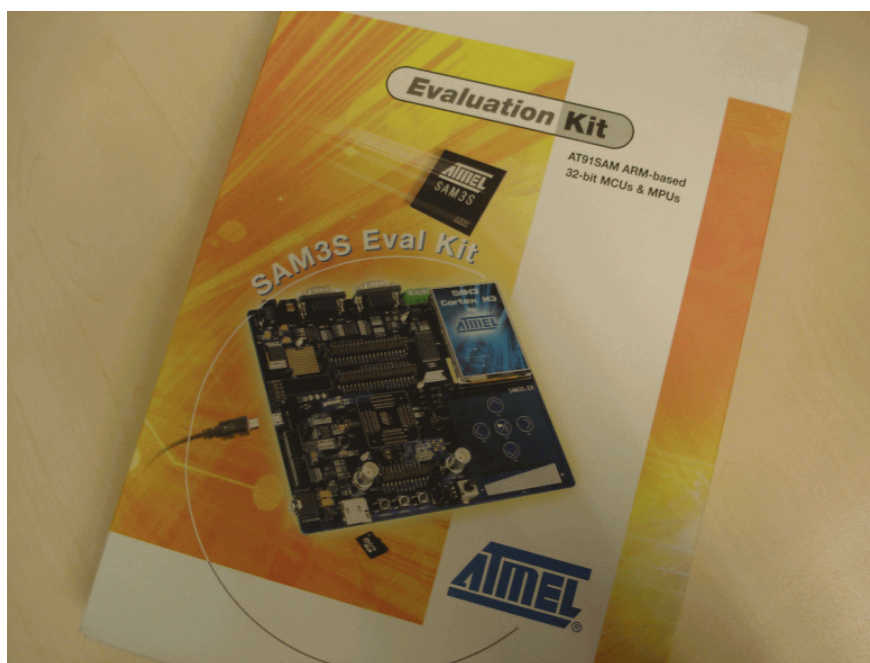


SAM3S-EK2 Test Software



Revision Table:

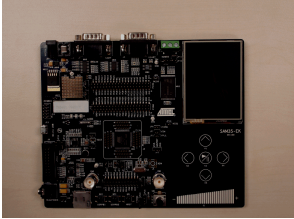




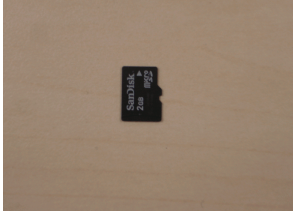

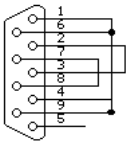
Revision	Date	Comments
1.0	Oct 10, 2011	First version

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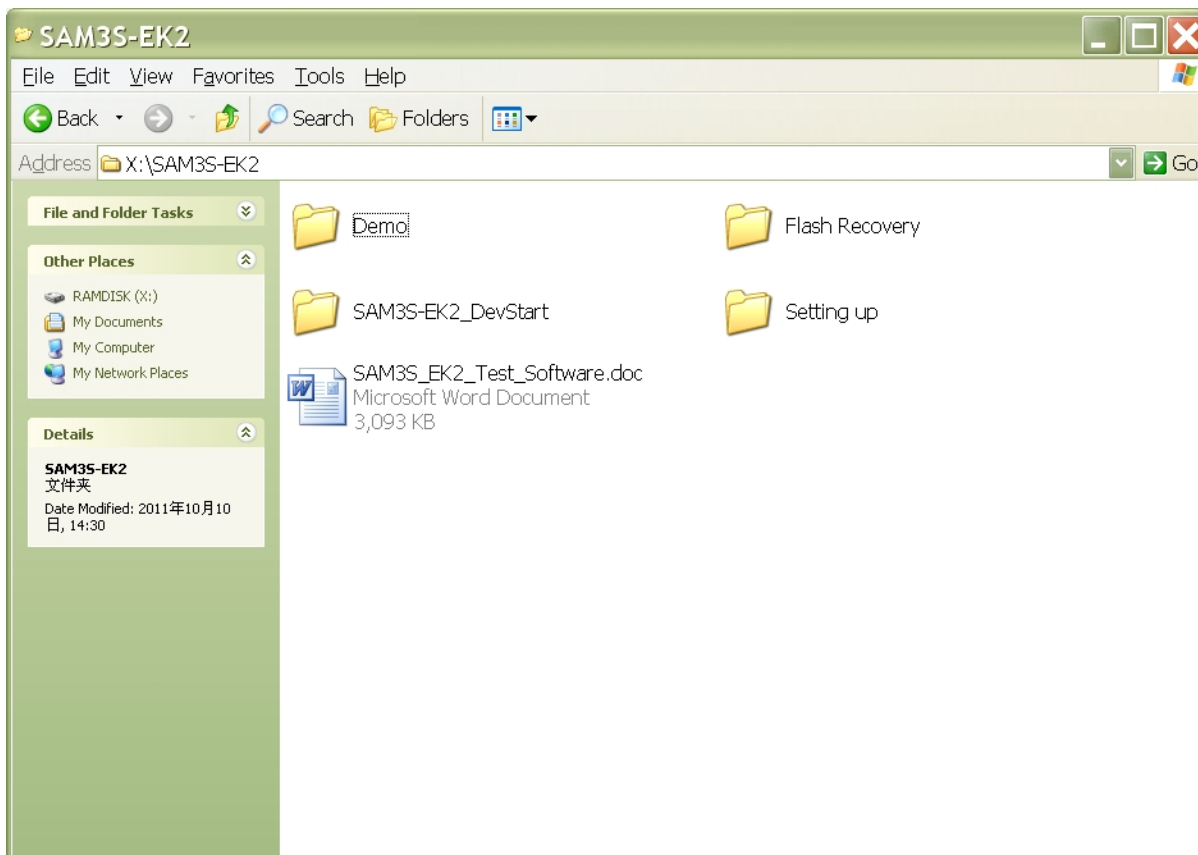
1 Requirements

1.1 Hardware Requirements

<p>SAM3S-EK2 :</p> 	<p>5V power supply :</p> 
<p>serial cross cable :</p> 	<p>micro-USB Cable :</p> 
<p>headphone :</p> 	<p>micro-SD card :</p> 
<p>PC with serial COM port and USB port Windows2000/XP</p>	<p>DB9 Serial loopback plug(Female) :</p> 
	<p>DB9 / F</p> 

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) software setup

2.1 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.

