

ADENEO

WINDOWS CE PORT ON AT91SAM9260EK BOARD

APPLICATION NOTE: USING THE WINDOWS CE BINARY BSP

Ref. : SAM9260-CE-50-D03A

HISTORY

Revision	Date	Update History
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1. Document presentation

1.1 Abbreviations used

BSP Board Support Package

OAL OEM Adaptation Layer

PB Platform Builder

WinCE Windows CE

AT91SAM9260EK Atmel evaluation kit for AT91SAM9260 product

%_TARGETPLATROOT%: this environment variable is set by platform builder to contain the BSP directory when building a Windows CE image. We use the same abbreviation in this document to refer to the BSP directory for AT91SAM9260EK board.

1.2 Document Purpose

This document provides information on how to use the demo Windows CE image for AT91SAM9260EK target device.

This document addresses users of the AT91SAM9260EK BSP:

- System developer who are generating CE image for AT91SAM9260EK targets, or willing to evaluate Windows CE 5.0 on an AT91SAM9260 based target
- Applicative developer who are developing applications that aim AT91SAM9260EK target.

2. Content of the BSP

The AT91SAM9260EK BSP contains the following components

- OAL for AT91SAM9260 processor
- Eboot : bootloader for AT91SAM9260EK board
- Serial Driver: Serial driver for AT91SAM9260
- USB Function Bus Driver : USB Device driver for AT91SAM9260
- USB HOST : USB Host driver for AT91SAM9260
- Ethernet : Ethernet driver for AT91SAM9260EK boards

3. Tutorial on using AT91SAM9260EK BSP

3.1 Requirements

To perform this tutorial, the following resources are required:

- A workstation with SAMBA, ActiveSync 3.7 at least. The PC should have at least:
 - A Serial link available
 - An Ethernet connection
 - An USB port
- BSP demo CD.

3.2 Step-by-Step tutorial

3.2.1 Preparing AT91SAM9260EK board for WindowsCE support

If there is already a bootloader in the SPI DataFlash, boot the board, and you should have the following log on DBGU (115200,8,n,1) :

```
RomBOOT
>
INFO : Low Level Init : OK
Starting main ...
Load CE-BOOT from Flash to SDRAM
Jumping ...
•%oÖ Serial Initialized30 Hz

Microsoft Windows CE Ethernet Bootloader Common Library Version 1.1 Built Oct 3
2006 17:01:15
Master Clock is 50003830 Hz
Microsoft Windows CE Ethernet Bootloader 1.7 for the AT91SAM9260EK board (built
Oct 4 2006)
Adaptation performed by ADENEO (c) 2005
Master Clock is 50003830 Hz
DataFlash : AT45DB321
Nb pages : 8192
Page Size : 528 bytes
Size : 4325376 bytes
Logical address : 0xD0000000

Resetting factory default configuration...

Press [ENTER] to download now or [SPACE] to cancel
```

In this case, you can jump directly to step 3.2.4, Copy and boot a Windows CE image in Nand Flash.

3.2.2 Windows CE Boot process on EK board

When booted the AT91SAM9260 ROMBoot tries to load from a bootable device a binary in SRAM and have it executed. If no executable binary is available, it will start Samba. In any cases, this code has to be less than internal SRAM size.

As the standard Windows CE bootloader (Eboot) is too big, the Windows CE BSP for AT91SAM9260EK board uses a boot process in 2 steps.

- First, a loader (BOOTRAM) is loaded from SPI Data Flash and executed in SRAM. It initializes AT91SAM9260EK SDRAM, downloads Eboot from SPI DataFlash in SDRAM and jump to the startup function of Eboot.
- Next, Eboot initialize the hardware necessary to load a Windows CE image, Load it either from the NandFlash or from Ethernet in SDRAM and jump to the startup function of the image

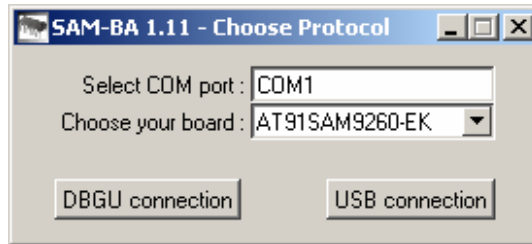
This way of working is dedicated to the EK board. For specific designs it can be adapted, according to the storage devices available on the custom board (NOR flash, NAND, ...)

