AMBER WEB SERVER Quick Start Guide

Release Notes Version: 1.4
For PCB Revision 1.5c
WinAVR-20090313-install.exe
Ethernut-4.8.3.exe

Thank you for purchasing the Amber Web Server Development Kit V1.4. Before you begin to use the Amber Web Server Kit you should perform the following procedures that lead you through hardware and software setup. The Amber (model number WS128) is functionally compatible with the Ethernut 1.3f board. SDK V1.4 contains a complete development environment for the Amber using GNU AVR GCC tools, ethernut tools and source code for the pre-installed demonstration applications.

WARNING: Do not attach or detach the programming cable while the unit is powered – always remove power from the unit first. It's also advised to remove the programming cable before shutting the PC off or rebooting the PC – leaving the cable attached may result in erasure of Flash memory.

Difference between Ethernut 1.3f and Amber 1.5c Board

There are several significant differences between the Amber and Ethernut 1.3f board. These differences are summarized below:

SPI 8pin SOIC Serial Flash added – 0.5,1 or 2Mx8 (not populated)
Full duplex RS-485 circuit added on the second serial channel (not populated)
Dual axis accelerometer added (not populated)
Light sensor added (not populated)
Temperature sensor added (not populated)
Provision for SMD LEDs
7805 voltage regulator replaced with LM317 SMD voltage regulator
DS1811 reset IC removed
Full wave rectifier bridge removed
Circuit trace width increased from 0.006 to 0.008 for easier manufacturing

The WS128 is now available in two versions: the WS128 and WS128 Plus. The Plus version comes with all components installed. The WS128 version is functionally equivalent to the Ethernut Rev 1.3f board and can be upgraded by the user to the Plus version by adding the missing components.

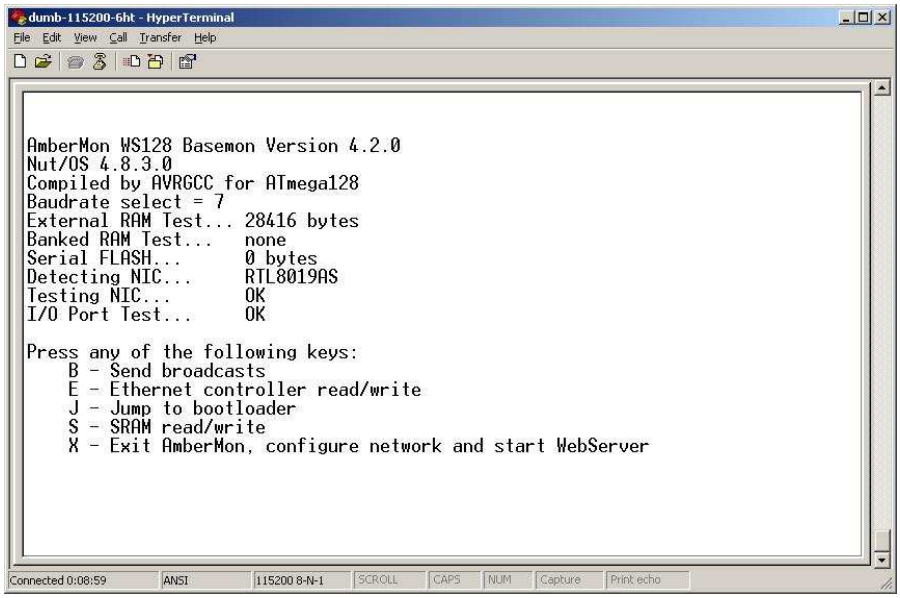
Hardware Setup

The Amber Web Server serial port is pre-strapped for standard PC to WS128 serial communication. A DC power supply (wall mount adapter), DB9 serial cable (MF) and Ethernet cable are required to verify operation.

