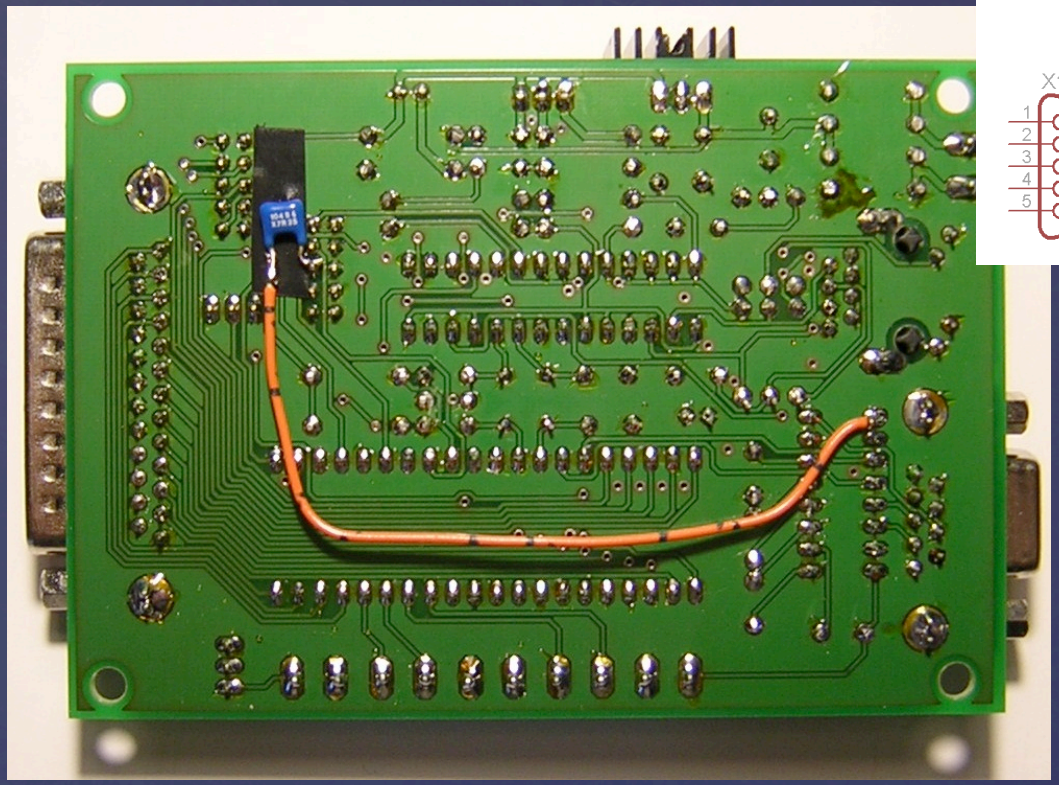
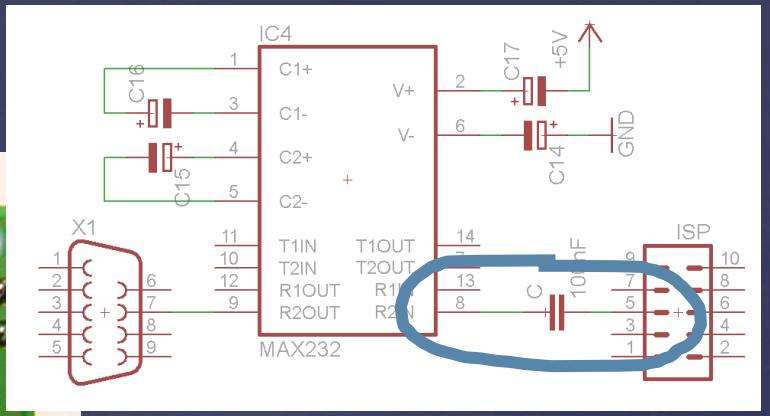
CheapNetDuinoHack

