

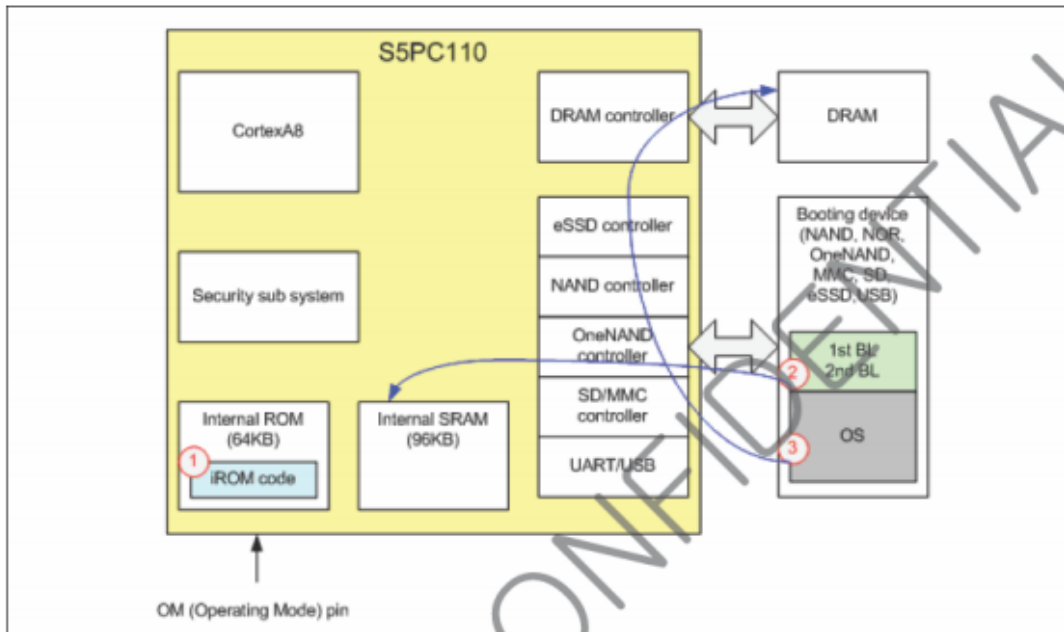


EM210 Download Wince6.0 Image Manual

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1. The S5PV210 process of UART BOOT



As show the picture:

IROM CODE: is Samsung curing in the internal ROM a program, when the user choose to start from a serial port, this program segment will run, its role is to download the first level BOOT to internal 96K SRM in and run.

1st Boot loader:

After it run, initialize USB, and through the USB download 2nd Boot Loader, and run it.

2nd Boot Loader:

It is responsible for the management of the flash, download NK and other documents and burn wrote NAND inside.

OS:

WINCE OS BIN file.

From the above analysis we can know:

In S5PV210 IROM is Samsung curing internal, is the factory with good and cannot be change, and never lost. And **1st Boot loader** and **2nd Boot Loader** is running in RAM, does not keep them to NAND.

Serial port is used to guide from the first written burn blank NAND, called **IROM guide**.

2. The S5PV210 process of NAND BOOT

BOOTIMAGE.NB0		TOC	MBR	NK.BIN/CHAIN.LST	EXTENSION PARTITION
STEPLDR	EBOOT	EBOOT Configuration	Master Boot Record	OS	Mounted at \NandFlash (RAM/ROM filesystem) \(ROM-only filesystem)
Block 0	Block 1 ~ Block 4	Block 5	Block 6 Sector 384	Single-XIP Multiple-XIP (BINFS)	Storage (exFAT)

From the above graph shows that:

Written in the burning SD (INAND) have two files, one is BOOTIAMGE. NB0, the other one is NK.Bin. One of the BOOTIMAGE.NB0 is STEPLDR and EBOOT connected

together a file Choose from SD (INAND) started, the S5PV210 will first loading STEPLDR, STEPLDR reload EBOOT, EBOOT reload NK.

From INAND FLASH start, it is called **normal guide**.

3. The compiled BSP generated several files introduction

BL_UART.nb0: Use IROM guide 1st Bootloader, only run in IRAM

EBOOT.nb0: Use IROM guide 2nd Bootloader, only run in IRAM

BootImage.nb0:

It is normal to guide the documents, the lead when IROM into two parts Stepldr + EBOOT, burned into NAND respectively

NK.bin: WINCE OS.

4. The IROM Serial guide to burn WINCE IMAGE

BOOT Select mode:

Boot mode	J1	J2	J3	J4	J5	J6
NAND	ON	ON	ON	ON	OFF	ON
SD(INAND)	ON	ON	OFF	OFF	ON	ON
USB	OFF	ON	ON	ON	OFF	ON

Note: The switch "JP106" up is OFF, down is ON.

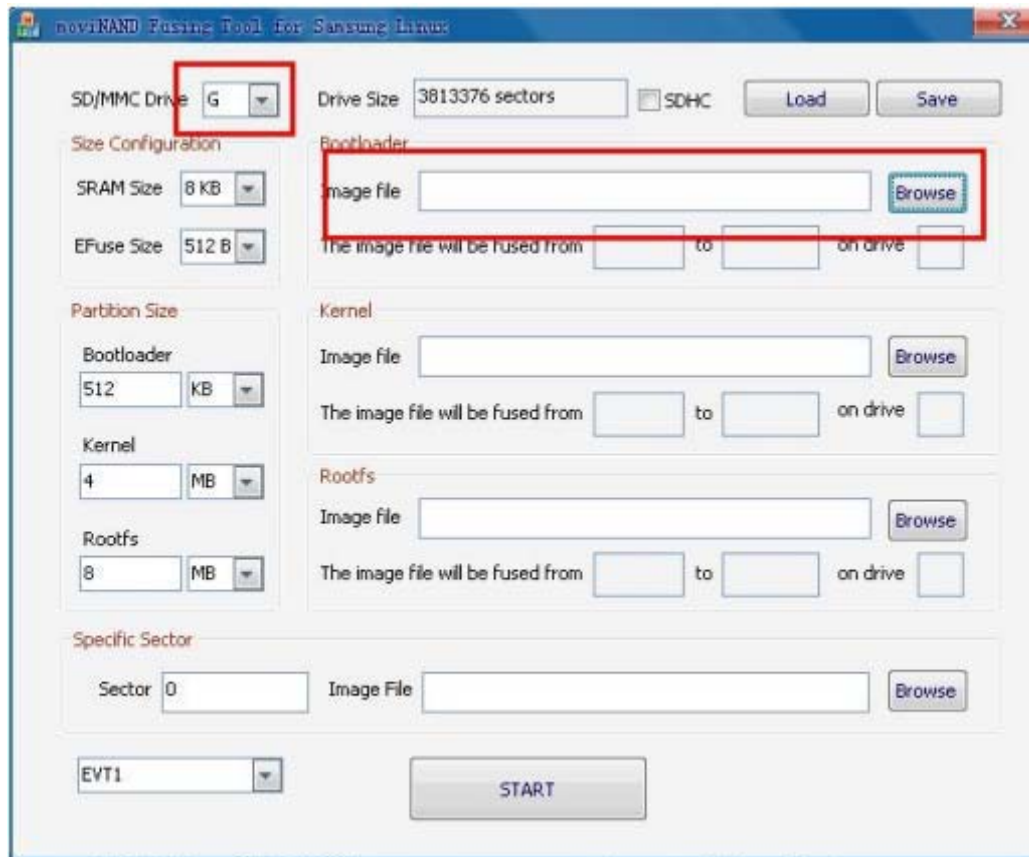
Board default is SD (INAND) start-up mode.

