



Installation Manual for SMDK6410 (Windows Embedded CE 6.0) PocketMory(MLC)

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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0.1	Preliminary draft	-	Hyuk Lee	2008-09-16
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Contents

1	OVERVIEW.....	1
2	COPYING BSP AND SETTING UP VISUAL STUDIO 2005	2
3	CREATING A NEW OS DESIGN.....	4
4	BUILDING OS IMAGE – WITHOUT KITL	12
5	RUNNING NK.NB0 IMAGE (AVAILABLE ON THE SINGLE-XIP ONLY).....	25
6	FUSING WINCE SINGLE .BIN IMAGE TO NAND FLASH VIA USB.....	32
7	BUILDING AND RUNNING OS IMAGE – WITH KITL	64
7.1	USB SERIAL KITL	66
7.2	ETHERNET KITL	77
	APPENDIX I – DIP SWITCH SETTINGS FOR BOOTING MODE	86

Figures

Figure 2-1 SMDK6410 BSP Files	2
Figure 2-2 Visual Studio 2005 Window	3
Figure 3-1 Creating New Project	4
Figure 3-2 New Project for WinCE6.0	5
Figure 3-3 Windows Embedded CE 6.0 OS Design Wizard	5
Figure 3-4 Windows Embedded CE 6.0 OS Design Wizard - Step 1	6
Figure 3-5 Windows Embedded CE 6.0 OS Design Wizard - Step 2	7
Figure 3-6 Windows Embedded CE 6.0 OS Design Wizard - Step 3	8
Figure 3-7 Windows Embedded CE 6.0 OS Design Wizard - Step 4	9
Figure 3-8 Windows Embedded CE 6.0 OS Design Wizard - Step 5	10
Figure 3-9 Windows Embedded CE 6.0 OS Design Wizard - Step 6	11
Figure 4-1 Catalog Items View	12
Figure 4-2 Build Mode in Visual Studio 2005	13
Figure 4-3 Adding File System and Data store Item to OS Design	14
Figure 4-4 Adding Graphics and Multimedia Technologies Item to OS Design	15
Figure 4-5 Adding Core OS Services Item to OS Design	16
Figure 4-6 Adding Core OS Services Item to OS Design	17
Figure 4-7 Adding Device Drivers Item to OS Design	18
Figure 4-8 Adding Networking Item to OS Design	19
Figure 4-9 Properties of OS Design	20
Figure 4-10 Selecting Language in the Property Pages Window	21
Figure 4-11 Removing KITL Setting in OS Design Properties Window	21
Figure 4-12 Build OS Design	22
Figure 4-13 Building Process	23
Figure 4-14 After Building the OS Image	24
Figure 5-1 DNW Window	25
Figure 5-2 UART/USB Options	26
Figure 5-3 DNW Window after Board Power ON	27
Figure 5-4 USB OTG Mon Menu	28
Figure 5-5 Download & Run	29
Figure 5-6 Selecting NK.nb0 for Download	30
Figure 5-7 Downloading Status of NK.nb0	31
Figure 6-1 DNW Window	32
Figure 6-2 UART/USB Options	33
Figure 6-3 DNW Window after Board Power ON	34
Figure 6-4 usb OTG Mon menu	35
Figure 6-5 Download & Run	36
Figure 6-6 Selecting EBOOT.nb0 for Download	37
Figure 6-7 After EBOOT.nb0 Download	38
Figure 6-8 Ethernet Boot Loader Configuration - Before	39
Figure 6-9 Foarmat FIL (Erase All Blocks)	40
Figure 6-10 DNW Window after reset	41
Figure 6-11 Selecting EBOOT.nb0 for Download	42
Figure 6-12 After EBOOT.nb0 Download	43
Figure 6-13 Ethernet Boot Loader Configuration - Before	44
Figure 6-14 Ethernet Boot Loader Configuration - After	45
Figure 6-15 Preparing to download image through USB	46
Figure 6-16 Selecting block0img.nb0 for Download	47
Figure 6-17 Messages via UART Port after block0img.nb0 Download	48
Figure 6-18 DNW Window after reset	49
Figure 6-19 Selecting EBOOT.nb0 for Download	50
Figure 6-20 After EBOOT.nb0 Download	51
Figure 6-21 Ethernet Boot Loader Configuration	52
Figure 6-22 Preparing to download image through USB	53
Figure 6-23 Selecting EBOOT.bin for Download	54

Figure 6-24 Messages via UART Port after EBOOT.bin Download	55
Figure 6-25 DNW Window after reset	56
Figure 6-26 Selecting EBOOT.nb0 for Download	57
Figure 6-27 After EBOOT.nb0 Download	58
Figure 6-28 Ethernet Boot Loader Configuration.....	59
Figure 6-29 Preparing to download image through USB.....	60
Figure 6-30 Selecting NK.bin for Download (no IMGMULTIXIP).....	61
Figure 6-31 Selecting chain.lst for Download (IMGMULTIXIP=1)	61
Figure 6-32 Messages via UART Port during NK.bin Download (no IMGMULTIXIP)	62
Figure 6-33 Messages via UART Port during chain.lst Download (IMGMULTIXIP=1)	62
Figure 7-1 OSDesign Properties	64
Figure 7-2 Property Pages for KITL	65
Figure 7-3 Build OSDesign.....	66
Figure 7-4 DNW Window after reset.....	67
Figure 7-5 Selecting EBOOT.nb0 for Download	68
Figure 7-6 After EBOOT.nb0 Download	69
Figure 7-7 Ethernet Boot Loader Configuration	70
Figure 7-8 Target Connectivity Option	71
Figure 7-9 Target Device Connectivity Options Window after Transport Select	72
Figure 7-10 Target Device Connectivity Options Window After Debugger Select	73
Figure 7-11 Attach Device	74
Figure 7-12 Messages via UART Port.....	75
Figure 7-13 Visual Studio 2005 Window after USB Serial KITL connected	76
Figure 7-14 Build OSDesign	77
Figure 7-15 After Reset the Board	78
Figure 7-16 Ethernet Boot Loader Configuration.....	79
Figure 7-17 Target Connectivity Option	80
Figure 7-18 Target Device Connectivity Options Window after Transport Select.....	81
Figure 7-19 Target Device Connectivity Options Window After Debugger Select	82
Figure 7-20 Attach Device	83
Figure 7-21 Messages via UART Port.....	84
Figure 7-22 Visual Studio 2005 Window after Ethernet KITL connected	85

1 Overview

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 OSDesign
- Building OS Image - Without KITL
- Running NK.nb0 Image
- Fusing WinCE Image on NAND Flash via USB
- Building and Running OS Image - With KITL
 - USB Serial KITL
 - Ethernet KITL

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.

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

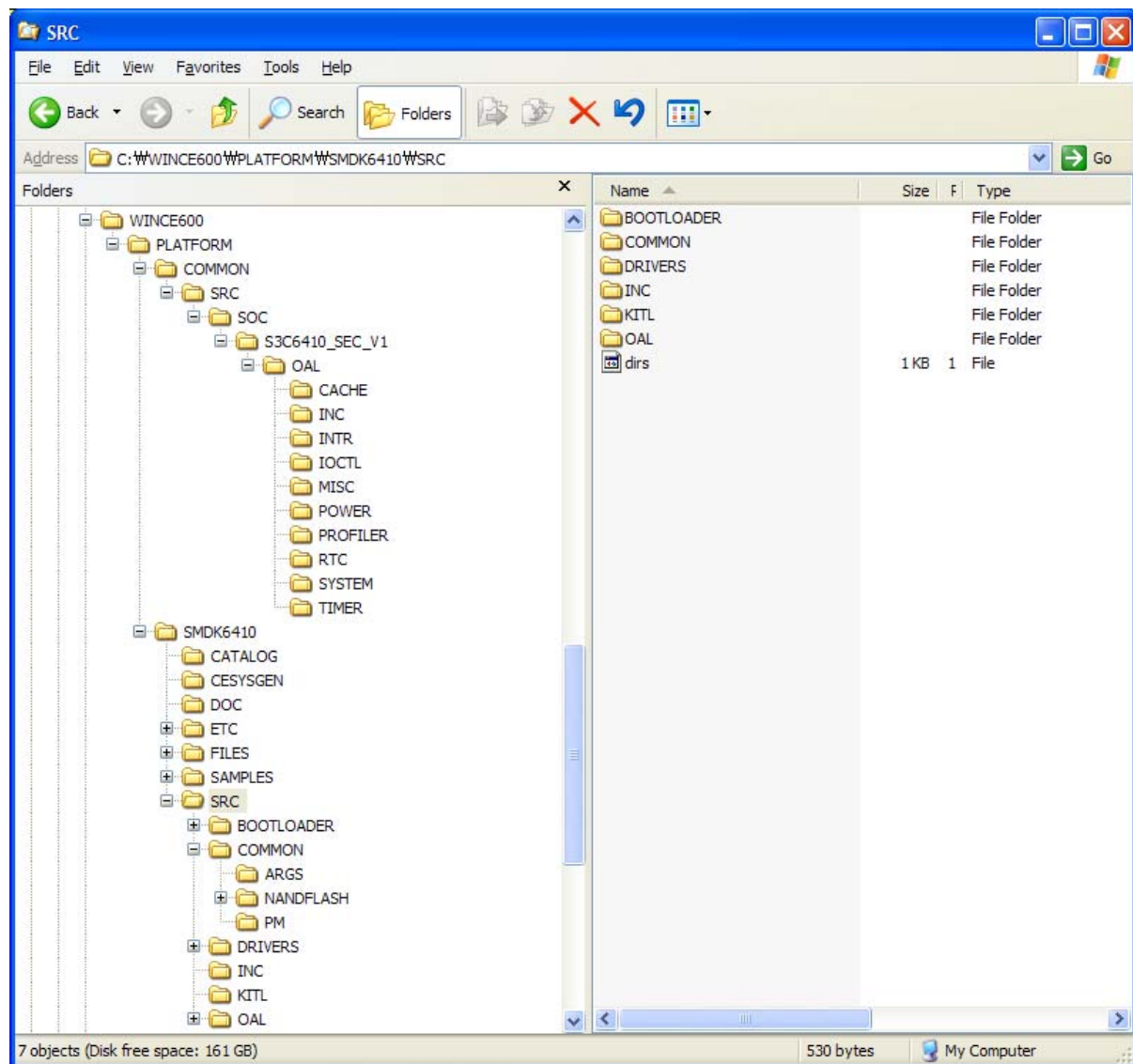


Figure 2-1 SMDK6410 BSP Files

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.

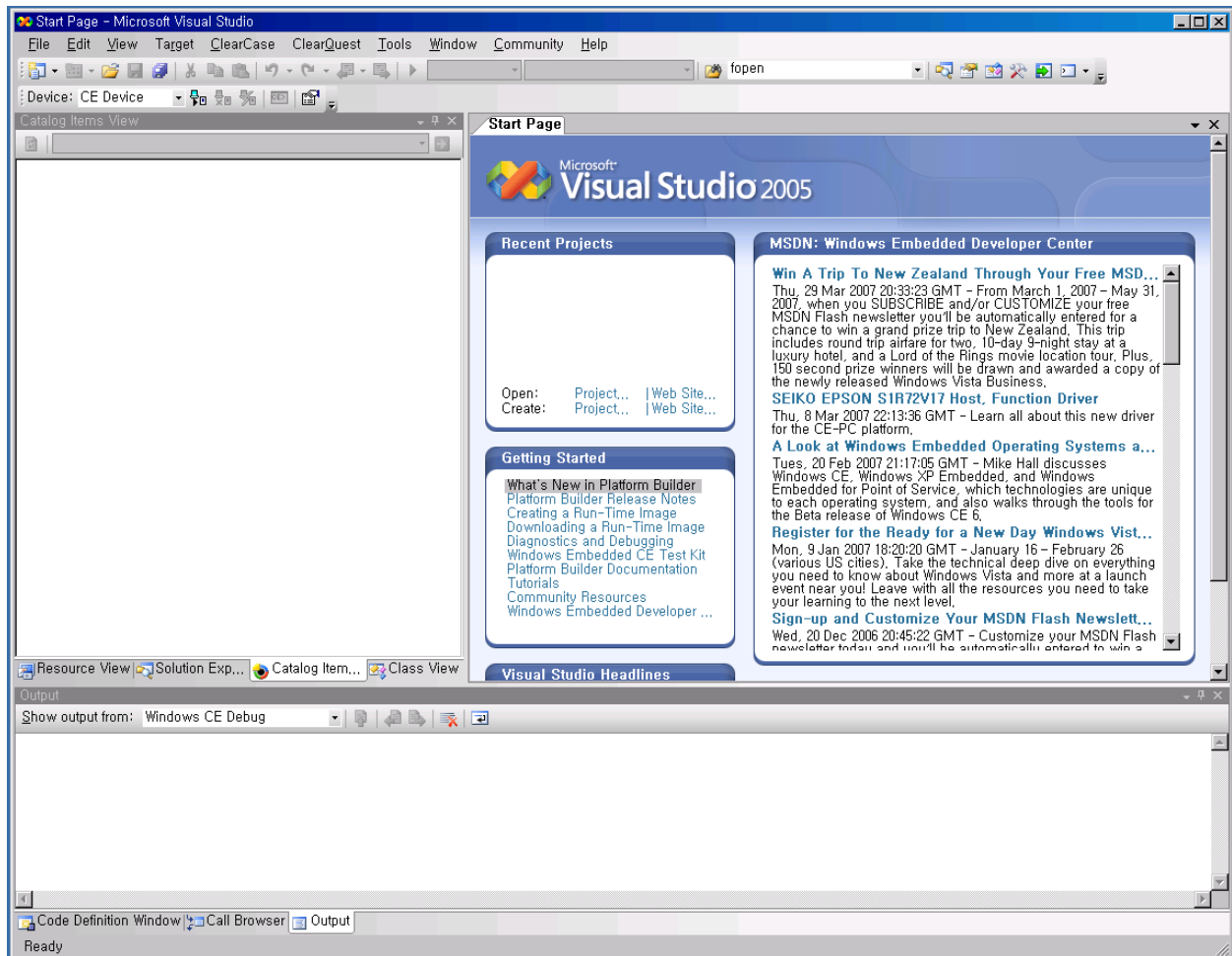


Figure 2-2 Visual Studio 2005 Window

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.

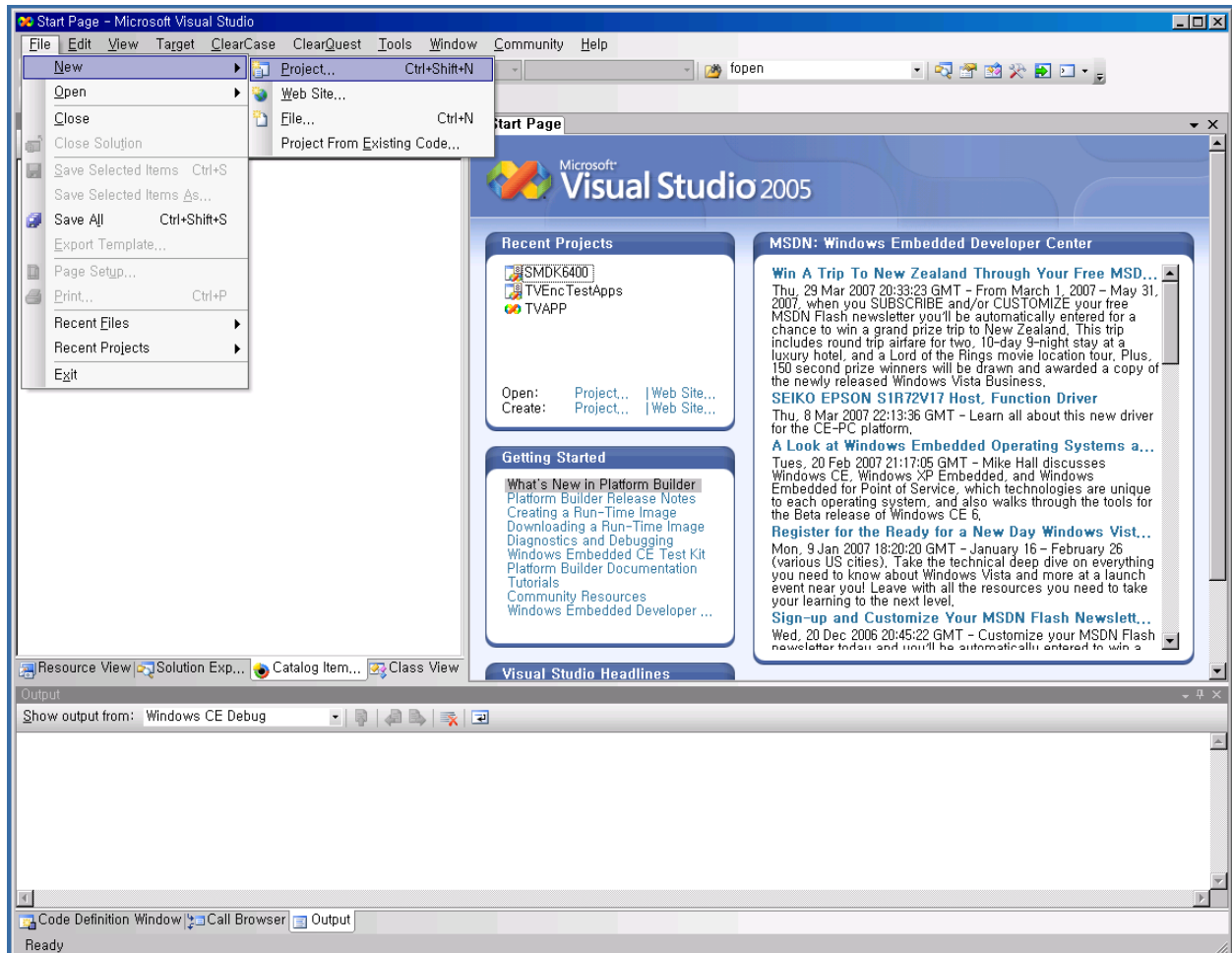


Figure 3-1 Creating New Project

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

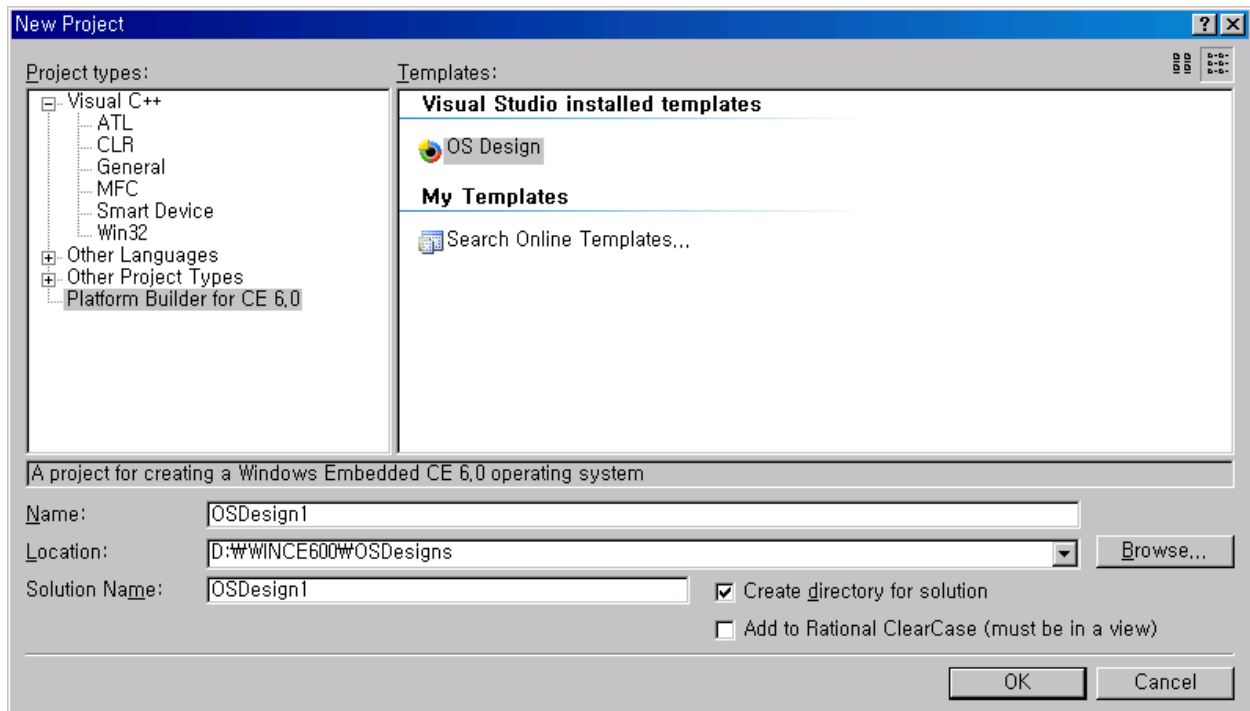


Figure 3-2 New Project for WinCE6.0

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

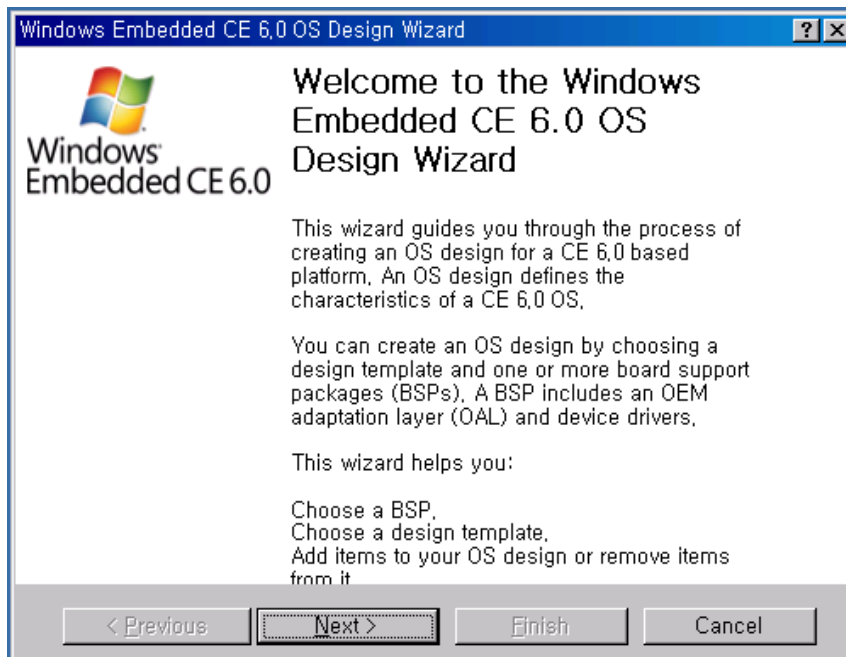


Figure 3-3 Windows Embedded CE 6.0 OS Design Wizard

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

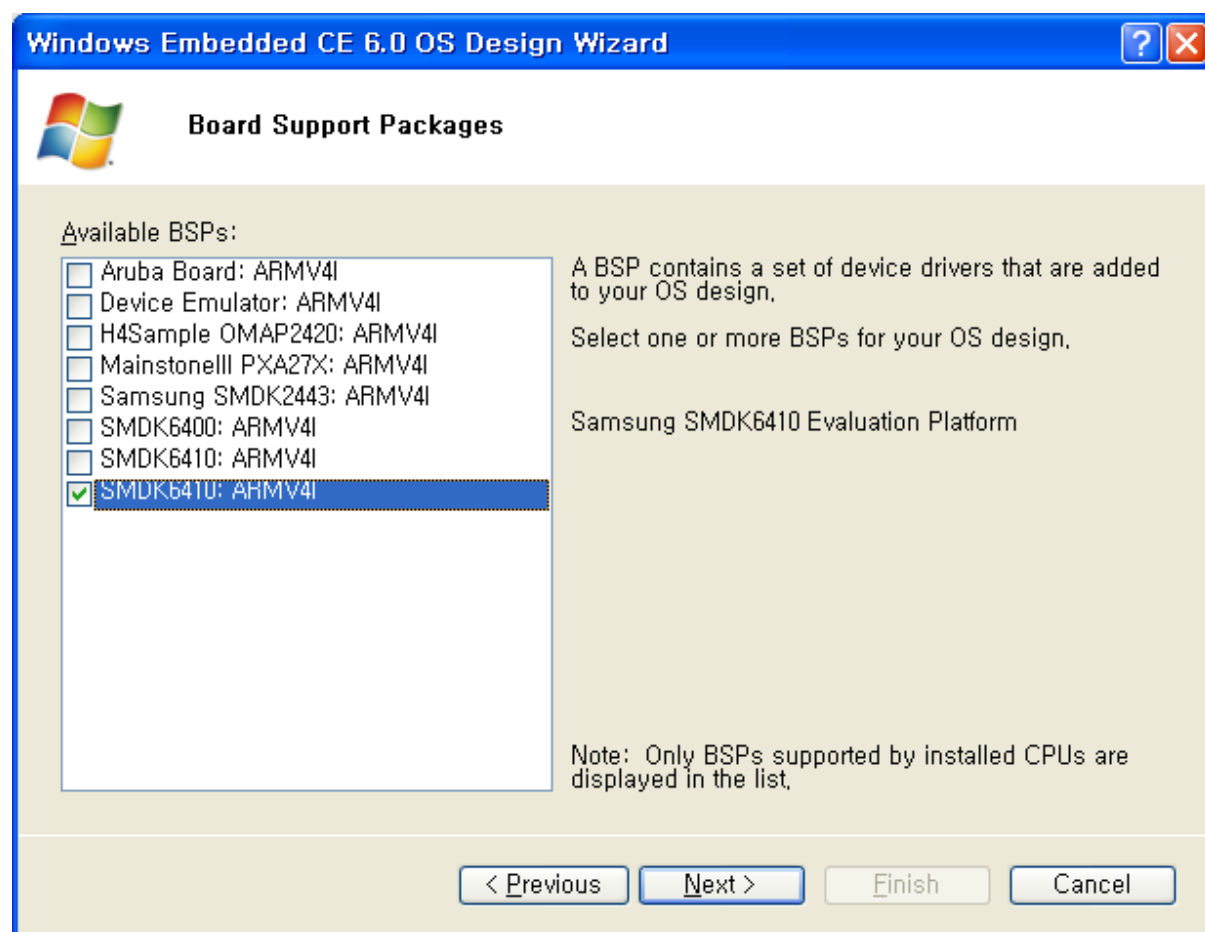


Figure 3-4 Windows Embedded CE 6.0 OS Design Wizard - Step 1

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

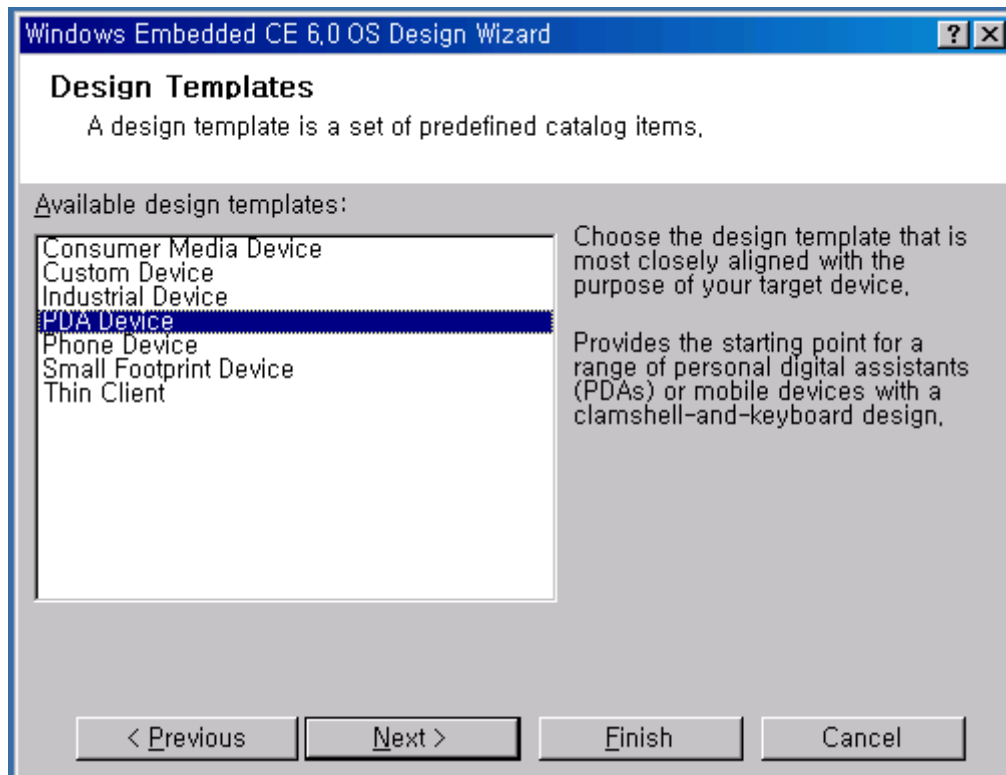


Figure 3-5 Windows Embedded CE 6.0 OS Design Wizard - Step 2

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

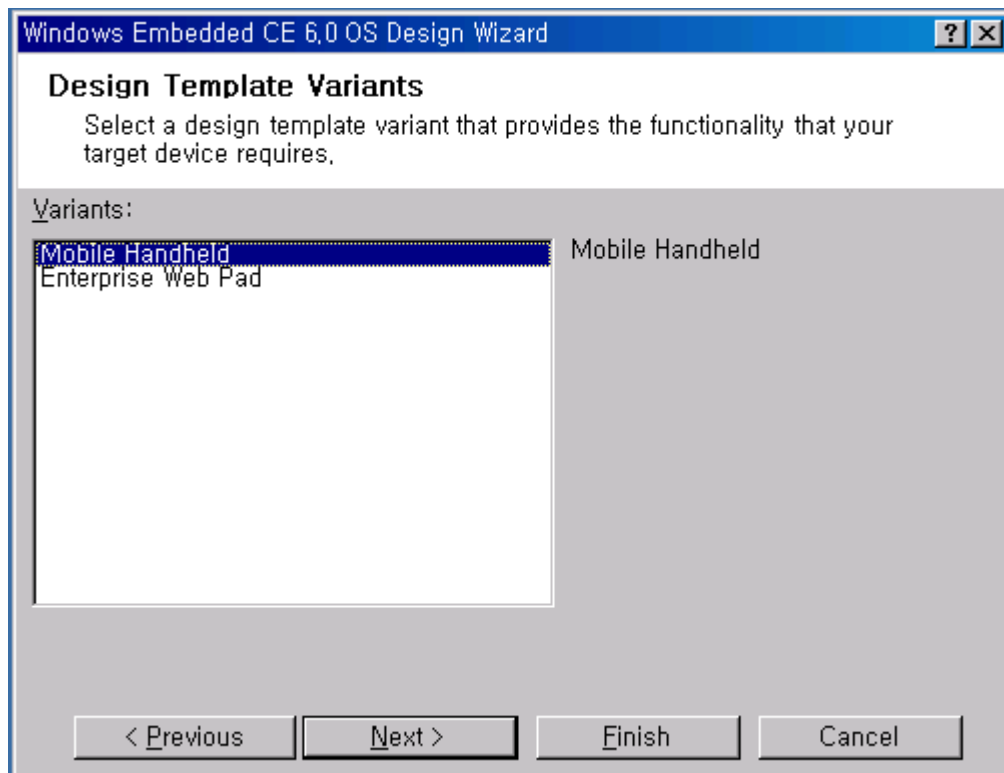


Figure 3-6 Windows Embedded CE 6.0 OS Design Wizard - Step 3

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

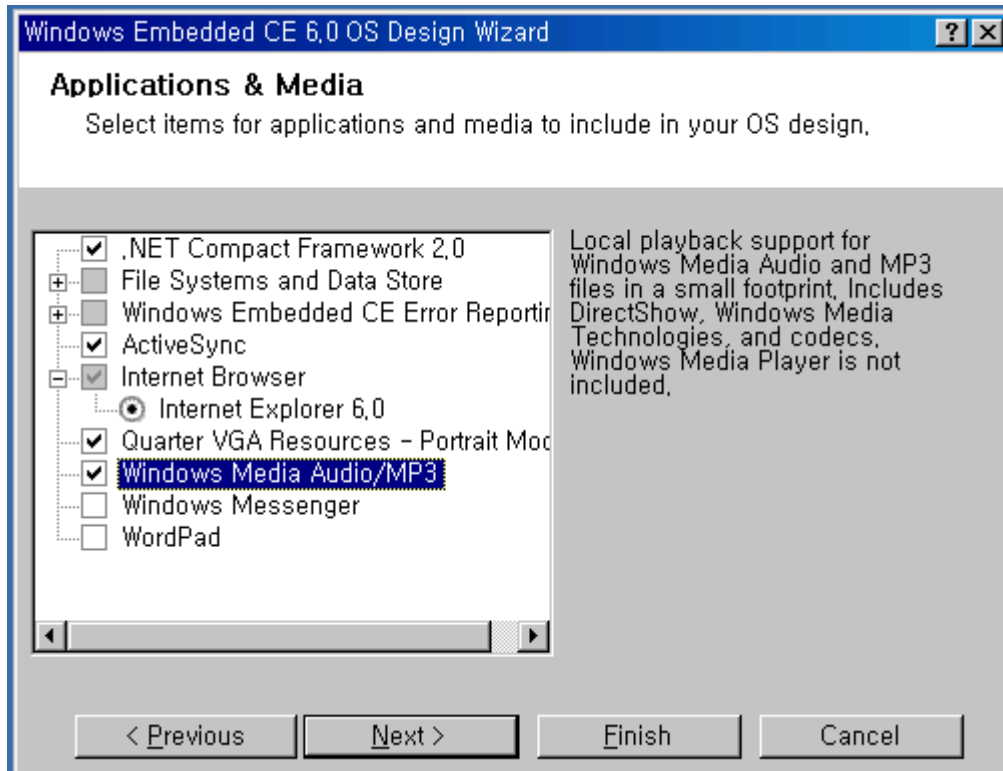


Figure 3-7 Windows Embedded CE 6.0 OS Design Wizard - Step 4

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

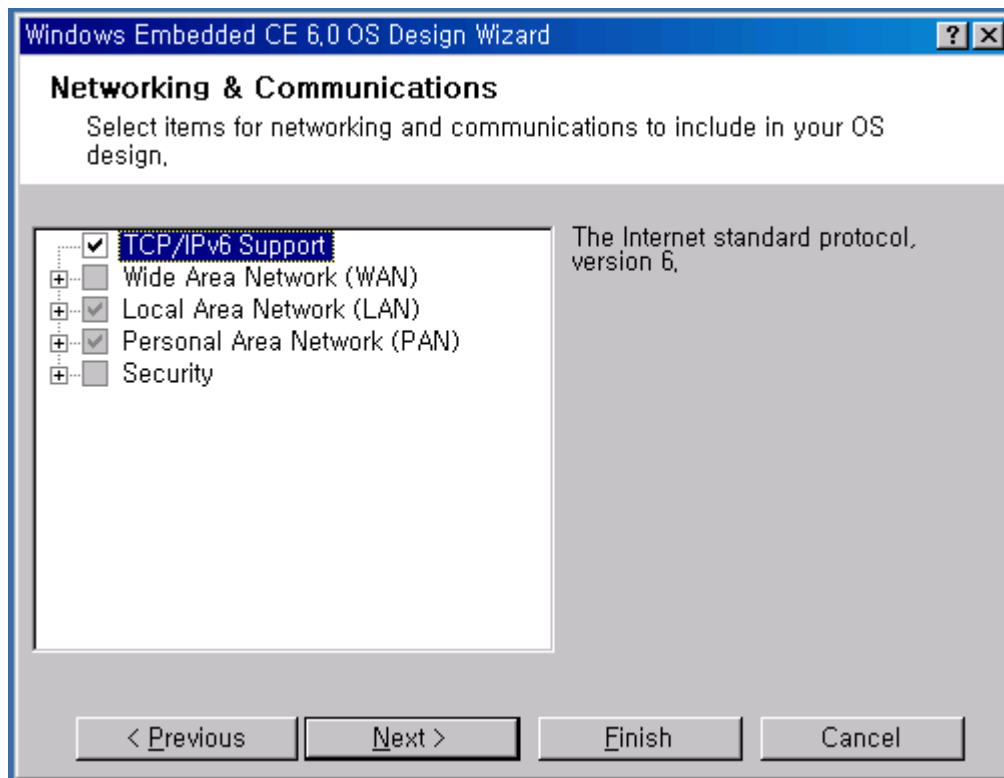


Figure 3-8 Windows Embedded CE 6.0 OS Design Wizard - Step 5

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.

