SAM3N-EK Test Software

Revision Table:

Revision	Date	Comments
1.0	July 19, 2010	Initial version

Table of Contents

1 Requirements

1.1 Hardware Requirements:

SAM3N-EK :		Switching power supply(+5V) :	
Serial cross cable :		Micro SD card:	
PC with serial COM port (Windows2000/XP)			

1.2 Software Requirements

An archive file which contains all the test files and tools mentioned in this user guide is provided for use. Please extract all its contents to your local disk just like:
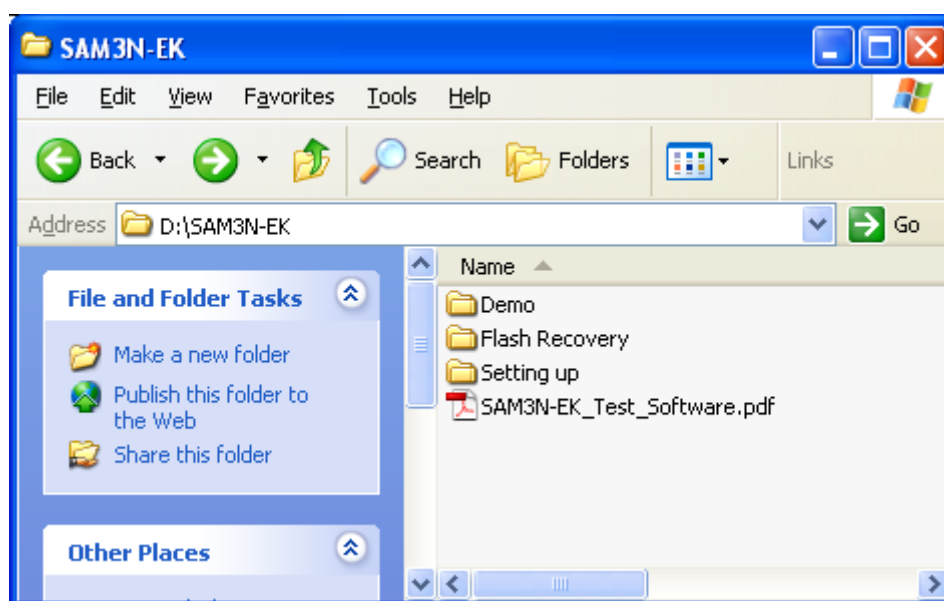
Note: please update antivirus software on your PC with latest virus definition.

2 Preliminary (mandatory) setup

2.1 PC environment

2.1.1 SAM-BA

SAM-BA (Boot Assistant) is one of the tools provided in ATMEL AT91 In-System Programming (ISP) solution. It provides an easy way for programming AT91 family microcontrollers using a graphical or command-line interface. It is also possible to create powerful scripts which can then be run via the command line, enabling the automation of many tasks. Those scripts can be hand written by the programmer or recorded through the graphical interface.
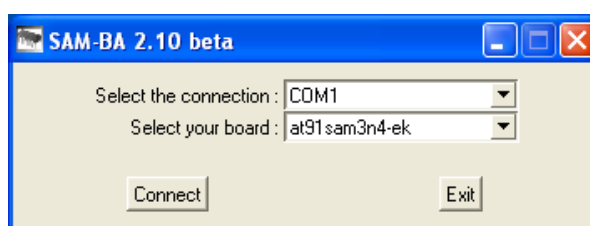
➢ During our test, we will need *SAM-BA* to program the testing board. So please install *Install_sam-ba_v2.10_beta.exe* provided with this document.

Note: any other version of SAM-BA previously installed on your PC should be removed.

2.2 SAM3N-EK

2.2.1 Jumpers setting

➢ Before the test, Please make sure Jumpers are in default status.