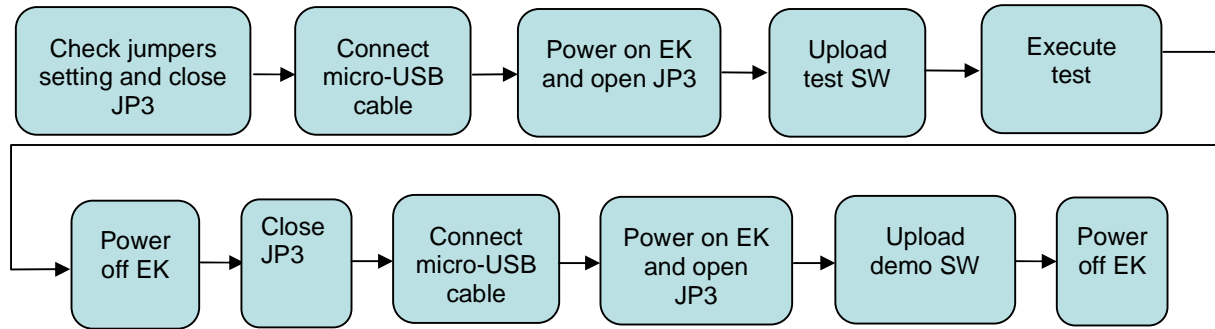


Ø During our test, we will need **SAM-BA** tool to program the testing board. So please install **sam-ba_2.10.exe** and **SAM-BA_2.10_sam3s8_sd8_s16_patch_1.0.zip** provided with this document.

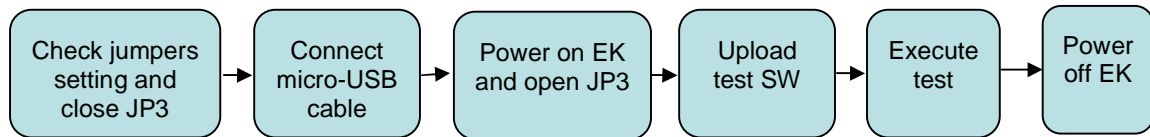
Note: any other version of SAM-BA previously installed on your PC should be removed.

3 Test procedure description

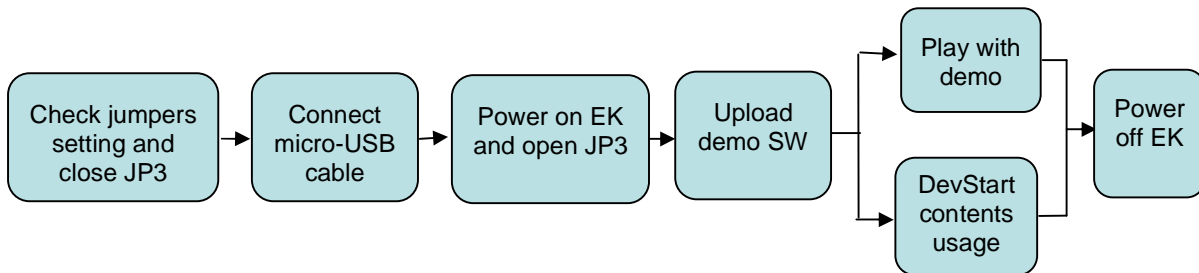
3.1 Production case



3.2 End user case



and / or



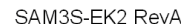
EK boards are delivered with all Jumpers in their default setting.

Summary:

Place all the Jumpers in default setting

Detail:

1. Before the test, please check that all Jumpers are in default status.

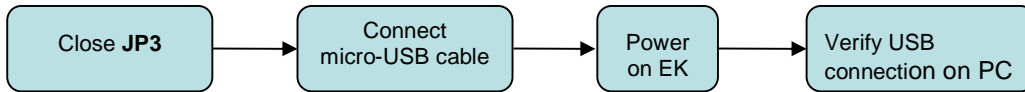


The table below lists all Jumpers on EK board and their default setting.

Designation	Default Setting	Feature
JP1	Open	Close to select JTAG boundary scan
JP2	2-1	Analog reference voltage selection: 2-1: 3.3V 2-3: 2.5V
JP3	Open	ERASE: close to reinitialize internal Flash contents and some of its NVM bits
JP4	Open	Test: close for manufacturing test or fast programming mode
JP5	Close	VPLL: access for current measurement
JP6	Close	VIO: access for current measurement
JP7	Close	VIN: access for current measurement
JP8	Close	VCORE: access for current measurement
JP9	Close	NandFlash chip select enable
JP11	Close	RS485 bus termination enable
JP10 JP12	Open	RS485 pull resistor selectors
JP13	Close	LCD chip select enable
JP14 JP15	Open	Sync close to degrade gain stage on microphone input
JP16	Open	Close for impedance matching on AD BNC port
JP18	2-1	ADC input selection: 2-1: potentiometer 2-3: BNC port
JP17 JP19	Open	Close to mux RIN/LIN into MONO-IN path within audio PA
JP20	Open	Close to fix in mono speaker mode, no matter stereo plug state
JP21	Open	Close for impedance matching on DA BNC port
JP22 JP23 JP24	2-1	DC voltage selection for PIO expansion ports: 2-1: 5V 2-3: 3.3V
JP25 JP26	Close	Open to disable Button BP2 and BP3
JP27	Close	Power consumption measure for ZigBee module

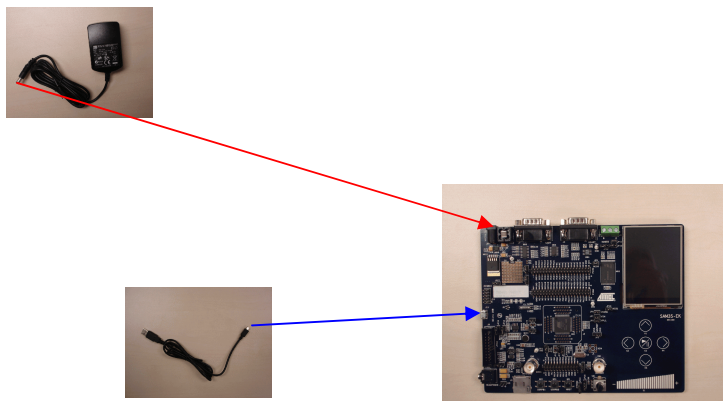
5 USB driver checking

Summary:



Detail:

1. **Close** Jumper JP3.
2. **Connect** EK board to PC via micro-USB Cable.

