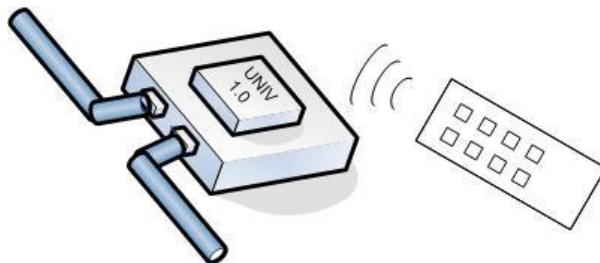
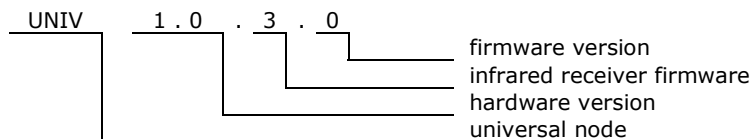


## Features:

- The infrared receiver of any remote controller transmitting RC5 or SIRC codes.
- Uses IR receiver TSOP4838
- Operation voltage 10-24V
- Current consumption 15mA
- Module can recognize:
  - SIRC 12bit code (32 addresses, 128 commands),
  - SIRC 15bit code (256 addresses, 128 commands),
  - RC5 code (32 addresses, 64 commands)
- 35m maximal transmission range
- Application can be uploaded into devices with bootloader version 2.5 or compatible.



## Application version



## 1. Operation overview

Module sends message to the bus when receives and recognizes IR code, and another message when the IR transmission stops. It can recognize 3 types of codes SIRC 12bit, SIRC 15bit (SONY) and RC5 (Philips).

## 2. Technical data

### Bus side

Parameter	Symbol	Value	Unit
Power supply voltage	$U_s$	10-24V	V
Current consumption	$I_s$	15	mA

### Receiver side

Parameter	Symbol	Value	Unit
Maximal transmission distance	d	$\leq 35$	m
Half range angle	$\phi_{1/2}$	$\pm 45$	deg
Maximum length of TSOP4838 connection	l	15	m

## 3. Hardware

### 3.1. Connections

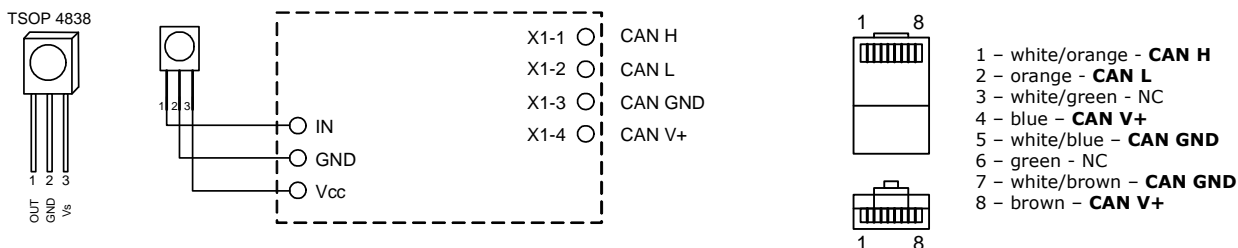
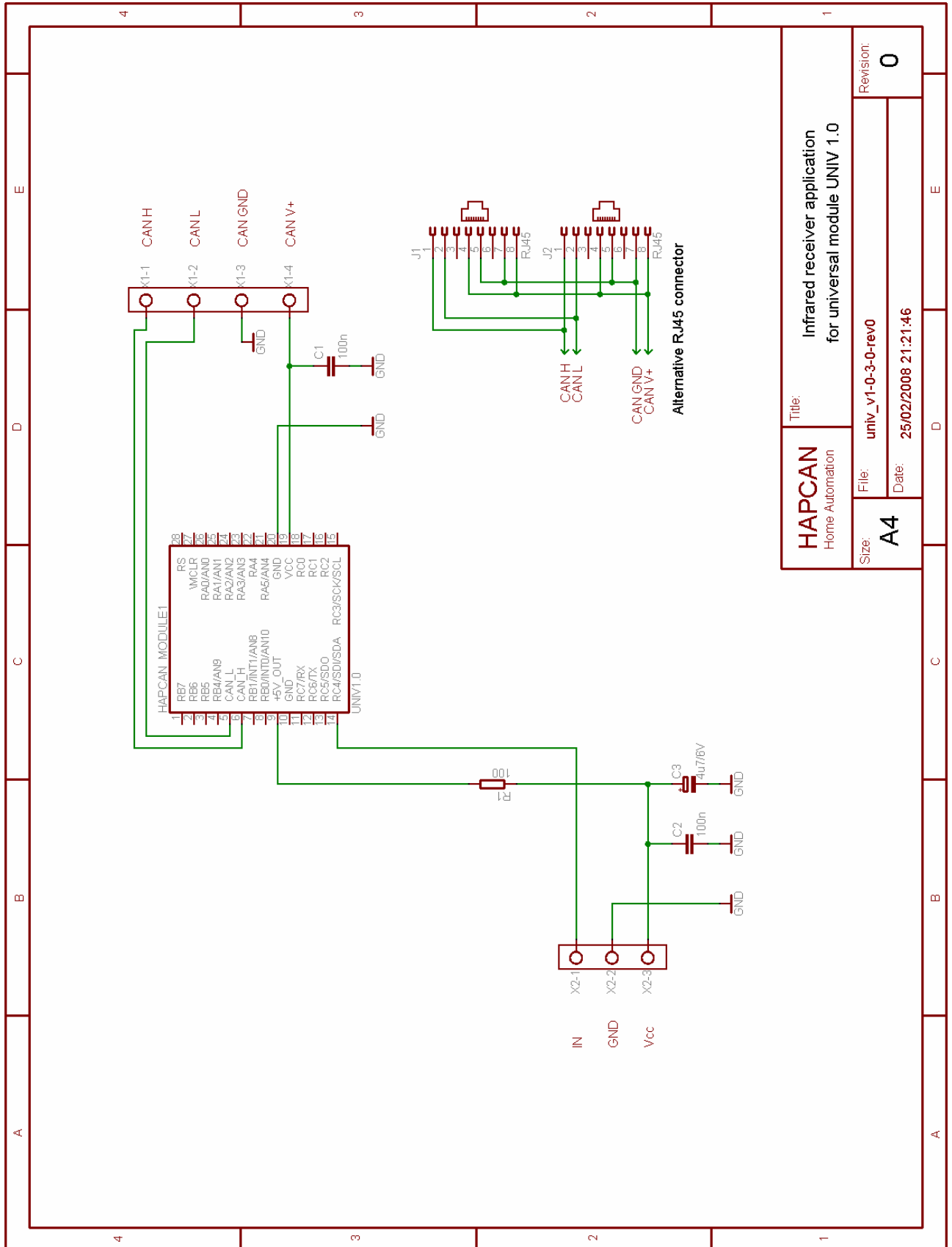


