

## Experiment Number 1:

### Download pre-configured Kernel Image, File System and Bootloader to the target device- ARM9 (MicroA960 Board).

**Aim:** To download a preconfigured image of the Bootloader, the kernel and the Filesystem onto the NAND flash of the MicroA960 Board so as to run Linux OS when the board is powered up.

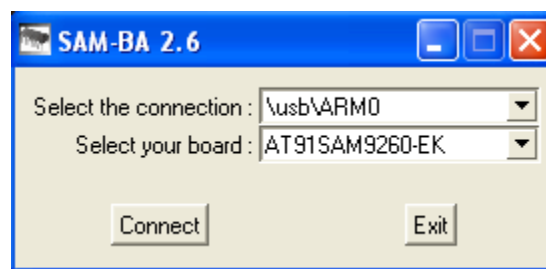
#### Step1: Power ON the Board.

The jumper **J1** on the MicroA960 Board is connected to the NAND Flash. When Closed (connected) the NAND Flash chip will be interfaced to the Processor. When Open (not connected) the NAND Flash will be disconnected from the processor.

- Disconnect the Jumper **J1** from the board.
- Connect the USB cable from connector CN7 (USB Device) to the PC.
- Also Connect a second USB cable from CN4 (USB to Serial) to the PC and note down the port number.
- Open a terminal program of your choice (HyperTerminal or Tera Terminal) with the following settings;
  - PORT: USB to Serial port selected by your PC.
  - Baud rate :38400
  - 8 Data Bits and 1 Stop Bit.
  - No Flow control.
- Now turn on the board and wait for the USB Device to be recognized by the PC.

#### Step2: Start SAM-BA software and connect to the board

Start the **SAM-BA** software.

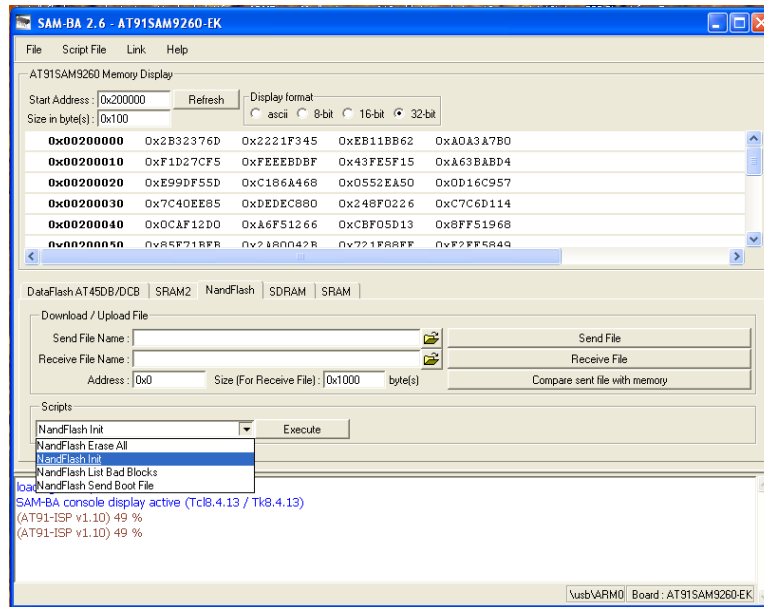


- In the **Select the Connection** tab: select **\usb\ARM0**
- In the **Select your Board** tab: select **AT91SAM9260-EK**
- Click **connect**. The board will get connected with the SAM-BA ISP software.

#### Step3: Initialize the NAND Interface.

To initialize the NAND Flash interface in SAM-BA

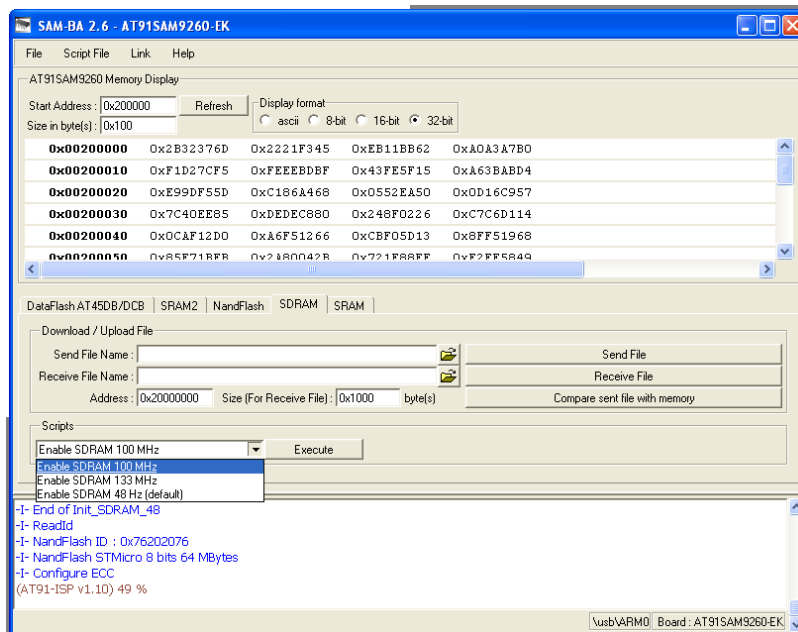
- Select the *NandFlash* tab.
- In the scripts section select **NandFlash Init**.
- Click **Execute**.
- You can see the result in the console in SAM-BA lowest window.