If the board has burned the Linux or Android system, please format the nand flash before download the Wince Image. The format nand flash as show below:

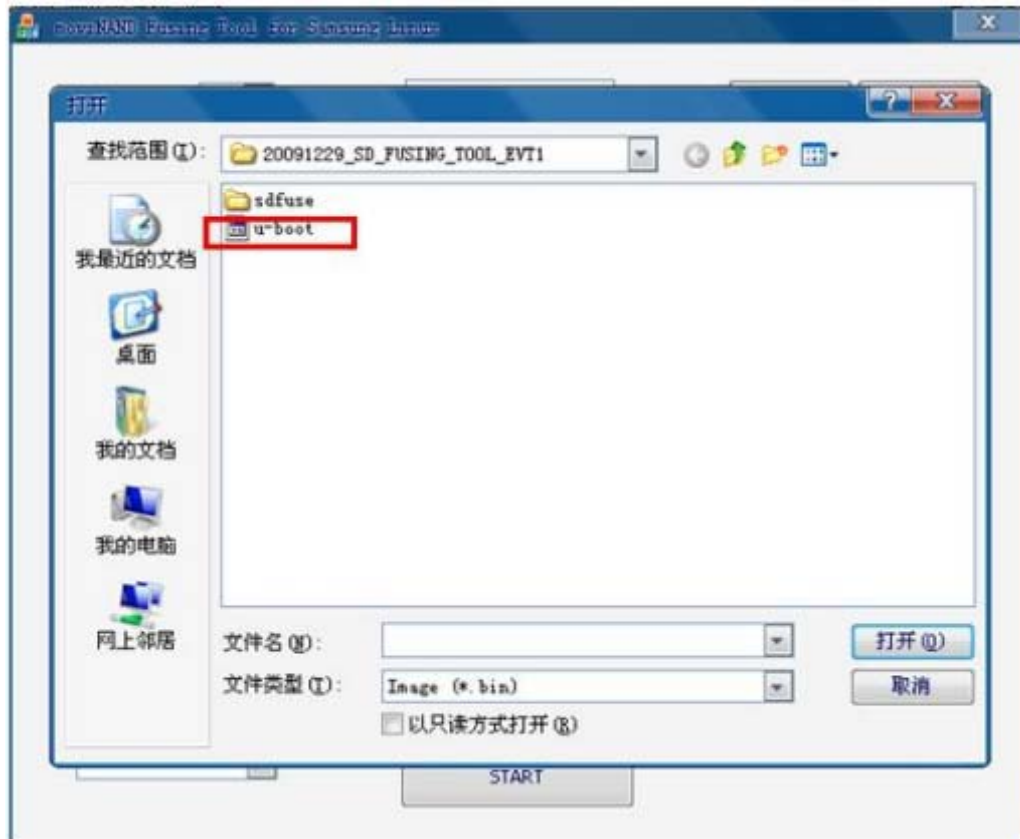
- (1) Format the SD card to FAT32 format.
- (2) Open "moviNAND_Fusing_Tool_v2.0".



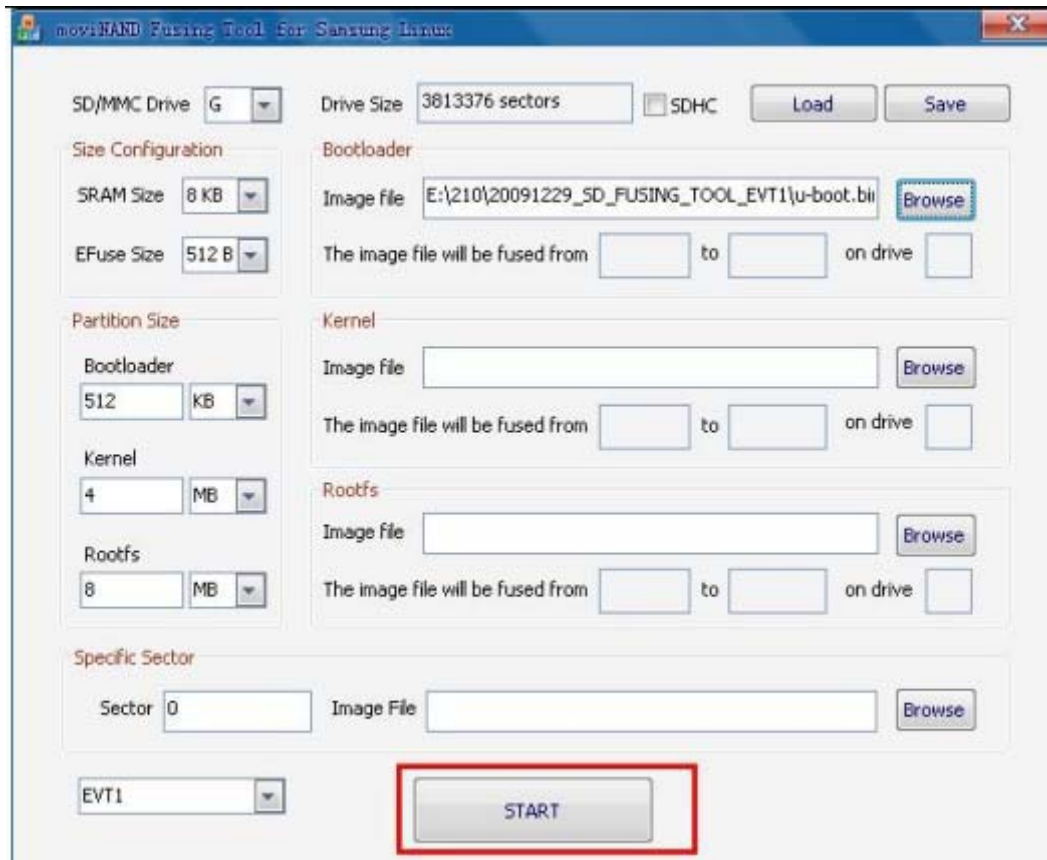
- (3) Open the disk corresponds to the SD card in moviNAND_Fusing_Tool_v2.0 (please use the SD card provided by boardcon) and select the file you want to burn.

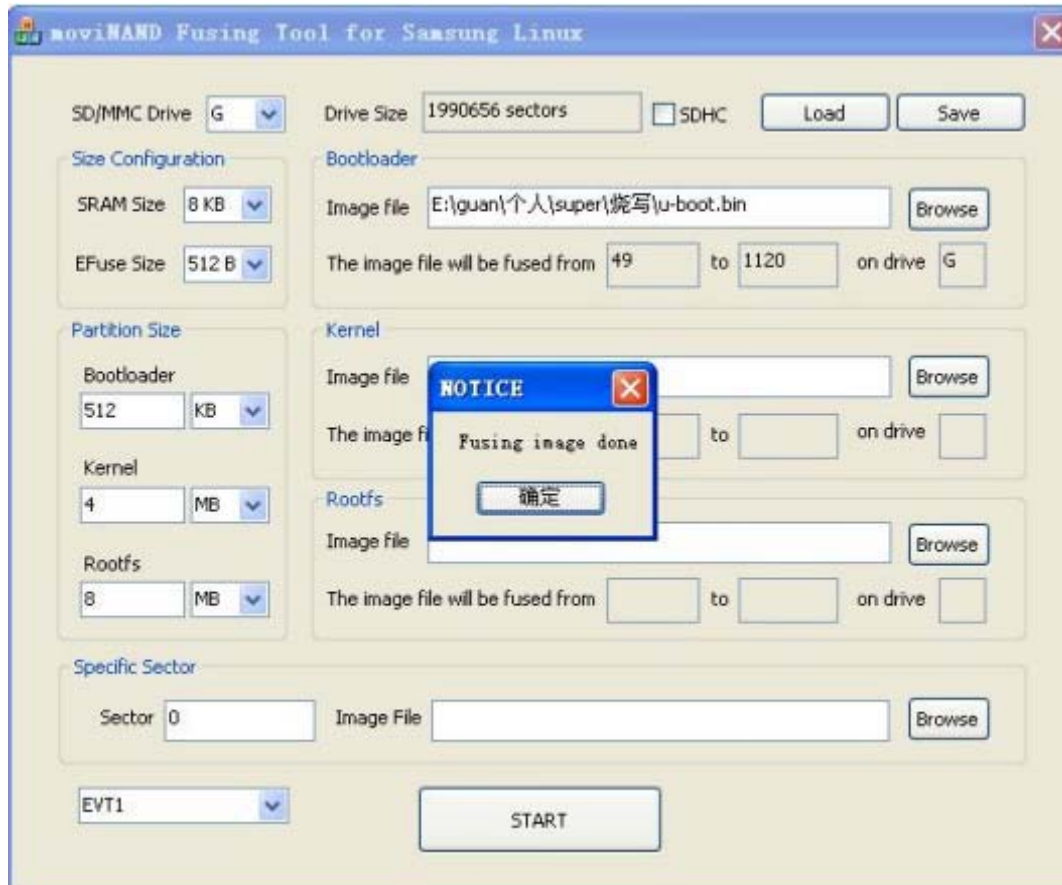


Click "**Browse**", that appear choose file dialog box, select the "**uboot**". The uboot is copied from Linux system or Android system. Here selecte the Linux system uboot in the CD: \ **EM210\Qt\Image\uboot**:

