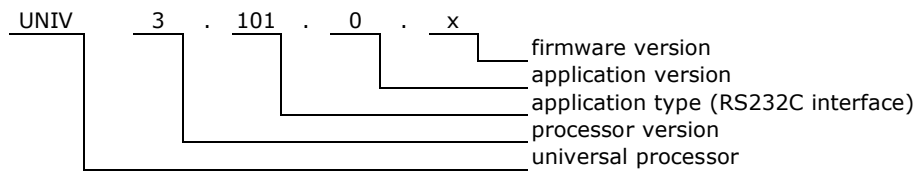


1. Features

- Isolated RS232C interface for HAPCAN system. It can also work as a controller of devices with RS232C ports.
- Works with USB-RS232C adaptors.
- It has got surge protectors built-in on the serial port side.
- Operation voltage 10-24V
- Current consumption 28mA
- For DIN rail mounting.
- Dimensions 90x58x36 mm (2 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	10-24V	V
Current consumption	I_s	66@10V, 28@24V	mA
Bus connector type		2x RJ45 connectors	

Serial port side

Parameter	Unit
Connector	DB9 female
Isolation voltage	2500V RMS @ 1min
Maximum baud rate	460kbps

4. Hardware

4.1. Wiring

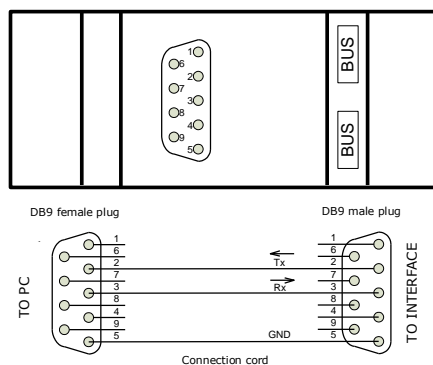
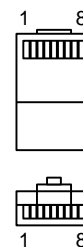


Figure 1. RS232C connector.



- 1 - white/orange - **CAN H**
- 2 - orange - **CAN L**
- 3 - white/green - NC
- 4 - blue - **CAN V+**
- 5 - white/blue - **CAN GND**
- 6 - green - NC
- 7 - white/brown - **CAN GND**
- 8 - brown - **CAN V+**

Note that if module is first or last on the bus, resistor 120ohm must be connected between pins CAN H and CAN L.

Figure 2. RJ45 bus connector.

