



# Installation Manual for SMDK6410 (Windows Embedded CE 6.0)

**S3C6410**

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## S3C6410 RISC Microprocessor Installation Manual

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Preliminary product information describe products that are in development, for which full characterization data and associated errata are not yet available. Specifications and information herein are subject to change without notice.

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NOTE: REVISED PARTS ARE WRITTEN IN BLUE.

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# 1 Overview

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This Installation Manual guides you to install the Samsung SMDK6410 Windows Embedded CE 6.0 BSP.

The manual explains the following topics:

- Copying BSP and Setting up Platform Builder
- Creating a New OS Design
- Building OS Image - Without KITL
- Running NK.nb0 Image
- Fusing WinCE Image on NAND Flash via USB

The detail information of each topic is explained in the following chapters.

## 2 Copying BSP and Setting up Visual Studio 2005

In this chapter, you can understand how to copy the Samsung SMDK6410 Windows Embedded CE 6.0 BSP and setup the Platform Builder. There are two distribution types. One is MSI (MS installer) distribution, another one is old-style zip-archived distribution. With MSI, you can just run the MSI file, and then follow the instruction on installer. Here are contents only for old-style zip-archived.

1. To start the BSP installation, Extract zip-archived file into \$(WINCEROOT)\PLATFORM. See the picture describes folder structure. In archives, PLATFORM folder has two sub folders. One is SMDK6410, and another one is COMMON/SRC/SOC/S3C6410\_SEC\_V1. For example, copy extracted SMDK6410\_WinCE60\_XX\_XX\PLATFORM BSP folder to X:\WINCE600\PLATFORM directory on your host PC. Make sure that catalog file and batch file in X:\WINCE600\PLATFORM\SMDK6410 directory has the same name as that of the BSP, i.e. SMDK6410.pbcxml and SMDK6410.bat.

**Note:** About PQQAL & SOC Folder Structure, Please refer to porting guide, If you don't know the difference between PQQAL and non-PQQAL structure, read first porting guide.

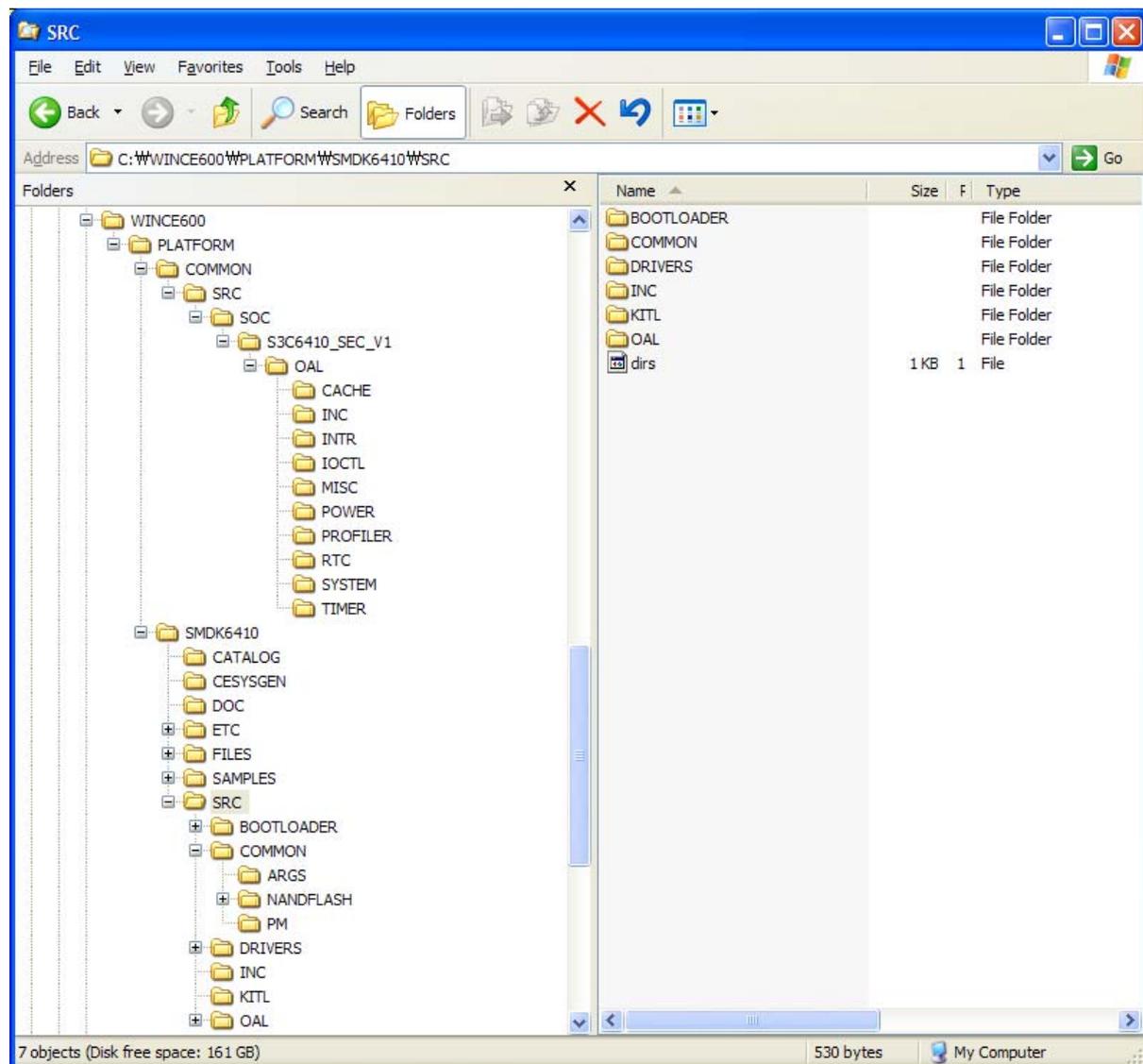


Figure 2-1 SMDK6410 BSP Files



2. To start SMDK6410 Windows Embedded CE 6.0 BSP Porting, on your host PC click **Start**, point to **All Programs**, point to **Microsoft Visual Studio 2005** and then click on **Microsoft Visual Studio 2005**. The following window appears on your screen.

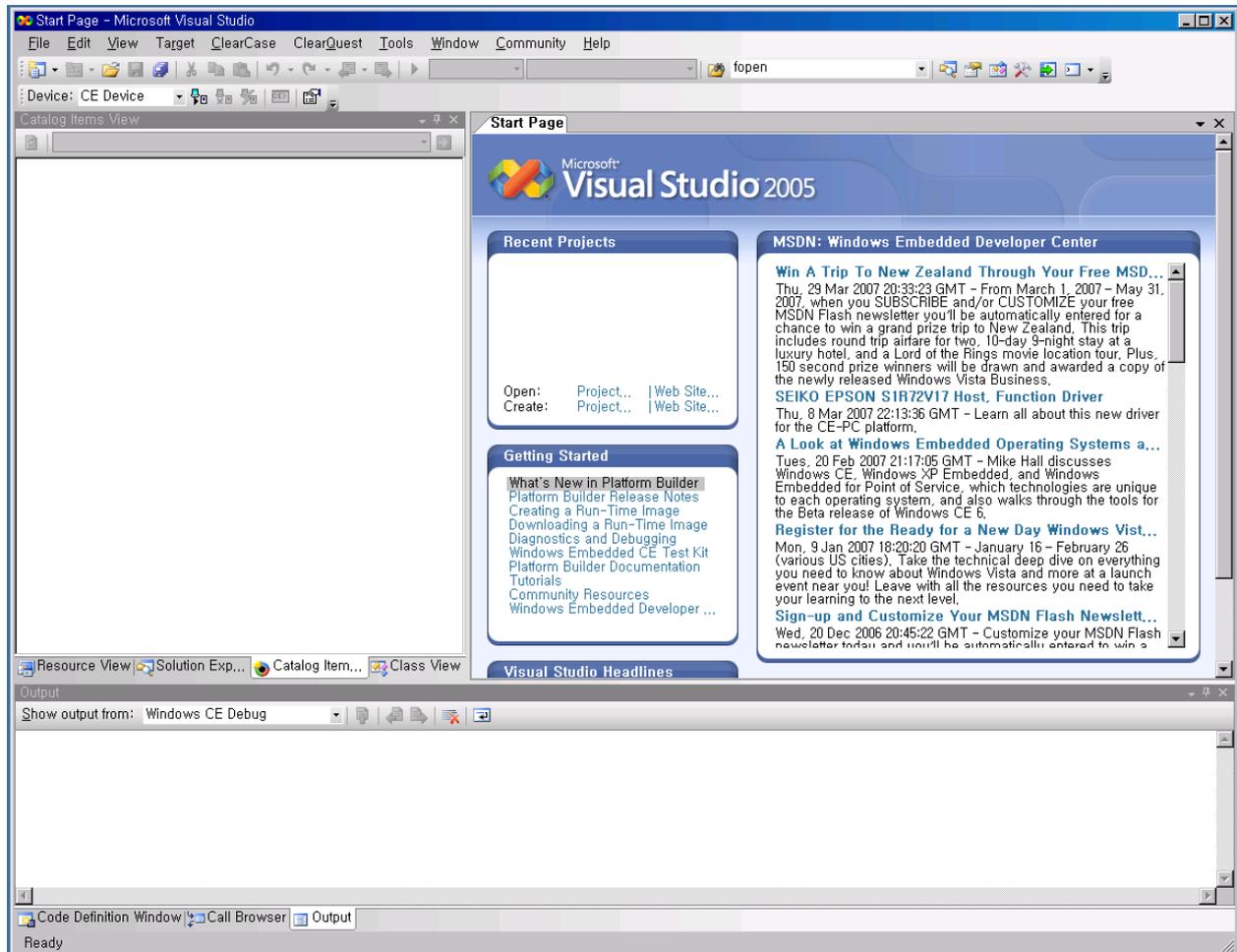


Figure 2-2 Visual Studio 2005 Window

## 3 Creating a New OS Design

In this chapter, you can understand how to create a new OS Design using the Visual Studio 2005.

1. On the File menu in the Visual Studio 2005 window, click New /Project as shown in figure 3-1.

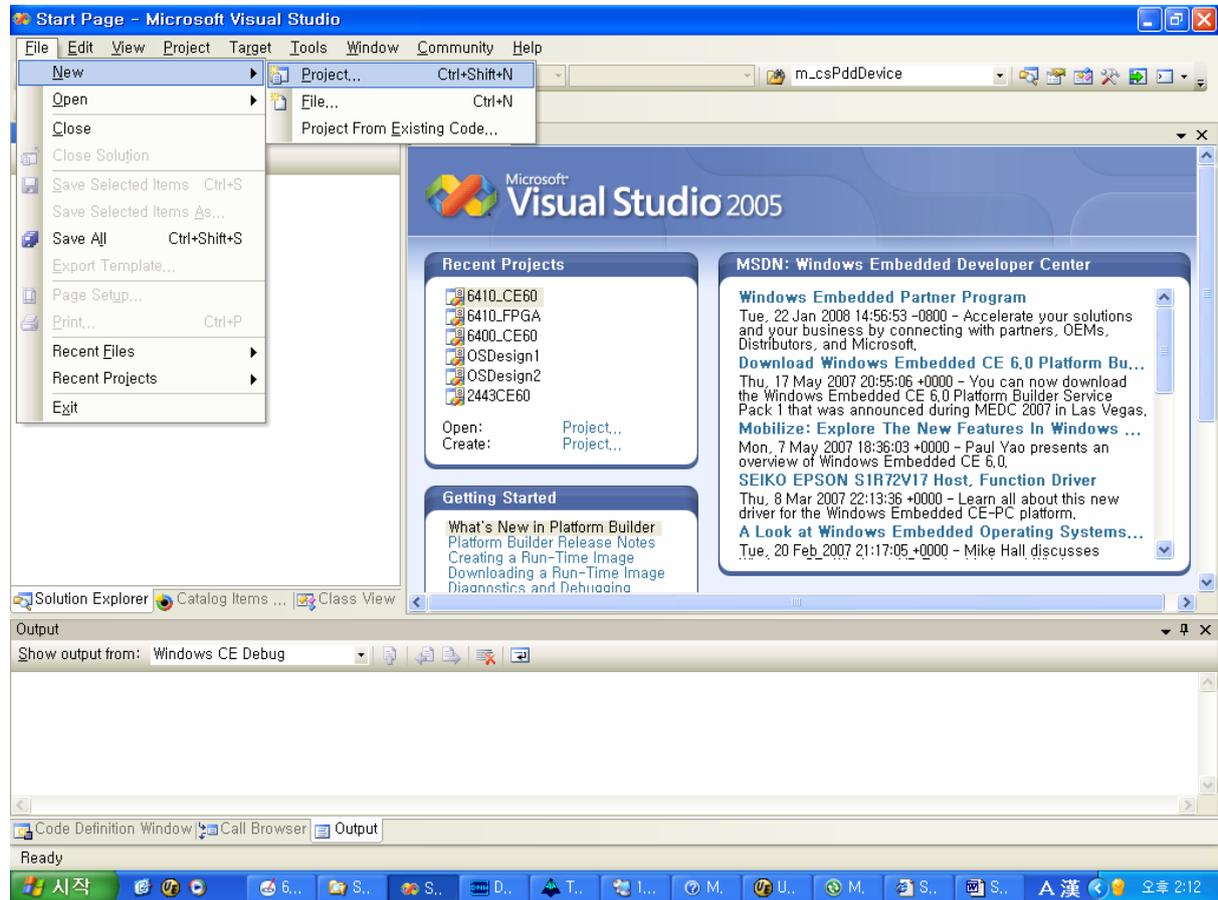


Figure 3-1 Creating New Project

- The following window appears on your screen. Click OK button to continue.

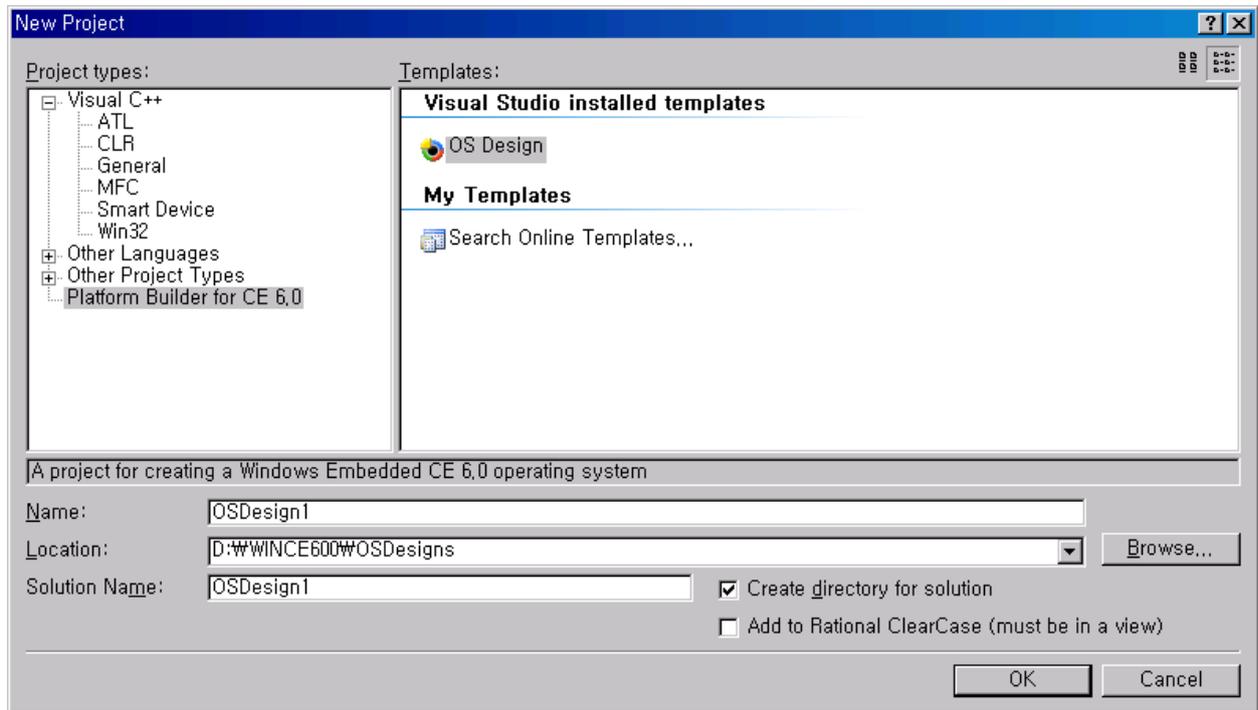


Figure 3-2 New Project for WinCE6.0

- The Windows Embedded CE 6.0 OS Design Wizard appears on your screen as below figure. Click NEXT button to continue .

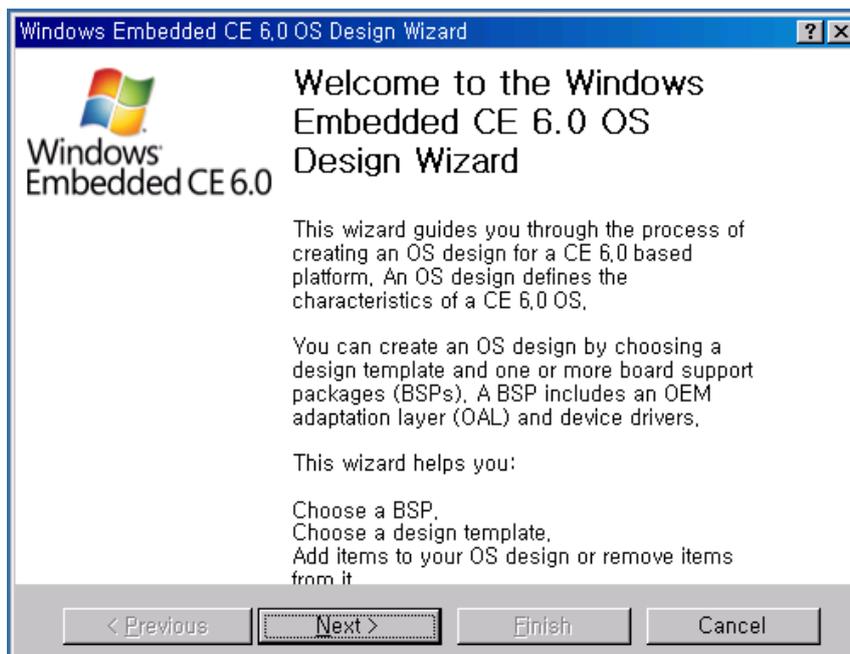


Figure 3-3 Windows Embedded CE 6.0 OS Design Wizard

4. The Board Support Packages (BSPs) window appears on your screen. Select SMDK6410: ARMV4I and then click Next button.

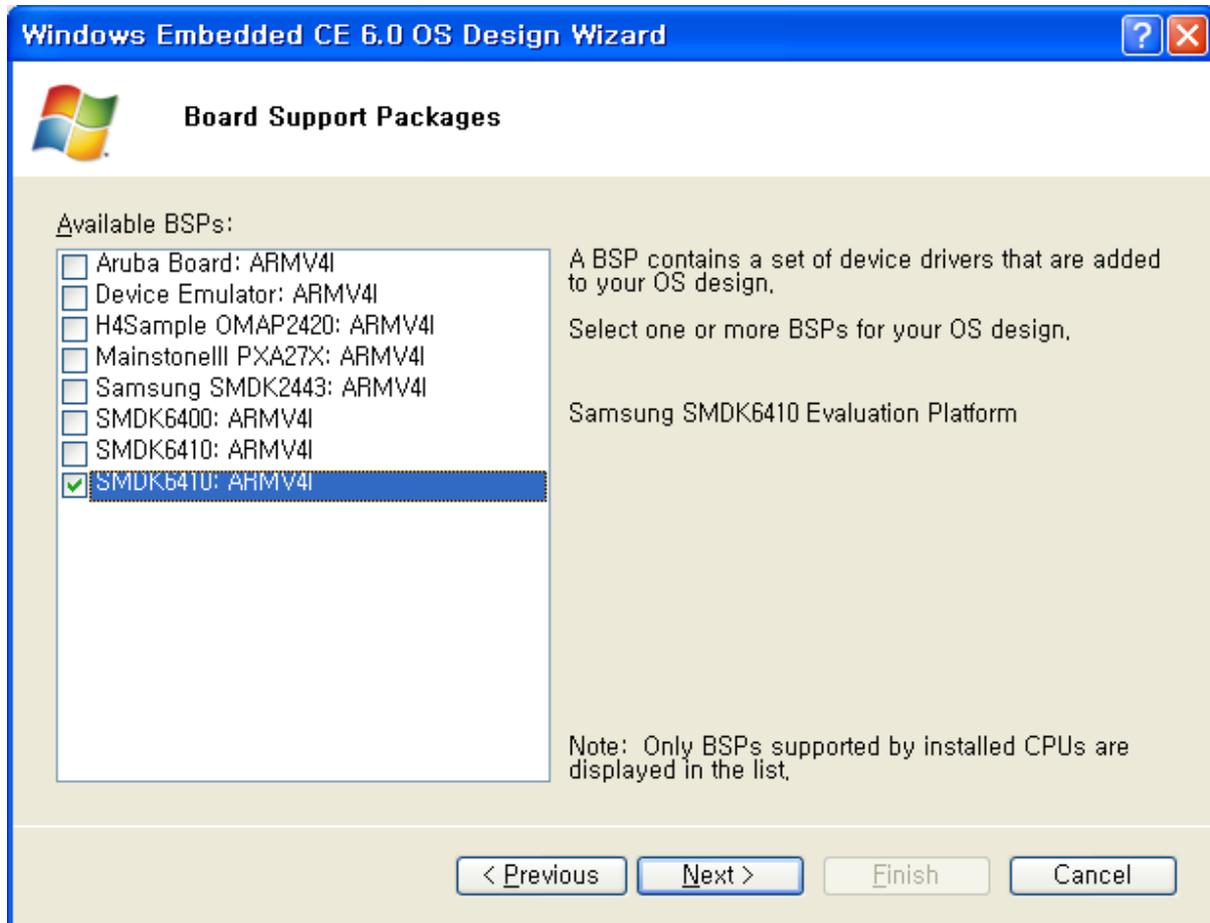


Figure 3-4 Windows Embedded CE 6.0 OS Design Wizard - Step 1

5. The Design Template Wizard window appears on your screen. Please select PDA Device from Available design templates list and then click Next button.

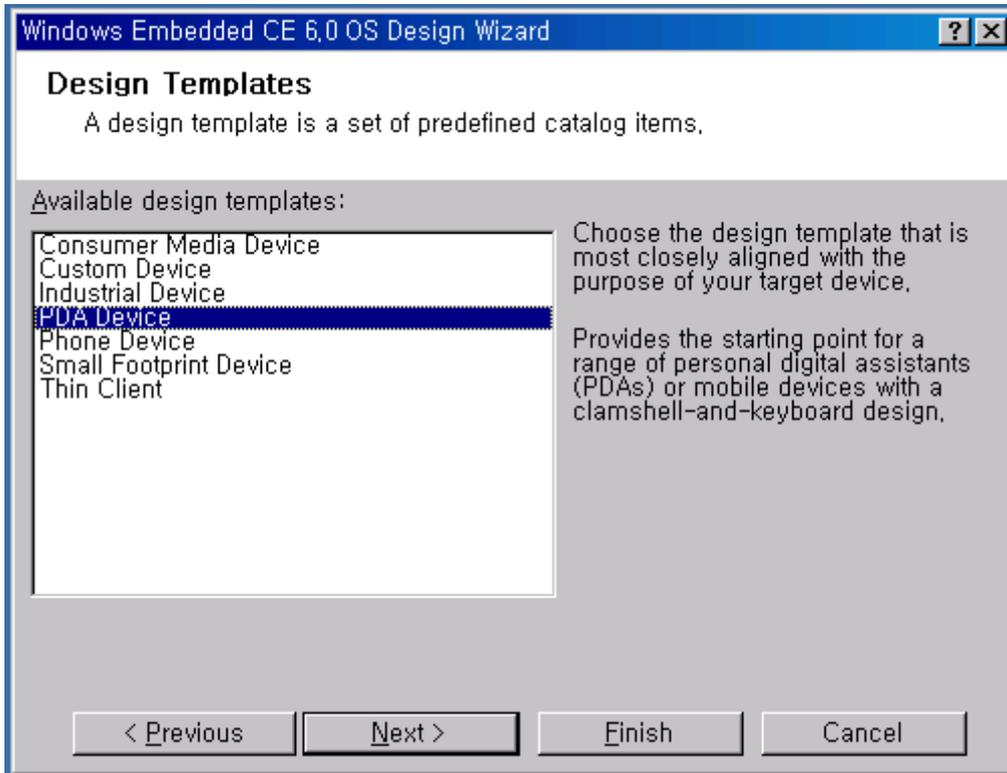


Figure 3-5 Windows Embedded CE 6.0 OS Design Wizard - Step 2

6. The Design Template Variants window appears on your screen. Please select **Mobile Handheld** from Available design Variants list and then click **Next** button.

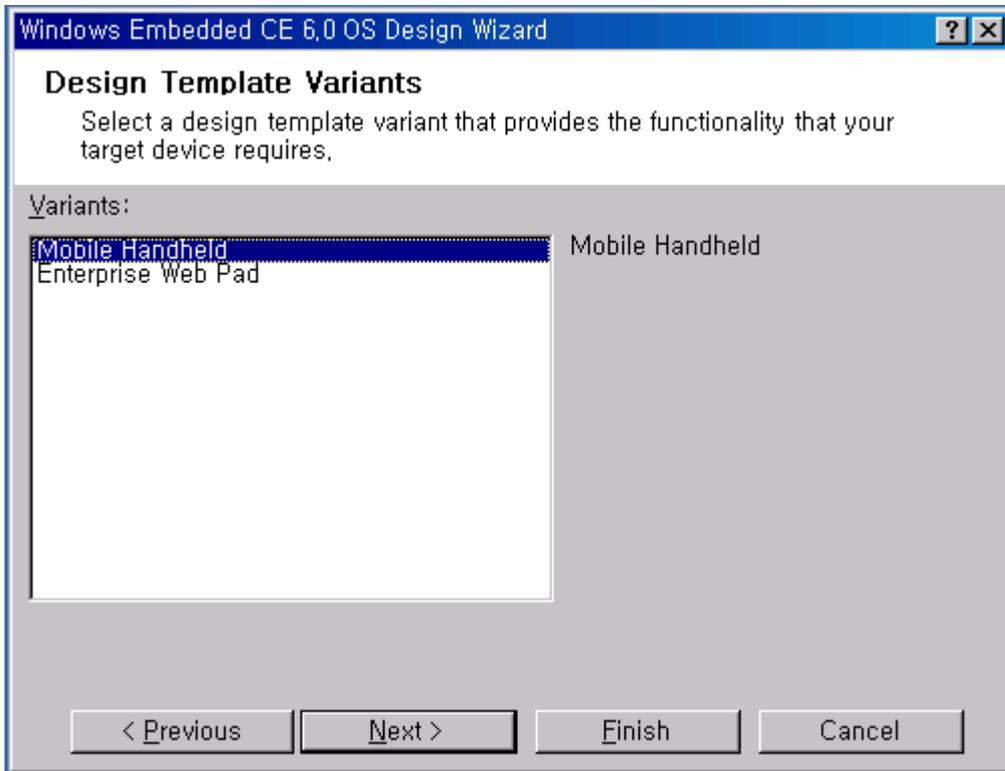


Figure 3-6 Windows Embedded CE 6.0 OS Design Wizard - Step 3

7. The following window appears on your screen. Here you can select the **Application & Media** you want to include in your platform and then click **Next** button.