{ Using a Pollin AVR NetIO as Arduino w/ Ethernet

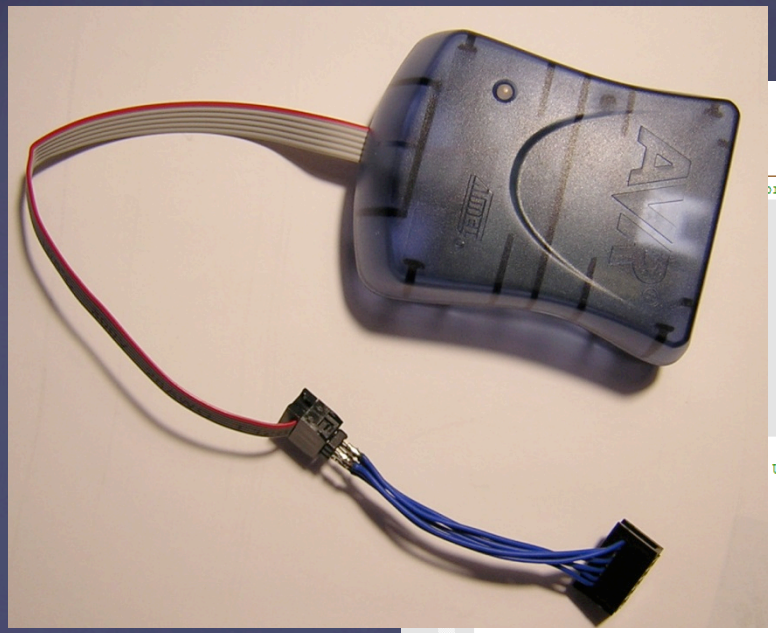
Markus Gebhard, Karlsruhe @ elektro:camp 2013:04





Add a RESET line for the Arduino IDE

Pollin AVR NetIO-duinofied

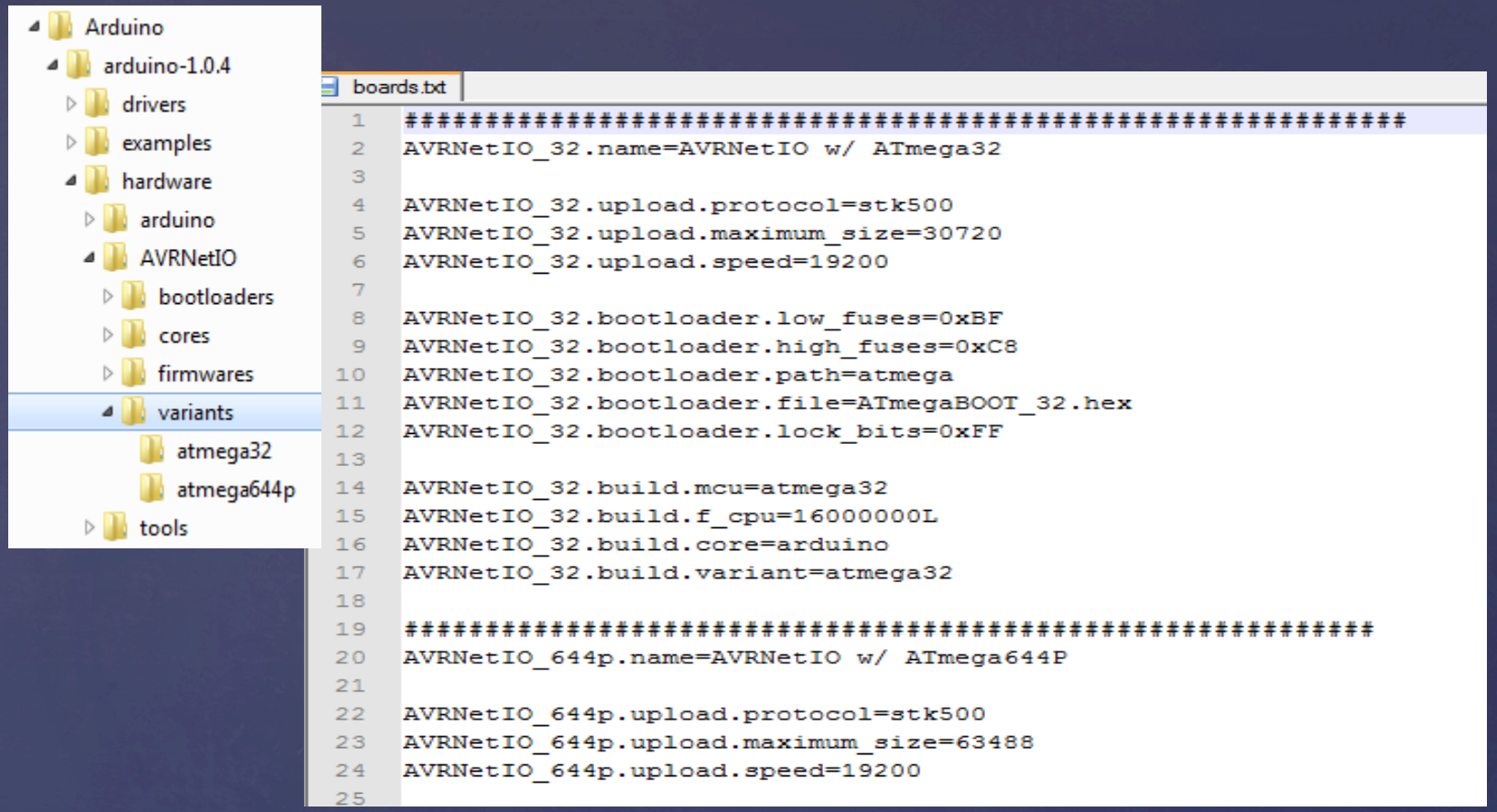


```
41  /* onboard LED is used to indicate, that the bootloade
42  /* if monitor functions are included, LED goes on afte
43  #if defined __AVR_ATmega128__ || defined __AVR_ATmega1
44  /* Onboard LED is connected to pin PB7 (e.g. Crumb128,
45  #define LED_DDR  DDRB
46  #define LED_PORT PORTB
47  #define LED_PIN  PINB
48  #define LED      PINB7
```

