



SAM460

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U-Boot Updater Guide Sam460 v1.5 – Apr 7, 2025

WARNING!

***Upgrading the Sam460 firmware is potentially dangerous.
If something should go wrong during the update, it might leave your system unusable.***

***Never unplug or turn off the computer during the update process!
Keep children away :-)***

***In case you have a problem, ask for help sending an email to:
info@acube-systems.com***

1. Which updater to use ?

Some Sam460 boards have 50 Mhz base clock while others have 55 Mhz or 60 Mhz.

In order to correctly update U-Boot the corresponding updater version needs to be used.

Included in the archive there is a little AmigaOS4.1 utility '**check_460_baseclock**' to run from a shell which reports the correct updater version to use.

Before running **check_460_baseclock**, set the 'E' protection bit.

Another way to check the base clock is from the System Information U-Boot menu (CLK freq)

After that, you need to check which brand is the flash chip mounted on the board, it could be ATMEL or SST, this will be needed later when running the updater.

In case you are unsure, select ATMEL since it is the most used type of flash chip on the Sam460.

Using the wrong updater doesn't cause any harm anyway, it will just print a warning and exit.

2. Updating using a CD/DVD

2.1 Preparing a CD/DVD with the updater program

You need to burn the ISO image directly on a CD or DVD using your preferred burning software.

Note that burning an ISO image file is different than creating a new CD/DVD with the ISO file on it.

You have to choose the "burn image" or "write image" option in your burning software and then select the file to burn.

Do not select "Bootable CD" or any similar option of the burning software.

Note: you might prefer using CD-R or DVD-R instead of CD-RW or DVD-RW. It is probably safer for such task.

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2.2 Running the update process

- Before inserting the CD into the DVD drive, boot the Sam460, enter the menu, select Video Options / Console and set it to Verbose, exit the menu, save and reboot. In alternative, enter the U-Boot shel and enter:

```
] setenv hush 0  
] save
```

and reboot.

- Insert your Updater CD into the DVD drive.
- Save any unfinished work and restart your computer. Pressing the power button once on your computer case will do it.
- If the CD is the first bootable device, the Updater CD will auto start.
If the computer does not start from the CD, it means you need to define the DVD drive as the first boot device: restart your computer and press the **Enter** key during the Uboot countdown.
Then select "X DVD" in the "Boot device" field, where X is the controller where the DVD is attached, press the **Esc** key and select "Boot this configuration".
- When the CD has booted you will see 2 options, one for use with ATMEL chip and another for SST chip. Select the appropriate one for your board, and run the updater. You will be see a warning message. If you wish to continue with the update, press the **SPACE** key.

Warning: pressing SPACE, the re-flashing process will start immediately.

- The process takes only a few seconds and in case the updater finds any problem, it will notify them. After the update is finished, the updater will output a few lines of information. You can remove the CD from the drive and restart the machine.

3. Updating from the network using a TFTP server

If, for any reason, you cannot use the ISO image to update U-Boot, you can use TFTP.

This update method requires a second machine running a TFTP server (for example, on OS4Depot there is a TFTP server for AmigaOS4. On Windows you may use tftpd32).

Your Sam460 and the machine with the TFTP server need to be on the same local network.

3.1 Configuring the Sam460 network settings

- When starting the computer, press the **Esc** key during the Uboot countdown to enter the Uboot prompt.
- Type the **menu** command
- Select the **Boot Sequence** menu
- Select the **Network Boot Options** menu.
- Set the **Local TCP/IP Address** field to the IP address of your Sam460.

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- Set the **Server TCP/IP Address** field to the IP address of the machine running the TFTP server.
- Press **Esc** 3 times.
- Select **Save settings and exit**.

3.2 Running the update process

- Copy the **updaterXX-2015d** and **updaterXX-2015d-sst** files on your TFTP server directory (where **XX** is 50, 55 or 60)
- In the U-Boot prompt, execute the following commands:

```
] tftp 500000 updaterXX-2015d (or updaterXX-2015d-sst)
] bootm
```

- U-boot will load the file from the network and execute it, then follow the on screen instructions. If you wish to continue with the update, press the **SPACE** key.

Warning: pressing SPACE, the re-flashing process will start immediately.

- The process takes only a few seconds and in case the updater finds any problem, it will notify them. After the update is finished, the updater will output a few lines of information. You can now restart the machine.