The table below gives details on Jumpers setting on the SAM3N-EK board and their default settings.
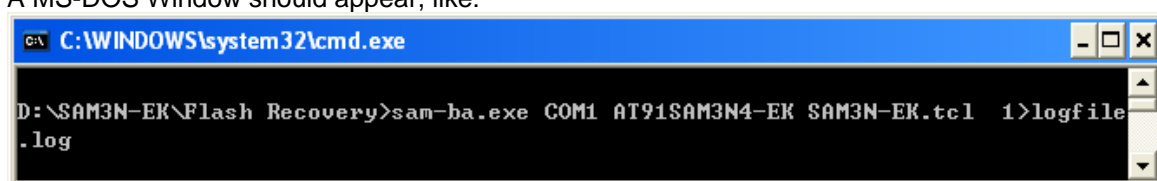
Designation	Default Setting	Feature
JP1	Opened	Close to select JTAG boundary scan
JP2	Closed	Analog reference voltage(3.3V)
JP3	Opened	ERASE: Close to reinitialize the Flash contents and some of its NVM bits
JP4	Closed	VDDIO[1]
JP5	Closed	VDDIN[1]
JP6	Closed	VDDPLL[1]
JP7	Closed	VDDCORE[1]
JP8	2-1	DC voltage selection between 3.3V and 5V on PIO
JP9	2-1	1-2 expansion ports, default for 3.3V (position 2-1).

Notes: 1. these jumpers are provided for power consumption measurement. By default, they are closed. To use this feature, the user has to open the strap and insert an ammeter.

3   Testing the board

3.1 Flash recovery

1. *Make sure* Jumpers are in default status, refer to *section 2.2*.