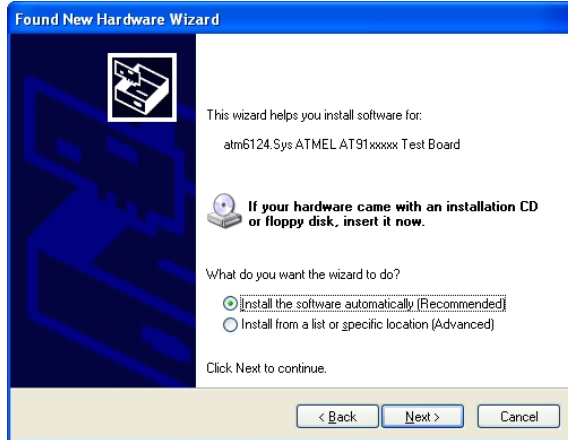


3. **Plug in** 5V power supply to power on EK board.

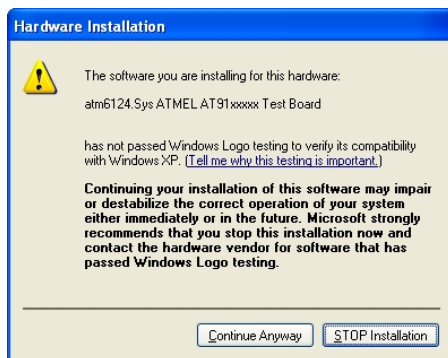
The driver is provided and installed along with the preliminary mandatory SAM-BA installation, but may occasionally need this additional installation:



Select "Yes, this time only" à "Next"



Select "Install the software automatically (Recommended)" à "Next"



Searching for driver and select "Continue Anyway"



Select "Finish".

4. **Verify** that the USB connection is established (click on the USB icon in the notification bar to make sure *ATMEL AT91xxxx Test Board* appears in taskbar notification area).

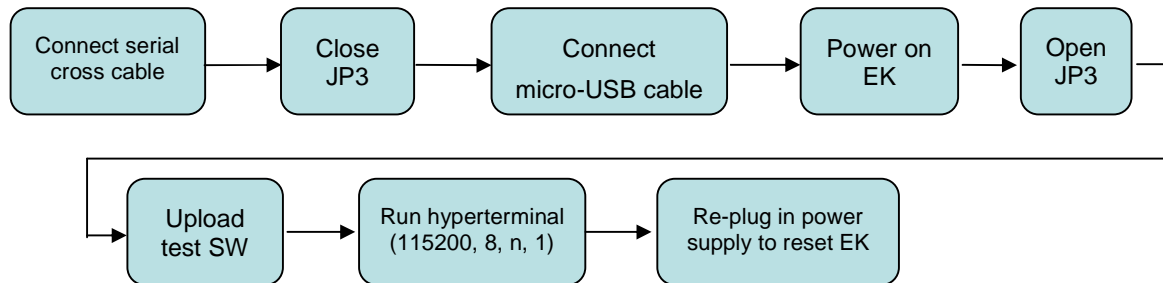
Safely remove atm6124.Sys ATMEL AT91xxxx Test Board



6 Test software upload

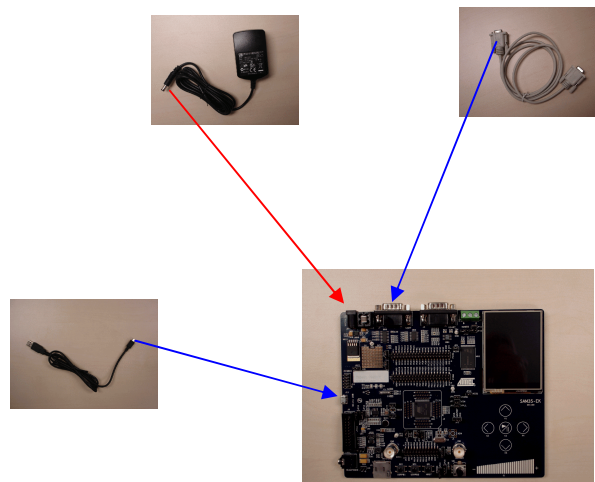
Follow below steps to upload test software into the EK board.

Summary:



Detail:

1. **Connect** serial cross cable between EK board (J7) and PC COM port.



2. Launch SAM-BA boot:

- I Close Jumper JP3.
- I Connect EK board to PC via micro-USB Cable.
- I Plug in 5V power supply to power on EK board.
- I Verify the USB connection is established. (by checking the board detection on the USB bus as explained in chapter 5)

3. **Open** Jumper JP3.

4. Launch *SAM3SEK_TestprogramRecovery.bat* by double-click on it under: *\Flash Recovery*.

A MS-DOS Window should appear, like:



5. Wait about 20 seconds and verify internal flash has been programmed correctly when *logfile.log* appear at the end of programming.

```
-I- Waiting ...
-I- TCL platform : Windows NT
-I- SAM-BA 2.10 on : windows
-I- Retrieved arguments from command line :
-I- argv 0 : \usb\ARM0
-I- argv 1 : at91sam3sd8-ek
-I- argv 2 : SAM3SEK2_TestprogramRecovery.tcl
-I- Connection : \usb\ARM0 (target(comType) = 0)
-I- Board : at91sam3sd8-ek
-I- Traces Level : 4
-I- target(handle) : 18188776
Read device Chip ID at 0x400e0640 --- get 0x00000000
Read device Chip ID at 0x400e0740 --- get 0x29ab0a6f
-I- Found processor : at91sam3sd8 (Chip ID : 0x29ab0a6f)
-I- Loading applet samba-flash-sam3sd8.bin at address 0x20001000
-I- Memory Size : 0x80000 bytes
-I- Buffer address : 0x200028F0
-I- Buffer size: 0xD300 bytes
-I- Applet initialization done
-I- FLASH initialized
-I- Command line mode : Execute script file : SAM3SEK2_TestprogramRecovery.tcl
-I- === SAM3S-EK2 product test software Programming ===
-I- === Init internal Flash ===
-I- Loading applet samba-flash-sam3sd8.bin at address 0x20001000
-I- Memory Size : 0x80000 bytes
-I- Buffer address : 0x200028F0
-I- Buffer size: 0xD300 bytes
-I- Applet initialization done
-I- === Send executable bin into Flash ===
-I- Send File ./test-board-project-flash.bin at address 0x400000
first_sector 0 last_sector 1
-I- Writing: 0x9258 bytes at 0x0 (buffer addr : 0x200028F0)
-I- 0x9258 bytes written by applet
-I- === Send .wav file ===
-I- Send File ./sound.wav at address 0x420000
first_sector 4 last_sector 7
-I- Writing: 0xD300 bytes at 0x20000 (buffer addr : 0x200028F0)
-I- 0xD300 bytes written by applet
-I- Writing: 0xD300 bytes at 0x2D300 (buffer addr : 0x200028F0)
-I- 0xD300 bytes written by applet
-I- Writing: 0xE08 bytes at 0x3A600 (buffer addr : 0x200028F0)
-I- 0xE08 bytes written by applet
-I- === Chang GPNVM to Boot from Flash ===
-I- GPNVM1 set
-I- === End of Flash programming ===
Close the window of this file.
```