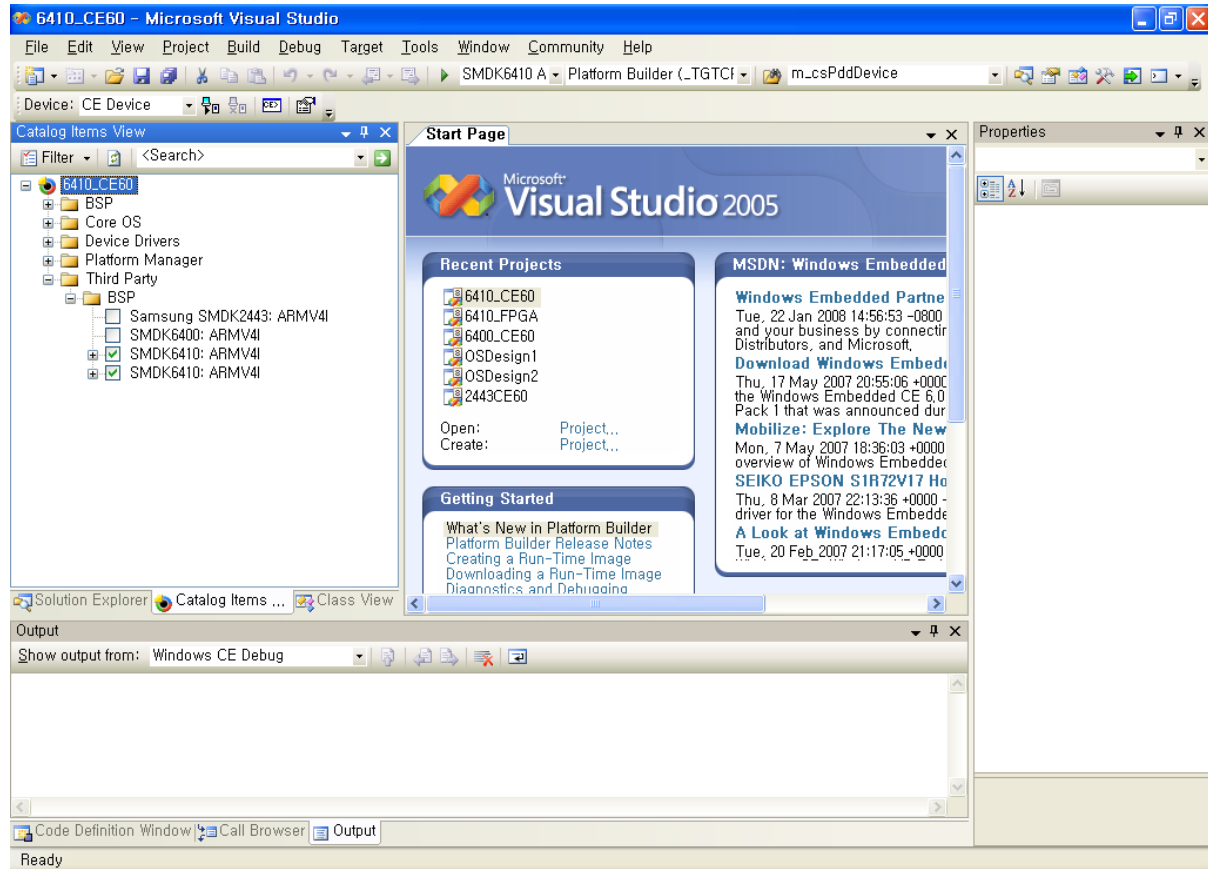


Figure 4-1 Catalog Items View

- You can change build mode (release or debug mode) as below figures. Select SMDK6410_ARMV4I Release.

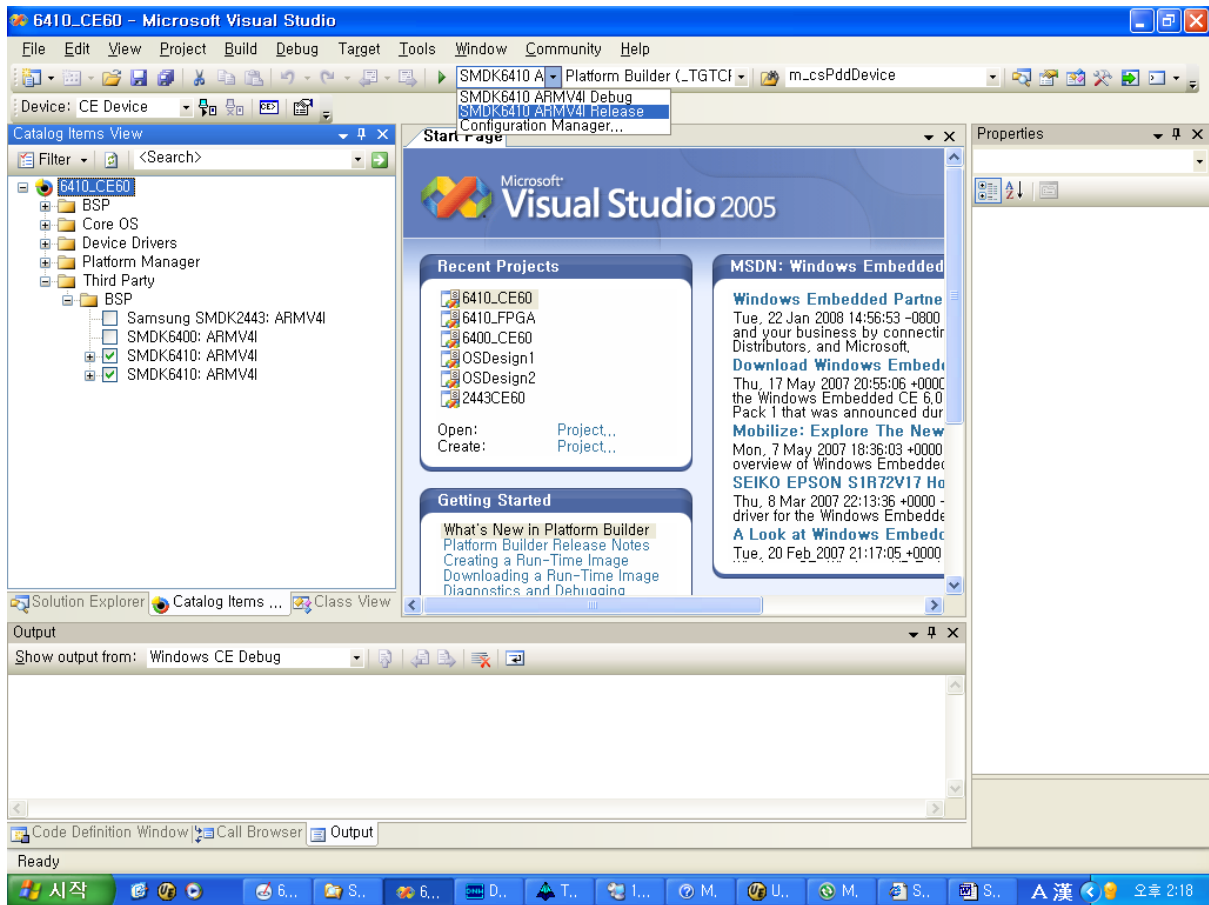


Figure 4-2 Build Mode in Visual Studio 2005

- 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

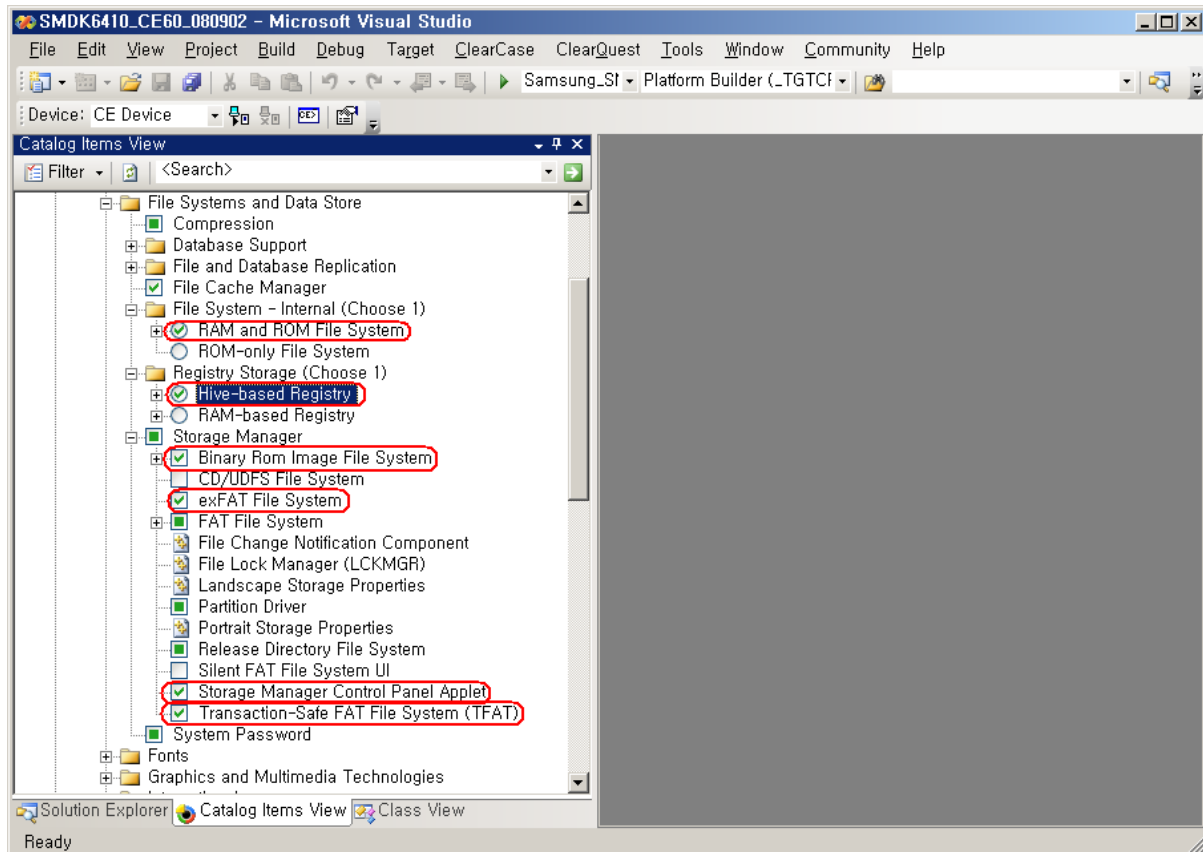


Figure 4-3 Adding File System and Data store Item to OS Design

- 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

Media-Video Codecs and Renderers-WMV/MPEG-4 Video Codec

Media-Windows Media Player

Media-DirectShow Video Capture

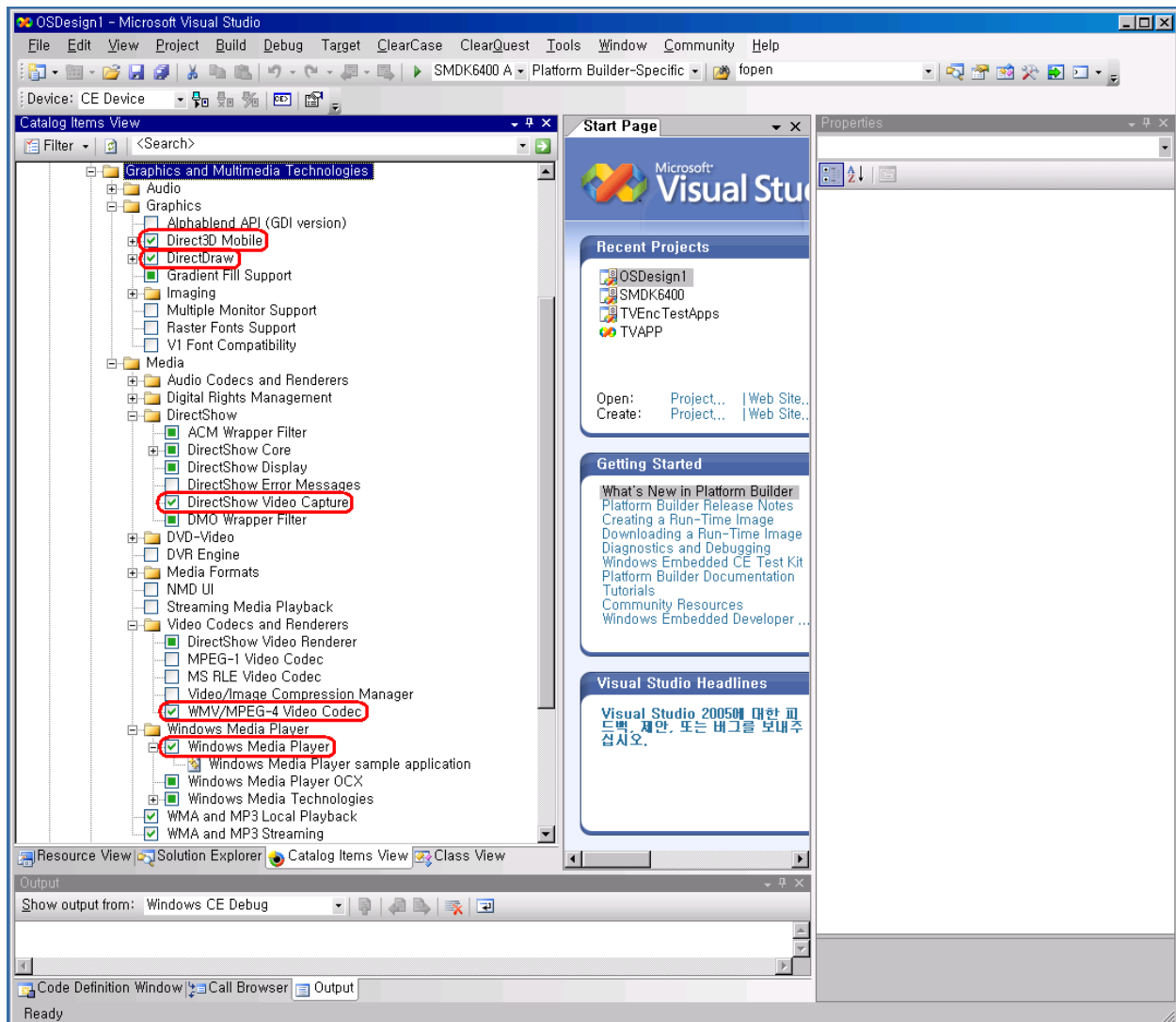


Figure 4-4 Adding Graphics and Multimedia Technologies Item to OS Design

- 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

USB HID Keyboard and Mouse

USB Storage Class Driver

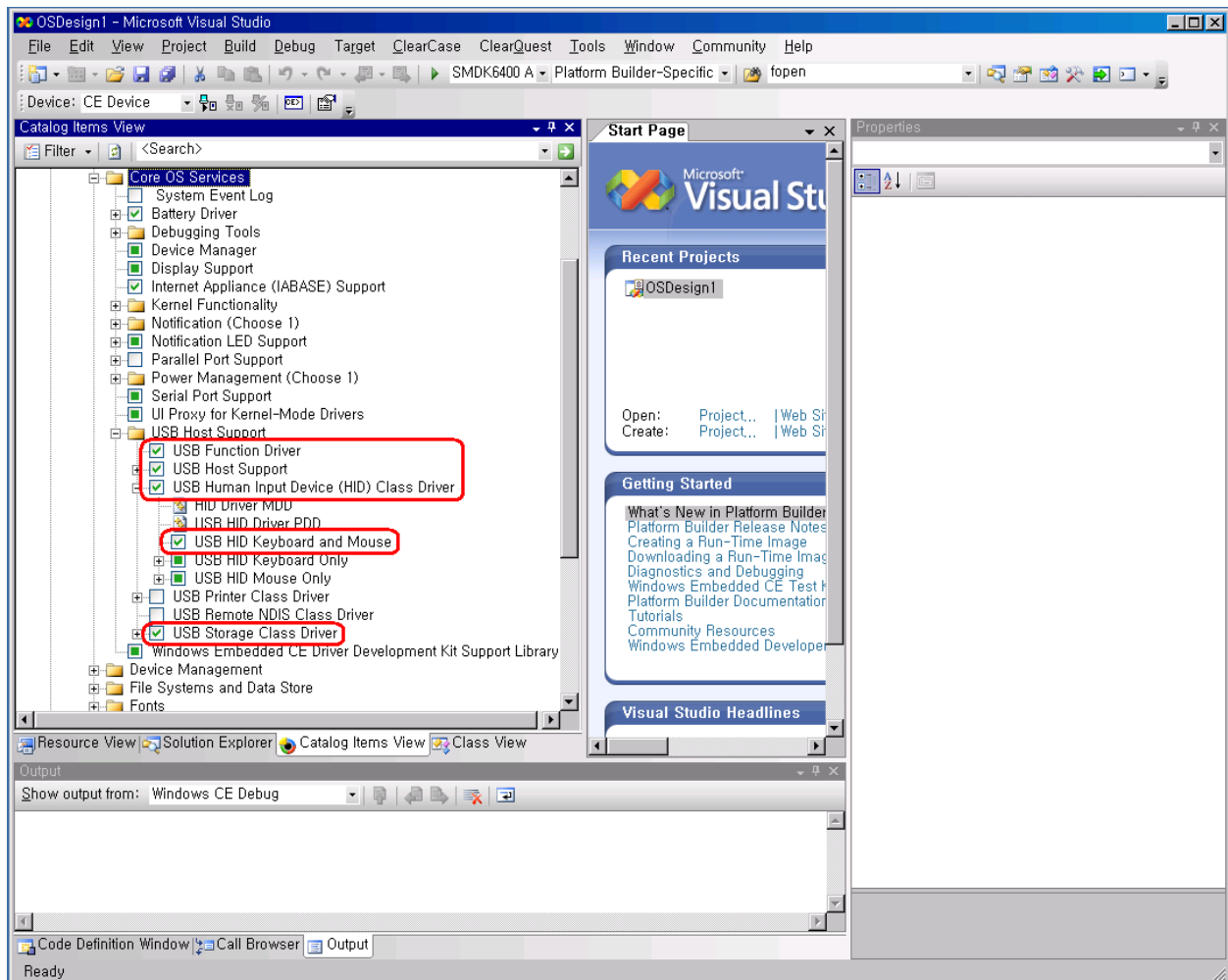


Figure 4-5 Adding Core OS Services Item to OS Design

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

Select **OBEX File Brower** and **OBEX Inbox**.

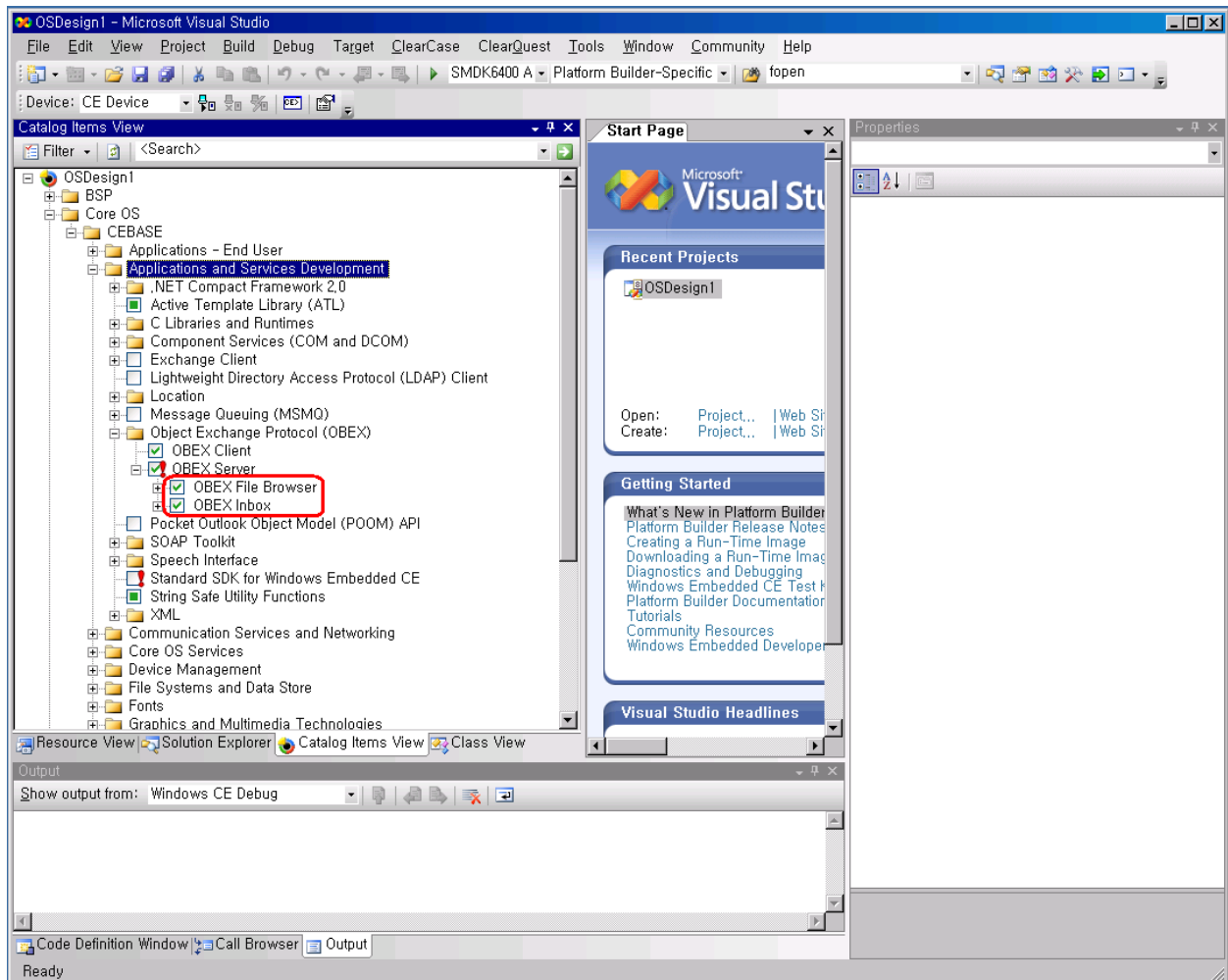


Figure 4-6 Adding Core OS Services Item to OS Design

- 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.

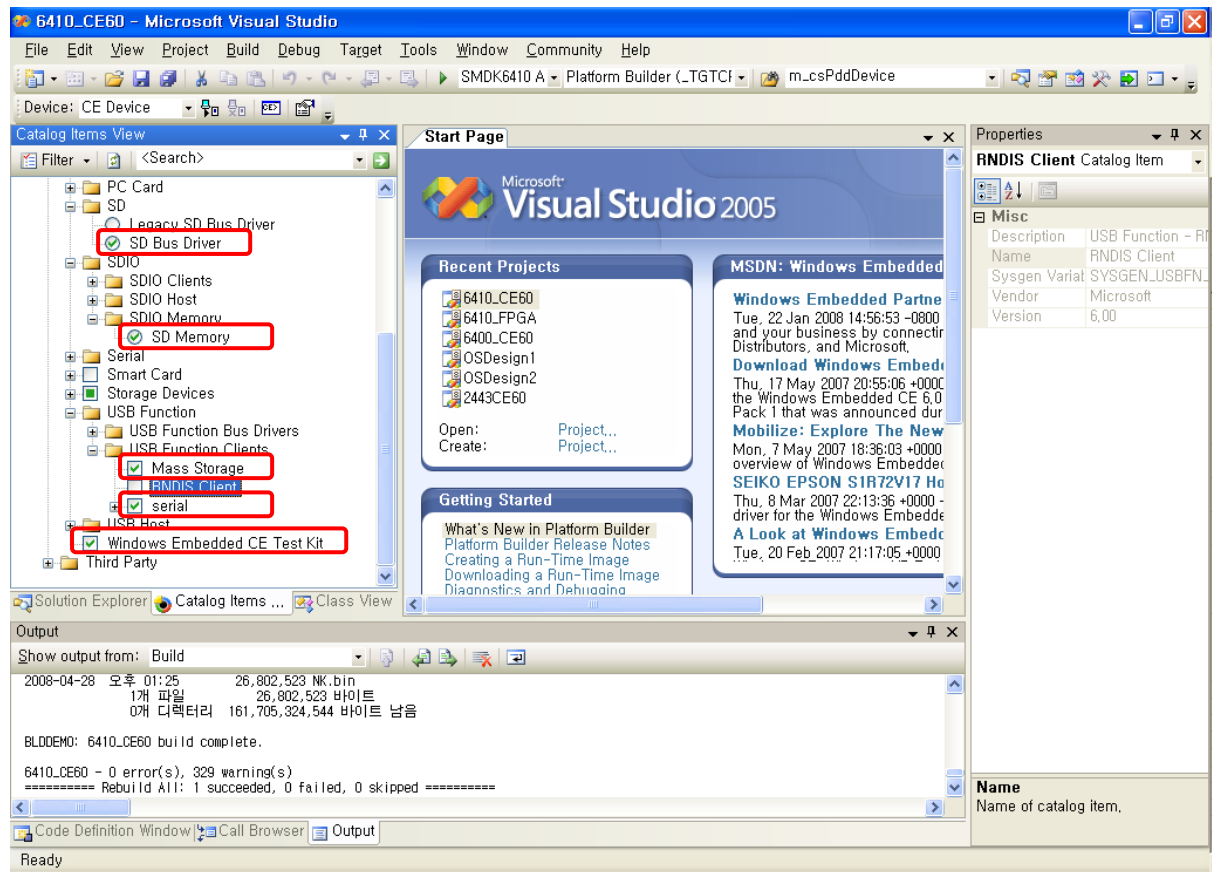


Figure 4-7 Adding Device Drivers Item to OS Design

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

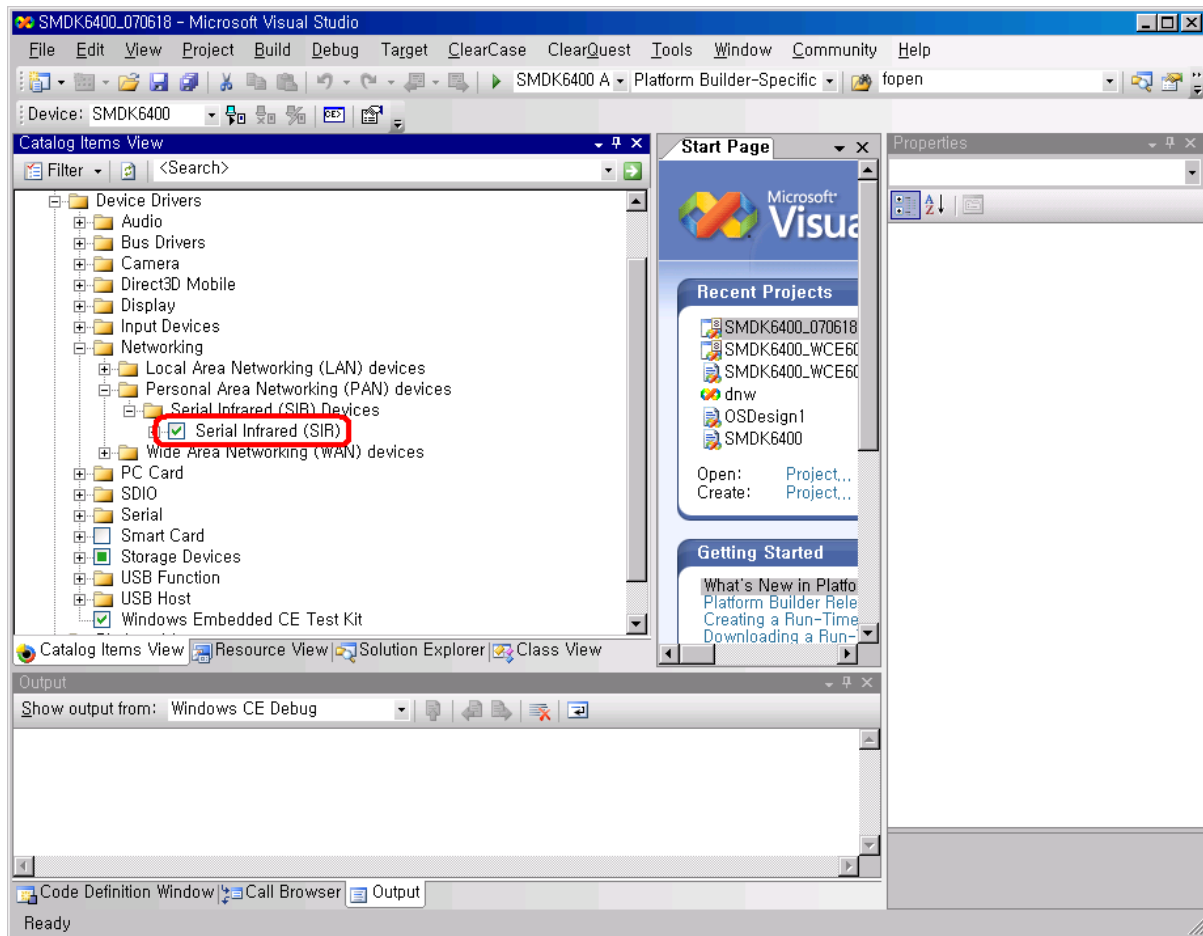


Figure 4-8 Adding Networking Item to OS Design

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

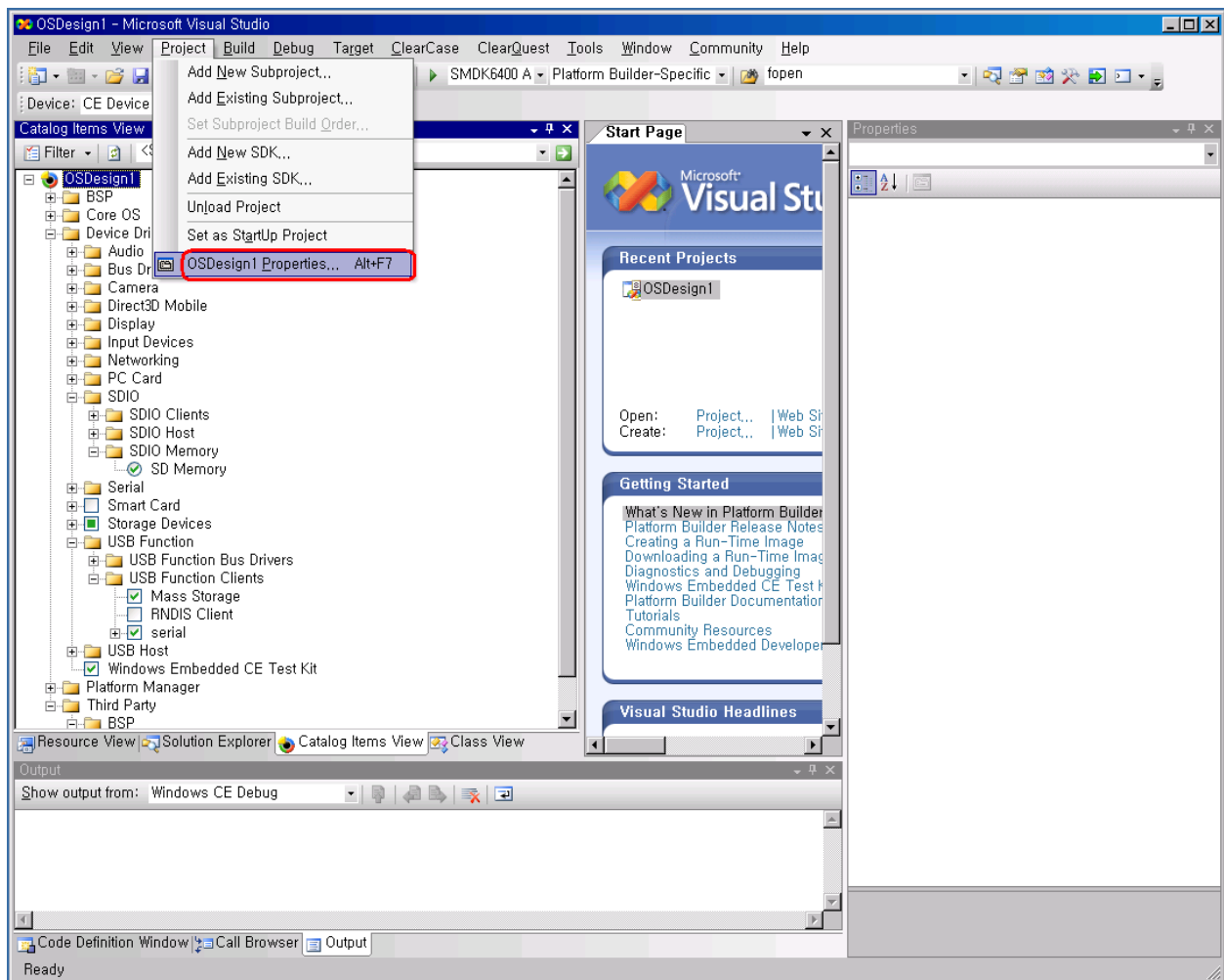


Figure 4-9 Properties of OS Design

10. 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.