2. *Connect* a serial cross cable between SAM3N-EK connector J4 and PC COM port.
3. *Close* Jumper JP3 on board.
4. *Power up* the board with provided 5V switching power supply.
5. *Open* Jumper JP3.
6. *Double check* that the COM port on your PC used to connect EK board is COM1,or please edit *SAM3N-EK.bat* under directory: \ *Flash Recovery* accordingly. If any application such as HyperTerminal console occupies this COM port, please close it and make this COM port available.
7. *Launch SAM3N-EK.bat* by double-click on it.
8. A MS-DOS Window should appear, like:

```
C:\WINDOWS\system32\cmd.exe                                        _ □ ×

D:\SAM3N-EK\Flash Recovery>sam-ba.exe COM1 AT91SAM3N4-EK SAM3N-EK.tcl  1>logfile
.log
```
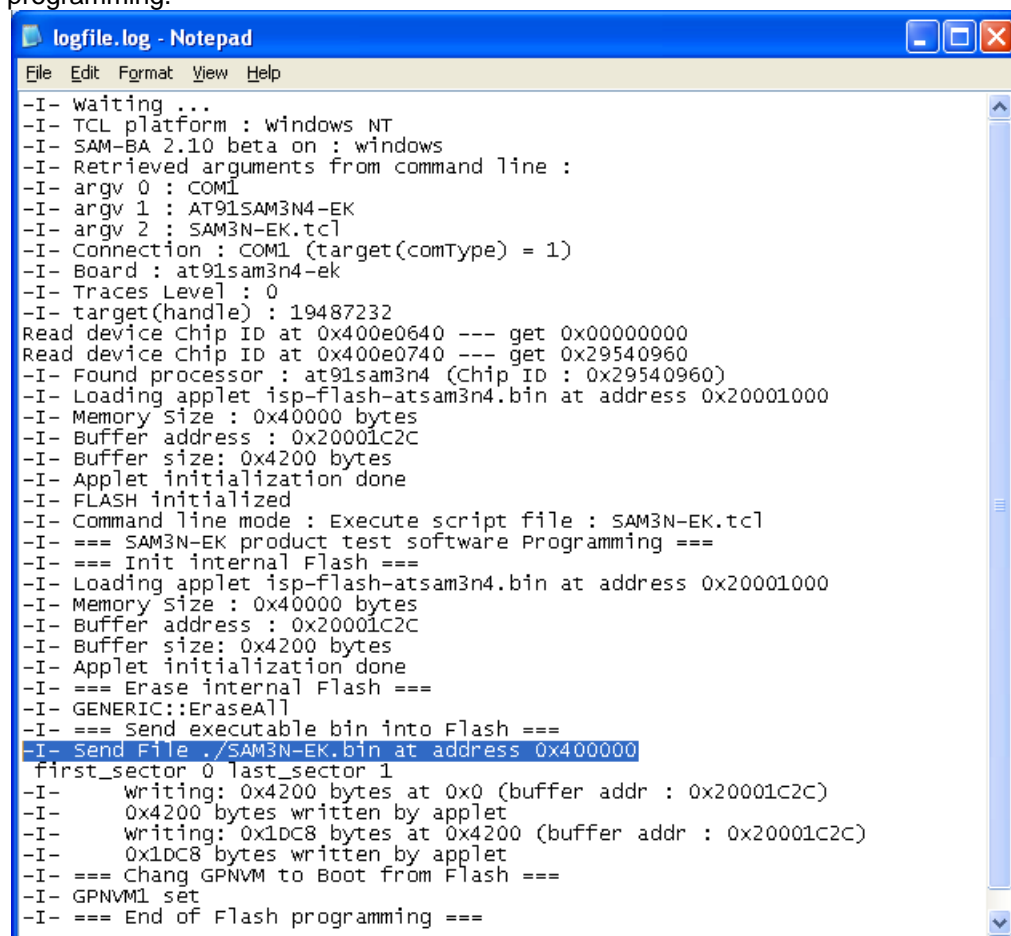
9. *Wait and verify* Flash on board have been programmed correctly when logfile.log appear at the end of programming.

```
logfile.log - Notepad                                        _ □ ×
File  Edit  Format  View  Help
-I- Waiting ...
-I- TCL platform : Windows NT
-I- SAM-BA 2.10 beta on : windows
-I- Retrieved arguments from command line :
-I- argv 0 : COM1
-I- argv 1 : AT91SAM3N4-EK
-I- argv 2 : SAM3N-EK.tcl
-I- Connection : COM1 (target(comType) = 1)
-I- Board : at91sam3n4-ek
-I- Traces Level : 0
-I- target(handle) : 19487232
Read device Chip ID at 0x400e0640 --- get 0x00000000
Read device Chip ID at 0x400e0740 --- get 0x29540960
-I- Found processor : at91sam3n4 (Chip ID : 0x29540960)
-I- Loading applet isp-flash-atsam3n4.bin at address 0x20001000
-I- Memory Size : 0x40000 bytes
-I- Buffer address : 0x20001C2C
-I- Buffer size: 0x4200 bytes
-I- Applet initialization done
-I- FLASH initialized
-I- Command line mode : Execute script file : SAM3N-EK.tcl
-I- === SAM3N-EK product test software Programming ===
-I- === Init internal Flash ===
-I- Loading applet isp-flash-atsam3n4.bin at address 0x20001000
-I- Memory Size : 0x40000 bytes
-I- Buffer address : 0x20001C2C
-I- Buffer size: 0x4200 bytes
-I- Applet initialization done
-I- === Erase internal Flash ===
-I- GENERIC::EraseAll
-I- === Send executable bin into Flash ===
-I- Send File ./SAM3N-EK.bin at address 0x400000
 first_sector 0 last_sector 1
-I-     writing: 0x4200 bytes at 0x0 (buffer addr : 0x20001C2C)
-I-     0x4200 bytes written by applet
-I-     writing: 0x1DC8 bytes at 0x4200 (buffer addr : 0x20001C2C)
-I-     0x1DC8 bytes written by applet
-I- === Chang GPNVM to Boot from Flash ===
-I- GPNVM1 set
-I- === End of Flash programming ===
```

10. *Close* the window.
11. *Power down* the board.

3.2 Test Software

1. *Open* hyper terminal console on PC (115200, 8, N, 1)
2. *Insert* a micro SD card in to slot J3.
3. *Power up* the board with provided 5V switching power supply.
    Test program should start with below info displayed on hyper terminal:

```
========================================================
-- TEST BOARD APPLICATION Version:1.0
-- Board: SAM3N-EK
-- Compiled: May 13 2010 11:30:36
========================================================


--------------------------------------------------------
 Tests list
--------------------------------------------------------
  led         01
  button      02
  lcd         03
  buzzer      04
  SDCard      05
  serialflash 06
--------------------------------------------------------
-I- Hit 'w' to launch test sequence or
-I- hit 'x' to do one test
```