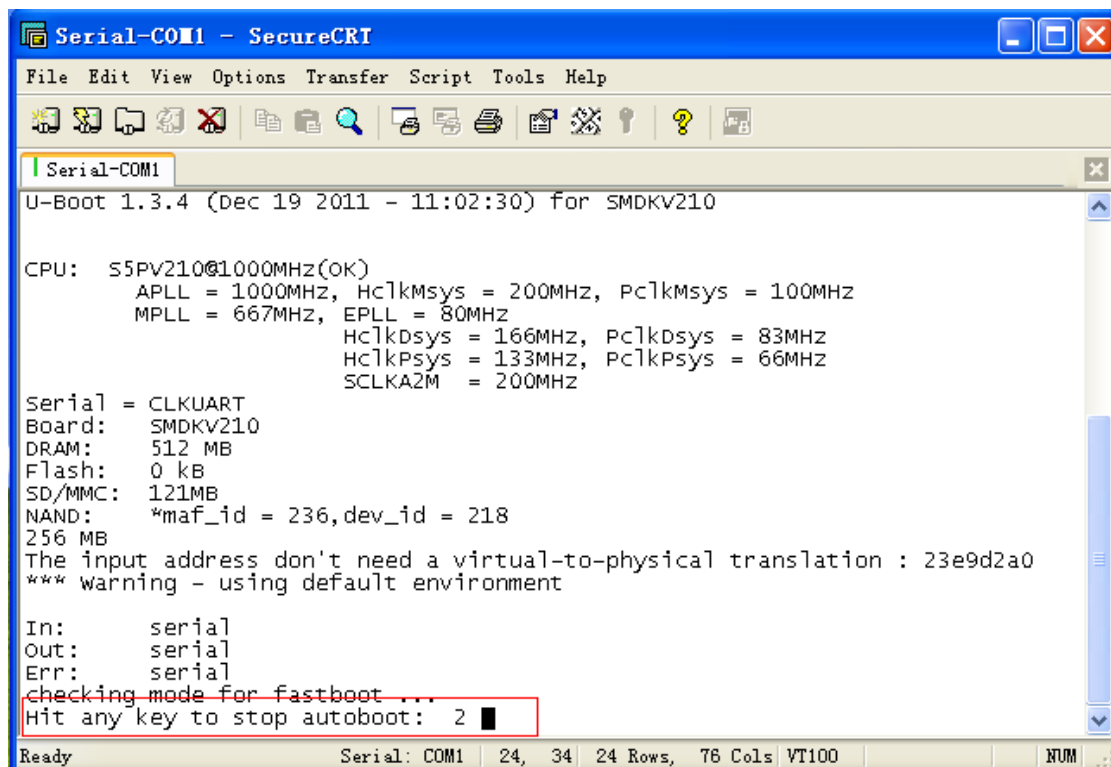


(4)Click **“START”**. The pop-up **“NOTICE”** window shows writing is successful.

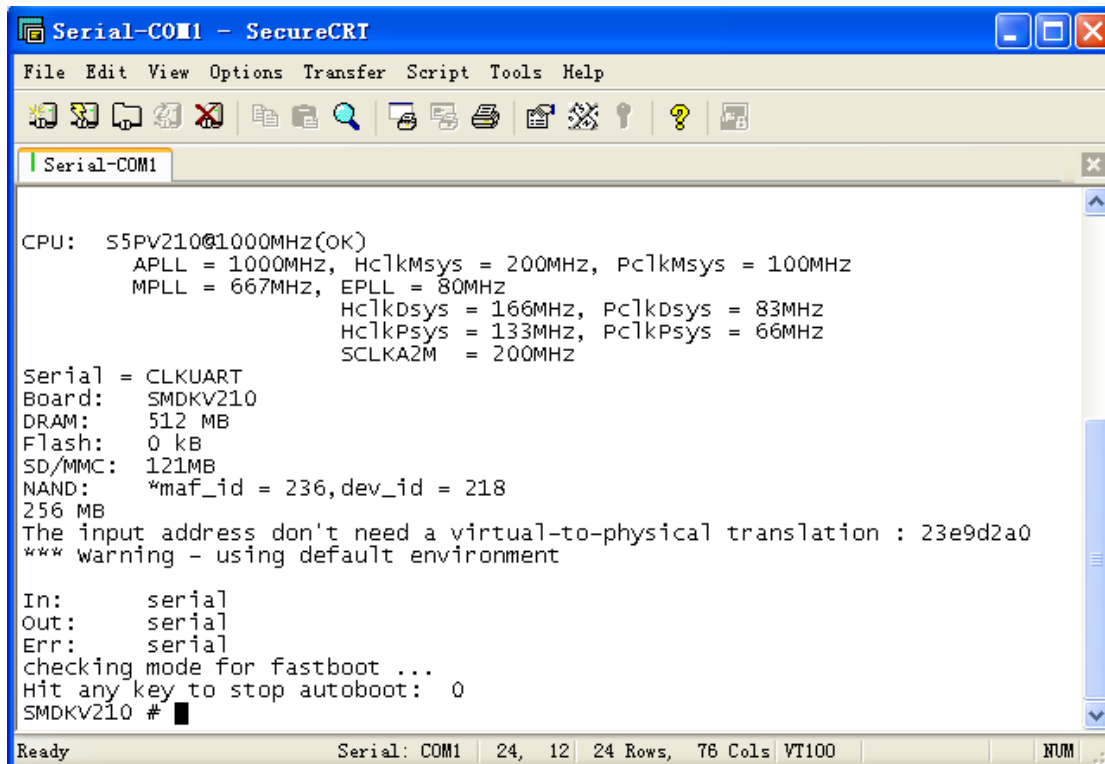




(5) Insert the SD card, set the board to boot from SD, connect the Serial cable. Open SecureCRT and power on:

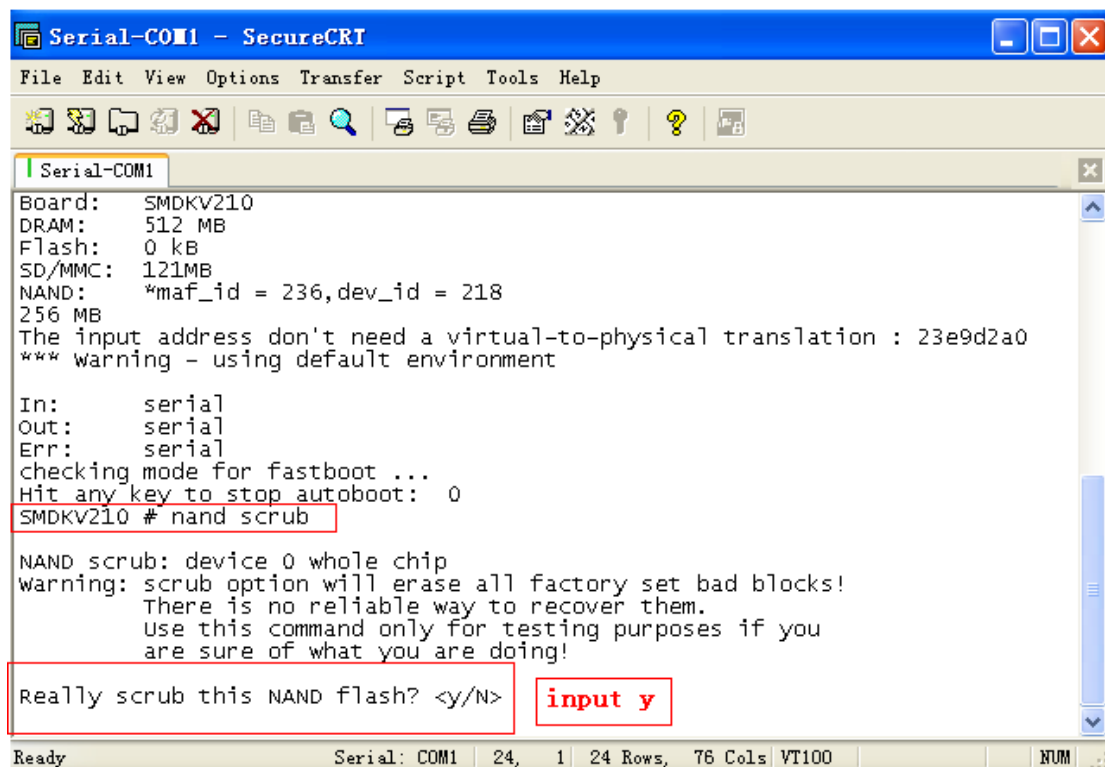


Click any key in 3 seconds countdown:

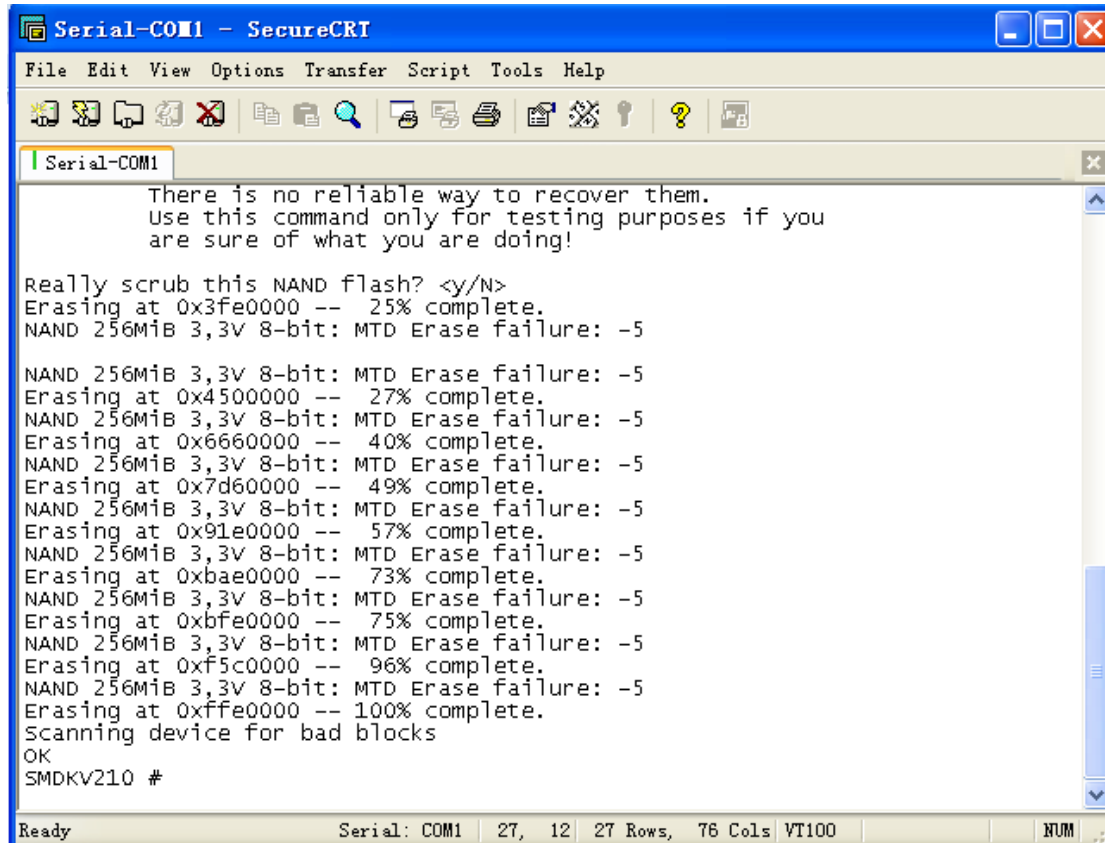


```
Serial-COM1 - SecureCRT
File Edit View Options Transfer Script Tools Help
Serial-COM1
CPU: S5PV210@1000MHz(OK)
      APLL = 1000MHz, Hclkmsys = 200MHz, Pclkmsys = 100MHz
      MPLL = 667MHz, EPLL = 80MHz
      Hclkdsys = 166MHz, Pclkdsys = 83MHz
      Hclkpsys = 133MHz, Pclkpsys = 66MHz
      SCLKA2M = 200MHz
Serial = CLKUART
Board: SMDKV210
DRAM: 512 MB
Flash: 0 kB
SD/MMC: 121MB
NAND: *maf_id = 236,dev_id = 218
256 MB
The input address don't need a virtual-to-physical translation : 23e9d2a0
*** warning - using default environment
In: serial
Out: serial
Err: serial
checking mode for fastboot ...
Hit any key to stop autoboot: 0
SMDKV210 #
```

Then input the command: "nand scrub" to format the nand flash:



```
Serial-COM1 - SecureCRT
File Edit View Options Transfer Script Tools Help
Serial-COM1
Board: SMDKV210
DRAM: 512 MB
Flash: 0 kB
SD/MMC: 121MB
NAND: *maf_id = 236,dev_id = 218
256 MB
The input address don't need a virtual-to-physical translation : 23e9d2a0
*** warning - using default environment
In: serial
Out: serial
Err: serial
checking mode for fastboot ...
Hit any key to stop autoboot: 0
SMDKV210 # nand scrub
NAND scrub: device 0 whole chip
warning: scrub option will erase all factory set bad blocks!
        There is no reliable way to recover them.
        Use this command only for testing purposes if you
        are sure of what you are doing!
Really scrub this NAND flash? <y/N> input y
```



```

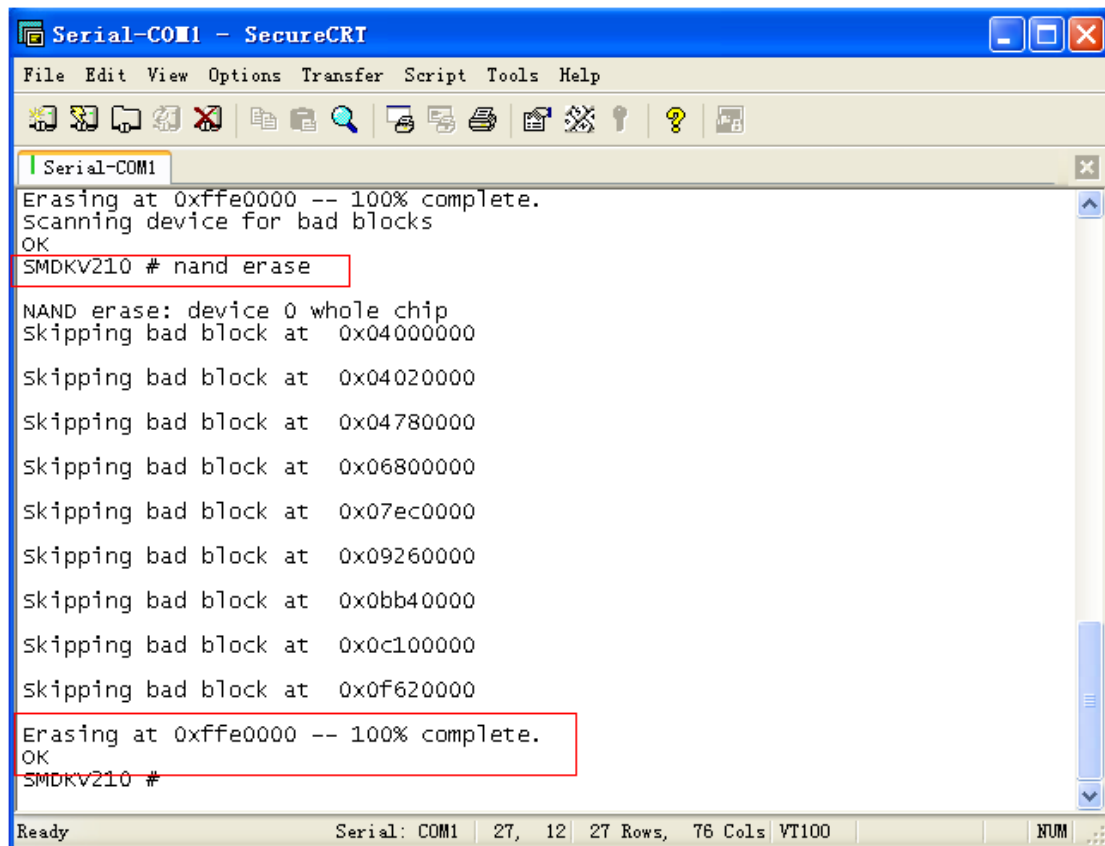
Serial-COM1 - SecureCRT
File Edit View Options Transfer Script Tools Help
Serial-COM1
There is no reliable way to recover them.
Use this command only for testing purposes if you
are sure of what you are doing!

Really scrub this NAND flash? <y/N>
Erasing at 0x3fe0000 -- 25% complete.
NAND 256MiB 3,3V 8-bit: MTD Erase failure: -5

NAND 256MiB 3,3V 8-bit: MTD Erase failure: -5
Erasing at 0x4500000 -- 27% complete.
NAND 256MiB 3,3V 8-bit: MTD Erase failure: -5
Erasing at 0x6660000 -- 40% complete.
NAND 256MiB 3,3V 8-bit: MTD Erase failure: -5
Erasing at 0x7d60000 -- 49% complete.
NAND 256MiB 3,3V 8-bit: MTD Erase failure: -5
Erasing at 0x91e0000 -- 57% complete.
NAND 256MiB 3,3V 8-bit: MTD Erase failure: -5
Erasing at 0xbae0000 -- 73% complete.
NAND 256MiB 3,3V 8-bit: MTD Erase failure: -5
Erasing at 0xbfe0000 -- 75% complete.
NAND 256MiB 3,3V 8-bit: MTD Erase failure: -5
Erasing at 0xf5c0000 -- 96% complete.
NAND 256MiB 3,3V 8-bit: MTD Erase failure: -5
Erasing at 0xffe0000 -- 100% complete.
Scanning device for bad blocks
OK
SMDKV210 #
Ready Serial: COM1 27, 12 27 Rows, 76 Cols VT100 NUM