6. **Open** hyper terminal console on PC (115200, 8, N, 1).
7. **Re-plug in** 5V power supply to reset EK board.

The EK board should boot from internal flash.

8. **Check** output information on hyper terminal and it looks like:

```
=====
TEST BOARD APPLICATION
```

```
Board : SAM3S-EK2
```

```
Version: 1.0 (Oct 10 2011 - 10:27:16)
=====
```

```
-l- Hit 'w' to launch test sequence or
-l- hit 'x' to do one test
```

```
-----
Tests list
```

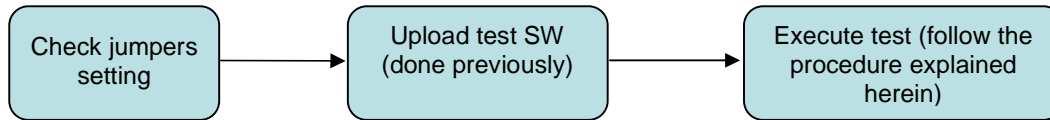
```
-----
UART  01
USART 02
Led    03
Button 04
RESET 05
Nand   06
SDCard 07
LCD    08
TSC    09
AD&DA 10
```

```
-----
-l- Type a test number :
```

7 Test EK board

In this chapter, our test software will perform a full test for components on EK board.

Summary:



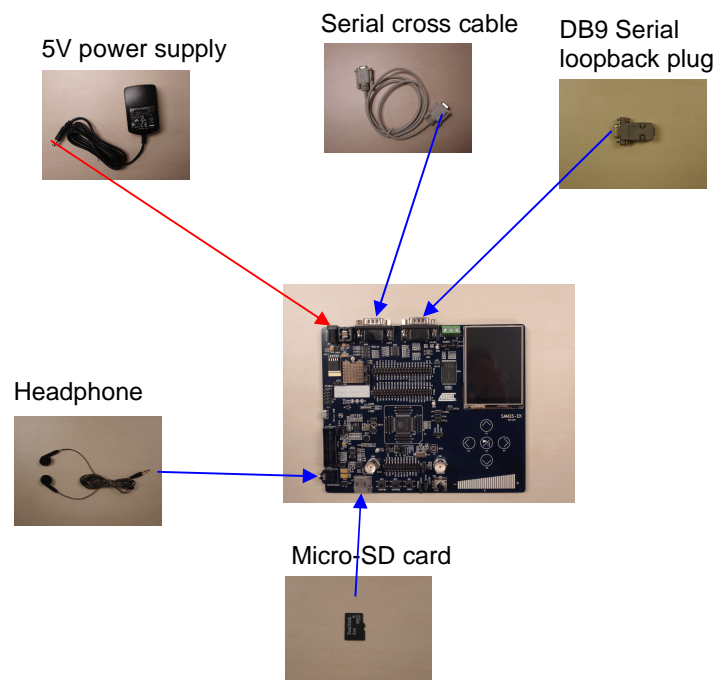
Detail:

1. Here, we assume test software has been uploaded to the EK board.

For more information please refer to chapter 6.

2. Make sure the jumpers are set in default setting as explained in chapter. 4
3. **Un-plug** 5V power supply to power off EK board if connected.
4. **Plug** DB9 Serial loopback plug to J5 on board.
5. **Connect** serial cross cable between J7 on board and PC COM port.
6. **Connect** a headphone to J11 on board.
7. **Insert** a micro-SD card into slot J3 on board.

The below picture shows the connections:



8. **Open** hyper terminal console on PC (115200, 8, N, 1).
9. **Plug in** 5V power supply to power on EK board. Test program should start with below info displayed on hyper terminal:

TEST BOARD APPLICATION
Board : SAM3S-EK2
Version: 1.0 (Oct 10 2011 - 10:27:16)

- Hit 'w' to launch test sequence or
- hit 'x' to do one test

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

[illegible]

```
-l- Test UART : Start...
-l- Test UART : hit 'Y' if this text is displayed
-l- Test UART : TEST OK !!!
```

11. **Make sure** USART port is tested OK. .

[illegible]

12. Check Power and USER LEDs are blinking independently.

Have a look on the board and Hit 'Y' if LEDs are tested OK.

[illegible]

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

```
-|- Test BUTTON : Push button BP2    -> Ok
-|- Test BUTTON : Push button BP3    -> Ok
```

14. **Make sure** RSTBUT is tested OK.

