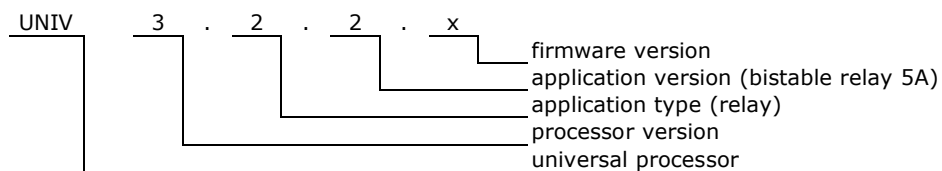


## 1. Features

- Controller of 6 bistable relays (6x5A).
- Operation voltage 16-24V
- Maximum current consumption from the bus 180mA
- For DIN rail mounting.
- Dimensions 90x106x53 mm (6 mod)
- Operating of module depends on firmware uploaded into it.
- Schematic and PCB design can be downloaded from [hapcan.com](http://hapcan.com) site



## 2. Application version



## 3. Technical data

### Bus side

Parameter	Symbol	Value	Unit
Power supply voltage	$U_s$	16-24V	V
Current consumption	$I_s$	12	mA
Maximum current consumption (when switching relays)	$I_{smax}$	180	mA
Bus connector type	2x RJ45		

### Relay side

Parameter	Symbol	Value	Unit
Nominal contacts current	$I_N$	5	A
Maximum inrush current	$I_{INRUSH}$	5	A
Nominal contacts voltage.	$U_N$	250	V AC
Relay connector type	Terminal Blocks (solid wire 4mm <sup>2</sup> , stranded 2,5mm <sup>2</sup> )		