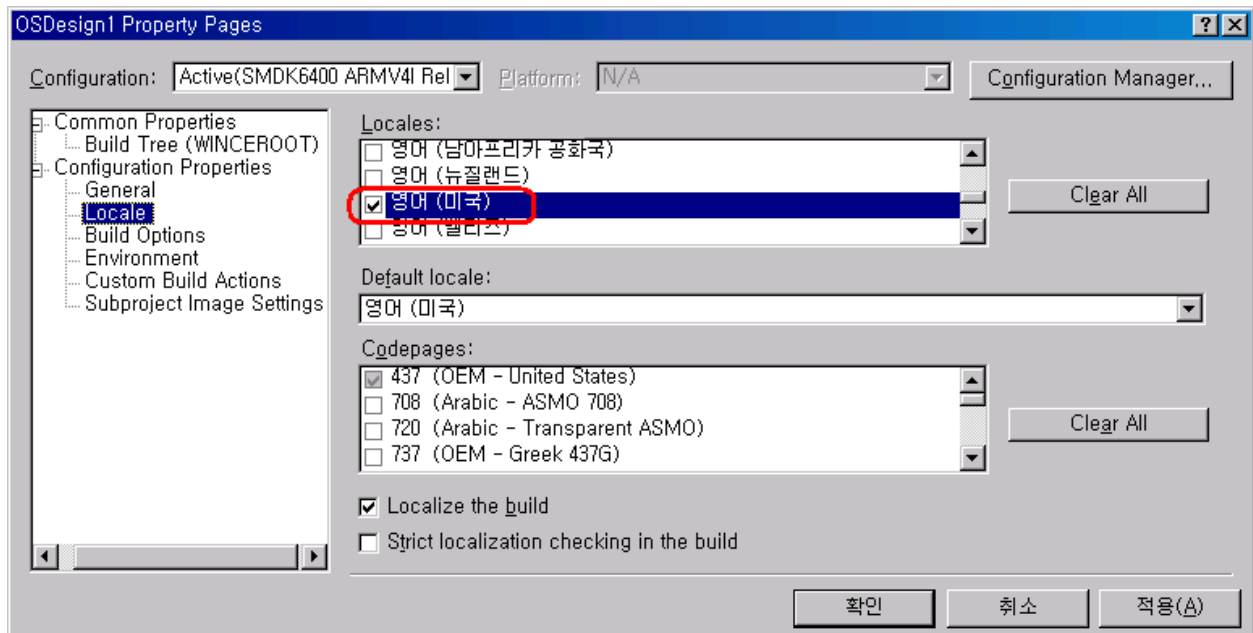


Figure 4-10 Selecting Language in the Property Pages Window

11. 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.

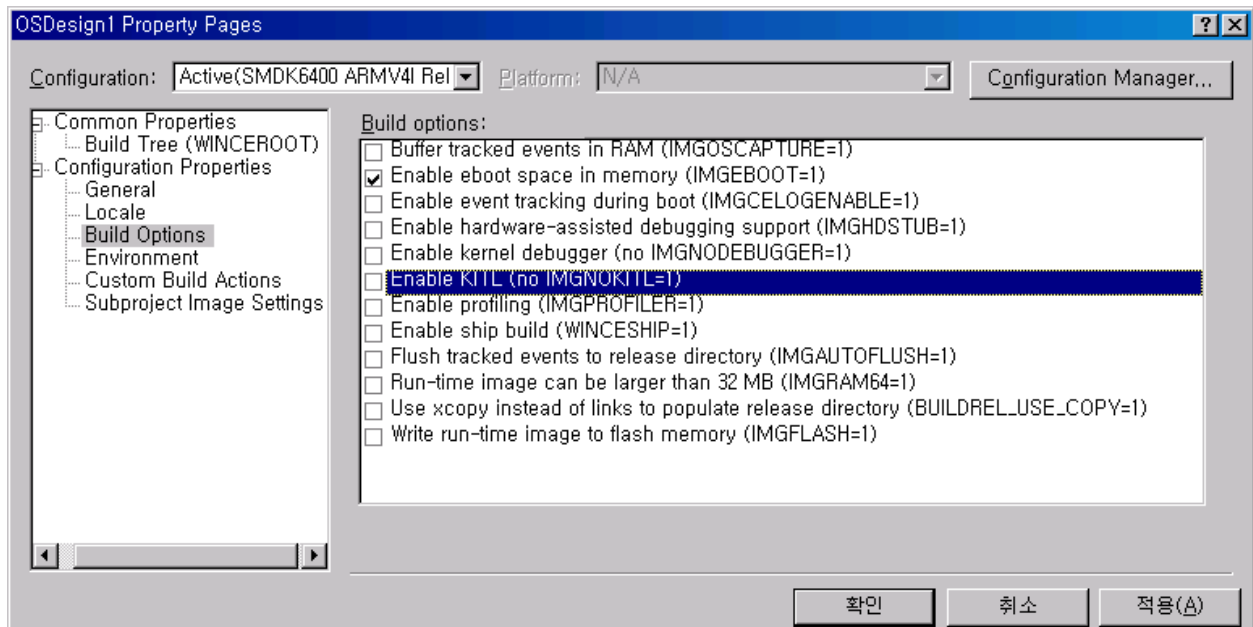


Figure 4-11 Removing KITL Setting in OS Design Properties Window

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

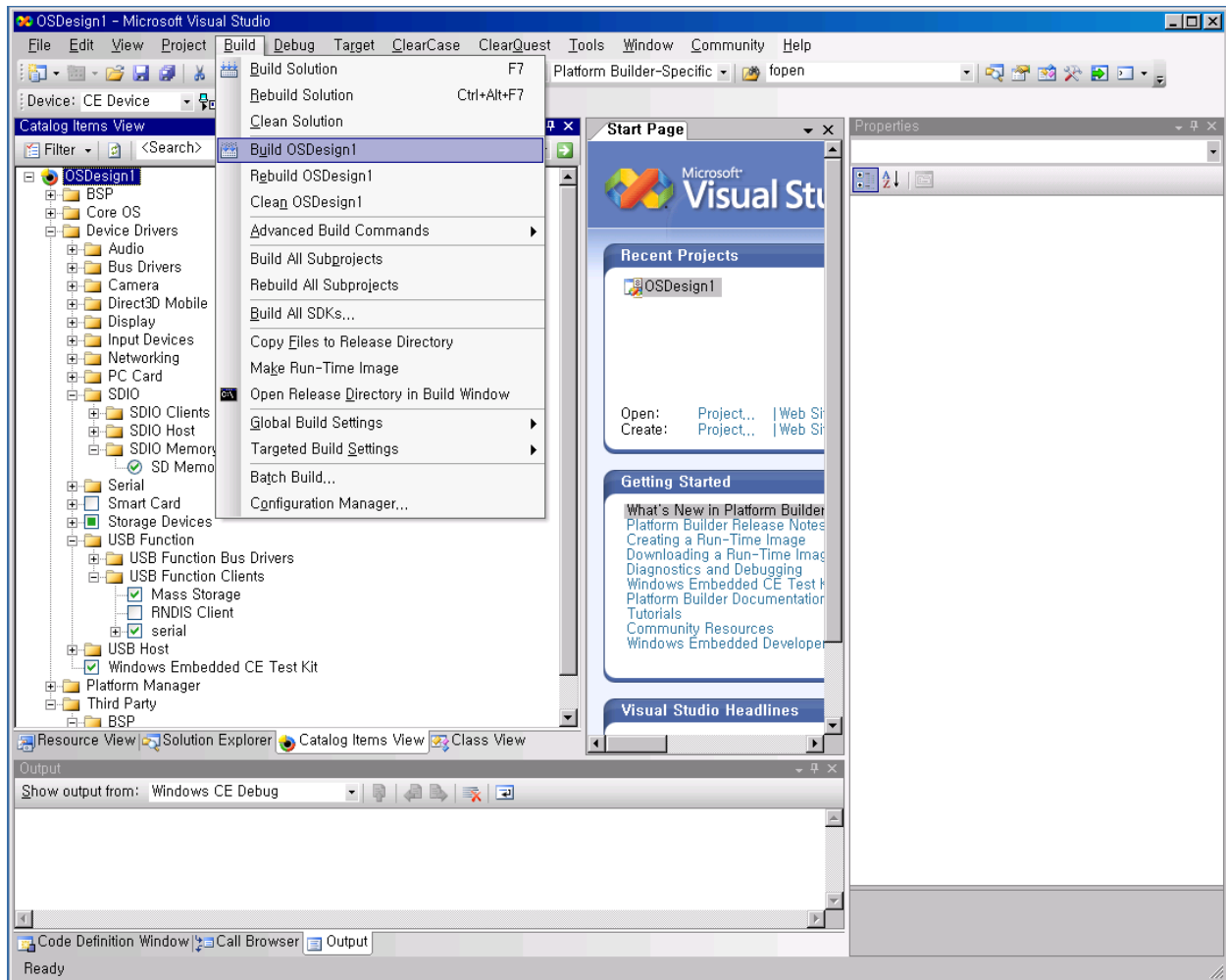


Figure 4-12 Build OS Design

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

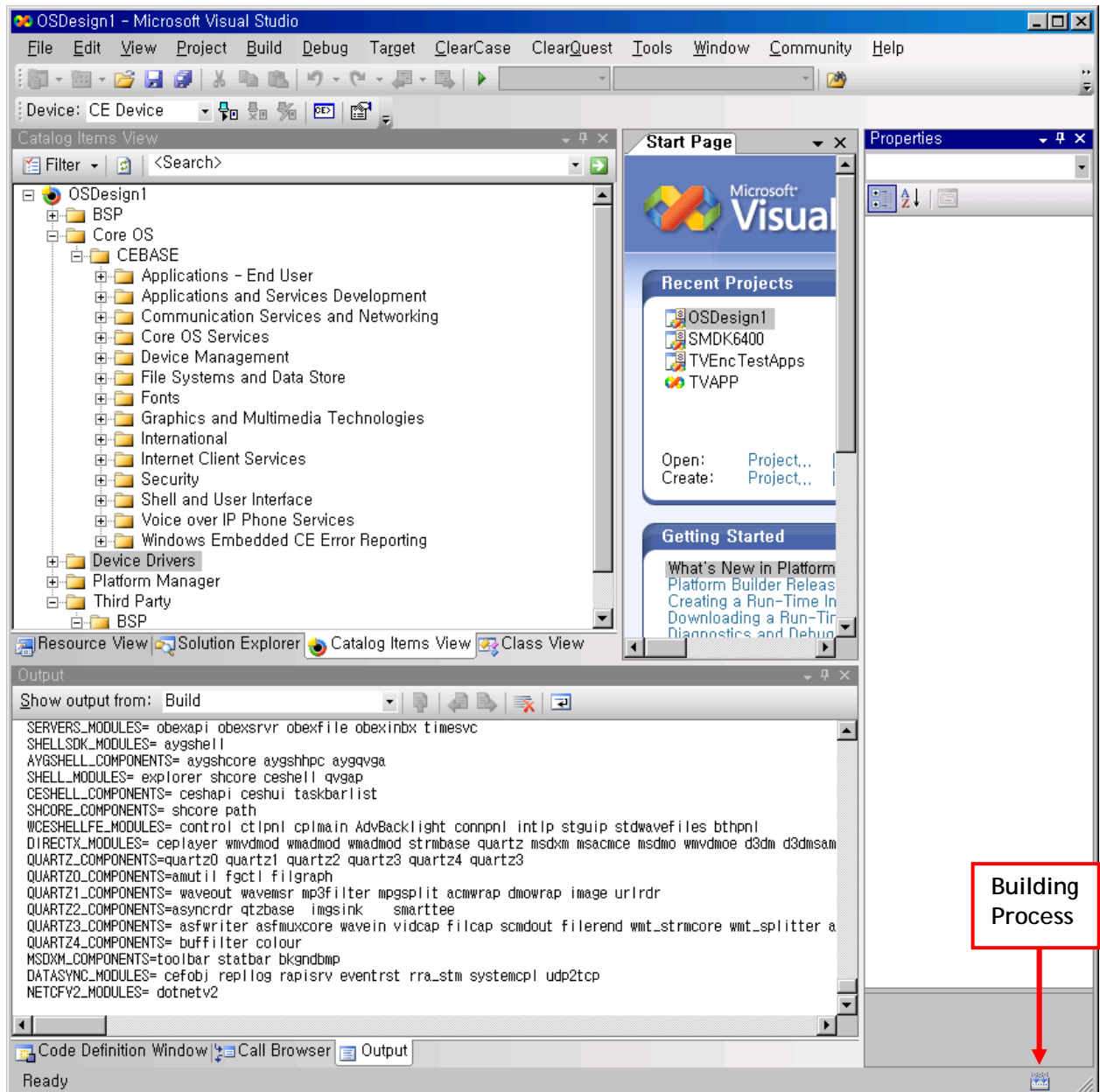


Figure 4-13 Building Process

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 4-14. EBOOT.nb0, EBOOT.bin, block0imag.nb0, NK.bin and NK.nb0 are now available in X:\WINCE600\OSDesigns \[OS Design Name] \[OS Design Name]\RelDir\SMDK6410_ARMV4I_Release directory.

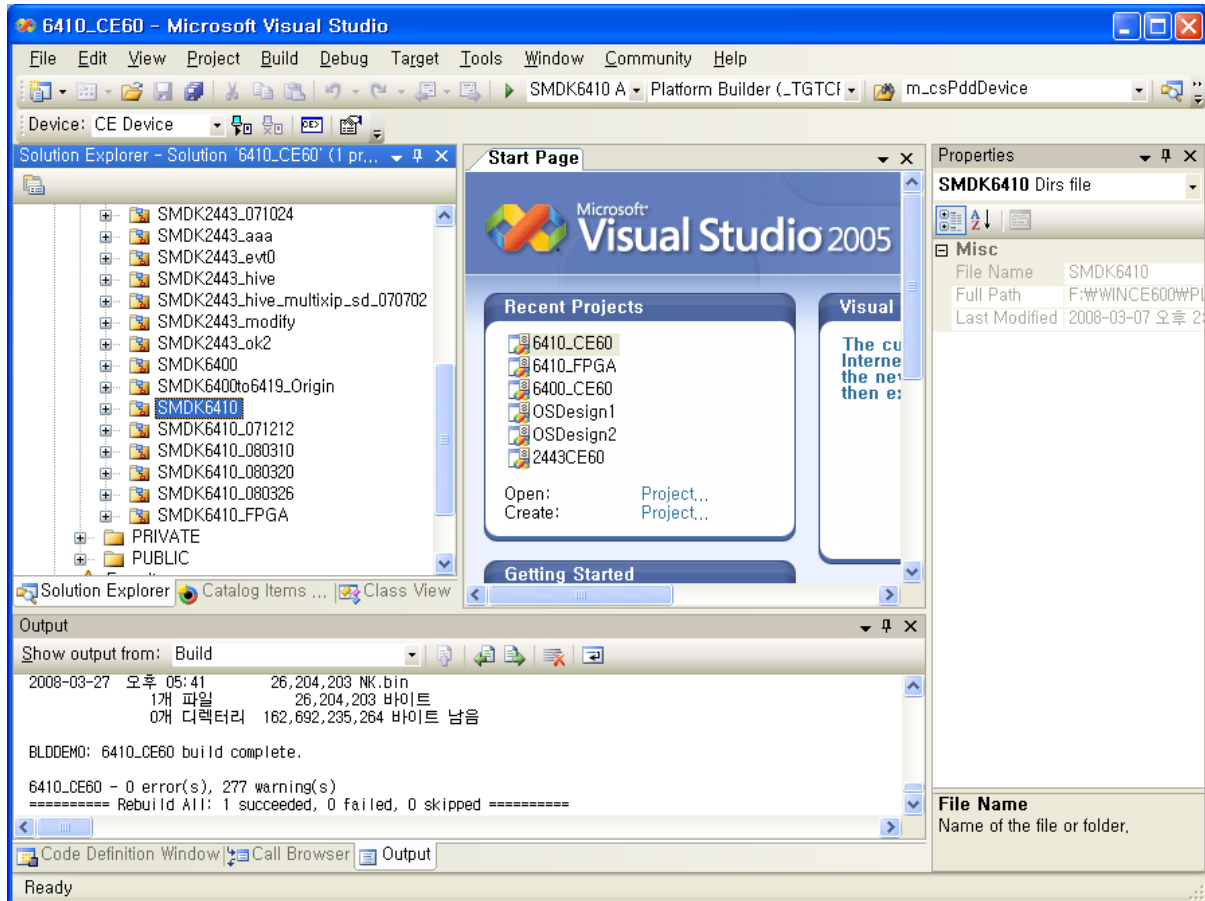


Figure 4-14 After Building the OS Image

5 Running NK.nb0 Image (available on the single-XIP only)

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.

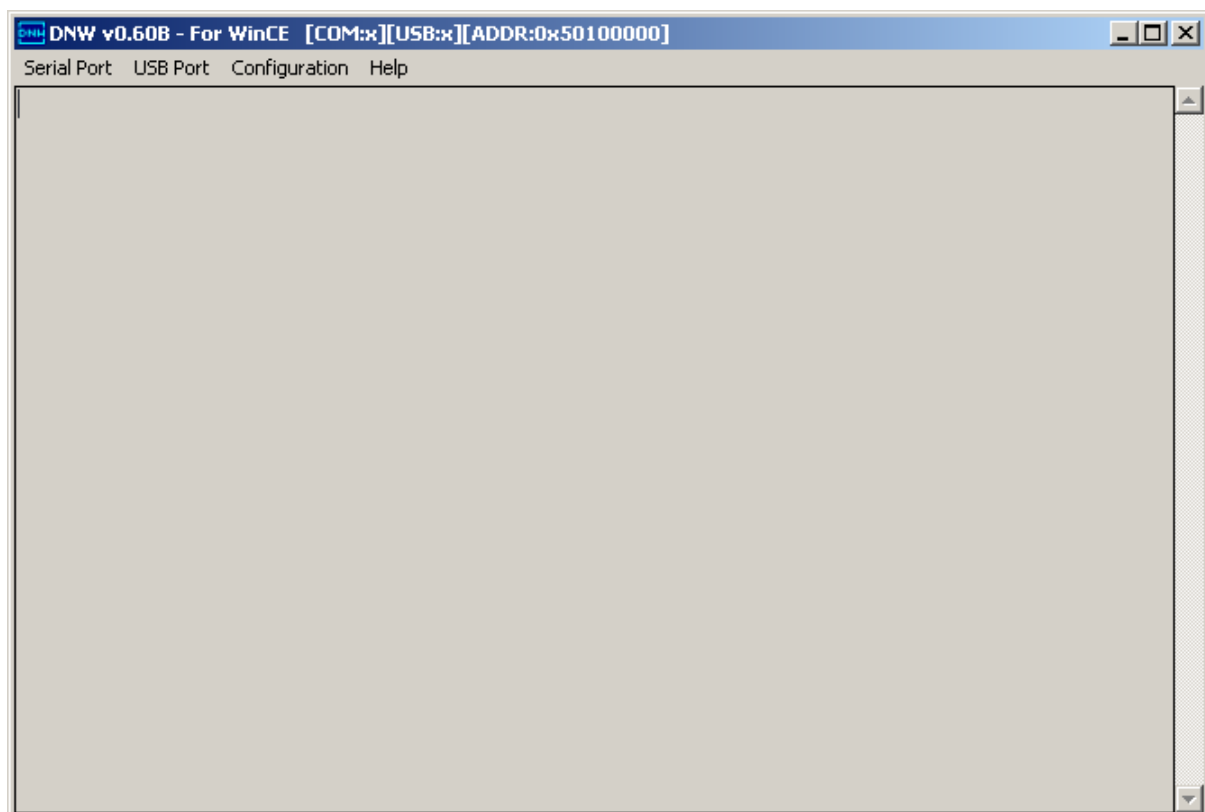


Figure 5-1 DNW Window

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.

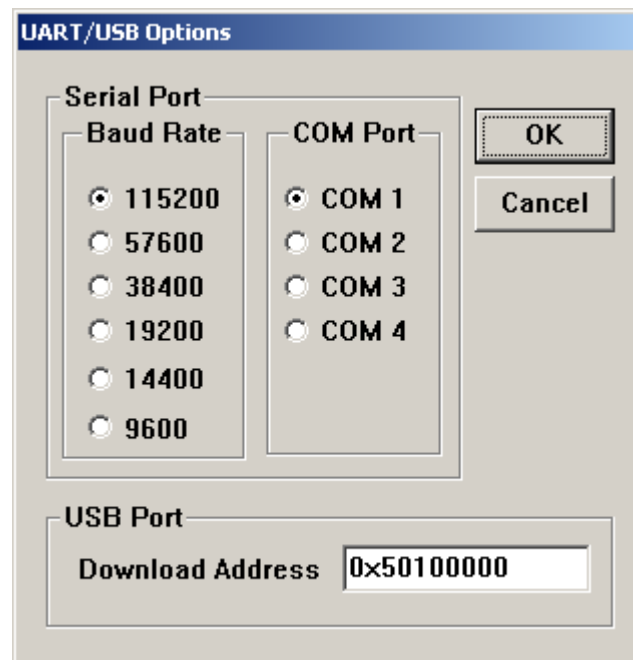


Figure 5-2 UART/USB Options

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.

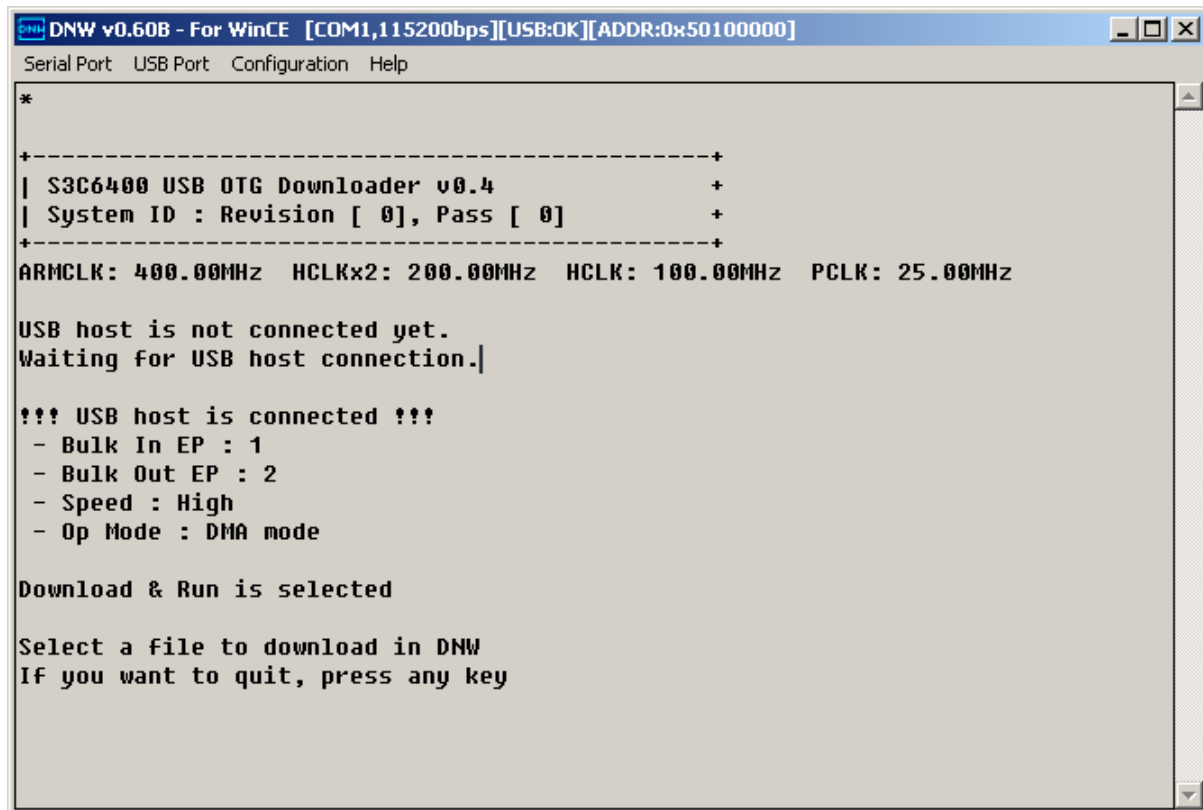


Figure 5-3 DNW Window after Board Power ON

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

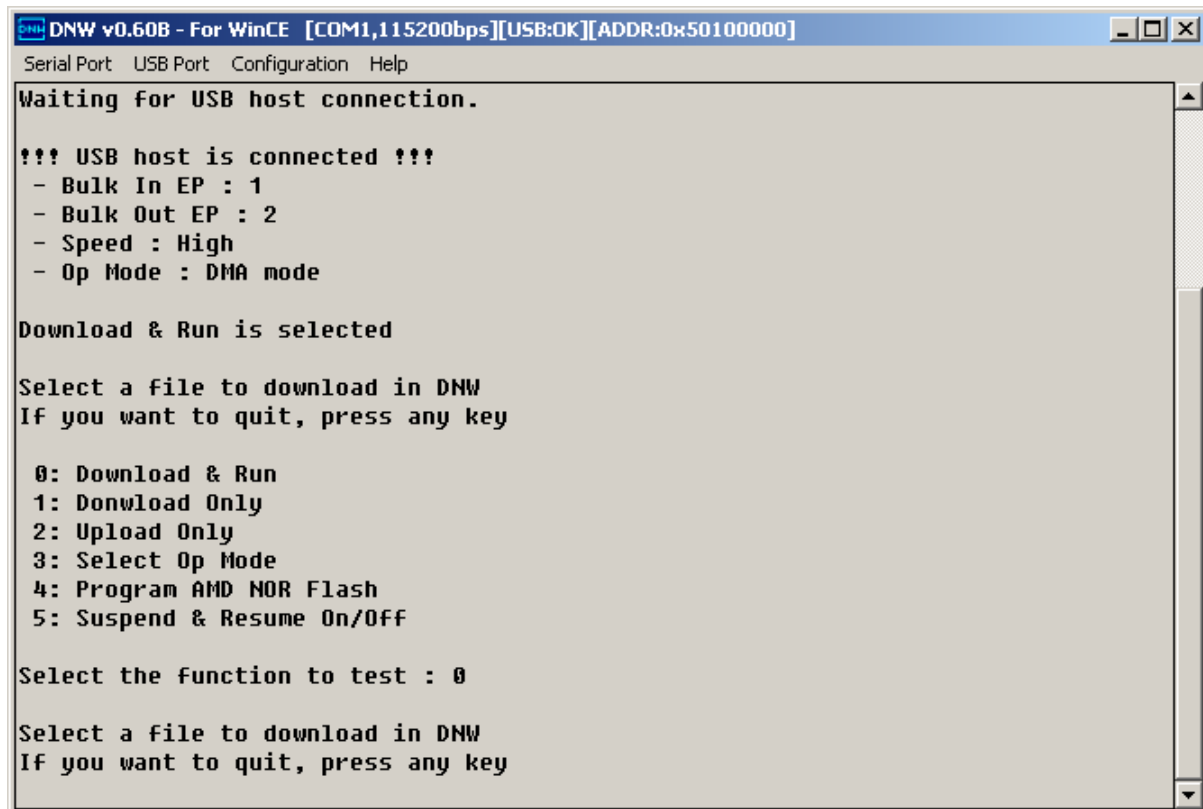


Figure 5-4 USB OTG Mon Menu

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

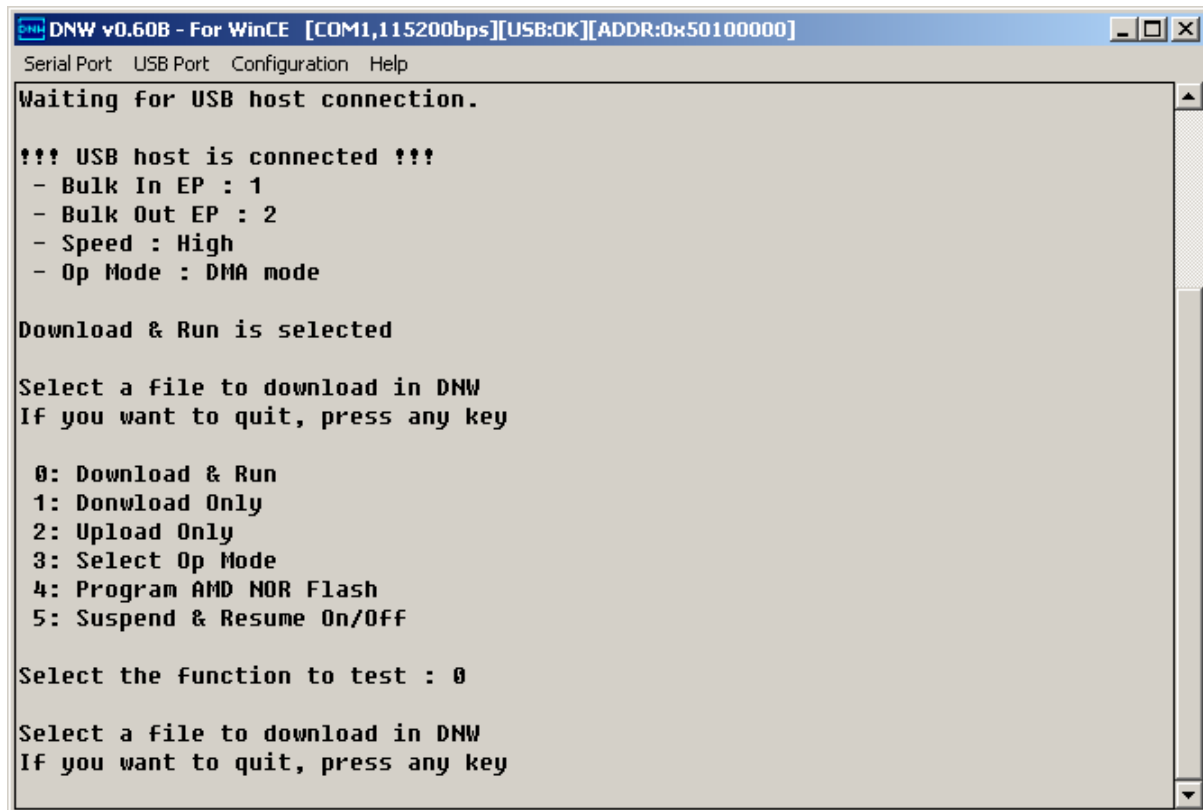


Figure 5-5 Download & Run

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.

