

LPC-2478-STK Software Quickstart Guide

By default, the board executes the U-Boot bootloader located in the internal flash. It's menu is displayed on the serial port of the board. The default settings of the bootloader are:

Com port: 115200 bps, 8N1

LAN settings:

IP address: 192.168.0.158

Netmask: 255.255.255.0

Server IP: 192.168.0.240

MAC: 00:de:ad:b0:05:03

A NULL-modem cable is needed to connect the board to a host PC

Programming u-boot to the board:

If the u-boot image gets corrupted for some reason, the user can easily restore it by using the free FlashMagic utility (available from <http://www.flashmagictool.com>). Select the correct processor type and frequency and under "Step 2 - Erase" select "Erase all Flash+Code read protect". Then load the "u-boot-bin.hex" file available in the "Images" section on the CD. Connect the board and close the "ISP_E" and "RST_E" jumpers . Then press the start button at the utility and, after the programming has completed, the u-boot image should be restored to the factory default.

Running uClinux:

As the board does not have a sufficiently large amount of non-volatile memory on board, the uClinux kernel and root filesystem must be transferred to the board every time the system starts up. There are several ways to do that - by using an USB flash drive, by using an SD/MMC card, by using a network TFTP server or through the serial port.

If you wish to use an USB flash drive, copy the files to it, the plug it in the board and issue the following commands

```
lpc-2478-stk # usb start
```

```
...
```

```
lpc-2478-stk # fatls usb 0
```

```
...
```

```
<size of your file> <filename>
```

```
lpc-2478-stk # fatload usb 0 <load_address> <filename>
```

```
...
```

If you use an SD/mmc card, substitute "usb" in the above example with "mmc"

You can also use a TFTP server on the network to load the images. This saves time during e.g. development, because the step of transferring the file to an intermediate medium is eliminated. You need to make sure that the "Server IP" option is set correctly for your network (the address can be changed with the "**setenv serverip 192.168.0.240**", "**saveenv**" commands). The command is:

```
lpc-2478-stk# tftpboot <load_address> <filename>
```

If the above methods are unavailable to you for some reason, you can still load a file through the serial line. The syntax is:

```
lpc-2478-stk# loady <load_address> 115200
```

Then send the file through your terminal program using the ymodem protocol.

As an example of the above, to run uClinux from an USB flash drive:

1. copy the files `vmlinux.bin` and `romfs_5.img` to the flash drive
2. plug it in the board, apply power and interrupt the boot process
3. issue the following commands:

```
lpc-2478-stk# usb start
lpc-2478-stk# fatload usb 0 0xa0800000 romfs_5.img
lpc-2478-stk# fatload usb 0 0xa0008000 vmlinux.bin
lpc-2478-stk# go a0008000
```

Compiling u-boot

The u-boot image has been built under a cygwin host using the GNUARM-gcc_3.4.3 available under the "Utils" folder. After you have your build environment set up correctly (basically installing cygwin and GNUARM under windows or installing an arm gcc cross compiler under linux), extract the sources from the "U-boot" directory and issue:

```
$ make lpc_2478_stk_config
$ make
```

After a while you should have a new u-boot image `u-boot-bin.hex` .

Recompiling uClinux

You need to use a linux host in order to build the uClinux kernel due to some cross-compiling issues. You also need to use the Snapgear arm-linux toolchain available from [their ftp site](#) (also included on the CD).

First extract the toolchain somewhere:

```
$ cd ~
$ mkdir -p lpc-2478-uclinux/snapgear-cross
$ cd lpc-2478-uclinux/snapgear-cross
$ tar zxf ~/arm-linux-tools-20061213.tar.gz
```

Add the toolchain to your PATH variable:

```
$ PATH=$PATH:~/lpc-2478-uclinux/snapgear-cross/usr/local/bin
```

Extract the sources:

```
$ cd ~/lpc-2478-uclinux/
$ tar zxf uClinux-dist-lpc_2478_stk-20081007.tgz
```

Enter the directory and configure for "Vendor=NXP, Product=LPC2468"

```
$ cd uClinux-dist-lpc_2478_stk
$ make menuconfig
```

Then compile the distribution

```
$ make menuconfig
```

The `vmlinux.bin` kernel image and the `romfs_5.img` root filesystem will be stored in the `uClinux-dist-lpc_2478_stk/images/` directory.

If you need to make changes to the configuration options, use the command

```
$ make menuconfig
```

Developing uClinux applications

It is best to add your custom application to the uClinux build system. See the corresponding documentation file in the uClinux distribution:

uClinux-dist-lpc_2478_stk/Documentation/Adding-User-Apps-HOWTO

The distribution contains a simple framebuffer application that user can use as a starting point. It's located in the following directory:

uClinux-dist-lpc_2478_stk/user/fbtest

It can be selected for inclusion in the uClinux ROMFS image by selecting “**fbtest**” in the “**Miscellaneous Applications**” uClinux user/vendor configuration menu.

On the uClinux board command prompt the frame buffer application can be executed:

```
$ fbtest
```

An alternative way to fill the screen with random pixels is to execute the following command

```
$ dd if=/dev/urandom of=/dev/fb0
```