## 4. Hardware

### 4.1. Schematic

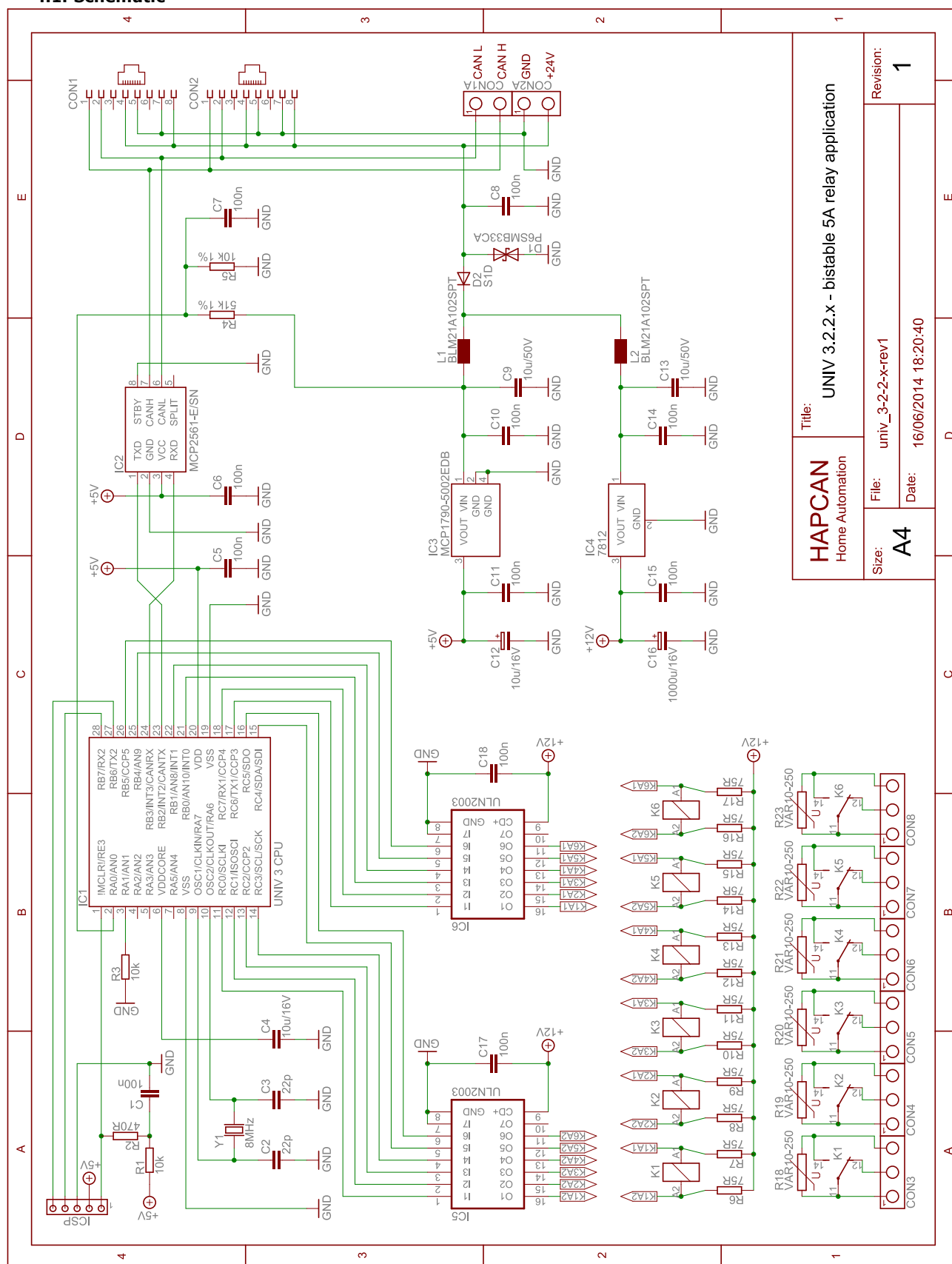


Figure 1. Schematic of UNIV 3.2.2.x application

## 4.2. Wiring

⚠ WARNING. This module must be connected only to **one phase** of mains.

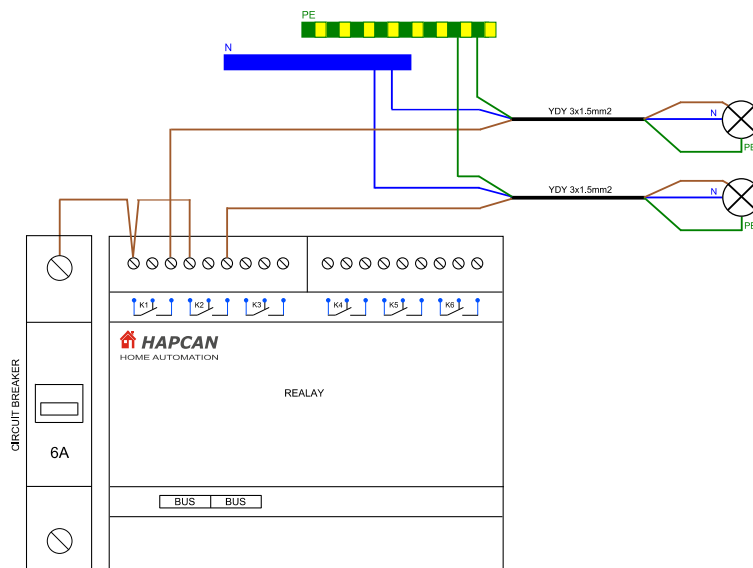
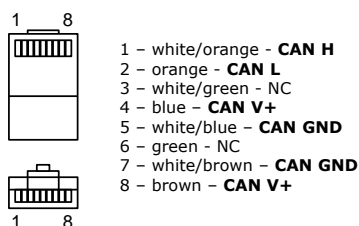


Figure 2. Relay wiring.