```

Or input the command: **"nand erase"** to format the nand flash:



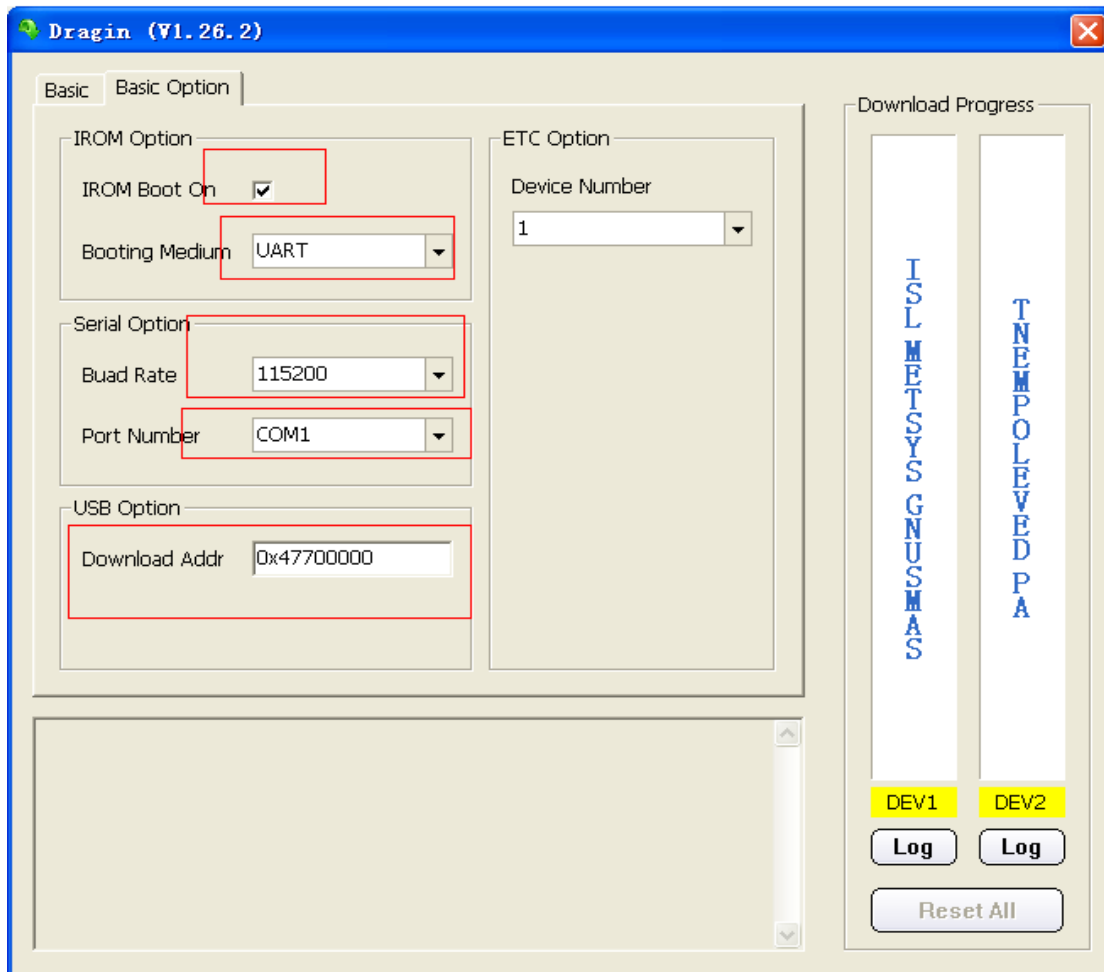
```

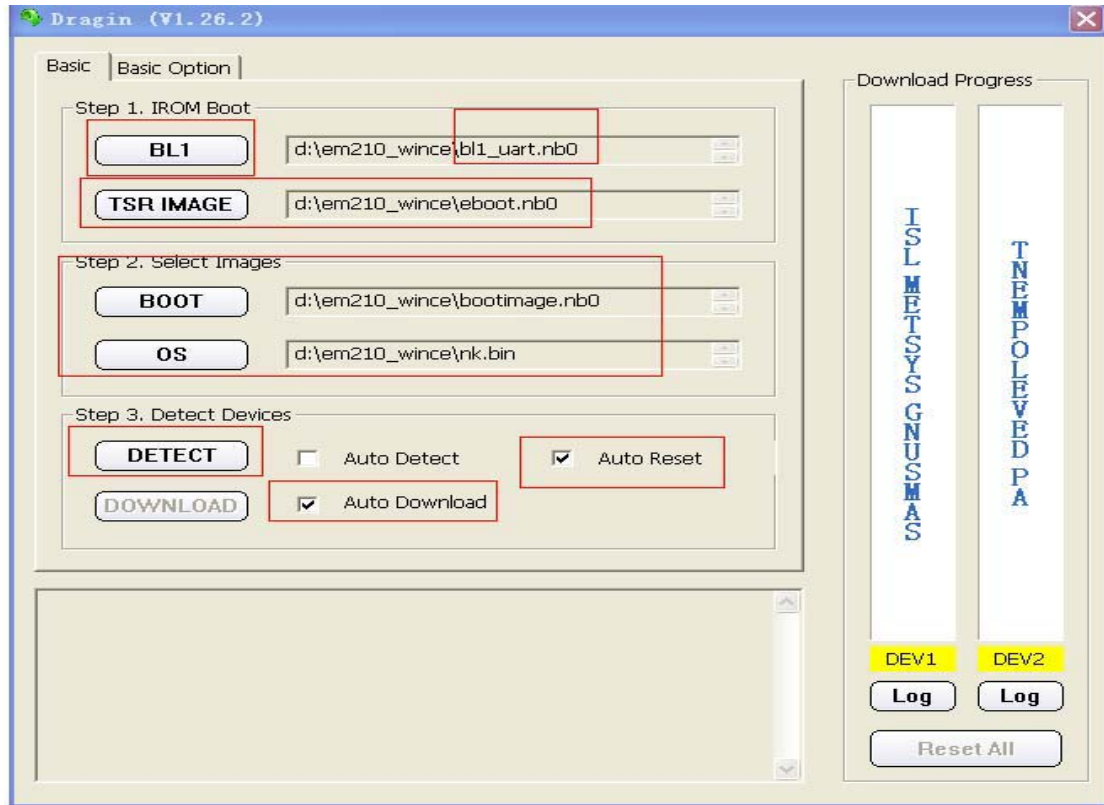
Serial-COM1 - SecureCRT
File Edit View Options Transfer Script Tools Help
Serial-COM1
Erasing at 0xffe0000 -- 100% complete.
Scanning device for bad blocks
OK
SMDKV210 # nand erase
NAND erase: device 0 whole chip
skipping bad block at 0x04000000
skipping bad block at 0x04020000
skipping bad block at 0x04780000
skipping bad block at 0x06800000
skipping bad block at 0x07ec0000
skipping bad block at 0x09260000
skipping bad block at 0x0bb40000
skipping bad block at 0x0c100000
skipping bad block at 0x0f620000
Erasing at 0xffe0000 -- 100% complete.
OK
SMDKV210 #
Ready Serial: COM1 27, 12 27 Rows, 76 Cols VT100 NUM

