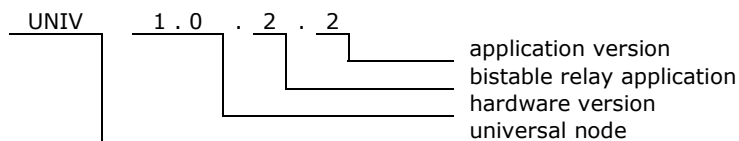


## 1. Features

- Controller of 6 bistable relays. These relays take energy only when switching from one state to the other
- Operation voltage 16-24V
- Current consumption 17mA, maximum 150mA
- For DIN rail mounting.
- Dimensions 90x106x53 mm (6 mod)
- Operating of module depends on firmware uploaded into it.



## 2. Application version



## 3. Technical data

### Bus side

Parameter	Symbol	Value	Unit
Power supply voltage	$U_s$	16-24V	V
Current consumption	$I_s$	17	mA
Maximum current consumption (t=250ms) (from firmware version UNIV 1.0.2.22 rev6)	$I_{SMAX}$	100-150	mA
Bus connector type	2x RJ45 connectors		

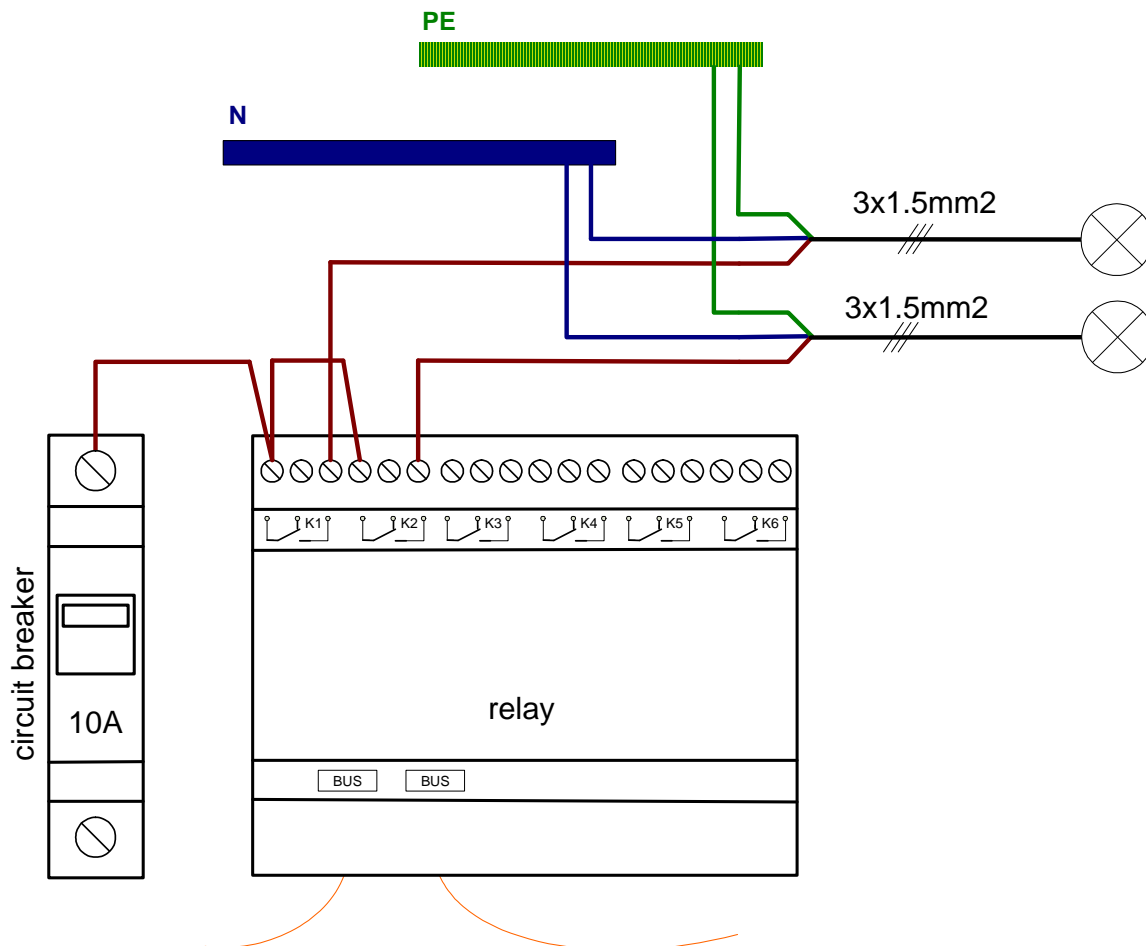
### Relay side

Parameter	Symbol	Value	Unit