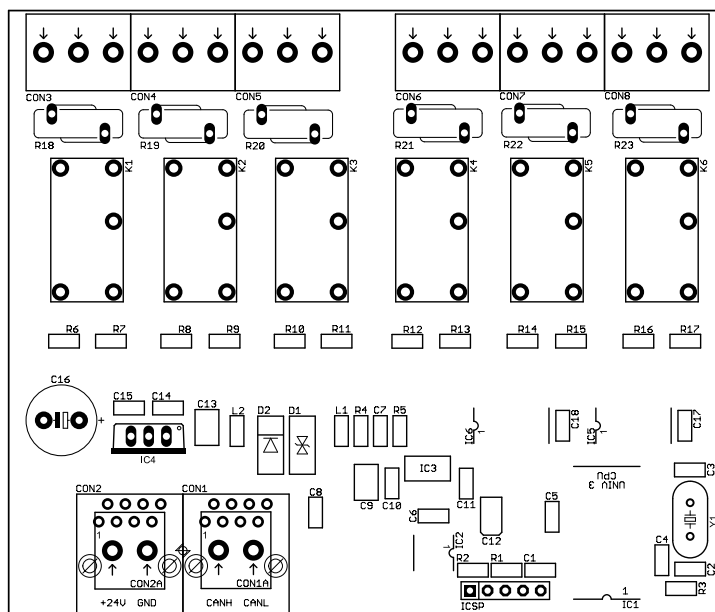


Note that if module is first or last on the bus, the terminator (resistor 120 Ohm) must be plugged into one of BUS ports.

Figure 3. RJ45 bus connector wiring.

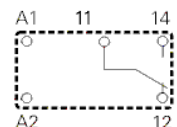
## 4.3. PCB assembly schematic

- Printed circuit board *PCB UNIV 3.2.(1-2).x* for UNIV 3.2.2.x module
- PCB dimensions: 103mm x 86.5mm



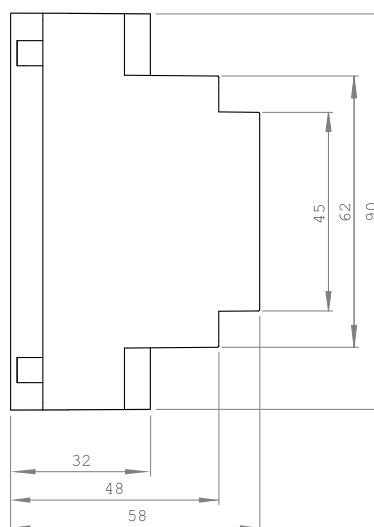
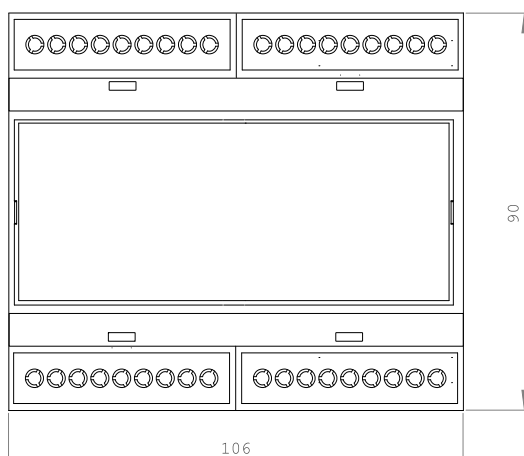
#### 4.4. Components

Designator	Type	Footprint	Description
C1, C5, C6, C7, C8, C10, C11, C14, C15, C17, C18	100nF/50V	0805	Capacitor
C2, C3	22pF/50V	0805	Capacitor
C4	10uF/16V (X5R)	0805	Capacitor
C9, C13	10uF/50V	1210	Capacitor
C12	10uF/16V	SMA, SMB	Tantalum capacitor
C16	1000uF/16V	5/10	Electrolytic Capacitor
R1, R3	10k	0805	Resistor
R2	470 Ohm	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
R18, R19, R20, R21, R22, R23	VAR10-250	raster 10mm	Varistor
L1, L2	BLM21A102SPT	0805	Choke
Y1	8MHz	HC49-S	Quartz crystal
D1	P6SMB33CA	DO-214	Quartz crystal
D2	S1D	DO-214	Rectifying diode
IC1	UNIV 3 CPU	SOIC-28	HAPCAN universal processor
IC2	MCP2561-E/SN	SOIC-8	CAN Transceiver
IC3	MCP1790-5002EDB	SOT-223	Voltage regulator
IC4	LM7812	TO-220	Voltage regulator
IC5, IC6	ULN2003A	SOIC-16N	Darlington transistors arrays
CON1, CON2	RJ45	L18xW15xH11	Connector
CON3, CON4, CON5, CON6, CON7, CON8	ARK3	L15xW10.5xH19 raster 5mm	Terminal block
K1, K2, K3, K4, K5, K6	SCHRACK PE014A12, PE014C12 Contacts 5A/250V Coil 12V/30mA PE014F12, PE014H12 Contacts 5A/250V Coil 12V/18.5mA	L20xW10xH10	Bistable relay