4. Updating from USB stick

Updating from a USB stick requires to format it on a Linux machine with the ext2 file system, for example using the following command:

```
> mke2fs -t ext2 /dev/usbX
```

where usbX is your USB stick device, and coping the **updaterXX-2015d** and **updaterXX-2015d-sst** files on it, Then boot your Sam460 with the USB stick inserted, stop the boot countdown and from the U-Boot shell check which disk number is the USB stick with the command:

```
] usb storage
```

which will show something like:

```
Device 0: Vendor: USB          Rev: 1100 Prod: Flash Disk
          Type: Removable Hard Disk
          Capacity: 7800.0 MB = 7.6 GB (15974400 x 512)
Device 1: Vendor: Generic      Rev: 1.68 Prod: Ultra HS-COMBO
          Type: Removable Hard Disk
          Capacity: not available
```

In this case the device to use is 0 (where the **Prod: Ultra HS-COMBO** is the internal SD card reader) After that, from the U-Boot shell run the command:

```
] ext2ls usb 0:0
```

to check for the files on the USB stick, and then run the updater with:

```
] ext2load usb 0:0 500000 updaterXX-rx (or updaterXX-rx-sst)
] bootm
```

The same procedure can be used with a FAT formatted USB stick, using **fat1s** and **fatload** instead of **ext21s** and **ext2load**

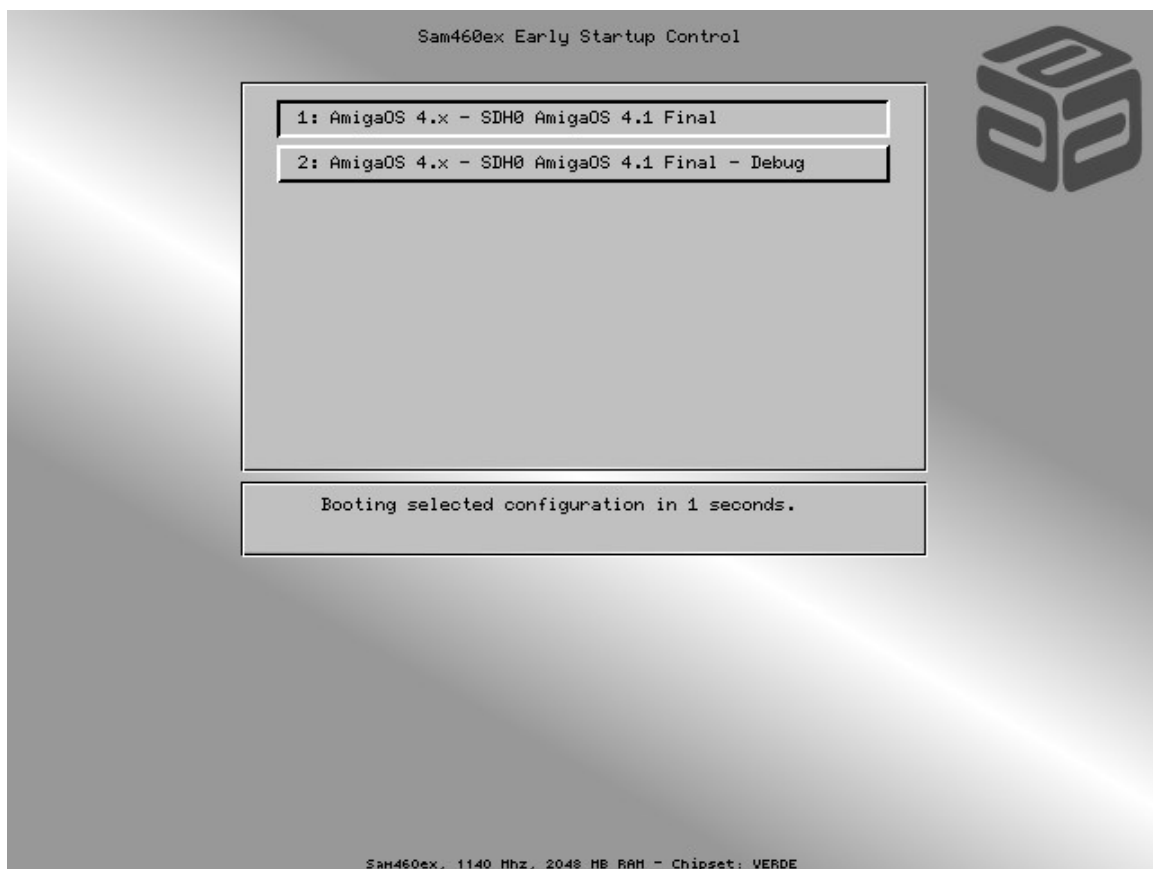
5. Checking if the update worked correctly