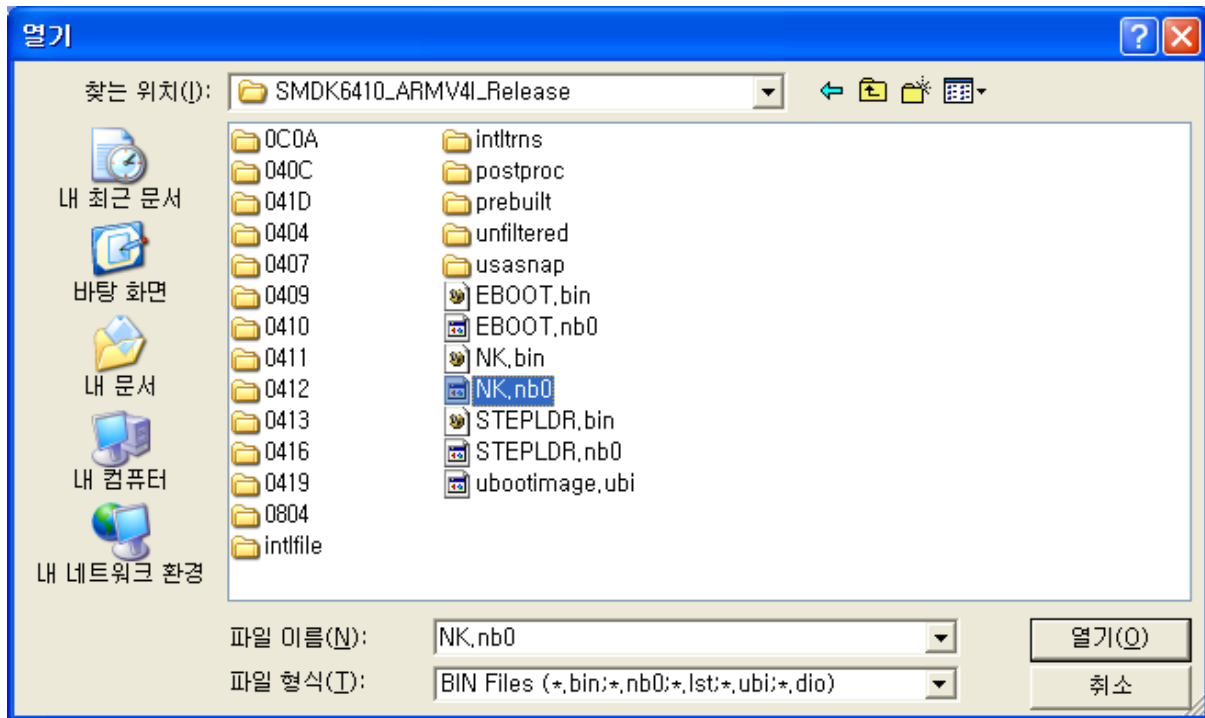


Figure 5-6 Selecting NK.nb0 for Download

10. 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

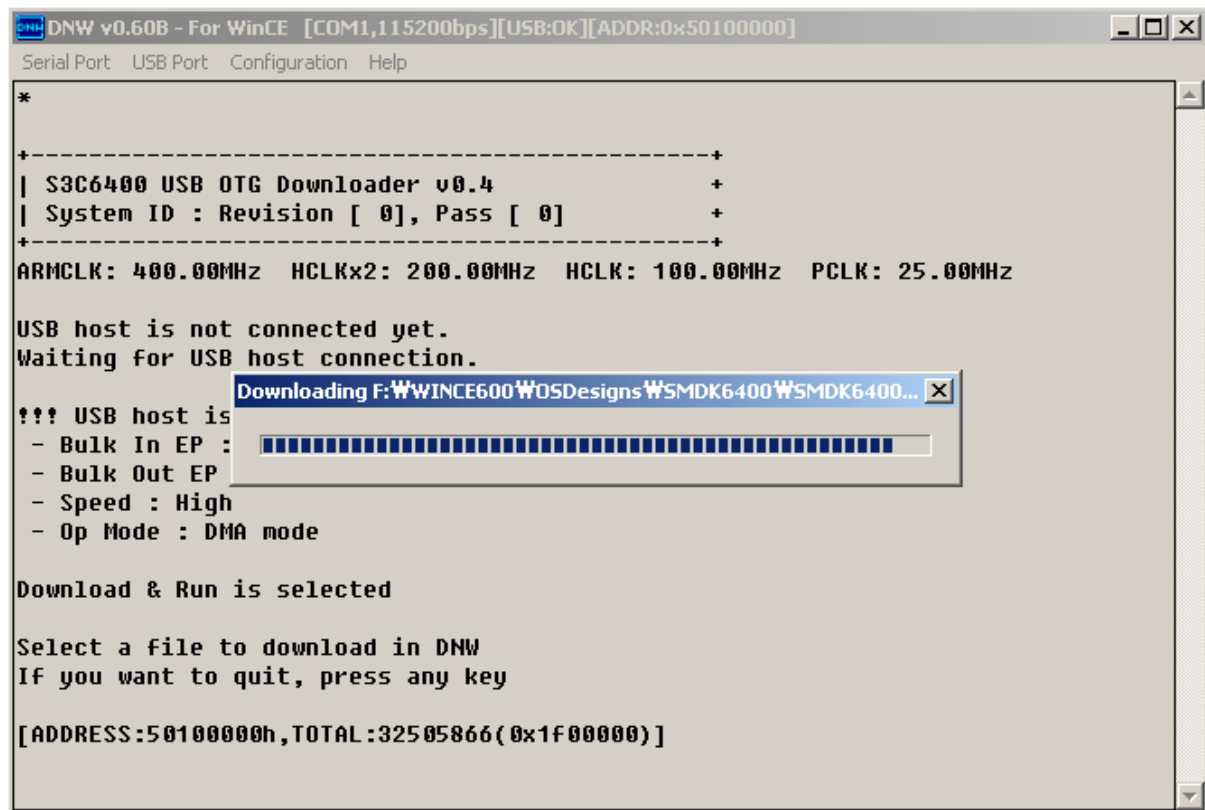


Figure 5-7 Downloading Status of NK.nb0

6 Fusing WinCE Single .bin 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.

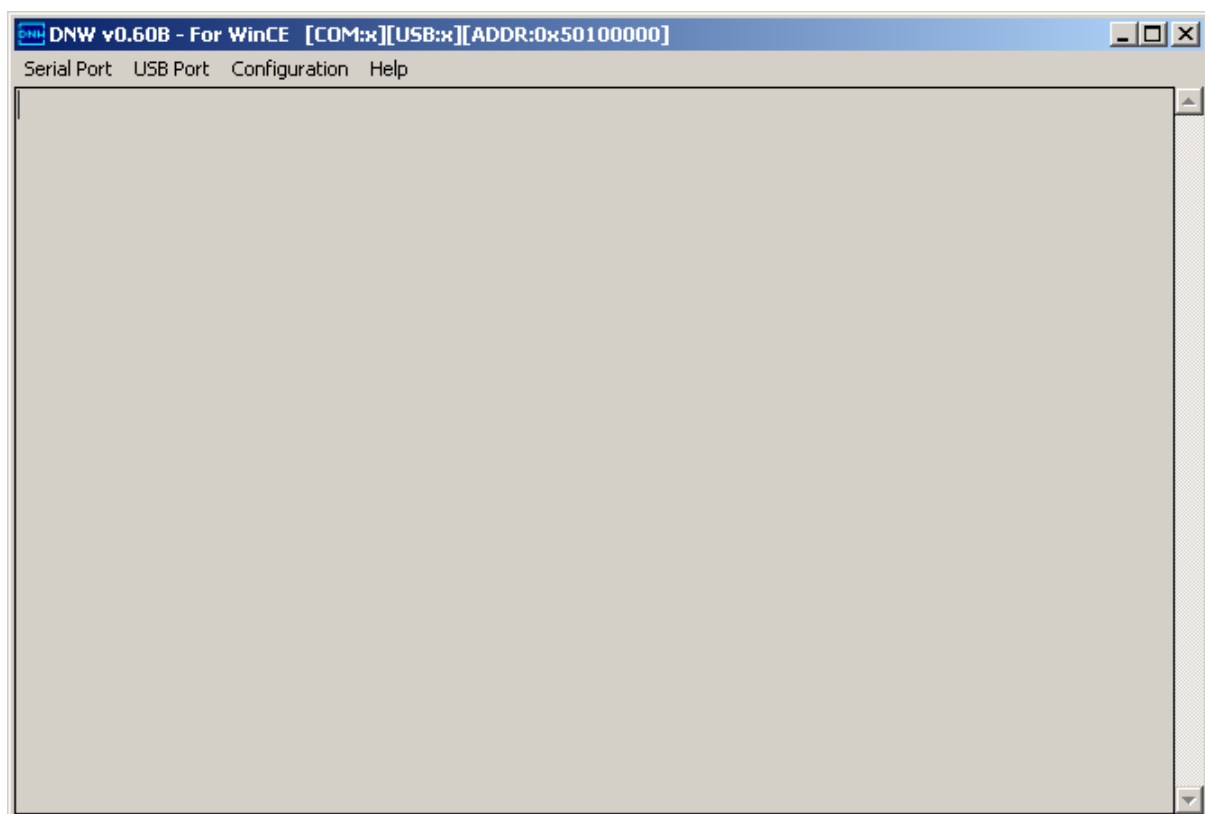


Figure 6-1 DNW Window

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 6-2, enter the download address as **0x50030000** and then click **OK** button.

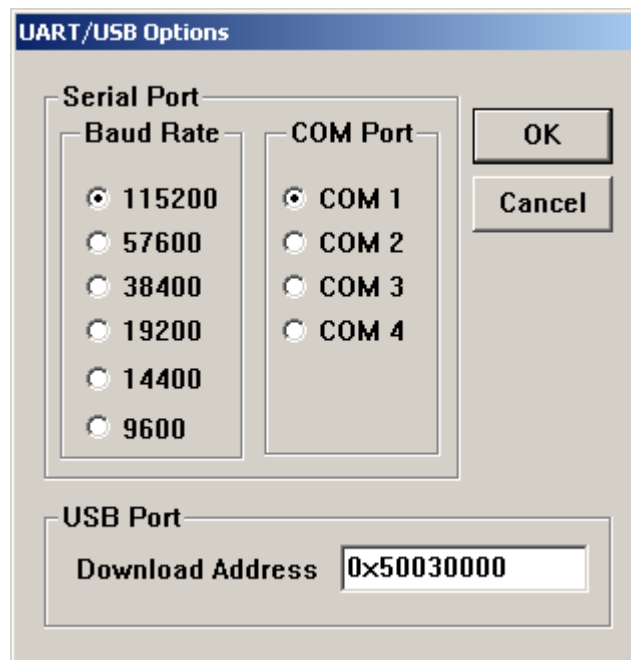


Figure 6-2 UART/USB Options

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.

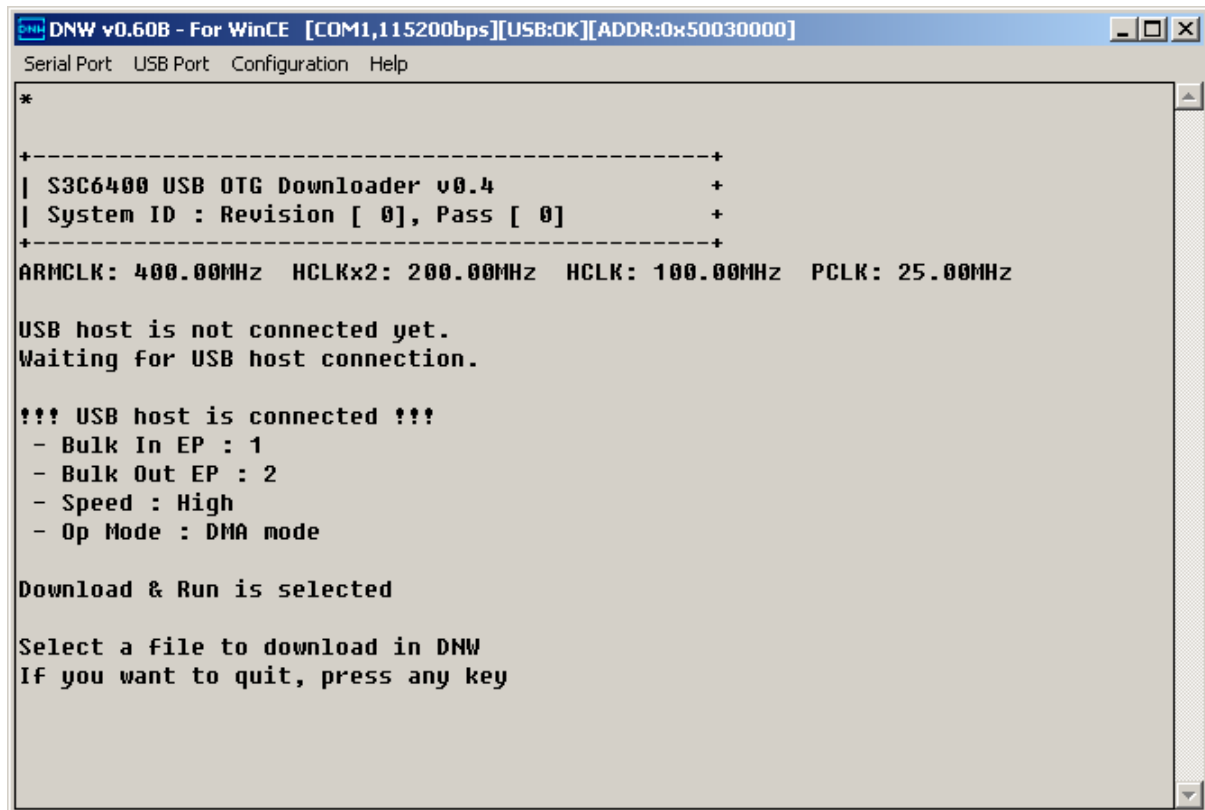


Figure 6-3 DNW Window after Board Power ON

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

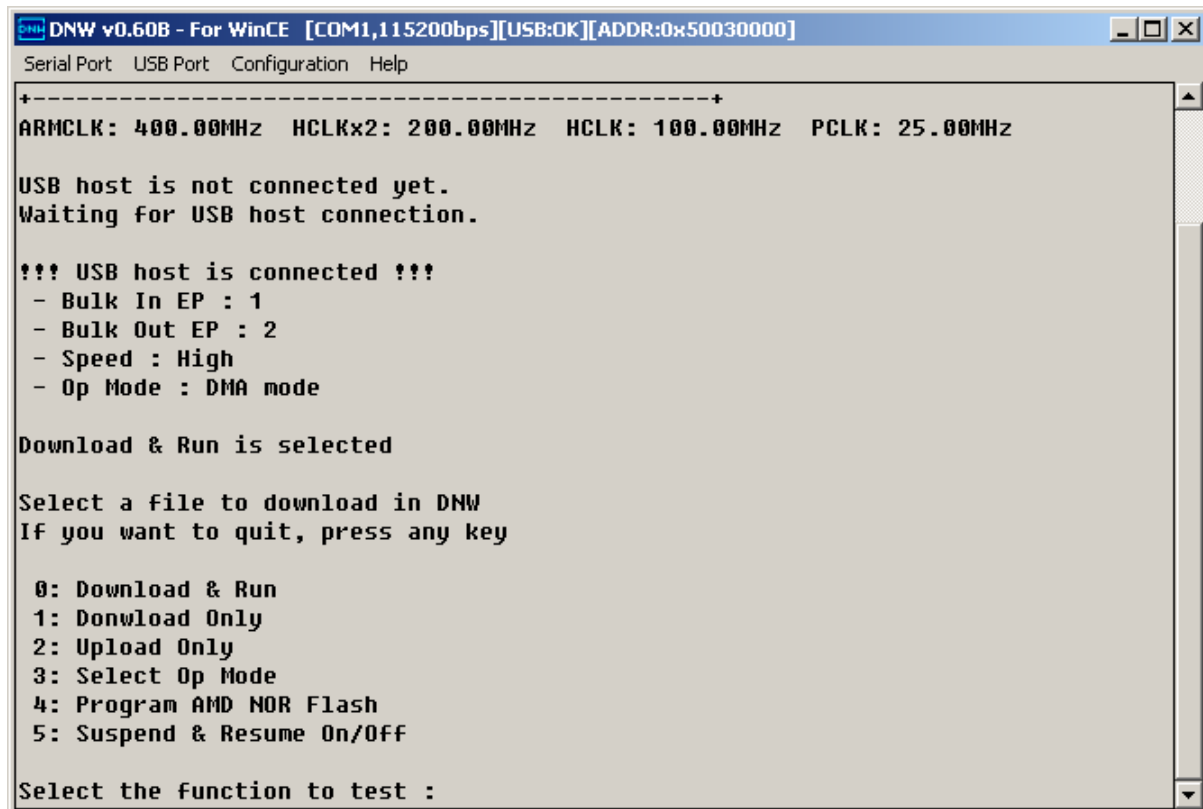


Figure 6-4 usb OTG Mon menu

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

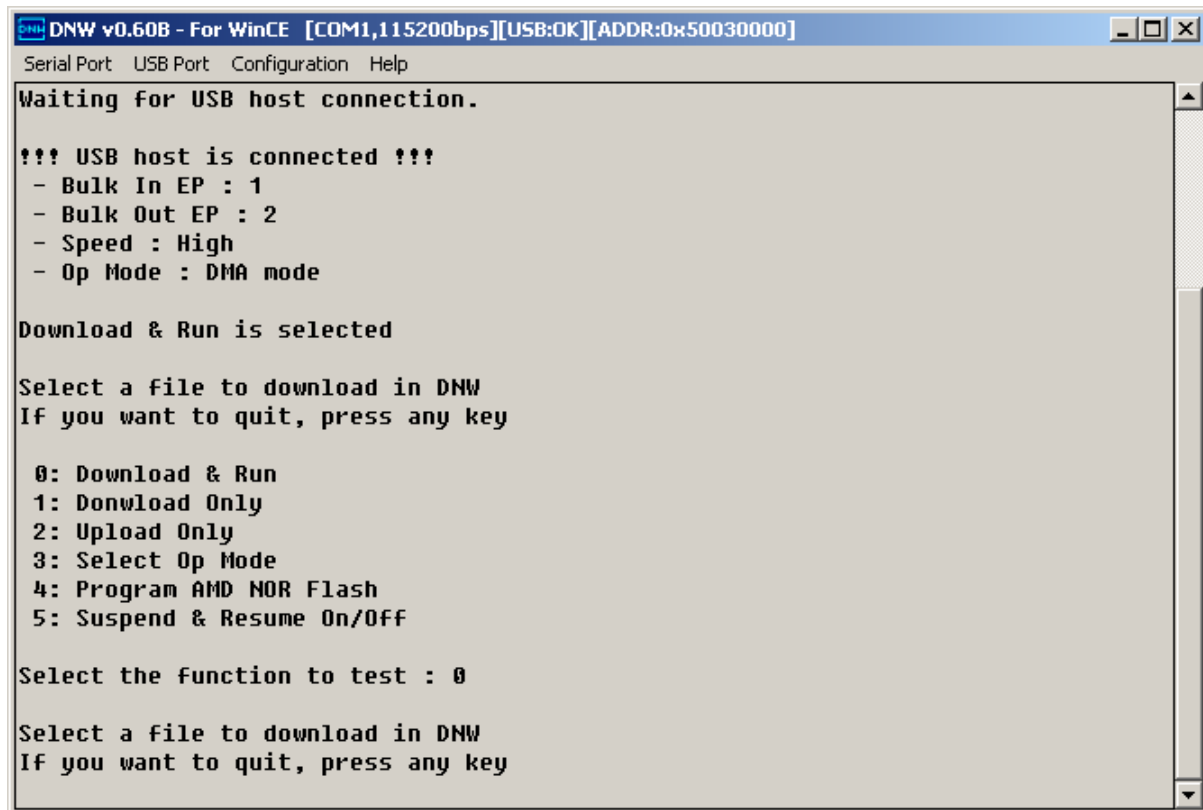


Figure 6-5 Download & Run

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.

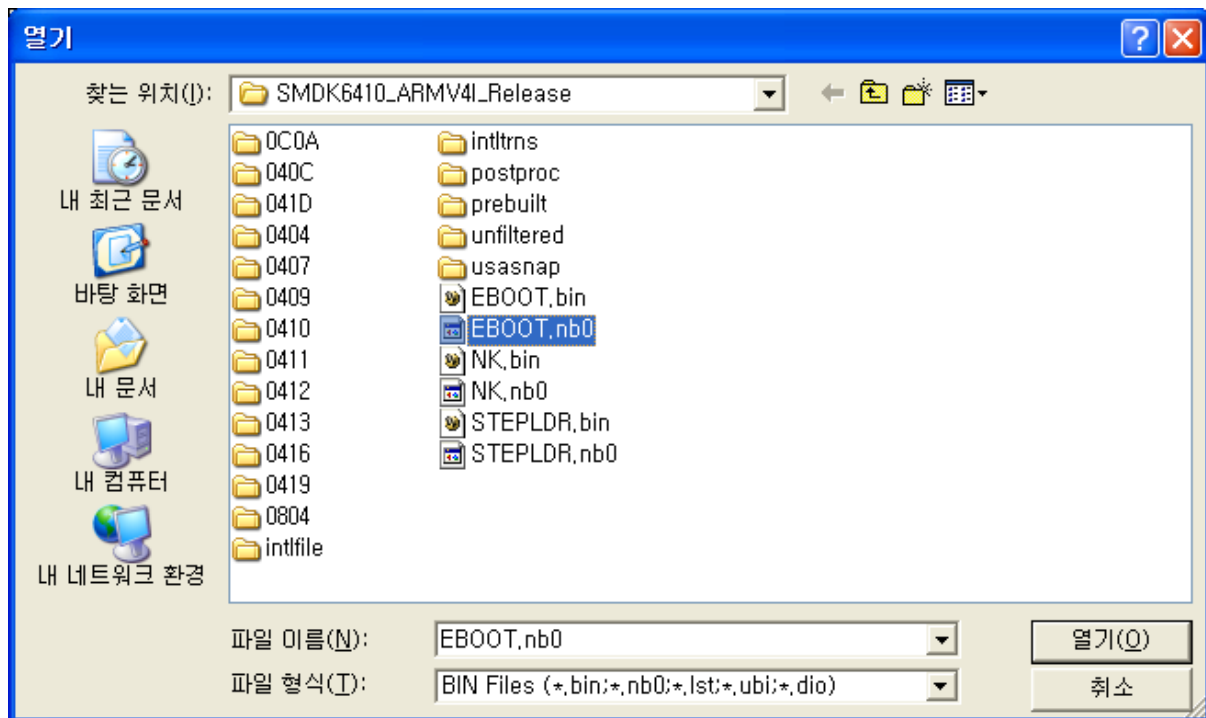
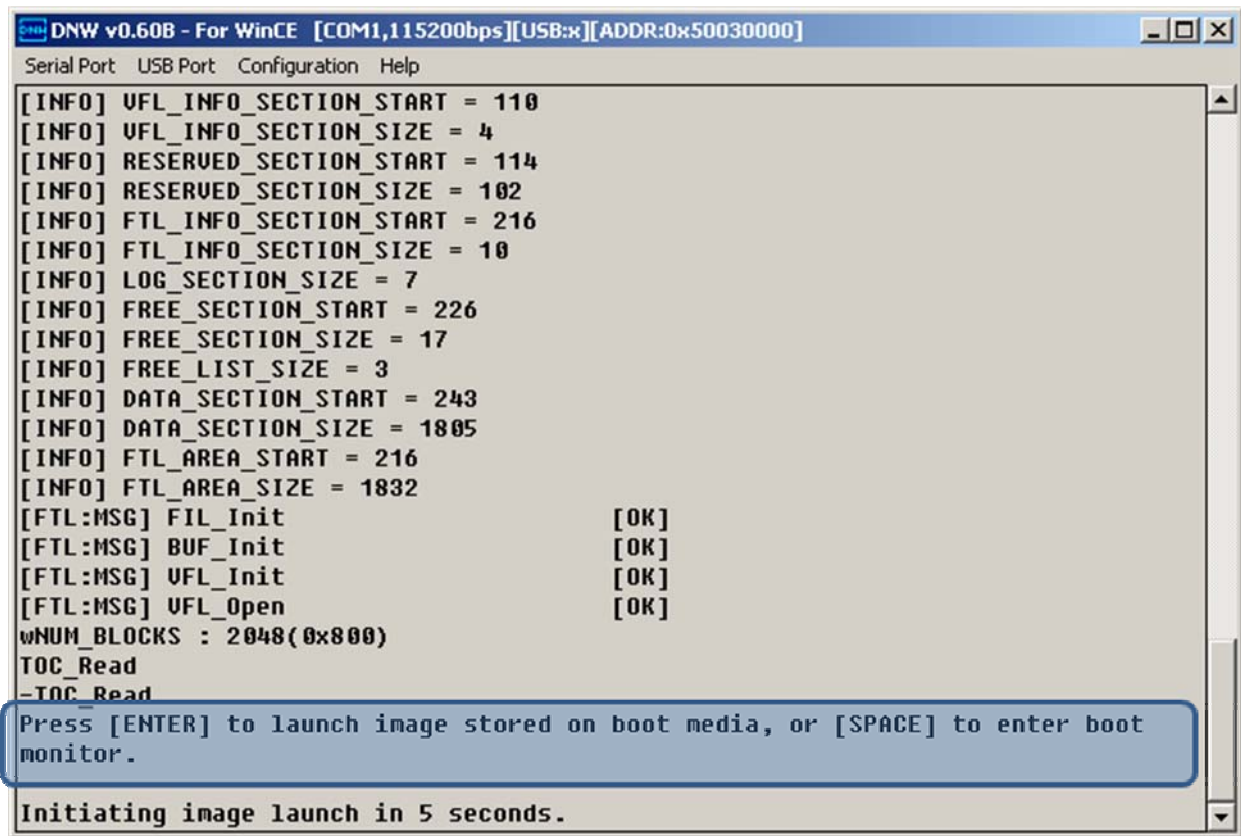


Figure 6-6 Selecting EBOOT.nb0 for Download

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



The screenshot shows a window titled "DNW v0.60B - For WinCE [COM1,115200bps][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:

```
[INFO] UFL_INFO_SECTION_START = 110
[INFO] UFL_INFO_SECTION_SIZE = 4
[INFO] RESERVED_SECTION_START = 114
[INFO] RESERVED_SECTION_SIZE = 102
[INFO] FTL_INFO_SECTION_START = 216
[INFO] FTL_INFO_SECTION_SIZE = 10
[INFO] LOG_SECTION_SIZE = 7
[INFO] FREE_SECTION_START = 226
[INFO] FREE_SECTION_SIZE = 17
[INFO] FREE_LIST_SIZE = 3
[INFO] DATA_SECTION_START = 243
[INFO] DATA_SECTION_SIZE = 1805
[INFO] FTL_AREA_START = 216
[INFO] FTL_AREA_SIZE = 1832
[FTL:MSG] FIL_Init [OK]
[FTL:MSG] BUF_Init [OK]
[FTL:MSG] UFL_Init [OK]
[FTL:MSG] UFL_Open [OK]
wNUM_BLOCKS : 2048(0x800)
TOC_Read
-TOC_Read
```

A blue-bordered box contains the text: "Press [ENTER] to launch image stored on boot media, or [SPACE] to enter boot monitor."

Below the box, it says: "Initiating image launch in 5 seconds."

Figure 6-7 After EBOOT.nb0 Download

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

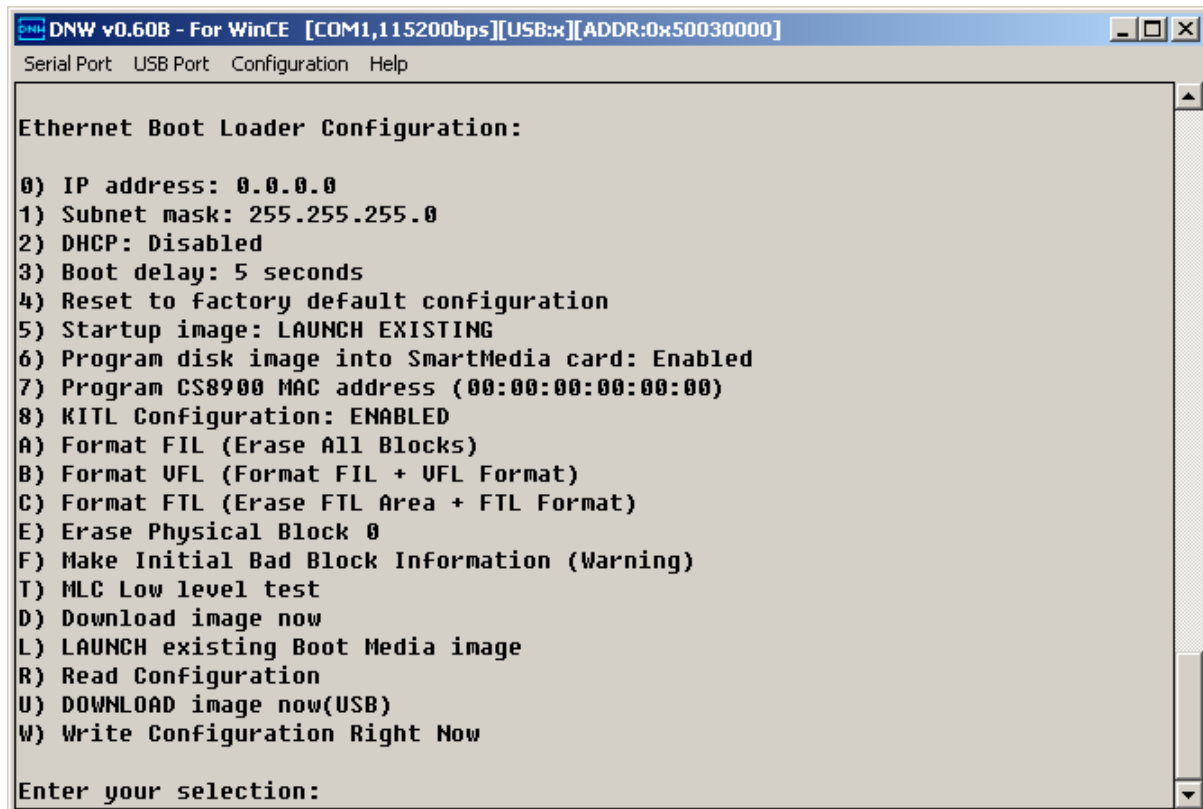
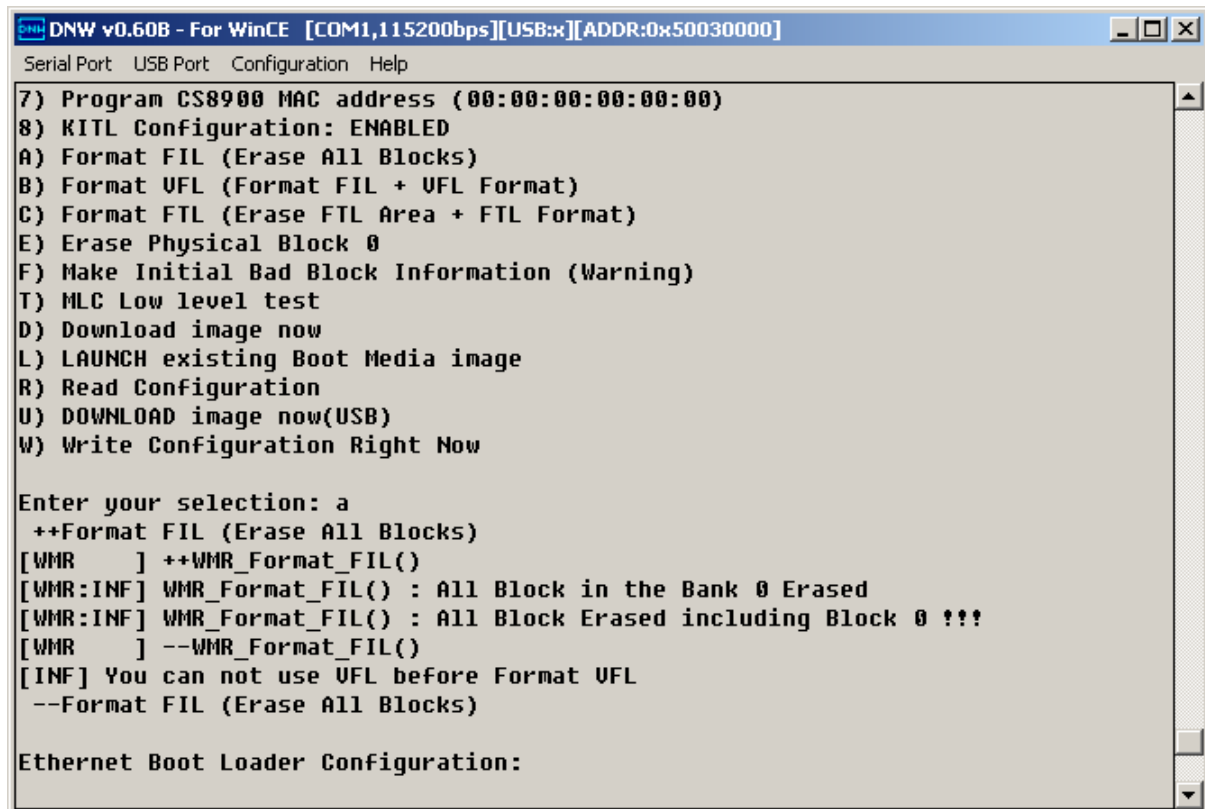