Relay coil voltage	$U_{COIL}$	12	V DC
Maximum contacts voltage	$U_{MAX}$	250 / 30	V AC / V DC
Maximum contacts current with resistive load	$I_{MAX}$	5	A
Maximum contacts current with inductive load	$I_{LMAX}$	2	A
Maximum contacts current with capacitive load	$I_{CMAX}$	0.4	A

4. Hardware

4.1. Wiring

- ⚠ WARNING 1. This module must be connected only to **one phase** of mains.
- ⚠ WARNING 2. When inductive load connected, use varistors pararelyly with relay contacts.



Note that if module is first or last on the bus, the terminator (resistor 120 Ohm) must be plugged into one of BUS ports.

Figure 2. Relay wiring.

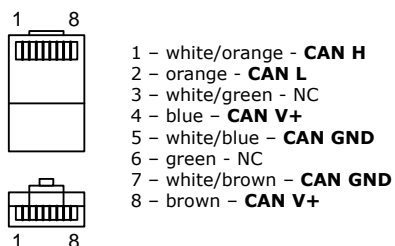
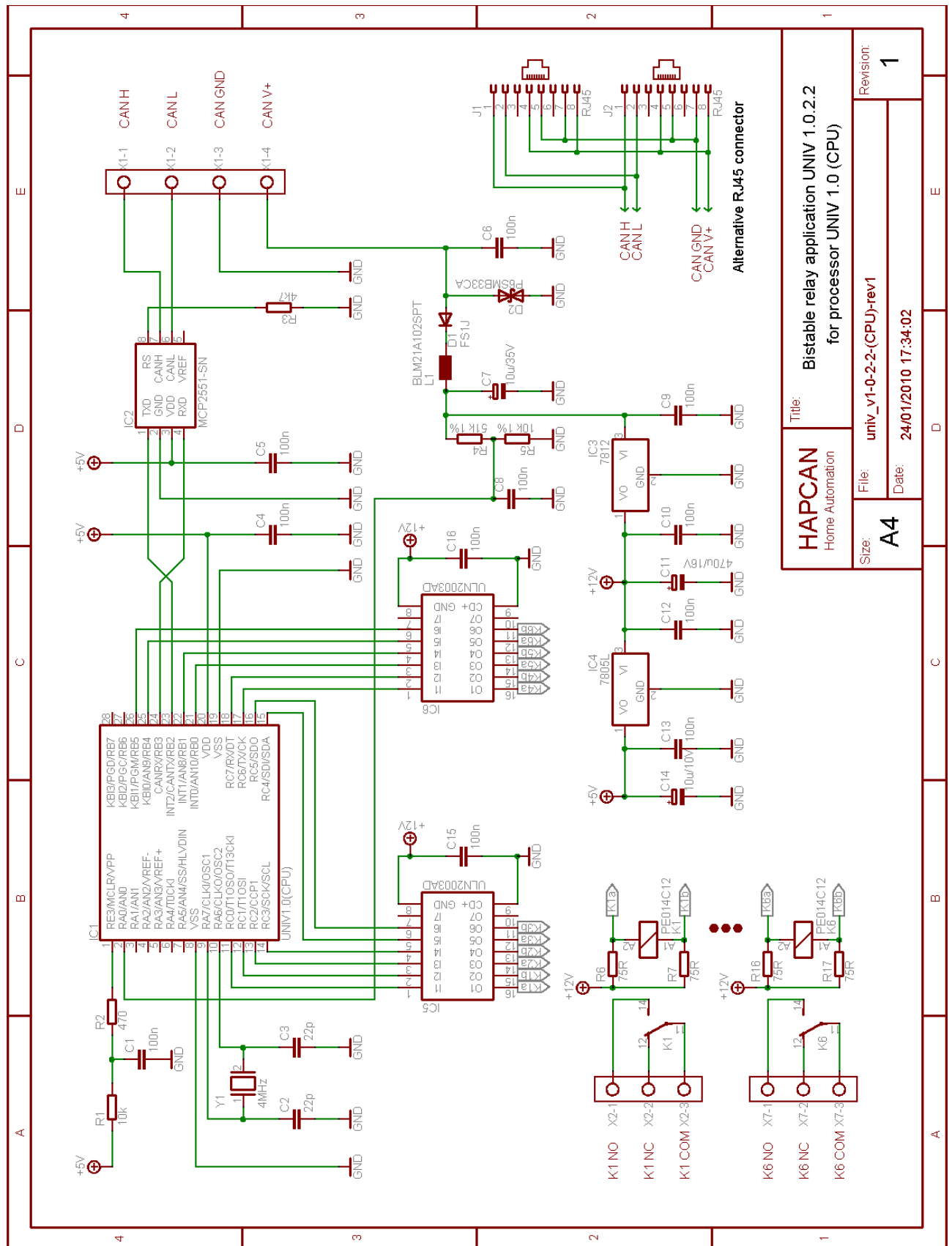