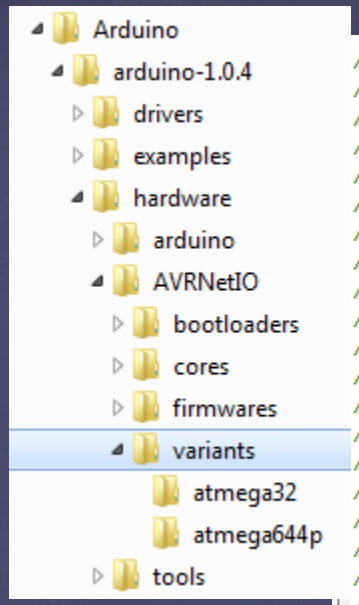
```
116  #define BL_PIN  PINF
117  #define BL0     PINF7
118  #define BL1     PINF6
119  #elif defined __AVR_ATmega1280__
120  /* we just don't do anything for the MEGA and enter bo
121  #elif defined __AVR_ATmega644P__  // the ATmega644P ha
122  #define BL_DDR  DDRD
123  #define BL_PORT PORTD
124  #define BL_PIN  PIND
125  #define BL0     PIND0
126  #define BL1     PIND2
127  #elif defined __AVR_ATmega32__
128  #define BL_DDR  DDRD
129  #define BL_PORT PORTD
130  #define BL_PIN  PIND
131  #define BL      PIND0
132  #else
133  /* other ATmegas have only one UART, so only one pin
134  #define BL_DDR  DDRD
135  #define BL_PORT PORTD
136  #define BL_PIN  PIND
137  #define BL      PIND6
138  #endif
139
140
141  /* onboard LED is used to indicate, that the bootload
142  /* if monitor functions are included, LED goes on aft
143  #if defined __AVR_ATmega128__ || defined __AVR_ATmega
144  /* Onboard LED is connected to pin PB7 (e.g. Crumb128,
145  #define LED_DDR  DDRB
146  #define LED_PORT PORTB
147  #define LED_PIN  PINB
148  #define LED      PINB7
149  #elif defined __AVR_ATmega644P__ || defined __AVR_ATm
150  /* use an LED on pin B1 (AVRNetIO jumper to select pr
151  #define LED_DDR  DDRB
152  #define LED_PORT PORTB
```

Flash Arduino Bootloader

Adapt standard ATmegaBOOT_168.c for ATmega32/644 – basically PINs, chip IDs and #defines – no serious changes required…



