# AVR Programmer Schematic

**U2 — ATmega8-SMD**

| Pin | Signal | | Signal | Pin |
|---|---|---|---|---|
| 1 | (INT1) PD3 | | PD2 (INT0) | 32 — P.USB+ |
| 2 | (XCK/T0) PD4 | | PD1 (TXD) | 31 — P.PD1 |
| 3 | GND | | PD0 (RXD) | 30 — P.PD0 |
| 4 | VCC | | PC6 (RESET) | 29 — P.RESET1 |
| 5 | GND | | PC5 (ADC5/SCL) | 28 |
| 6 | VCC | | PC4 (ADC4/SDA) | 27 |
| 7 | (XTAL1/TOSC1) PB6 — P.XTAL1 | | PC3 (ADC3) | 26 |
| 8 | (XTAL2/TOSC2) PB7 — P.XTAL2 | | PC2 (ADC2) | 25 — P.SPEED |
| 9 | (T1) PD5 | | PC1 (ADC1) | 24 — P.RED |
| 10 | (AIN0) PD6 | | PC0 (ADC0) | 23 — P.GREEN |
| 11 | (AIN1) PD7 | | ADC7 | 22 |
| 12 | (ICP1) PB0 — P.USB- | | GND | 21 — GND |
| 13 | (OC1A) PB1 — P.USB+ | | AREF | 20 |
| 14 | (SS/OC1B) PB2 — P.PB2 | | ADC6 | 19 |
| 15 | (MOSI/OC2) PB3 — P.PB3 | | AVCC | 18 — P.VCC |
| 16 | (MISO) PB4 — P.MISO | | PB5 (SCK) | 17 — P.PB5 |

## Components / Nets

- LED3 RED, R6 1K — P.VCC
- LED4 GREEN, R7 1K — P.VCC — P.GREEN / P.RED
- R5 10K — P.VCC
- C6 104, C7 104, C8 104 — P.VCC / GND
- J10 Speed (1,2) — P.SPEED / GND
- J8 Update (1,2) — P.RESET1
- J9 ISP (1,2,3,4,5)
  - P.PB2 — R8 270R — P.RESET — 1
  - P.PB3 — R9 270R — P.MOSI — 2
  - P.MISO — 3
  - P.PB5 — R10 270R — P.SCK — 4
  - P.VCC — (5)
- J11 Serial (1,2)
  - P.PD0 — R11 100R — P.RX — 1
  - P.PD1 — R12 100R — P.TX — 2
- X2 12Mhz, C9 22pF, C10 22pF — P.XTAL1 / P.XTAL2 / GND
- J12 5VDC (1,2)
- D1 SS14 — P.VCC
- LED5 RED, R16 470R — P.VCC / GND
- USB1 USB_MINI
  - 1 VCC
  - 2 D-
  - 3 D+
  - 4 ID
  - 5 GND
  - 9, 8, 7, 6
- R13 2K2 — P.VCC
- R14 68R — P.USB-
- R15 68R — P.USB+
- R17 2K2
- C12 104, C11 4.7uF — GND
- D2 3V6, D3 3V6 — GND

Schematic sheet — AVR WINTER

Grid references: 1, 2, 3, 4 (top and bottom); A, B, C, D (left and right)

GND
C1
100nF

U1
PORTB
PB0 14 PB0 (ICP)          PC0 (ADC0) 23        AREF  PORTC
PB1 15 PB1 (OC1A)         PC1 (ADC1) 24              1
    16 PB2 (SS/OC1B)      PC2 (ADC2) 25              2
MOSI 17 PB3 (MOSI/OC2)    PC3 (ADC3) 26              3
MISO 18 PB4 (MISO)    PC4 (ADC4/SDA) 27              4
SCK 19 PB5 (SCK)      PC5 (ADC5/SCL) 28              5
XTAL1 9 PB6 (XTAL1/TOSC1)                            6
XTAL2 10 PB7 (XTAL2/TOSC2)  PC6 (RESET) 1  RESET     7
                                                     8
J1
1
2
3
4
5
6

GND

RX  2 PD0 (RXD)           VCC 7  5V
TX  3 PD1 (TXD)          AVCC 20
BUTTON 4 PD2 (INT0)      AREF 21  AREF
    5 PD3 (INT1)
    6 PD4 (XCK/T0)        GND 22
    11 PD5 (T1)           GND 8
    12 PD6 (AIN0)
    13 PD7 (AIN1)                  GND