#### 4.5. Enclosure

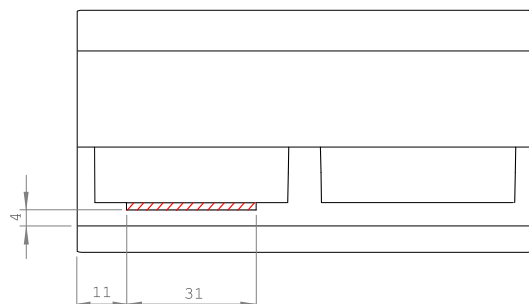
- Gainta D6MG enclosure (6 modules wide)
- Dimensions: 90mm x 58mm x 106mm



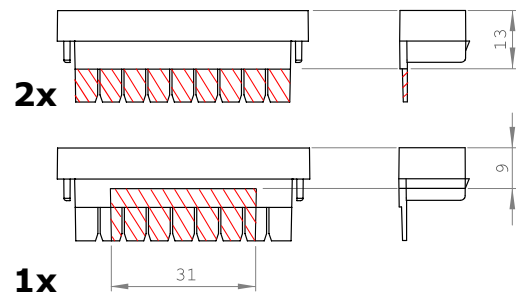
#### 4.6. Mechanical processing

Striped parts must be removed.

BODY

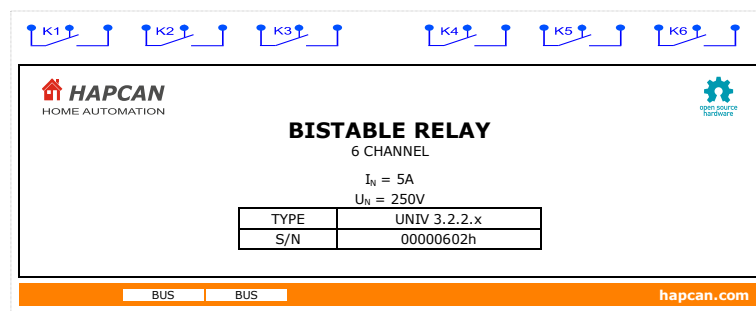


TERMINAL GUARDS



#### 4.7. Label

Editable label version is available at [hapcan.com](http://hapcan.com) website.



### 5. Commissioning

#### 5.1. CPU voltage measurement

After verifying the correctness and quality of the soldering, the bus voltage should be connected while measuring the processor voltage. To do this, connect a voltmeter to pins 2 and 3 of the ICSP connector. Processor supply voltage should be about 5V.

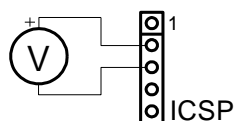


Figure 3. CPU voltage measurement

#### 5.2. Checking the CPU clock

Proper operation of the CPU can be checked by temporarily connecting the LED to pins 3 and 5 of the ICSP connector. When device is powered, the LED should light up four times in the sequence 1 second on - 1 second off - 1 second on. The LED lights up only once for 50ms, if the processor is in programming mode.

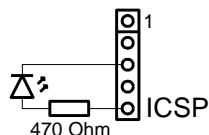


Figure 4. Checking the CPU clock

#### 5.3. Firmware uploading

The device requires a firmware uploading for proper operation. It can be done with HAPCAN Programmer software. Both, firmware and HAPCAN Programmer can be downloaded from [hapcan.com](http://hapcan.com) website.

## 6. License



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## 7. Document version

File	Description	Date
univ_3-2-2-x_a.pdf	Original version	June 2014