Hardware for Arduino IDE →boards.txt




```
// ATMEL ATMEGA32
//
//                                  +---\/---+
//  Ext7         T0      D0  PB0 1  |        |40  PA0 AI0/D24 Eingang1/SubD10
//  J11          T1      D1  PB1 2  |        |39  PA1 AI1/D25 Eingang2/SubD11
//  ENC-INT      INT2    D2  PB2 3  |        |38  PA2 AI2/D26 Eingang3/SubD12
//  Ext8         PWM     D3  PB3 4  |        |37  PA3 AI3/D27 Eingang4/SubD13
//  ENC-SPI/ISP SS       D4  PB4 5  |        |36  PA4 AI4/D28 ADC1
//  ENC-SPI/ISP MOSI     D5  PB5 6  |        |35  PA5 AI5/D29 ADC2
//  ENC-SPI/ISP MISO     D6  PB6 7  |        |34  PA6 AI6/D30 ADC3
//  ENC-SPI/ISP SCK      D7  PB7 8  |        |33  PA7 AI7/D31 ADC4
//                           RST 9  |        |32  AREF
//                           VCC 10 |        |31  GND
//                           GND 11 |        |30  AVCC
//                         XTAL2 12 |        |29  PC7 D23     Ausgang8/SubD9
//                         XTAL1 13 |        |28  PC6 D22     Ausgang7/SubD8
//  MAX232-RX    RX0     D8  PD0 14 |        |27  PC5 D21 TDI Ausgang6/SubD7
//  MAX232-TX    TX0     D9  PD1 15 |        |26  PC4 D20 TDO Ausgang5/SubD6
//  Ext1         INT0    D10 PD2 16 |        |25  PC3 D19 TMS Ausgang4/SubD5
//  Ext2         INT1    D11 PD3 17 |        |24  PC2 D18 TCK Ausgang3/SubD4
//  Ext3         PWM     D12 PD4 18 |        |23  PC1 D17 SDA Ausgang2/SubD3
//  Ext4         PWM     D13 PD5 19 |        |22  PC0 D16 SCL Ausgang1/SubD2
//  Ext5                 D14 PD6 20 |        |21  PD7 D15 PWM Ext6
//                                  +--------+
//
//

#define NOT_A_PIN 0
#define NOT_A_PORT 0

#define NOT_ON_TIMER 0
#define TIMER0 1
#define TIMER1A 2
```

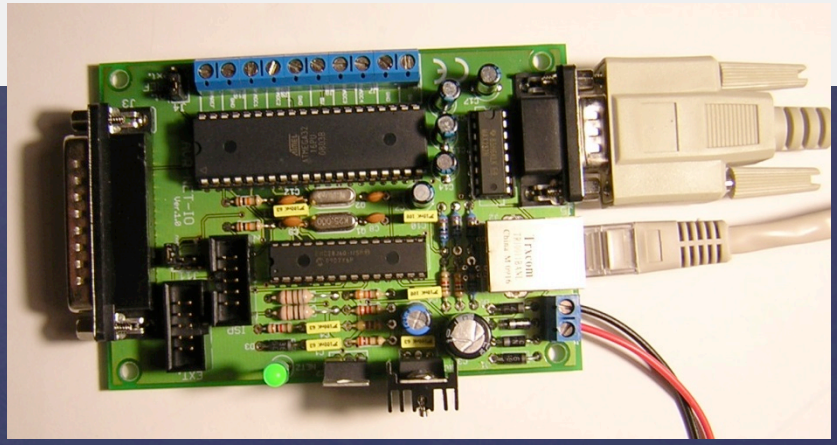
Hardware for Arduino IDE
→pins_arduino.h variants

Use Jean-Claude's brilliant ethercard driver…

Enjoy a cheap Arduino w/ ethernet capability

Received Data

```
1    5    10    15    20    25    30    35    40    45    50    55    60    65    70    75    80    85
AVRNetIO Test\r\n
\r\n
Assigned IP address 192.168.0.128\r\n
GET /?o1=1&o4=1&o5=1&o8=1 HTTP/1.1\r\n
Host: 192.168.0.128\r\n
User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64; rv:20.0) Gecko/20100101 Firefox/20.0\r\n
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8\r\n
Accept-Language: de-de,de;q=0.8,en-us;q=0.5,en;q=0.3\r\n
Accept-Encoding: gzip, deflate\r\n
DNT: 1\r\n
Referer: http://192.168.0.128/?o1=1&o4=1&o5=1&o8=1\r\n
Connection: keep-alive\r\n
\r\n
\r\n
```



Simple AVRNetIO webserver

☑ Output 1	☐ Output 2
☐ Output 3	☑ Output 4
☑ Output 5	☐ Output 6
☐ Output 7	☑ Output 8
Input 1: 1	Input 2: 1
Input 3: 1	Input 4: 1
ADC1: 824	ADC2: 666
ADC3: 435	ADC4: 331

Daten absenden

Easy Server

https://github.com/gebhardm/energyhacks/tree/master/AVRNetIOduino

With ideas taken from
http://sanguino.cc/
http://son.ffdf-clan.de/?path=start

Resources