generated, that can trigger a digital input of a PLC.
- The relay K1 acts as the potential separation and has to be powered by the PLC itself at its ‘com’ contact (pin 1) with +24V. Pin 2 then carries the formed pulse and has to be wired to a PLC input.

4.2. Pushbutton 2

Normally K2 is inactive (pins 3+4 at the connector are open)
The LED inside the pushbutton is controlled by an external voltage at connector pin 7 with 24V dc and the GND at pin 8.
No internal logic is involved now!
That input is optically isolated from the rest of the circuit to maintain continued safety.
Pushing the button results in the following actions:

- Relay K2 closes its contacts (pins 3+4) for approx. 0,5 seconds and so acts as a monoflop converter for the PLC. Regardless of the behaviour of the user, a well defined signal is generated, that can trigger a digital input of a PLC.
- The relay K2 acts as the potential separation and has to be powered by the PLC itself at its ‘com’ contact (pin 3) with +24V. Pin 4 then carries the formed pulse and has to be wired to a PLC input.

5. Maintenance

5.1 power supply

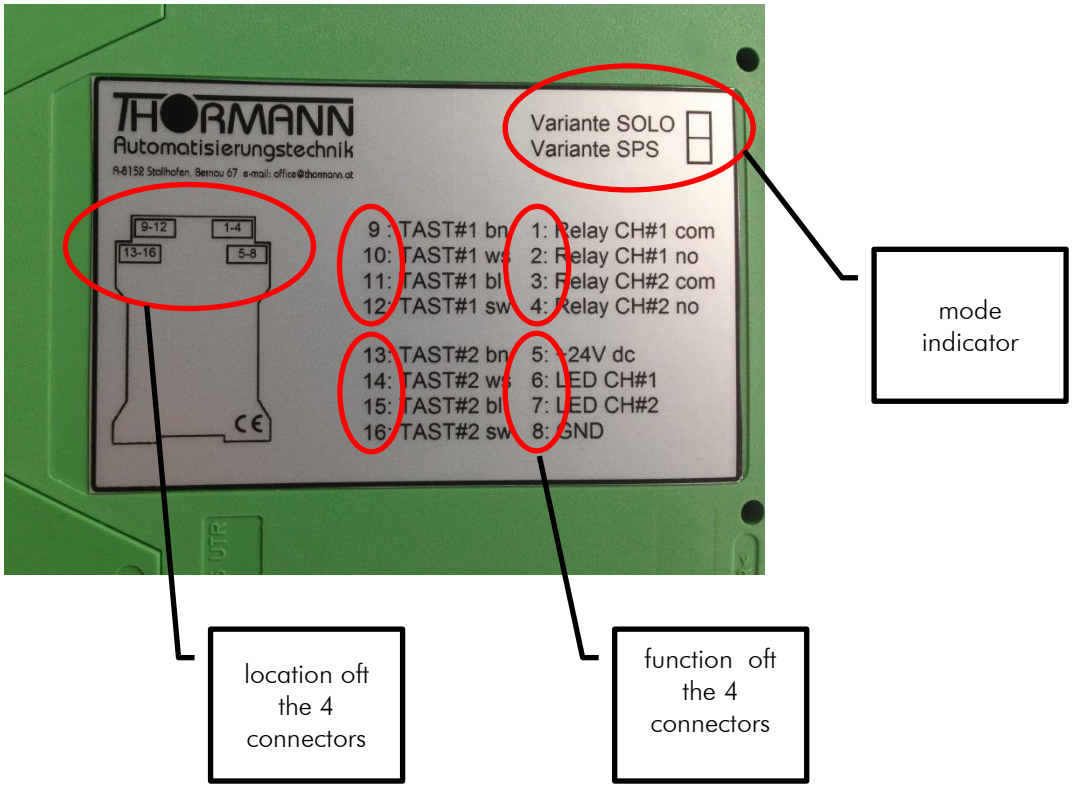
An LED glows constantly blue if the correct power is supplied (18-30Vdc) to pin 5 with 0V at pin 8.