```

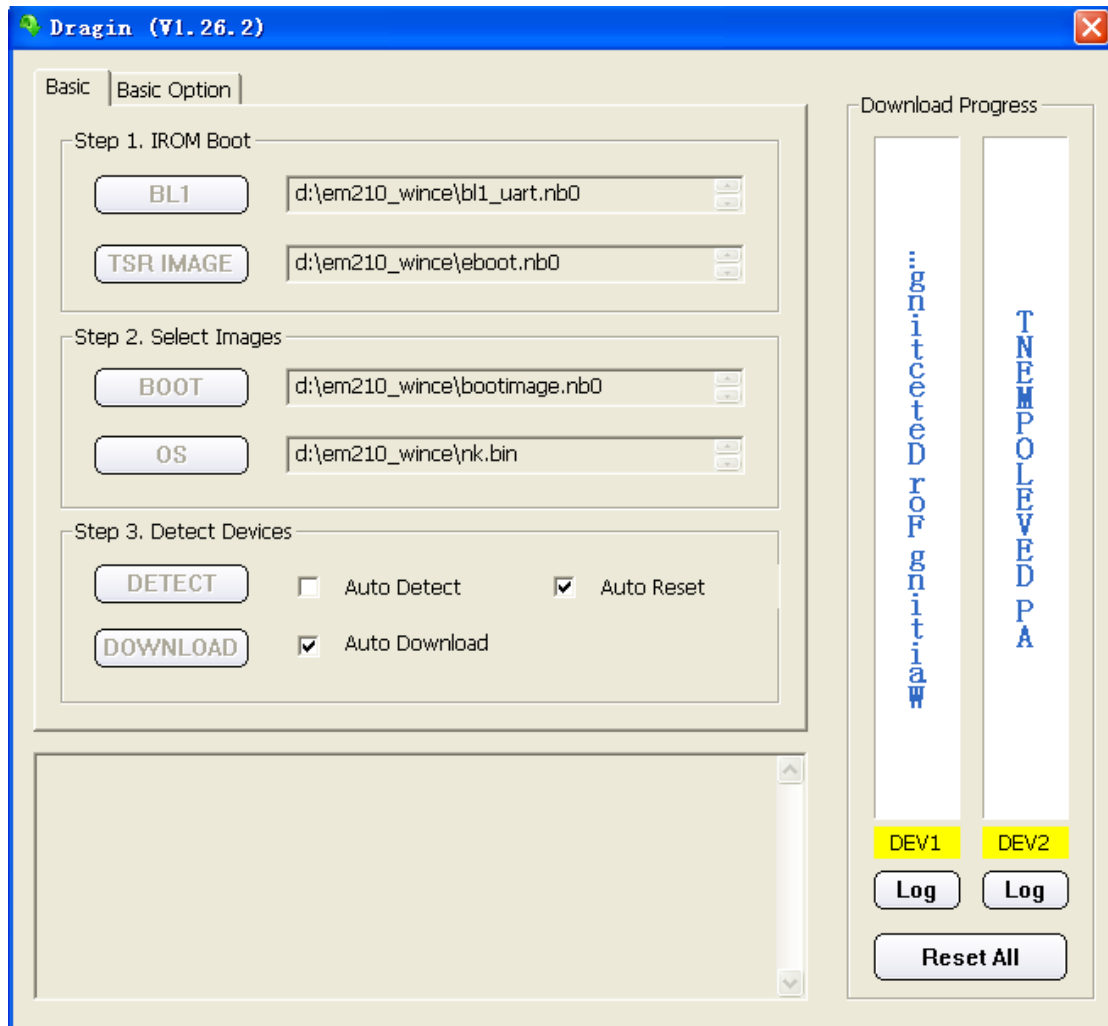
(6) Download WINCE IMAGE: set the board to boot from USB, insert the USB cable,

power on the board, then open the “Dragin V1.26.2.exe” software, and set it as follow:

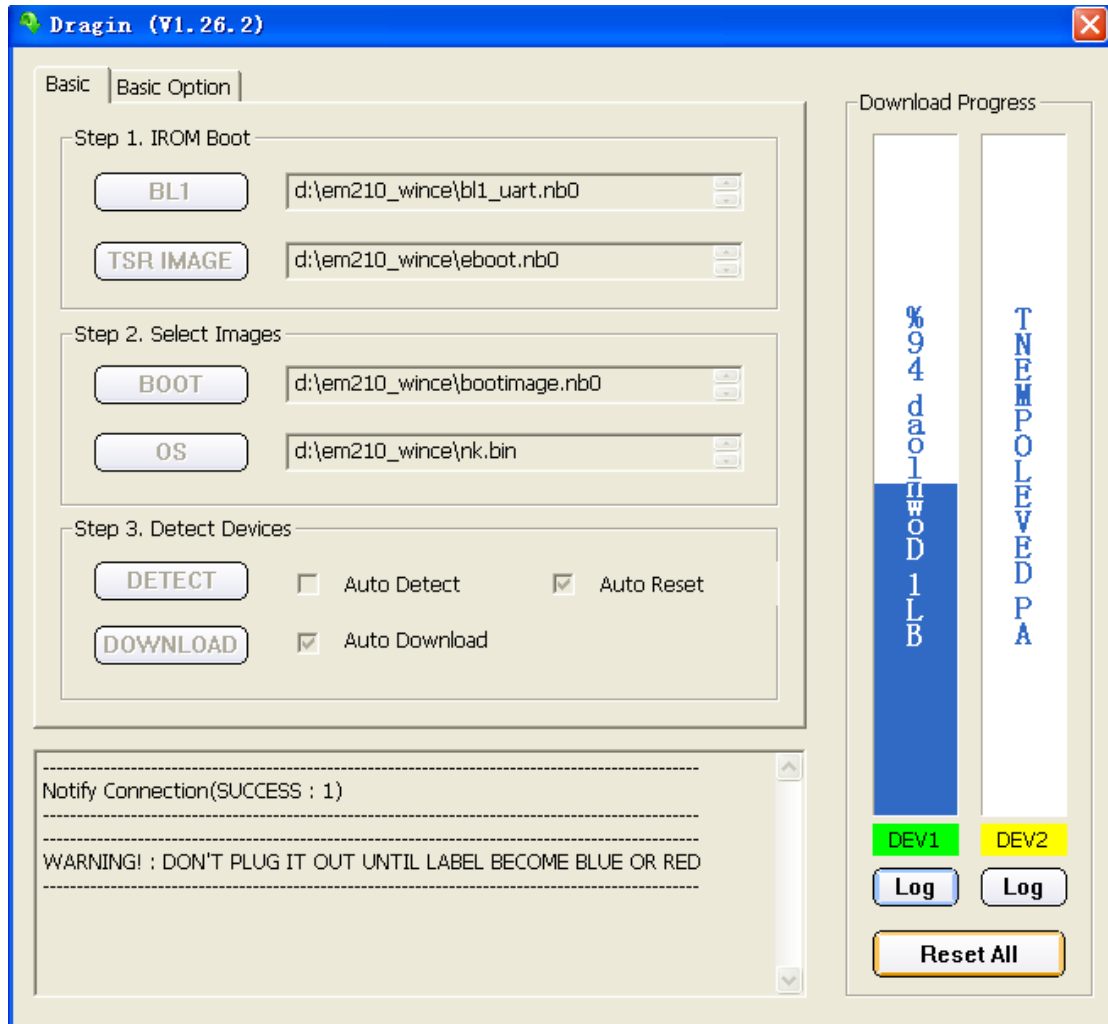




Then click "DETECT":