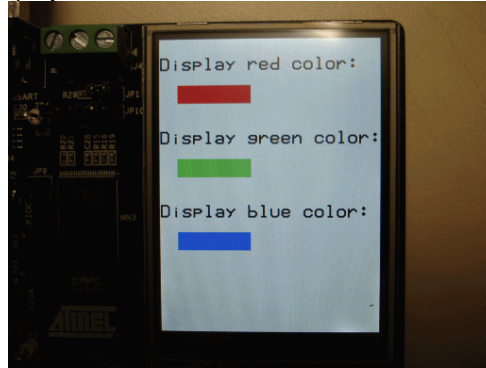
```
-|->>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
-|- Test RSTBut : Start...
-|- Test RSTBut : (this test does not test the reset but the button reset)
-|- Test RSTBut : Press button Reset or press any key to cancel
-|- Test RSTBut : TEST OK !!!
```

15. **Make sure** micro-SD is tested ok.

```
-I- >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
-I- Please connect a SD card ...
-I- SD card connection detected
-I- Cannot check if SD card is write-protected
-W- SdMmcIdentify.Cmd5: 3
-W- SD 4-bit mode
-W- SD HS Enabled
-I- Set SD/MMC clock to 32000K
```

- [illegible]

16. Now you should see LCD display like:



Hit 'Y' if the LCD display is OK.

- ```
-I- Test LCD : TEST OK !!!
-I- Test LCD : (Test Backlight)Start...
-I- Test LCD : (Test Backlight)hit 'Y' if backlight is changed and 'N' if no
```

Hit 'Y' if LCD backlight can be changed.

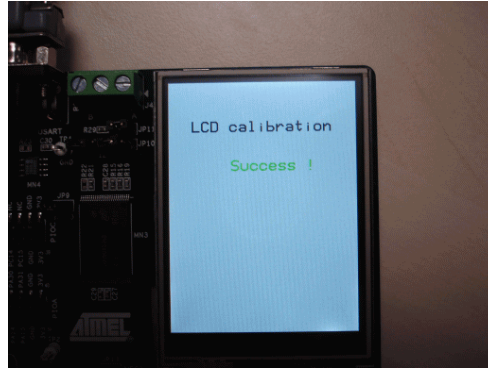
- ```
-|->>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
-I- Test TSC   : Start...
-I- Test TSC   : Touchscreen calibration...
```



17. **Touch** the 5 dots on LCD in sequence.

- ```
-l- Test TSC : Calibration successful !
-l- Test TSC : TEST OK !!!
-l- Test TSC : TEST OK !!!
```



[illegible]

```
-l- >>
-l- Test AD&DA : Start...
-l- Test AD&DA : wav_size = 0x1b3dc
-l- Test AD&DA : P1:Adjust vr1 and voltage(AD5) range should be 0-3300mv
-l- Test AD&DA : P2:Headphone(R channel) is playing the wav file
-l- Test AD&DA : P3:MIC input should be played on headphone(L channel)
-l- Test AD&DA : hit 'Y' if all parts are tested OK!
```

-I- Test AD&DA : 3mV  
TEST OK !!!

```

Tests result

```

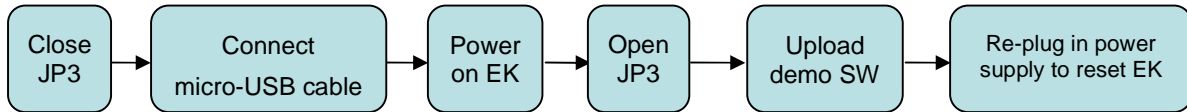
```
UART : ok
USART : ok
Led : ok
Button : ok
RESET : ok
Nand : ok
SDCard : ok
LCD : ok
TSC : ok
AD&DA : ok
```

\*\*\*\*\* TEST OK \*\*\*\*\*

-I- End of test!

## 8 Demo software upload

Summary:



Detail:

### 8.1 Demo

After this procedure is completed, the board is configured with the default demonstration material it contains upon delivery.

1. **Close** Jumper JP3 on board.
2. **Connect** EK Board to PC via micro-USB Cable.
3. **Plug in** 5V power supply to power on EK board.
4. **Verify** that the USB connection is established (*ATMEL AT91xxxx Test Board* appears in taskbar notification area).
5. **Open** Jumper JP3 on board.
6. **Launch** *demo-sam3sek2.bat* by double-click on it in directory: *\ Demo*



```

C:\WINDOWS\system32\cmd.exe
X:\Demo>sam-ba.exe \usb\ARM0 at91sam3sd8-ek demo-sam3sek2.tcl 1>logfile.log 2>&
1
local disk drives list is CDEFLMNOPX
WARNING: do not plug any USB key until EK board
 is recognized as a removable disk
wait for EK board connection via USB ...

```

7. **When** this prompt appears, please power off the board and then on again, system will be reset. about 10 seconds, the demo will start automatically on board and the EK board is recognized as a removable disk:

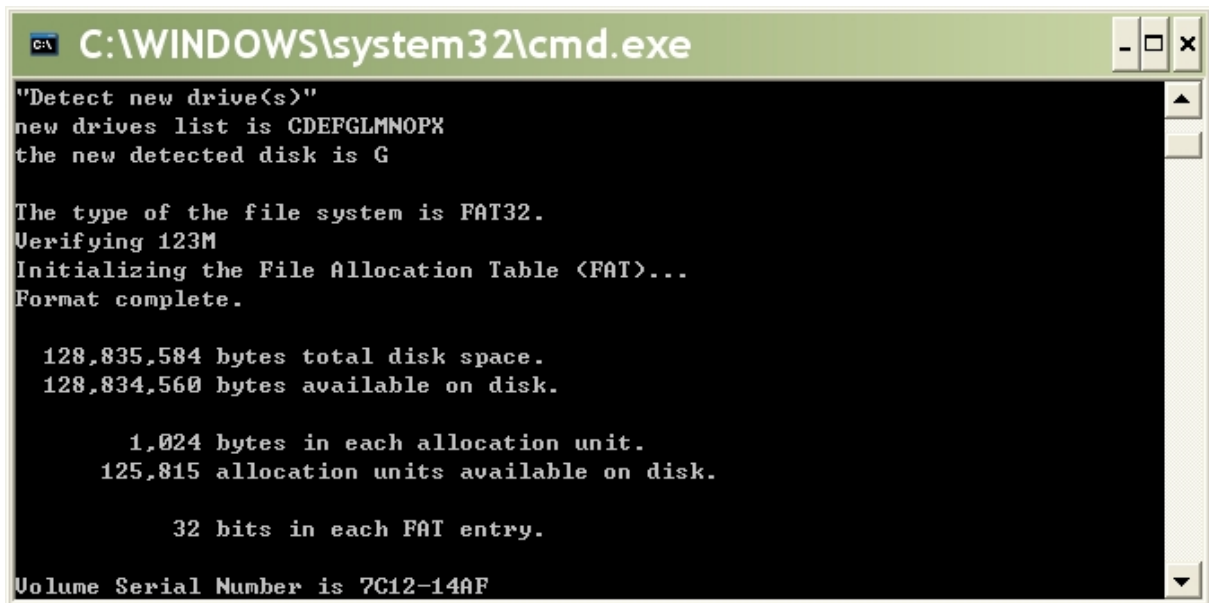


```

C:\WINDOWS\system32\cmd.exe
local disk drives list is CDEFLMNOPX
WARNING: do not plug any USB key until EK board
 is recognized as a removable disk
wait for EK board connection via USB ...
"Detect new drive(s)"
new drives list is CDEFGMLNOPY
the new detected disk is G

