# AVR-IO (Rev. B) DEVELOPMENT BOARD WITH
4 OPTOISOLATED INPUTS AND 4 RELAY OUTPUTS

Features:
AVR-IO is development board for 20 pin AVR microcontrollers with following features:
- 4 optocoupler isolated inputs
- 4 relay with 5A/240VAC contacts
- 10 MHz crystal resonator
- status LED
- RS232 Tx, Rx and connector
- ICSP 10 pin connector (STK compatible)
- RESET IC ZM33064C
- 10MHz quartz oscillator
- DIL20 microcontroller socket
- power supply plug in connector
- screw terminal blocks on all inputs and outputs
- +5V power supply voltage regulator
- 0.1" (2.54 mm) grid
- dimensions: 100x80 mm
- four mounting holes
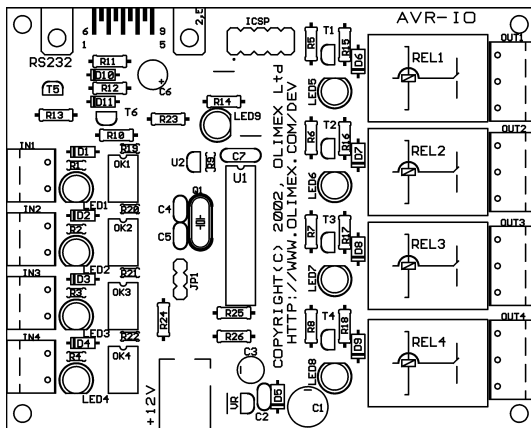
Programming:
To program AVR-IO you need serial port or parallel port AVR-ICSP programmer dongle (Olimex part # AVR-PG1B or AVR-PG2B).
The serial port ICSP programmer (AVR-PG1B) works with PonyProg software by from Claudio Lanconelli and the latest release may be download for free from **http://www.lancos.com**
The parallel port ICSP programmer (AVR-PG2B) works with AVR ISP from Atmel and may be download for free from Atmel's web site.

ICSP interface:
The ICSP connector is 2x5 pin with 0,1" step with Atmel STKxxx compatible layout. The PIN.1 is marked with square pad on bottom and arrow on top. ICSP signals are: 1- MOSI, 2- VCC, 3- NC, 4- GND, 5- RST, 6- GND, 7- SCK, 8- GND, 9- MISO, 10- GND
TOP view PCB board layout:
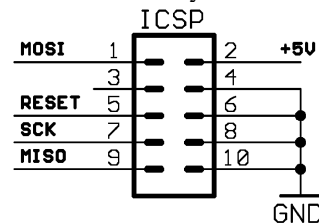
RS232 interface connection:
Rx – PD0, Tx – PD1

Optoisolated inputs:
IN1 to PD2/INT0, IN2 to PD3/INT1 or PD4/T0 via JP1 jumper split, IN3 to PD5/T1, IN4 to PD6/ICP. All inputs have LED to visualize input state.

Relay outputs:
OUT1 to PB3, OUT2 to PB2, OUT3 to PB1 and OUT4 to PB0. All outputs have LED to visualize relay state

Status LED:
Connected to PB4

RESET supervisor circuit:
IC ZM33064C with 4.6V threshold.