4. *Hit* 'w' to launch test sequence and test items one by one automatically.

```
-I- Launch test sequence...
-I- >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
-I- Test LED    : Start...
-I- Test LED    : Configure system tick to get 1ms tick period.
-I- Test LED    : Configure LED PIOs.
-I- Test LED    : hit 'Y' if the 4 leds are blinking or 'N' if not
```

5. *Check* Power and USER LEDs are *blinking independently.*
    Have a look on the board and Hit 'Y' if LEDs are tested OK.

```
-I- Test LED    : TEST OK !!!
-I- >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
-I- Test BUTTON : Start...
-I- Test BUTTON : Press any key to abort test !
-I- Test BUTTON : Push  button  USR-LEFT
```

6. *Push* button BP2 and BP3 on EK board.
    Make sure each button tested ok.

```
-I- Test BUTTON : Push  button  USR-LEFT       -> Ok
-I- Test BUTTON : Push  button  USR-RIGHT      -> Ok
-I- >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
-I- Test LCD    : Start...
-I- Test LCD    : hit 'Y' if display is OK and any other key if not
```
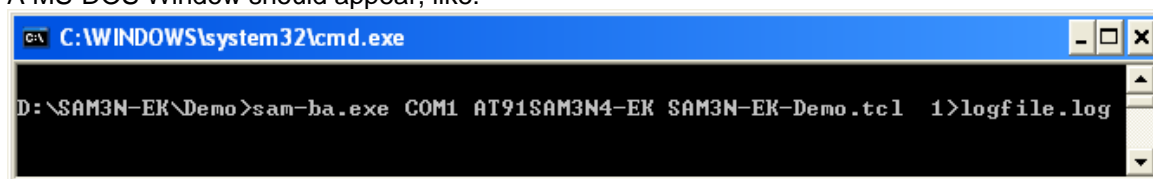
7. Now you should see the LCD showing information like:

Hit 'Y' if it is OK and continue to test LCD backlight.

-I- Test LCD   : (Test Backlight) Start...
-I- Test LCD   : (Test Backlight) hit 'Y' if backlight is changed and any other key if not

Hit 'Y' if LCD backlight luminance is adjustable.

-I- Test LCD   : (Test Backlight)TEST OK !!!
-I- >>>
-I- TEST BUZZER : Start...
-I- TEST BUZZER : hit 'Y' if buzzer is OK and any other key if not

8.   Hit 'Y' if the buzzer sounds playing a music.

-I- TEST BUZZER : TEST OK !!!

9.   SD card and serial dataflash will be tested.

Test SD:
-I- >>>
-I- Test SDCARD : Start...
-I- Test SDCARD : Please connect a SD card ...
-I- Test SDCARD : SD card connection detected
-I- Test SDCARD : Configure system tick to get 1ms tick period.
-I- Test SDCARD : Cannot check if SD card is write-protected
-I- Test SDCARD : -I- SD/MMC card initialization successful
-I- Test SDCARD : -I- Size: 120 MB, 246016 * 512
-I- ======== CSD ========
……
……
……
-I- -SD_TOTAL_SIZE   0x7820000
-I- -SD_TOTAL_BLOCK   0x3C100
-I- Test SDCARD : [246014 - 246014] ...
-I- End of test

Test serial datafalsh:
-I- >>>
-I- Test FLASH : Start...
-I- Test FLASH : SPI and AT25 drivers initialized
-I- Test FLASH : AT25DF321 serial flash detected
-I- Test FLASH : Serial flash unprotected
-I- Test FLASH : Chip is being erased...
-I- Test FLASH : Checking erase ...
-I- Test FLASH : Erase successful.
-I- Test FLASH : Programming a walking 1 on all pages ...
-I- Test FLASH : Walking 1 test successful.