Figure 6-8 Ethernet Boot Loader Configuration - Before

12. And then Enter [A] for Erase All Blocks. If so, You can see the below window.



```
DNW v0.60B - For WinCE [COM1,115200bps][USB:x][ADDR:0x50030000]
Serial Port  USB Port  Configuration  Help

7) Program CS8900 MAC address (00:00:00:00:00:00)
8) KITL Configuration: ENABLED
A) Format FIL (Erase All Blocks)
B) Format UFL (Format FIL + UFL Format)
C) Format FTL (Erase FTL Area + FTL Format)
E) Erase Physical Block 0
F) Make Initial Bad Block Information (Warning)
T) MLC Low level test
D) Download image now
L) LAUNCH existing Boot Media image
R) Read Configuration
U) DOWNLOAD image now(USB)
W) Write Configuration Right Now

Enter your selection: a
++Format FIL (Erase All Blocks)
[WMR    ] ++WMR_Format_FIL()
[WMR:INF] WMR_Format_FIL() : All Block in the Bank 0 Erased
[WMR:INF] WMR_Format_FIL() : All Block Erased including Block 0 !!!
[WMR    ] --WMR_Format_FIL()
[INF] You can not use UFL before Format UFL
--Format FIL (Erase All Blocks)

Ethernet Boot Loader Configuration:
```

Figure 6-9 Foarmat FIL (Erase All Blocks)

13. Reset the board. DNW window appears as shown in figure 6-10.

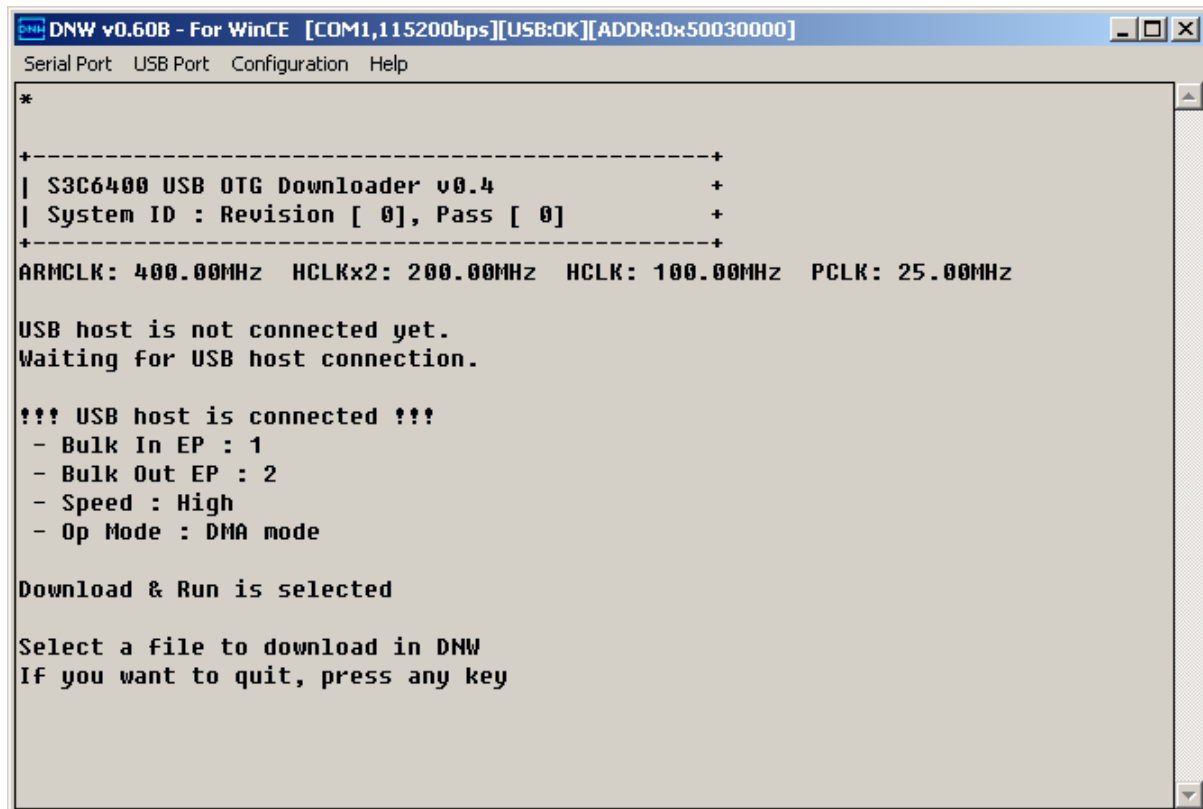


Figure 6-10 DNW Window after reset

14. 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.

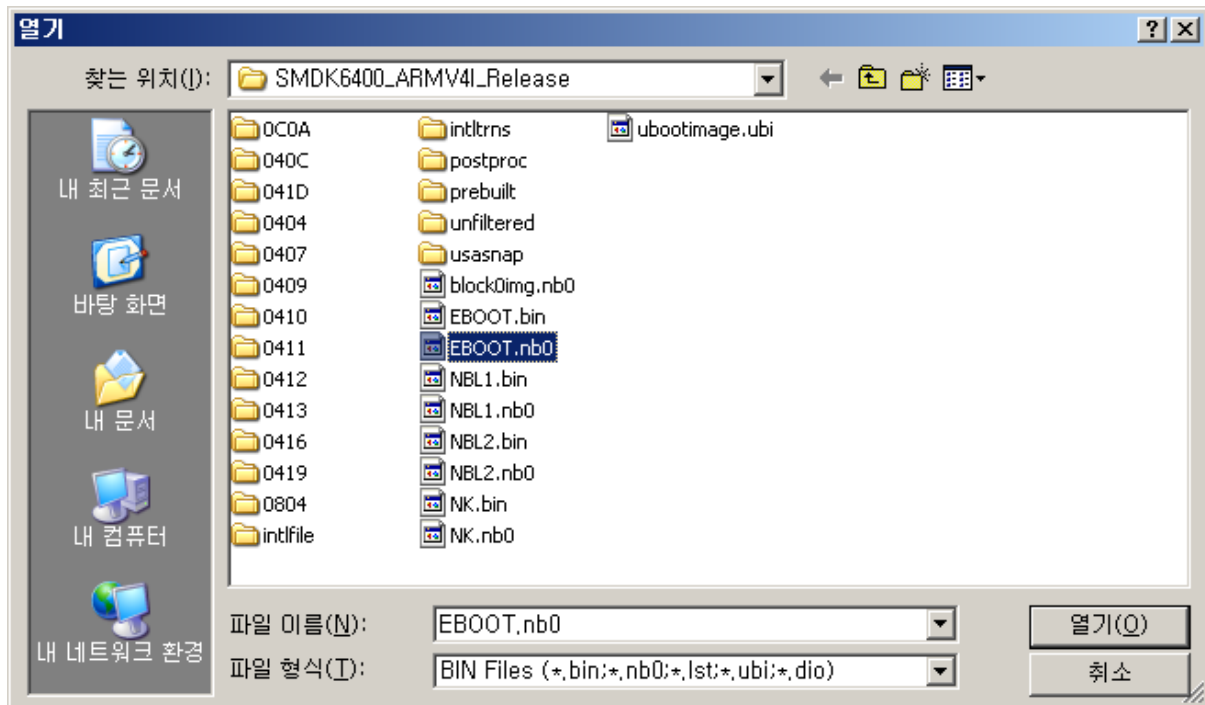
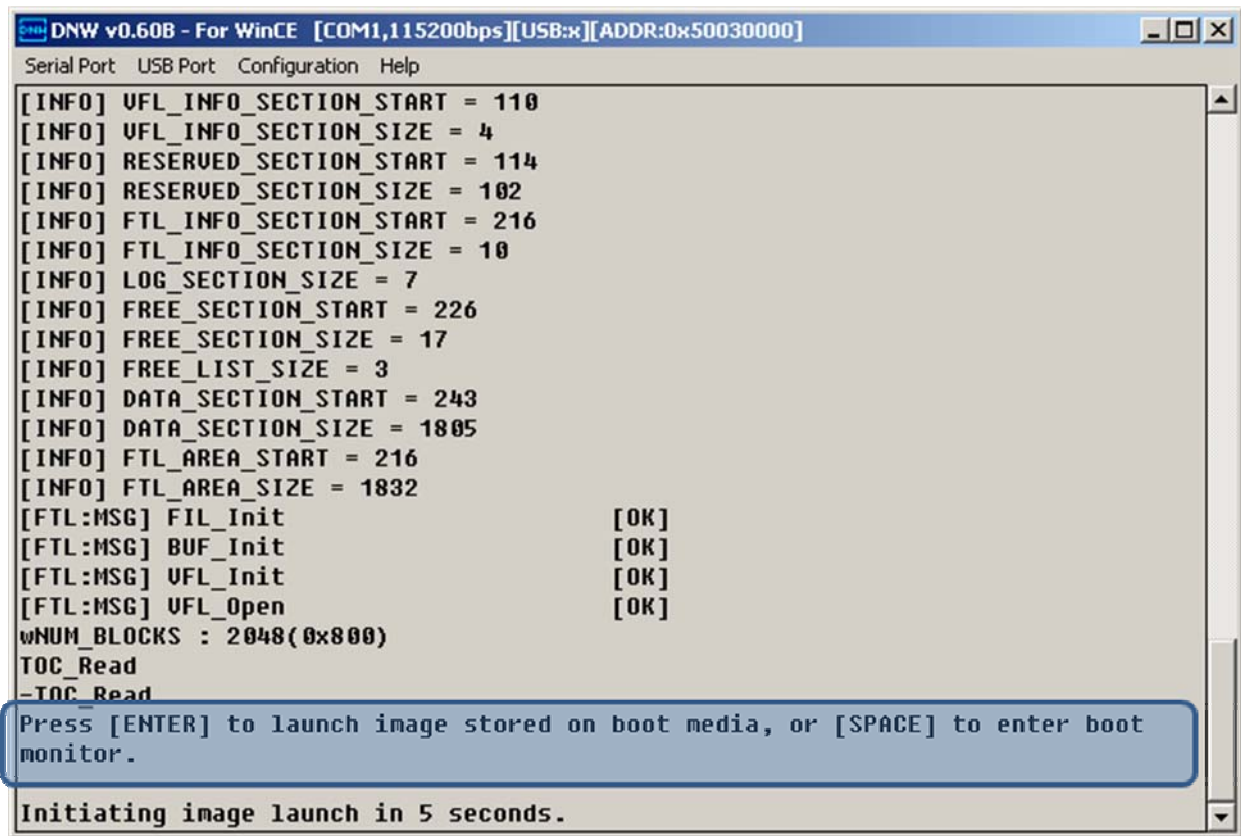


Figure 6-11 Selecting EBOOT.nb0 for Download

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



The screenshot shows a window titled "DNW v0.60B - For WinCE [COM1,115200bps][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:

```
[INFO] VFL_INFO_SECTION_START = 110
[INFO] VFL_INFO_SECTION_SIZE = 4
[INFO] RESERVED_SECTION_START = 114
[INFO] RESERVED_SECTION_SIZE = 102
[INFO] FTL_INFO_SECTION_START = 216
[INFO] FTL_INFO_SECTION_SIZE = 10
[INFO] LOG_SECTION_SIZE = 7
[INFO] FREE_SECTION_START = 226
[INFO] FREE_SECTION_SIZE = 17
[INFO] FREE_LIST_SIZE = 3
[INFO] DATA_SECTION_START = 243
[INFO] DATA_SECTION_SIZE = 1805
[INFO] FTL_AREA_START = 216
[INFO] FTL_AREA_SIZE = 1832
[FTL:MSG] FIL_Init [OK]
[FTL:MSG] BUF_Init [OK]
[FTL:MSG] VFL_Init [OK]
[FTL:MSG] VFL_Open [OK]
wNUM_BLOCKS : 2048(0x800)
TOC_Read
-TOC_Read
Press [ENTER] to launch image stored on boot media, or [SPACE] to enter boot
monitor.
Initiating image launch in 5 seconds.
```

Figure 6-12 After EBOOT.nb0 Download

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

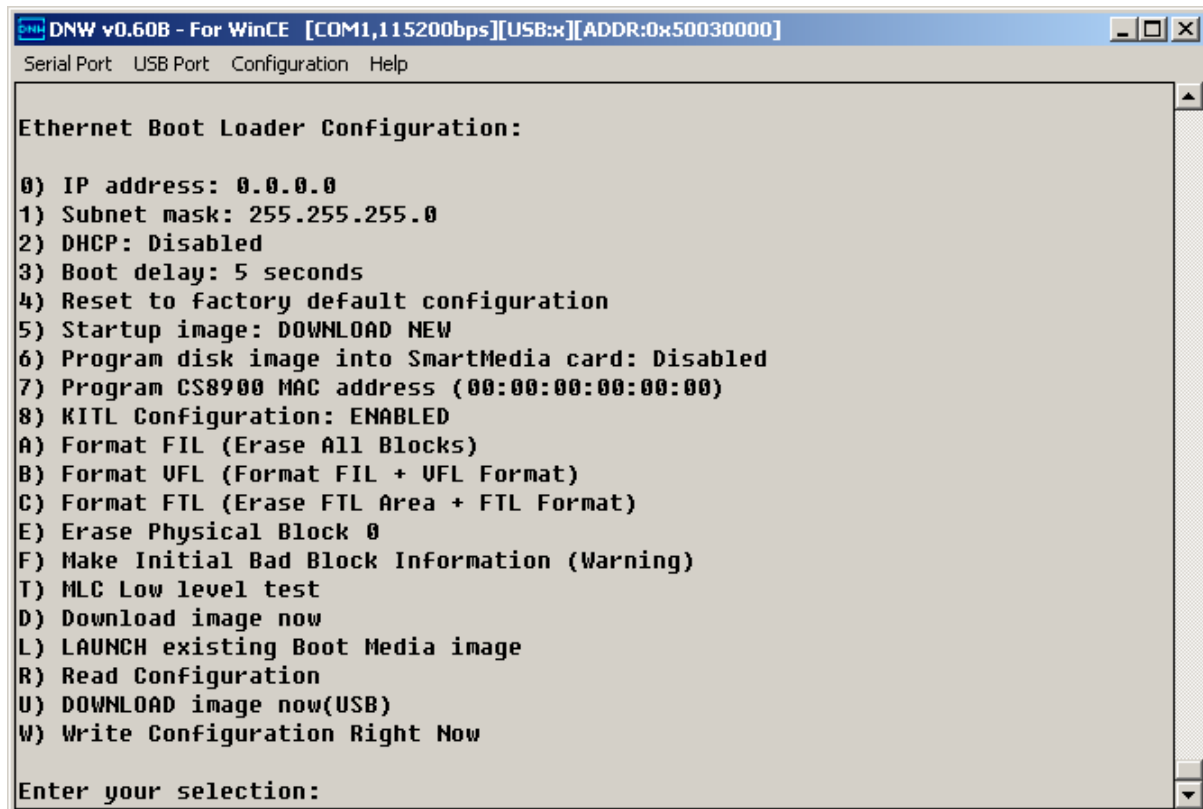


Figure 6-13 Ethernet Boot Loader Configuration - Before

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

- Keep Startup image: LAUNCH EXISTING
- Keep Program disk image: **ENABLED**
- Keep KITL Configuration: **DISABLED**

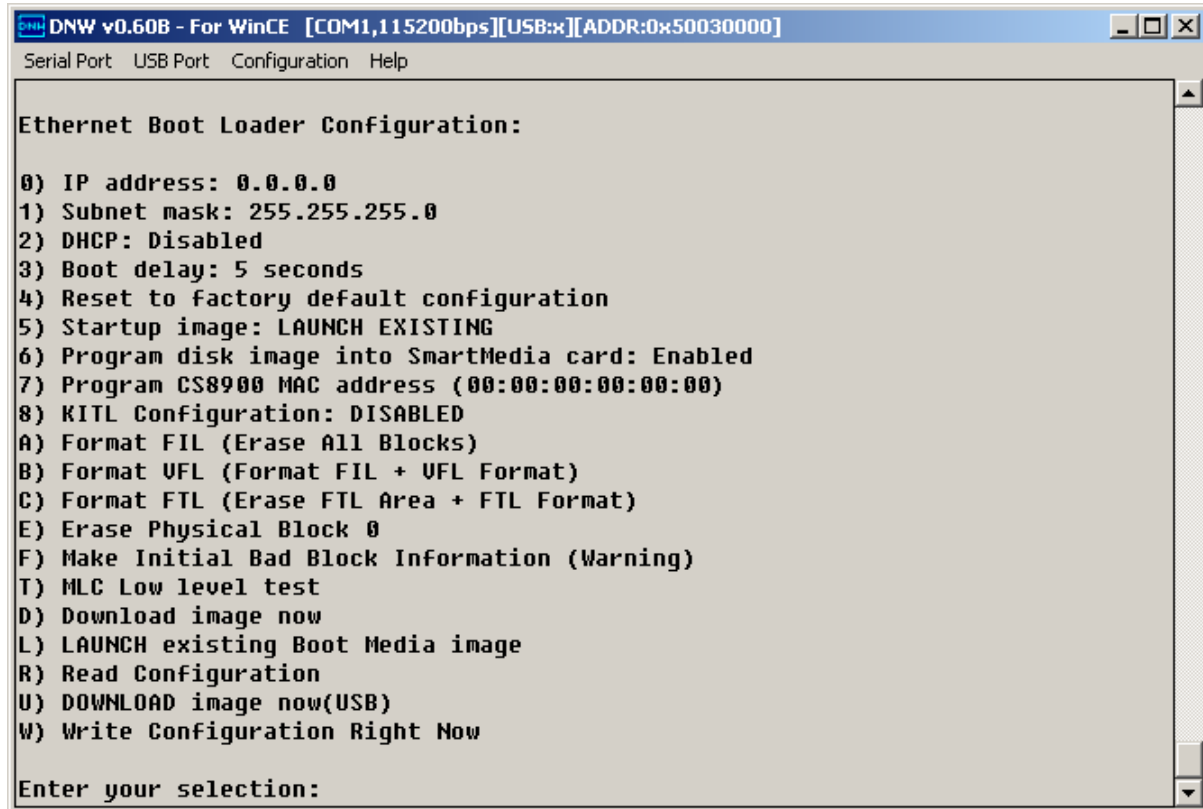


Figure 6-14 Ethernet Boot Loader Configuration - After

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

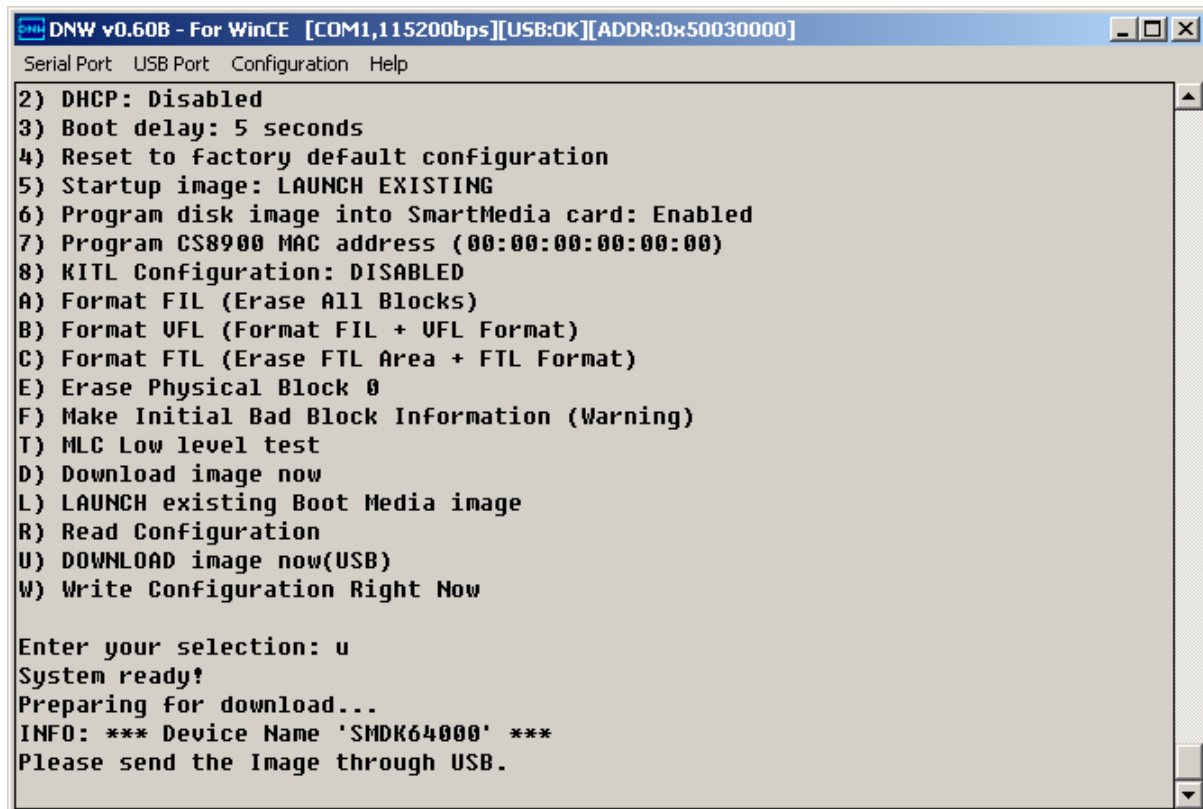


Figure 6-15 Preparing to download image through USB

19. On the USB Port menu click UBOOT and the following window appears on your screen. Select block0img.nb0 from X:\WINCE600\OSDesigns\[OSDesign name]\[OSDesign name]\ReIDir\SMDK6410_ARMV4I_Release directory and then click Open button.

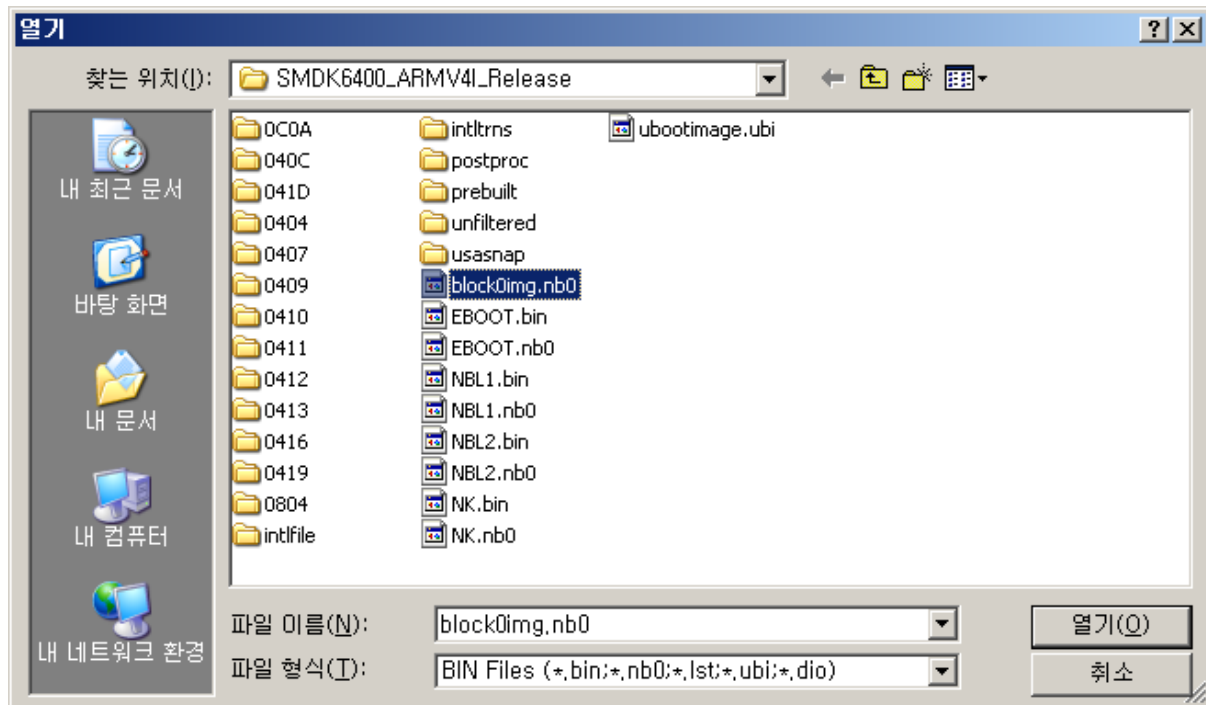


Figure 6-16 Selecting block0img.nb0 for Download

20. You can see the following messages on the DNW window after **block0img.nb0** download is over.

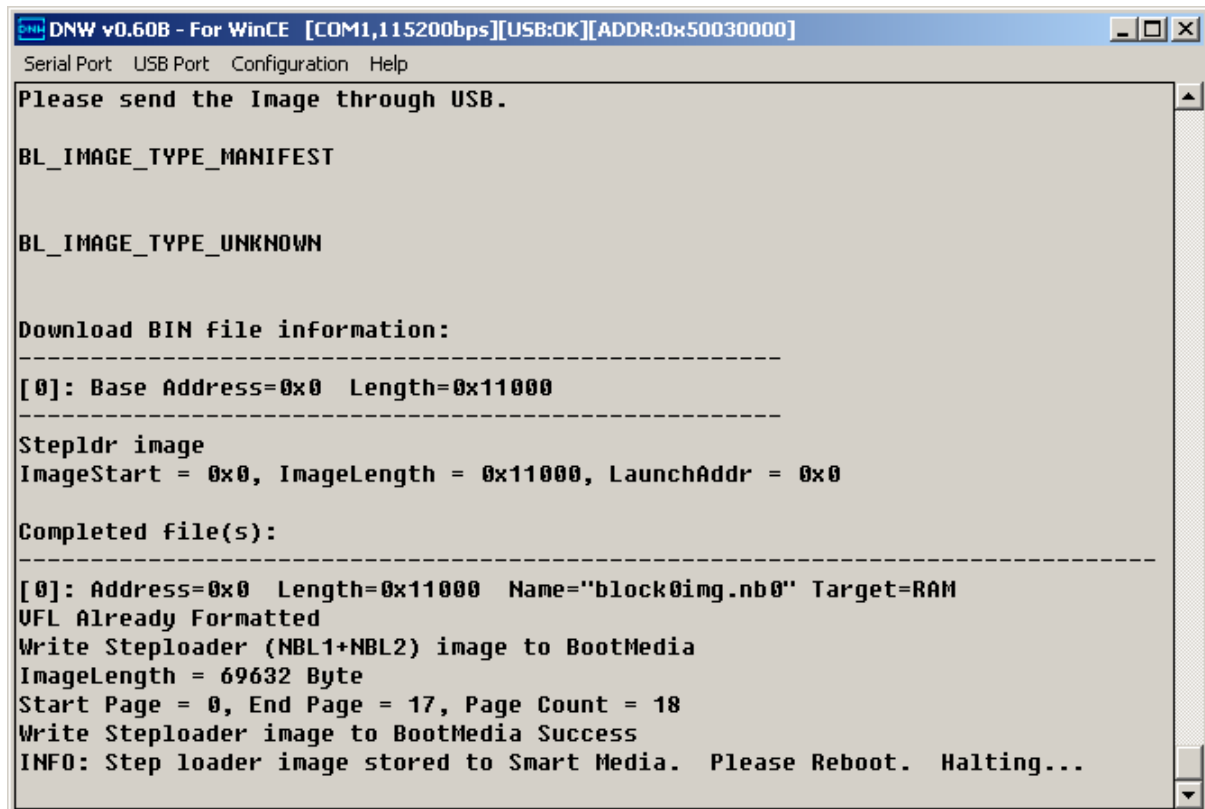


Figure 6-17 Messages via UART Port after block0img.nb0 Download

21. Reset the board. DNW window appears as shown in figure 6-18.

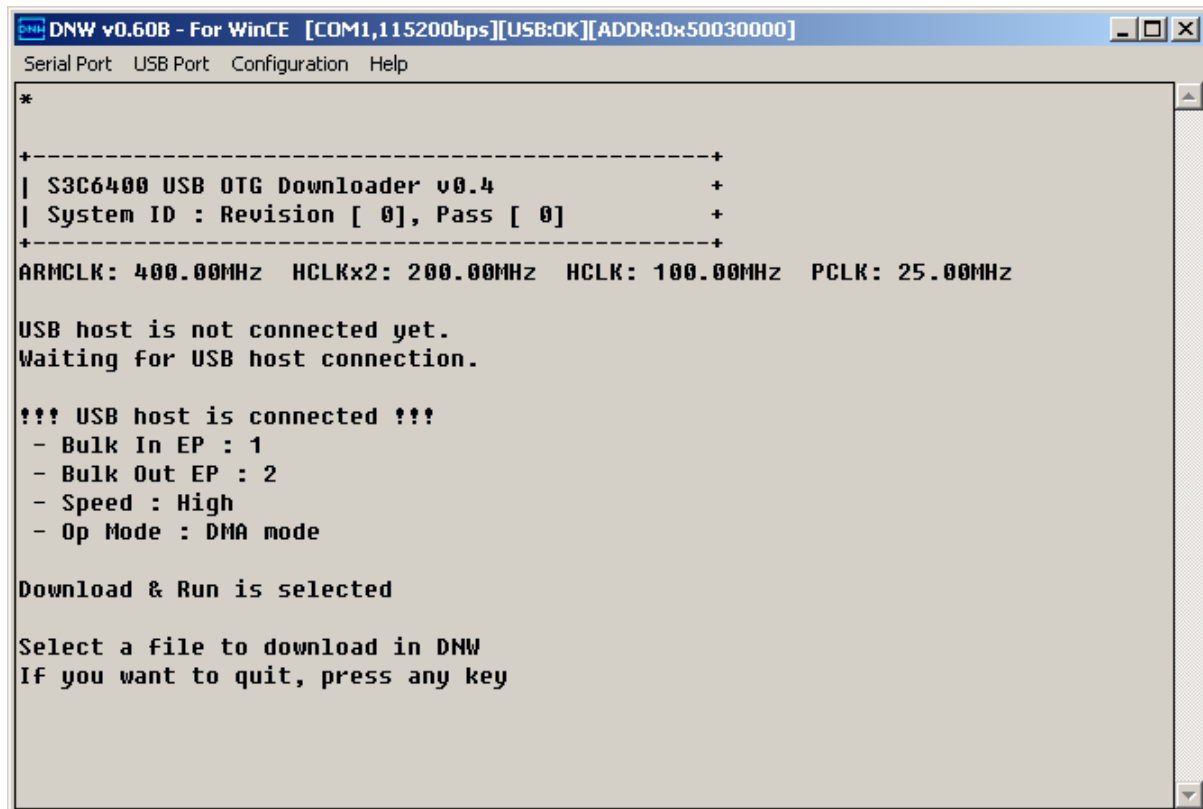


Figure 6-18 DNW Window after reset

22. 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.