4.2. Schematic

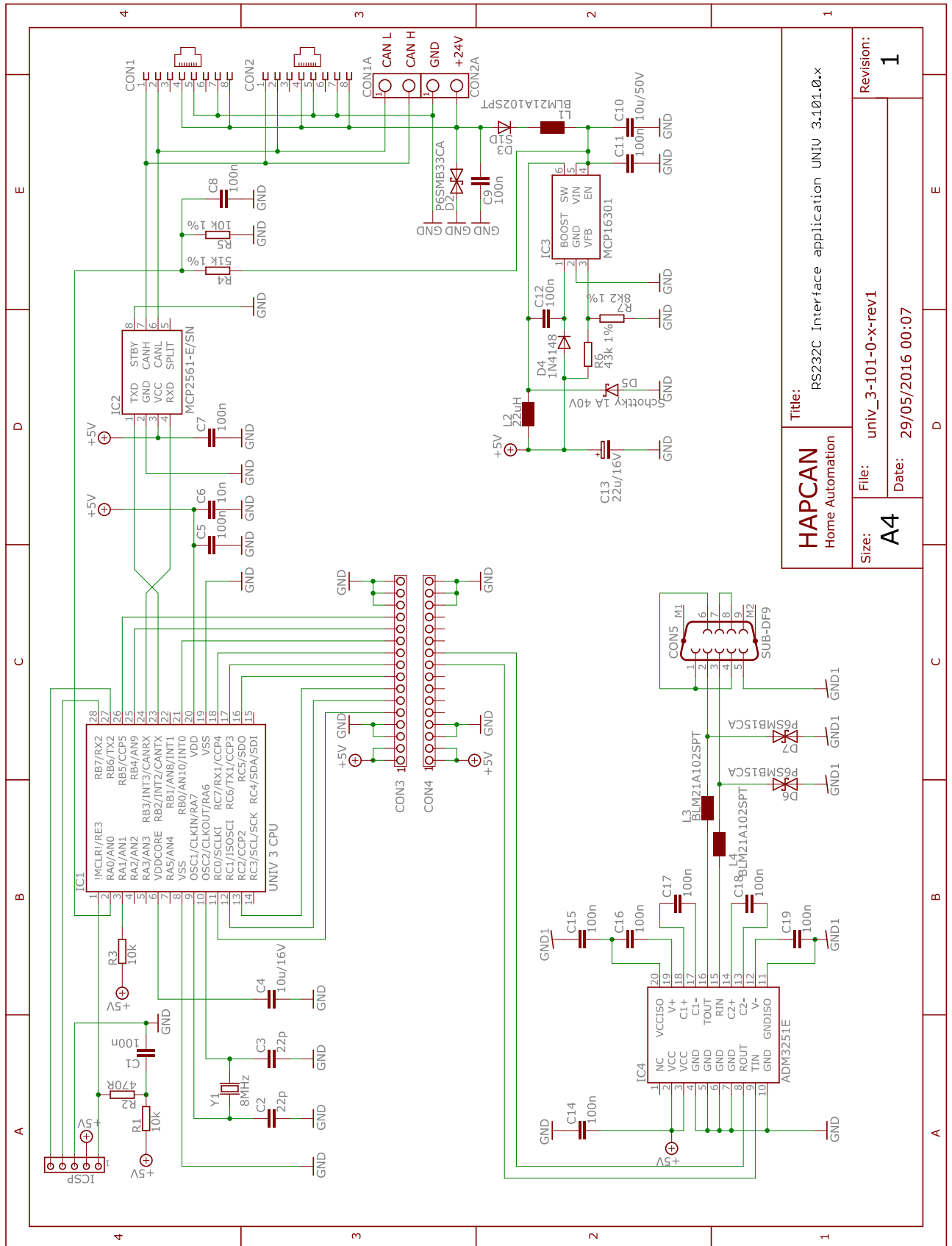
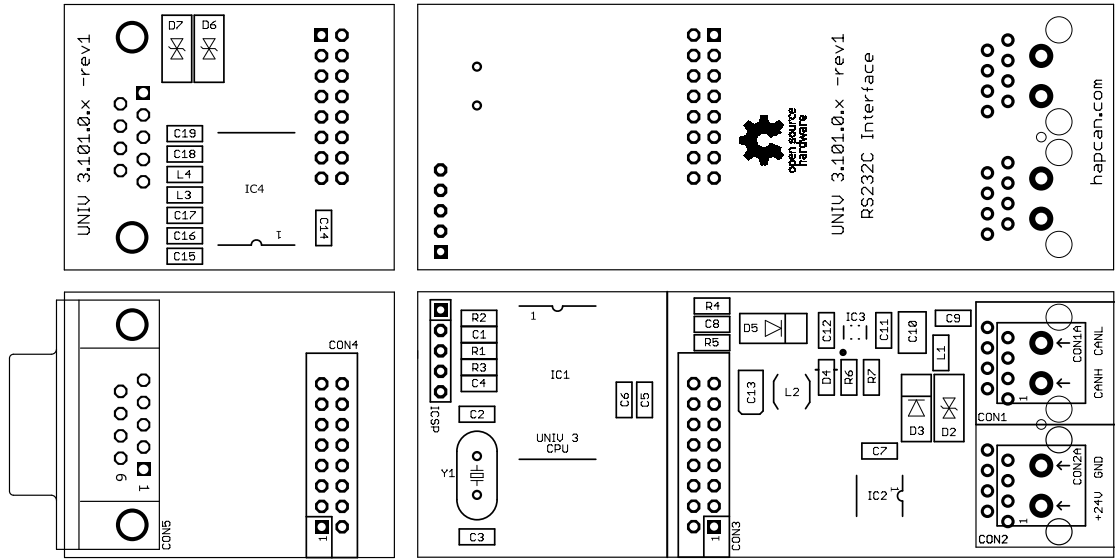


Figure 3. Schematic of UNIV 3.101.0.x application

4.3. Assembly schematic

- Printed circuit boards *PCB UNIV 3.101.0.x* for UNIV 3.101.0.x application
- PCBs dimensions: 86.5mm x 33mm i 41mm x 33mm