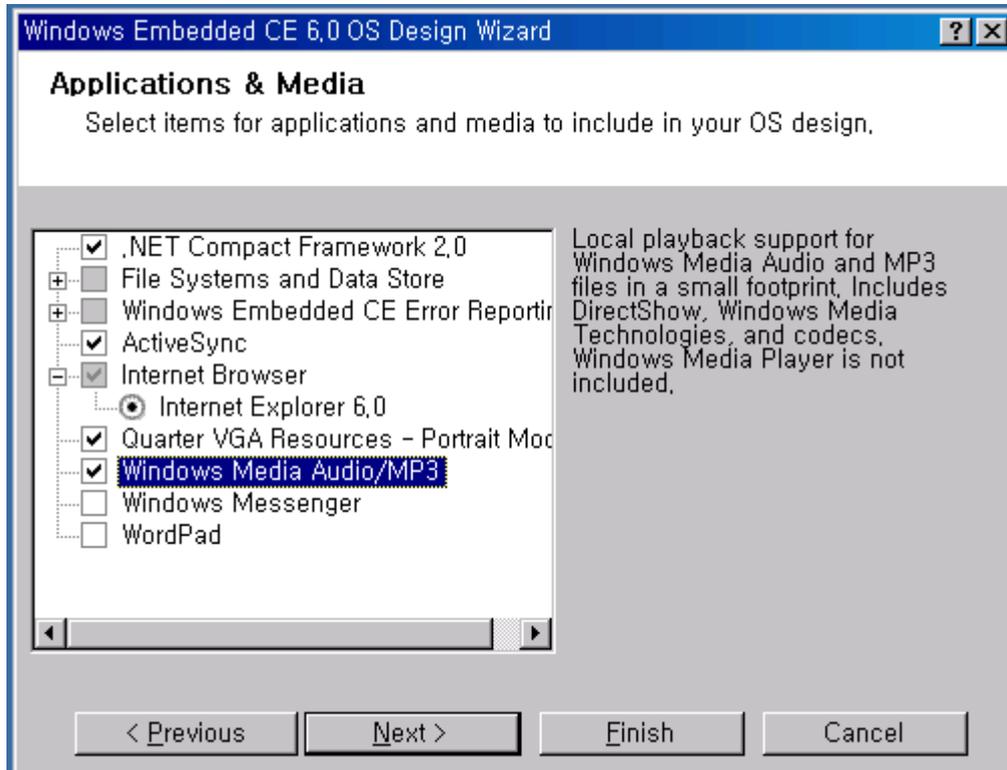


Figure 3-7 Windows Embedded CE 6.0 OS Design Wizard - Step 4

8. The Networking & Communications wizard window appears on your screen. Click Finish button.

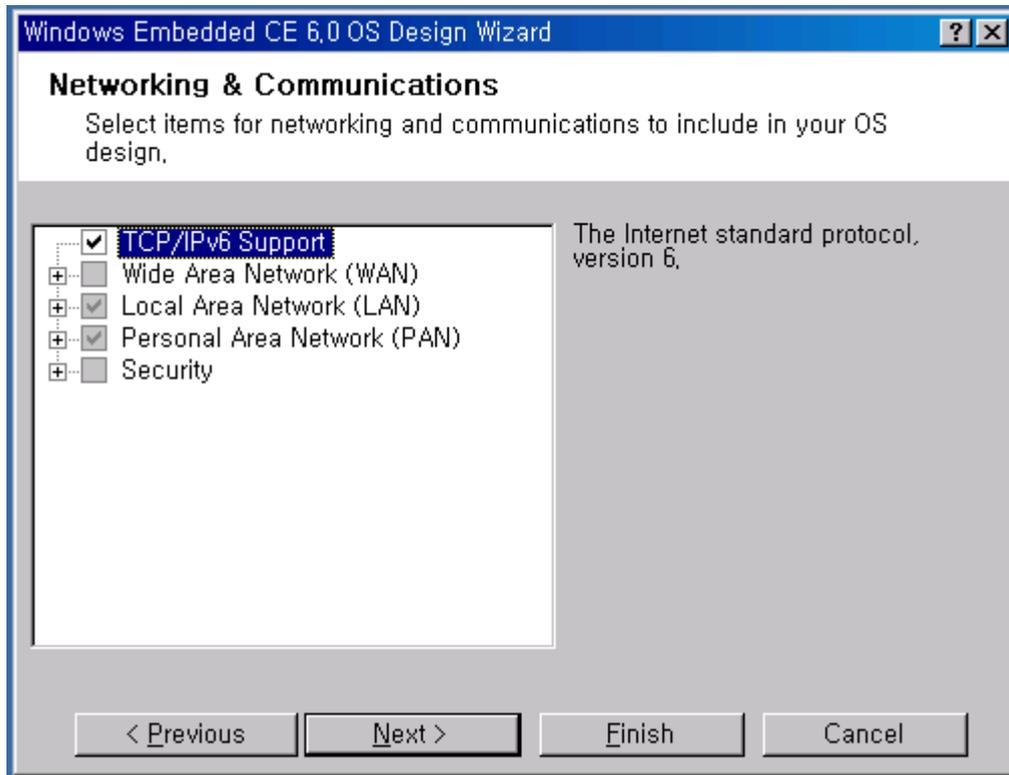


Figure 3-8 Windows Embedded CE 6.0 OS Design Wizard - Step 5

9. The following window appears on your screen. Please read all the security warnings and then click Acknowledge button.

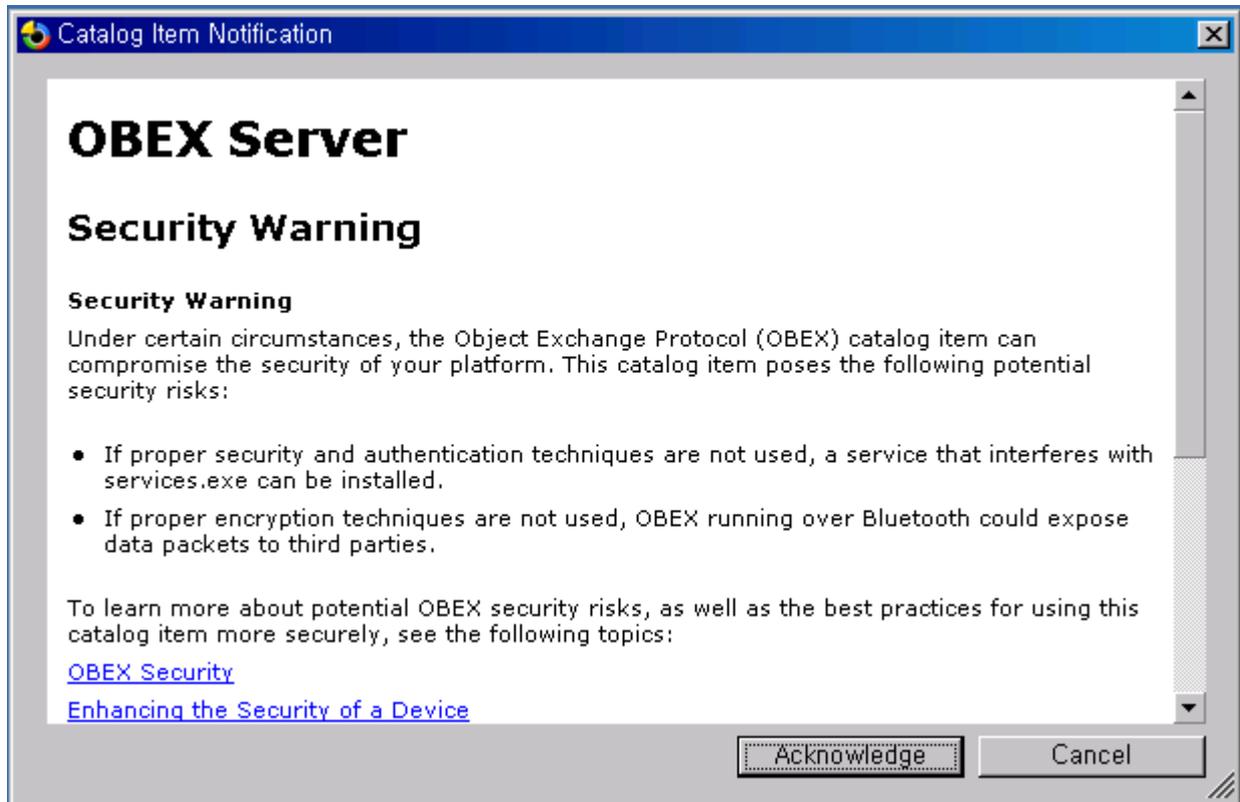


Figure 3-9 Windows Embedded CE 6.0 OS Design Wizard - Step 6

## 4 Building OS Image - Without KITL

1. In the Visual Studio 2005 window on your host PC, you can see the new OS Design along with its various sub-directories on the left hand side Catalog Items View as shown in figure 4-1. Here, you can choose items what you want to include in your OS design. The chosen items in this instruction are only for sample purpose.

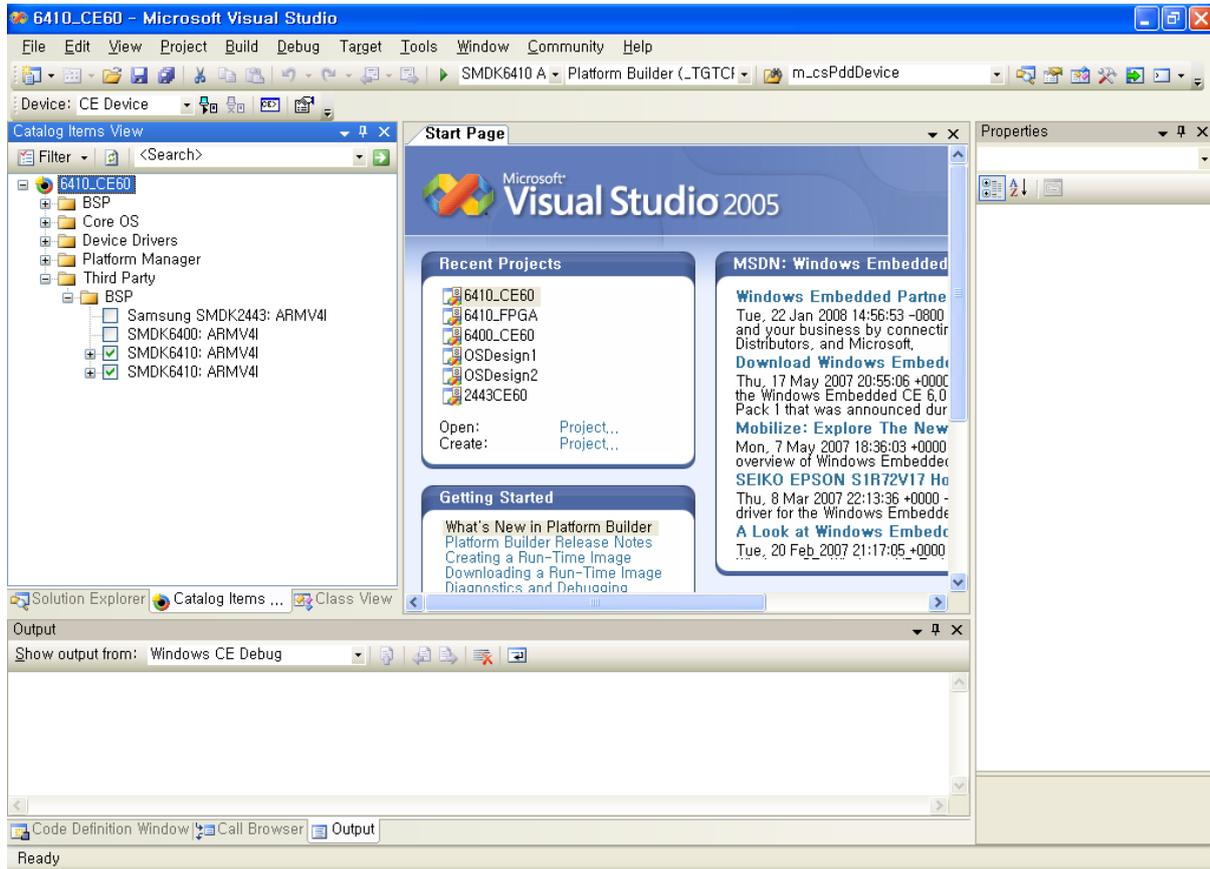


Figure 4-1 Catalog Items View

2. You can change build mode (release or debug mode) as below figures. Select SMDK6410\_ARMV4I Release.

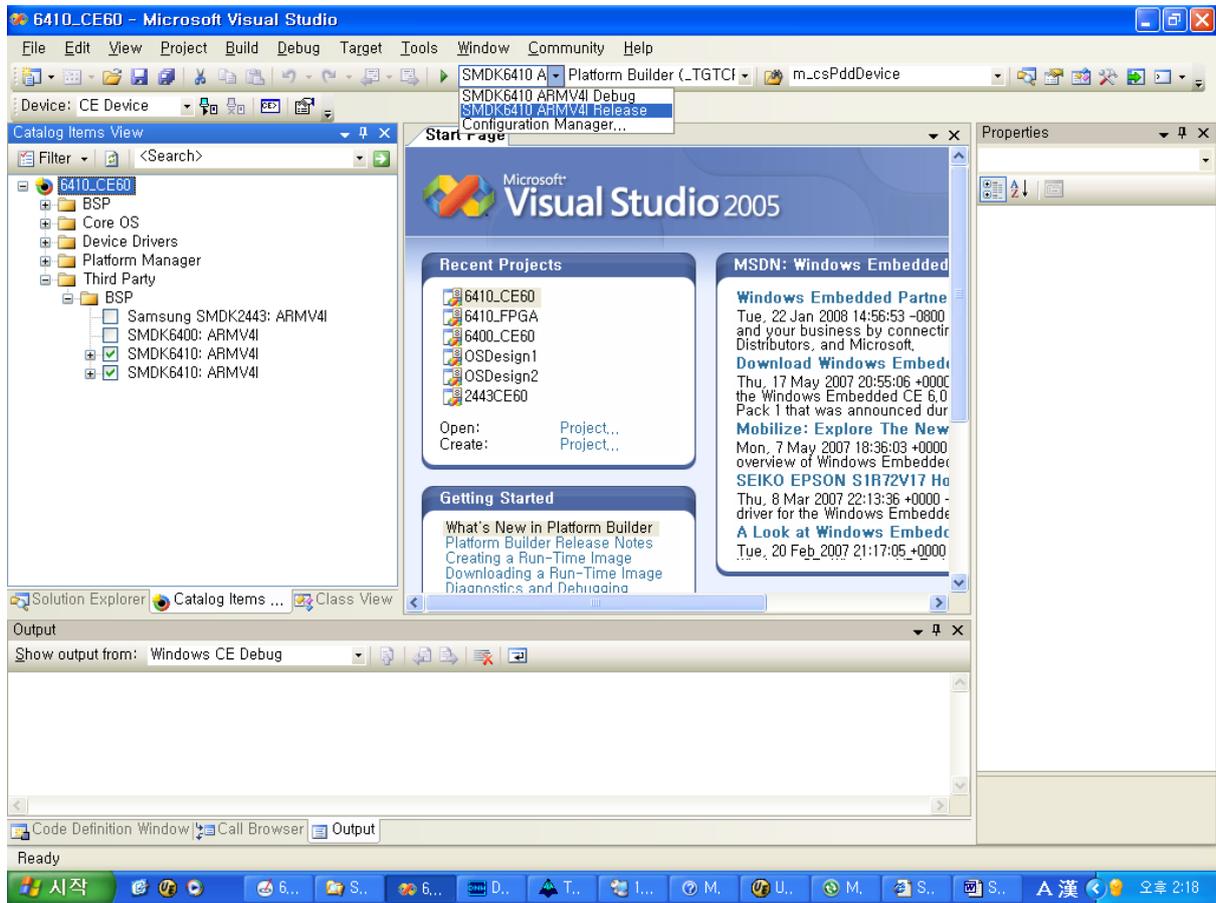


Figure 4-2 Build Mode in Visual Studio 2005

- Expand File Systems and Data Store node in the Core OS node in Catalog Items View, then select some items as shown in the figure below.

File System-RAM and ROM File System

Registry Storage-Hive-based Registry(recommended) or RAM-based Registry

Storage Manager-Binary Rom Image file System

Storage Manager-exFAT File System

Storage Manager-Storage Manager Control Panel Applet

Storage Manager-TFAT File System

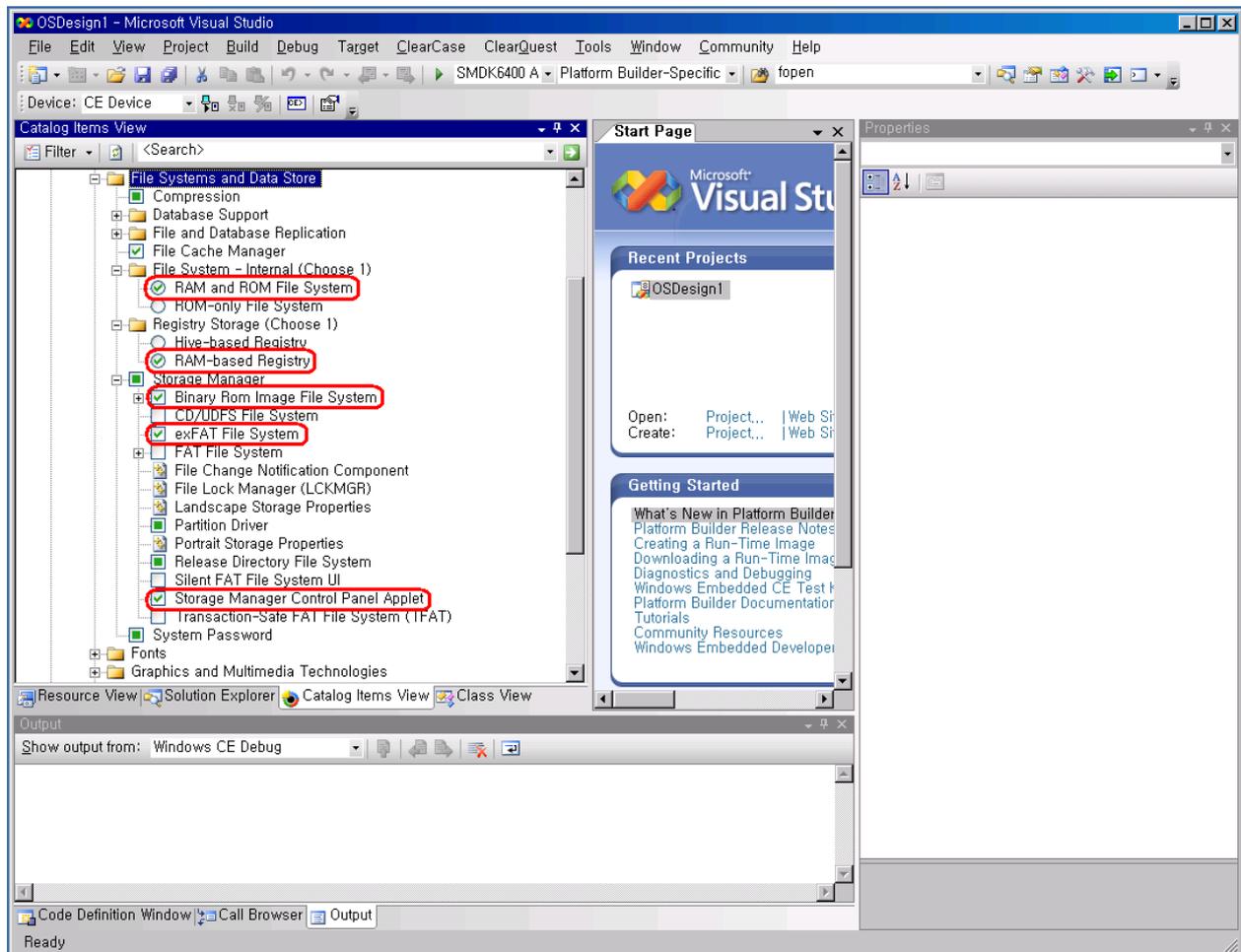


Figure 4-3 Adding File System and Data store Item to OS Design

- Expand Core OS node in Catalog Items View window, then expand Graphics and Multimedia Technologies. Select some items as shown in the figure below.

Graphics-Direct3D Mobile

Graphics-DirectDraw (Required for Display Driver)

Media-Video Codecs and Renderers-WMV/MPEG-4 Video Codec (Required for MFC)

Media-Windows Media Player (Required for MFC)

Media-DirectShow Video Capture (Required for Camera)

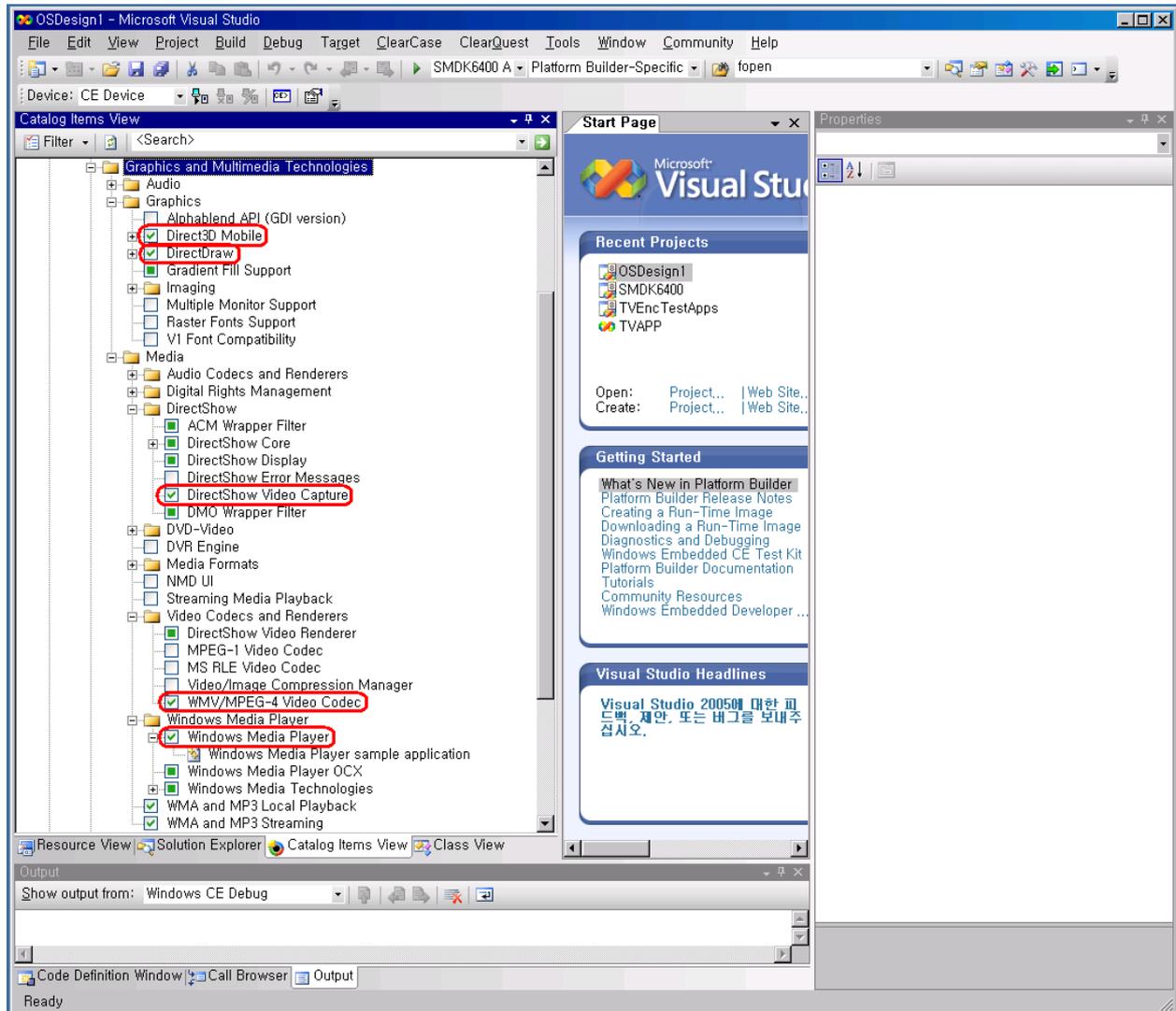


Figure 4-4 Adding Graphics and Multimedia Technologies Item to OS Design

- Expand Core OS Services node in the Core OS node in Catalog Items View, then expand USB Host Support. Select some items as shown in the figure below.

USB Function Driver

USB Host Support

USB Human Input Device(HID) Class Driver (recommended)

USB HID Keyboard and Mouse

USB Storage Class Driver

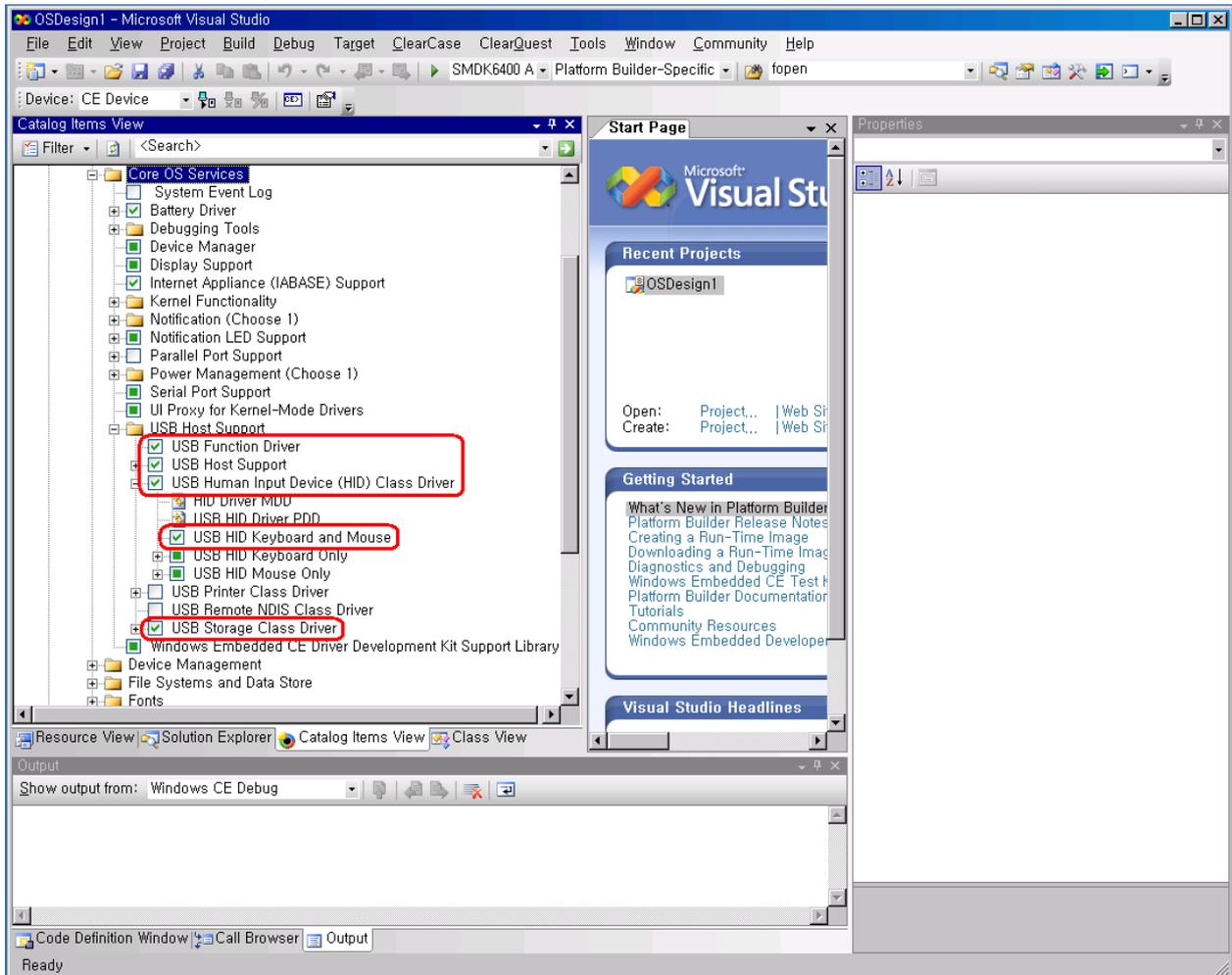


Figure 4-5 Adding Core OS Services Item to OS Design

- Expand Applications and Services Development node in Catalog Items View window, then expand OBEX Server.

Select OBEX File Brower and OBEX Inbox.

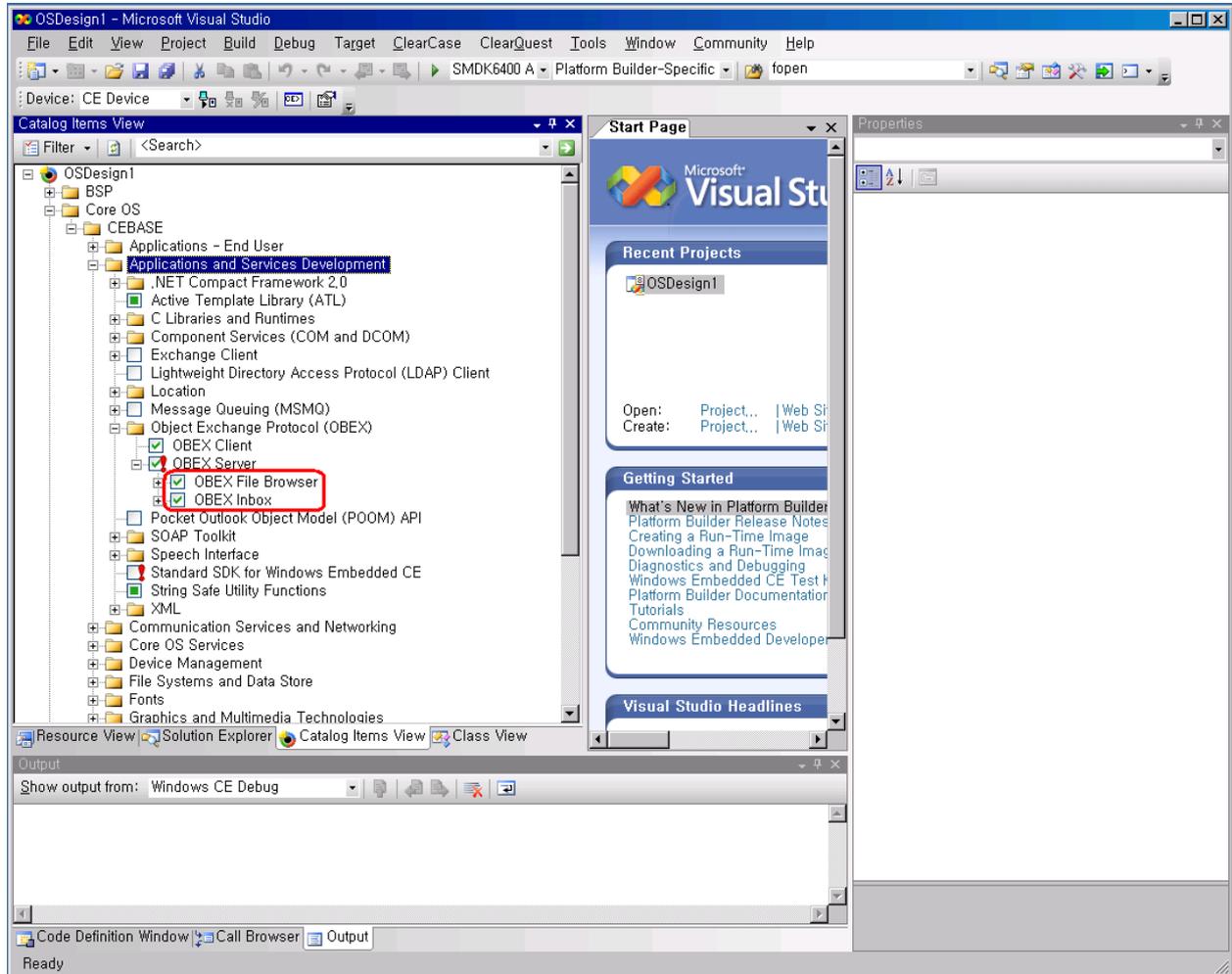


Figure 4-6 Adding Core OS Services Item to OS Design

- Expand Device Drivers node in Catalog Items View window, then expand USB Function. Select Some Items as shown in the figure below.

USB Function Clients-Mass Storage

USB Function Clients-serial

Select SD Bus Driver in SD, SD Memory in SDIO and Windows Embedded CE Test Kit.

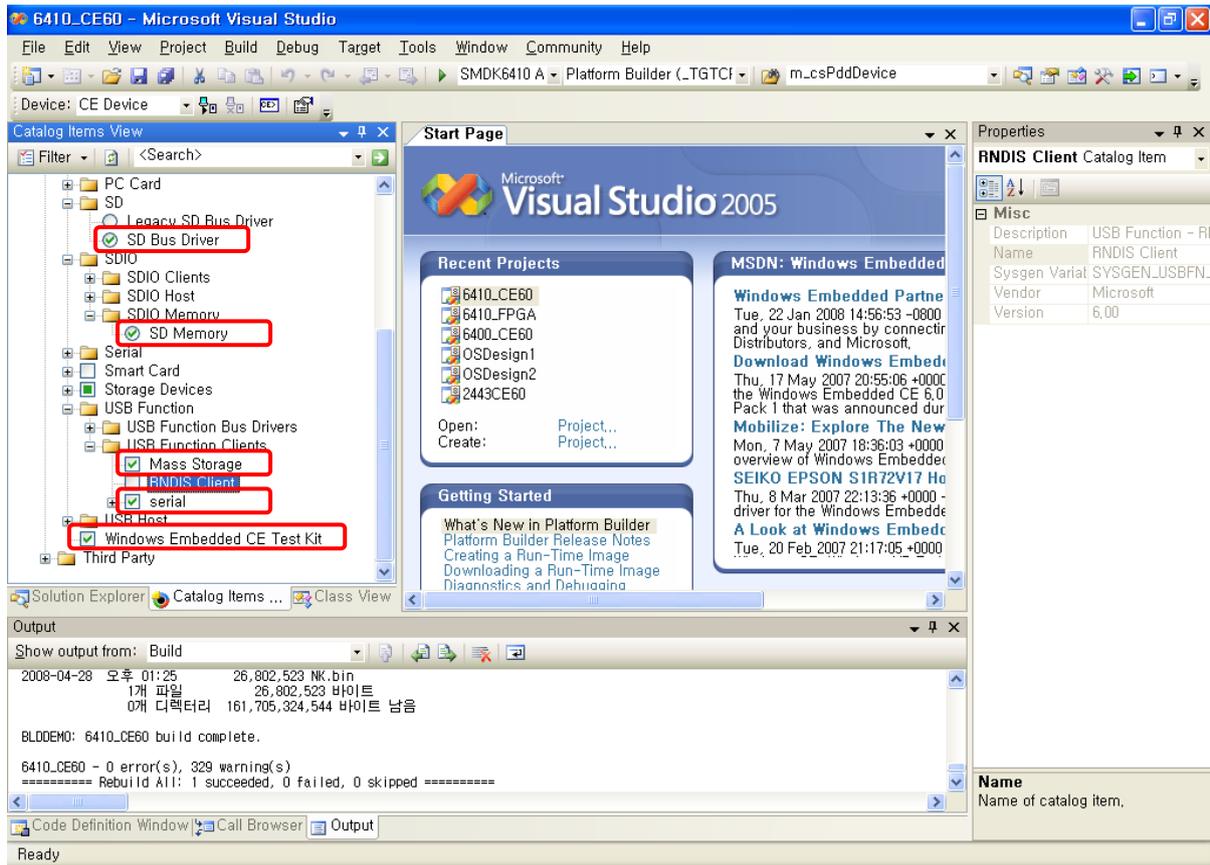


Figure 4-7 Adding Device Drivers Item to OS Design

- Expand Device Drivers node in Catalog Items View window, then expand Networking. Select Serial Infrared (SIR) as shown in the figure below.