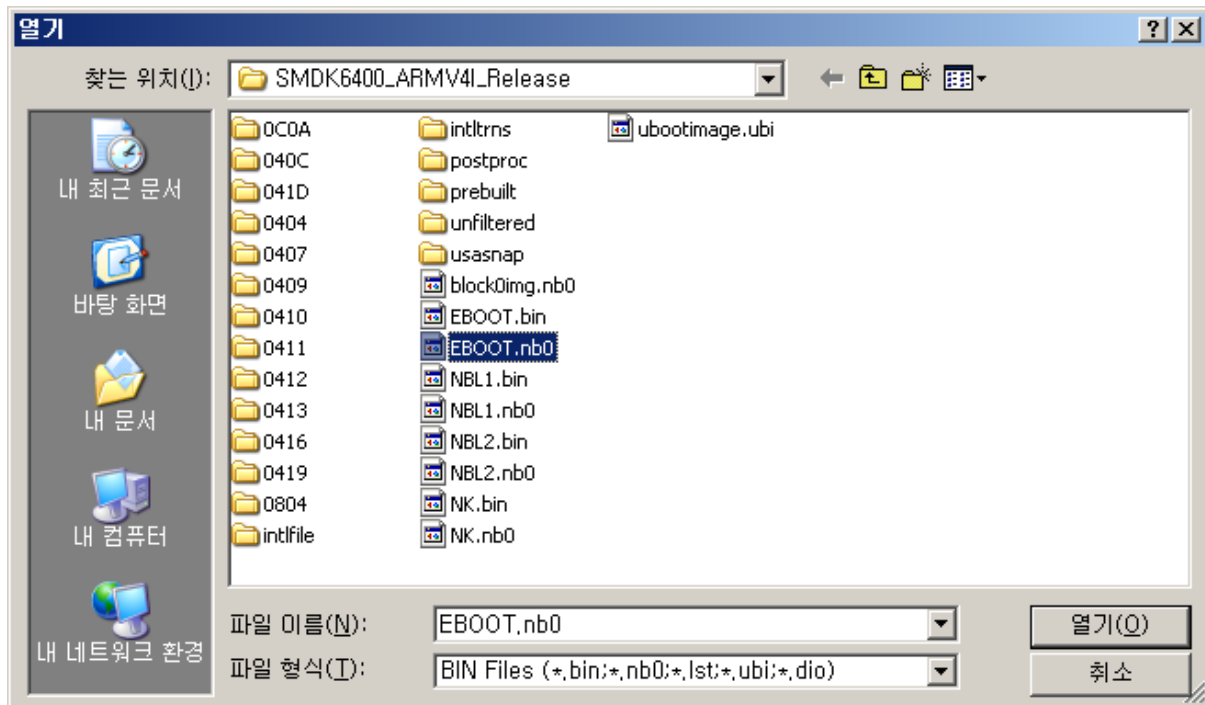
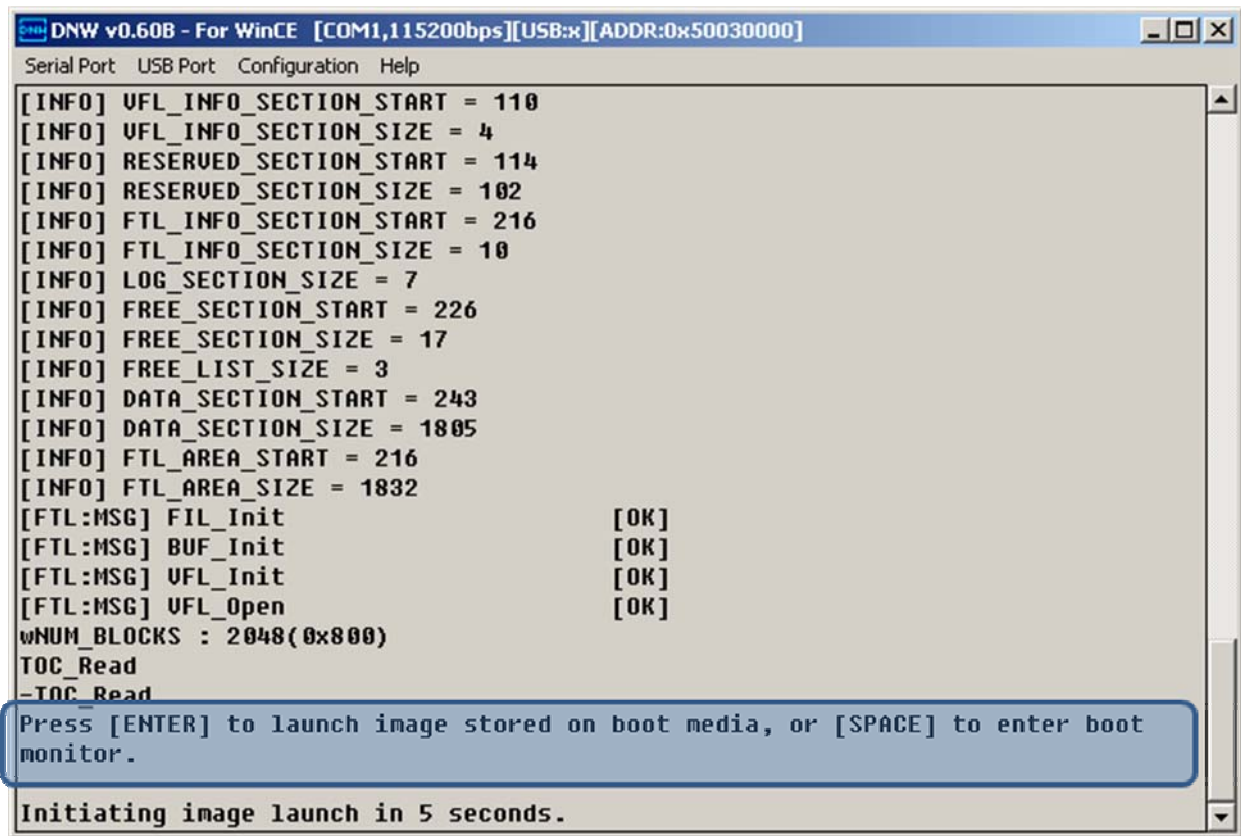


Figure 6-19 Selecting EBOOT.nb0 for Download

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



The screenshot shows a window titled "DNW v0.60B - For WinCE [COM1,115200bps][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:

```
[INFO] VFL_INFO_SECTION_START = 110
[INFO] VFL_INFO_SECTION_SIZE = 4
[INFO] RESERVED_SECTION_START = 114
[INFO] RESERVED_SECTION_SIZE = 102
[INFO] FTL_INFO_SECTION_START = 216
[INFO] FTL_INFO_SECTION_SIZE = 10
[INFO] LOG_SECTION_SIZE = 7
[INFO] FREE_SECTION_START = 226
[INFO] FREE_SECTION_SIZE = 17
[INFO] FREE_LIST_SIZE = 3
[INFO] DATA_SECTION_START = 243
[INFO] DATA_SECTION_SIZE = 1805
[INFO] FTL_AREA_START = 216
[INFO] FTL_AREA_SIZE = 1832
[FTL:MSG] FIL_Init [OK]
[FTL:MSG] BUF_Init [OK]
[FTL:MSG] VFL_Init [OK]
[FTL:MSG] VFL_Open [OK]
wNUM_BLOCKS : 2048(0x800)
TOC_Read
-TOC_Read
Press [ENTER] to launch image stored on boot media, or [SPACE] to enter boot
monitor.
Initiating image launch in 5 seconds.
```

Figure 6-20 After EBOOT.nb0 Download

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

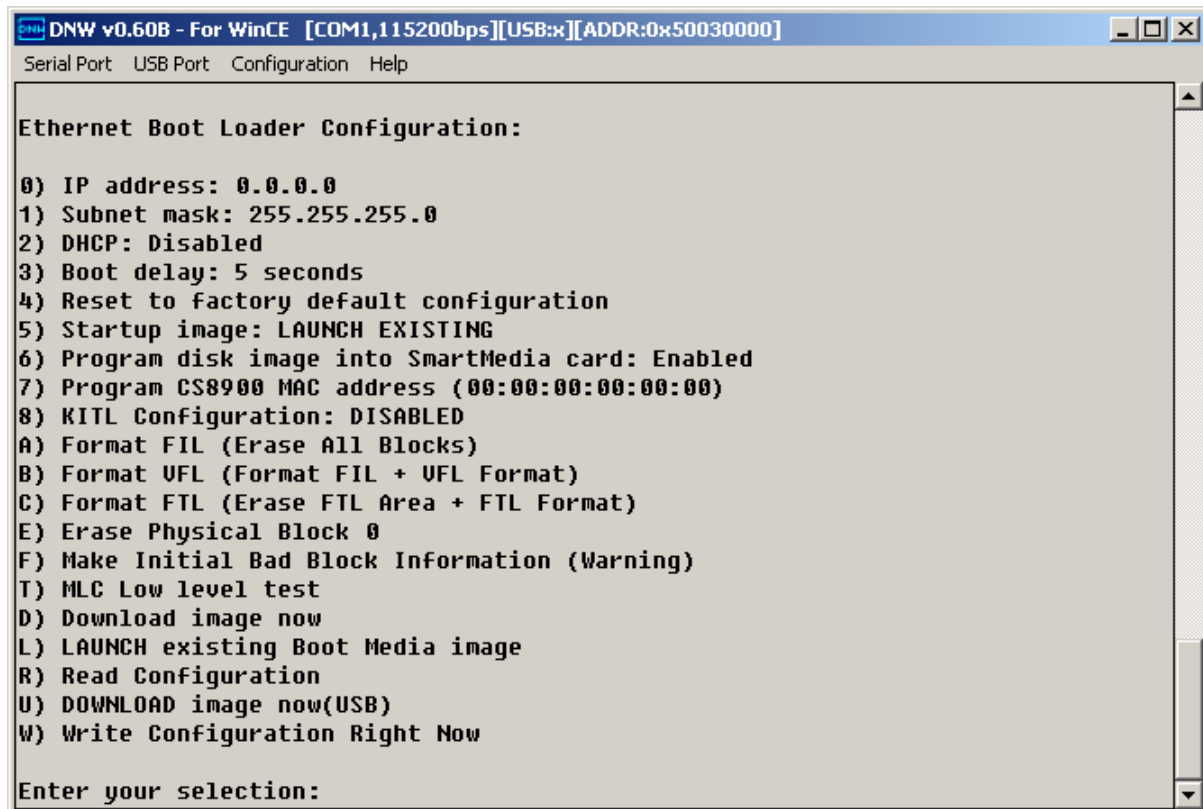


Figure 6-21 Ethernet Boot Loader Configuration

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

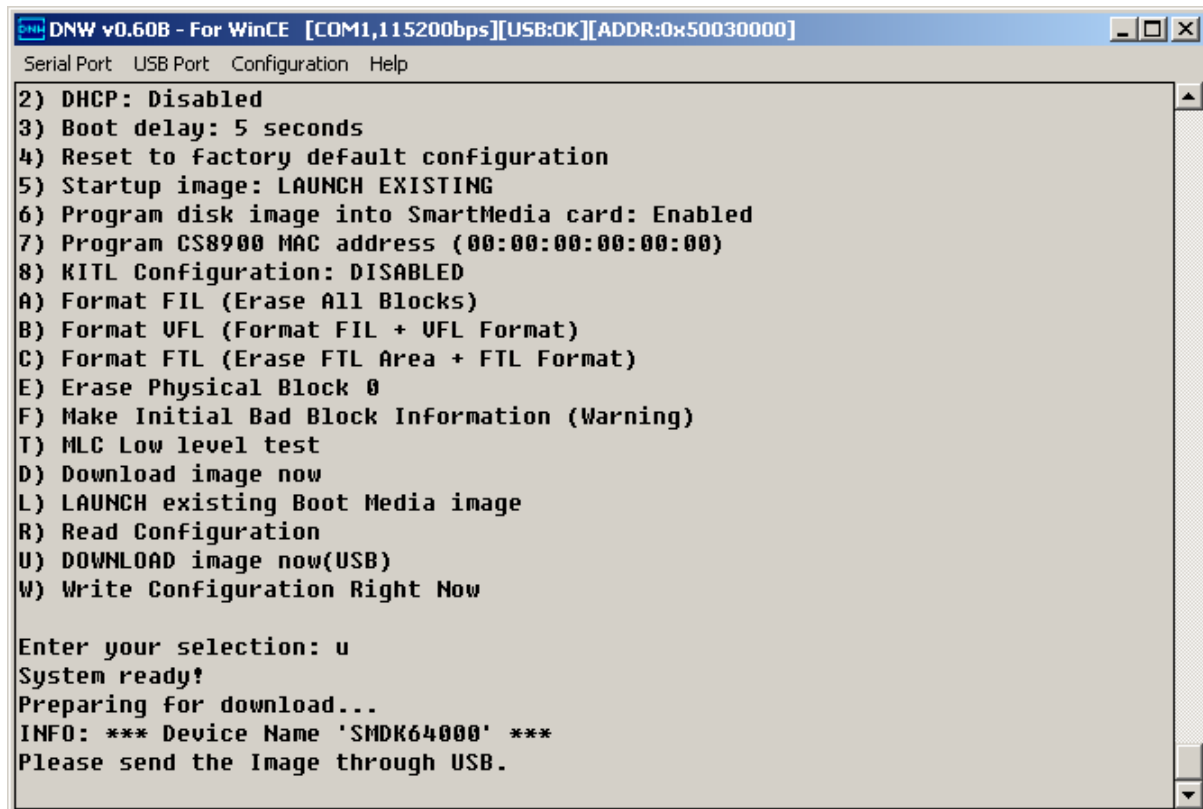


Figure 6-22 Preparing to download image through USB

26. 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.

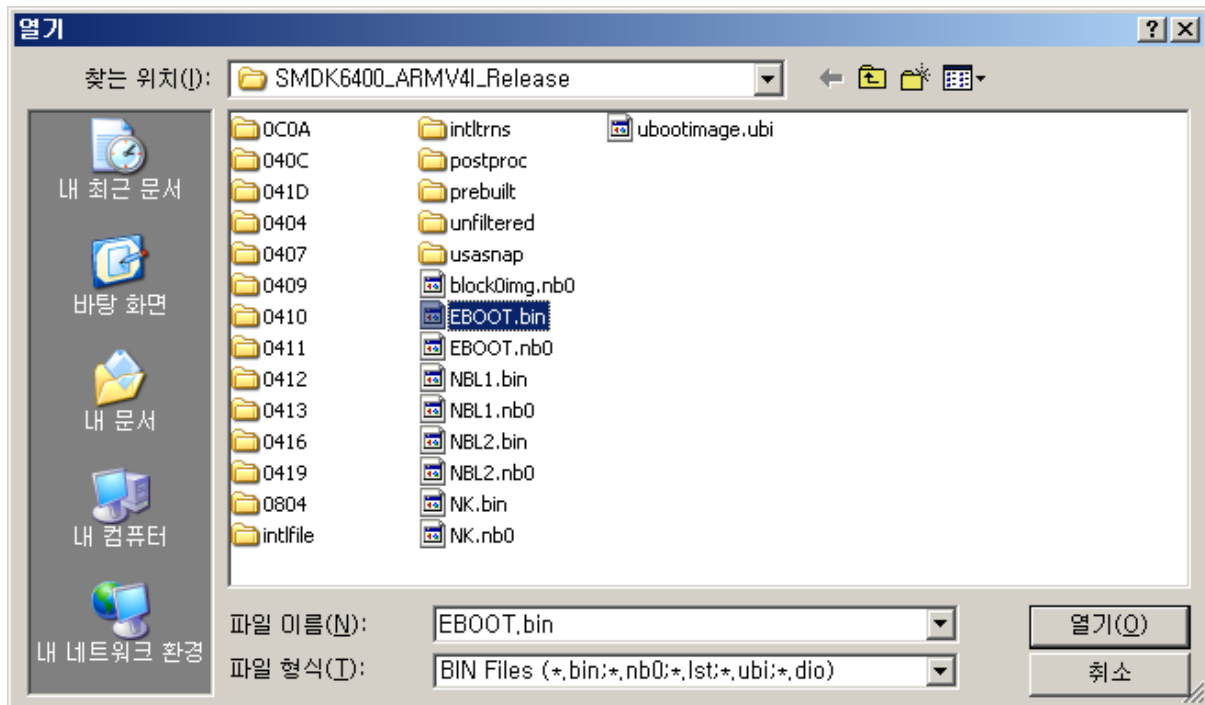
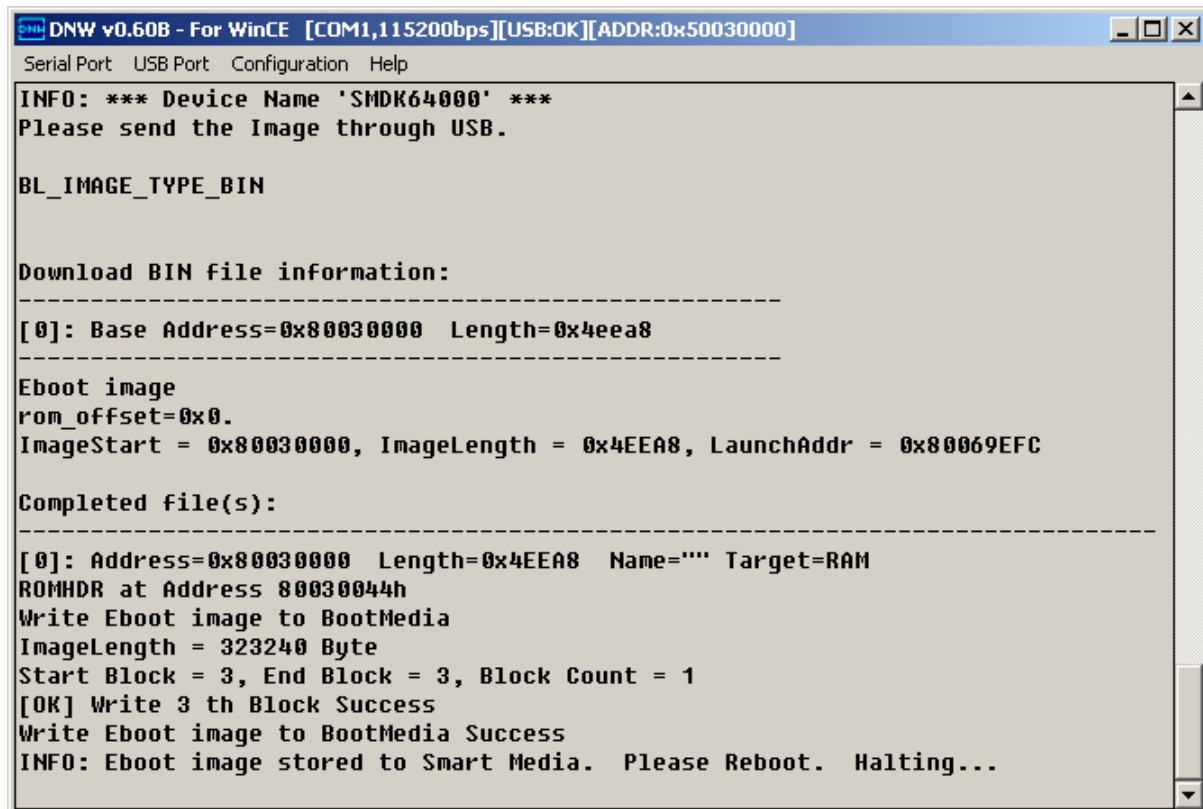


Figure 6-23 Selecting EBOOT.bin for Download

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



The screenshot shows a window titled "DNW v0.60B - For WinCE [COM1,115200bps][USB:OK][ADDR:0x50030000]". The window has a menu bar with "Serial Port", "USB Port", "Configuration", and "Help". The main text area displays the following messages:

```
INFO: *** Device Name 'SMDK64000' ***
Please send the Image through USB.

BL_IMAGE_TYPE_BIN

Download BIN file information:
-----
[0]: Base Address=0x80030000 Length=0x4eea8
-----

Eboot image
rom_offset=0x0.
ImageStart = 0x80030000, ImageLength = 0x4EEA8, LaunchAddr = 0x80069EFC

Completed file(s):
-----
[0]: Address=0x80030000 Length=0x4EEA8 Name="" Target=RAM
ROMHDR at Address 8003004h
Write Eboot image to BootMedia
ImageLength = 323240 Byte
Start Block = 3, End Block = 3, Block Count = 1
[OK] Write 3 th Block Success
Write Eboot image to BootMedia Success
INFO: Eboot image stored to Smart Media. Please Reboot. Halting...
```

Figure 6-24 Messages via UART Port after EBOOT.bin Download

28. Reset the board. DNW window appears as shown in figure 6-25.

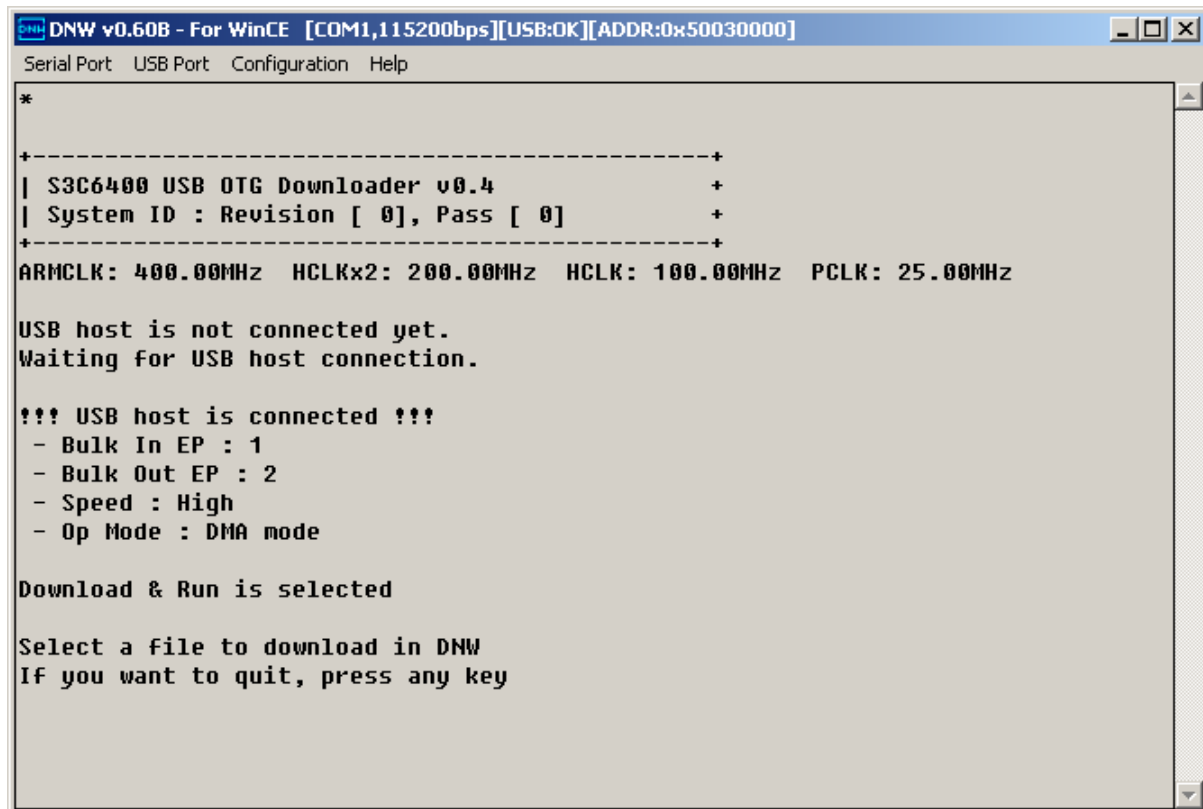


Figure 6-25 DNW Window after reset

29. 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.

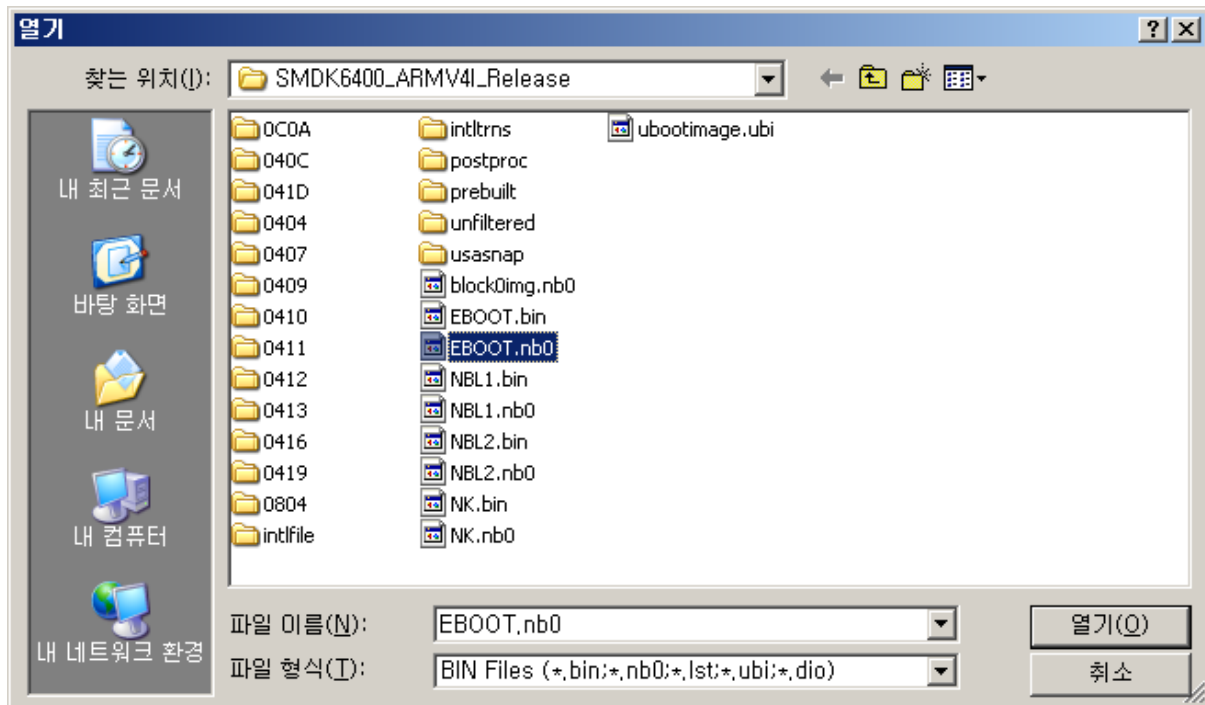
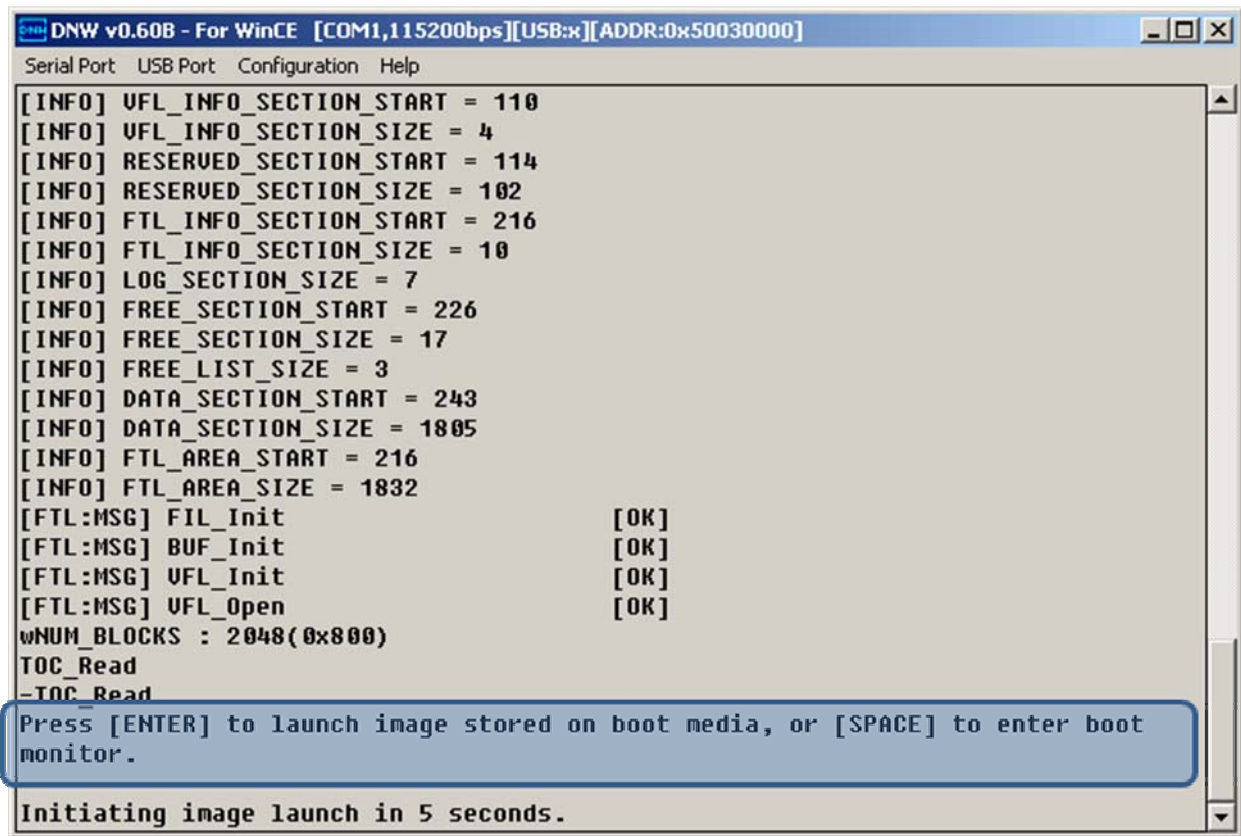


Figure 6-26 Selecting EBOOT.nb0 for Download

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



The screenshot shows a window titled "DNW v0.60B - For WinCE [COM1,115200bps][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:

```
[INFO] UFL_INFO_SECTION_START = 110
[INFO] UFL_INFO_SECTION_SIZE = 4
[INFO] RESERVED_SECTION_START = 114
[INFO] RESERVED_SECTION_SIZE = 102
[INFO] FTL_INFO_SECTION_START = 216
[INFO] FTL_INFO_SECTION_SIZE = 10
[INFO] LOG_SECTION_SIZE = 7
[INFO] FREE_SECTION_START = 226
[INFO] FREE_SECTION_SIZE = 17
[INFO] FREE_LIST_SIZE = 3
[INFO] DATA_SECTION_START = 243
[INFO] DATA_SECTION_SIZE = 1805
[INFO] FTL_AREA_START = 216
[INFO] FTL_AREA_SIZE = 1832
[FTL:MSG] FIL_Init [OK]
[FTL:MSG] BUF_Init [OK]
[FTL:MSG] UFL_Init [OK]
[FTL:MSG] UFL_Open [OK]
wNUM_BLOCKS : 2048(0x800)
TOC_Read
-TOC_Read
Press [ENTER] to launch image stored on boot media, or [SPACE] to enter boot
monitor.
Initiating image launch in 5 seconds.
```

Figure 6-27 After EBOOT.nb0 Download

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

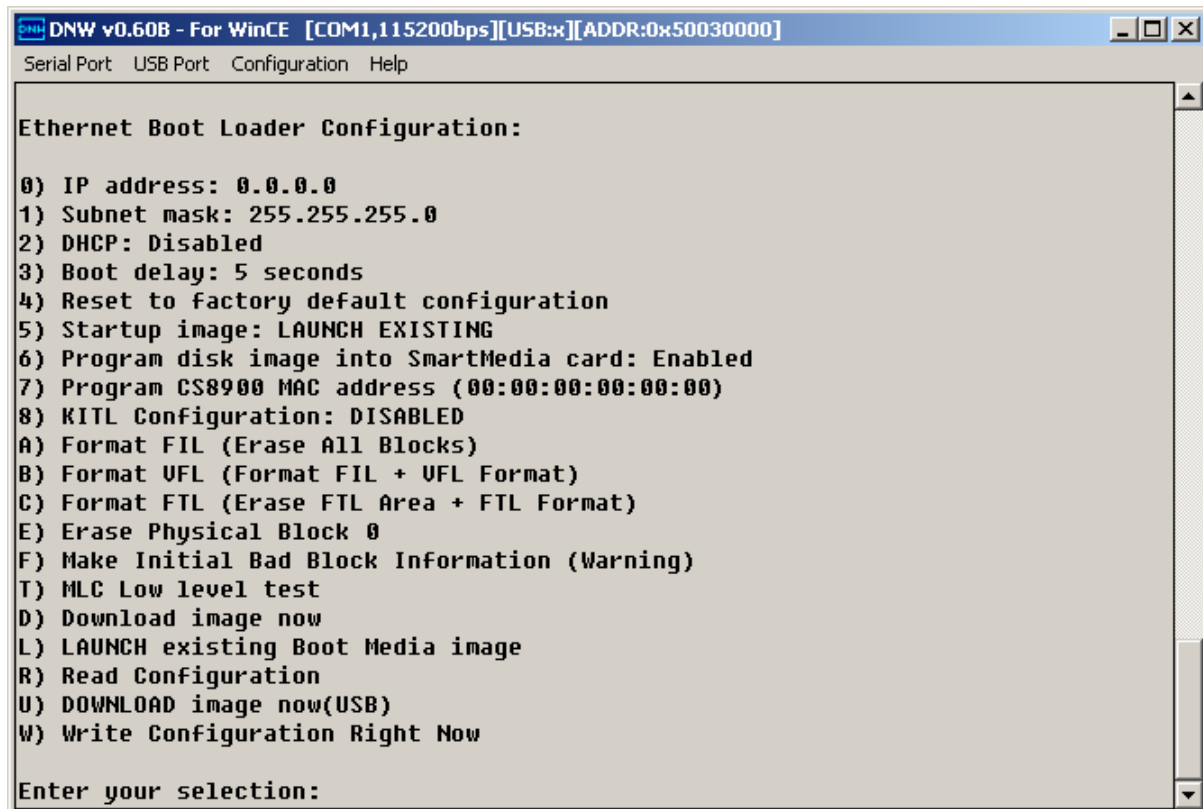


Figure 6-28 Ethernet Boot Loader Configuration

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

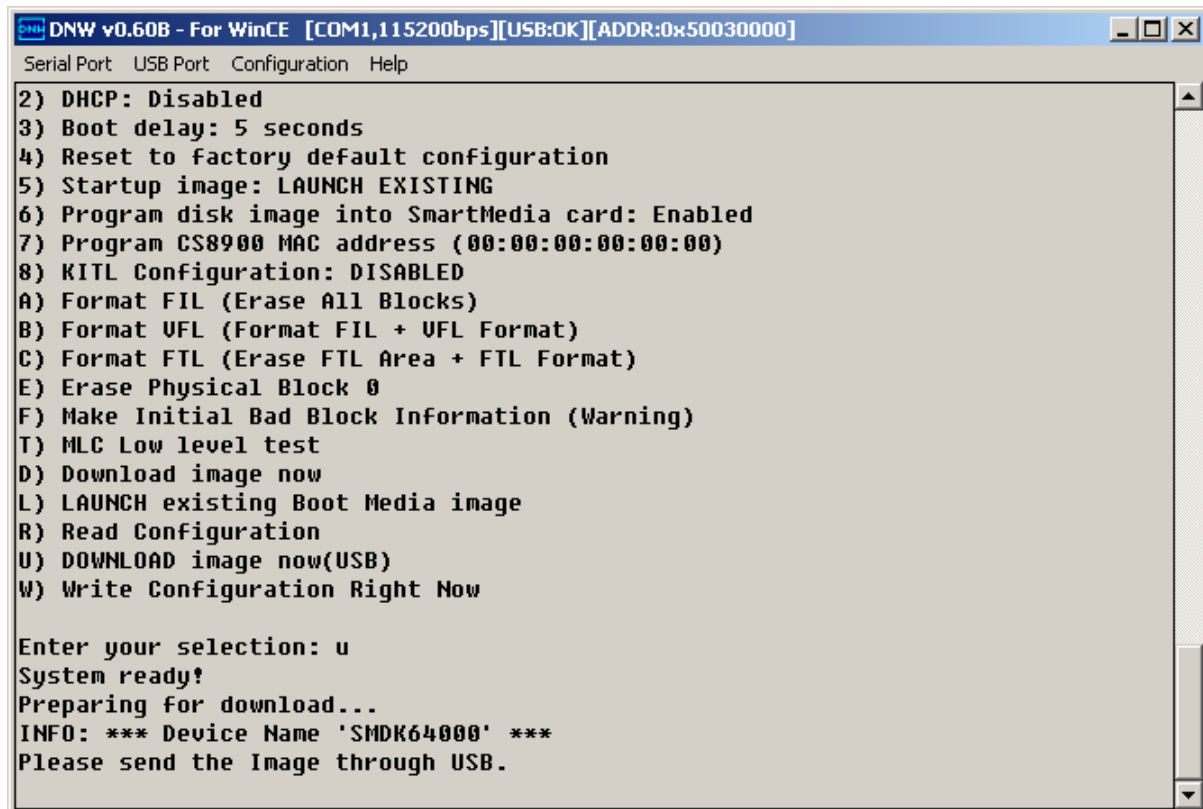


Figure 6-29 Preparing to download image through USB

33. 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]\ReDir\SMDK6410_ARMV4I_Release directory and then click Open button.