3.2.3 Downloading Atmel loader to SPI DataFlash:

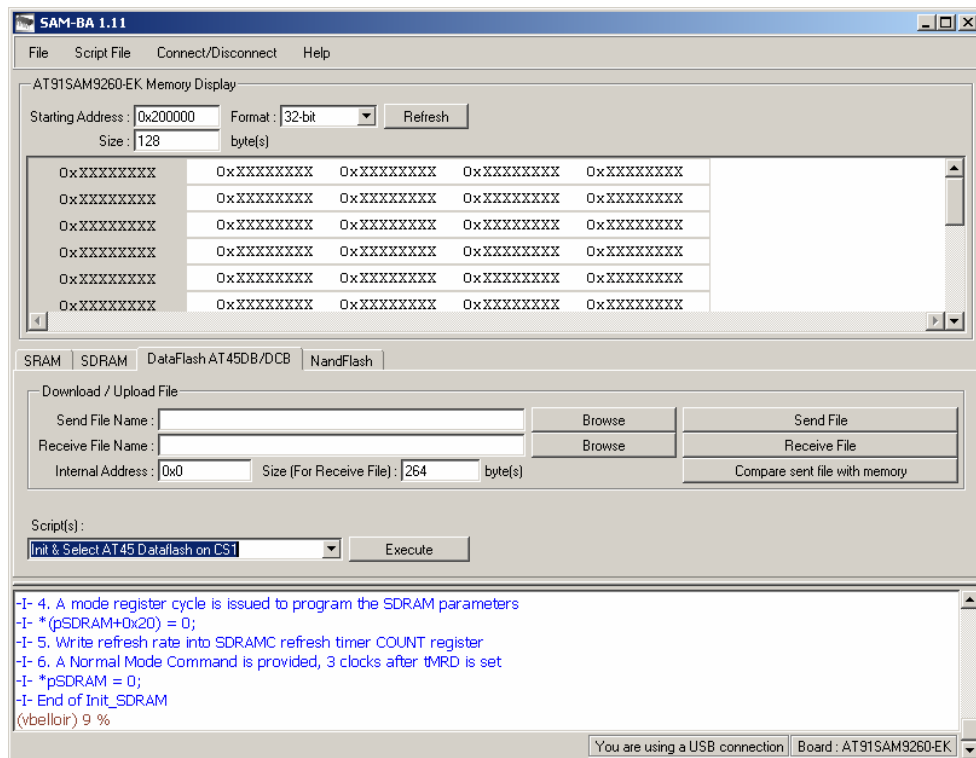
Atmel provide software (SAMBA) to download the bootloader in the AT91SAM9260EK board.

To download the bootloader, follow the next instructions:

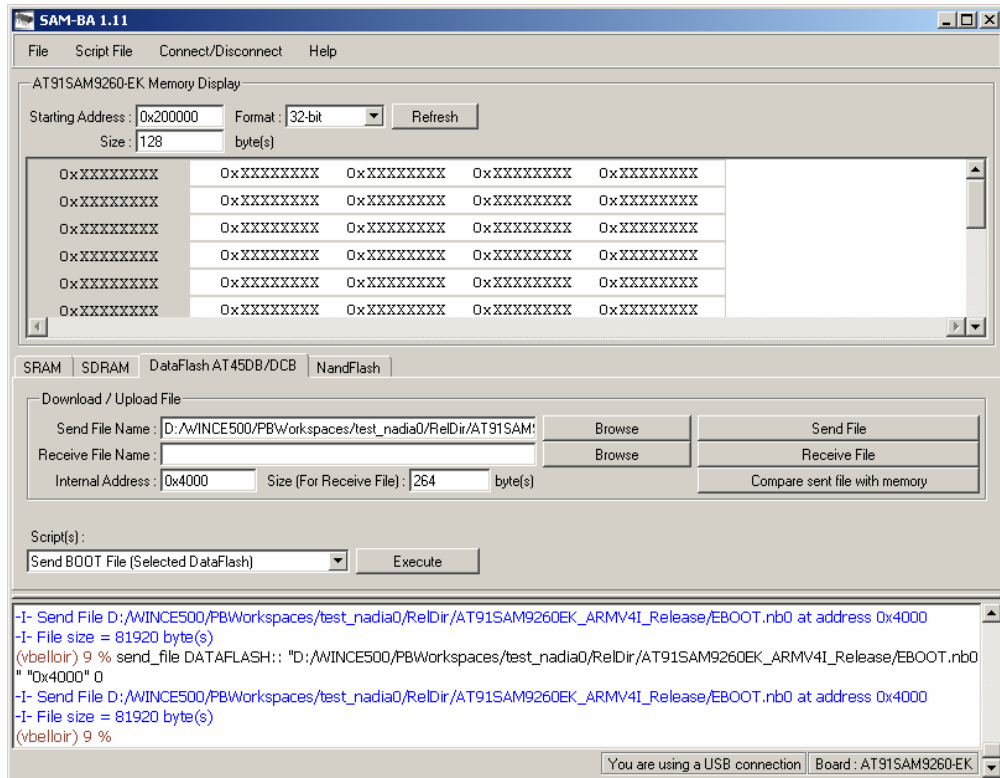
- Install the software SAMBA v1.11
- Connect an USB cable between the Workstation and the AT91SAM9260EK board.
- Shortcuts (It makes the SPI dataflash unavailable for the BootROM)
- The workstation will detect the board. Install the board's driver delivered with SAMBA.
- Once SAMBA is installed, launch it. You must obtain the following screen :



- Choose the board AT91SAM9260EK, and select "USB connection".
- In the main window of SAMBA, select the tab "DataFlash AT45DB/DCB"
- In the "Script(s) :" List box, Select "Init & Select AT45 DataFlash on CS1" and press "Execute", you will obtain this screen :



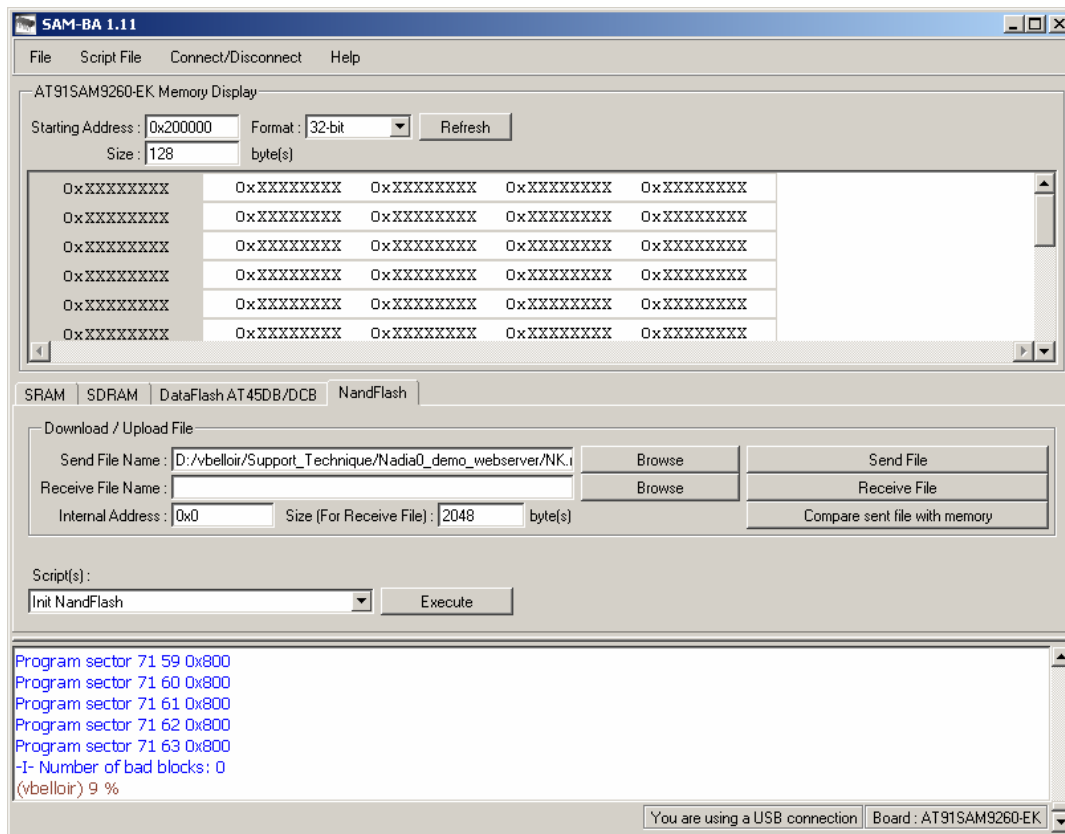
- In the "Script(s) :" List box, Select "Send BOOT File (Selected Dataflash)" and press "Execute".
- You will have to select the BootRam.nb0 file from the tools directory of the BSP CD.
- Then, in the "Send File Name:" box, select the eboot.nb0 file from BSP CD.
- In the "Internal Address:", enter the address 0x4000 and, press the button "Send File". You will obtain the next screen :