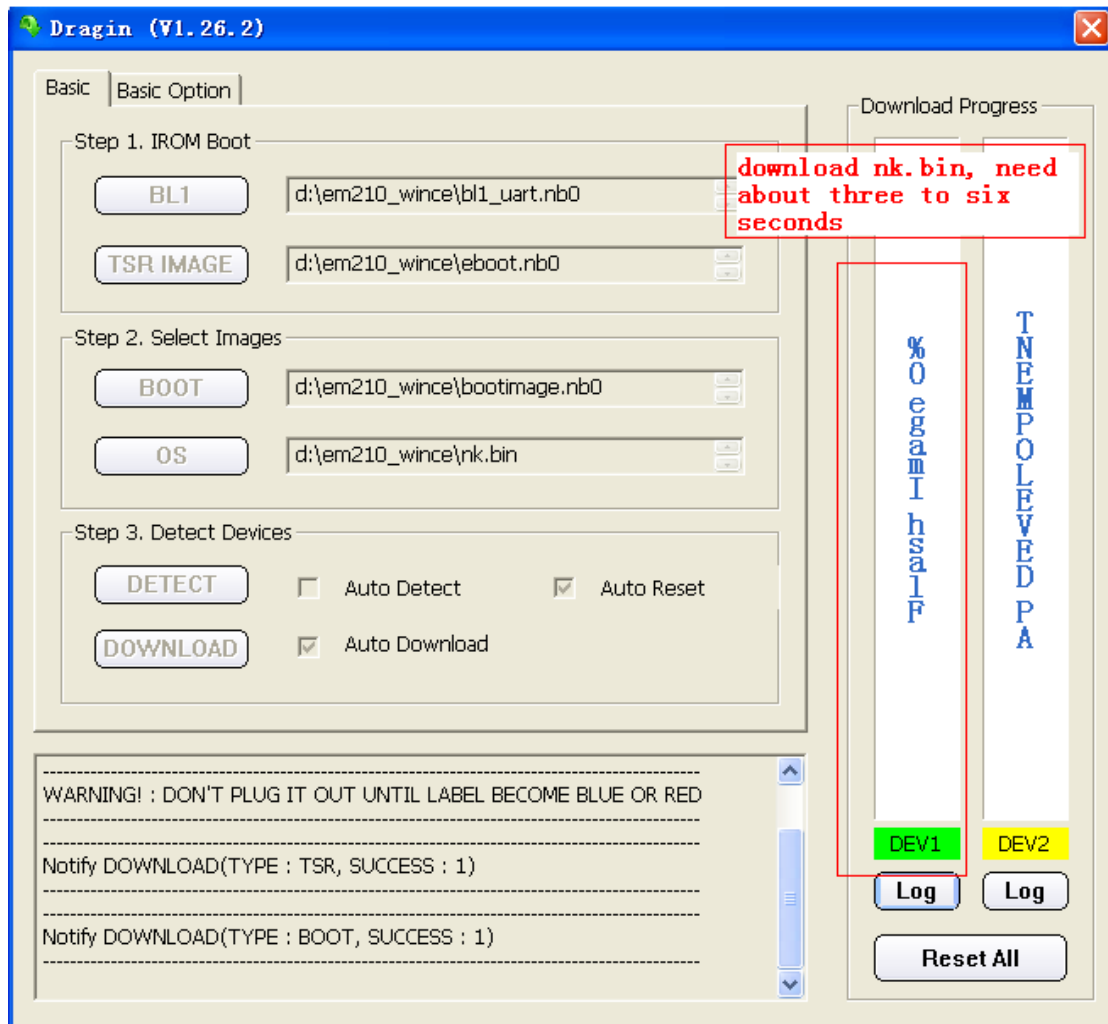
Then press “Reset” button, and the image will be downloaded into the board:



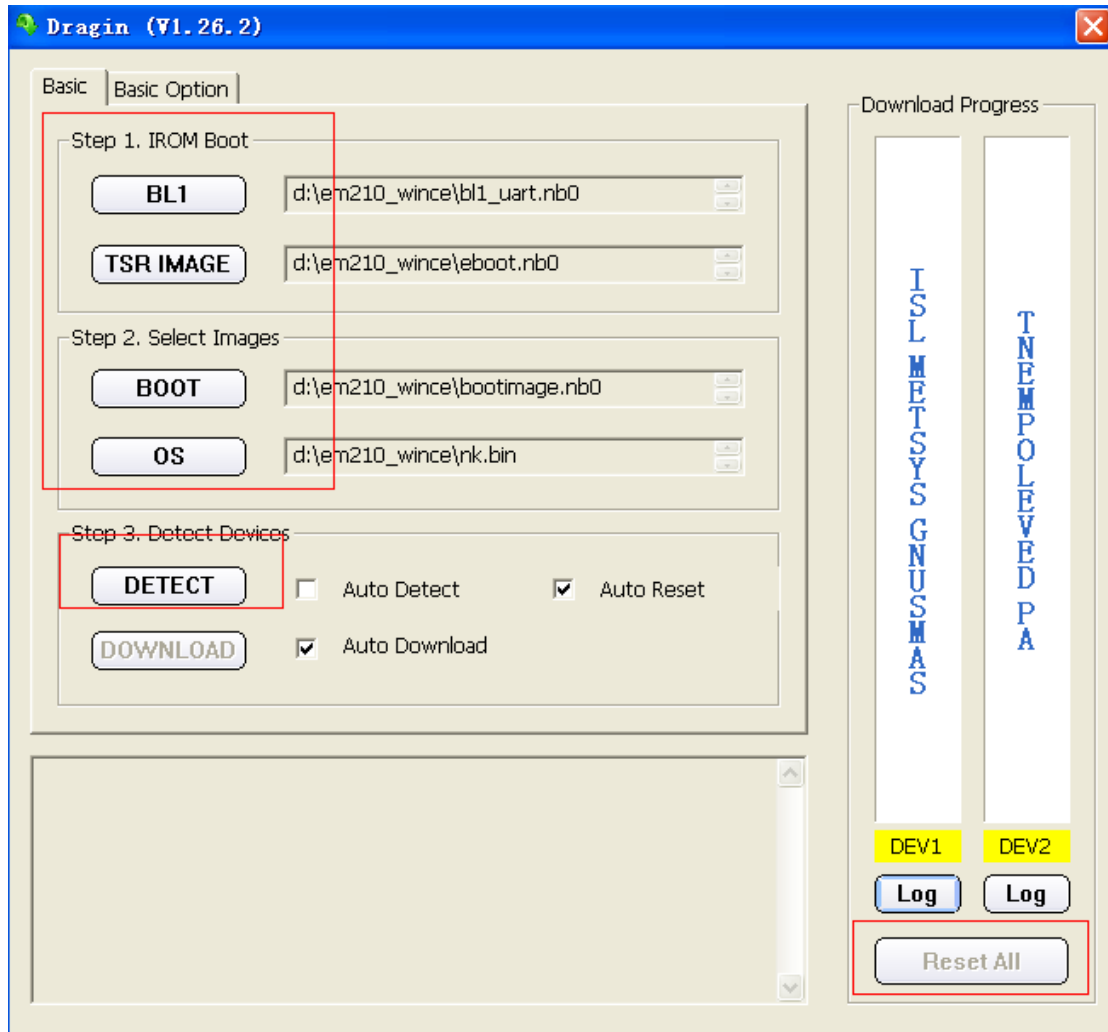
Download **NK.bin**:

The screenshot shows the Dragin (V1.26.2) software interface. The window title is "Dragin (V1.26.2)". The interface is divided into several sections:

- Basic Option:** Contains three steps:
 - Step 1. IROM Boot:** Includes buttons for "BL1" (pointing to d:\em210_wince\bl1_uart.nb0) and "TSR IMAGE" (pointing to d:\em210_wince\boot.nb0).
 - Step 2. Select Images:** Includes buttons for "BOOT" (pointing to d:\em210_wince\bootimage.nb0) and "OS" (pointing to d:\em210_wince\mk.bin).
 - Step 3. Detect Devices:** Includes "DETECT" and "DOWNLOAD" buttons, and checkboxes for "Auto Detect" (unchecked), "Auto Reset" (checked), and "Auto Download" (checked).
- Download Progress:** A vertical progress bar on the right side. It shows two devices:
 - DEV1:** Labeled "OS Download 100%", with a blue progress bar and a green "DEV1" label.
 - DEV2:** Labeled "TSR Download 100%", with a yellow progress bar and a yellow "DEV2" label.
- Log:** A text area at the bottom left containing:
 - WARNING! : DON'T PLUG IT OUT UNTIL LABEL BECOME BLUE OR RED
 - Notify DOWNLOAD(TYPE : TSR, SUCCESS : 1)
 - Notify DOWNLOAD(TYPE : BOOT, SUCCESS : 1)
- Buttons:** "Log" buttons for each device and a "Reset All" button at the bottom right.



