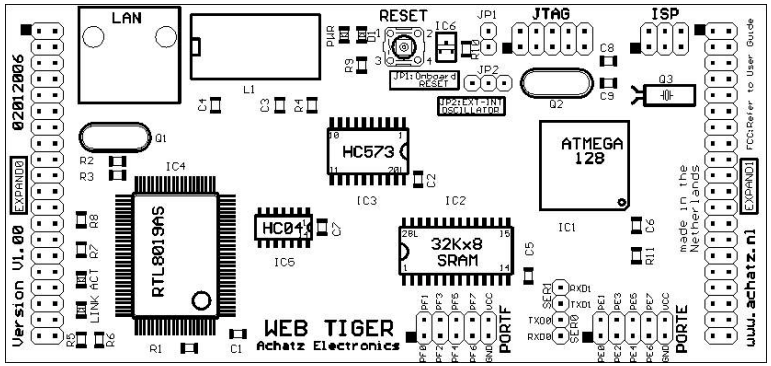
Web Tiger Hardware User Guide

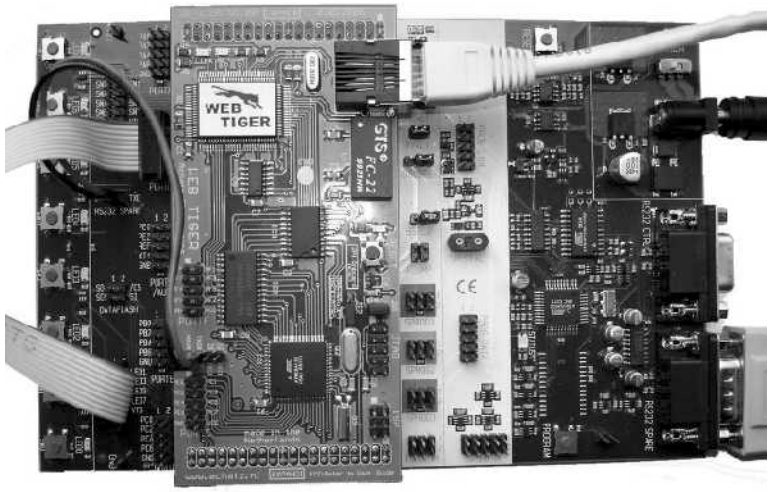
The Web Tiger board is a top module designed to fit on a STK 500 developing board from Atmel Corporation. With this board the STK500 is extended with a ATMEGA128 and a Ethernet Interface. This user guide acts as a complete technical hardware reference for advanced users.