Figure 1. Connection schematic.

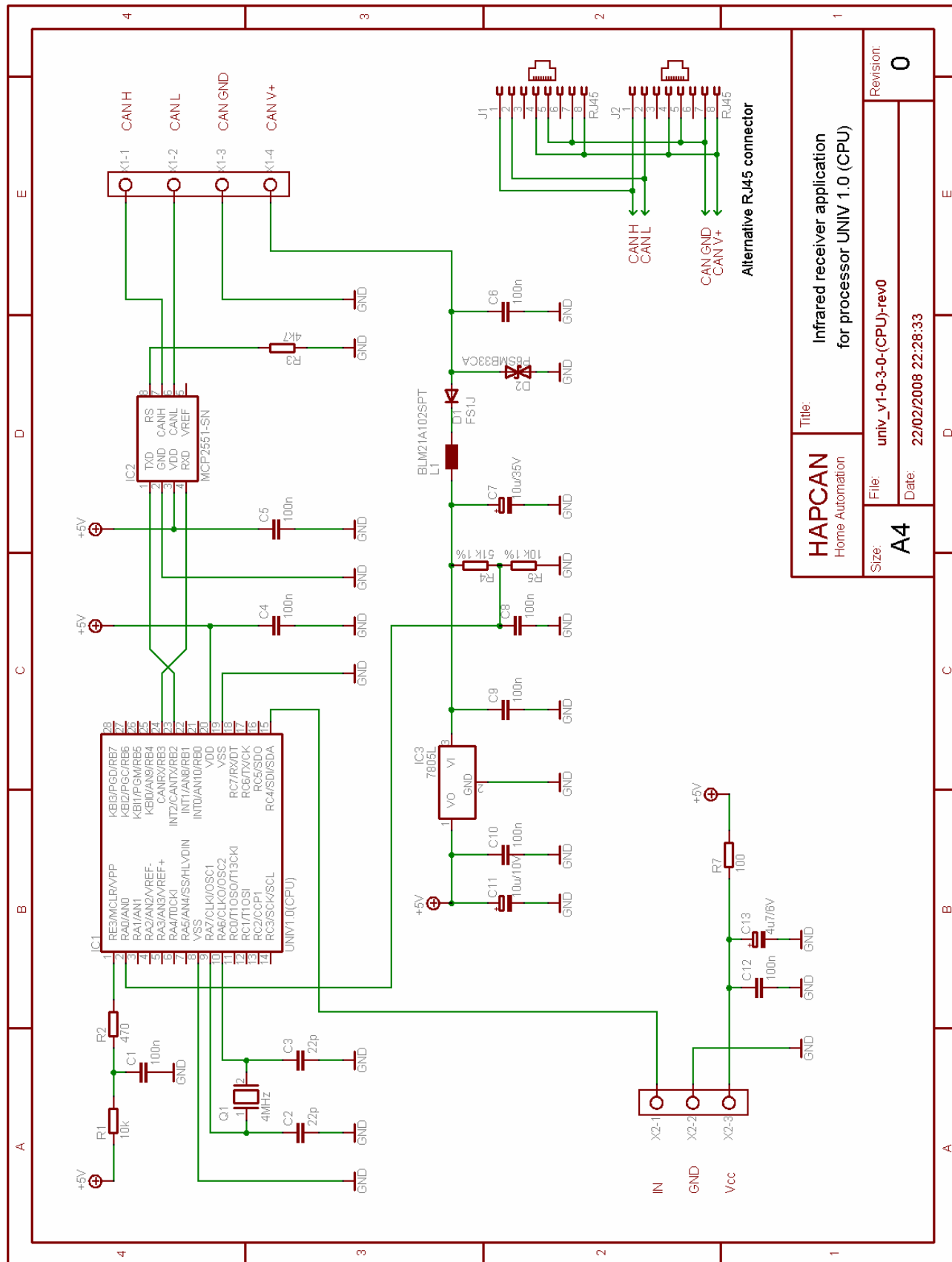
Figure 2. Option of RJ45 bus connector.