Figure 3. RJ45 bus connector wiring.

4.2. Schematic

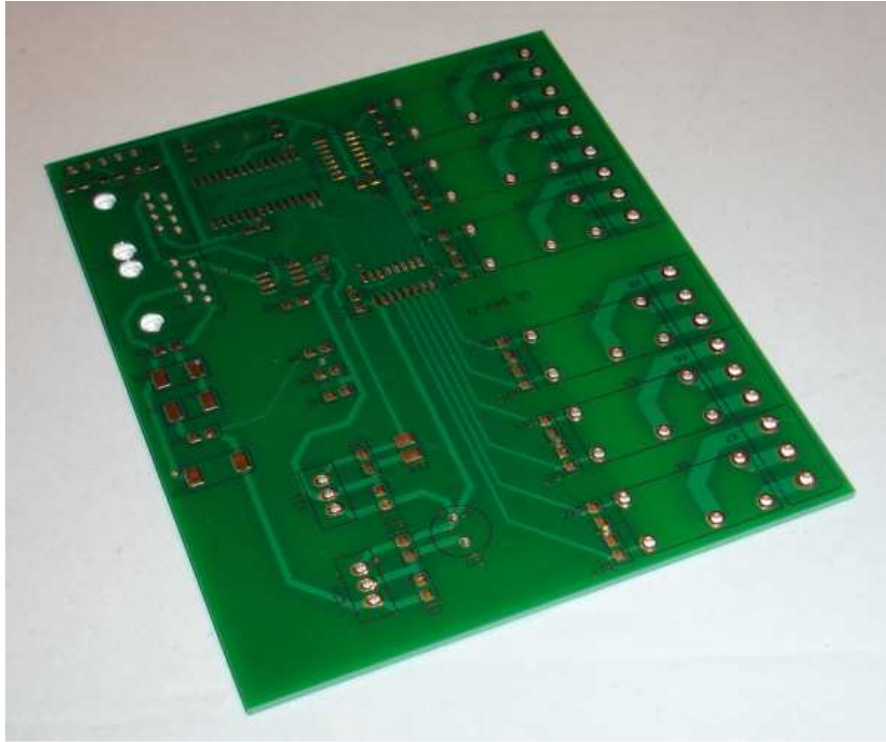


<b>HAPCAN</b> Home Automation		Title: Bistable relay application UNIV 1.0.2.2 for processor UNIV 1.0 (CPU)	
Size: <b>A4</b>	File: univ_v1-0-2-2-(CPU)-rev1	Date: 24/01/2010 17:34:02	Revision: <b>1</b>