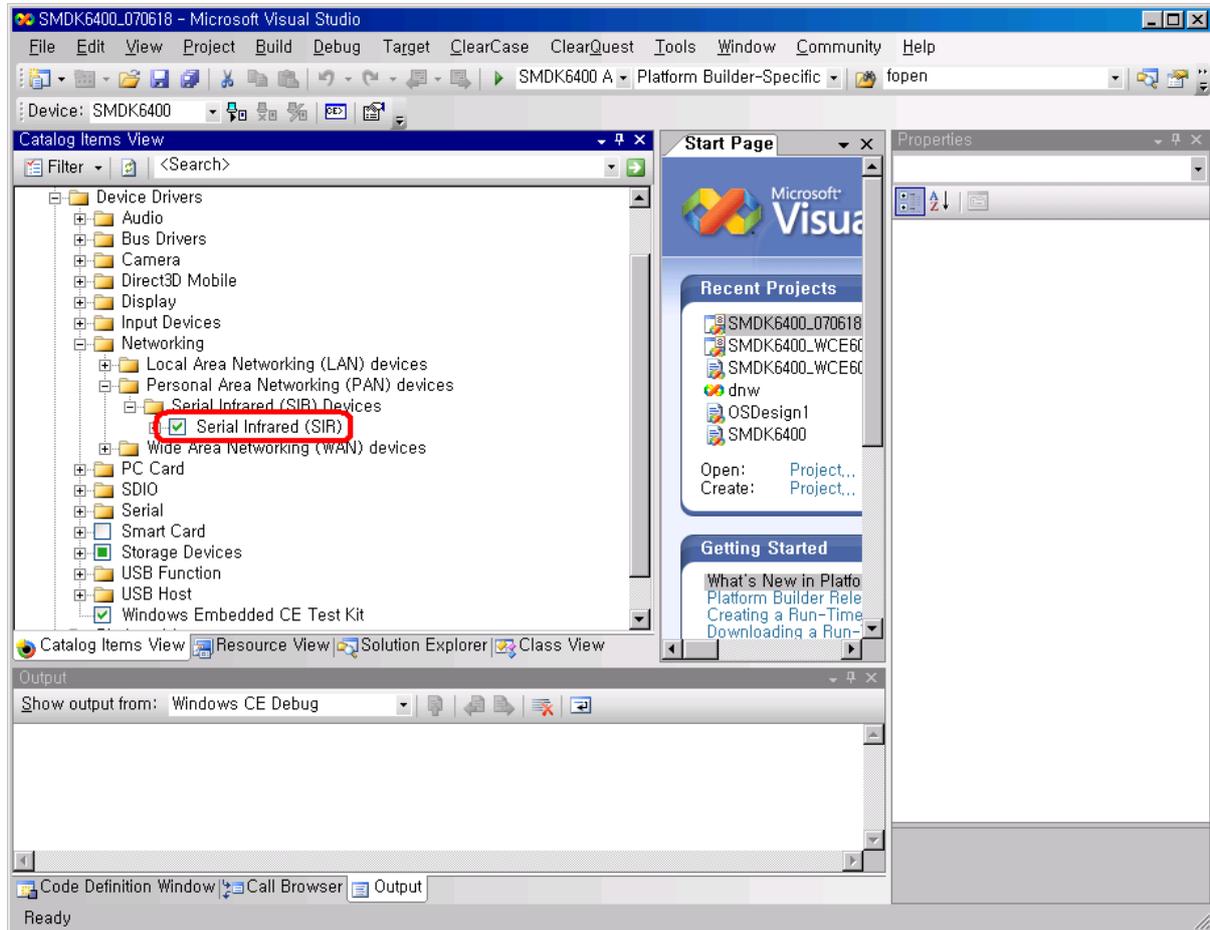


Figure 4-8 Adding Networking Item to OS Design

9. On the top of Visual Studio 2005, You can see the Project menu as below figure.  
And then select Properties...

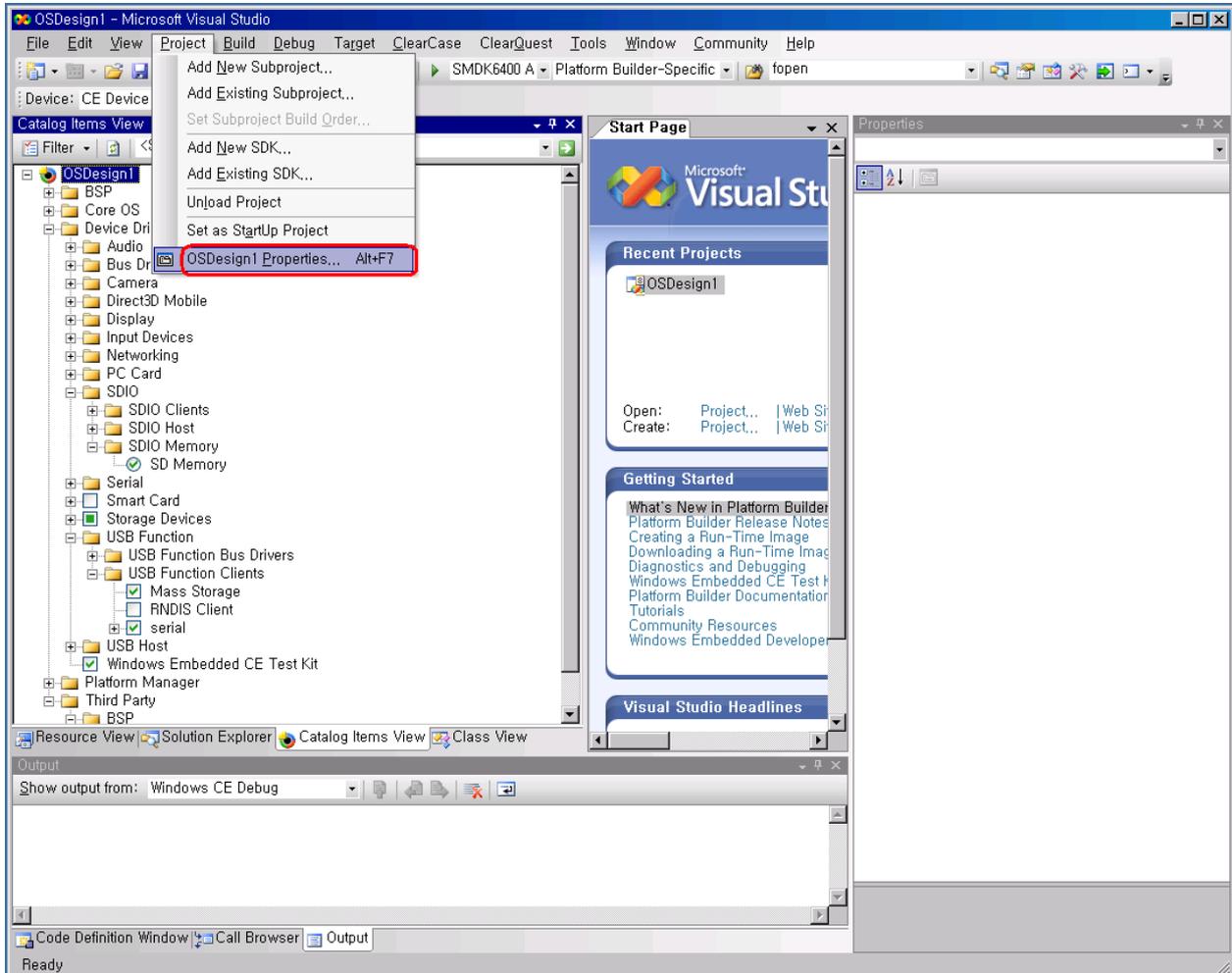


Figure 4-12 Properties of OS Design

- The OS Design Properties Pages window appears on your screen. Select **Locale** tab and click **Clear All** button. It clears all the language settings in your platform. Now select **English (United States)** as shown in figure 4-10.

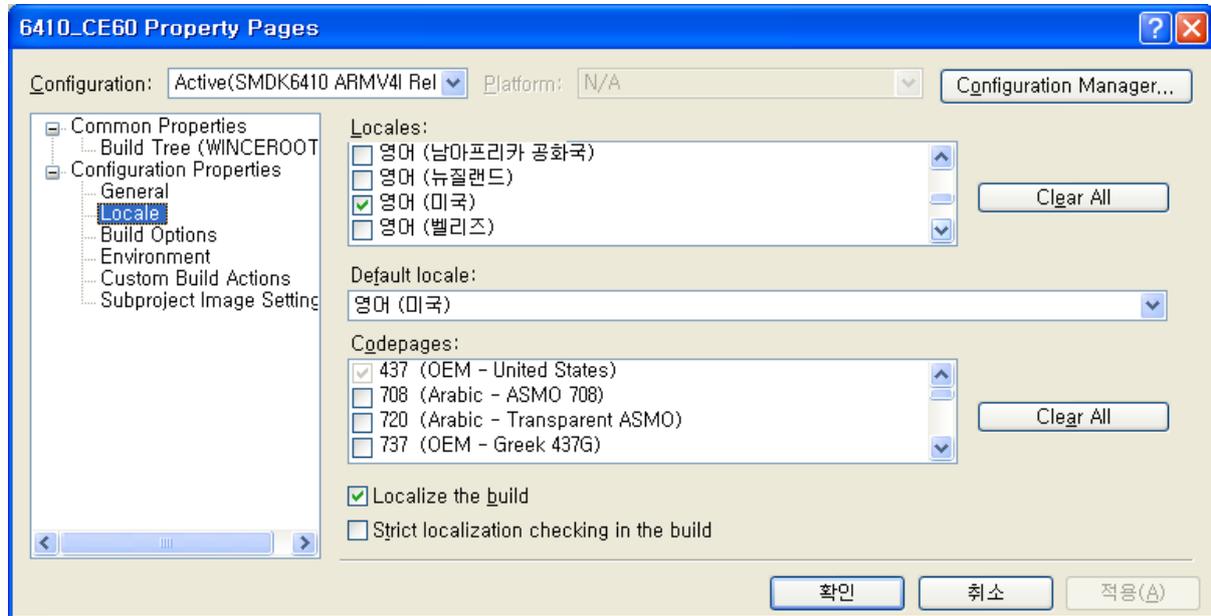


Figure 4-13 Selecting Language in the Property Pages Window

- Now please uncheck the square boxes **Enable KITL (no IMGNOKITL=1)** in the **Build Options Properties** in OS Design Properties Pages window and then click **OK** button.

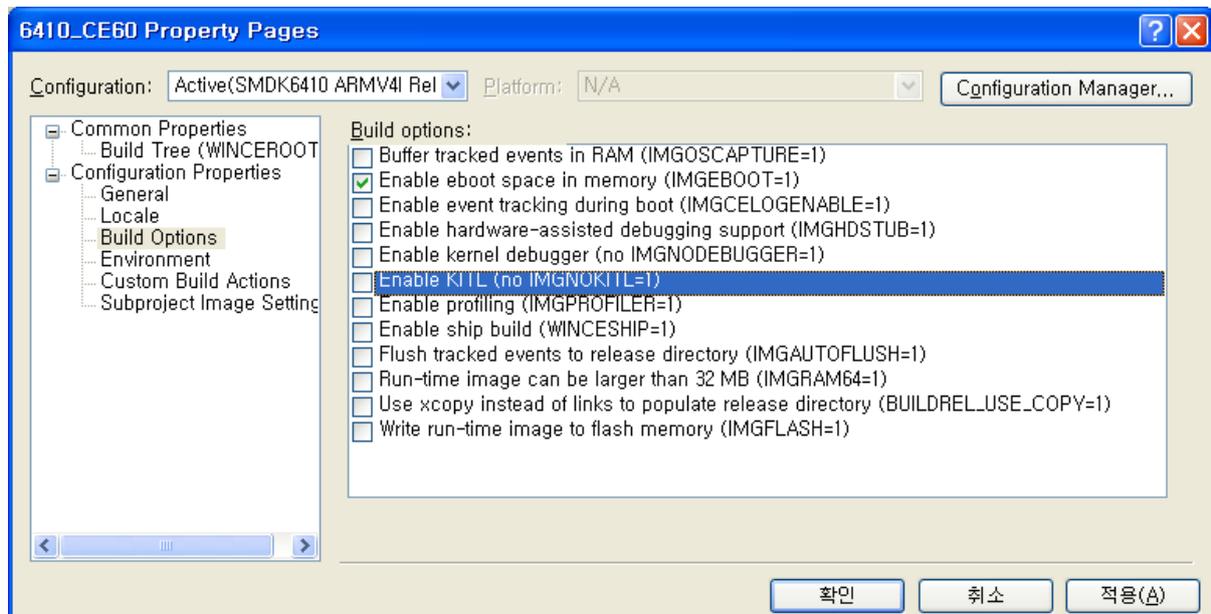


Figure 4-14 Removing KITL Setting in OS Design Properties Window

12. On the **Build** menu, click **Build OSDesign1** as shown in figure 4-12 to build the Eboot and OS image.

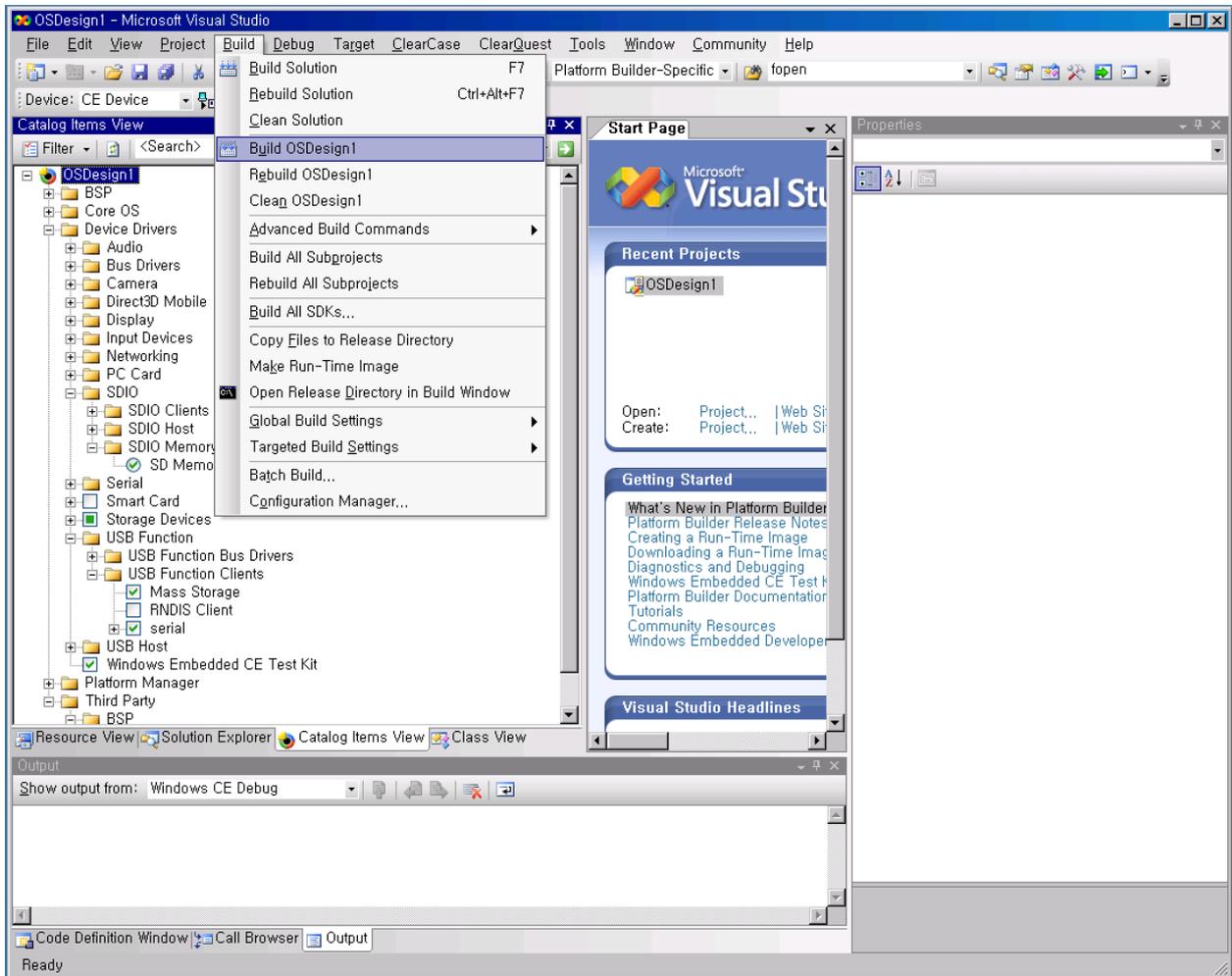


Figure 4-15 Build OS Design

13. The arrow pointing to the icon in the following figure indicates the Building process.

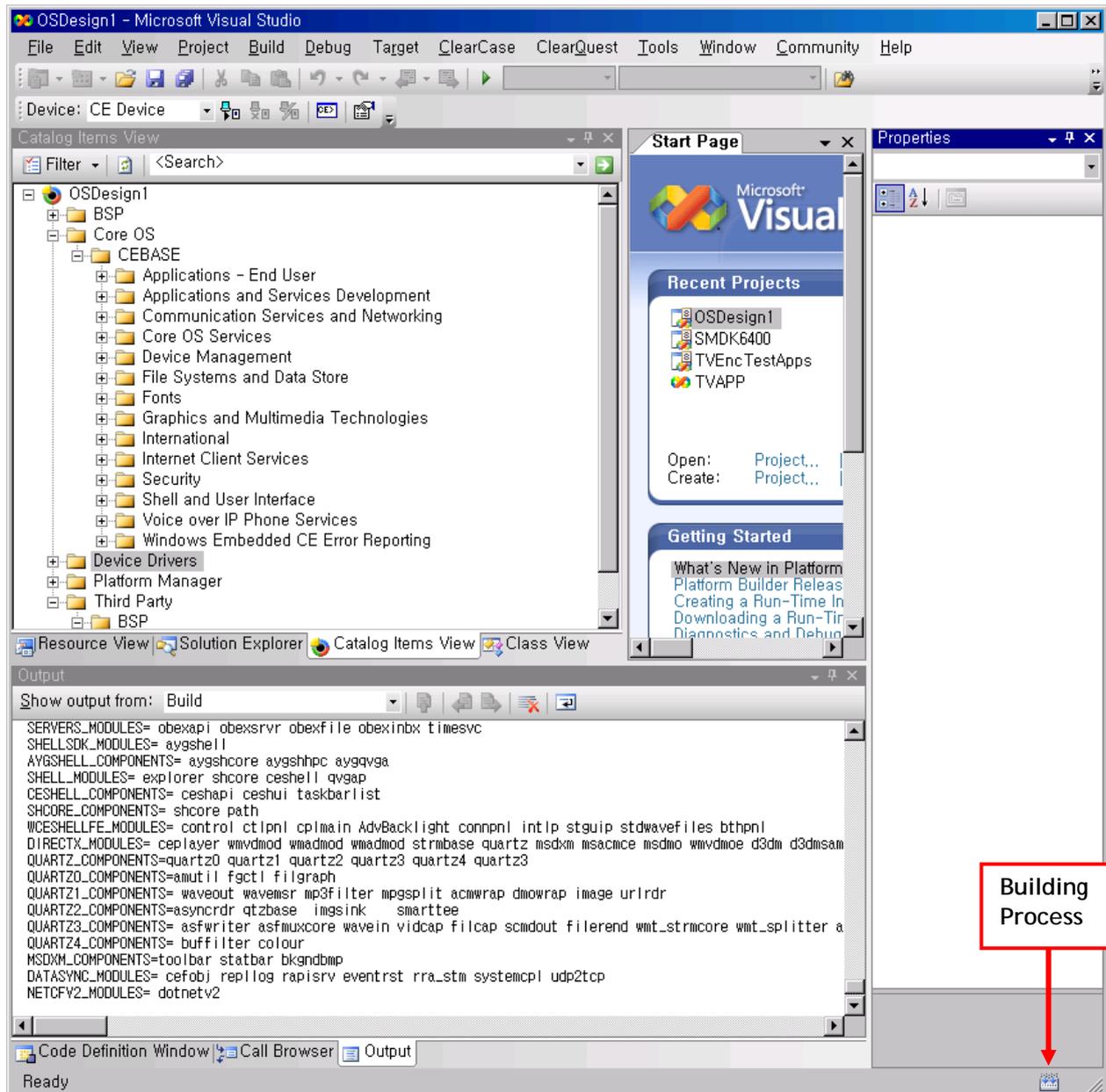


Figure 4-16 Building Process

**Note:** Building process may take some time depending on your system capability. So, please wait for the build process to be completed. It might take around 1 hour.

14. After completion of build process, following messages appear as shown in figure 4-12. EBOOT.nb0, EBOOT.bin, STEPLDR.nb0, NK.bin and NK.nb0 are now available in X:\WINCE600\OSDesigns \[OS Design Name] \[OS Design Name]\ReIDir\SMDK6410\_ARMV4I\_Release directory.

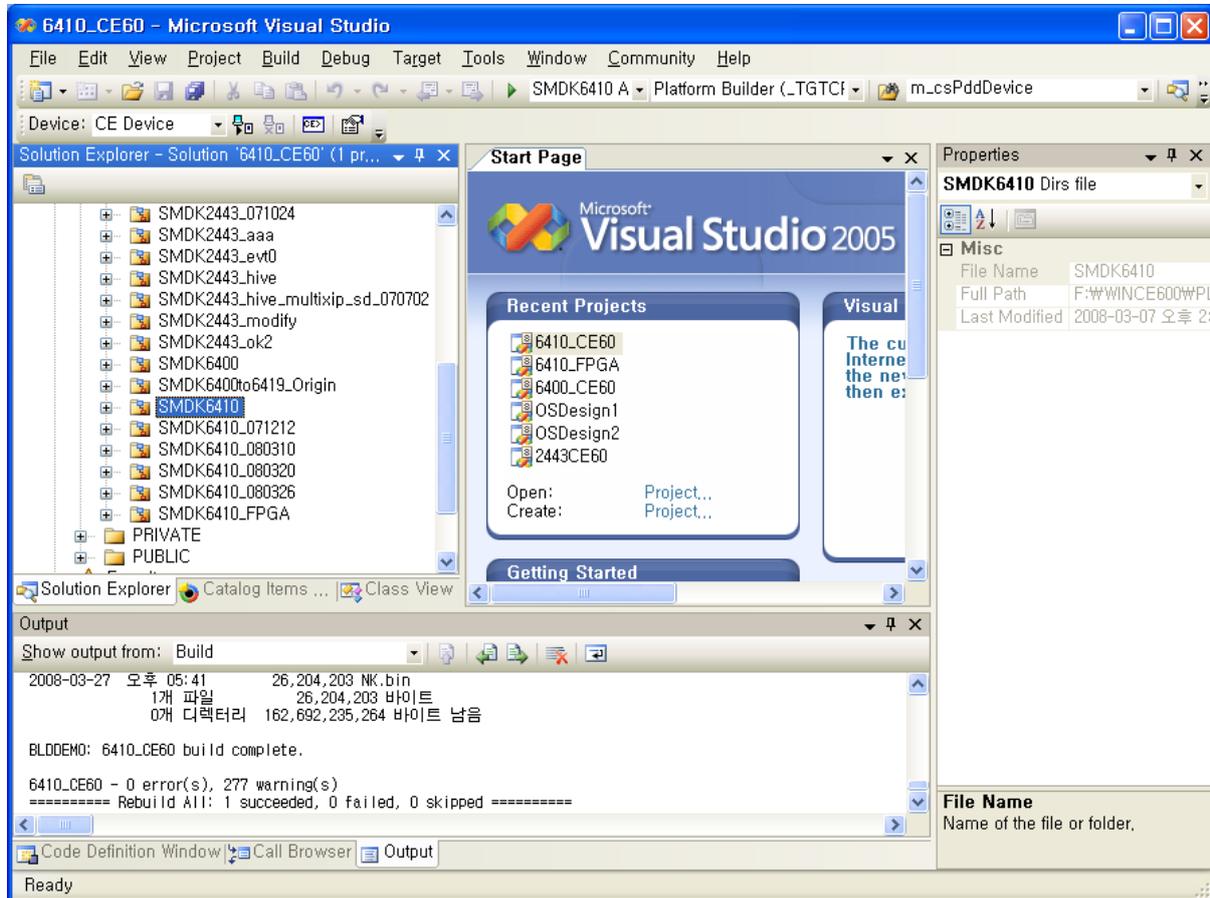


Figure 4-17 After Building the OS Image

## 5 Running NK.nb0 Image

---

In this chapter, you can understand how to download and run the NK.nb0 image.

1. Before you download the WinCE Image through the USB, you must have **6410\_OtgMon.bin** image on your AMD Flash. (The image was already fused on your AMD Flash in the board before release)
2. Configure DIP switch CFG0 on the CPU Board and CFGB1 on the CPU board properly for booting from AMD Flash. (For more information, Read SMDK6410 Board User's Manual in Document folder...)
3. Please install the USB Driver and DNW application on your host PC.
4. After installing the USB driver, run **dnw.exe** on the host PC. The following window appears on your screen.

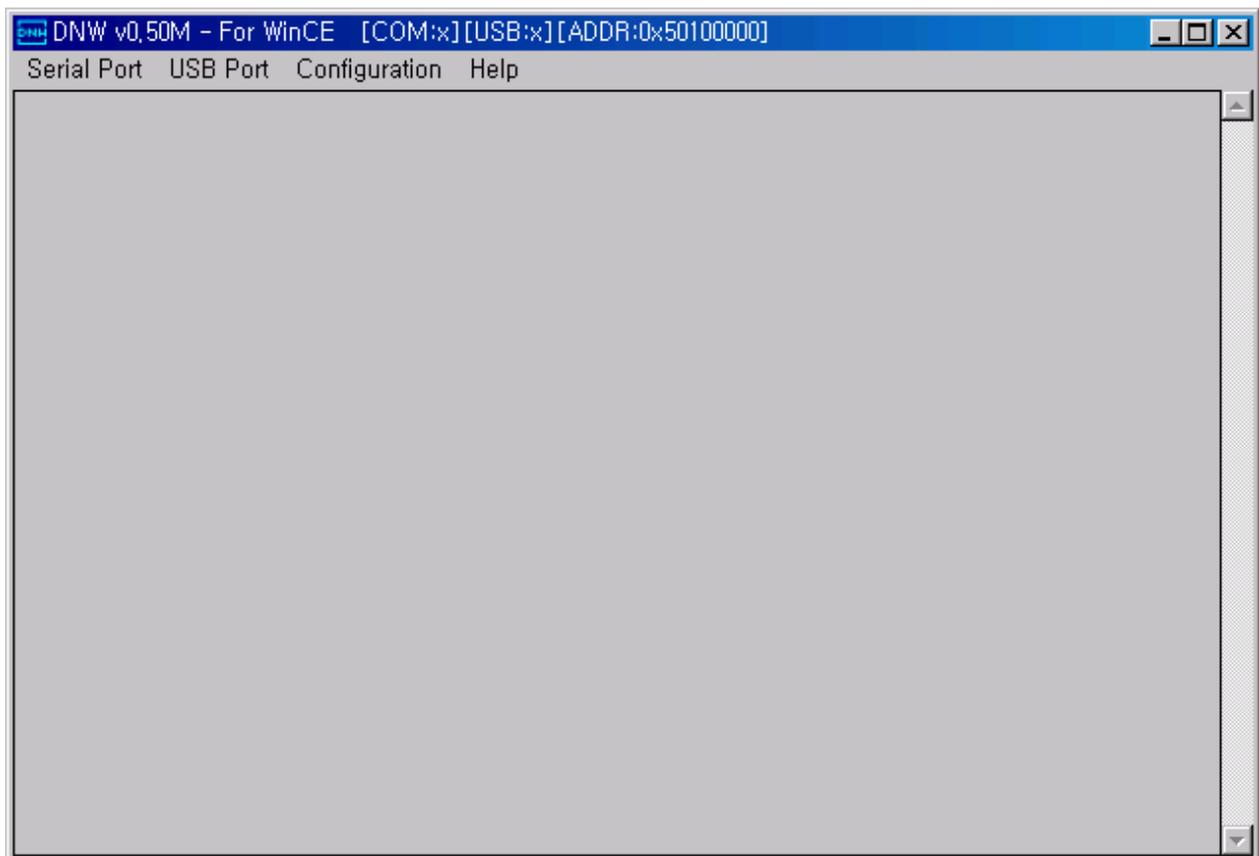


Figure 5-1 DNW Window

5. On the **Configuration** menu, click **Options** to set the UART/USB options. The following window appears on your screen. Select Baud Rate and COM Port as shown in figure 5-2, enter the download address as `0x50100000` and then click **OK** button.