Supported devices:
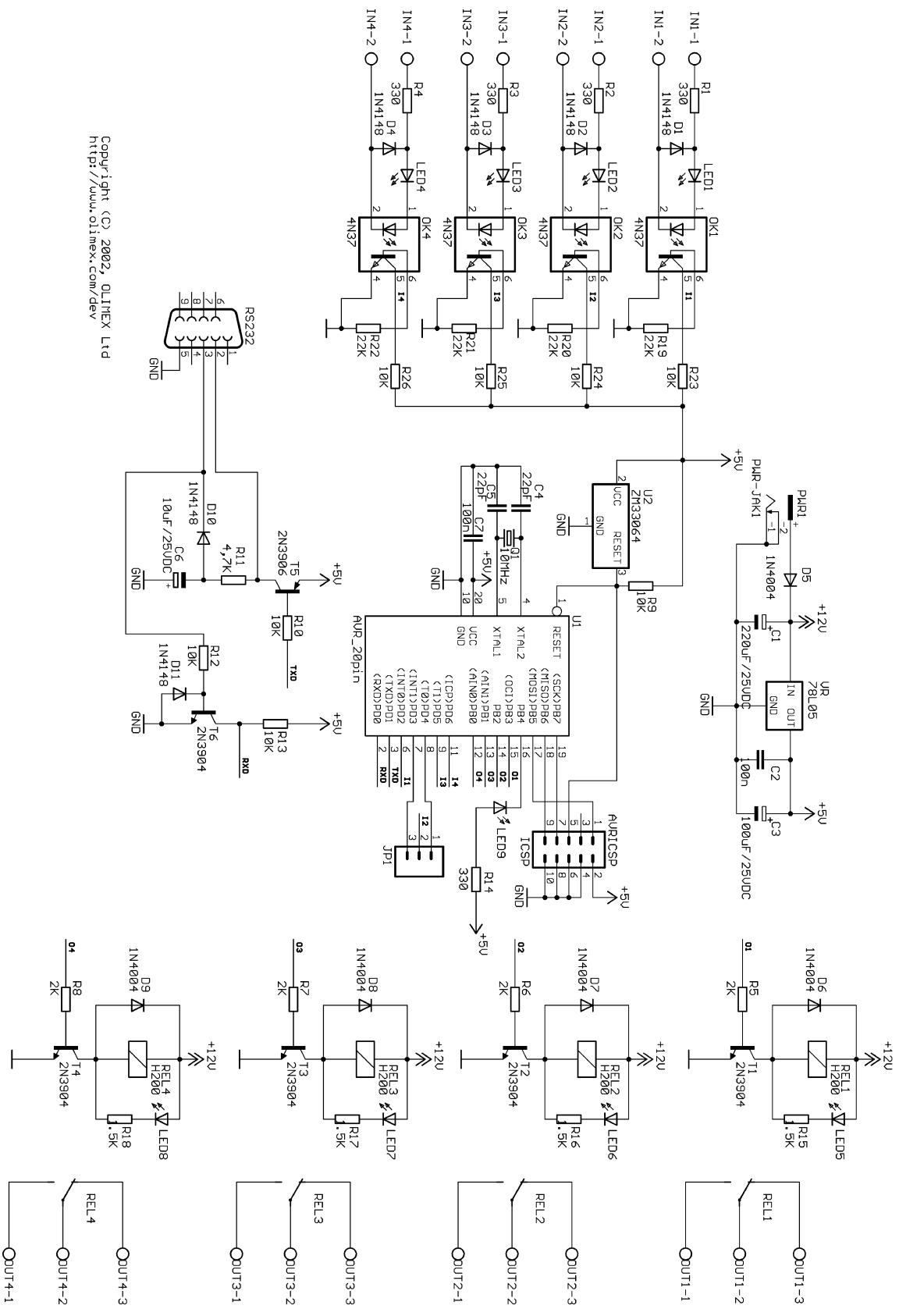AT90S1200 and AT90S2313 microcontrollers.

Power supply:
The power supply should be in range +10 +14VDC.

Ordering codes:
AVR-IO   - assembled and tested

IN4-2 IN4-1 IN3-2 IN3-1 IN2-2 IN2-1 IN1-2 IN1-1

R4 330 R3 330 R2 330 R1 330
D4 1N4148 D3 1N4148 D2 1N4148 D1 1N4148
LED4 LED3 LED2 LED1

OK4 4N37 OK3 4N37 OK2 4N37 OK1 4N37
I4 I3 I2 I1

R22 22K R21 22K R20 22K R19 22K
R26 10K R25 10K R24 10K R23 10K

RS232
GND

D10 1N4148
C6 10uF/25VDC
R11 4,7k
T5 2N3906
R10 10K
TXD

R12 10K
D11 1N4148
T6 2N3904
R13 10K
RXD

+5V

C5 22pF C4 22pF
C7 100n
Q1 10MHz
U2 ZM33064
VCC GND RESET
GND
R9 10K

U1 AVR_20pin
RESET
XTAL2 XTAL1
VCC GND
PB7 (SCK) PB6 (MISO) PB5 (MOSI) PB4 PB3 (OC1) PB2 (AIN1) PB1 (AIN0) PB0
PD6 (ICP) PD5 (T1) PD4 (T0) PD3 (INT1) PD2 (INT0) PD1 (TXD) PD0 (RXD)
I4 I3 I2 I1 O4 O3 O2 O1 RXD TXD

JP1

LED9
R14 330
AVRICSP
ICSP
GND +5V

PWR-JAK1
PWR1
D5 1N4004
+12V
C1 220uF/25VDC
VR 78L05
IN OUT GND
GND
C2 100n
C3 100uF/25VDC
+5V

O4 R8 2K D9 1N4004 T4 2N3904 REL4 H200 R18 .5K LED8 REL4 OUT4-1 OUT4-2 OUT4-3 +12V
O3 R7 2K D8 1N4004 T3 2N3904 REL3 H200 R17 .5K LED7 REL3 OUT3-1 OUT3-2 OUT3-3 +12V
O2 R6 2K D7 1N4004 T2 2N3904 REL2 H200 R16 .5K LED6 REL2 OUT2-1 OUT2-2 OUT2-3 +12V
O1 R5 2K D6 1N4004 T1 2N3904 REL1 H200 R15 .5K LED5 REL1 OUT1-1 OUT1-2 OUT1-3 +12V