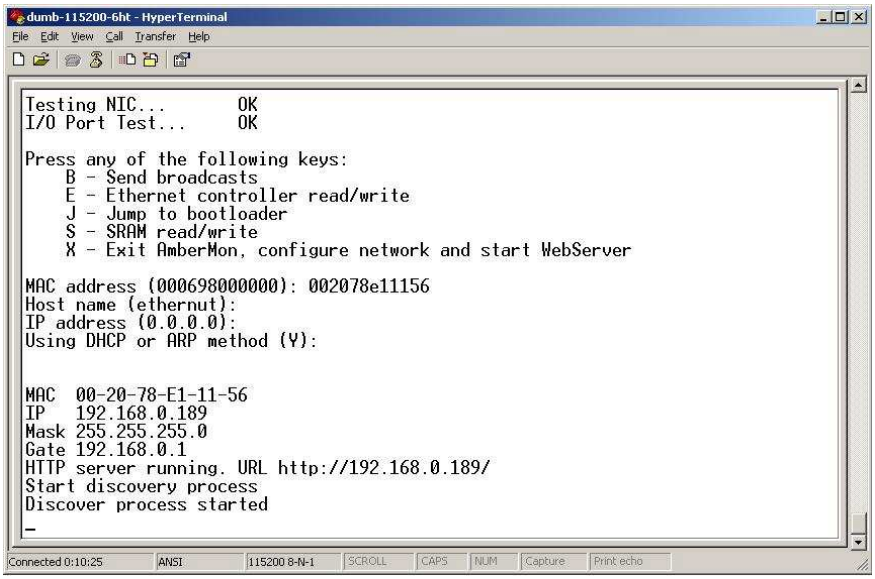
1. Remove the Amber WS128 from the anti-static bag and place on a non-conducting surface. The WS128 is pre-configured with a sample web server application and the serial port is pre-strapped. Attach an Ethernet and serial cable to the WS-128. For the moment leave the ISP10 programming adapter unattached. Connect a DC power source between 9-14VDC –default is center pin positive. A diode protects the board from reverse polarity connection.

2. The unit should power-up with the GRN power and GRN activity leds on. Press the reset button once.

3. Start Hyperterminal, select a baud rate in the range 9600 to 115,200 with XON/XOFF flow control off. Hold done the space bar. After a few moments the Amber Monitor should start with a sign-on message and test option suite. If no message appears press the reset button again. If still nothing, check your serial cable TX/RX lines – they maybe reversed. The sign-on message is shown below:



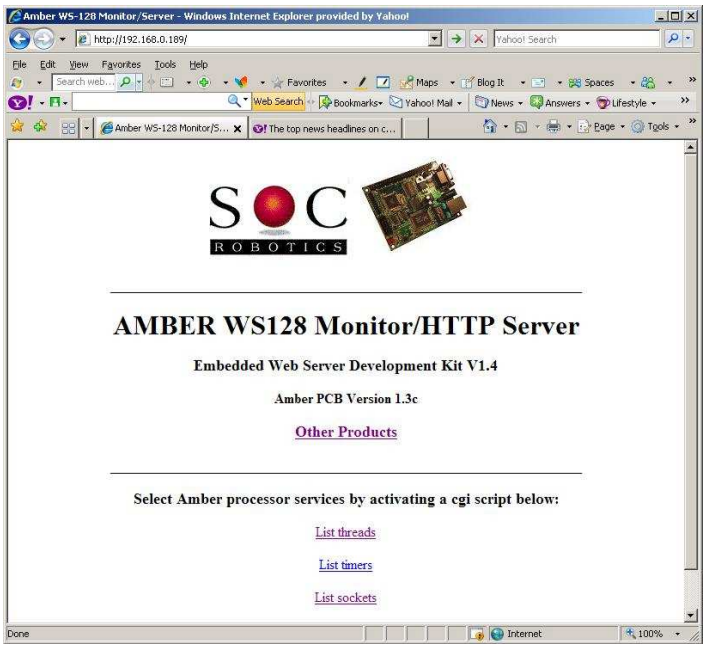
4. Press the X key to start the web server. The default Ethernet MAC address programmed into the server is 00-20-78-e1-11-56 – you can change this to another setting by entering the new setting after the prompt. If your Ethernet network supports DHCP or you wish to configure the IP address using ARP leave the IP address blank – just hit return. The next question asks you to select DHCP or ARP setup. For ARP setup type Y – hit return to select DHCP. Use ARP service if the WS128 is directly connected the PC. The Web server will start as shown below:



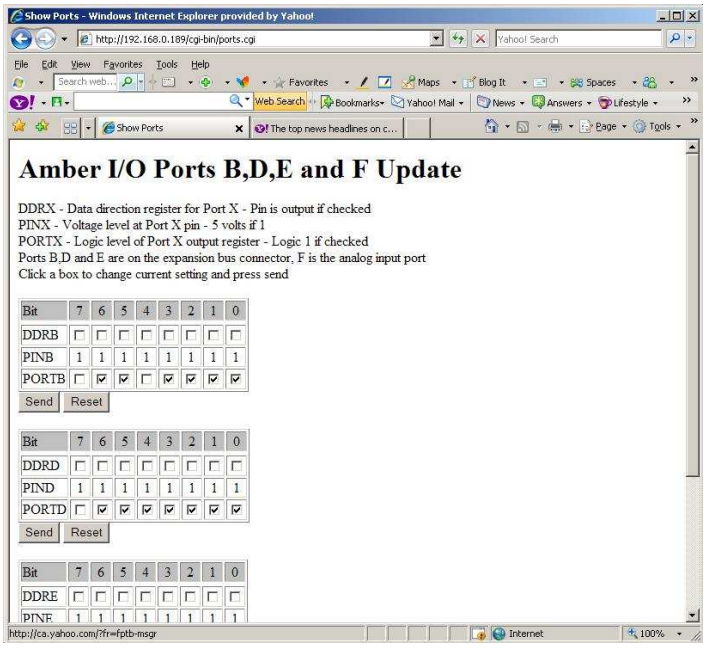
5. If DHCP setup was selected the web server is provided a dynamic IP address by the DHCP server (typically a WIFI router). Enter this address in your browser to access the web server.

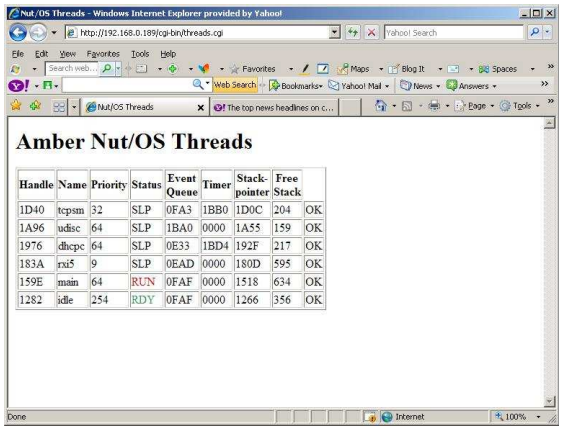
6. For ARP setup type **arp –s 192.168.0.100 00-20-78-e1-11-56** at the DOS prompt or CMD prompt. Now ping the server using the IP address provided by the Amber Server.

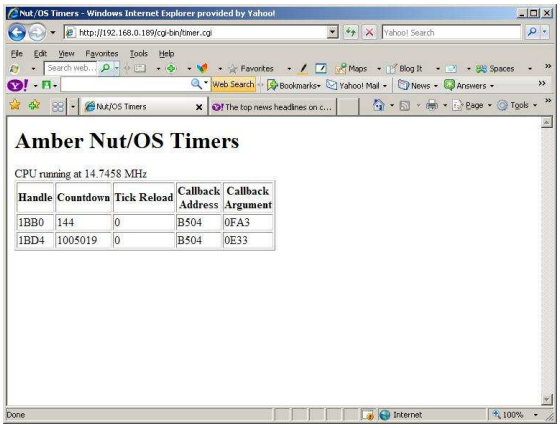
7. The server should now be up. The Amber web Server will show the following start screen in the browser.

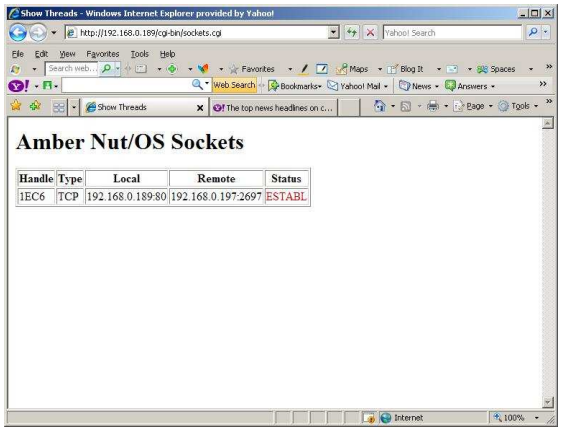


8. Walk through the web pages in the sample application. This particular application consumes slightly less the 80% of system Flash. You can set AVR Port IO by clicking the radio buttons on the Port IO page.