Then, you can get a summary. Please double check all test items are tested OK.

```
*********************************************************
 Tests result
*********************************************************
  led        : ok
  button     : ok
  lcd        : ok
  buzzer     : ok
  SDCard     : ok
  serialflash : ok
*********************** TEST OK***********************
-I- hit any key to restart!
```

10. Press BP1 to reset the EK board and test program should restart.

4   Demo
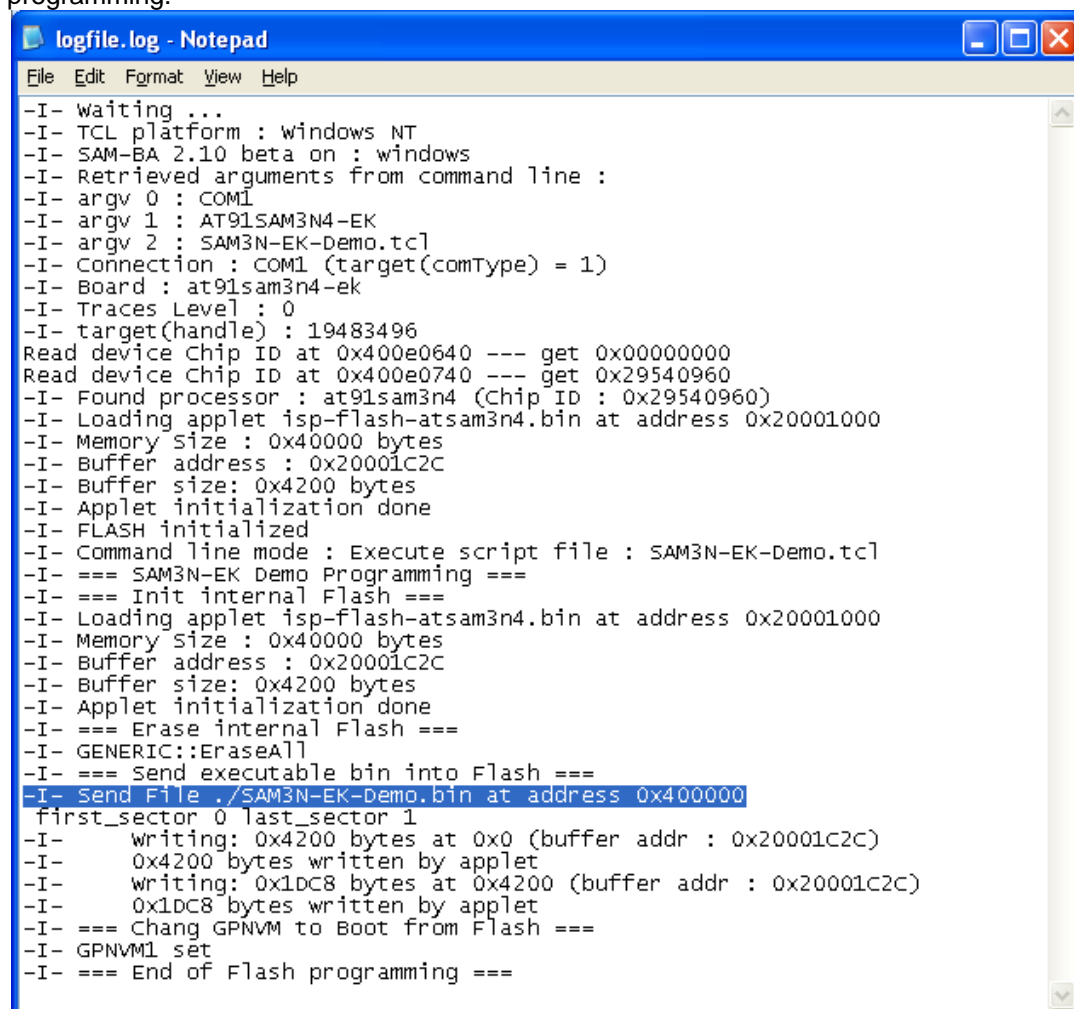
After test procedure is completed, the board is configured with a default demo it contains upon delivery.

1.   Make sure Jumpers are in default status, refer to *section 2.2*.

2.   Connect a serial cross cable between SAM3N-EK connector J4 and PC COM port.
3.   Close Jumper JP3 on board.
4.   Power up the board with provided 5V switching power supply.
5.   Open Jumper JP3.
6.   Double check that the COM port on your PC used to connect EK board is COM1,or please edit
      SAM3N-EK-Demo.bat under directory: \ *Demo* accordingly. If any application such as HyperTerminal
      console occupies this COM port, please close it and make this COM port available.
7.   Launch *SAM3N-EK-Demo.bat* by double-click on it.
8.   A MS-DOS Window should appear, like:

```
C:\WINDOWS\system32\cmd.exe

D:\SAM3N-EK\Demo>sam-ba.exe COM1 AT91SAM3N4-EK SAM3N-EK-Demo.tcl  1>logfile.log
```