The bootloader is now loaded in the SPI DataFlash. Close SAMBA

3.2.4 Copy and boot a Windows CE image in Nand Flash

- Connect a serial link between DBGU AT91SAM9260EK board connector and Development workstation. Launch a terminal session on development workstation,
- Reboot AT91SAM9260EK board,
- When terminal displays “Press [ENTER] to download now or [SPACE] to cancel.”, press SPACE key to configure bootloader,
- From bootloader main menu under the terminal, press 7 to select “Download image to Flash”
- From bootloader main menu under the terminal, press 6 to select “Launch existing flash resident image at startup”
- Press “N” to enter in the nandflash Menu, and then press “2” to configure nandflash settings :
 - Physical Start address : 0x80067000
 - Starting IP : 0x80068000
 - Total Rom Size : 0x8b3bfc
- Open SAMBA, choose the at91sam9260ek board like in step Step 3.1 : downloading Atmel loader to SPI DataFlash.
- In the main window of SAMBA, select the “NandFlash” tab
- In the “Script(s) :” list box, select “Init NandFlash” and press “Execute”,
- Then, in the “Send File Name:” box, select the nk.nb0 file from BSP CD, and press “Send File” button. It takes a few time. You will get the following screen :



- Once downloading is finished, the target must be rebooted and the local image Nand flash is launched.

3.2.5 ActiveSync connexion

To perform ActiveSync connection, configure ActiveSync on Workstation to accept USB connection. Then, connect AT91SAM9260EK USB Device port to Workstation USB port. The CE target automatically tries to connect to ActiveSync, and on the workstation, ActiveSync shows as "Connecting".

When connection is established, try copying a file from and to CE target under the Workstation explorer.

3.2.6 Configure The AT91SAM9260EK web server

The demo Windows CE image contains a demo web site. It's possible to access it with a web browser and the board IP address, for example <http://192.168.100.128>.

It's possible to change use several web site located in a USB disk. To launch them you have to modify registry settings. This can be done with the WebServerSettings application.

This page will explain you how to configure the Windows CE Web Server. You have to launch the WebServerSettings application with the console or telnet.

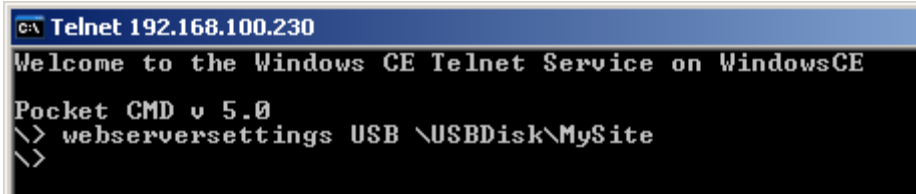
This application needs two parameters:

- the VROOTS parameter : this parameter defines several web site (only ROOT and USB are supported),
- the web site location

For example, if your web site is located on a USB disk, in the directory MySite, you must launch the command:

WebServerSettings USB \USBDisk\MySite.

Be careful, if you can't use space character in the directory.



```
C:\> Telnet 192.168.100.230
Welcome to the Windows CE Telnet Service on WindowsCE
Pocket CMD v 5.0
\> webserversettings USB \USBDisk\MySite
\>
```

When the registry is configured, you can access the web site with the board IP address and the USB web server profile, for example <http://192.168.100.128/USB>.