Features

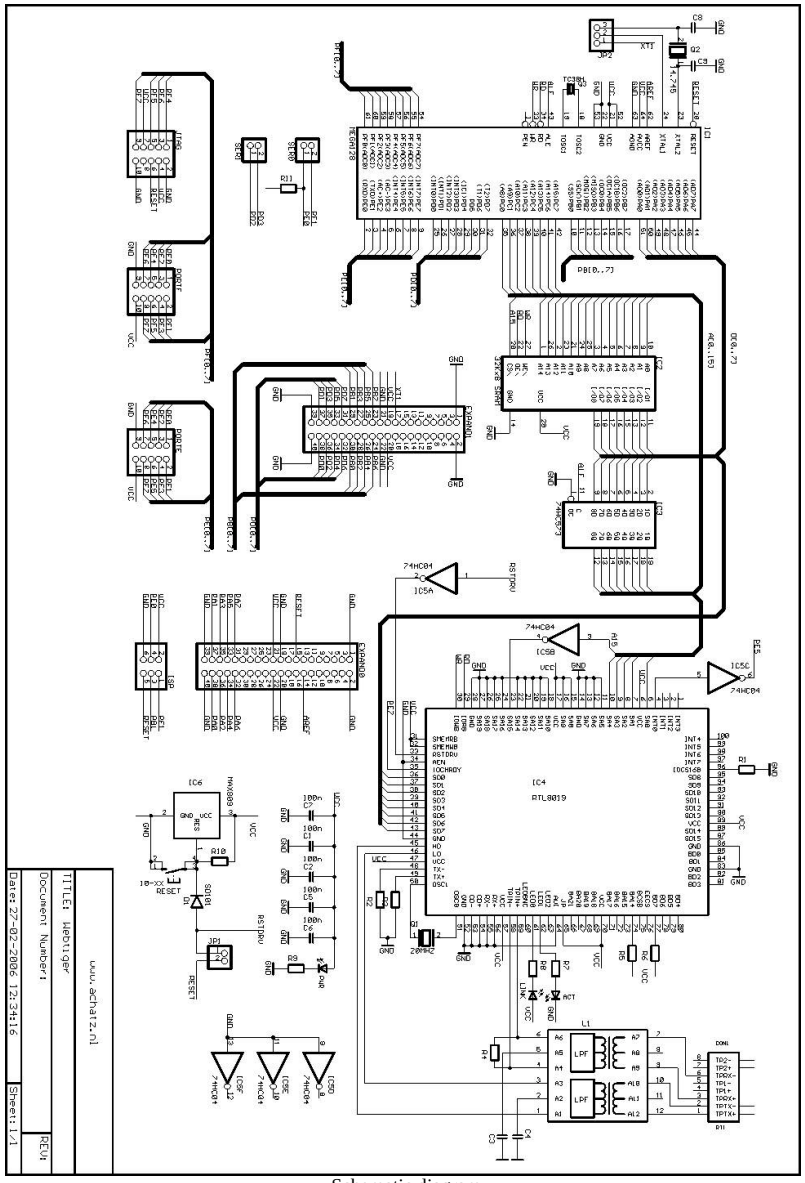
- STK 500 Compatible
- AVR Studio® Compatible
- Ethernut V1.3 Compatible
- Supports ATMEGA128-16
- Ethernet Controller
- External 32 KB SRAM
- 32 kHz Crystal for RTC Implementations
- JTAG for On-Chip Debugging
- Serial In-System Programming (ISP)
- Parallel High-Voltage Programming
- Running NUT/OS or BASCOM



Board Layout



It fits on a STK 500 Evaluation Board



Schematic diagram

Expansion 0 and 1

The STK500 board has two expansion connectors, one on each side. Therefore the Web Tiger board should be connected to the STK500 expansion header 0 and 1. It is importand that the top module is connected in the correct way. The EXPAND 0 written on the Web Tiger board should match the EXPAND 0 written beside the expansion header on the STK500 board.

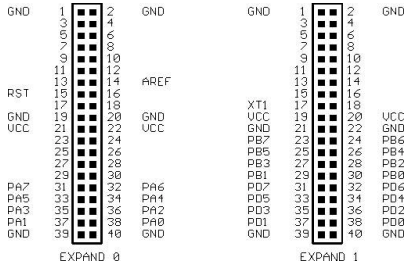


Figure 1

Figure 1 shows the Web Tiger Expansion connectors and the supported signals

Port E and Port F

The Port headers for Port E and Port F are not available on the STK500 board. These ports are located on the Web Tiger board
and have the same pinout and functionality as the ports om the STK500 board.

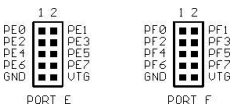


Figure 2

ISP and JTAG

To programm the Web Tiger board using ISP programming mode, connect the 6-wire cable between the ISP6PIN connector on the STK500 board and the ISP connector om the Web Tiger board (Figure 3).
A JTAG connector is also available on the Web Tiger board and is compliant with the pinout of the JTAC ICE from Atmel.

Figure 3

32 KB EXTERNAL SRAM

The ATMEGA128 works in normal-mode (refere to fuse-settings)

ADDRESS Data Memory
$0000-$001F 32 registers
$0020-$005F 64 I/O reg.
$0060-$00FF 160 Ext I/O reg.
$0100-$10FF Internal SRAM
$1100-$7FFF External SRAM

The startaddress for the external SRAM is $1100 and available are 28416 Bytes
The Atmega128 has internal RAM from $0100-$10FF. 4096 bytes. The WebTiger has 32 K SRAM external memory, but it overlaps these first bytes. So only 28416 byte of the external SRAM is left to use.