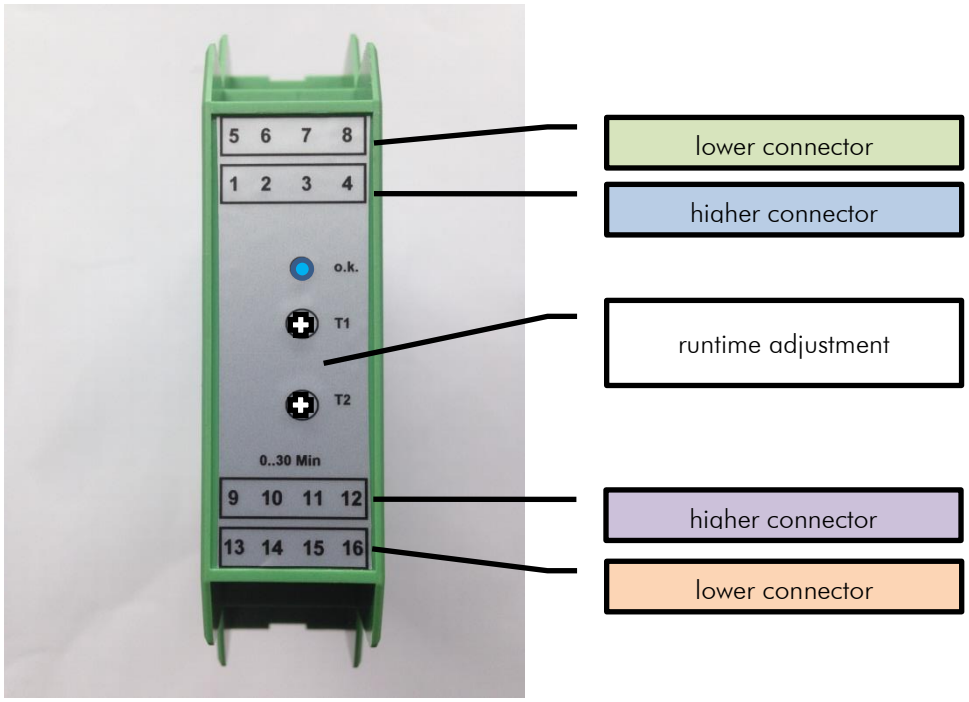
6. Overview of connectors

The pinout is also shown on the outside label oft he product.
There are 4 pluggable connectors for easy replacement oft he part.

Pin	Function	Notes
1	Relay channel 1	Pot free, max. 230V/1A co
2	Relay channel 1	Pot free, max. 230V/1A no
3	Relay channel 2	Pot free, max. 230V/1A co
4	Relay channel 2	Pot.free, max. 230V/1A no
5	Supply voltage +24V/max. 0,3A	Use 24V power supply with appropriate safety standards only !
6	LED1 control	+24V dc switches the LED in the pushbutton
7	LED2 control	+24V dc switches the LED in the pushbutton
8	Common (GND)	
9	key 1 (bn)	M12 cable pin 1 12V SELV voltage for pushbutton
10	key 1 (wt)	M12 cable pin 2 active low signal from pushbutton
11	key 1 (bl)	M12 cable pin 3 Ground
12	key 1 (bk)	M12 cable pin 4 LED-control, active low GND switches LED on
13	key 2 (bn)	M12 cable pin 1 12V SELV voltage for pushbutton
14	key 2 (wt)	M12 cable pin 2 active low signal from pushbutton
15	key 2 (bl)	M12 cable pin 3 Ground
16	key 2 (bk)	M12 cable pin 4 LED-control, active low GND switches LED on

7. Outline





Notice: „higher“ and „lower“ refer to the distance from the mounting plate up to the connectors

8. Technical specifications

Power supply
24V/1A regulated

Relay outputs
2 pcs., each max. 230Vac/3A resistive load (suitable only for control circuits)
For inductive loads, external contact protection is required !

Pushbutton inputs
2 pcs, for Thormann-Wellkey® only
Internally supplied with12Vdc

Pushbutton outputs
2 pcs. for driving LED's with 100 mA max. current. (active low signal)

PLC-Inputs
2 pcs. accepting voltages from 18 to 30V dc

Power –on behaviour
All relays off, all counters reset.
The program itself is permanently stored in a FLASH Prom

Mechanical specs
Mounting: DIN-rail
Protection level IP20
Cable ports: 16x screw terminal up to 1,5 mm2

9. External documents

Those added here are integrated part of the specifications and have to be obtained!

10. Other stuff

Documents and hardware are subject to change at any time without prior notice. Always refer to the latest documents.

The product must be considered as a component: it is neither a machine, nor a device ready for use in accordance with European directives. It is the responsibility of the user to ensure that his machine, equipment or similar, meets all those standards required.