```

8. **Wait** till all contents of DevStart are copied into the removable disk



```

C:\WINDOWS\system32\cmd.exe

"Detect new drive(s)"
new drives list is CDEFGHLMNOPX
the new detected disk is G

The type of the file system is FAT32.
Verifying 123M
Initializing the File Allocation Table (FAT)...
Format complete.

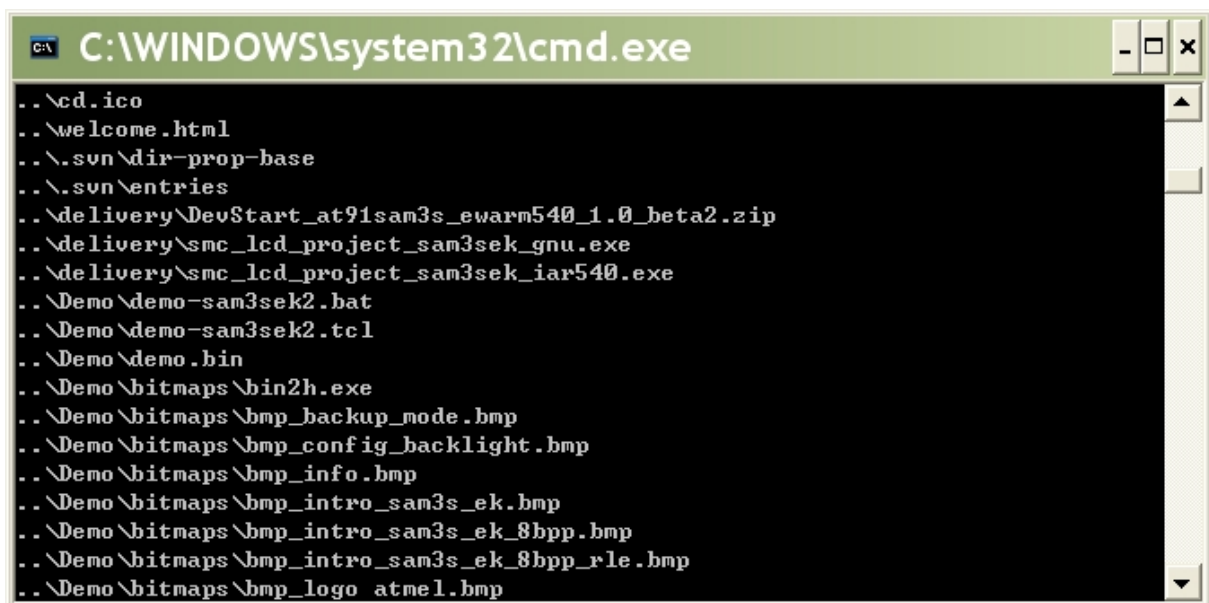
128,835,584 bytes total disk space.
128,834,560 bytes available on disk.

1,024 bytes in each allocation unit.
125,815 allocation units available on disk.

32 bits in each FAT entry.

Volume Serial Number is 7C12-14AF

```



```

C:\WINDOWS\system32\cmd.exe

.. \cd.ico
.. \welcome.html
.. \svn\dir-prop-base
.. \svn\entries
.. \delivery\DevStart_at91sam3s_ewarm540_1.0_beta2.zip
.. \delivery\smc_lcd_project_sam3sek_gnu.exe
.. \delivery\smc_lcd_project_sam3sek_iar540.exe
.. \Demo\demo-sam3sek2.bat
.. \Demo\demo-sam3sek2.tcl
.. \Demo\demo.bin
.. \Demo\bitmaps\bin2h.exe
.. \Demo\bitmaps\bmp_backup_mode.bmp
.. \Demo\bitmaps\bmp_config_backlight.bmp
.. \Demo\bitmaps\bmp_info.bmp
.. \Demo\bitmaps\bmp_intro_sam3s_ek.bmp
.. \Demo\bitmaps\bmp_intro_sam3s_ek_8bpp.bmp
.. \Demo\bitmaps\bmp_intro_sam3s_ek_8bpp_rle.bmp
.. \Demo\bitmaps\bmp_logo_atmel.bmp