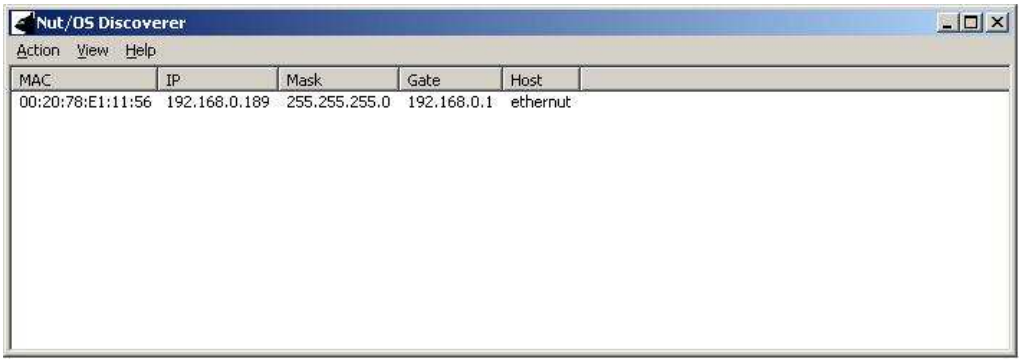








9. Run the **nutdisc.exe** application in the ethernut root directory. This application locates all ethernuts on the local network.



10. To re-program the WS128 remove power from the WS128, attach an ISP10 programming adapter (note the 10pin ISP connector is keyed) and re-apply power. Start ISProg.exe – if the ISP10 is installed properly and the Amber Web Server is powered it will respond with a sign-on message by holding the space bar down. Now try re-programming the web server application by loading **ambermon.hex** located in the **AmberMon** directory. This will replace the Flashed server application with a new copy of the application - the Ethernet MAC is reset to 00-00-00-00-00-00. Restart the WS128 as before but be sure to enter a MAC address.

11. You are now ready to start application development.

Software Setup

The Amber Web Server comes pre-loaded with an Embedded micro Web Server demonstration application. Download the Amber SDK V1.4 zip file from the download section of the SOC Robotics web site www.soc-robotics.com/downloads. Included in the zip file is the latest WinAVR GCC tools and latest Ethernut open source embedded web server tools for the Amber WS128.

1. The Amber SDK V1.4 zip contains all the necessary software to start developing applications on the Amber Web Server under the Windows environment. If developing under Unix download the appropriate tools by going to www.ethernut.de. You should check to see if there is a more recent update for each of the tools. The Amber Web Server is designed to run the Ethernut OS - an open source development platform.

2. Install the latest Ethernut OS development tools and application software (NutOS 4.8.3) using the supplied Windows installer **– ethernut-4.8.3.exe**.

3. Install the AVR GNU C compiler using the supplied Windows installer **WinAVR-20090313-install.exe.**

4. Install the latest version of AVR Studio available from the Atmel web site. AVR Studio integrates the WinAVR GCC tools in a Windows IDE.

5. Run the **NutOS Configurator** from the ethernut root directory**.** The Configurator configures Ethernut for the Amber Web Server. Select the ethernut13f.conf file when prompted. Click the settings tab. Go into the tools field and select GCC AVR as the development tool. Consult the NutConf documentation for the correct steps to configure Ethernut for the ethernut13f. Be sure to create the nutapp folder using the create folder option.

7. Install the **AmberMon** and **AmberMonWLP12** folders in the nutapp folder. **AmberMon** contains the source code for the sample web server application preloaded in the WS128. **AmberMonWLP12** contains the sample web server with additional code to support the WLP12 LCD/Keyboard daughter card.

8. The application examples are compiled using the **make** utility. Activate the utility from the target directory in the DOS or CMD window. Update the path variable using the following command:

```
>set path=c:\ethernut-4.8.3\nut\tools\win32;%PATH%
```

9. Check the SOC Robotics web site for additional application examples.

Hardware Differences

The Amber Web Server Revision 1.5c is software compatible with the Ethernut Rev 1.3f board except for a change in the memory/IO expansion bus - the ALE line is routed to pin 1 and the addition of a number of additional features. Note that the Amber has a pad for an external Serial Flash device.

Limited Warranty

The Amber Web Server is warranted against defects in materials and workmanship for a period of one year from the date of purchase from SOC Robotics, or from an authorized dealer. The Amber Web Server is sensitive to static discharge – please be careful and try not to blow it up.

FCC Part 15 Statement

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.