Documentation Author

Pierre Bureau for K-Team S.A.
Ch. de Vuasset, CP 111
1028 Préverenges
Switzerland

email: info@k-team.com
Url: www.k-team.com

Trademark Acknowledgments:

IBM PC: International Business Machine Corp.
Macintosh: Apple Corp.
SUN Sparc-Station: SUN Microsystems Corp.
LabView: National Instruments Corp.
MatLab: MathWorks Corp.
Webots: Cyberbotics
Khepera: K-Team and LAMI

Legal Notice:

- The content of this manual is subject to change without notice.
- All effort have been made to ensure the accuracy of the content of this manual. However, should any error be detected, please inform K-Team S.A.
- The above notwithstanding K-Team can assume no responsibility for any error in this manual.

Table Of Contents

1 How To Install U-Boot **3**
1.1 Flash the U-Boot Image 3

2 How to Upgrade U-Boot **4**
2.1 Check Flash Status 4
2.2 Upload and Flash the New U-Boot Image 5

3 How To Avoid Bad CRC Warning **6**

4 How To Flash New Kernel Image **7**
4.1 Create Kernel u-boot Image 7
4.2 Load and Flash Kernel Image from u-boot 7

5 How To Flash Distribution Image **9**
5.1 Load and Flash Image from u-boot 9

1 How To Install U-Boot

1.1 Flash the U-Boot Image

Upload the u-boot image, normally named u-boot.bin, to the korebot, for instance using minicom zmodem transfer.

```
korebot login: root
Password:
~ # ls
kmot_test   postinst    postinst-x  pxaregs
~ # ls
kmot_test   postinst    postinst-x  pxaregs     u-boot.bin
~ #
```

Erase the first Flash parition.

```
~ # eraseall /dev/mtd/0
Erasing 256 Kibyte @ c0000 -- 75 % complete.
```

Copy the u-boot image to Flash memory.

```
~ # cp u-boot.bin /dev/mtd/0
```

Then the board can be halted using the halt command and reset to boot with u-boot loader. Please refer to section 4 and section 5 for further information on reflashing your system.

2 How to Upgrade U-Boot

2.1 Check Flash Status

Use the Flash Info command to check the Flash status.

```
uboot$ flinfo
Bank # 1: INTEL 28F128J3A
  Size: 32 MB in 128 Sectors
  Sector Start Addresses:
    00000000 (RO) 00040000 (RO) 00080000      000C0000      00100000
    00140000      00180000      001C0000      00200000      00240000
    00280000      002C0000      00300000      00340000      00380000
    003C0000      00400000      00440000      00480000      004C0000
    00500000      00540000      00580000      005C0000      00600000
    00640000      00680000      006C0000      00700000      00740000
    00780000      007C0000      00800000      00840000      00880000
    008C0000      00900000      00940000      00980000      009C0000
    00A00000      00A40000      00A80000      00AC0000      00B00000
    00B40000      00B80000      00BC0000      00C00000      00C40000
    00C80000      00CC0000      00D00000      00D40000      00D80000
    00DC0000      00E00000      00E40000      00E80000      00EC0000
    00F00000      00F40000      00F80000      00FC0000      01000000
    01040000      01080000      010C0000      01100000      01140000
    01180000      011C0000      01200000      01240000      01280000
    012C0000      01300000      01340000      01380000      013C0000
    01400000      01440000      01480000      014C0000      01500000
    01540000      01580000      015C0000      01600000      01640000
    01680000      016C0000      01700000      01740000      01780000
    017C0000      01800000      01840000      01880000      018C0000
    01900000      01940000      01980000      019C0000      01A00000
    01A40000      01A80000      01AC0000      01B00000      01B40000
    01B80000      01BC0000      01C00000      01C40000      01C80000
    01CC0000      01D00000      01D40000      01D80000      01DC0000
    01E00000      01E40000      01E80000      01EC0000      01F00000
    01F40000      01F80000      01FC0000
```

Unprotect the first two Flash Banks

```
uboot$ protect off 0x0 0x0007ffff
Un-Protected 2 sectors
```