ATmega8/48/88/168/328

J3
1
2
3
4
5
6
7
8
9
10
PORTD

5V

J2

RESET

5V
R1
10K

RESET

SW1
RESET

C2
100nF

GND   GND

ISP1
ISP
1
2
3
4
5
RESET
MOSI
MISO
SCK

5V

J4
1
2
Serial
RX
TX

5V
R2
10K

BUTTON

C5
100nF

SW2
PD2

GND

PB0

J6
2
1
PB0

LED1
RED

R3
330R

GND

PB1

J7
2
1
PB1

LED2
GREEN

R4
330R

GND

XTAL1

XTAL2

X1
12Mhz

C3
22pF

C4
22pF

GND

5V

J5
1
2
3
4
POWER

GND

Tuong thich voi cac dong chip sau:
 - ATmega8/L
 - ATmega48A/PA
 - ATmega88A/PA
 - ATmega168A/PA
 - ATmega328/P

USB1

R17

R16

R15

D3 D2

Rev 1.0

RX1 TX1

GND
5V
PD0 (RX)
PD1 (TX)
PD2 (BUTTON)
PD3
PD4
PD5
PD6
PD7

GND
GND
5V

RESET

R5

LED3

LED4

RST

R8

ATmega48/88/168/328

RST/PC6
PC5
PC4
PC3
PC2
PC1
PC0

AREF

PB5
PB4
PB3
PD2
PB1
PB0

5V RST MOSI MISO SCK

LED1 LED2

PD2

| Comment | Description | Designator | Footprint | LibRef | Quantity |
|---|---|---|---|---|---|
| 100nF | Cap np 1pF - 472pF | C1, C2, C5 | C0805 | CN1 | 3 |
| 22pF | Cap np 1pF - 472pF | C3, C4, C9, C10 | C0603 | CN1 | 4 |
| 104 | Cap np 104 => 105pF | C6, C7, C8, C12 | C0805 | CN2 | 4 |
| 4.7uF | Cap P 0,1uF < 22uF , 16 - 50V | C11 | C1210 | CP1 | 1 |
| SS14 | Diode 1A | D1 | SS14 | D1A | 1 |
| 3V6 | Diode Zenner | D2, D3 | 1N5226 | DZ | 2 |
| ISP | Header 5 (Green) | ISP1, J9 | Header_5 | Hed5 | 2 |
| PORTB | Header 6 | J1 | Header_6 | Hed6 | 1 |
| PORTC | Hedear 8 | J2 | Header_8 | Hed8 | 1 |
| PORTD | Header 10 | J3 | Header_10 | Hed10 | 1 |
| Serial | Header 2 (Green) | J4, J11 | Header_2 | Hed2 | 2 |
| POWER | Header 4 (Green) | J5 | Header_4 | Hed4 | 1 |
| PB0 | Header 2 (Green) | J6 | Header_2 | Hed2 | 1 |
| PB1 | Header 2 (Green) | J7 | Header_2 | Hed2 | 1 |
| Update | Header 2 (Green) | J8 | Header_2 | Hed2 | 1 |
| Speed | Header 2 (Green) | J10 | Header_2 | Hed2 | 1 |
| 5VDC | Header 2 (Green) | J12 | Header_2 | Hed2 | 1 |
| RED | LED Single colour Green and Red | LED1, LED3, LED5 | Led 0805R | LED | 3 |
| GREEN | LED Single colour Green and Red | LED2, LED4 | Led 0805G | LED | 2 |
| Res2 | Resistor | R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17 | RESC2012(0805) | Res2 | 17 |
| RESET | Switch button 2 pin | SW1 | BUTTON 2PIN TRON | SW2 | 1 |
| PD2 | Switch button 2 pin | SW2 | BUTTON 2PIN TRON | SW2 | 1 |
| ATmega8/48/88/168/32 8 | 8-Bit AVR Microcontroller with 8K Bytes of In-System Programmable Flash Memory | U1 | SOCKET_28 | ATmega8-L | 1 |
| ATmega8-SMD | High-performance, Low-power Atmel ® AVR ® 8-bit Microcontroller | U2 | ATMEGA_8_SMD | ATmega8_SMD_32pin | 1 |
| USB_MINI | | USB1 | USBMNIB | USB_MINI | 1 |
| 12Mhz | Crystal For all Crystal 2p | X1, X2 | CRYSTAL | XT2 | 2 |