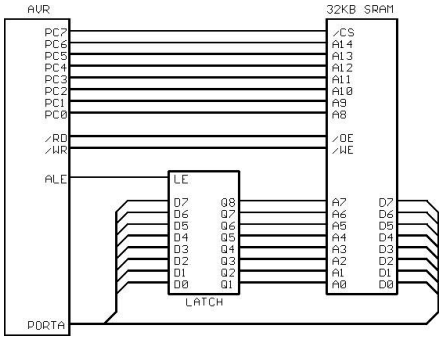


Figure 4

Ethernet Controller

ADDRESS RTL8019
$8300-$831F RTL8019as

The RTL8019 is memory mapped and occupies 32 bytes at address $8300-$831F. If you do a check you will see that it occurs several times in the memory space above $8000. All traffic from and to the RTL8019as will be done with only these 32 bytes.
Important: The ATMEGA128 Portpins PE5 and PE7 are used for the Ethernetcontroller.

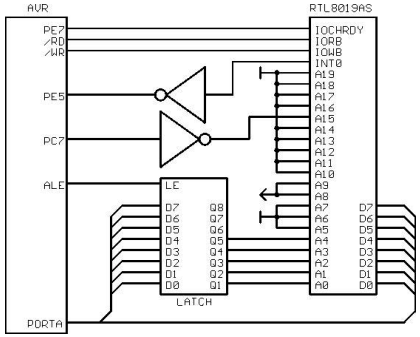


Figure 5

VTARGET SETTINGS

VTARGET controls the supply voltage to the Web Tiger board. It can be controlled using the AVR Studio Software. If the VTARGET jumper on the STK500 is mounted, the VTARGET supply is connected to the Web Tiger board. VTARGET can be adjusted to 0 - 6V from the AVR Studio. Please do this job before connecting the Web Tiger board on the STK500 board. The correct voltage settings must be about 5V (Figure 7) and approximiately 0.5A can be delivered to the Web Tiger board.

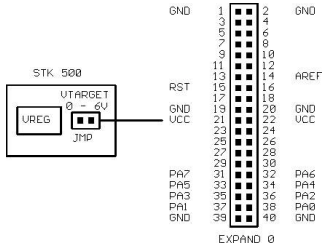


Figure 6

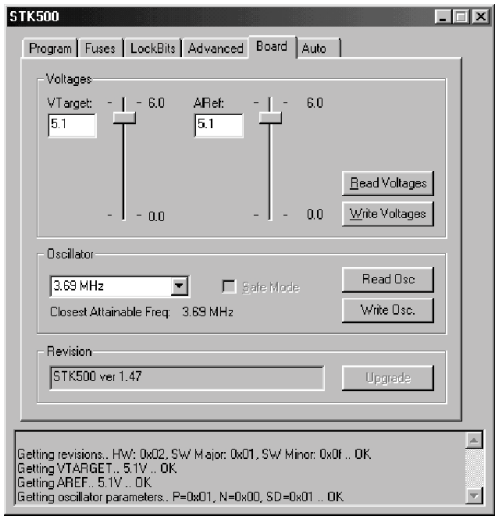


Figure 7

Figure 7 shows VTG adjusting using the AVR Studio

In-System-Programming

The ATMEGA128 can be programmed using SPI and High-Voltage Programming. This section eplain how to use the programming cables and successfully programm in one of these two modes.

To Programm the ATMEGA128 selecting ISP programming mode, connect the 6-wire cable between ISP6PIN connector on the STK500 board and the ISP connector on the Web Tiger board as shown in Figure 9.
The Web Tiger board can be programmed using the serial programming mode in the AVR Studio Software.
For more Information please see the STK500 User Guide.