2.2 Upload and Flash the New U-Boot Image

Upload the bin file in SDRAM using the ymodem transfer. The RAM address to load the image can be changed by adding an offset to the loady command.

```
uboot$ loady
## Ready for binary (ymodem) download to 0xA2000000 at 38400 bps...
CRC mode, 795(SOH)/0(STX)/0(CAN) packets, 4 retries
## Total Size      = 0x00018b9c = 101276 Bytes
```

Erase the target Flash section, this step must be performed before trying to write anything to Flash memory.

```
uboot$ erase 0 0007ffff

Erasing sector  0 ...  done
Erasing sector  1 ...  done
Erased 2 sectors
```

Copy the new u-boot image to Flash memory. **In case anything goes wrong: Do NOT reset the board! Do NOT switch off the power! Instead, recover the old TQ monitor which is still running in RAM.**

The number of bytes for the cp.b command (third parameter) is given by the result of the loady command. The exact number of bytes should be passed to the copy and **it must be in hexadecimal format**.

```
uboot$  cp.b a2000000 0 0x00018b9c
Copy to Flash...\done
```

Reset the board with the reset command.

3 How To Avoid Bad CRC Warning

Most probably everything is OK. The message is printed because the flash sector or ERPROM containing the environment variables has never been initialized yet. The message will go away as soon as you save the envrionment variables using the saveenv command.

4 How To Flash New Kernel Image

4.1 Create Kernel u-boot Image

The korebot kernel image should be built using the korebot kernel source distribution. Please refer to the korebot documentation for instructions on building the korebot Linux kernel.

The *ktboot* utility should be dowloaded from K-Team website, it contains a simple Makefile to create the u-boot image. Simply edit the Makefile to localize your kernel source directory.

```
/home/pbureau/Software/ktboot-1.0 : make
Copying zImage from Linux Kernel...
Creating kt-uImage.bin ...
Image Name:   2.4.19-kb11
Created:      Wed Feb 28 16:41:32 2007
Image Type:   ARM Linux Kernel Image (uncompressed)
Data Size:    755708 Bytes = 738.00 kB = 0.72 MB
Load Address: 0xA1000000
Entry Point:  0xA1000000
-------------------------------------------------------
 File 'kt-uImage.bin' contains the Flash Linux Boot
 loader (u-boot) and the Linux zImage.
-------------------------------------------------------
```

4.2 Load and Flash Kernel Image from u-boot

First erase the flash partition that contains the kernel image.

```
uboot$ erase 00080000 0017ffff
```

Load the u-boot image to RAM using y-modem.

```
uboot$ loady
## Ready for binary (ymodem) download to 0xA2000000 at 115200 bps...
C## Total Size      = 0x000b883c = 755772 Bytes
```

Copy the u-boot image to Flash. The number of bytes for the cp.b command (third parameter) is given by the result of the loady command. The exact number of bytes should be passed to the copy and **must be in hexadecimal format**.

```
uboot$ cp.b a2000000 00080000 0x000b883c
Copy to Flash...\done
```

Check the loaded image.

```
uboot$ iminfo 0080000

## Checking Image at 00080000 ...
   Image Name:   2.4.19-kb11
   Image Type:   ARM Linux Kernel Image (uncompressed)
   Data Size:    755708 Bytes = 738 kB
   Load Address: a1000000
   Entry Point:  a1000000
   Verifying Checksum ... OK
```

Reset the board to boot the new Linux kernel image.

5 How To Flash Distribution Image

5.1 Load and Flash Image from u-boot

First erase the flash partition that contains the kernel image.

```
uboot$ erase 00180000 00a7ffff
```

Load the image to RAM using y-modem.

```
uboot$ loady
## Ready for binary (ymodem) download to 0xA2000000 at 115200 bps...
C## Total Size      = 0x00900000 = 9437184 Bytes
```

Copy the distribution image to Flash. The number of bytes for the cp.b command (third parameter) is given by the result of the loady command. The exact number of bytes should be passed to the copy and **must be in hexadecimal format**.

```
uboot$ cp.b a2000000 00180000 0x00900000
Copy to Flash...\done
```

Reset the board to boot the new distribution image.