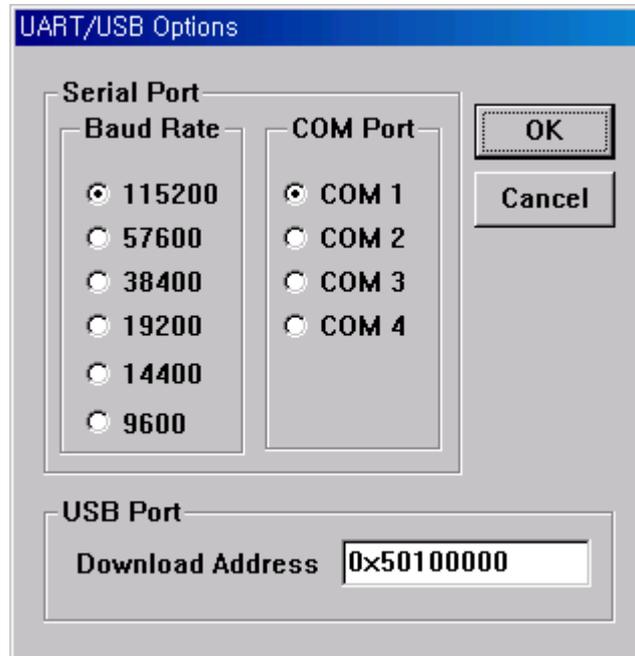
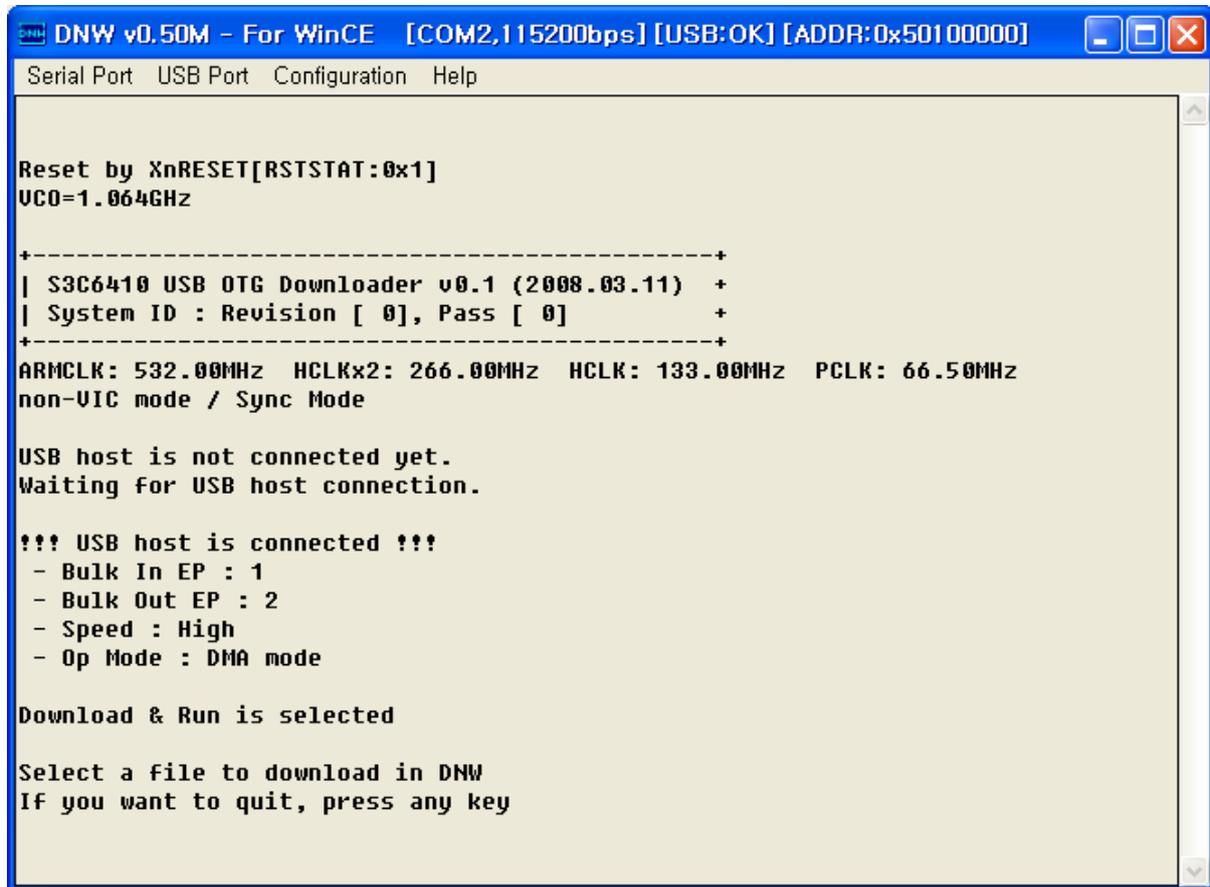


Figure 5-2 UART/USB Options

6. On the Serial Port menu, click Connect. Switch ON the board and then press any key. The DNW window appears as shown in figure 5-3.



```
DNW v0.50M - For WinCE [COM2,115200bps] [USB:OK] [ADDR:0x50100000]
Serial Port  USB Port  Configuration  Help

Reset by XnRESET[RSTSTAT:0x1]
UC0=1.064GHz

+-----+
| S3C6410 USB OTG Downloader v0.1 (2008.03.11) |
| System ID : Revision [ 0], Pass [ 0]       |
+-----+
ARMCLK: 532.00MHz  HCLKx2: 266.00MHz  HCLK: 133.00MHz  PCLK: 66.50MHz
non-VIC mode / Sync Mode

USB host is not connected yet.
Waiting for USB host connection.

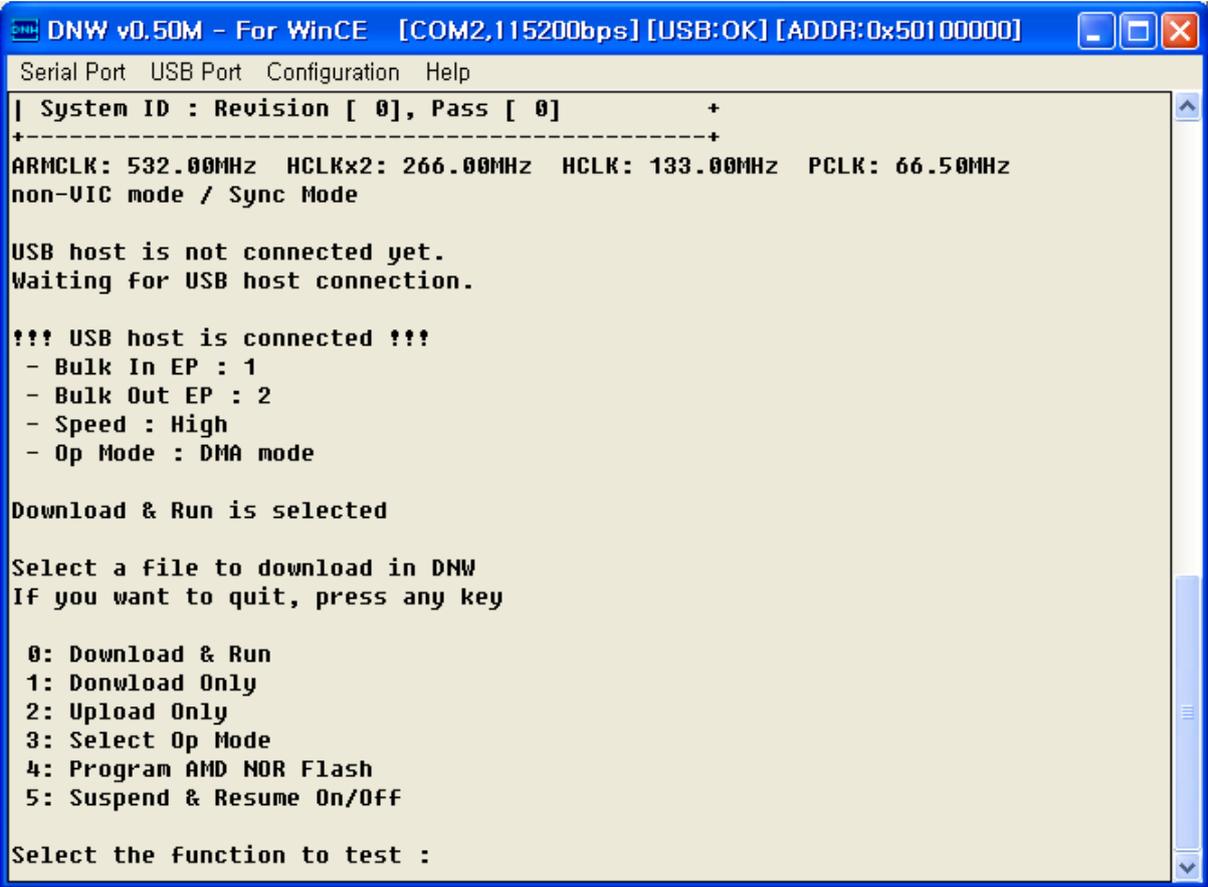
!!! USB host is connected !!!
- Bulk In EP : 1
- Bulk Out EP : 2
- Speed : High
- Op Mode : DMA mode

Download & Run is selected

Select a file to download in DNW
If you want to quit, press any key
```

Figure 5-3 DNW Window after Board Power ON

7. Press any key to see USB OTG Mon menu. Now DNW window appears as shown below.



```
DNW v0.50M - For WinCE [COM2,115200bps] [USB:OK] [ADDR:0x50100000]
Serial Port  USB Port  Configuration  Help
| System ID : Revision [ 0], Pass [ 0]          +
+-----+
ARMCLK: 532.00MHz  HCLKx2: 266.00MHz  HCLK: 133.00MHz  PCLK: 66.50MHz
non-VIC mode / Sync Mode

USB host is not connected yet.
Waiting for USB host connection.

!!! USB host is connected !!!
- Bulk In EP : 1
- Bulk Out EP : 2
- Speed : High
- Op Mode : DMA mode

Download & Run is selected

Select a file to download in DNW
If you want to quit, press any key

0: Download & Run
1: Download Only
2: Upload Only
3: Select Op Mode
4: Program AMD NOR Flash
5: Suspend & Resume On/Off

Select the function to test :
```

Figure 5-4 USB OTG Mon Menu

8. Enter 0 to download and run the Image on the board. DNW window appears as shown in figure 5-5.

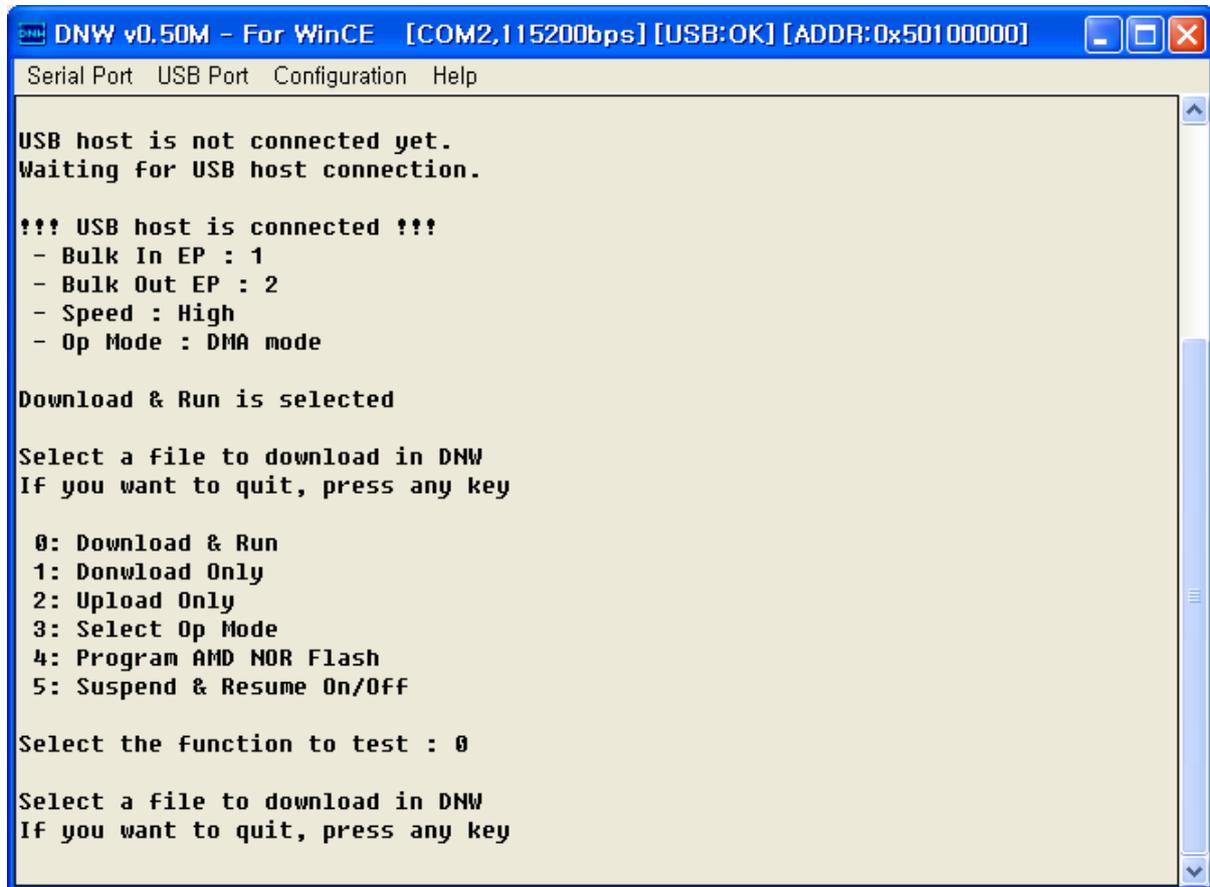


Figure 5-5 Download & Run

9. On the USB Port menu, click Transmit and the following window appears on your screen. Select NK.nb0 from X:\WINCE600\OSDesins\[OS Design name]\[OS Design name]\ReIDir\SMDK6410\_ARMV4I\_Release directory and then click Open button.

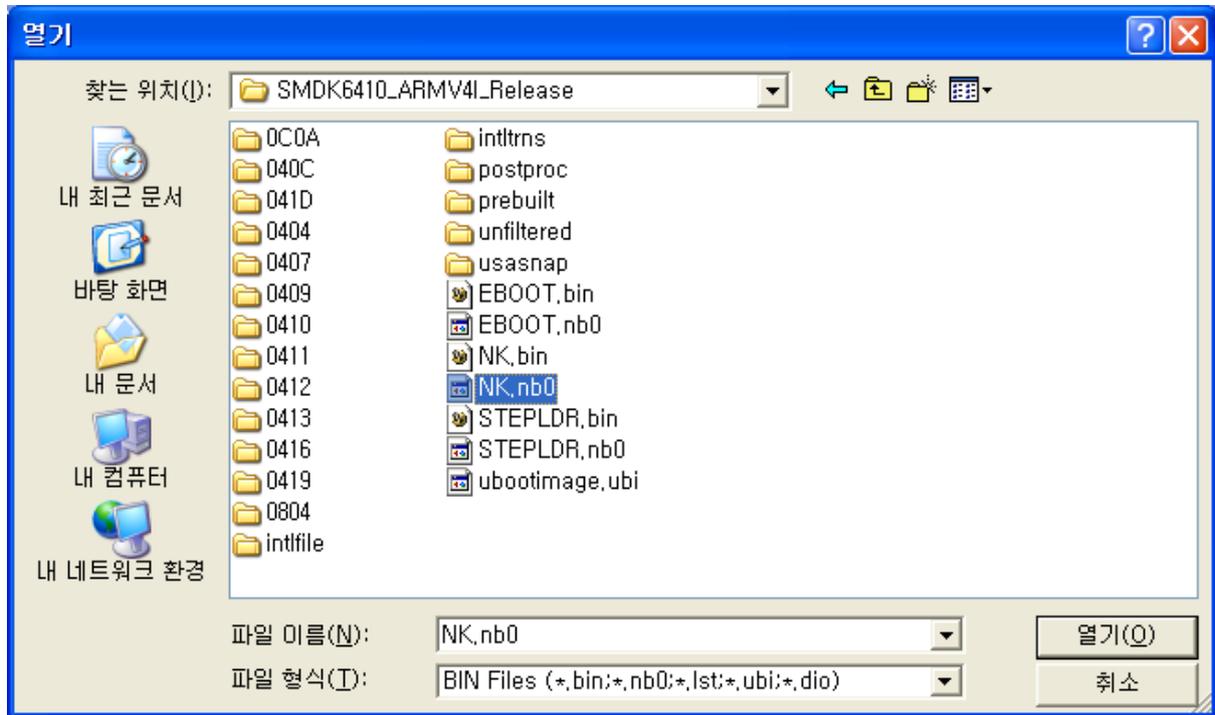


Figure 5-6 Selecting NK.nb0 for Download

- Once download begins, a download status bar appears on your screen as shown in figure 5-7. After NK.nb0 download is over, Windows Embedded CE 6.0 boots on the target Board

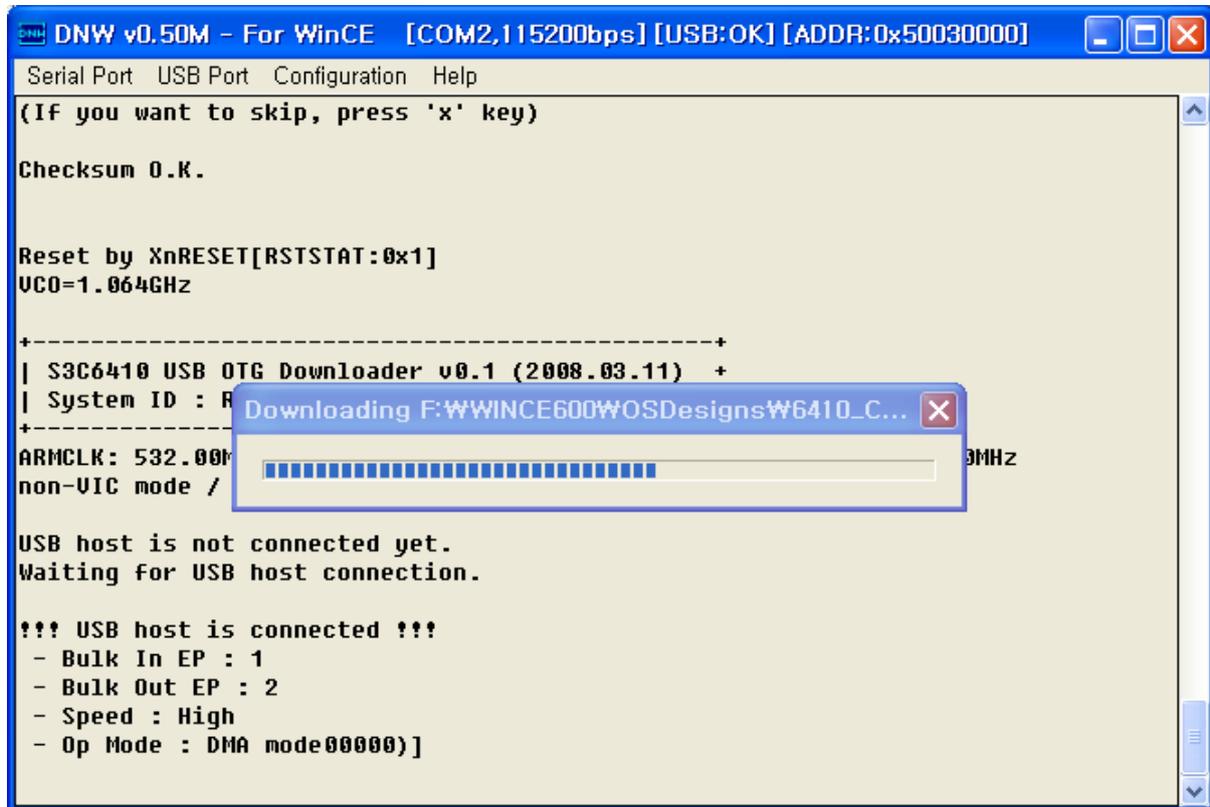


Figure 5-7 Downloading Status of NK.nb0

## 6 Fusing WinCE Image to NAND Flash via USB

In this chapter, you can understand how to fuse WinCE image to NAND Flash via USB.

1. Before you download the WinCE Image through the USB, you must have 6410\_OtgMon.bin image on your AMD Flash. (The image was already fused on your AMD Flash in the board before release)
2. Configure CFG0 DIP switch on the CPU Board and CFGB1 on the CPU board properly for booting from AMD Flash. (For more information, Read SMDK6410 Board User's Manual in Document folder...)
3. Please install the USB Driver and DNW application on your host PC.
4. Run dnw.exe on the host PC. The following window appears on your screen.

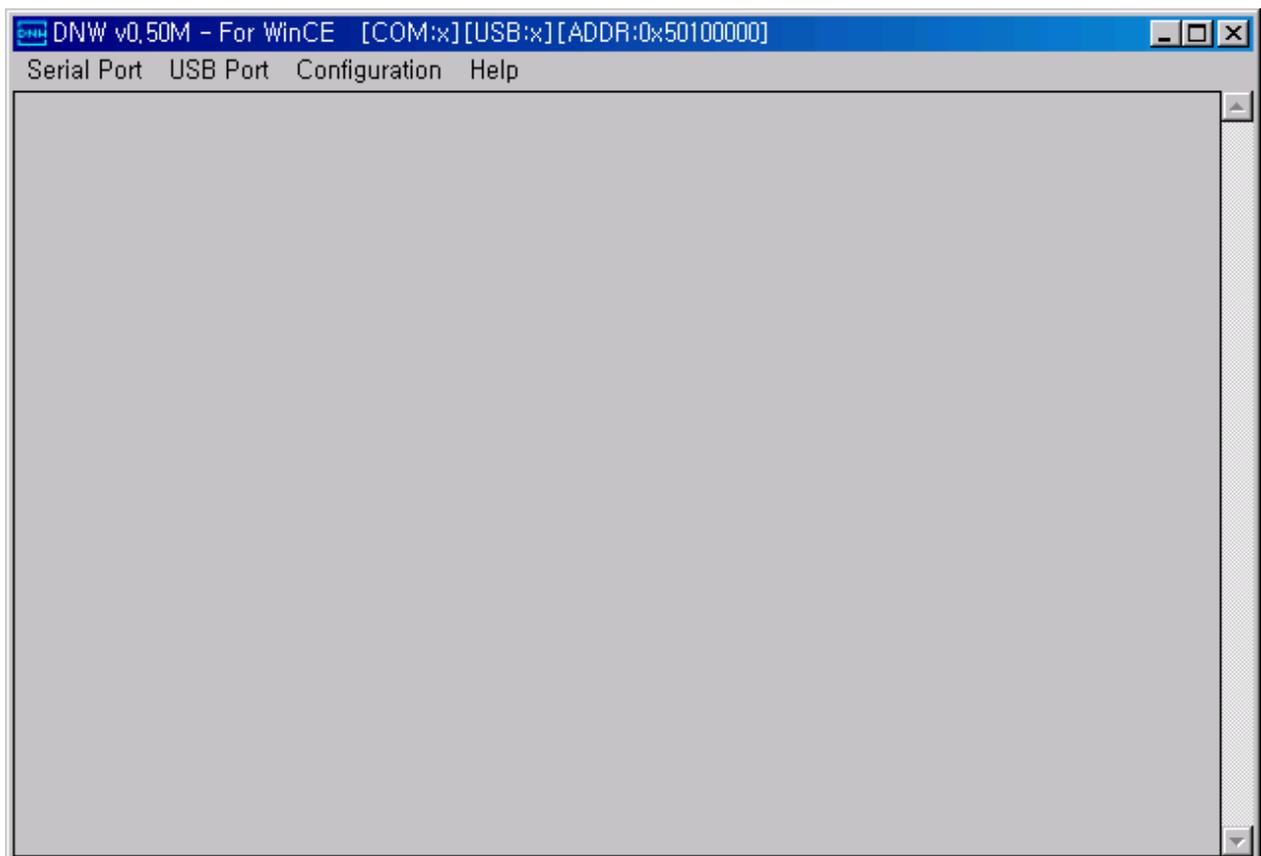


Figure 6-1 DNW Window

5. On the **Configuration** menu in the DNW window, click **Options** to set the UART/USB options. The following window appears on your screen. Select Baud Rate and COM Port as shown in figure 7-4, enter the download address as **0x50030000** and then click **OK** button.

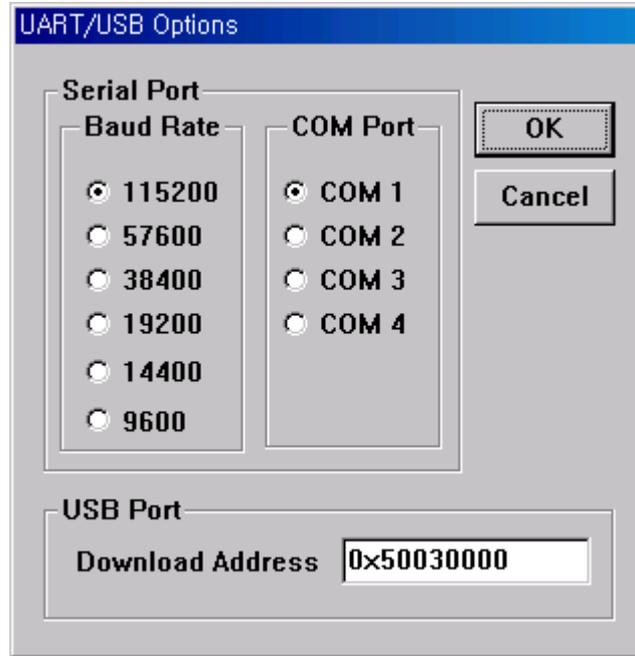
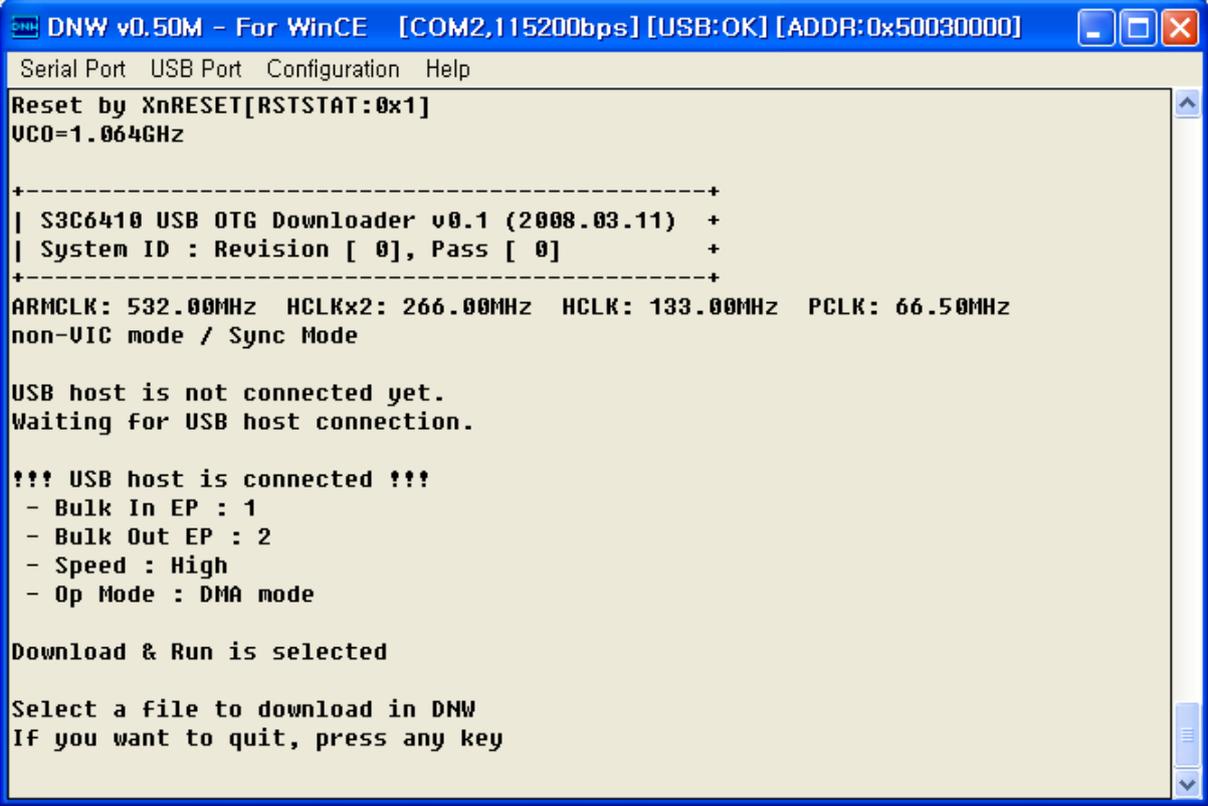


Figure 6-2 UART/USB Options

6. On the Serial Port menu, click Connect. Switch ON the board and then press any key. The DNW window appears as shown in figure 6-3.



```
DNW v0.50M - For WinCE [COM2,115200bps] [USB:OK] [ADDR:0x50030000]
Serial Port  USB Port  Configuration  Help
Reset by XnRESET[RSTSTAT:0x1]
UCO=1.064GHz

+-----+
| S3C6410 USB OTG Downloader v0.1 (2008.03.11) |
| System ID : Revision [ 0], Pass [ 0]         |
+-----+
ARMCLK: 532.00MHz  HCLKx2: 266.00MHz  HCLK: 133.00MHz  PCLK: 66.50MHz
non-VIC mode / Sync Mode

USB host is not connected yet.
Waiting for USB host connection.

!!! USB host is connected !!!
- Bulk In EP : 1
- Bulk Out EP : 2
- Speed : High
- Op Mode : DMA mode

Download & Run is selected

Select a file to download in DNW
If you want to quit, press any key
```