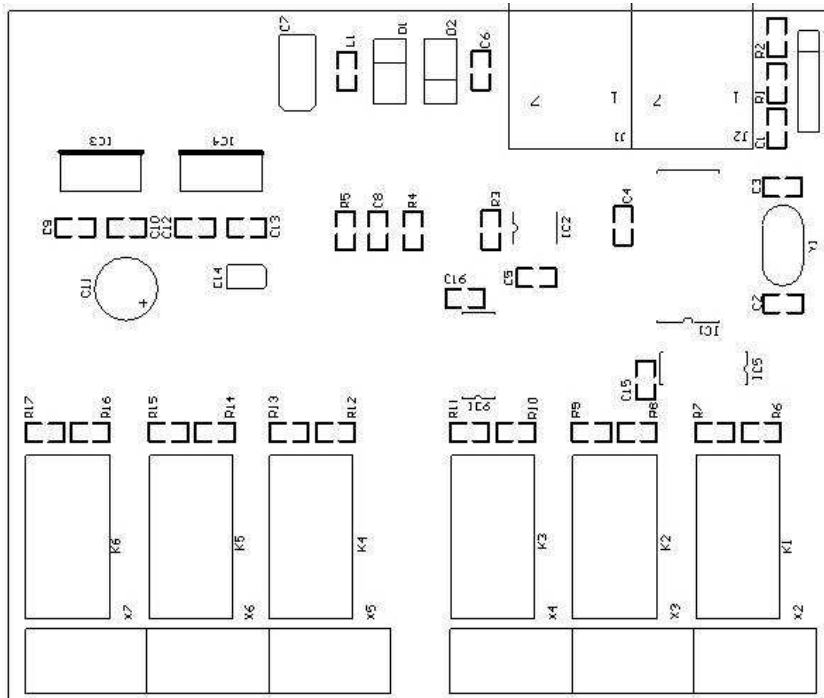
Figure 1. Schematic of bistable relay application for universal module UNIV 1.0

**4.3. Printed Circuit Board**

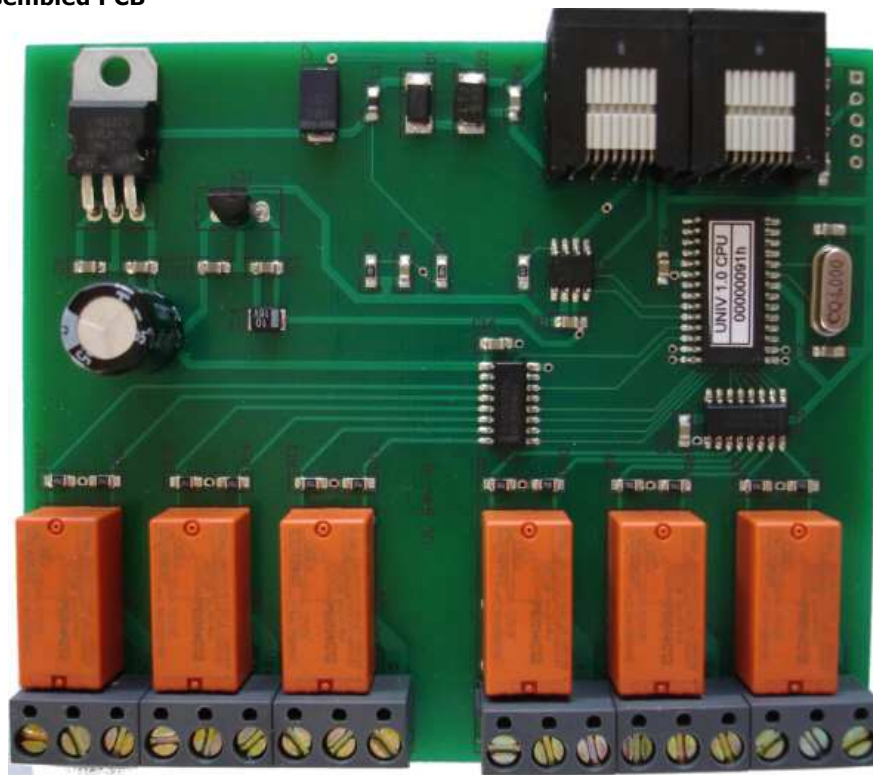
- Printed circuit board for bistable relay application UNIV 1.0.2.2 with use of processor UNIV 1.0 (CPU)
- PCB dimensions: 86mm x 103mm