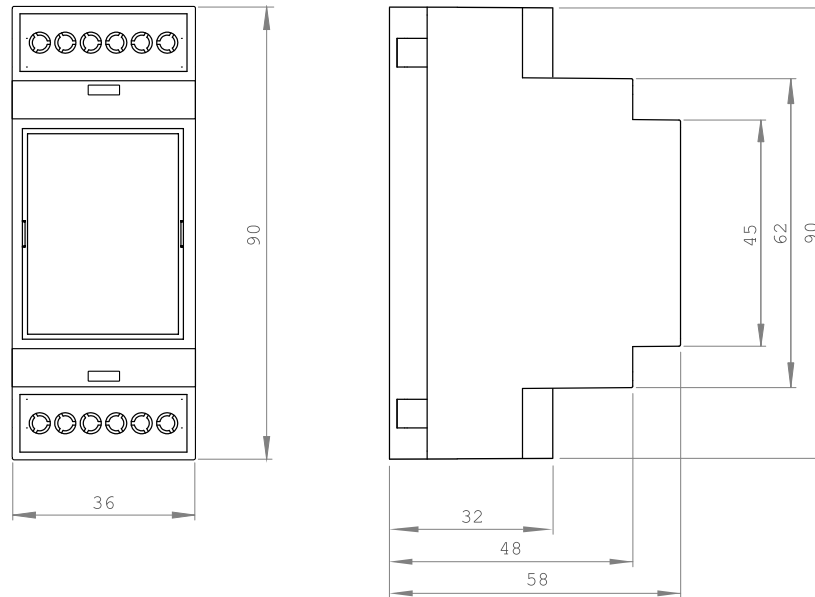


4.4. Components

Designator	Quantity	Type	Footprint	Description
C1, C5, C7, C8, C9, C11, C12, C14, C15, C16, C17, C18, C19	13	100nF/50V	0805	Capacitor
C2, C3	2	22pF/50V	0805	Capacitor
C4	1	10uF/16V (X5R)	0805	Capacitor
C6	1	10nF/50V	0805	Capacitor
C10	1	10uF/50V	1210	Capacitor
C13	1	22uF/16V	SMA, SMB	Tantalum capacitor
R1, R3	2	10k	0805	Resistor
R2	1	470 Ohm	0805	Resistor
R4	1	51k 1%	0805	Resistor
R5	1	10k 1%	0805	Resistor
R6	1	43K 1%	0805	Resistor
R7	1	8k2 1%	0805	Resistor
L1, L3, L4	3	BLM21A102SPT	0805	Choke Murata
L2	1	DL16-22	DL16 (6.60x4.45x2.92)	Choke Ferrocere
Y1	1	8MHz	HC49-S	Quartz crystal
D2	1	P6SMB33CA	DO-214	Transil diode
D3	1	S1B	DO-214	Rectifying diode
D4	1	1N4148	0805	Rectifying diode
D5	1	MBRS140T3	DO-214	Shottky diode
D6, D7	2	P6SMB15CA	DO-214	Transil diode
IC1	1	UNIV 3 CPU	SOIC-28	HAPCAN universal processor
IC2	1	MCP2561-E/SN	SOIC-8	CAN transceiver Microchip
IC3	1	MCP16301T-I/CHY	SOT-23-6	DC/DC converter Microchip
IC4	1	ADM3251E	SOIC-20	Isolated RS232C transceiver Analog Devices
CON1, CON2	2	95501-2881	L18xW15xH11	Connector RJ45 Molex
CON3/4	1	2x8pin	Raster 2.54mm	Pin header
CON5	1	DHP8-09F	30.84x12.50x18.3x	RS232C connector Ninigi

4.5. Enclosure

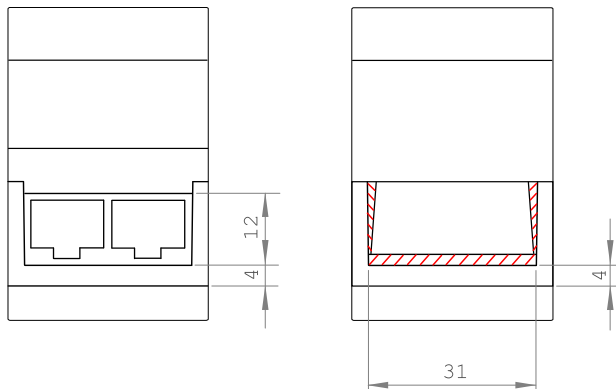
- Gainta D2MG rail mounting enclosure (2 modules wide)
- Dimensions: 90mm x 58mm x 36mm



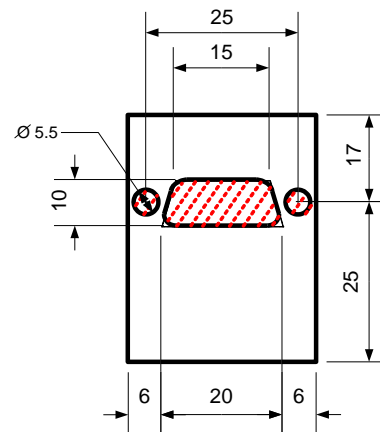
4.6. Mechanical processing

Striped parts must be removed.

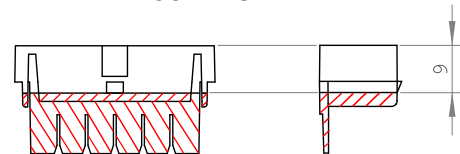
BODY



FRONT PANEL

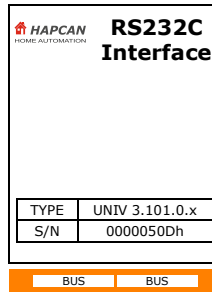


TERMINAL GUARDS



4.7. Labels

Editable labels version is available on hapcan.com site.



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.

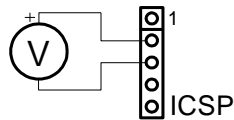


Figure 4. CPU voltage measurement

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 0.5 second on - 0.5 second off. If the processor is in programming mode, the LED lights up only once for 50ms.

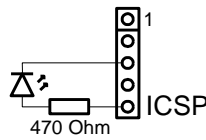


Figure 5. Checking the CPU clock

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 website.

6. License



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7. Document version

File	Hardware Revision	Description	Date
univ_3-101-0-x_a.pdf	rev0	Original version	July 2012
univ_3-101-0-x_b.pdf	rev0	Enclosure has been changed	June 2014
univ_3-101-0-x_c.pdf	rev1	CAN transceiver has been changed	May 2016