9.   Wait and verify Flash on board have been programmed correctly when logfile.log appear at the end of
      programming.

```
logfile.log - Notepad
File  Edit  Format  View  Help
-I- waiting ...
-I- TCL platform : Windows NT
-I- SAM-BA 2.10 beta on : windows
-I- Retrieved arguments from command line :
-I- argv 0 : COM1
-I- argv 1 : AT91SAM3N4-EK
-I- argv 2 : SAM3N-EK-Demo.tcl
-I- Connection : COM1 (target(comType) = 1)
-I- Board : at91sam3n4-ek
-I- Traces Level : 0
-I- target(handle) : 19483496
Read device Chip ID at 0x400e0640 --- get 0x00000000
Read device Chip ID at 0x400e0740 --- get 0x29540960
-I- Found processor : at91sam3n4 (Chip ID : 0x29540960)
-I- Loading applet isp-flash-atsam3n4.bin at address 0x20001000
-I- Memory Size : 0x40000 bytes
-I- Buffer address : 0x20001C2C
-I- Buffer size: 0x4200 bytes
-I- Applet initialization done
-I- FLASH initialized
-I- Command line mode : Execute script file : SAM3N-EK-Demo.tcl
-I- === SAM3N-EK Demo Programming ===
-I- === Init internal Flash ===
-I- Loading applet isp-flash-atsam3n4.bin at address 0x20001000
-I- Memory Size : 0x40000 bytes
-I- Buffer address : 0x20001C2C
-I- Buffer size: 0x4200 bytes
-I- Applet initialization done
-I- === Erase internal Flash ===
-I- GENERIC::EraseAll
-I- === Send executable bin into Flash ===
-I- Send File ./SAM3N-EK-Demo.bin at address 0x400000
 first_sector 0 last_sector 1
-I-    writing: 0x4200 bytes at 0x0 (buffer addr : 0x20001C2C)
-I-    0x4200 bytes written by applet
-I-    writing: 0x1DC8 bytes at 0x4200 (buffer addr : 0x20001C2C)
-I-    0x1DC8 bytes written by applet
-I- === Chang GPNVM to Boot from Flash ===
-I- GPNVM1 set
-I- === End of Flash programming ===
```

10. Close the window.

11. re-plug in 5V switching power supply to reset the board and default demo should start:
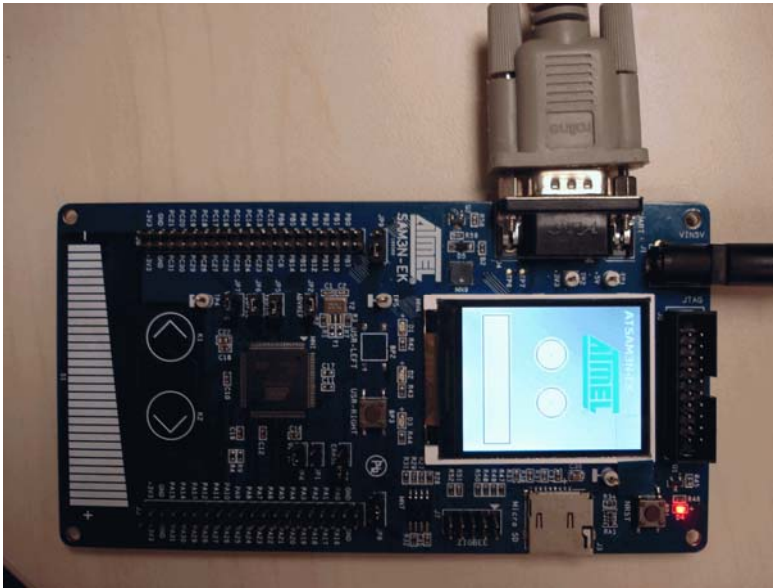
When you place a finger on pad K1&K2 or slider S1, the demo will show its position on LCD screen.

12. Put the board in a protective anti-static package and pack.