**4.3.1. Assembly schematic**

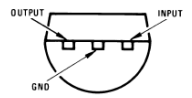


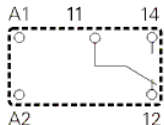
4.3.2. Assembled PCB



4.3.3. Components

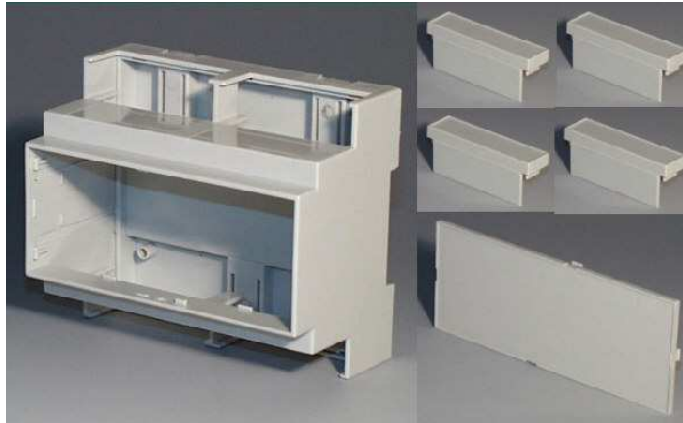
Designator	Type	Footprint	Description
C1, C4, C5, C6, C8, C9, C10, C12, C13, C15, C16	0.1uF	0805	Capacitor
C2, C3	22pF	0805	Capacitor
C7	10uF/35V	SME	Electrolytic Capacitor
C11	470uF/16V	4/8	Electrolytic Capacitor
C14	10uF/16V	SMB	Electrolytic Capacitor
R1	10k	0805	Resistor
R2	470 Ohm	0805	Resistor
R3	4k7	0805	Resistor
R4	51k 1%	0805	Resistor
R5	10k 1%	0805	Resistor
R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17	75 Ohm	0805	Resistor
L1	BLM21A102SPT	0805	Choke
Y1	4MHz	HC49-S	Quartz crystal
D1	FS1J	DO-214	Diode
D2	P6SMB33CA	DO-214	Transil diode
IC1	UNIV 1.0 (CPU)	SOIC-28	Processor of HAPCAN universal module
IC2	MCP2551-SN	SOIC-8	CAN Transceiver
IC3	LM7812	TO-220	Voltage regulator
IC4	LM7805L	TO-92	Voltage regulator
IC5, IC6	ULN2003A	SOIC-16	IC
J1, J2	RJ45	L18xW15xH11	Connector
X2, X3, X4, X5, X6, X7	ARK3	H=12,5mm raster=5mm	Terminal block



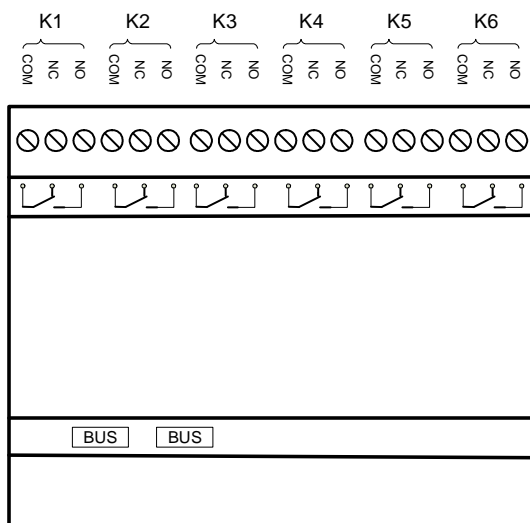
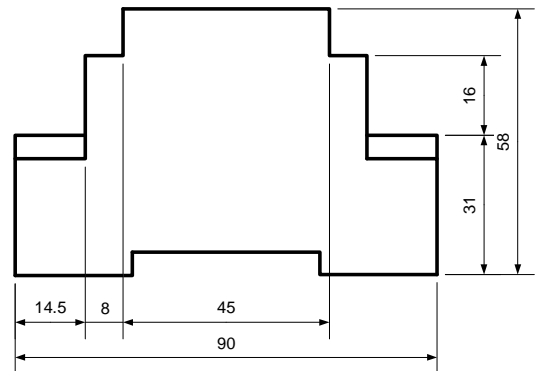
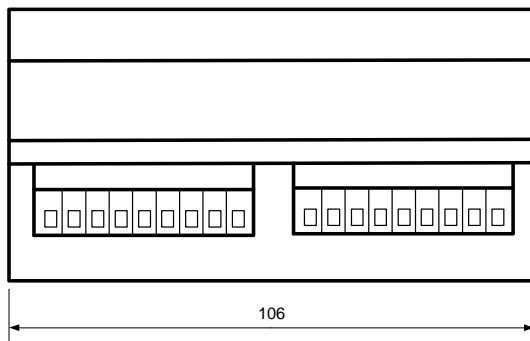
K1, K2, K3, K4, K5, K6	PE014C12 SCHRACK Contacts 5A/250V Coil 12V/30mA	L20xW10xH10	Bistable relay 
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**4.4. Enclosure**