```

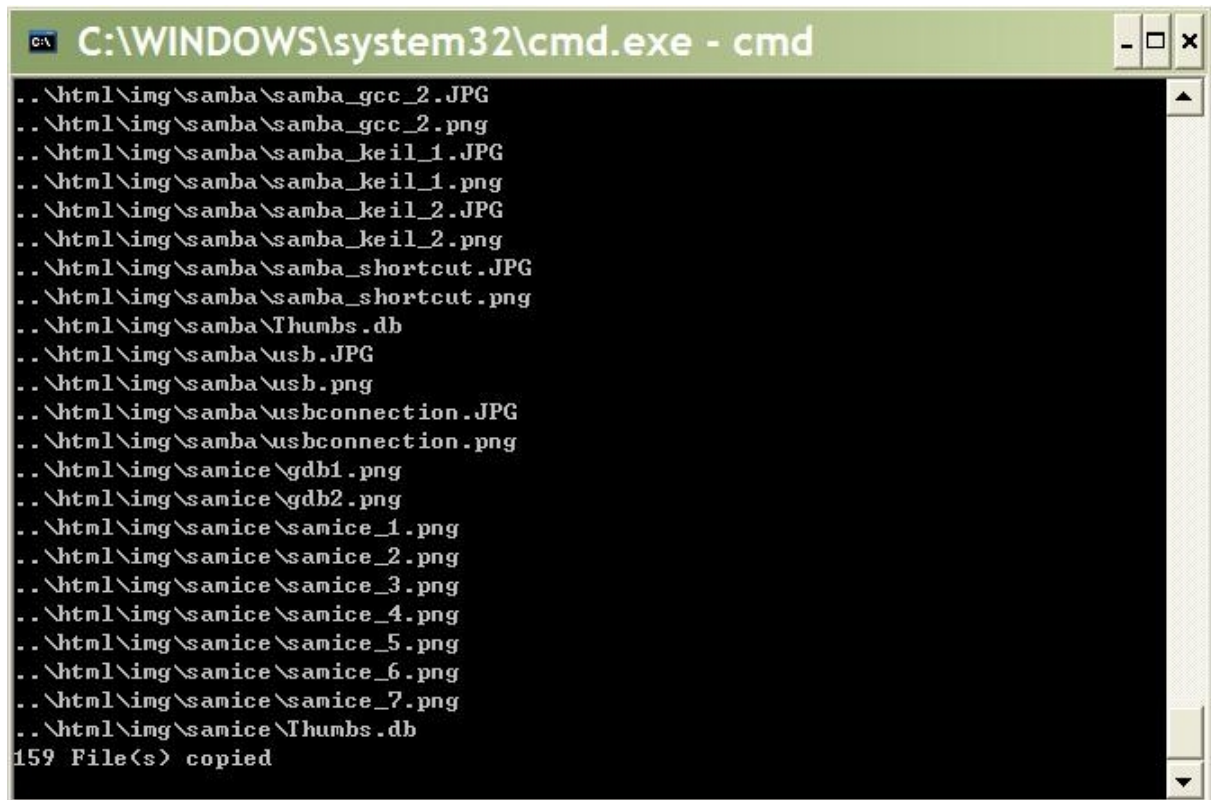
```
C:\WINDOWS\system32\cmd.exe

..\Demo\bitmaps\bmp_logo_atmel.bmp
..\Demo\bitmaps\bmp_sleep_mode.bmp
..\Demo\bitmaps\bmp_smiley.bmp
..\Demo\bitmaps\bmp_sun.bmp
..\Demo\bitmaps\bmp_under_construction.bmp
..\Demo\bitmaps\bmp_wait_mode.bmp
..\Demo\bitmaps\btn_audio.bmp
..\Demo\bitmaps\btn_back.bmp
..\Demo\bitmaps\btn_backlight_setup.bmp
..\Demo\bitmaps\btn_backup_mode.bmp
..\Demo\bitmaps\btn_date_setup.bmp
..\Demo\bitmaps\btn_down.bmp
..\Demo\bitmaps\btn_infos.bmp
..\Demo\bitmaps\btn_low_power_modes.bmp
..\Demo\bitmaps\btn_massstorage.bmp
..\Demo\bitmaps\btn_minus.bmp
..\Demo\bitmaps\btn_plus.bmp
..\Demo\bitmaps\btn_qtouch.bmp
..\Demo\bitmaps\btn_qt_down.bmp
..\Demo\bitmaps\btn_qt_down_pressed.bmp
..\Demo\bitmaps\btn_qt_enter.bmp
..\Demo\bitmaps\btn_qt_enter_pressed.bmp
..\Demo\bitmaps\btn_qt_next.bmp
..\Demo\bitmaps\btn_qt_next_pressed.bmp
```

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

..\Demo\bitmaps\btn_time_setup.bmp
..\Demo\bitmaps\btn_up.bmp
..\Demo\bitmaps\btn_video.bmp
..\Demo\bitmaps\btn_wait_mode.bmp
..\Demo\bitmaps\Thumbs.db
..\Demo\slideshow\Slide1.BMP
..\Demo\slideshow\Slide10.BMP
..\Demo\slideshow\Slide11.BMP
..\Demo\slideshow\Slide12.BMP
..\Demo\slideshow\Slide13.BMP
..\Demo\slideshow\Slide14.BMP
..\Demo\slideshow\Slide2.BMP
..\Demo\slideshow\Slide3.BMP
..\Demo\slideshow\Slide4.BMP
..\Demo\slideshow\Slide5.BMP
..\Demo\slideshow\Slide6.BMP
..\Demo\slideshow\Slide7.BMP
..\Demo\slideshow\Slide8.BMP
..\Demo\slideshow\Slide9.BMP
..\Demo\slideshow\Thumbs.db
..\html\build_gcc.html
..\html\build_iar.html
..\html\debug_gcc.html
..\html\debug_iar.html
```

.....



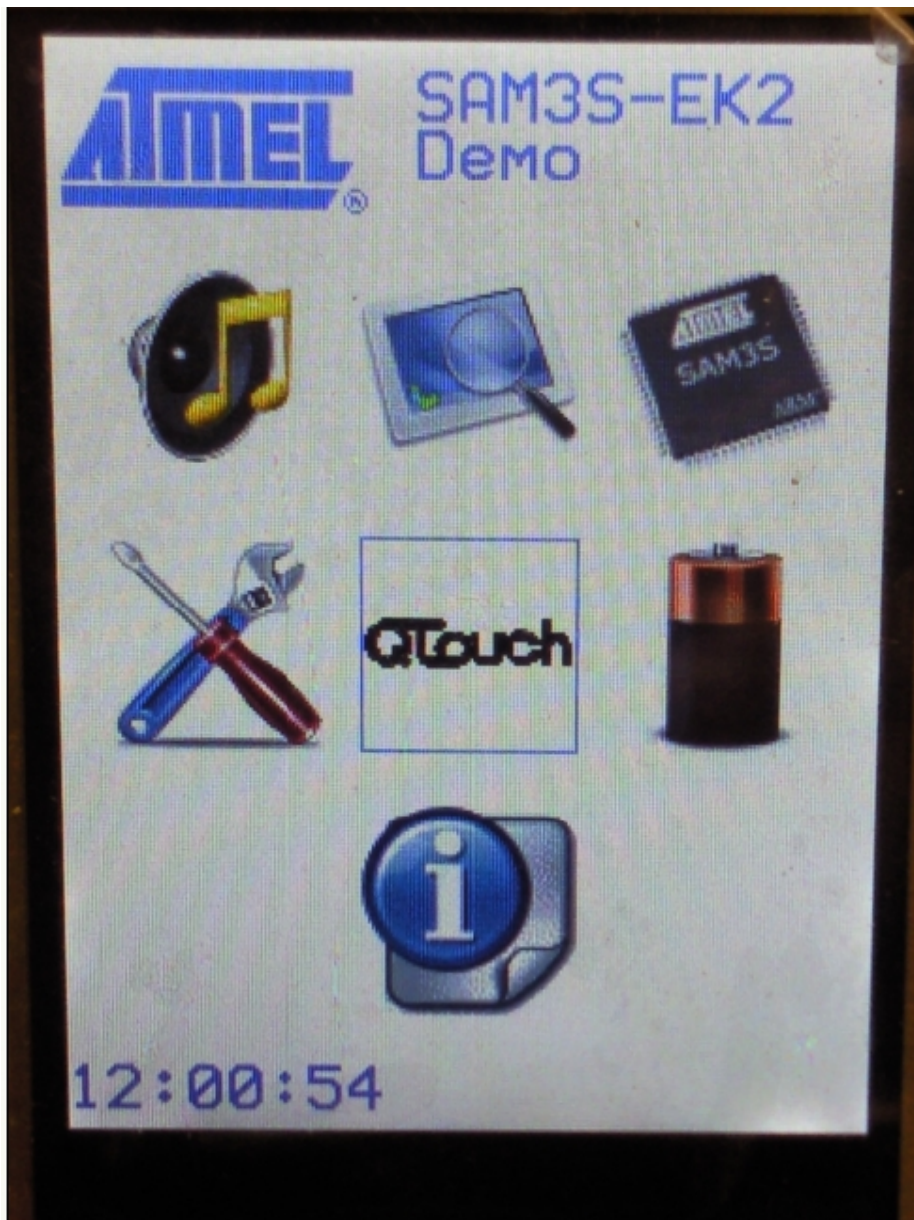
```