Figure 6-3 DNW Window after Board Power ON

7. Press any key to see USB OTG Mon menu. Now DNW window appears as shown below.

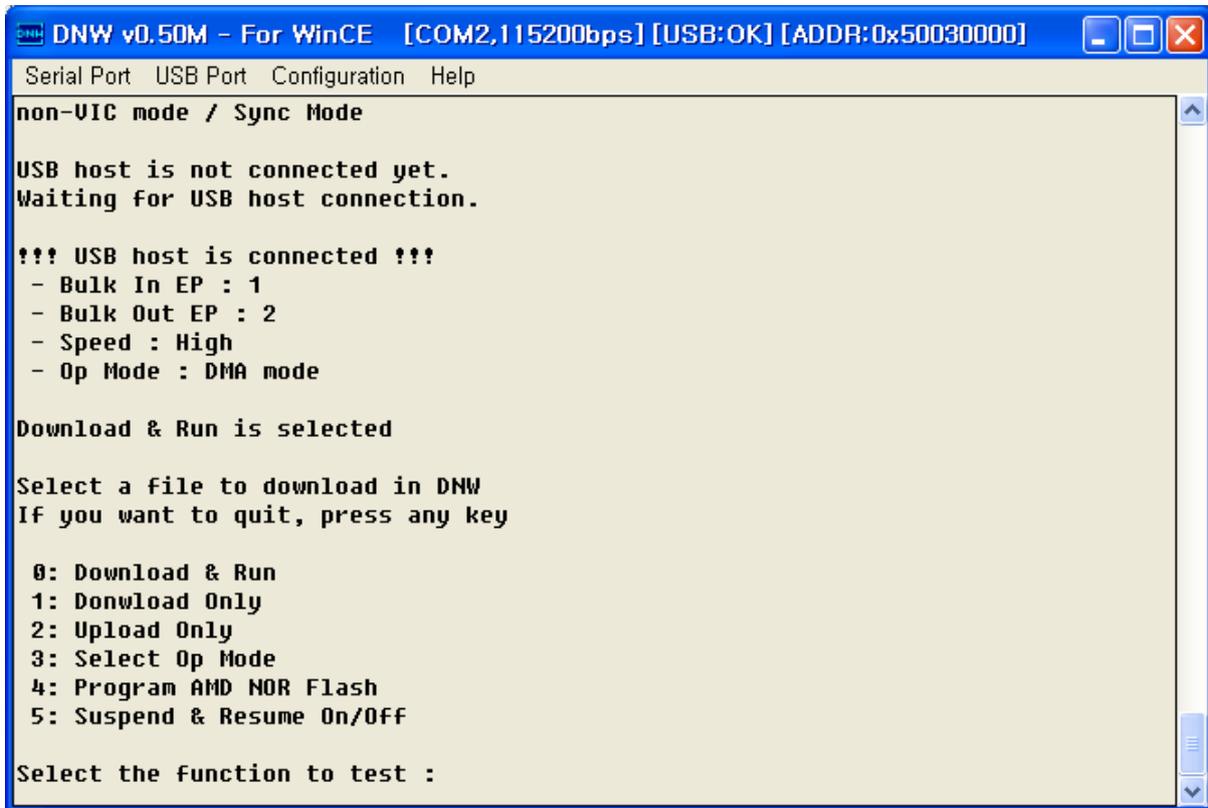


Figure 6-4 usb OTG Mon menu

8. Enter 0 to download and run the Image on the board. DNW window appears as shown in figure 6-5.

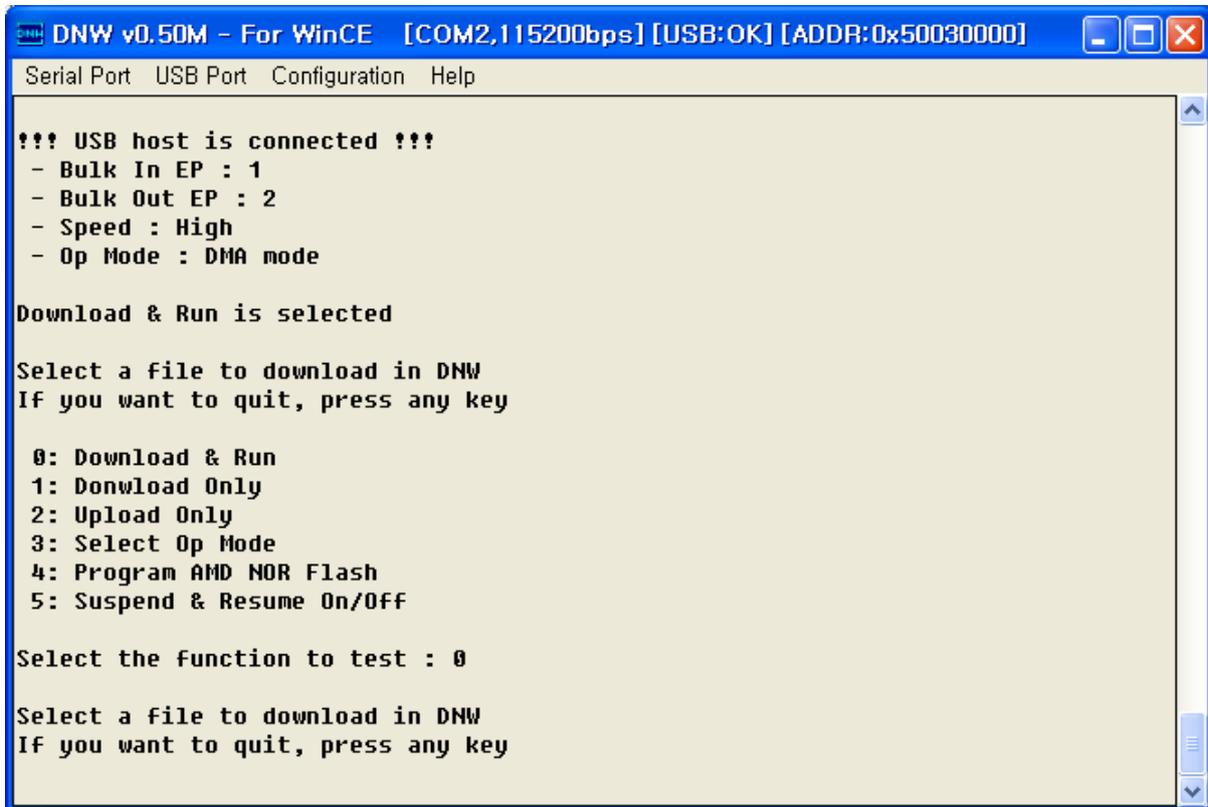


Figure 6-5 Download &amp; Run

9. On the USB Port menu, click Transmit and the following window appears on your screen. Select EBOOT.nb0 file from X:\WINCE600\OSDesigns\[OSDesign name] \[OSDesign name]\ReIDir\SMDK6410\_ARMV4I\_Release directory and then click Open button.

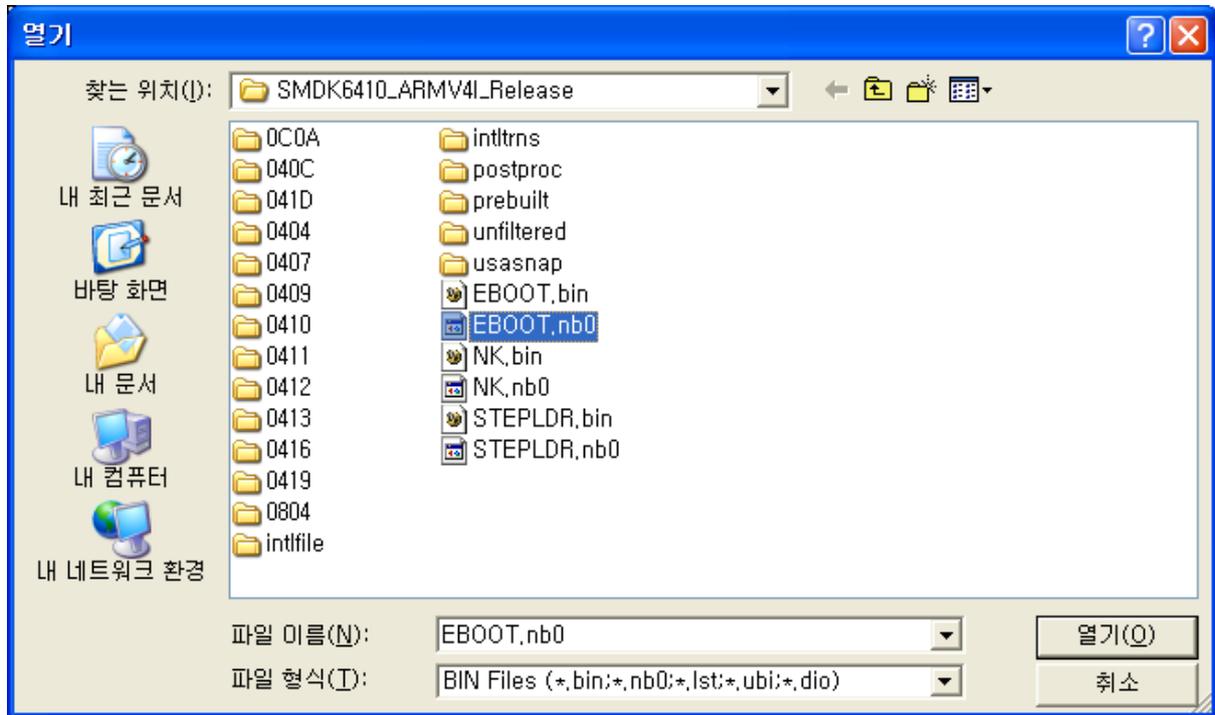
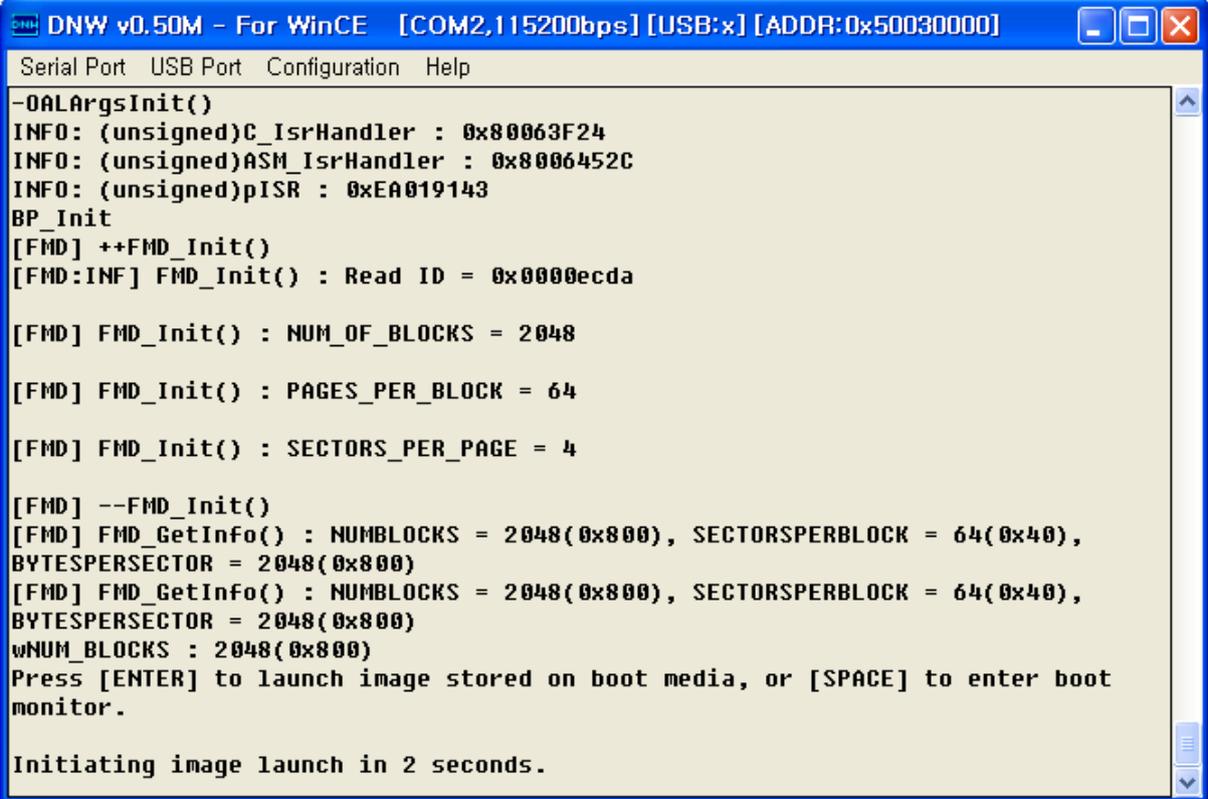


Figure 6-6 Selecting EBOOT.nb0 for Download

10. As soon as EBOOT.nb0 download is over, the following messages appear in the DNW window.

The image shows a screenshot of a terminal window titled "DNW v0.50M - For WinCE [COM2,115200bps] [USB:x] [ADDR:0x50030000]". The window has a menu bar with "Serial Port", "USB Port", "Configuration", and "Help". The main text area displays the following output:

```
-OALargsInit()
INFO: (unsigned)C_IsrHandler : 0x80063F24
INFO: (unsigned)ASM_IsrHandler : 0x8006452C
INFO: (unsigned)pISR : 0xEA019143
BP_Init
[FMD] ++FMD_Init()
[FMD:INF] FMD_Init() : Read ID = 0x0000ecda

[FMD] FMD_Init() : NUM_OF_BLOCKS = 2048

[FMD] FMD_Init() : PAGES_PER_BLOCK = 64

[FMD] FMD_Init() : SECTORS_PER_PAGE = 4

[FMD] --FMD_Init()
[FMD] FMD_GetInfo() : NUMBLOCKS = 2048(0x800), SECTORS_PER_BLOCK = 64(0x40),
BYTES_PER_SECTOR = 2048(0x800)
[FMD] FMD_GetInfo() : NUMBLOCKS = 2048(0x800), SECTORS_PER_BLOCK = 64(0x40),
BYTES_PER_SECTOR = 2048(0x800)
wNUM_BLOCKS : 2048(0x800)
Press [ENTER] to launch image stored on boot media, or [SPACE] to enter boot
monitor.

Initiating image launch in 2 seconds.
```

Figure 6-7 After EBOOT.nb0 Download

11. Please hit the SPACE BAR key to view the current Ethernet Boot Loader Configuration.

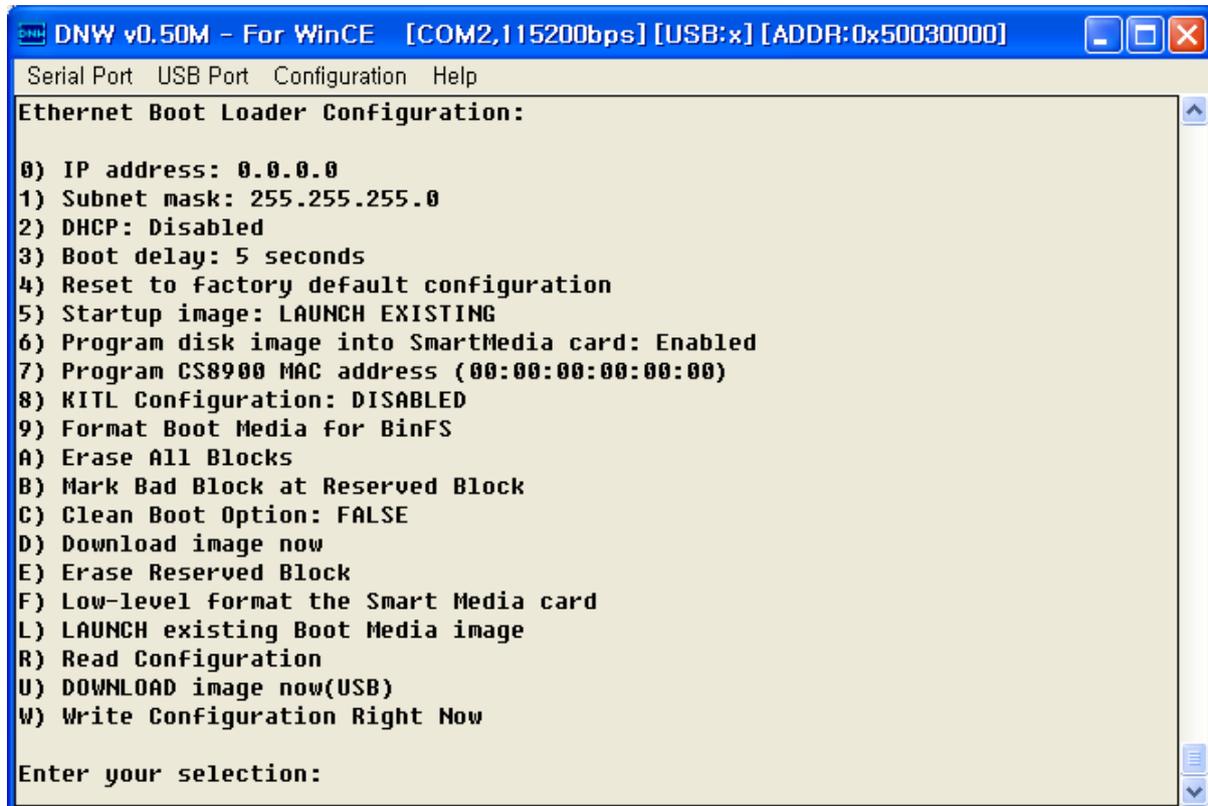


Figure 6-8 Ethernet Boot Loader Configuration - Before

12. Configure the Ethernet Boot loader as follows by entering the respective options:

- Enter [0] to enter SMDK6410 Board IP address
- Enter [1] to enter SMDK6410 Board Subnet mask
- Keep DHCP: **DISABLED**
- Keep Startup image: LAUNCH EXISTING
- Keep Program disk image: **ENABLED**
- Enter [7] to enter SMDK6410 Board MAC Address
- Keep KITL Configuration: **DISABLED**
- Enter [W] to Write Configuration Right Now
- Enter [E] to Erase Reserved Blocks in NAND Flash
- Enter [F] to do Low-level format the NAND Flash and wait for few seconds
- Enter [9] to Format Boot Media for BinFS
- After entering [9], please wait for few minutes.
- Enter [U] to Download image now(USB)

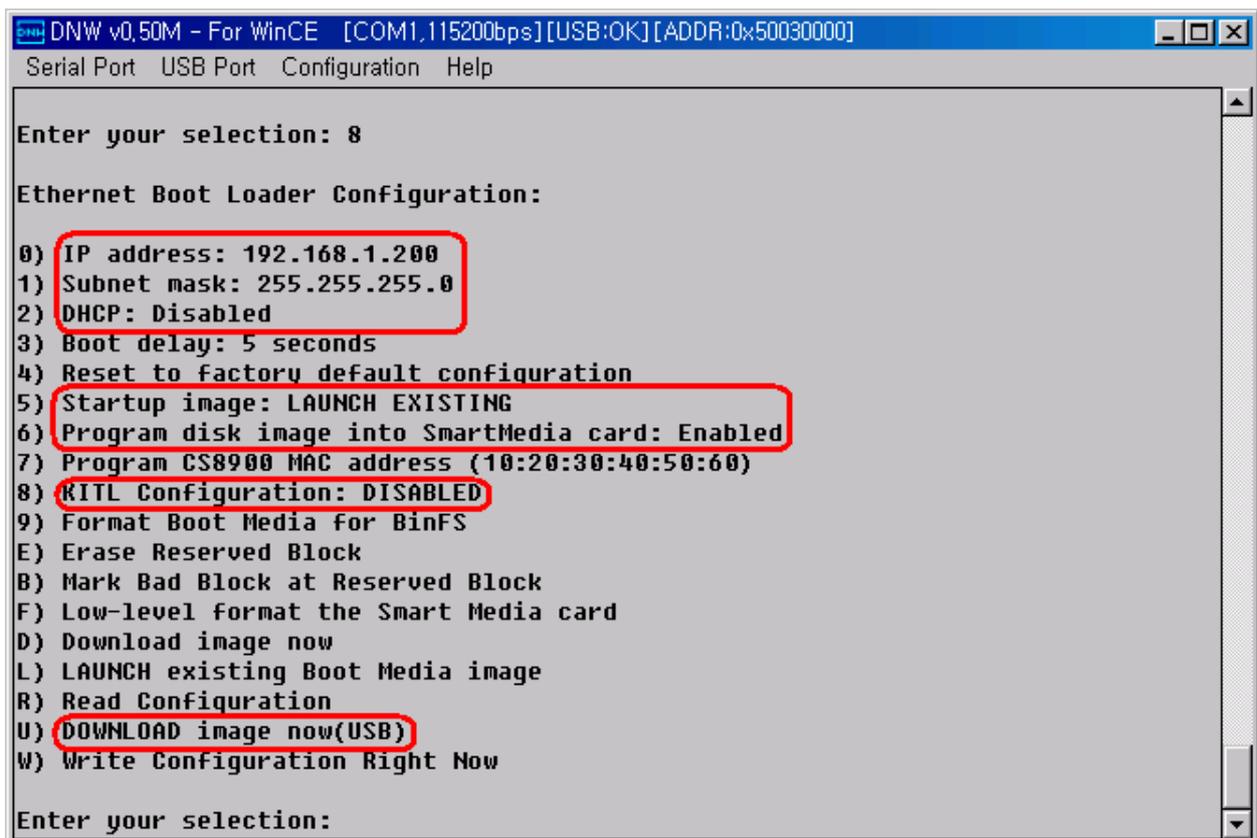


Figure 6-9 Ethernet Boot Loader Configuration - After

13. Change the IP address and Subnet Mask manually on your Host PC in TCP/IP properties before you start to download the OS image to the target board. For example, if the Target Board IP Address is 192.168.1.200, then set Host PC IP address as 192.168.1.100. Set the subnet mask as 255.255.255.0 (You can skip this step for downloading via USB)

And then Enter [U] for download image. If so, You can see the below window.

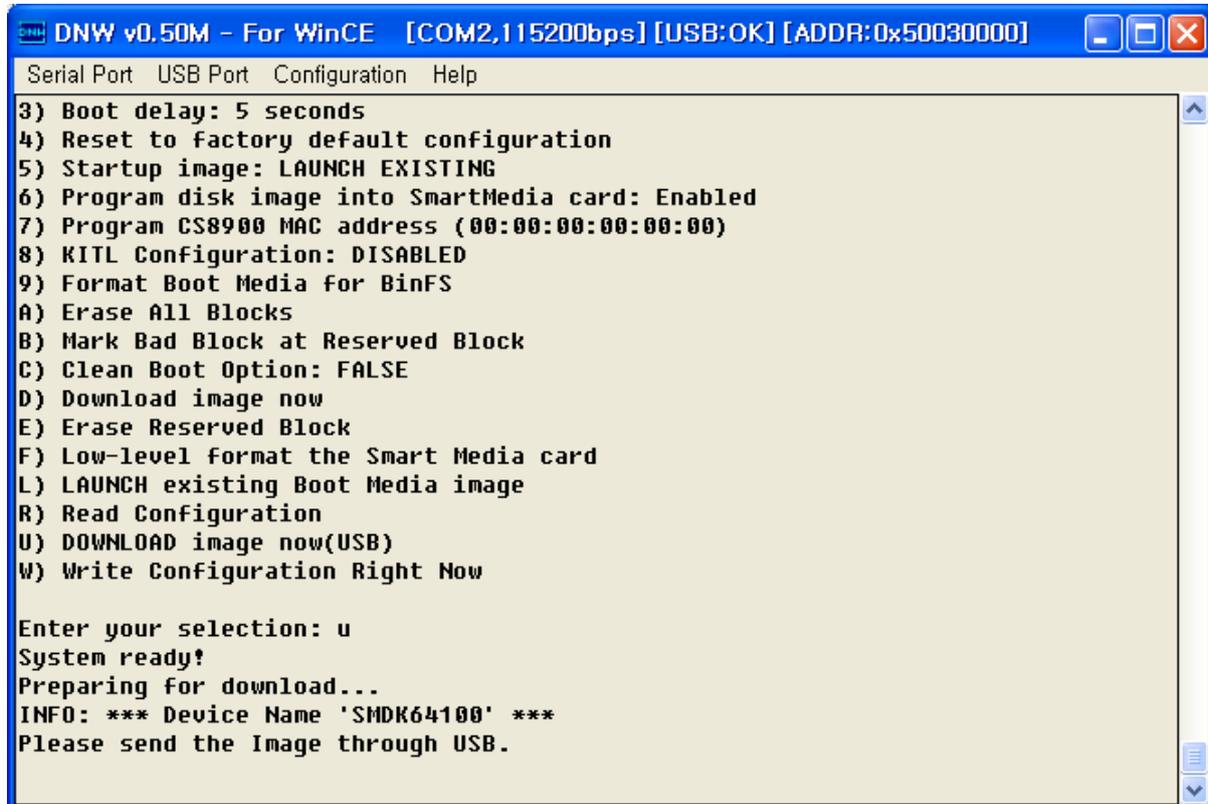


Figure 6-10 Preparing to download image through USB

14. On the USB Port menu click UBOOT and the following window appears on your screen. Select STEPLDR.nb0 from X:\WINCE600\OSDesigns\[OSDesign name]\[OSDesign name]\ReIDir\SMDK6410\_ARMV4I\_Release directory and then click Open button.

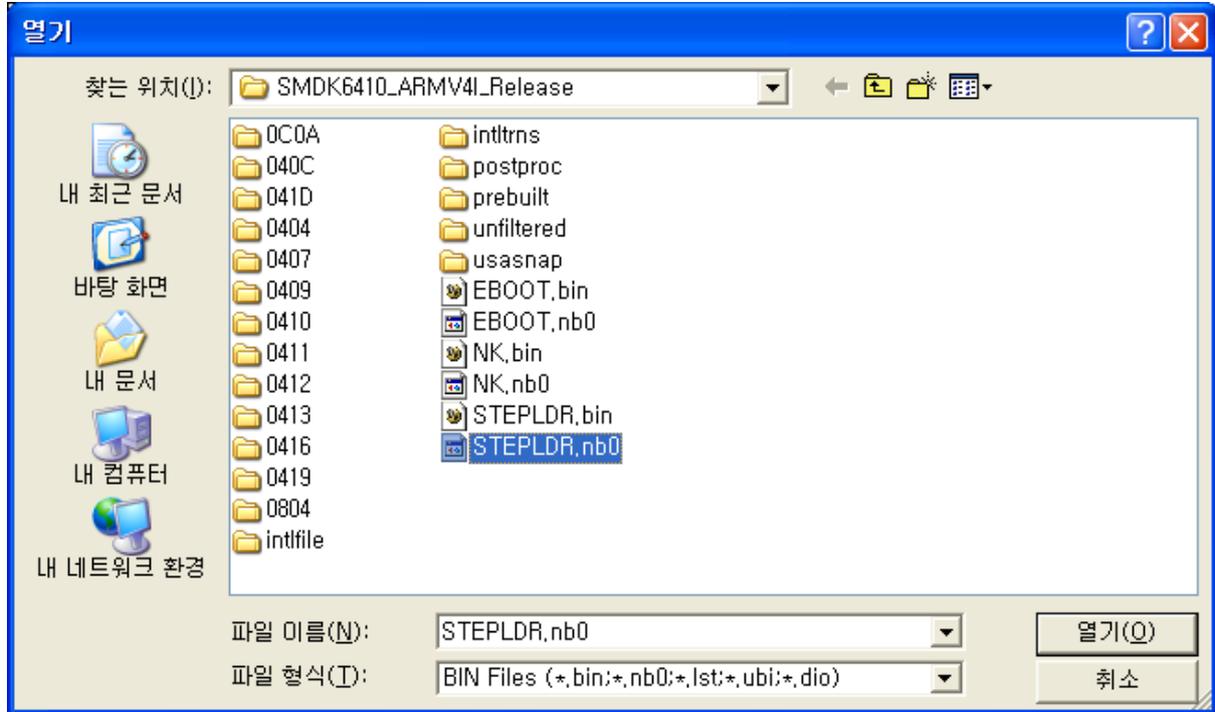
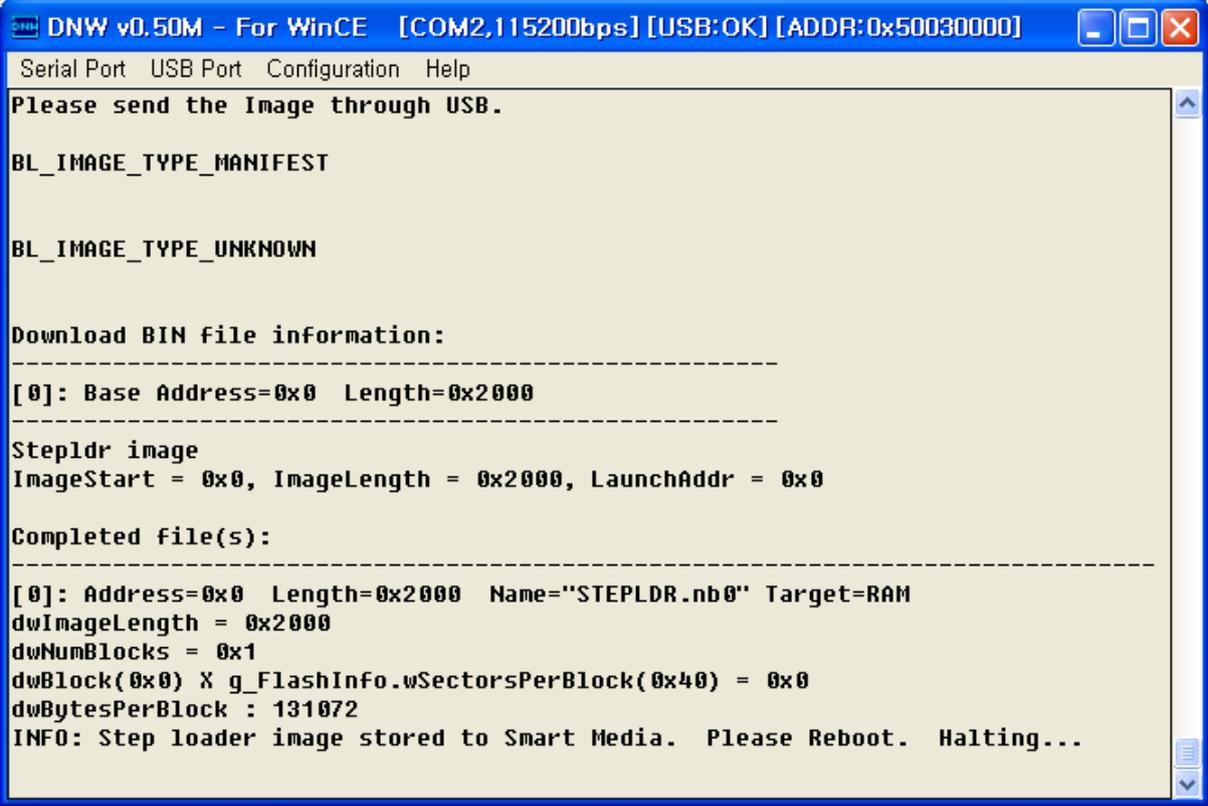


Figure 6-11 Selecting STEPLDR.nb0 for Download

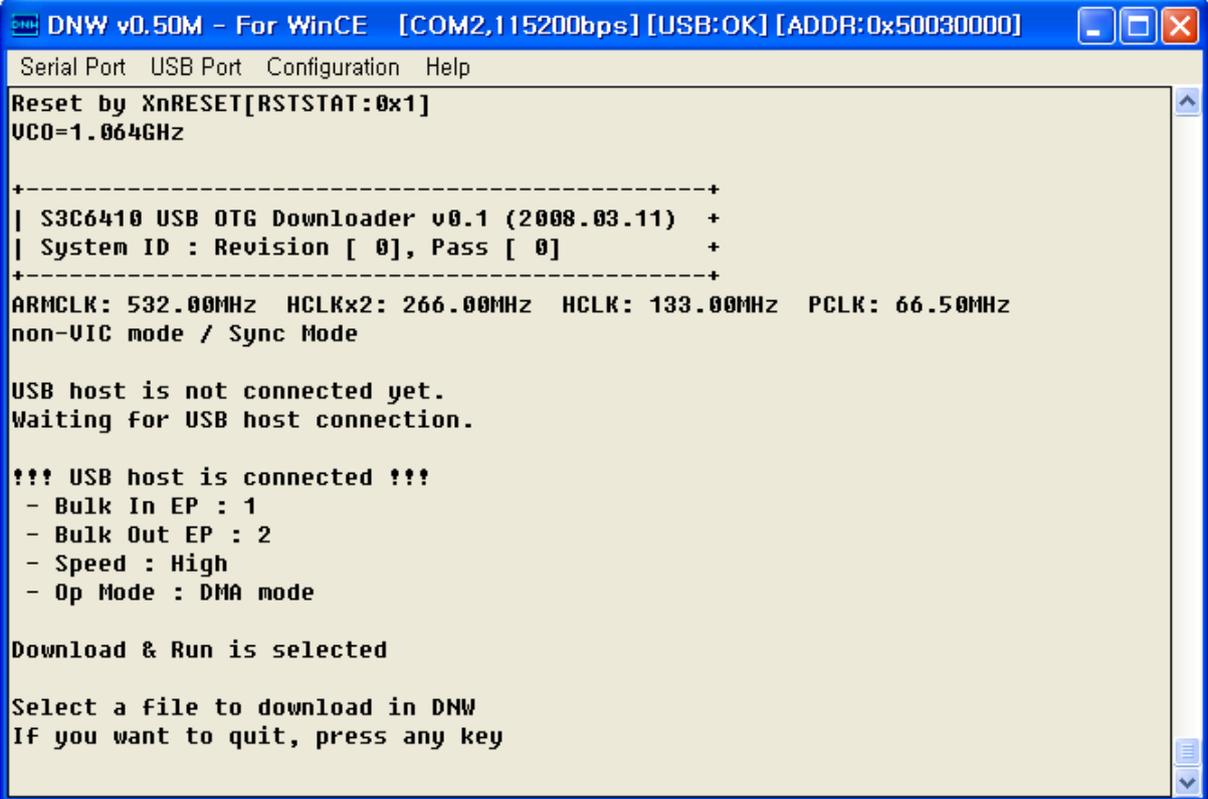
15. You can see the following messages on the DNW window after STEPLDR.nb0 download is over.



```
DNW v0.50M - For WinCE [COM2,115200bps] [USB:OK] [ADDR:0x50030000]
Serial Port USB Port Configuration Help
Please send the Image through USB.
BL_IMAGE_TYPE_MANIFEST
BL_IMAGE_TYPE_UNKNOWN
Download BIN file information:
-----
[0]: Base Address=0x0 Length=0x2000
-----
Stepldr image
ImageStart = 0x0, ImageLength = 0x2000, LaunchAddr = 0x0
Completed file(s):
-----
[0]: Address=0x0 Length=0x2000 Name="STEPLDR.nb0" Target=RAM
dwImageLength = 0x2000
dwNumBlocks = 0x1
dwBlock(0x0) X g_FlashInfo.wSectorsPerBlock(0x40) = 0x0
dwBytesPerBlock : 131072
INFO: Step loader image stored to Smart Media. Please Reboot. Halting...
```

Figure 6-12 Messages via UART Port after STEPLDR.nb0 Download

16. Reset the board. DNW window appears as shown in figure 6-13.



```
DNW v0.50M - For WinCE [COM2,115200bps] [USB:OK] [ADDR:0x50030000]
Serial Port  USB Port  Configuration  Help
Reset by XnRESET[RSTSTAT:0x1]
UCO=1.064GHz

+-----+
| S3C6410 USB OTG Downloader v0.1 (2008.03.11) | +
| System ID : Revision [ 0], Pass [ 0]         | +
+-----+
ARMCLK: 532.00MHz  HCLKx2: 266.00MHz  HCLK: 133.00MHz  PCLK: 66.50MHz
non-VIC mode / Sync Mode

USB host is not connected yet.
Waiting for USB host connection.

!!! USB host is connected !!!
- Bulk In EP : 1
- Bulk Out EP : 2
- Speed : High
- Op Mode : DMA mode

Download & Run is selected

Select a file to download in DNW
If you want to quit, press any key
```

Figure 6-13 DNW Window after reset

17. On the USB Port menu, click Transmit and the following window appears on your screen. Select EBOOT.nb0 file from X:\WINCE600\OSDesigns\[OSDesign name] \[OSDesign name]\RelDir\SMDK6410\_ARMV4I\_Release directory and then click Open button.