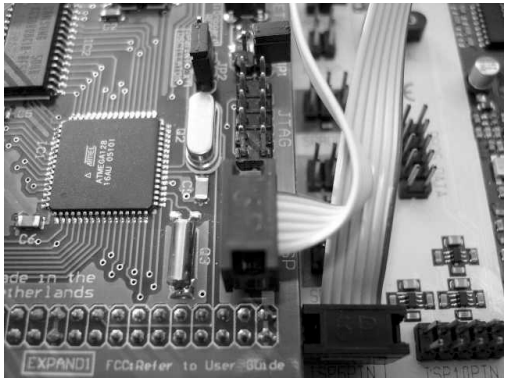


Figure 8

Figure 8 shows the ISP6PIN cable connected

High-Voltage-Programming

To programm the Web Tiger board using High-Voltage Parallel programming, connect the PROGCTRL to PORTD and PROGDATA to PORTB on the STK500 board as show in Figure 10.
If the ISP6PIN cable is still connected, please disconnect it !!!
The BSEL2 Jumper (STK500 board) must be mounted when using the High-Voltage Programming mode.

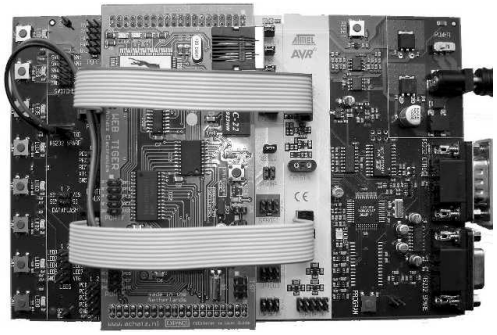


Figure 9

Figure 9 shows PROGCTRL to PORTD and PROGDATA to PORTB

The OSCSEL Jumper must be mounted on pins 1 and 2 on the STK500 board.
The XTAL1 Jumper must be mounted on the STK500 board.

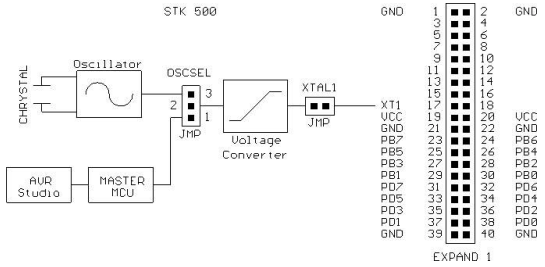


Figure 10

Figure 10 shows external OSC settings on the STK500 board

When using High-Voltage Parallel Programming, you also must take care for two jumpers on the Web Tiger board.

Jumper 1 (JP1) is NOT jumpered
Jumper 2 (JP2) is set to extern OSC

It is very important that JP1 is not jumpered.
On the reset line 12 Volts will accur and will destroy the 74HC04 and MAX 809.
See Figure 11.

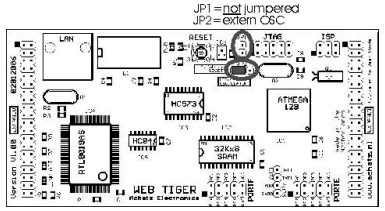


Figure 11

Serial 0 and Serial 1

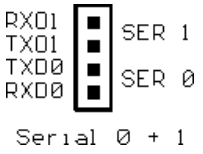


Figure 12

The STK500 board includes two RS232 ports. One RS232 port is used for programming via the AVR Studio and the second RS232 port can be used for communication between the Web Tiger board and a PC. The STK500 two pin header "RS232 spare" can be used. Connect a 2-wire cable from RS232 spare to the SER0 or SER1 header of the Web Tiger board.

AREF

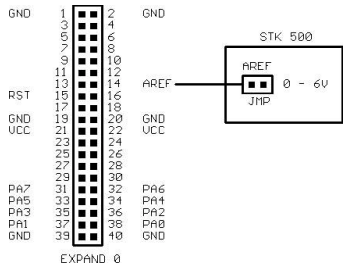


Figure 13

The analog reference voltage (AREF) can be routed to the Web Tigers AREF-Pin by closing the STK500 jumper AREF. The analog reference voltage (AREF) can be adjusted from the AVR Studio to 0 - 6V, but not above VTG.

Technical Specifications

Physical Dimensions	56 x 120 x 25 mm
Weight	45 g
Voltage Supply	4.8 - 5.5 V
Connection	Ethernet 10 Mbit
Supported Device	ATmega128

Technical Support

Atmel Corporation	www.atmel.com
STK 500 User Guide	www.atmel.com/dyn/resources/prod_documents/doc1925.pdf
Web Tiger Board	www.achatz.nl