After download all image to the board, then close Dragin:



(2) Set the board to boot from “SD (INAND)” pull out the USB cable, open the SecureCRT, repower on the board:

```

Serial-COM1 - SecureCRT
File Edit View Options Transfer Script Tools Help
Serial-COM1
dwVersion: 0x1
dwSignature: 0x48534643
String: NK
dwImageType: 0x8
dwTtlSectors: 0x7EBE
dwLoadAddress: 0x80020000
dwJumpAddress: 0x80027DCC
dwStoreOffset: 0x0
}
ID[4]
{
  dwVersion: 0x0
  dwSignature: 0x0
  String:
  dwImageType: 0x8770E394
  dwTtlSectors: 0x0
  dwLoadAddress: 0x0
  dwJumpAddress: 0x8770E50C
  dwStoreOffset: 0x0
}
[Eboot] g_pBSPArgs->bdVFSDisable: 0
[Eboot] ++initializedDisplay()
-----LCD Type: 6-----
[Eboot] --initializedDisplay()
Press [ENTER] to download now or [SPACE] to cancel.
Initiating image download in 4 seconds.
Ready          Serial: COM1  27, 41  27 Rows, 76 Cols VT100          NUM

```

Click [SPACE], select the LCD size:

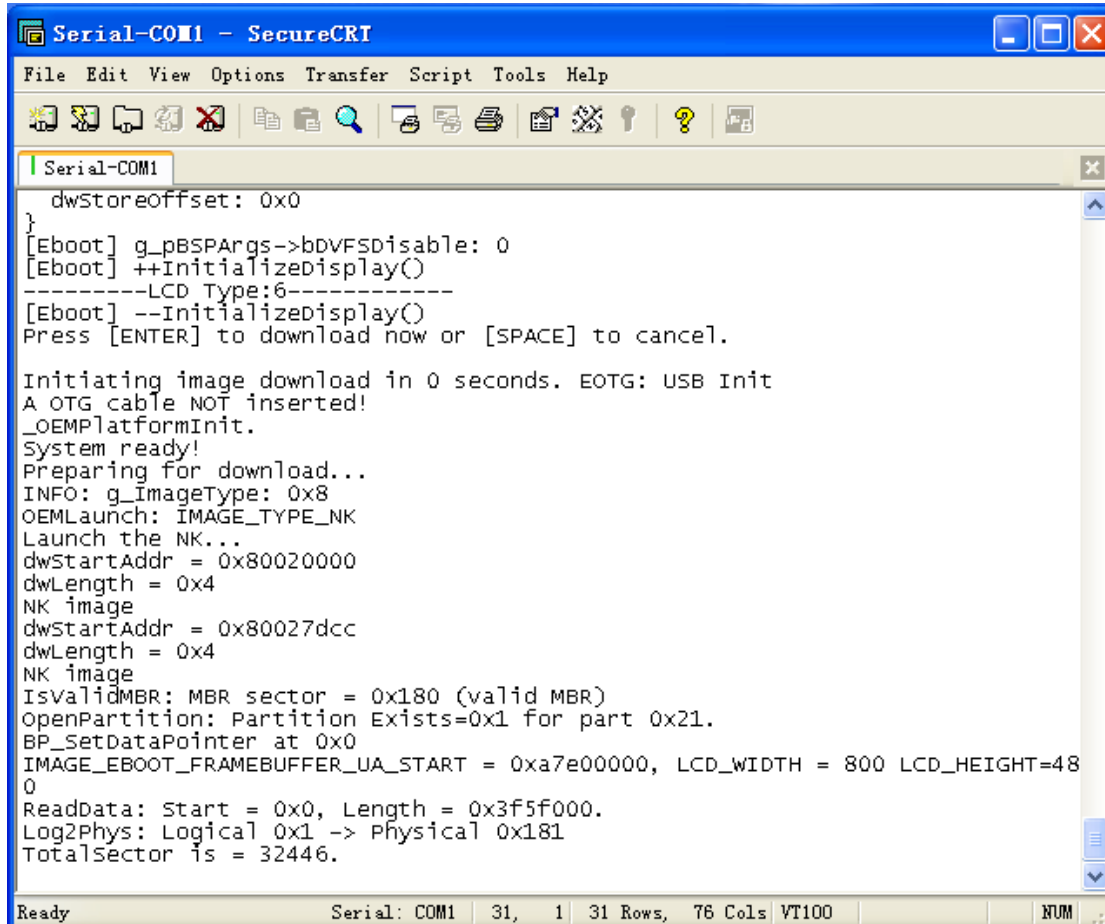
```

Serial-COM1 - SecureCRT
File Edit View Options Transfer Script Tools Help
Serial-COM1
Initiating image download in 4 seconds.
*****
**                System Configuration                **
*****
C) Bootloader Configurations
N) NAND Flash Memory Menu
L) Launch existing flash resident image now
G) Select LCD Type
X: Exit to previous menu
-----
Enter choice >> g

1. Wanxin WXCAT43
2. HannStar HSD050
3. INNOLUX AT070V83V.1
4. VGA(CH7026)
5. AT080TN52(800*600)
6. AT070TN92(800*480)
Enter LCD Select: 6*****
*****
**                System Configuration                **
*****
C) Bootloader Configurations
N) NAND Flash Memory Menu
L) Launch existing flash resident image now
G) Select LCD Type
X: Exit to previous menu
-----
Enter choice >>
Ready          Serial: COM1  31, 18  31 Rows, 76 Cols VT100          NUM

```


Then restart the board, the WINCE6.0 system is start, as follow:



```
Serial-COM1 - SecureCRT
File Edit View Options Transfer Script Tools Help
Serial-COM1
dwStoreOffset: 0x0
}
[Eboot] g_pBSPArgs->bdVFSDisable: 0
[Eboot] ++InitializedDisplay()
-----LCD Type:6-----
[Eboot] --InitializedDisplay()
Press [ENTER] to download now or [SPACE] to cancel.

Initiating image download in 0 seconds. EOTG: USB Init
A OTG cable NOT inserted!
_OEMPlatformInit.
System ready!
Preparing for download...
INFO: g_ImageType: 0x8
OEMLaunch: IMAGE_TYPE_NK
Launch the NK...
dwStartAddr = 0x80020000
dwLength = 0x4
NK image
dwStartAddr = 0x80027dcc
dwLength = 0x4
NK image
IsValidMBR: MBR sector = 0x180 (valid MBR)
OpenPartition: Partition Exists=0x1 for part 0x21.
BP_SetDataPointer at 0x0
IMAGE_EBOOT_FRAMEBUFFER_UA_START = 0xa7e00000, LCD_WIDTH = 800 LCD_HEIGHT=48
0
ReadData: Start = 0x0, Length = 0x3f5f000.
Log2Phys: Logical 0x1 -> Physical 0x181
TotalSector is = 32446.

Ready Serial: COM1 31, 1 31 Rows, 76 Cols VT100 NUM
```



```
Serial-COM1 - SecureCRT
File Edit View Options Transfer Script Tools Help
Serial-COM1
--PHY_SetPowerDown
[MFC] DLL_PROCESS_ATTACH!
MFC_Init()+++++
MFCPowerInit()----
MfcSfrMemMapping()----
MfcFWBufMemMapping()+++++
[1][CMM_IOControl] IOCTL_CODEEC_MEM_ALLOC [CMM_IOControl] bufsize : 0x004e000
0
[CMM_IOControl] IOCTL_CODEEC_GET_PHY_ADDR(0xd3240000)
MfcFWBufMemMapping()----
InitializeIST()----
MFC_Init()----
MFC power on
[UFNPDD] USB_POWER : D0 IN
[UFNPDD] USB_POWER : D0MFC power off
OUT
[UFNPDD] USB Serial Function Class Enabled
LCD type=6, LCD width=800, LCD high= 480
+KeybdDriverInitializeAddresses
LayMgr.cpp: Layout Manager successfully initialized to 2
Maximum Allowed Error 7:
Backlight driver: GetSystemPowerStstusEx2 failed with error 0x1f.
[BootCompleteApp] Boot Complete Event Occurred
[UFNPDD] USB_POWER : D0 IN
[UFNPDD] USB_POWER : D0 OUT
MSIM: IM_ReadRegistry read KB 5
Explorer(V2.0) taskbar thread started.
NDISPWR:: Found adapter [DM9CE1]
NDISPWR:: Found adapter [wWAN1]
Ready Serial: COM1 31, 1 31 Rows, 76 Cols VT100 NUM
```