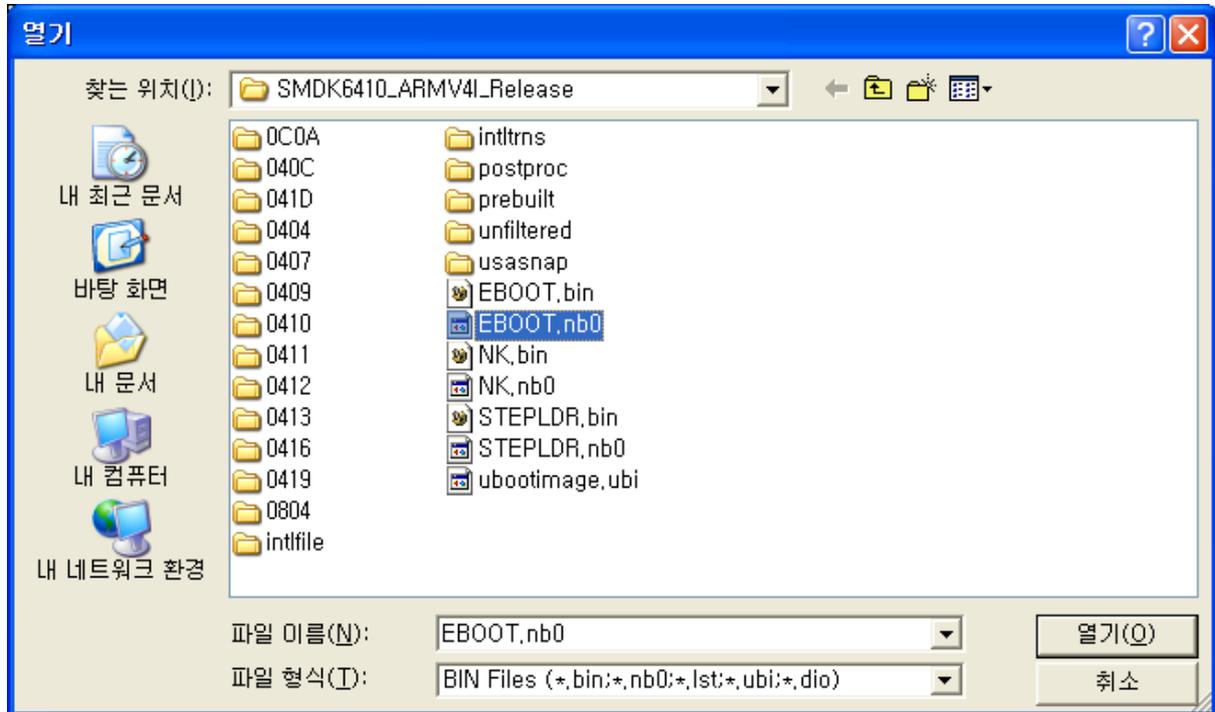
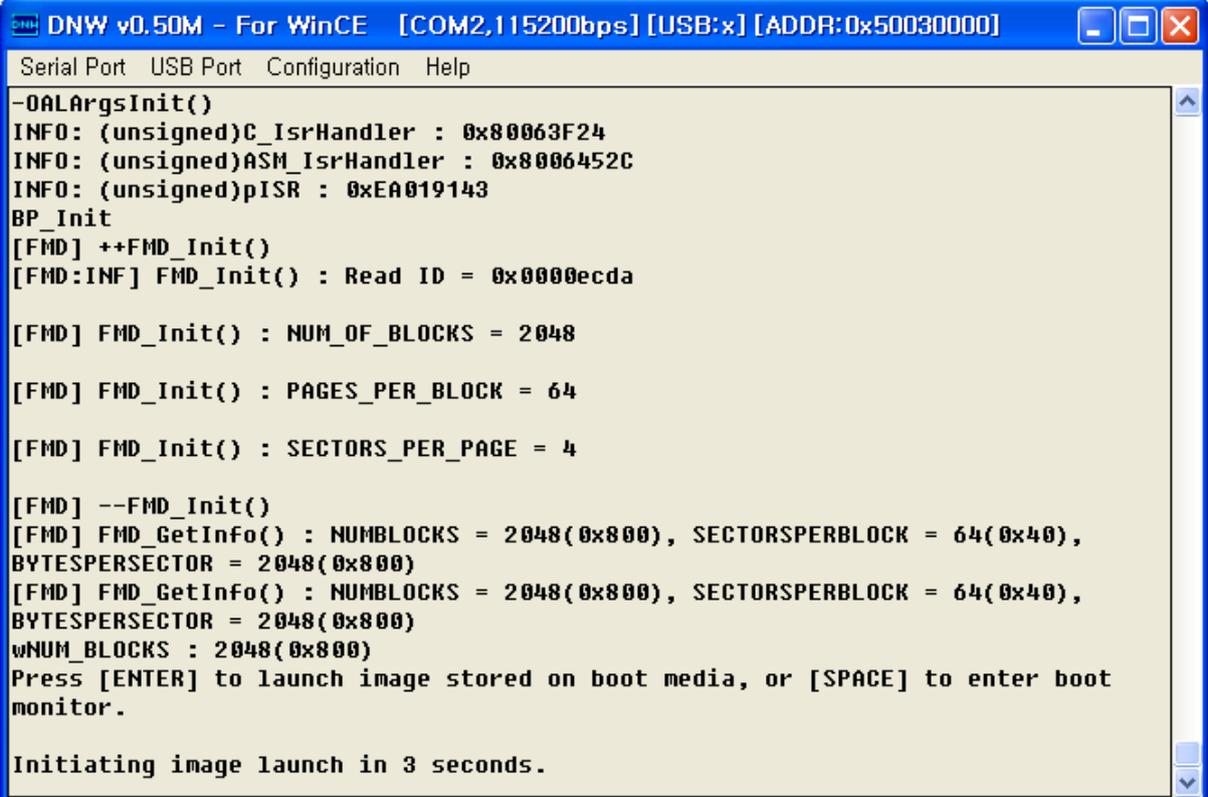


Figure 6-14 Selecting EBOOT.nb0 for Download

18. As soon as EBOOT.nb0 download is over, the following messages appear in the DNW window.

The image shows a screenshot of a terminal window titled "DNW v0.50M - For WinCE [COM2,115200bps] [USB:x] [ADDR:0x50030000]". The window has a menu bar with "Serial Port", "USB Port", "Configuration", and "Help". The main area displays the following text:

```
-OALargsInit()
INFO: (unsigned)C_IsrHandler : 0x80063F24
INFO: (unsigned)ASM_IsrHandler : 0x8006452C
INFO: (unsigned)pISR : 0xEA019143
BP_Init
[FMD] ++FMD_Init()
[FMD:INF] FMD_Init() : Read ID = 0x0000ecda

[FMD] FMD_Init() : NUM_OF_BLOCKS = 2048

[FMD] FMD_Init() : PAGES_PER_BLOCK = 64

[FMD] FMD_Init() : SECTORS_PER_PAGE = 4

[FMD] --FMD_Init()
[FMD] FMD_GetInfo() : NUMBLOCKS = 2048(0x800), SECTORS PERBLOCK = 64(0x40),
BYTESPERSECTOR = 2048(0x800)
[FMD] FMD_GetInfo() : NUMBLOCKS = 2048(0x800), SECTORS PERBLOCK = 64(0x40),
BYTESPERSECTOR = 2048(0x800)
wNUM_BLOCKS : 2048(0x800)
Press [ENTER] to launch image stored on boot media, or [SPACE] to enter boot
monitor.

Initiating image launch in 3 seconds.
```

Figure 6-15 After EBOOT.nb0 Download

19. Please hit the SPACE BAR key to view the current Ethernet Boot Loader Configuration.

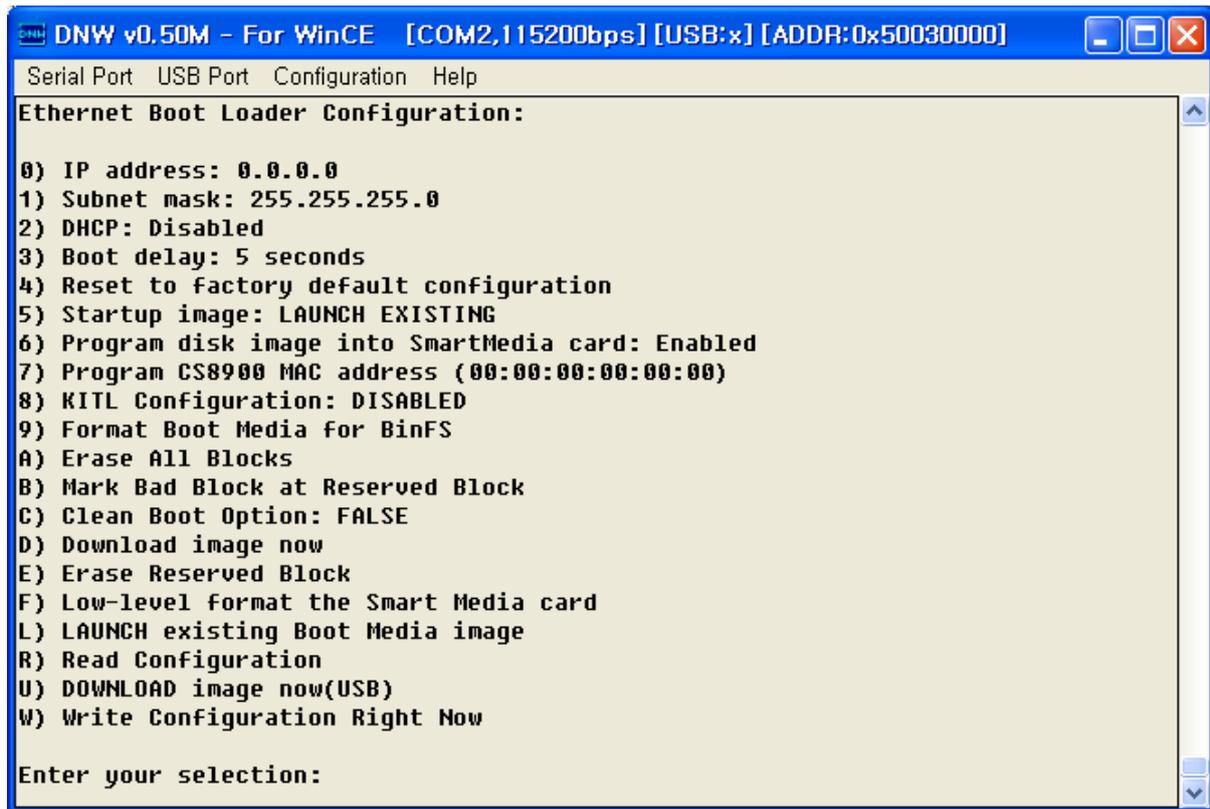


Figure 6-16 Ethernet Boot Loader Configuration

20. Enter [U] to Download image now(USB), the following messages appear in the DNW window.

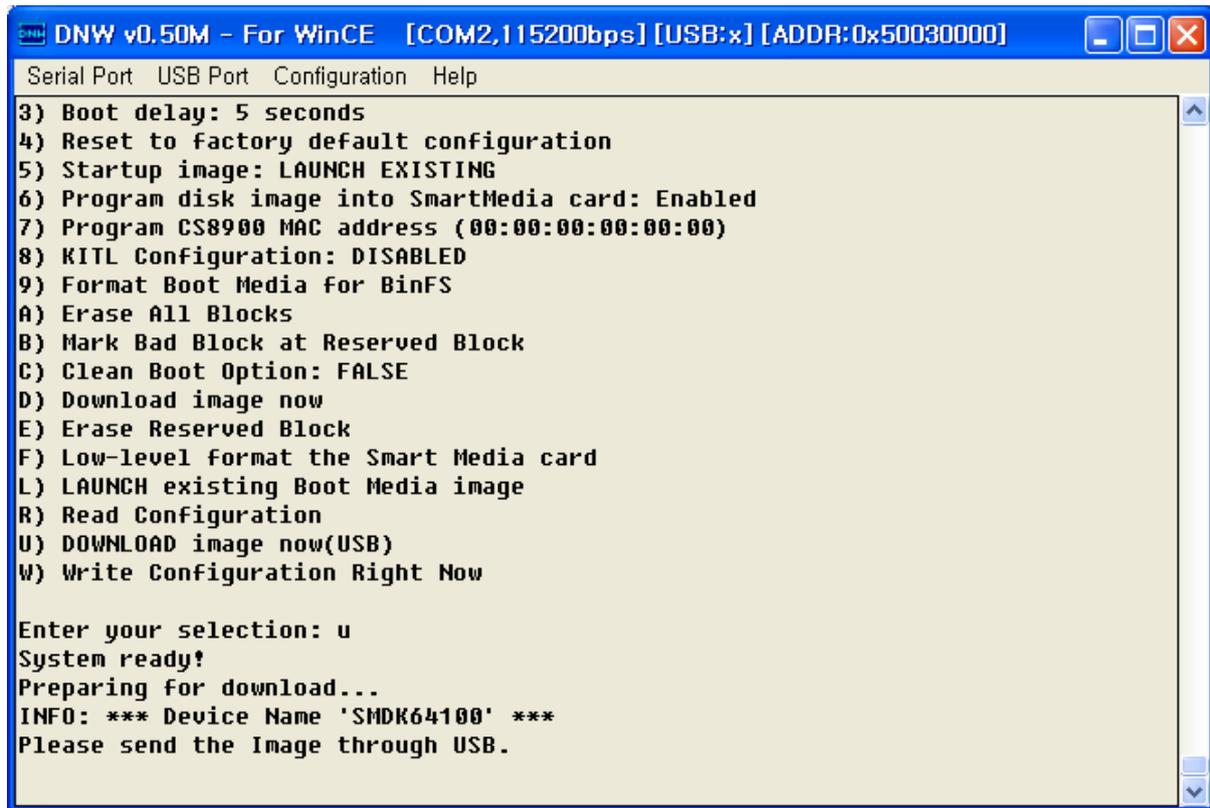


Figure 6-17 Preparing to download image through USB

21. On the USB Port menu click UBOOT and the following window appears on your screen. Select Eboot.bin from X:\WINCE600\OSDesigns\[OSDesign name]\[OSDesign name]\ReIDir\SMDK6410\_ARMV4I\_Release directory and then click Open button.

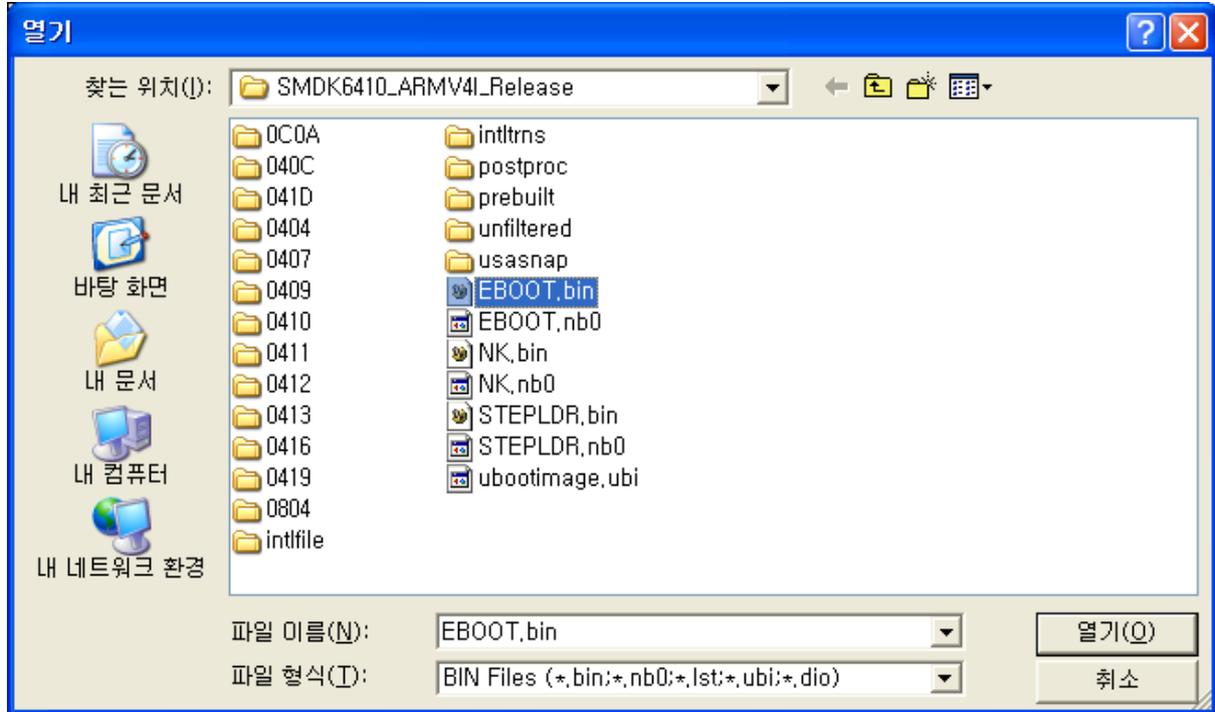
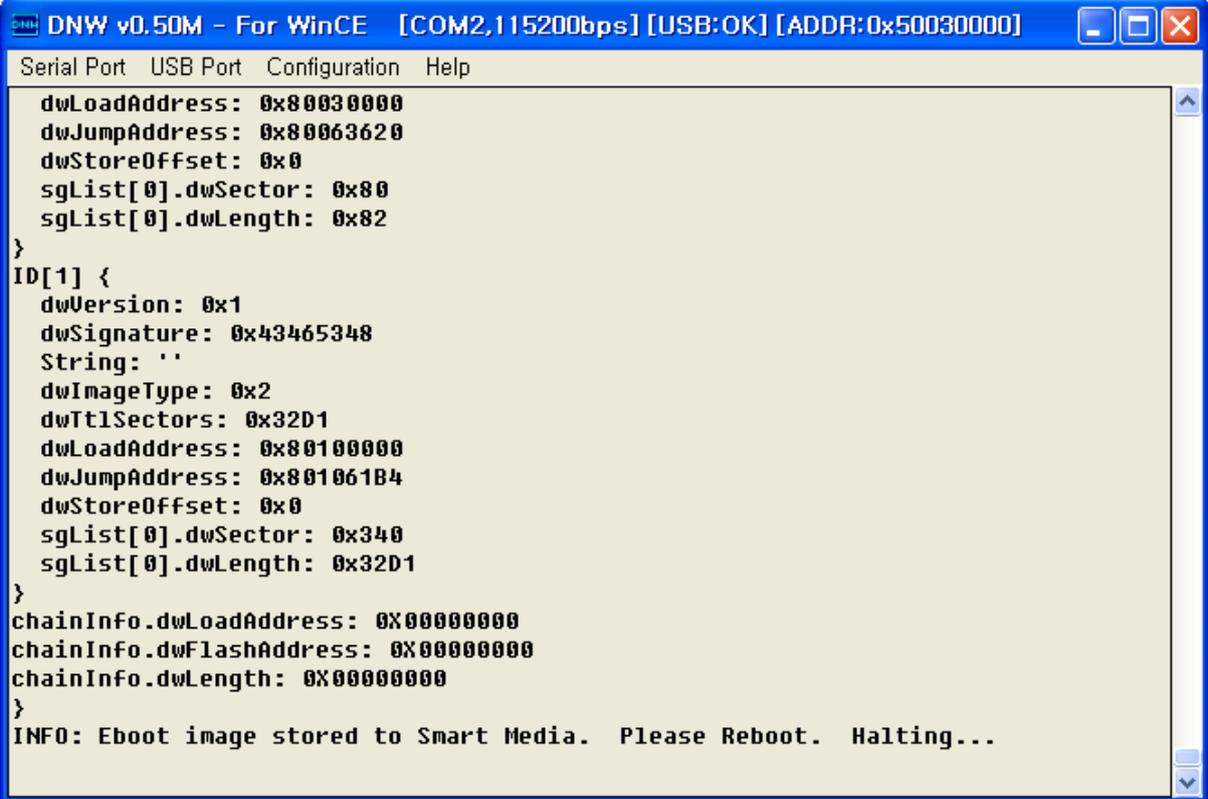


Figure 6-18 Selecting EBOOT.bin for Download

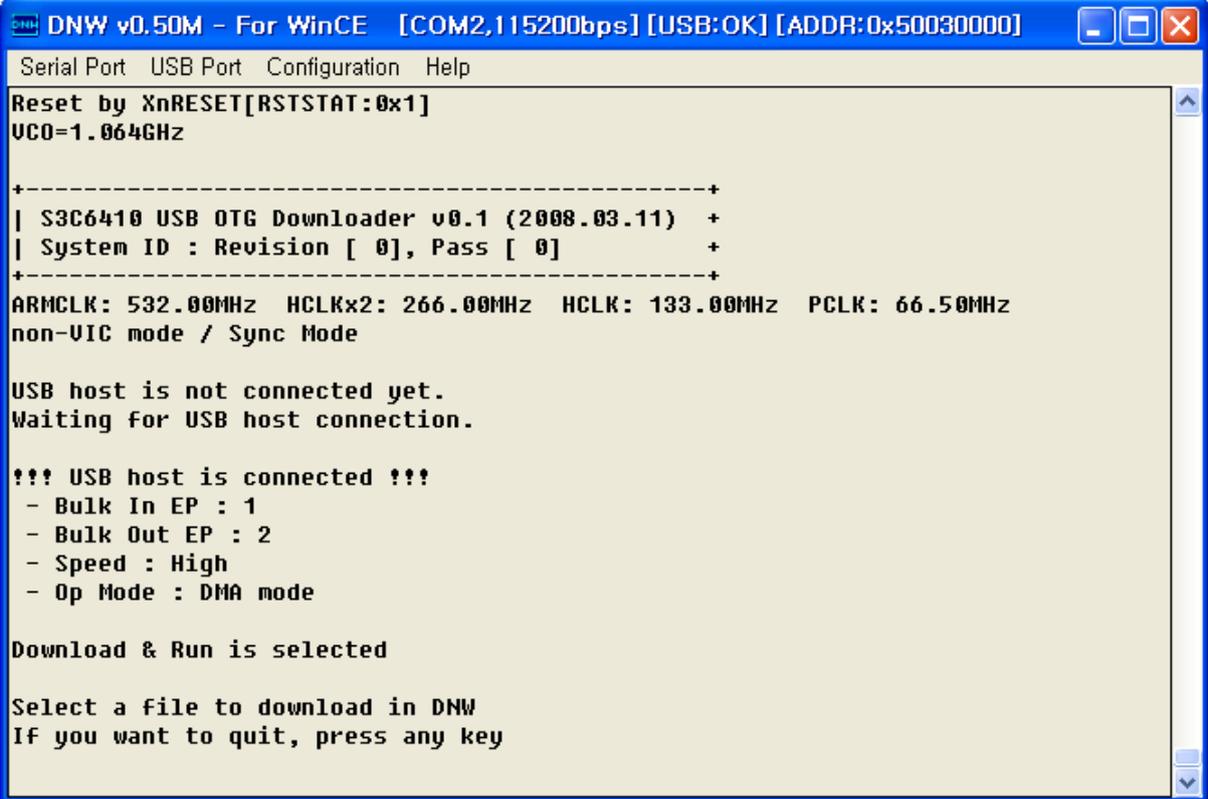
22. You can see the following messages on the DNW window after EBOOT.bin download.

The image shows a screenshot of a software window titled "DNW v0.50M - For WinCE [COM2,115200bps] [USB:OK] [ADDR:0x50030000]". The window has a menu bar with "Serial Port", "USB Port", "Configuration", and "Help". The main area displays a series of hexadecimal values and strings, representing the output of the EBOOT.bin download process. The output includes fields for load and jump addresses, store offsets, sector and length information for a sector list, and a block of ID[1] containing version, signature, string, image type, and total sectors. It also shows chainInfo fields for load address, flash address, and length. The final line of output is "INFO: Eboot image stored to Smart Media. Please Reboot. Halting...".

```
dwLoadAddress: 0x80030000
dwJumpAddress: 0x80063620
dwStoreOffset: 0x0
sgList[0].dwSector: 0x80
sgList[0].dwLength: 0x82
}
ID[1] {
  dwVersion: 0x1
  dwSignature: 0x43465348
  String: ''
  dwImageType: 0x2
  dwTtlSectors: 0x32D1
  dwLoadAddress: 0x80100000
  dwJumpAddress: 0x801061B4
  dwStoreOffset: 0x0
  sgList[0].dwSector: 0x340
  sgList[0].dwLength: 0x32D1
}
chainInfo.dwLoadAddress: 0X00000000
chainInfo.dwFlashAddress: 0X00000000
chainInfo.dwLength: 0X00000000
}
INFO: Eboot image stored to Smart Media. Please Reboot. Halting...
```

Figure 6-19 Messages via UART Port after EBOOT.bin Download

23. Reset the board. DNW window appears as shown in figure 6-20.



```
DNW v0.50M - For WinCE [COM2,115200bps] [USB:OK] [ADDR:0x50030000]
Serial Port  USB Port  Configuration  Help
Reset by XnRESET[RSTSTAT:0x1]
UCO=1.064GHz

+-----+
| S3C6410 USB OTG Downloader v0.1 (2008.03.11) | +
| System ID : Revision [ 0], Pass [ 0]         | +
+-----+
ARMCLK: 532.00MHz  HCLKx2: 266.00MHz  HCLK: 133.00MHz  PCLK: 66.50MHz
non-VIC mode / Sync Mode

USB host is not connected yet.
Waiting for USB host connection.

!!! USB host is connected !!!
- Bulk In EP : 1
- Bulk Out EP : 2
- Speed : High
- Op Mode : DMA mode

Download & Run is selected

Select a file to download in DNW
If you want to quit, press any key
```

Figure 6-20 DNW Window after reset

24. On the USB Port menu, click Transmit and the following window appears on your screen. Select EBOOT.nb0 file from X:\WINCE600\OSDesigns\[OSDesign name] \[OSDesign name]\RelDir\SMDK6410\_ARMV4I\_Release directory and then click Open button.