When your computer starts, interrupt the boot process with the **Esc** key while the countdown is running. This will make you enter the Uboot prompt. Type the “**version**” command:

```
] version
```

You will see an output similar to this:

```
U-Boot 2015.d (Apr 7 2025 - 16:00:00)
```



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U-boot 2015.d – Apr 7, 2025

What's new:

- driver for NVMe SSD, you can boot from this device using a NVMe to PCIe adapter
- driver for PCIe SATA2 Silicon Image 3132 controller, supports booting from SSDs and DVDs
- DDR2 timings: timings of DDR2 RAM can be changed to achieve faster memory accesses
- ability to select the preferred USB stack, whether EHCI or OHCI, the former being faster in transferring data from mass storage, while the latter is more compatible with more keyboards
- reworked 'sata' command, it shows more information about drivers and attached devices
- when using the serial console, menu items can be navigated using the W and S (up and down) keys
- general bug fix and improvements
- unified source code for 460ex/440ep platforms

Additional notes:

- in order to be able to modify DDR2 timings, on Sam460ex and Sam460cr boards, the jumper J38 need to be closed. It's located near the CR2032 backup battery
- With some AMD video cards, it is necessary to set the x86 emulator to Medium. If this is not possible from U-Boot, it can be set from the AmigaOS shell with the following command

```
1> C:nvsetvar x86emu 2
```

- to select the USB stack, in case your keyboard doesn't work under U-Boot, and thus cannot enter the menu, you can set it from AmigaOS, open the shell and type the following command:

```
1> C:nvsetvar usb_speed ohci
```

or

```
1> C:nvsetvar usb_speed ehci
```

- The timeout duration for controlling a DVD medium inside the reader can be modified via the U-Boot variable `ide_cd_timeout`, whose default value is 20 seconds. If the timeout is too long, it can be set to a lower value, e.g. 10 seconds.

```
] setenv ide_cd_timeout 10  
] saveenv
```

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Boot sources:

Silicon Image PATA 0680 (HD/DVD)
Silicon Image SATA 3112/3512 (HD/DVD)
Silicon Image SATA 3114 (HD/DVD)
Silicon Image SATA2 3131/3132/3124 (HD/DVD)
AMCC SATA2 460 (HD)
NVME
USB (HD)
NET

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Commands included in this U-Boot release:

? - alias for 'help'
base - print or set address offset
bdinfo - print Board Info structure
boota - start AmigaOS boot procedure
bootelf - Boot from an ELF image in memory
bootm - boot application image from memory
bootp - boot image via network using BOOTP/TFTP protocol
bootvx - Boot vxWorks from an ELF image
cmp - memory compare
cp - memory copy
crc32 - checksum calculation
date - get/set/reset date & time
eeprom - EEPROM sub-system
ext2load - load binary file from a Ext2 filesystem
ext2ls - list files in a directory (default /)
fatinfo - print information about filesystem
fatload - load binary file from a dos filesystem
fatls - list files in a directory (default /)
fdt - flattened device tree utility commands
fpga - show FPGA firmware revision
go - start application at address 'addr'
help - print command description/usage
i2c - I2C sub-system
loop - infinite loop on address range
md - memory display
menu - Show preferences menu
mii - MII utility commands
mm - memory modify (auto-incrementing address)
mtest - simple RAM read/write test
mw - memory write (fill)
nm - memory modify (constant address)
pci - list and access PCI Configuration Space
ping - send ICMP ECHO_REQUEST to network host
printenv - print environment variables
rarpboot - boot image via network using RARP/TFTP protocol
reset - Perform RESET of the CPU
run - run commands in an environment variable
sata - SATA sub-system
saveenv - save environment variables to persistent storage
setenv - set environment variables
shutdown - switch machine off
tftpboot - boot image via network using TFTP protocol
usb - USB sub-system
version - print monitor version

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