- Rail mounting enclosure, 6 modules size
- Dimensions: 90mm x 106mm x 53mm



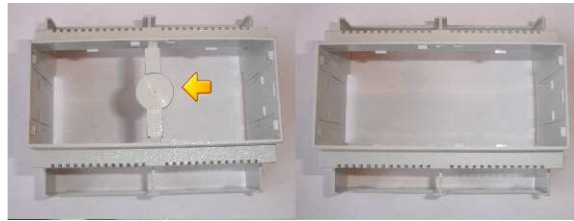
**4.4.1. Dimensions**



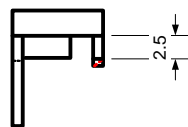
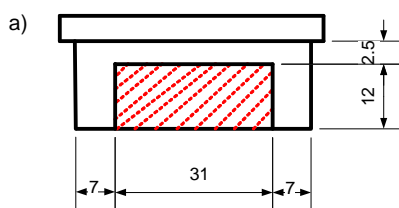
**4.4.2. Mechanical processing**

**4.4.2.1. Main part**

The part shown on drawings has to be removed from enclosure.



**4.4.2.2. Terminal guards**

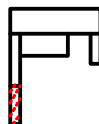
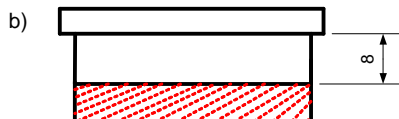


Striped parts must be removed.

Drawing a) shows RJ45 connector guard (1 piece).

Drawing b) shows terminal block guard (2 pieces).

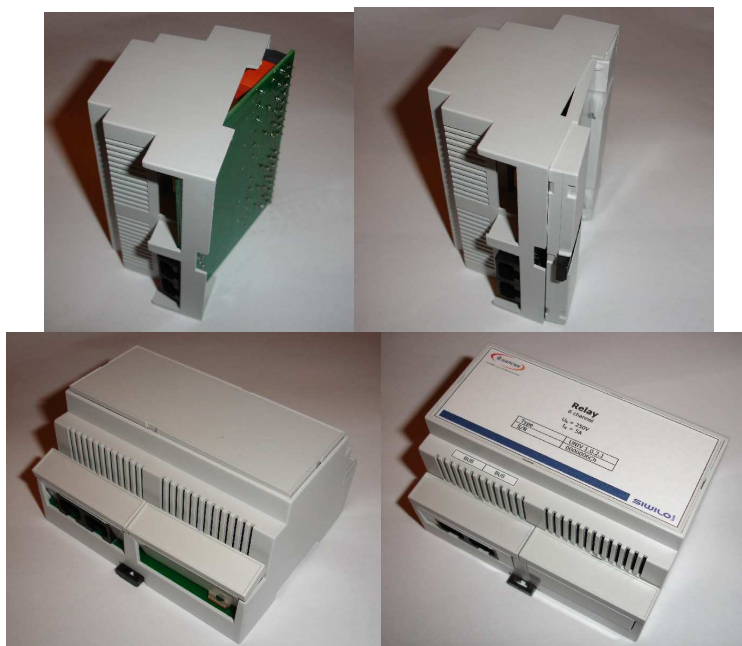
There is nothing to change in forth piece.



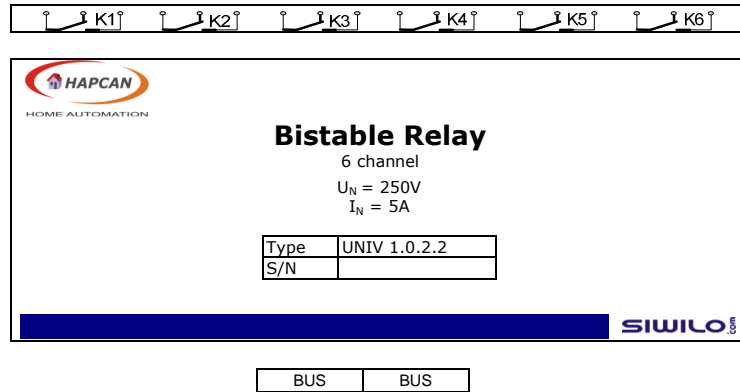
**4.4.2.3. Front panel**

Does not need processing.

**4.4.3. Assembling**



**4.4.4. Labels**



**5. Document version**

File	Description	Date
univ_v1-0-2-2-pcba.pdf	Original version	January 2009
univ_v1-0-2-2-pcbb.pdf	Updated with schematic	January 2011