- Single-XIP (no IMGMULTIXIP) : Select NK.bin
- Multiple-XIP (IMGMULTIXIP=1) : Select chain.lst

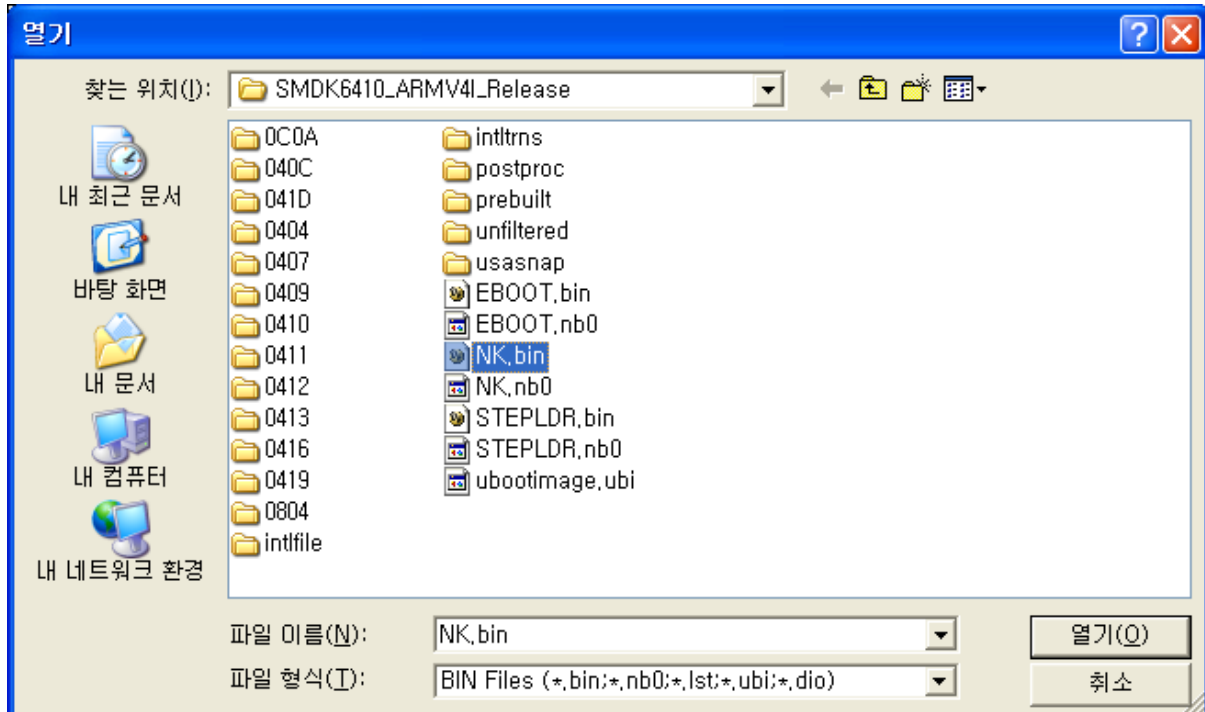


Figure 6-30 Selecting NK.bin for Download (no IMGMULTIXIP)

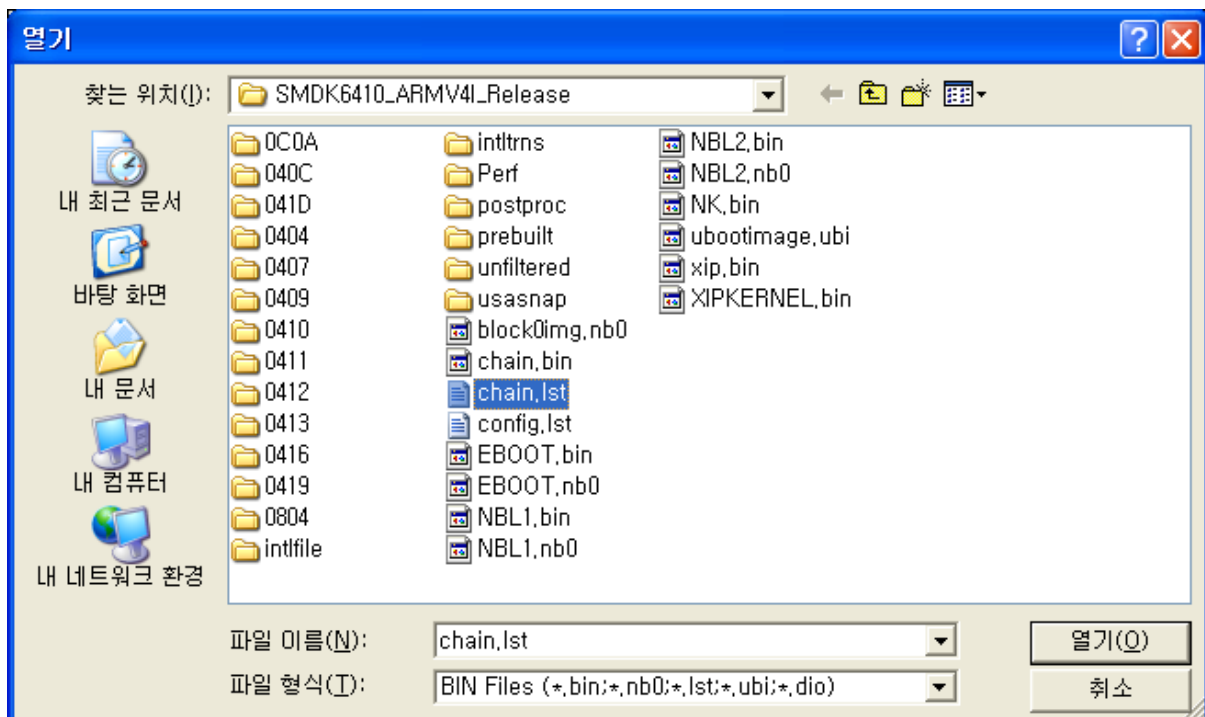
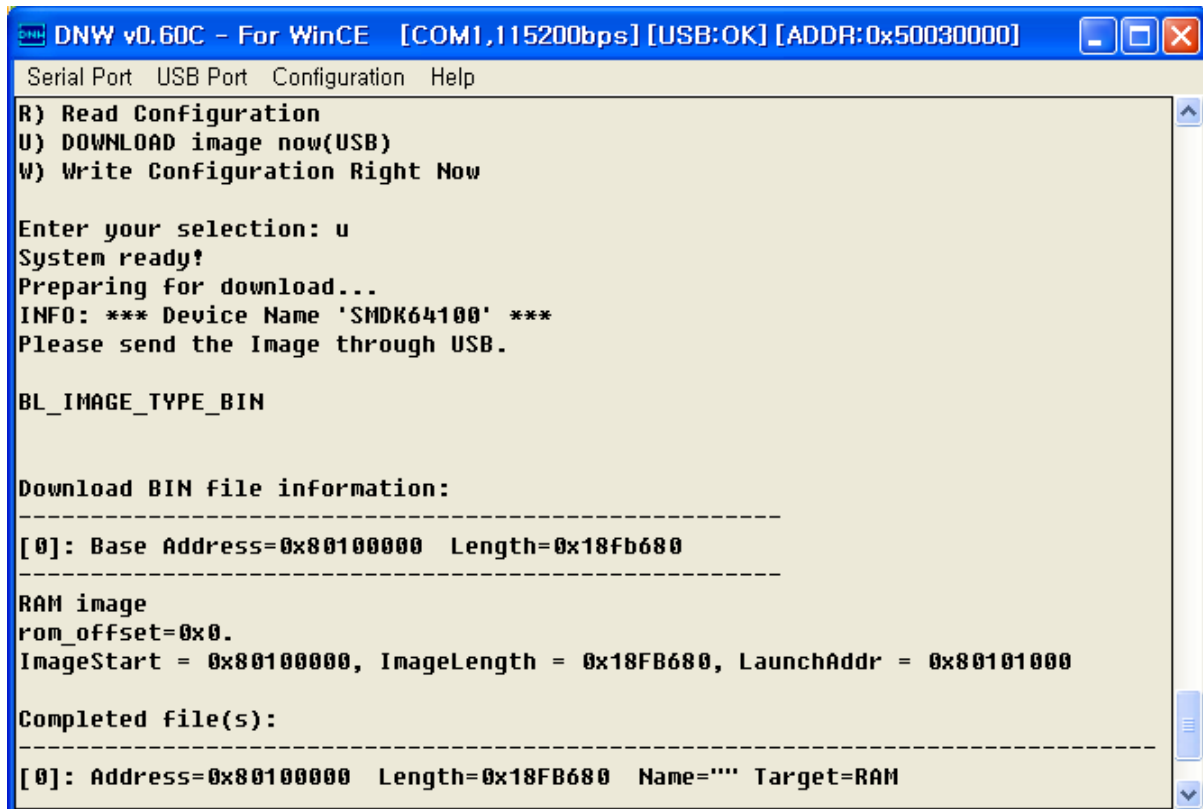


Figure 6-31 Selecting chain.lst for Download (IMGMULTIXIP=1)

34. You can see the following messages on the DNW window after OS image download.



```

DNW v0.60C - For WinCE [COM1,115200bps] [USB:OK] [ADDR:0x50030000]
Serial Port  USB Port  Configuration  Help
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.

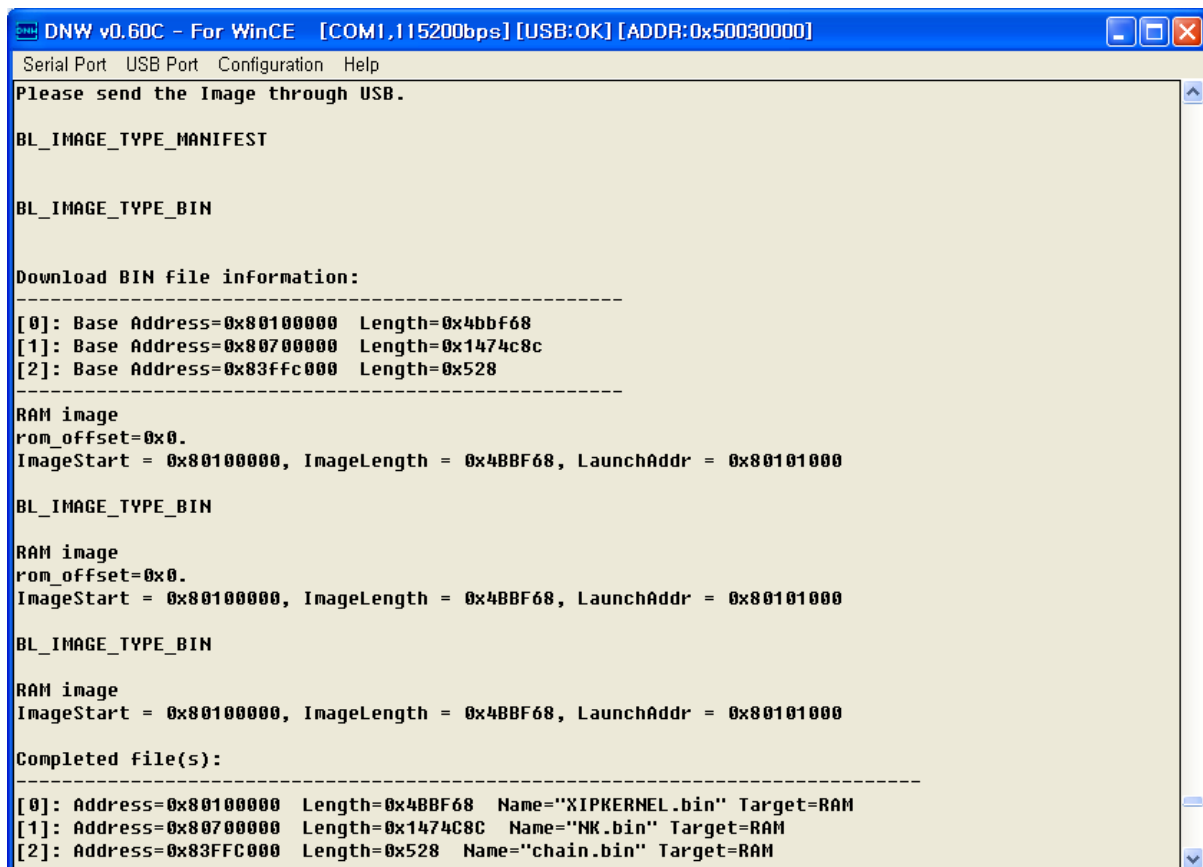
BL_IMAGE_TYPE_BIN

Download BIN file information:
-----
[0]: Base Address=0x80100000 Length=0x18fb680
-----

RAM image
rom_offset=0x0.
ImageStart = 0x80100000, ImageLength = 0x18FB680, LaunchAddr = 0x80101000

Completed file(s):
-----
[0]: Address=0x80100000 Length=0x18FB680 Name="" Target=RAM
  
```

Figure 6-32 Messages via UART Port during NK.bin Download (no IMGMULTIXIP)



```

DNW v0.60C - For WinCE [COM1,115200bps] [USB:OK] [ADDR:0x50030000]
Serial Port  USB Port  Configuration  Help
Please send the Image through USB.

BL_IMAGE_TYPE_MANIFEST

BL_IMAGE_TYPE_BIN

Download BIN file information:
-----
[0]: Base Address=0x80100000 Length=0x4bbf68
[1]: Base Address=0x80700000 Length=0x1474c8c
[2]: Base Address=0x83ffc000 Length=0x528
-----

RAM image
rom_offset=0x0.
ImageStart = 0x80100000, ImageLength = 0x4BBF68, LaunchAddr = 0x80101000

BL_IMAGE_TYPE_BIN

RAM image
rom_offset=0x0.
ImageStart = 0x80100000, ImageLength = 0x4BBF68, LaunchAddr = 0x80101000

BL_IMAGE_TYPE_BIN

RAM image
ImageStart = 0x80100000, ImageLength = 0x4BBF68, LaunchAddr = 0x80101000

Completed file(s):
-----
[0]: Address=0x80100000 Length=0x4BBF68 Name="XIPKERNEL.bin" Target=RAM
[1]: Address=0x80700000 Length=0x1474C8C Name="NK.bin" Target=RAM
[2]: Address=0x83FFC000 Length=0x528 Name="chain.bin" Target=RAM
  
```

Figure 6-33 Messages via UART Port during chain.lst Download (IMGMULTIXIP=1)

35. After OS image download is over, **Windows Embedded CE 6.0** boots on the target Board.
36. 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, Refer to the SMDK6410 Board User's Manual in SRC\DOC directory)
37. 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 top of Visual Studio 2005, you can see the Project menu as below figure. And then select **Properties...**

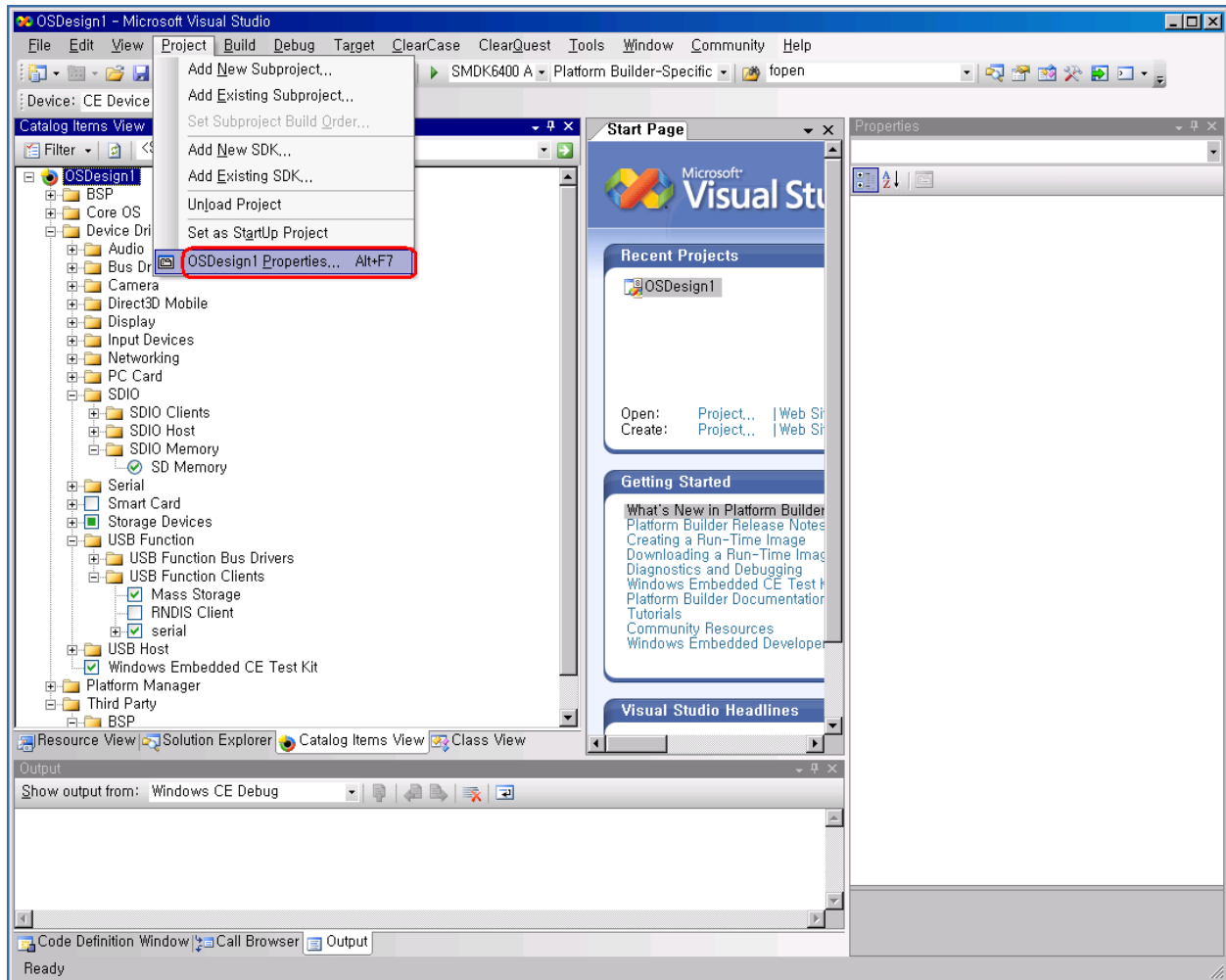


Figure 7-1 OSDesign Properties

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.

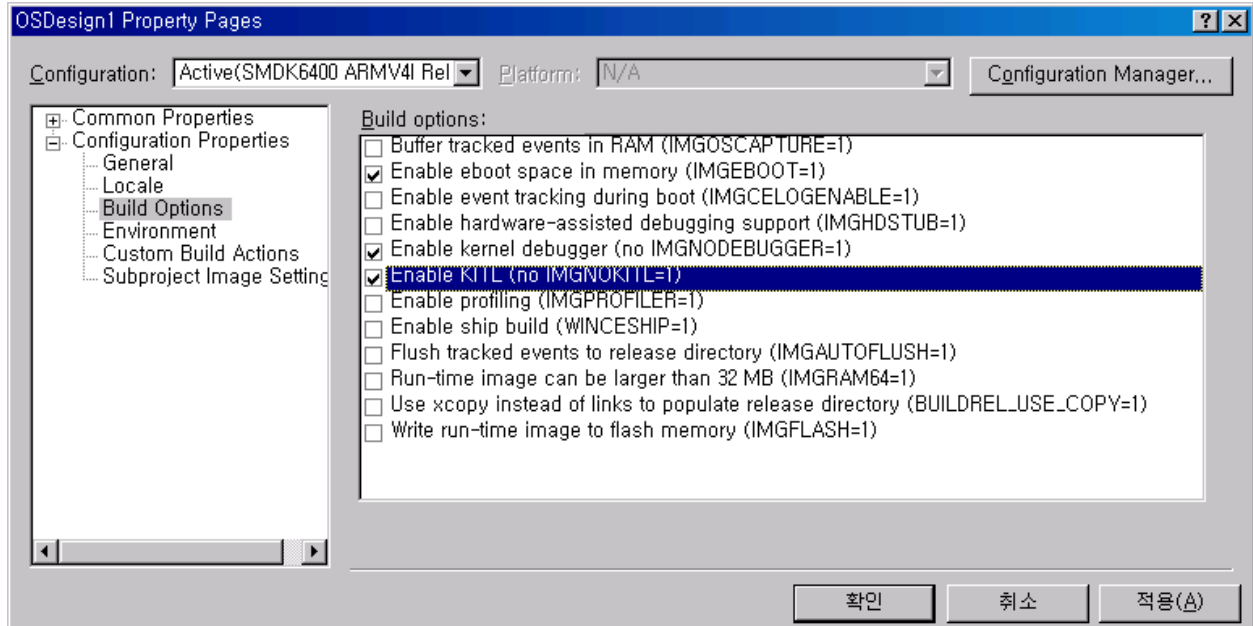


Figure 7-2 Property Pages for KITL

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_NOUSBFN=1

set BSP_KITL=USBSERIAL

2. On the **Build** menu, click **Build OSDesign1** as shown in figure 7-3 to build the Eboot and OS image.

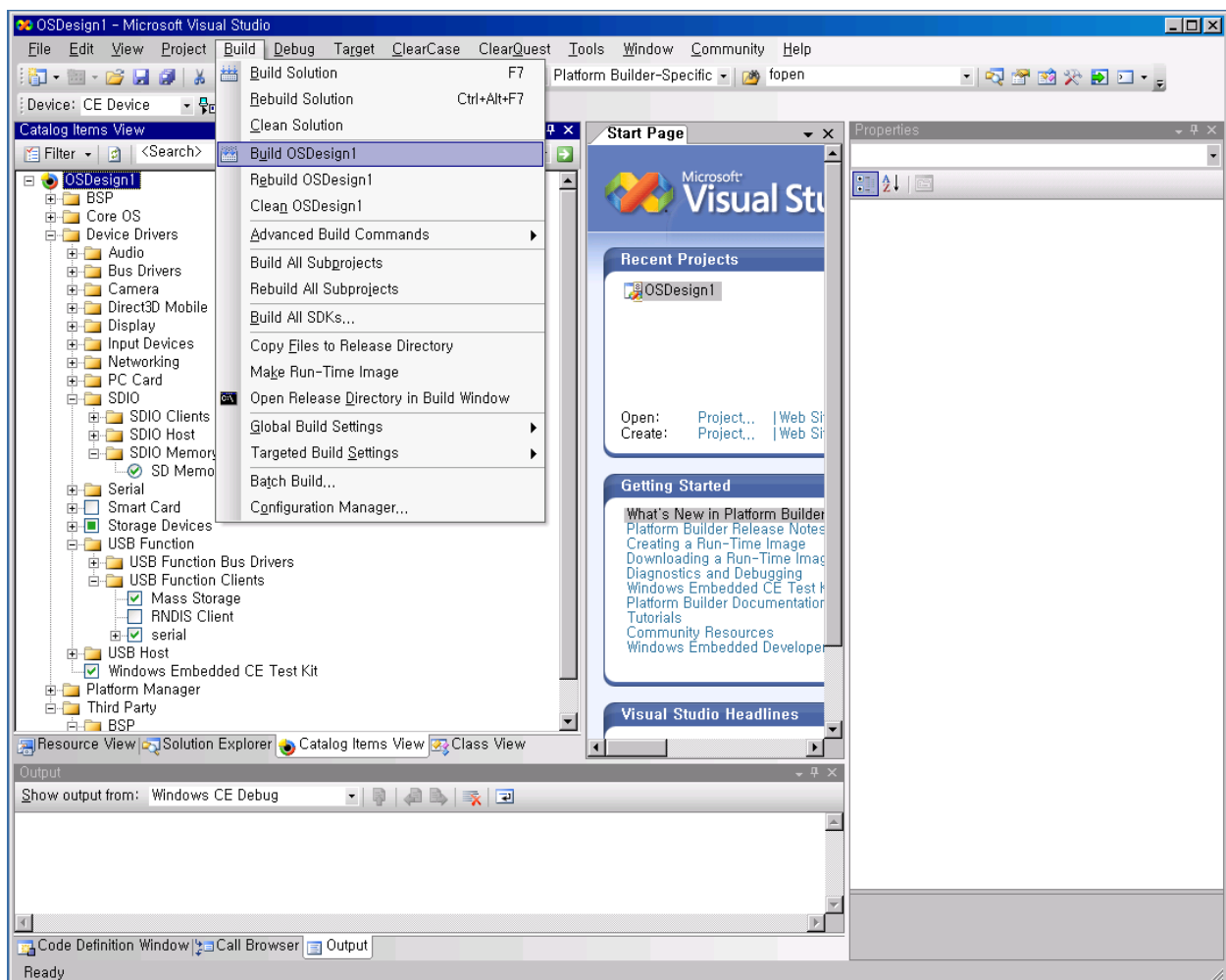


Figure 7-3 Build OSDesign

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, block0img.nb0, NK.bin and NK.nb0 are now available in X:\WINCE600\OSDesigns \[OS Design Name]\ [OS Design Name]\RelDir\SMDK6410_ARMV4I_Release directory.
4. Configure DIP switch CFG0 on the CPU Board and CFGB1 on the CPU board properly for booting from AMD Flash. (For more information about board configuration, Read SMDK6410 Board User's Manual in Document folder...)
5. Please install the USB Driver and DNW application on your host PC if it is not installed before.
6. Please refer to chapter 6 Fusing WinCE image to NAND Flash via USB in this documentation. And fuse to NAND Flash along to Step 29 from Step 1 in Chapter 6.
7. Reset the board. DNW window appears as shown in figure 7-4.

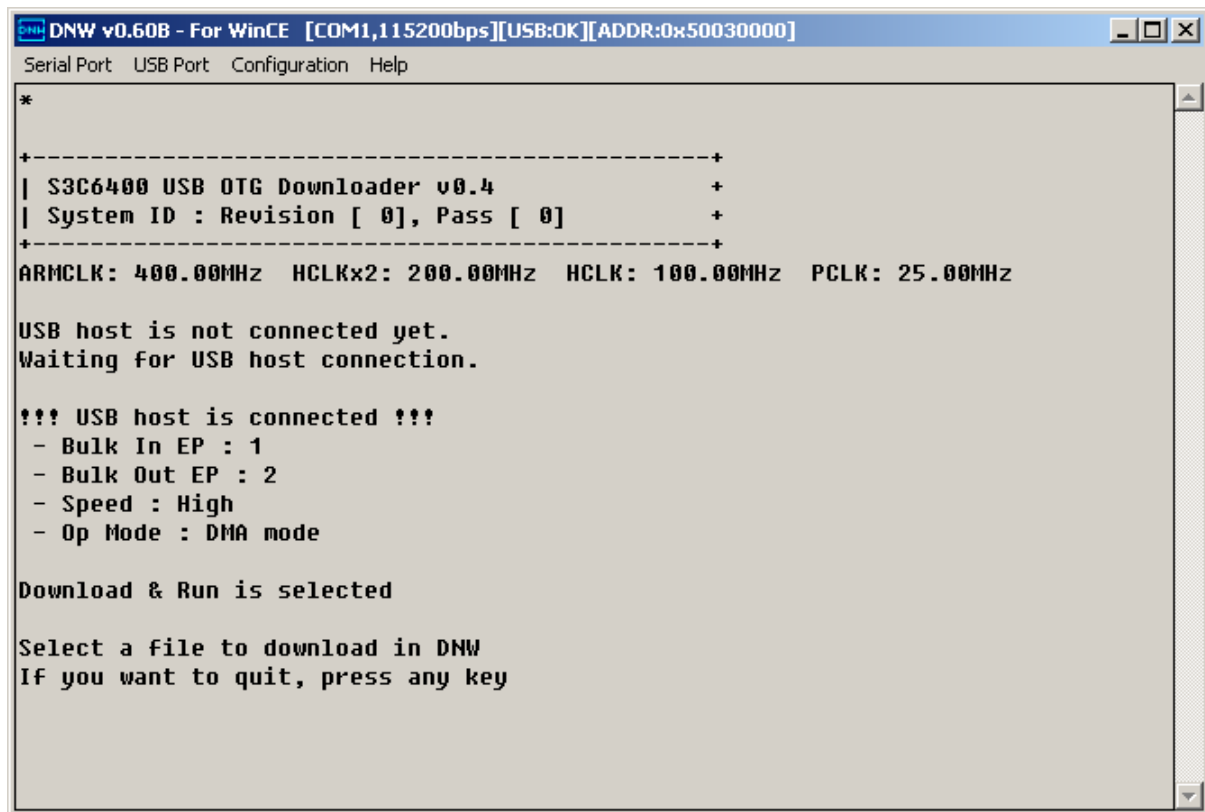


Figure 7-4 DNW Window after reset

8. 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.