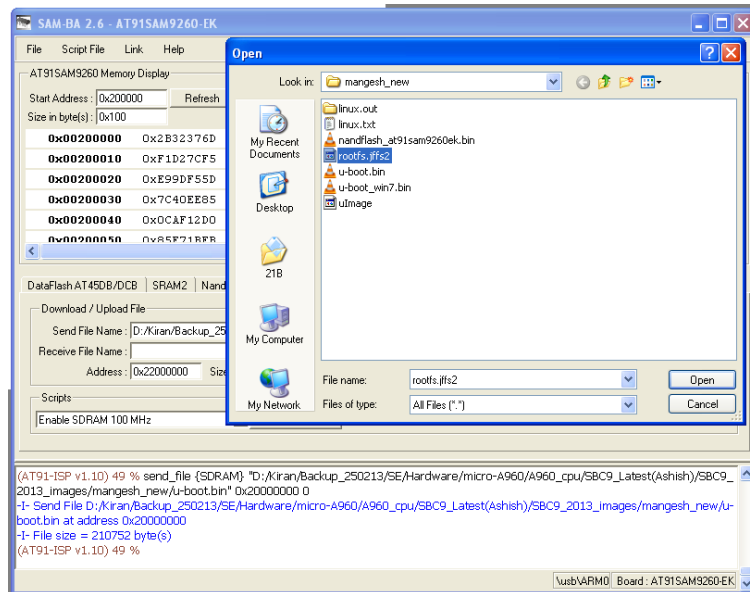
#### Step4: Initialize the SDRAM interface.

To initialize the SDRAM interface in SAM-BA

- Select the *SDRAM* tab.
- In the scripts section select **Enable SDRAM**.
- Click **Execute**.
- You can see the result in the console in SAM-BA lowest window.



## Step5: Download the Bootstrap (first level bootloader), U-boot, Kernel and Filesystem images into the SDRAM.



### Downloading U-Boot Image.

- In the Download/Upload File section in SAM-BA ;
- Browse for the **uboot.bin** file
- In the address section : type **0x20000000**
- Click on **Send File**

### Downloading Bootstrap (first level bootloader) Image.

- In the Download/Upload File section in SAM-BA ;
- Browse for the **bootstrap.bin** file
- In the address section : type **0x21000000**
- Click on **Send File**

### Downloading Kernel Image.

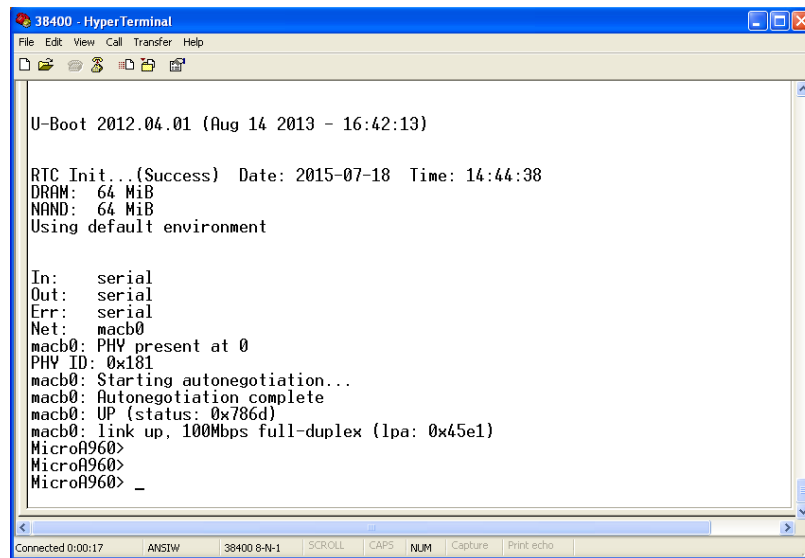
- In the Download/Upload File section in SAM-BA ;
- Browse for the **ulimage** file (make sure to select **All Files(\*.\*)** in the **Files of Type** )
- In the address section : type **0x22000000**
- Click on **Send File**

### Downloading File System Image.

- In the Download/Upload File section in SAM-BA ;
- Browse for the **rootfs.jffs2** file (make sure to select **All Files(\*.\*)** in the **Files of Type** )
- In the address section : type **0x23000000**
- Click on **Send File**

**Step6: Run U-boot and flash the kernel and Filesystem images into the NAND Flash.**

- At this point we will run the uboot.
- In the SAM-BA console window: type **go 0x20000000** and hit **Enter** key on the PC keyboard.
- This will run the uboot.

**Now switch to the terminal program window (HyperTerminal or Tera Terminal)**


```

38400 - HyperTerminal
File Edit View Call Transfer Help

U-Boot 2012.04.01 (Aug 14 2013 - 16:42:13)

RTC Init...(Success) Date: 2015-07-18 Time: 14:44:38
DRAM: 64 MiB
NAND: 64 MiB
Using default environment

In: serial
Out: serial
Err: serial
Net: macb0
macb0: PHY present at 0
PHY ID: 0x181
macb0: Starting autonegotiation...
macb0: Autonegotiation complete
macb0: UP (status: 0x786d)
macb0: link up, 100Mbps full-duplex (lpa: 0x45e1)
MicroA960>
MicroA960>
MicroA960> _

Connected 0:00:17 ANSIV 38400 8-N-1 SCROLL CAPS NUM Capture Print echo

```

When the uboot runs successfully you will see a **MicroA960>** prompt.

**Following are the commands to flash the images in the SDRAM into the flash;**

Erase the NAND Flash completely using the command;

**MicroA960> nand erase.chip**

Write the first level Bootloader into the flash:

**MicroA960> nand write 21000000 0 1000**

Write the Kernel into the Flash

**MicroA960> nand write 0x22000000 8000 200000**

Write the JFFS2 Flash File System into the Flash

**MicroA960> nand write.jffs2 0x23000000 800000 4c0000**

**Step8: Reset the Board.**

You will now see the linux booting on the MicroA960 Board.