### 3.2. Schematic



<b>HAPCAN</b> Home Automation		Title: Infrared receiver application for universal module UNIV 1.0	
Size: <b>A4</b>	File: univ_v1-0-3-0-rev0	Revision: <b>0</b>	
	Date: 25/02/2008 21:21:46		

Figure 3. Schematic of infrared receiver application for universal module UNIV 1.0



<b>HAPCAN</b> Home Automation		Title: Infrared receiver application for processor UNIV 1.0 (CPU)	
Size: <b>A4</b>	File: univ_v1-0-3-0-(CPU)-rev0	Revision: <b>0</b>	
	Date: 22/02/2008 22:28:33		

Figure 4. Schematic of infrared receiver application for processor UNIV 1.0 (CPU).

**4. Firmware**

Firmware can be uploaded by using HAPCAN Programmer, which can be downloaded from site <http://siwilo.com/hapcan/software>.

**4.1. Infrared receiver message**

The module sends information of received infrared code, and another message when infrared transmission stops.

Table 1. INFRARED RECEIVER frame

Frame type	Flags	Module	Group	D0	D1	D2	D3	D4	D5	D6	D7
0x303	3 2 1 0	Node Nr	Group Nr	0xFF	0xFF	CODE	ADDRESS	COMMAND	0xFF	0xFF	0xFF

0x303	- universal	module frame, infrared receiver application									
3	-	- not used flag, read as "0"									
2	-	- not used flag, read as "0"									
1	-	- not used flag, read as "0"									
0	RE	- response flag. Flag is equal "1" if node was requested. If flag is equal „0" it means that status of input has just changed.									
		Node Nr	- node number on the network								
		Group Nr	- group number of the node on the network								

**CODE** - type of received code 0x00 – SIRC 12bit, 0x01 – SIRC 15bit, 0x02 – RC5

**ADDRESS** - address of received code

**COMMAND** - command of received code

When transmission of infrared signal stops, the module sends another message. The difference between message at the beginning and at the end of transmission is in a D2 byte.

Table 2. INFRARED RECEIVER frame – end of the IR transmission

Frame type	Flags	Module	Group	D0	D1	D2	D3	D4	D5	D6	D7
0x303	0x0	Node Nr	Group Nr	0xFF	0xFF	CODE+0x80	ADDRESS	COMMAND	0xFF	0xFF	0xFF

**4.2. Status request**

The module does not respond to STATUS REQUEST.

**4.3. Configuration**

This version of application can configure parameters:

- Module identifier (module number and group number);
- Module description (16 chars);

Configuration process can be done by using HAPCAN Programmer.

**4.3.1. Module Identifier.**

Every module on the network must have unique identifier. The identifier is made of two bytes, module number (1 byte) and group number (1 byte). Belonging to particular group might be used in future applications.

**4.3.2. Module description.**

Every module can have 16 char description, which makes easier for user (programmer) to distinguish nodes. Examples of node descriptions: living-IR, bed2-IR etc.

**5. Document version**

File	Note	Date
univ_v1-0-3-0a.pdf	Original version	June 2007
univ_v1-0-3-0b.pdf	UNIV 1.0 (CPU) update	February 2008
univ_v1-0-3-0c.pdf	Parameter 'l' added	September 2008