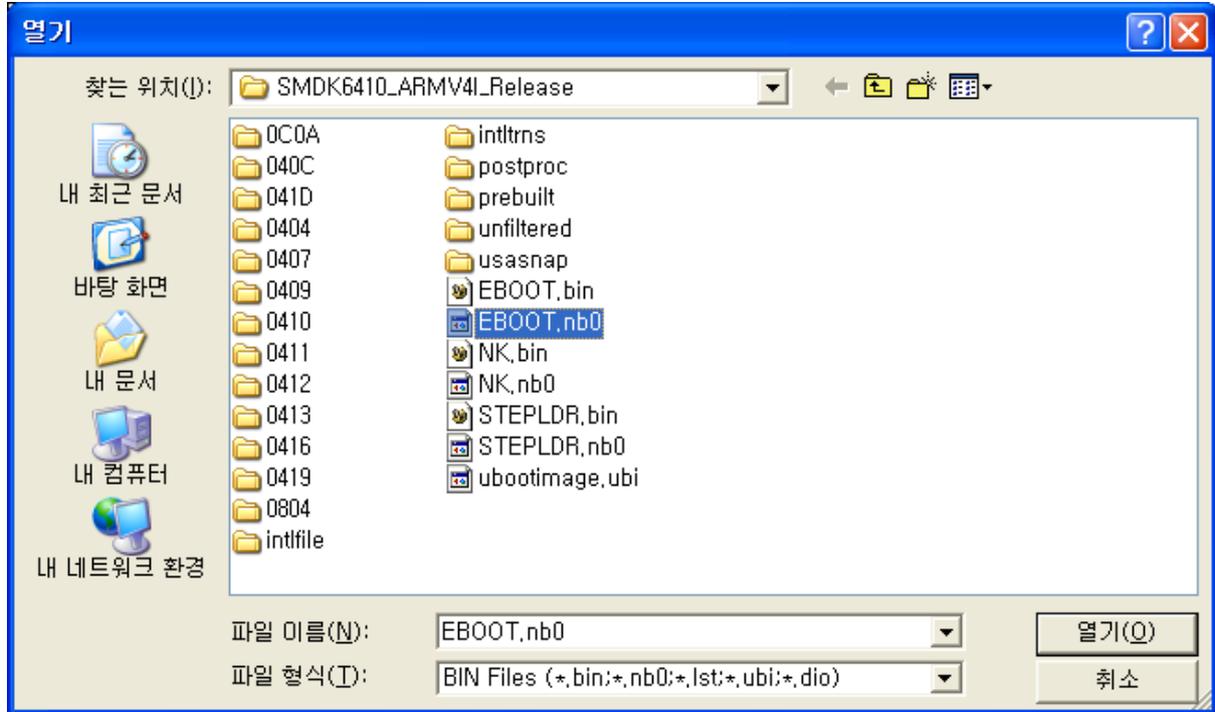
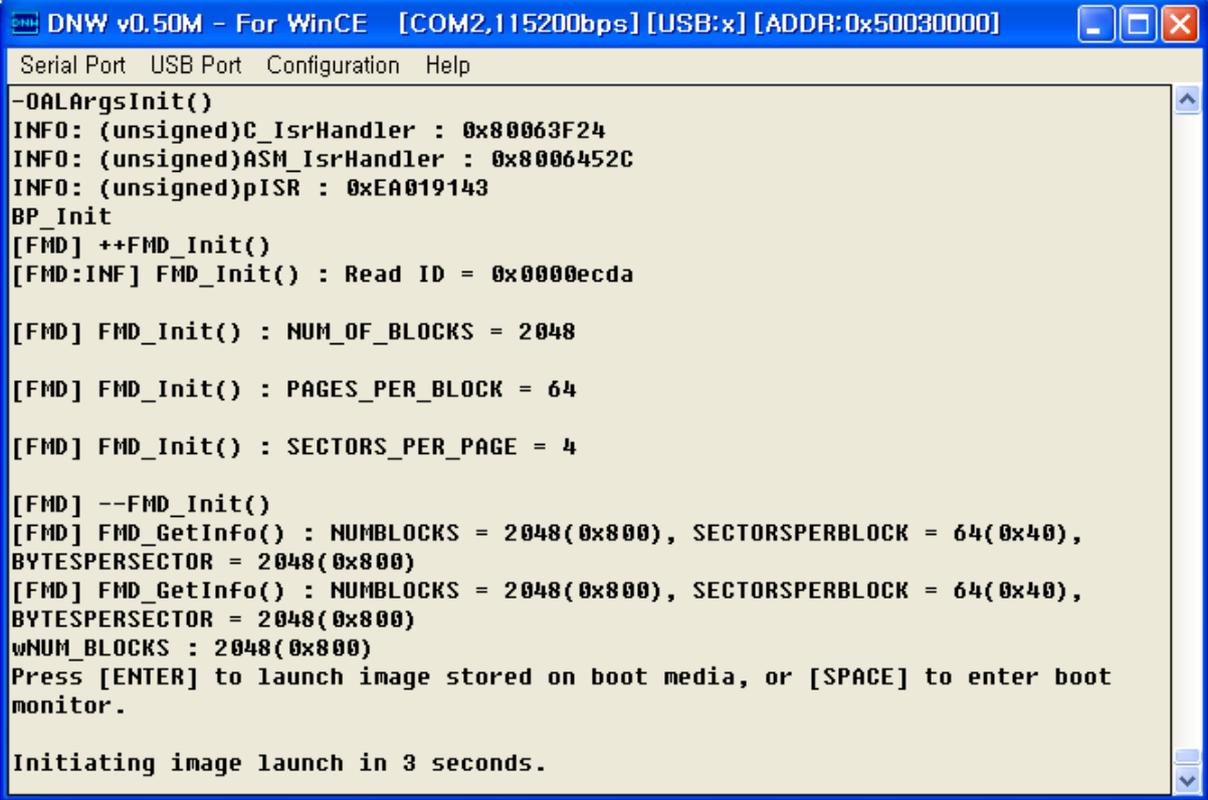


Figure 6-21 Selecting EBOOT.nb0 for Download

25. As soon as EBOOT.nb0 download is over, the following messages appear in the DNW window.

The image shows a screenshot of a terminal window titled "DNW v0.50M - For WinCE [COM2,115200bps] [USB:x] [ADDR:0x50030000]". The window has a menu bar with "Serial Port", "USB Port", "Configuration", and "Help". The main area displays the following text:

```
-OALargsInit()
INFO: (unsigned)C_IsrHandler : 0x80063F24
INFO: (unsigned)ASM_IsrHandler : 0x8006452C
INFO: (unsigned)pISR : 0xEA019143
BP_Init
[FMD] ++FMD_Init()
[FMD:INF] FMD_Init() : Read ID = 0x0000ecda

[FMD] FMD_Init() : NUM_OF_BLOCKS = 2048

[FMD] FMD_Init() : PAGES_PER_BLOCK = 64

[FMD] FMD_Init() : SECTORS_PER_PAGE = 4

[FMD] --FMD_Init()
[FMD] FMD_GetInfo() : NUMBLOCKS = 2048(0x800), SECTORS_PER_BLOCK = 64(0x40),
BYTES_PER_SECTOR = 2048(0x800)
[FMD] FMD_GetInfo() : NUMBLOCKS = 2048(0x800), SECTORS_PER_BLOCK = 64(0x40),
BYTES_PER_SECTOR = 2048(0x800)
wNUM_BLOCKS : 2048(0x800)
Press [ENTER] to launch image stored on boot media, or [SPACE] to enter boot
monitor.

Initiating image launch in 3 seconds.
```

Figure 6-22 After EBOOT.nb0 Download

26. Please hit the SPACE BAR key to view the current Ethernet Boot Loader Configuration.

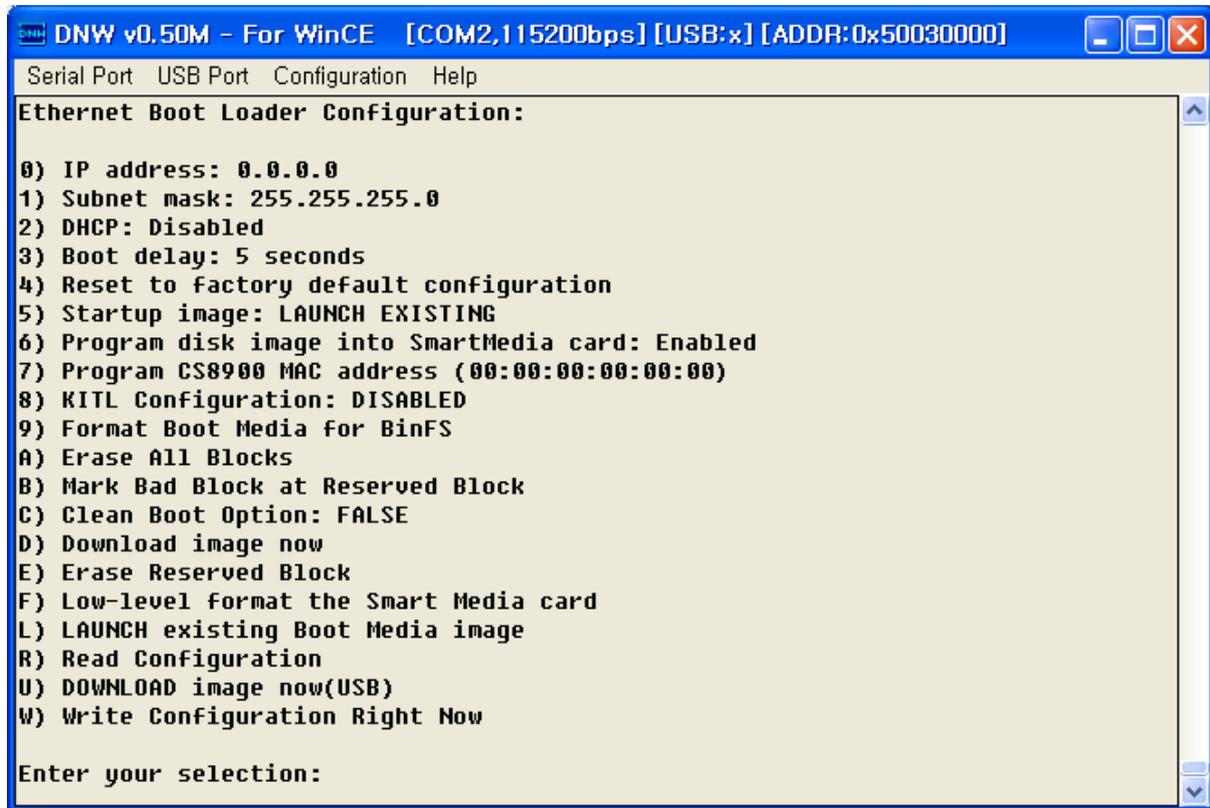


Figure 6-23 Ethernet Boot Loader Configuration

27. Enter [F] to Reserve for Blocks of Stepldr.nb0 and Eboot.bin, and format other blocks
28. Enter [9] to make BinFS on other blocks,
29. Enter [U] to Download image now(USB), the following messages appear in the DNW window.

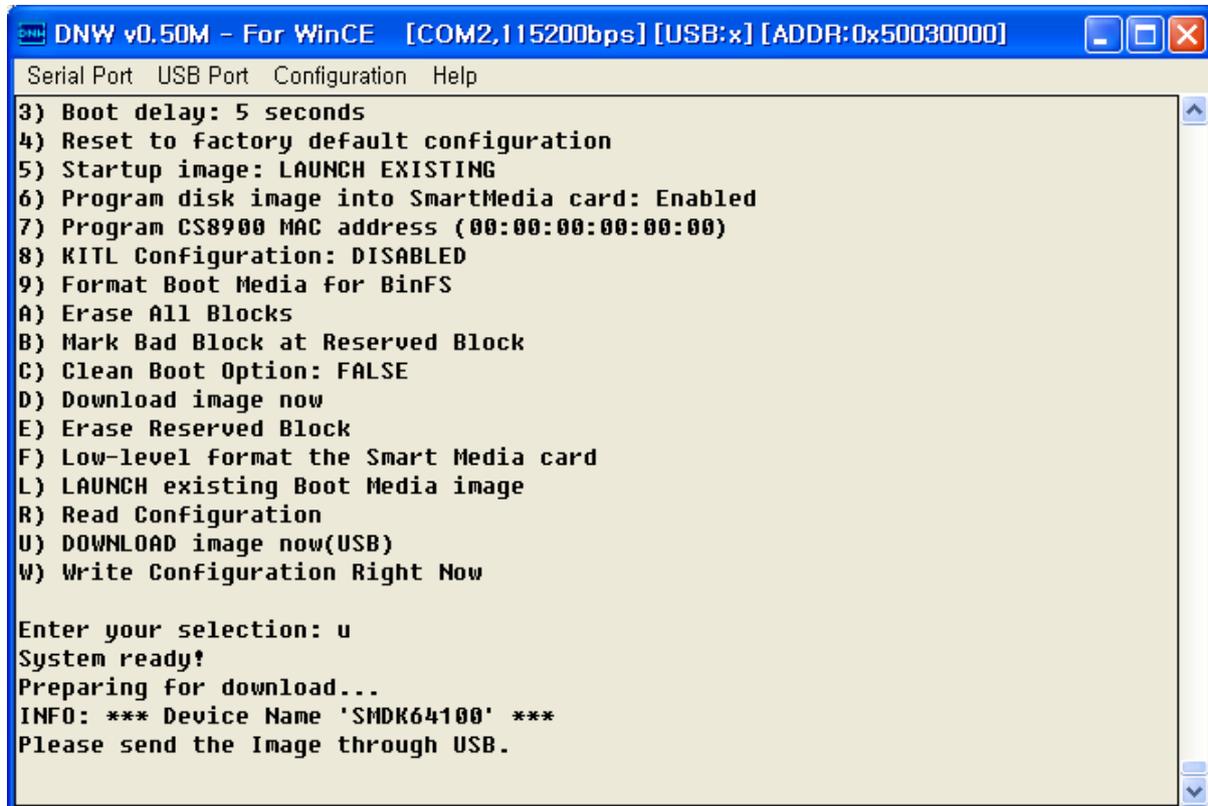


Figure 6-24 Preparing to download image through USB

30. On the USB Port menu click UBOOT and the following window appears on your screen. Select NK.bin from X:\WINCE600\OSDesigns\[OSDesign name]\[OSDesign name]\ReIDir\SMDK6410\_ARMV4I\_Release directory and then click Open button.

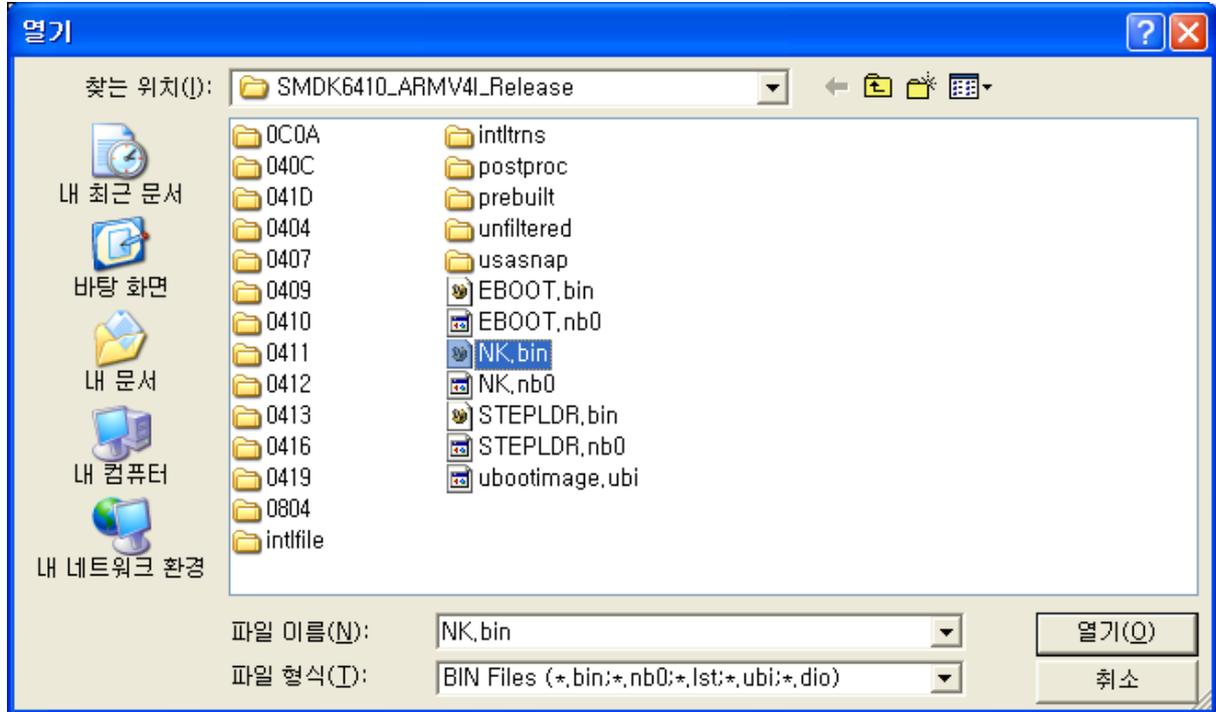
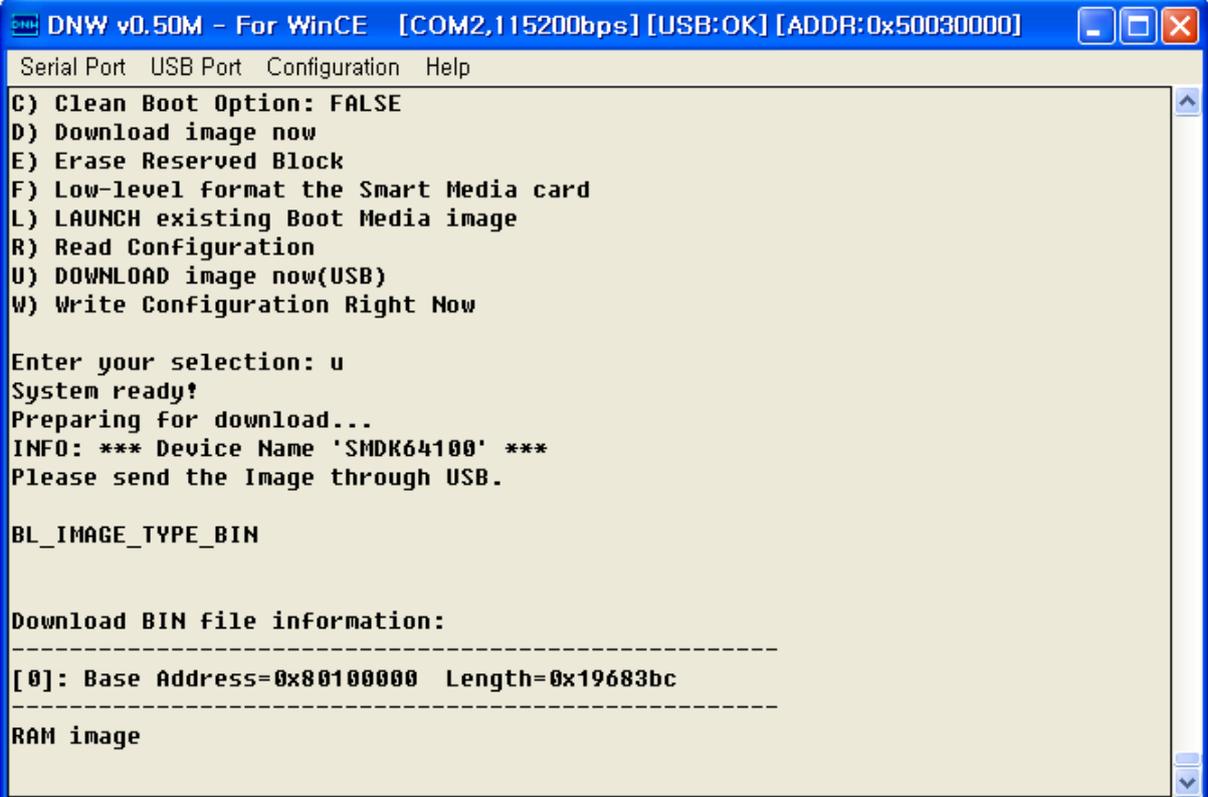


Figure 6-25 Selecting NK.bin for Download

31. You can see the following messages on the DNW window after NK.bin download.



The screenshot shows a window titled "DNW v0.50M - For WinCE [COM2,115200bps] [USB:OK] [ADDR:0x50030000]". The window contains a menu bar with "Serial Port", "USB Port", "Configuration", and "Help". The main text area displays the following messages:

```
C) Clean Boot Option: FALSE
D) Download image now
E) Erase Reserved Block
F) Low-level format the Smart Media card
L) LAUNCH existing Boot Media image
R) Read Configuration
U) DOWNLOAD image now(USB)
W) Write Configuration Right Now

Enter your selection: u
System ready!
Preparing for download...
INFO: *** Device Name 'SMDK64100' ***
Please send the Image through USB.

BL_IMAGE_TYPE_BIN

Download BIN file information:
-----
[0]: Base Address=0x80100000 Length=0x19683bc
-----

RAM image
```

Figure 6-26 Messages via UART Port during NK.bin Download

32. After NK.bin download is over, Windows Embedded CE 6.0 boots on the target Board.
33. Power OFF the board and Configure DIP switch CFG0 on the CPU Board and CFGB3 on the base board properly for booting from NAND Flash. (For more information about board configuration, Read SMDK6410 Board User's Manual in Document folder)
34. Power ON the board. You can see Windows Embedded CE 6.0 boots on the target board.

## 7 Building and Running OS Image - With KITL

In this chapter, you can understand how to build, download and run the OS image with KITL.

1. To enable KITL, on the left side of **Visual Studio 2005**, You can see the Solution Explorer as below figure. And then right click on OSDesign1 and select **Properties**.

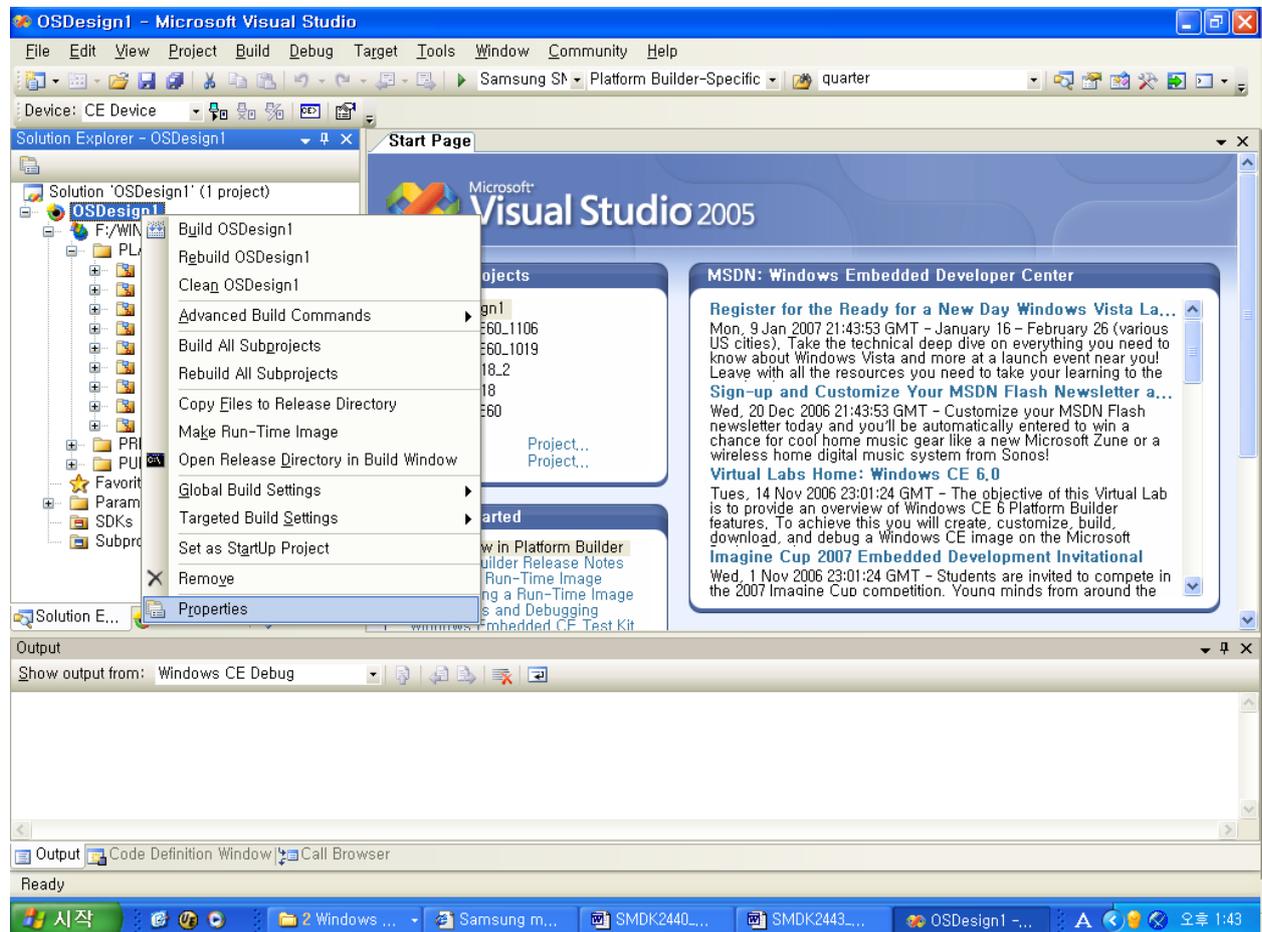


Figure 7-1 OSDesign Properties

2. OSDesign1 Property Pages window appears on your screen. Check square boxes **Enable kernel debugger**(no `IMGNODEBUGGER=1`) and **Enable KITL** (no `IMGNOKITL=1`) in the **Build Options** and then click **OK** button.

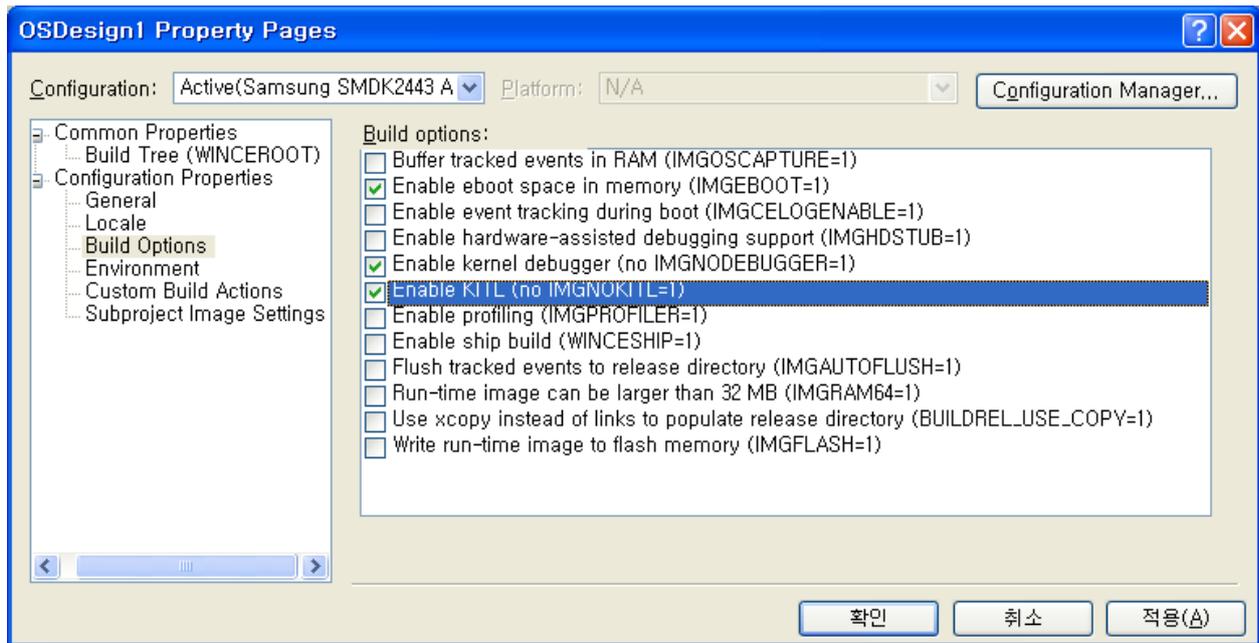


Figure 7-2 Property Pages for KITL

## 7.1 USB Serial KITL

1. To enable WinCE image with USB Serial KITL, you must do the following:

➤ X:\WINCE600\PLATFORM\SMDK6410\smdk6410.bat file must have the following settings.

```
set BSP_NOSERIAL=
set BSP_NOUSBFN=1

rem set BSP_KITL=NONE
rem set BSP_KITL=SERIAL_UART0
rem set BSP_KITL=SERIAL_UART1
rem set BSP_KITL=SERIAL_UART2
rem set BSP_KITL=SERIAL_UART3
set BSP_KITL=USBSERIAL
```

2. On the **Build** menu, click **Build OSDesign1** as shown in figure 7-16 to build the Eboot and OS image.

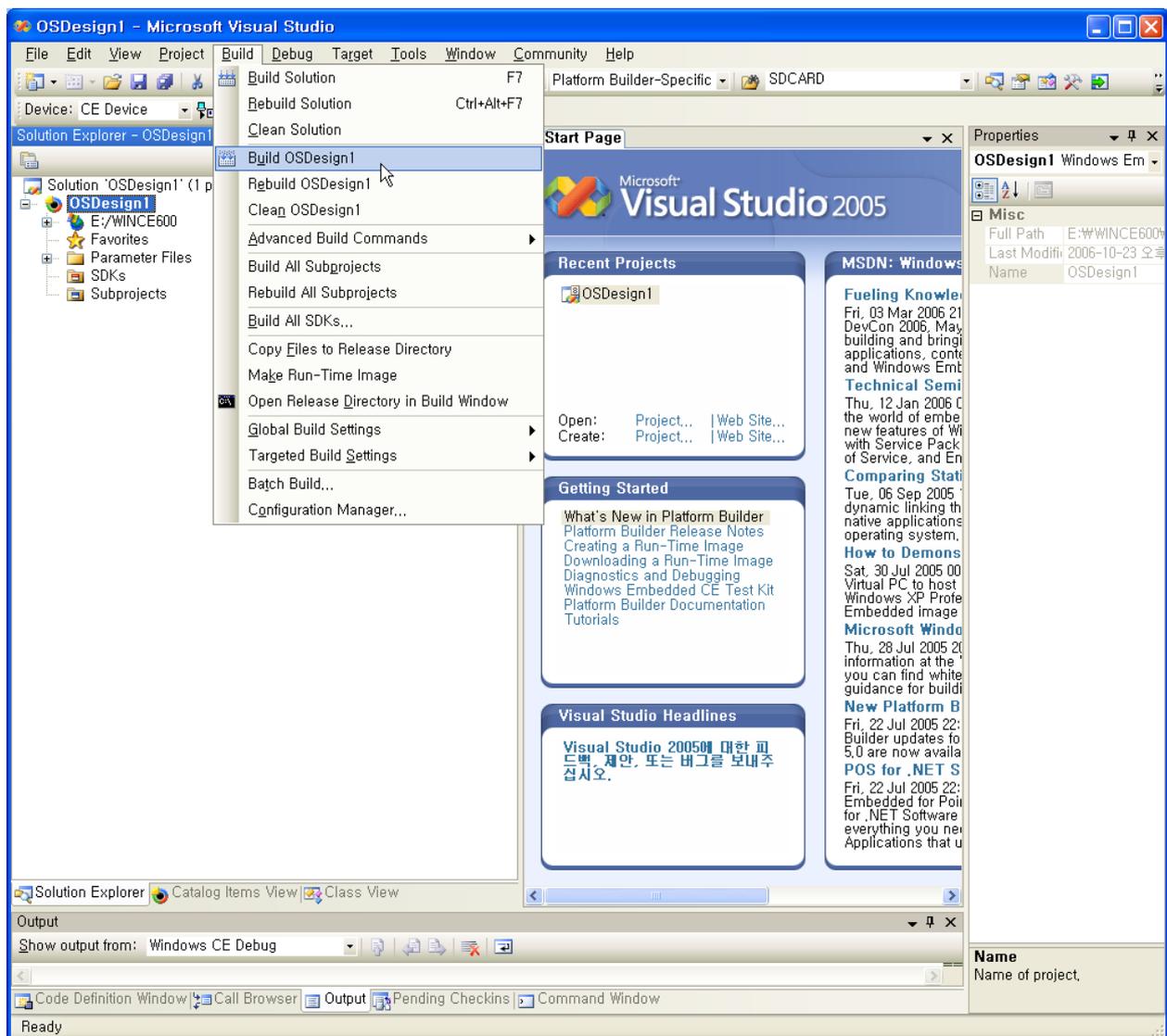


Figure 7-3 Build OSDesign

**Note:** Building process may take some time depending on your system capability. So, please wait for the build process to be completed. It might take around 1 hour.