C:\WINDOWS\system32\cmd.exe - cmd
.. \html\img\samba\samba_gcc_2.JPG
.. \html\img\samba\samba_gcc_2.png
.. \html\img\samba\samba_keil_1.JPG
.. \html\img\samba\samba_keil_1.png
.. \html\img\samba\samba_keil_2.JPG
.. \html\img\samba\samba_keil_2.png
.. \html\img\samba\samba_shortcut.JPG
.. \html\img\samba\samba_shortcut.png
.. \html\img\samba\Thumbs.db
.. \html\img\samba\usb.JPG
.. \html\img\samba\usb.png
.. \html\img\samba\usbconnection.JPG
.. \html\img\samba\usbconnection.png
.. \html\img\samice\gdb1.png
.. \html\img\samice\gdb2.png
.. \html\img\samice\samice_1.png
.. \html\img\samice\samice_2.png
.. \html\img\samice\samice_3.png
.. \html\img\samice\samice_4.png
.. \html\img\samice\samice_5.png
.. \html\img\samice\samice_6.png
.. \html\img\samice\samice_7.png
.. \html\img\samice\Thumbs.db
159 File(s) copied

```

Hit any key to close this window.

9. **Re-plug** in 5V power supply to reset EK board and on-board demo should start:
10. LCD display should look like:



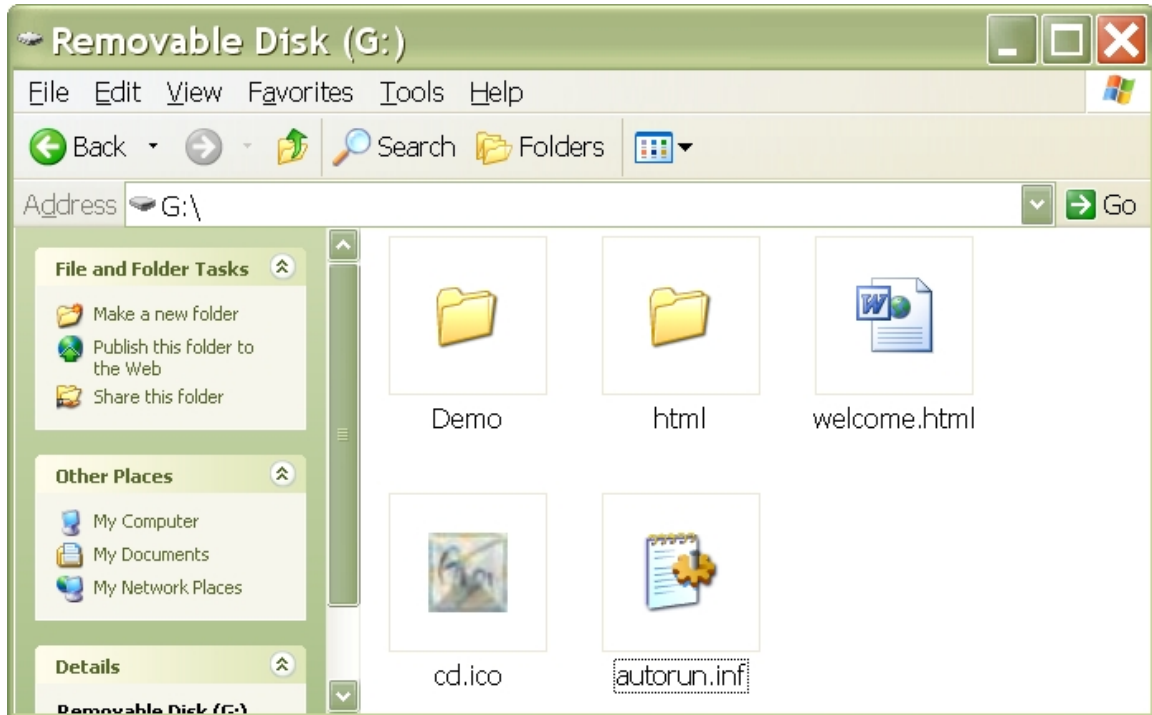
By now, the demo fully functions.



## 8.2 DevStart contents

DevStart is a part of on-board software and stored in NANDFLASH. Just connect EK board to you PC and you will find its contents in a new detected removable disk.

1. **Check** its contents and look like:



Trouble shooting:

- I If some files are missing, just copy them from the SAM3S-EK2\_DevStart directory of the present test/demo software package into the new detected removable disk.
- I If no new detected removable disk found on your PC, please refer to section 8.1 and do demo recovery.

## 9 Pack EK board

Follow below steps to pack EK board:

1. **Disconnect** all cables connected to EK board.
2. **Set** the jumpers back to the default settings described in chapter. 4.
3. **Put** EK board in a protective anti-static package and pack.