---

3. After completion of build process, . EBOOT.nb0, EBOOT.bin, STEPLDR.bin, NK.bin and NK.nb0 are now available in X:\WINCE600\OSDesigns \[OS Design Name] \[OS Design Name]\RelDir\smdk6410\_ARMV4I\_Release directory.
4. Please install the USB Driver and DNW application on your host PC if it is not installed before.
5. Please refer to chapter 6 Fusing WinCE image to SMC via USB in this documentation. And fuse to SMC along to Steps in Chapter 6.
6. Reset the board. DNW window appears as shown in figure 7-17.

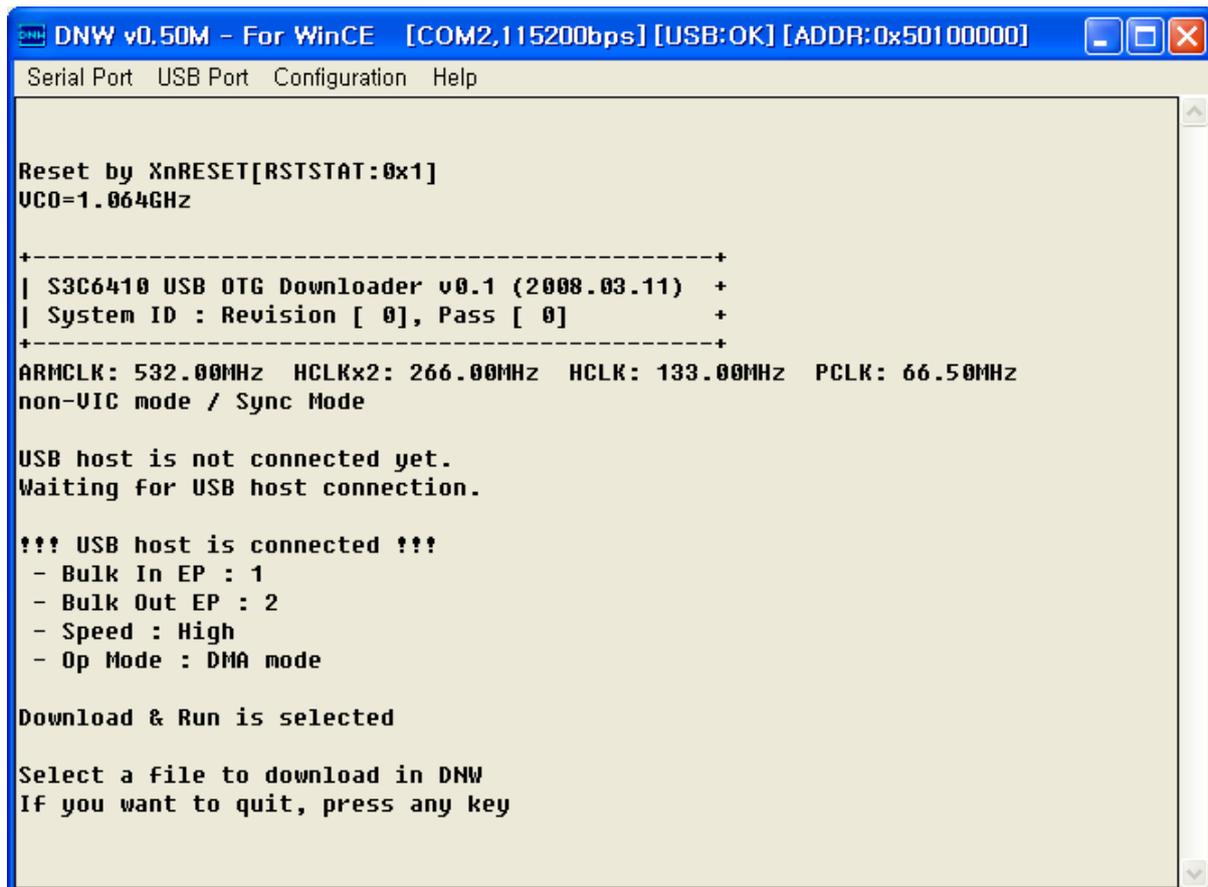


Figure 7-4 DNW Window after reset

7. On the USB Port menu, click Transmit and the following window appears on your screen. Select EBOOT.nb0 file from X:\WINCE600\OSDesigns\[OSDesign name] \[OSDesign name]\RelDir\smdk6410\_ARMV4I\_Release directory and then click Open button.

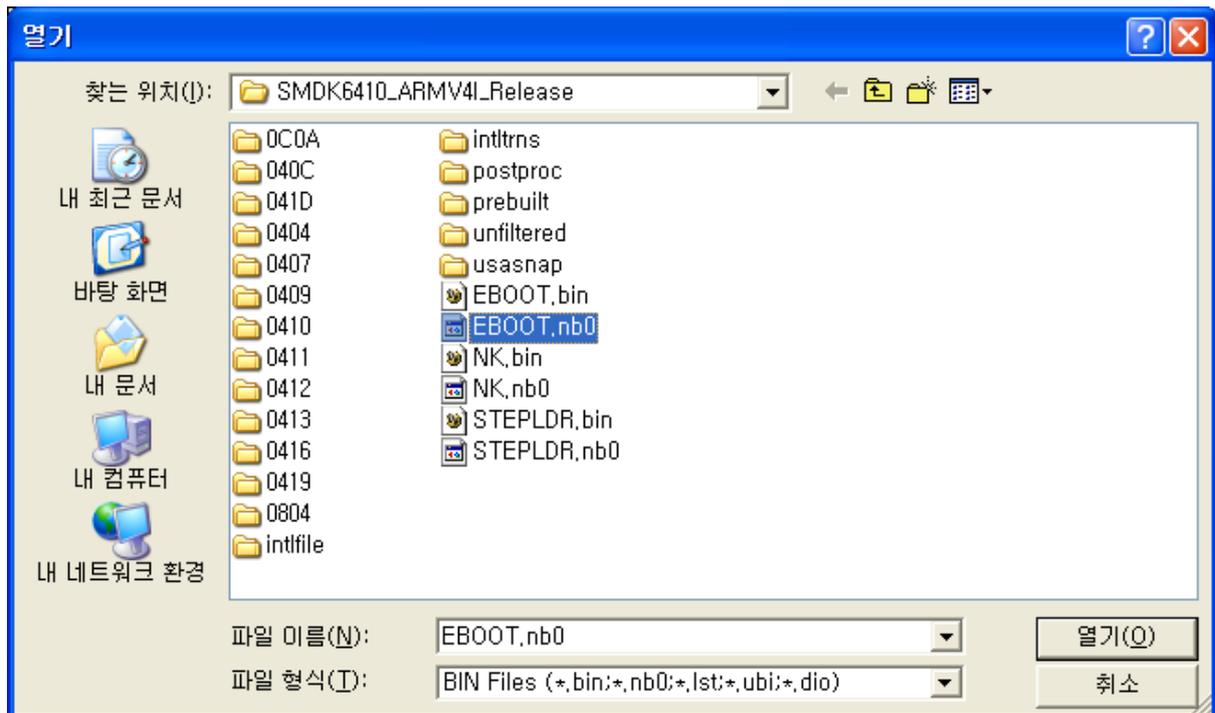


Figure 7-5 Selecting EBOOT.nb0 for Download

8. As soon as EBOOT.nb0 download is over, the following messages appear in the DNW window.

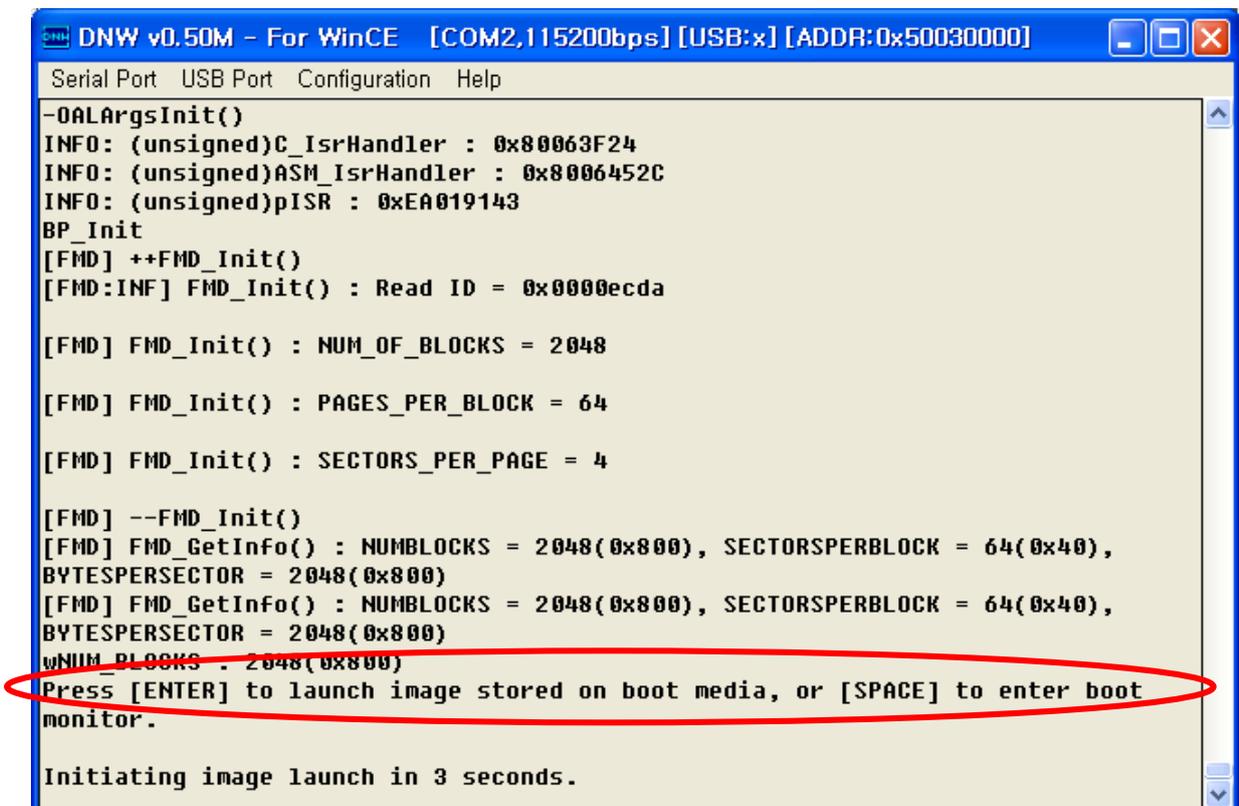


Figure 7-6 After EBOOT.nb0 Download

9. Please hit the SPACE BAR key to view the current Ethernet Boot Loader Configuration. Configure the Ethernet Boot Loader as follows by entering the respective options:

- Keep KITL Configuration: **ENABLED**
- Enter [L] to LAUNCH existing Boot Media image

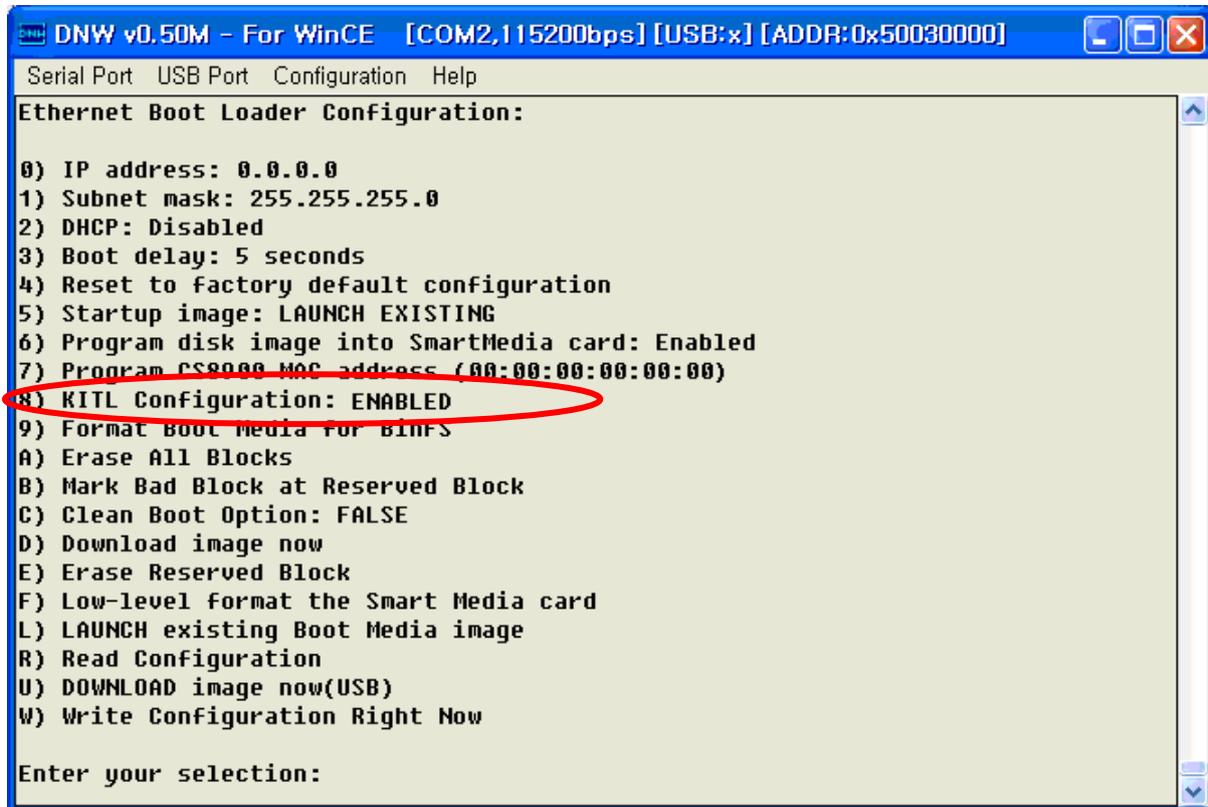


Figure 7-7 Ethernet Boot Loader Configuration

10. On the Target menu in the Visual Studio 2005 window, click **Connectivity Options...** as shown below. Target Device Connectivity Options window appears on your screen as shown in figure 7-22.

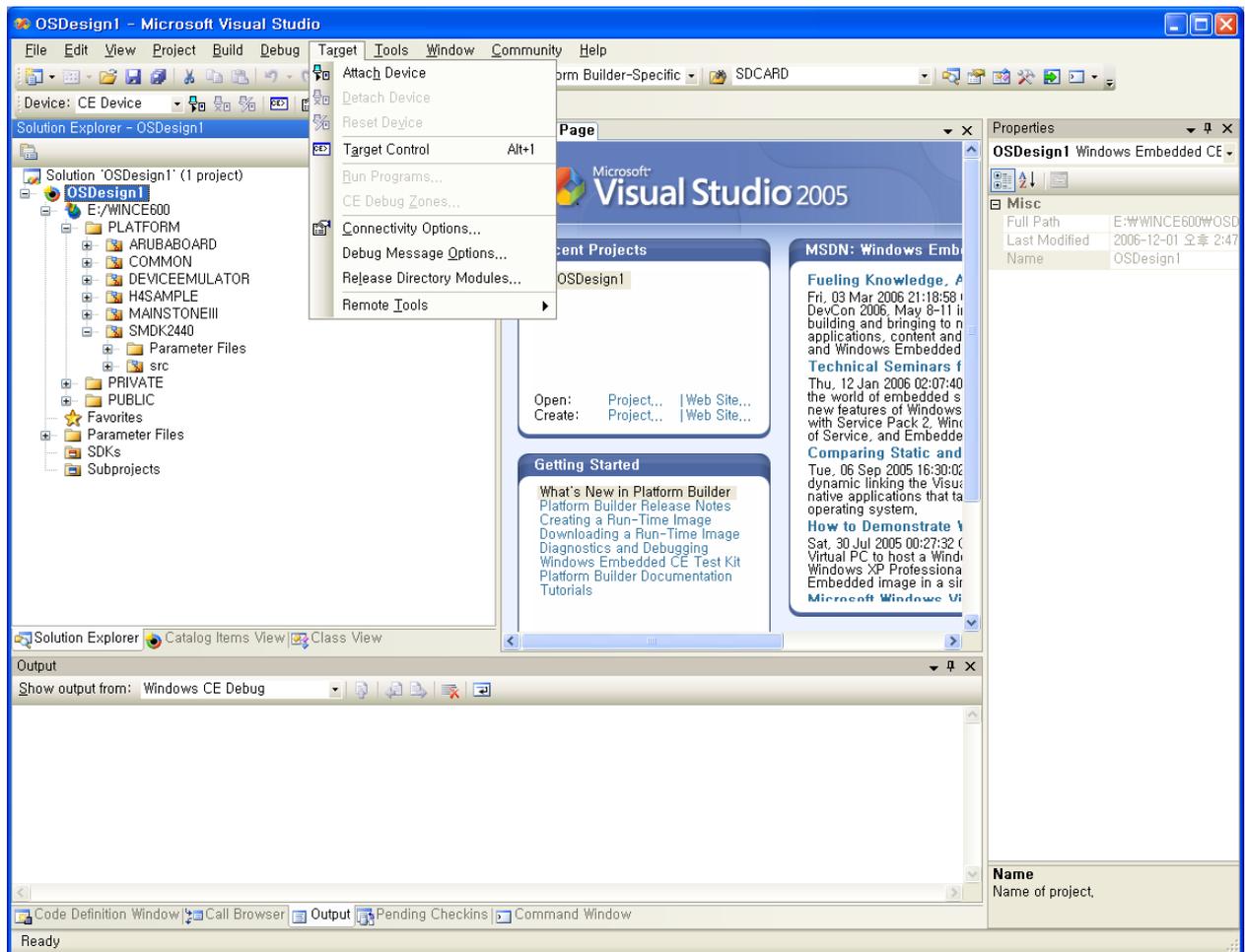


Figure 7-8 Target Connectivity Option

11. On the Target Device Connectivity Options window, select USB option from Transport drop down menu box.

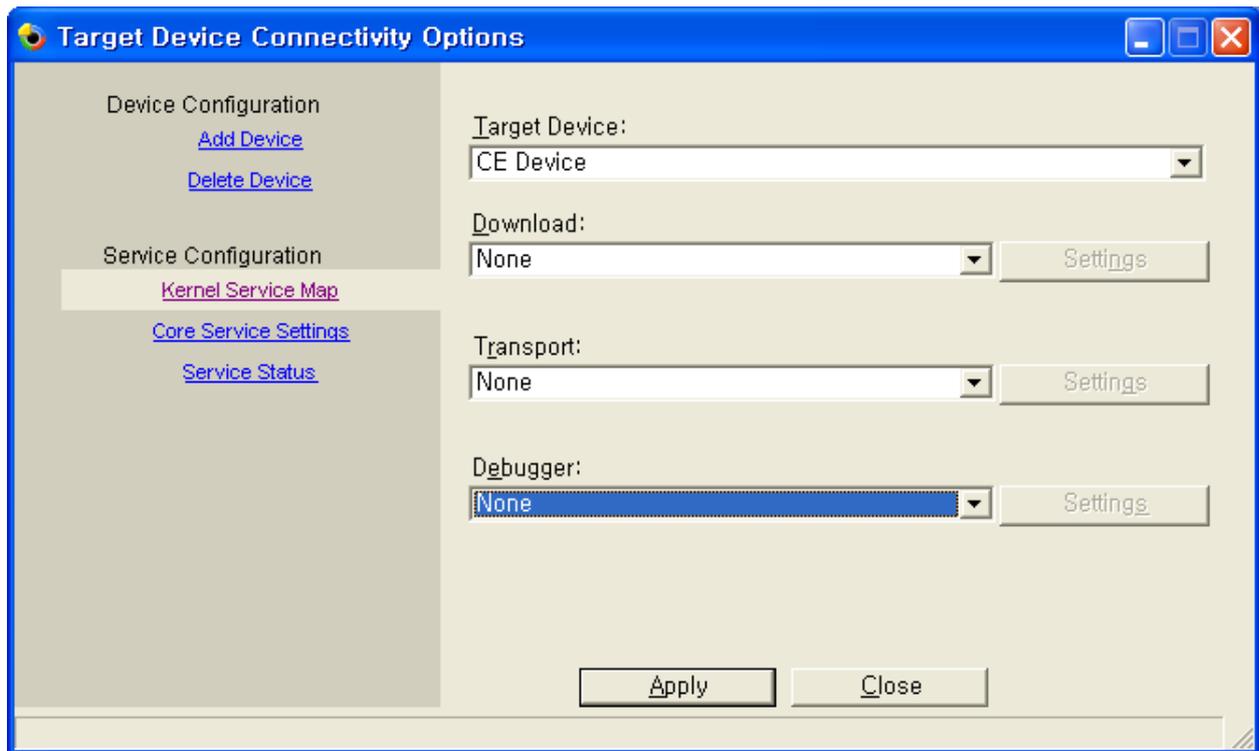


Figure 7-9 Target Device Connectivity Options Window Before Transport Select

12. Configure the KdStub option in Debugger drop down menu box.

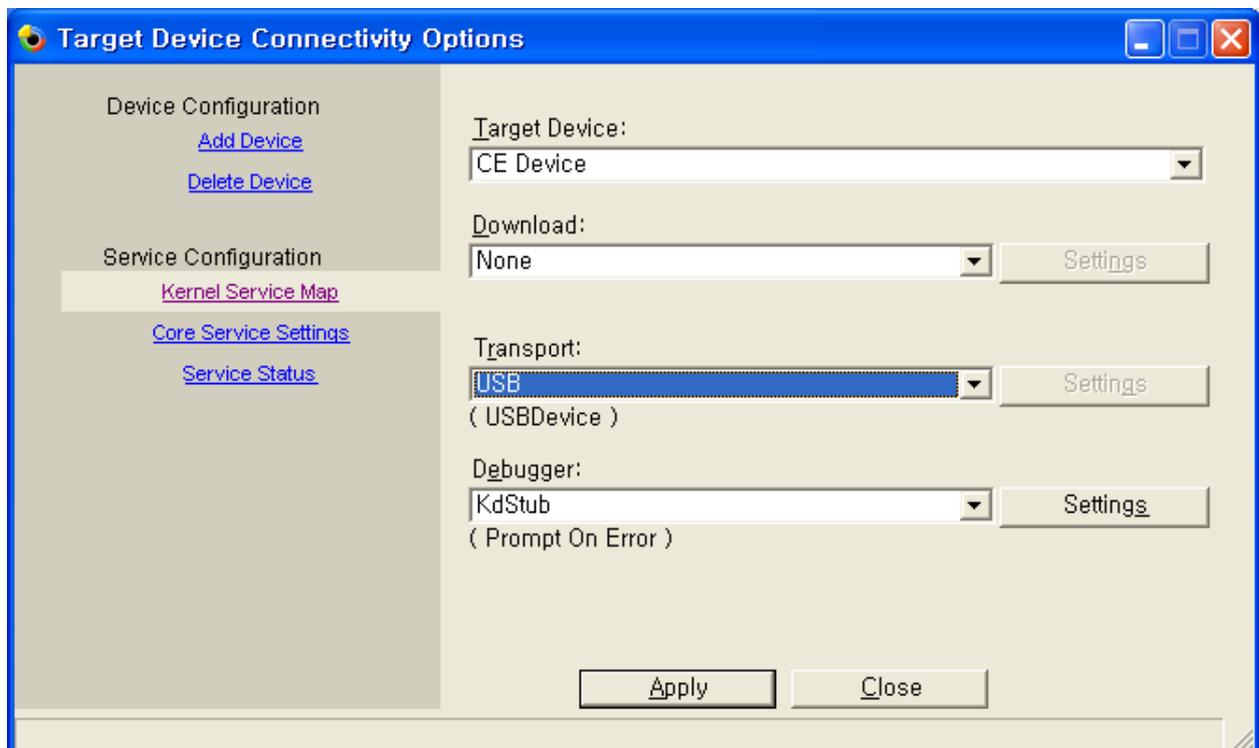


Figure 7-10 Target Device Connectivity Options Window After Transport Select

13. On the Target menu in Visual Studio 2005 window, click **Attach Device** as shown below.

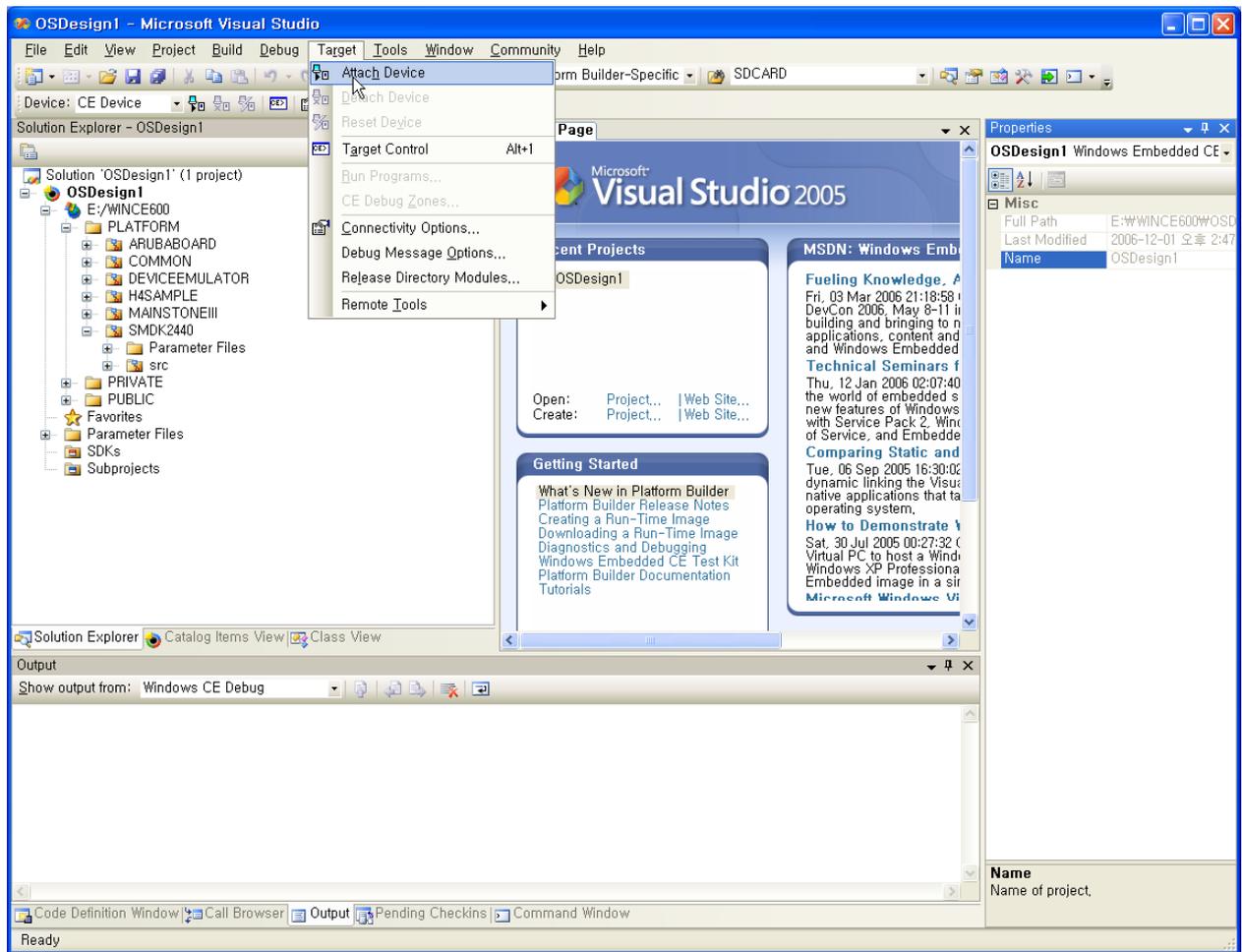


Figure 7-11 Attach Device

14. You can see the following messages on the DNW window.



```
DNW v0.60C - For WinCE [COM3,115200bps][USB:x][ADDR:0x50100000]
Serial Port USB Port Configuration Help
-OALArgsInit()
+OALTimerInit( 1, 16624, 0 )
-OALIntrRequestSysIntr(irq = 38, sysIntr = 16)
[KITL] ++OEMKitlStartup()
[KITL] KITL: USB Serial
DeviceId..... 6410USBSerKITL
kitlArgs.flags..... 0x11
kitlArgs.devLoc.Ifctype.... -1
kitlArgs.devLoc.LogicalLoc. 0x7c000000
kitlArgs.devLoc.PhysicalLoc 0x0
kitlArgs.devLoc.Pin..... 96
kitlArgs.ip4address..... 0.0.0.0
[KITL] Call OALKitlInit()

DeviceId..... 6410USBSerKITL

pArgs->flags..... 0x11
pArgs->devLoc.Ifctype.... -1
pArgs->devLoc.LogicalLoc. 0x7C000000
pArgs->devLoc.PhysicalLoc 0x0
pArgs->devLoc.Pin..... 96
pArgs->ip4address..... 0
pDevice->Name..... s
pDevice->ifctype..... -1
pDevice->id..... 0x7C000000
pDevice->resource..... 0
pDevice->type..... 1
pDevice->pDriver..... 0x81BB9028

Wait for connecting
WARN: KITL will run in polling mode

Connecting to Desktop

Connecting to Desktop .. resending
```

Figure 7-12 Messages via UART Port



## 8 Appendix I - DIP Switch Settings for Booting Mode

Table 8-1 and 8-2 explains the DIP Switch configuration on the SMDK6410 board for Booting mode.

### AMD NOR/SROM Boot

<i>Description</i>	CFG3[6:1]				
	[6]	[5]	[4]	[3]	[2]
NOR Boot ( 8bit Data Width)	Don't Care	OFF	ON	OFF	OFF
NOR Boot (16bit Data Width)	Don't Care	OFF	ON	OFF	ON

Table 8-1 DIP Switch setting for AMD Flash Boot (NOR Flash)

### NAND Boot

<i>Description</i>	CFG3[6:1]				
	[6]	[5]	[4]	[3]	[2]
Normal NAND, 512-byte page, 3 addr. Cycle	ON	OFF	OFF	OFF	OFF
Normal NAND, 512-byte page, 4 addr. Cycle	ON	OFF	OFF	OFF	ON
Advanced NAND, 2K-byte page, 4 addr. Cycle	ON	OFF	OFF	ON	OFF
Advanced NAND, 2K-byte page, 5 addr. Cycle	ON	OFF	OFF	ON	ON

<i>Description</i>	CFG3[4:1]			
	[4]	[3]	[2]	[1]
Connected NandFlash to Xm0CSn2	OFF	OFF	OFF	ON
Connected XD Picture Card to Xm0CSn2	OFF	OFF	ON	OFF

Table 8-2 DIP Switch setting for NAND Flash Boot

**Note:** For more information about board configuration, Check SMDK6410 Board Manual in DOC folder