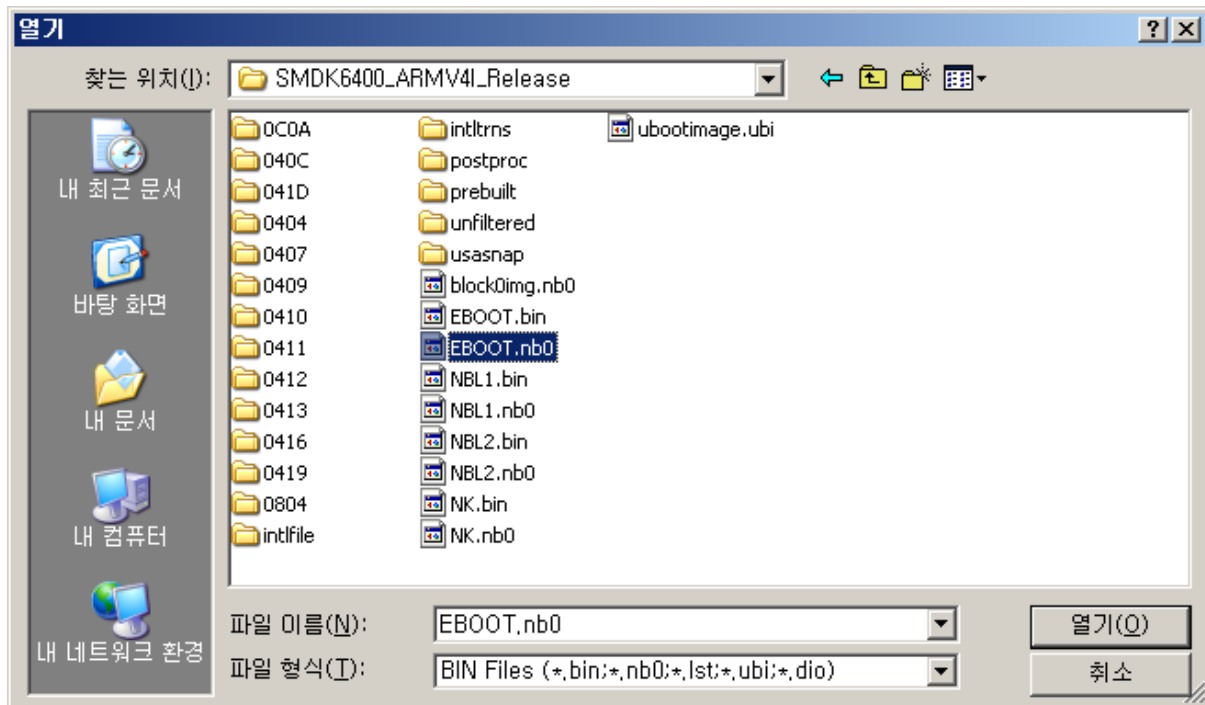
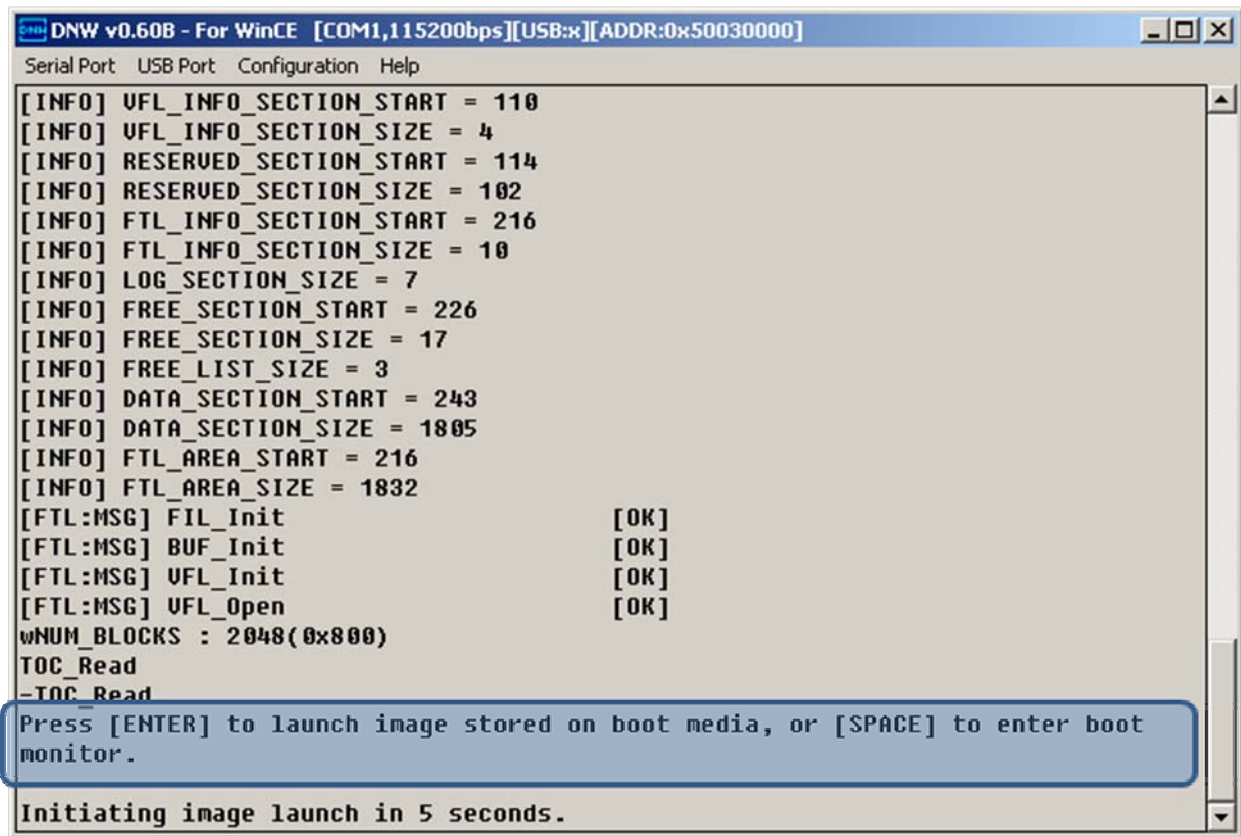


Figure 7-5 Selecting EBOOT.nb0 for Download

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



The screenshot shows a window titled "DNW v0.60B - For WinCE [COM1,115200bps][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 information:

```
[INFO] UFL_INFO_SECTION_START = 110
[INFO] UFL_INFO_SECTION_SIZE = 4
[INFO] RESERVED_SECTION_START = 114
[INFO] RESERVED_SECTION_SIZE = 102
[INFO] FTL_INFO_SECTION_START = 216
[INFO] FTL_INFO_SECTION_SIZE = 10
[INFO] LOG_SECTION_SIZE = 7
[INFO] FREE_SECTION_START = 226
[INFO] FREE_SECTION_SIZE = 17
[INFO] FREE_LIST_SIZE = 3
[INFO] DATA_SECTION_START = 243
[INFO] DATA_SECTION_SIZE = 1805
[INFO] FTL_AREA_START = 216
[INFO] FTL_AREA_SIZE = 1832
[FTL:MSG] FIL_Init [OK]
[FTL:MSG] BUF_Init [OK]
[FTL:MSG] UFL_Init [OK]
[FTL:MSG] UFL_Open [OK]
wNUM_BLOCKS : 2048(0x800)
TOC_Read
-TOC_Read
```

A blue-bordered box contains the text: "Press [ENTER] to launch image stored on boot media, or [SPACE] to enter boot monitor." Below this box, the text "Initiating image launch in 5 seconds." is displayed.

Figure 7-6 After EBOOT.nb0 Download

10. 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

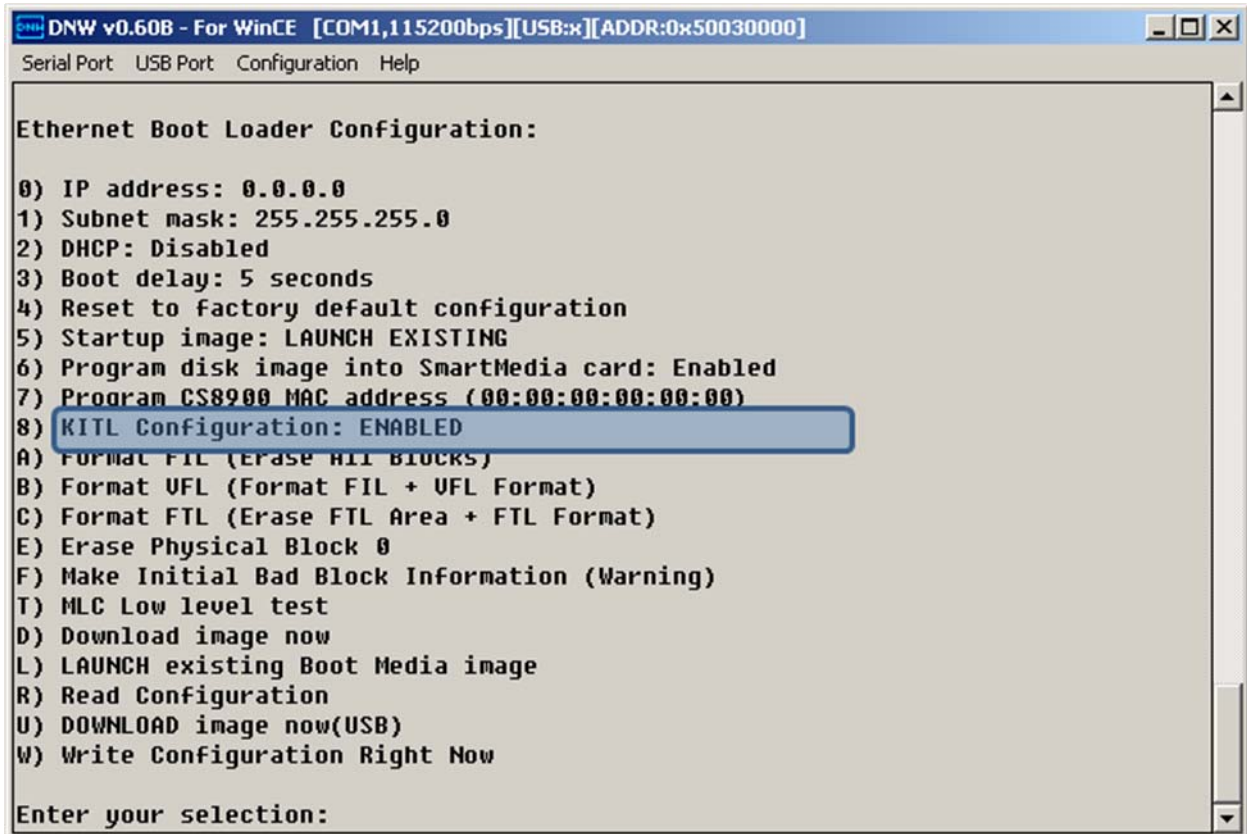


Figure 7-7 Ethernet Boot Loader Configuration

11. 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 7-8.

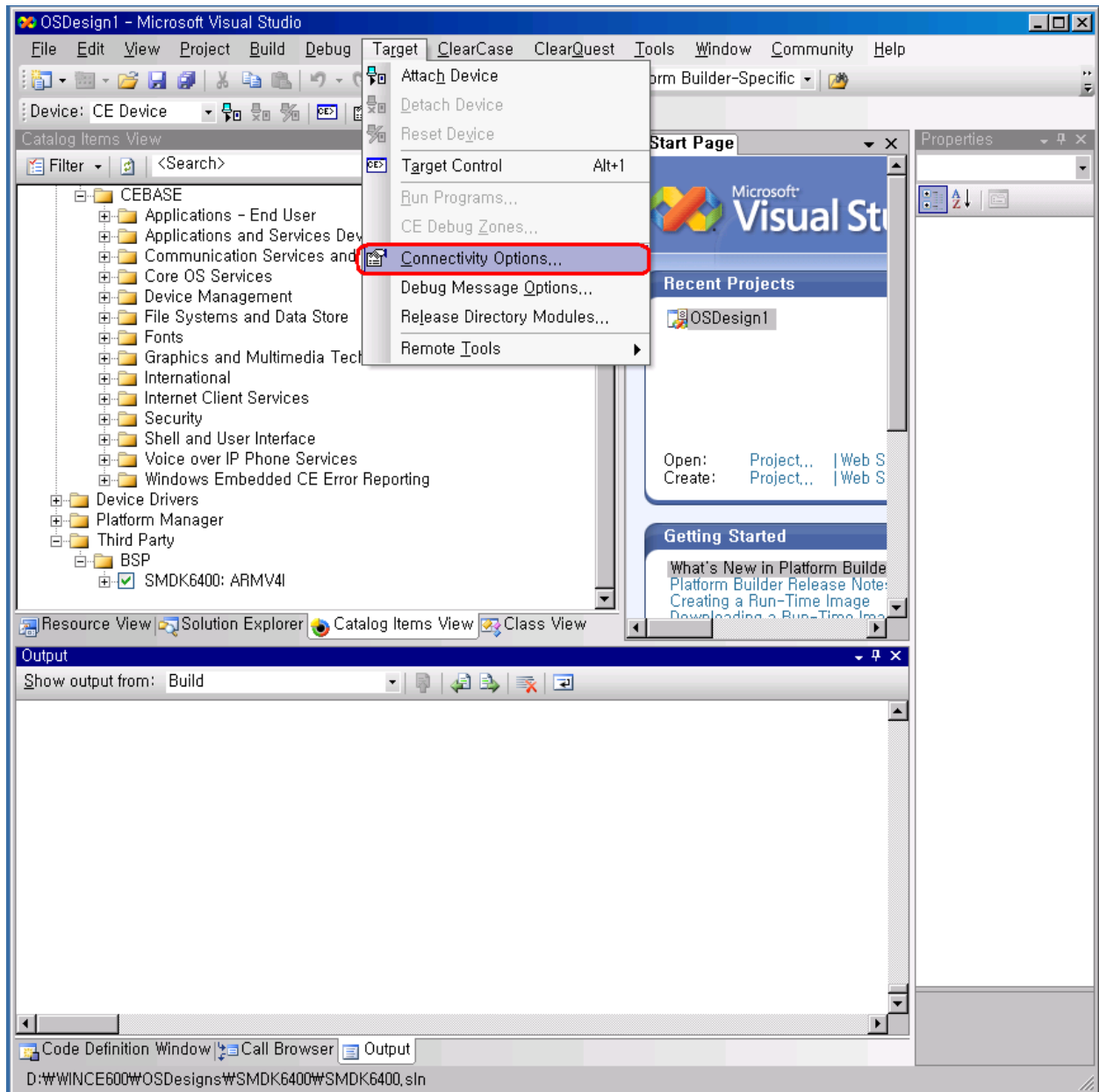


Figure 7-8 Target Connectivity Option

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

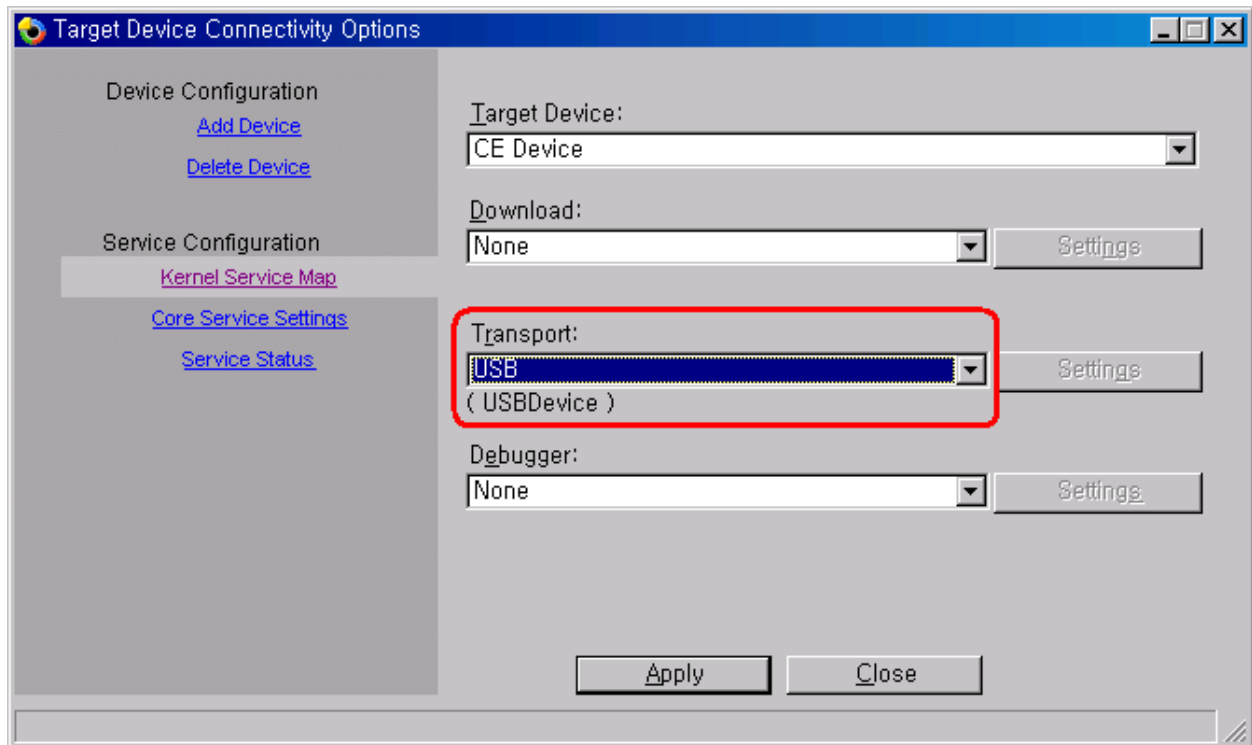


Figure 7-9 Target Device Connectivity Options Window after Transport Select

13. Configure the **KdStub** option in **Debugger** drop down menu box. And click **Apply** button

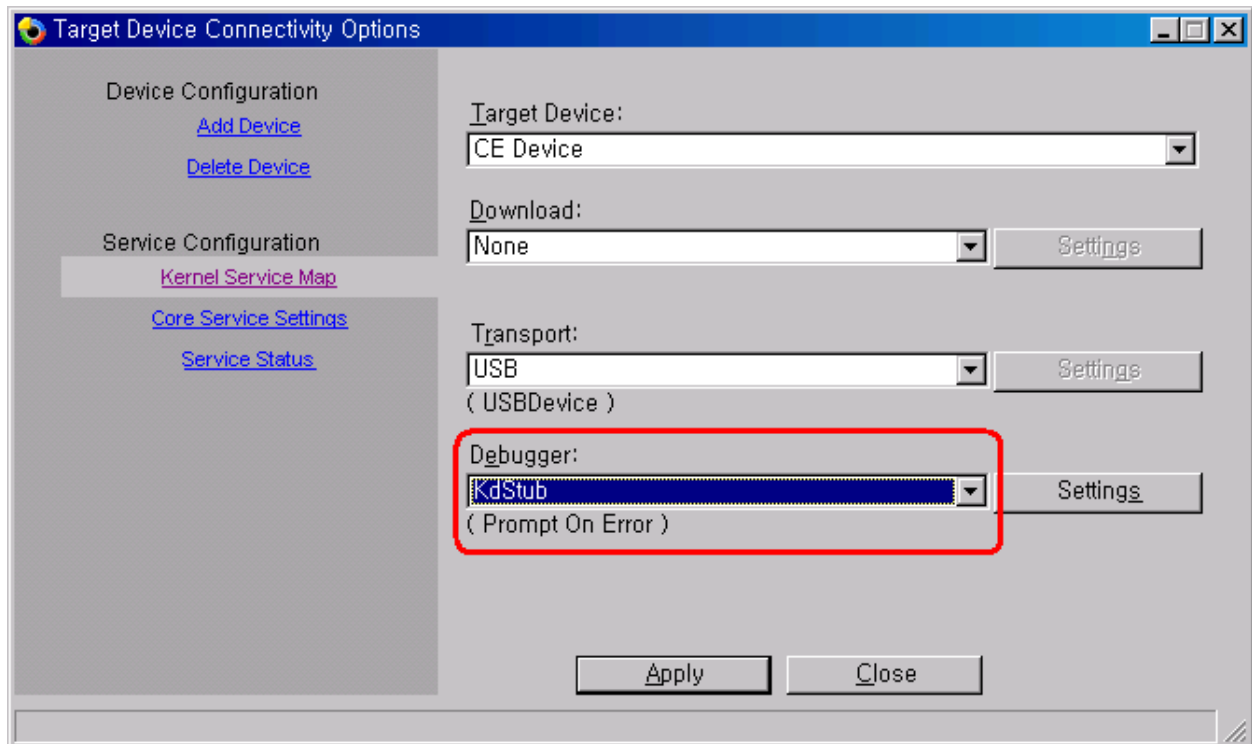


Figure 7-10 Target Device Connectivity Options Window After Debugger Select

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

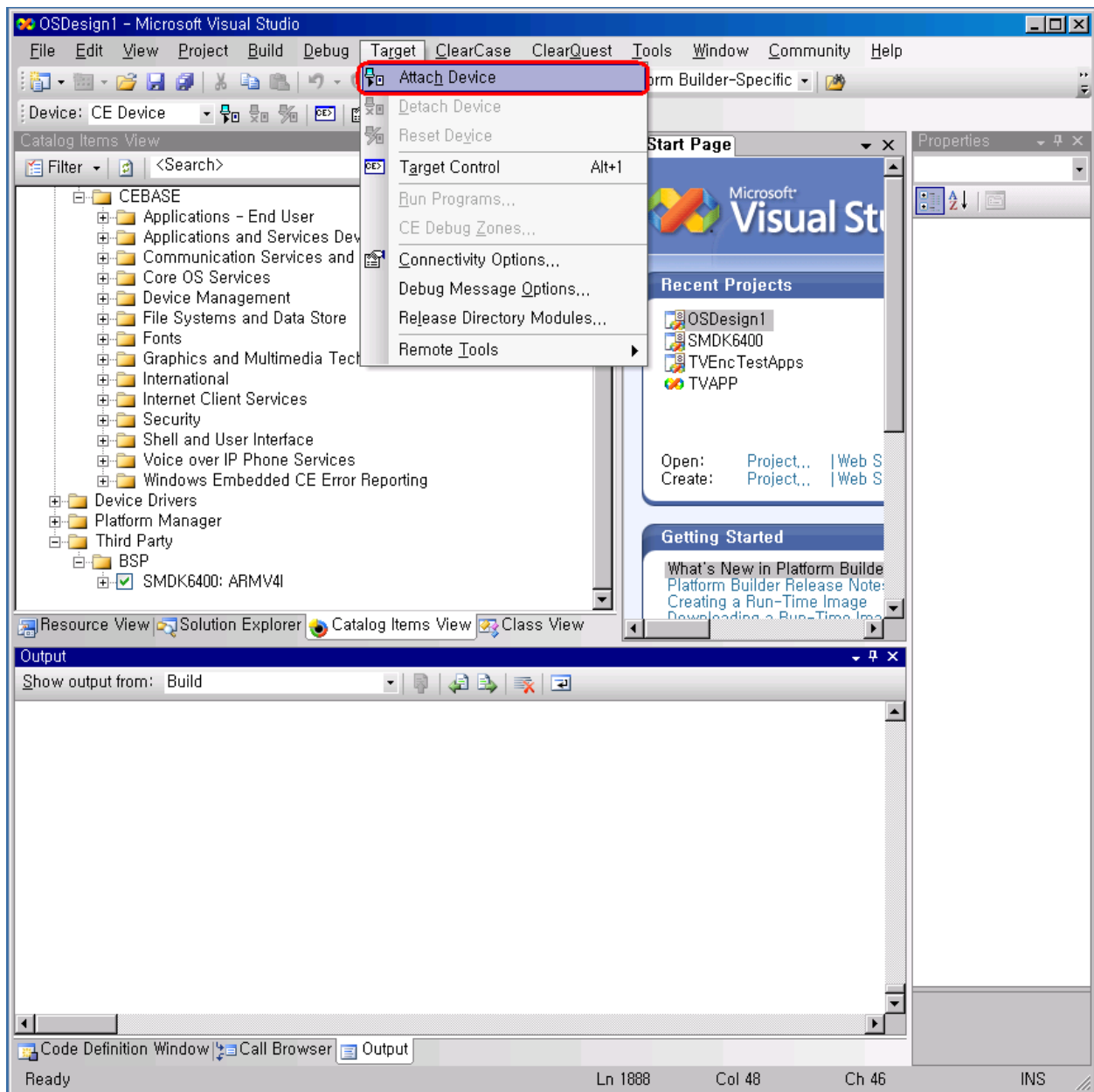
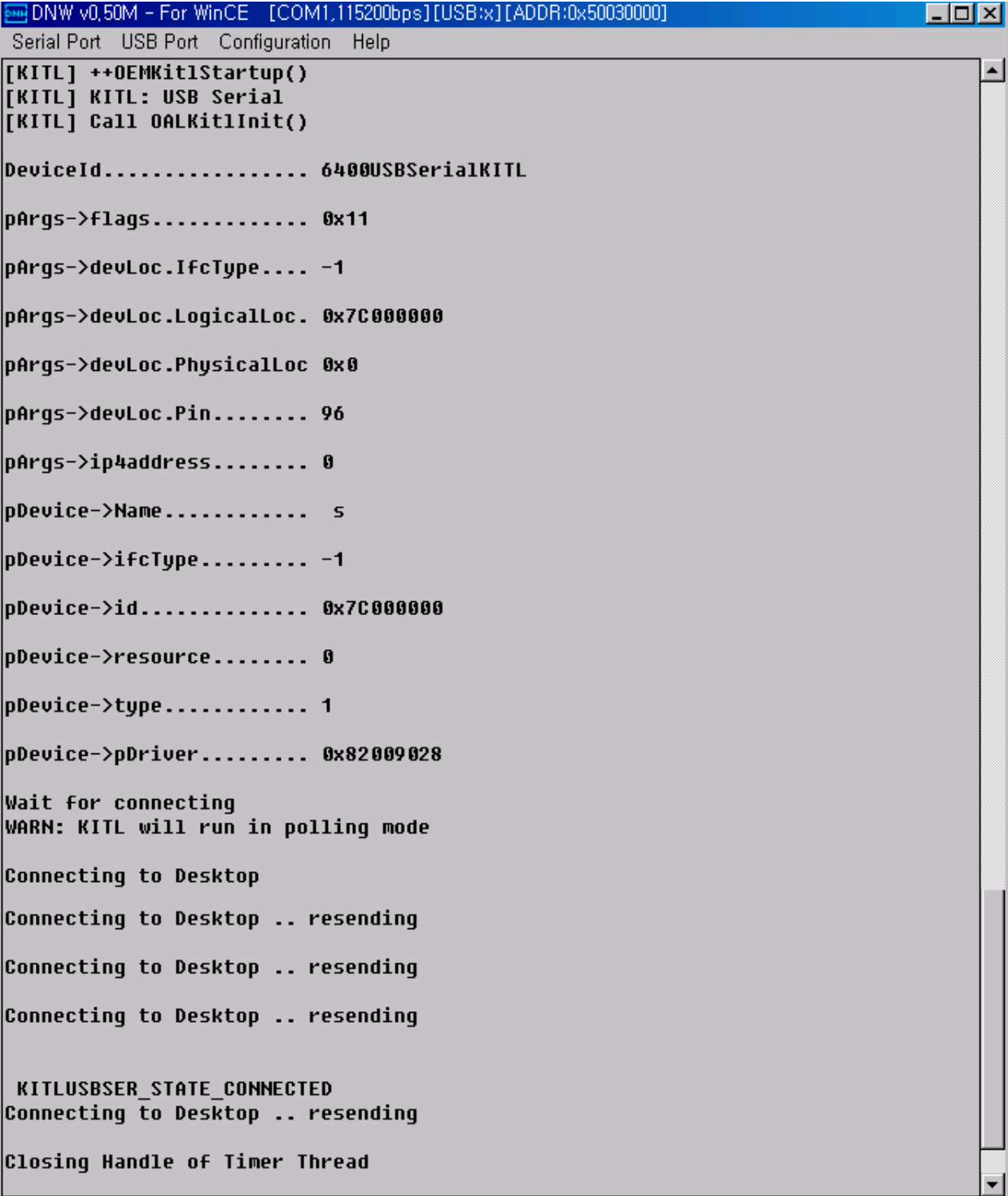


Figure 7-11 Attach Device

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

The image is a screenshot of a software window titled "DNW v0.50M - For WinCE [COM1,115200bps][USB:x][ADDR:0x50030000]". The window has a menu bar with "Serial Port", "USB Port", "Configuration", and "Help". The main area displays a series of text messages from a device. The messages include function calls like ++OEMKitlStartup(), KITL: USB Serial, and Call OALKitlInit(). They also show device information such as DeviceId (6400USBSerialKITL), flags (0x11), and various location and pin values. A warning message states "WARN: KITL will run in polling mode". The sequence ends with "Connecting to Desktop .. resending" (repeated three times), "KITLUSBSER_STATE_CONNECTED", another "Connecting to Desktop .. resending", and finally "Closing Handle of Timer Thread".

```
DNW v0.50M - For WinCE [COM1,115200bps][USB:x][ADDR:0x50030000]
Serial Port  USB Port  Configuration  Help

[KITL] ++OEMKitlStartup()
[KITL] KITL: USB Serial
[KITL] Call OALKitlInit()

DeviceId..... 6400USBSerialKITL

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..... 0x82009028

Wait for connecting
WARN: KITL will run in polling mode

Connecting to Desktop
Connecting to Desktop .. resending
Connecting to Desktop .. resending
Connecting to Desktop .. resending

KITLUSBSER_STATE_CONNECTED
Connecting to Desktop .. resending

Closing Handle of Timer Thread
```

Figure 7-12 Messages via UART Port

16. Windows Embedded CE 6.0 boots on the target board and platform builder window appears as shown below.

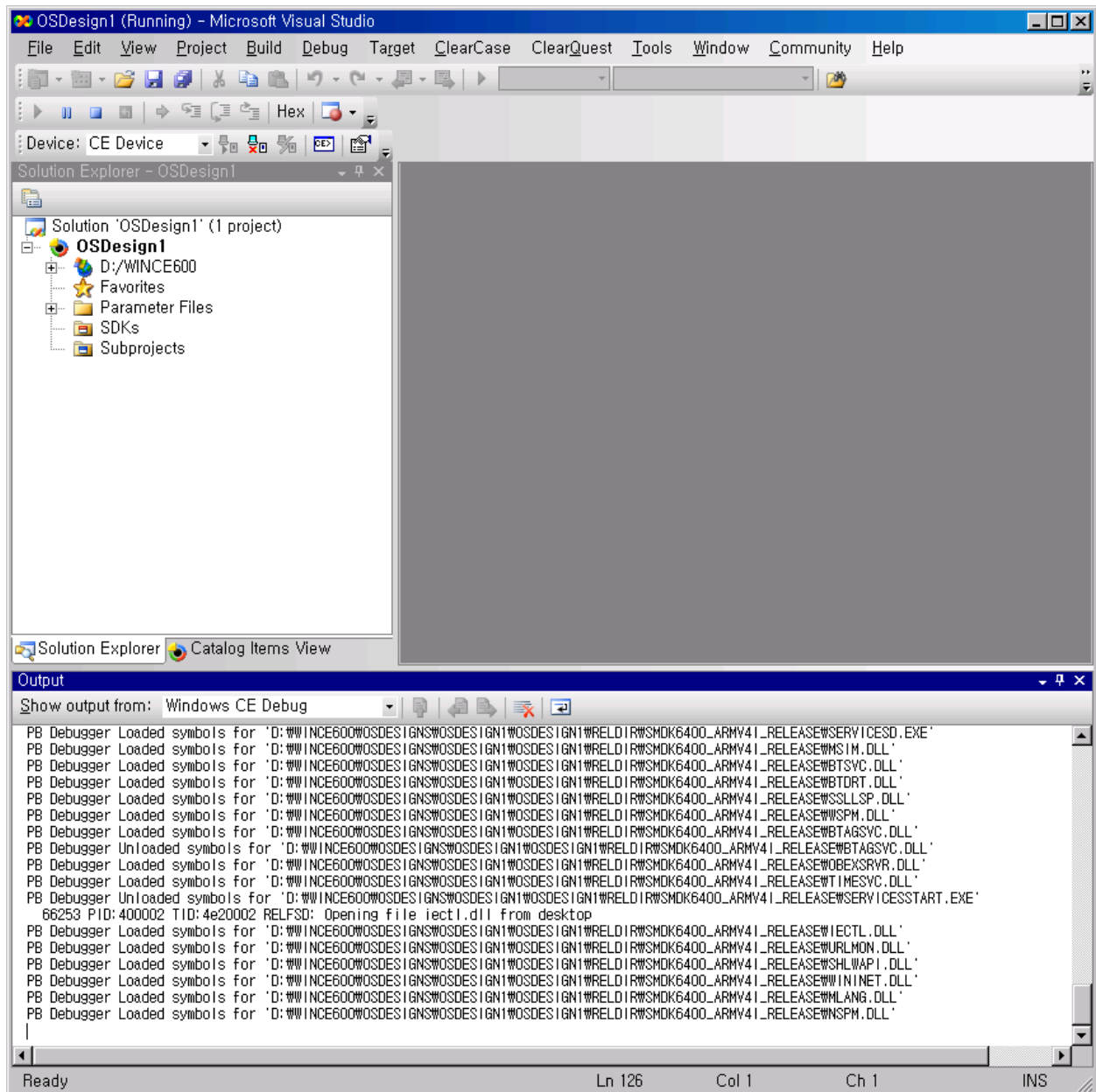


Figure 7-13 Visual Studio 2005 Window after USB Serial KITL connected

7.2 Ethernet KITL

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

- X:\WINCE600\PLATFORM\SMDK6410\SMDK6410.bat file must have the following settings. Because of SMDK Board HW Conflict, You should disable Power Button Driver.

set BSP_KITL=ETHERNET

set BSP_NOPWRBTN=1

- X:\WINCE600\PLATFORM\SMDK6410\Src\Inc\kitl_cfg.h file must be modified IP Address and Network Properties as your network environment properly

#define ETH_KITL_MAC_ADDRESS L"11:22:33:44:55:66"

#define ETH_KITL_IP_ADDRESS L"192.168.1.2"

#define ETH_KITL_IP_MASK L"255.205.255.0"

#define ETH_KITL_IP_ROUTER L"192.168.1.0"

2. On the **Build** menu, click **Build OSDesign1** as shown in figure 7-14 to build the Eboot and OS image.

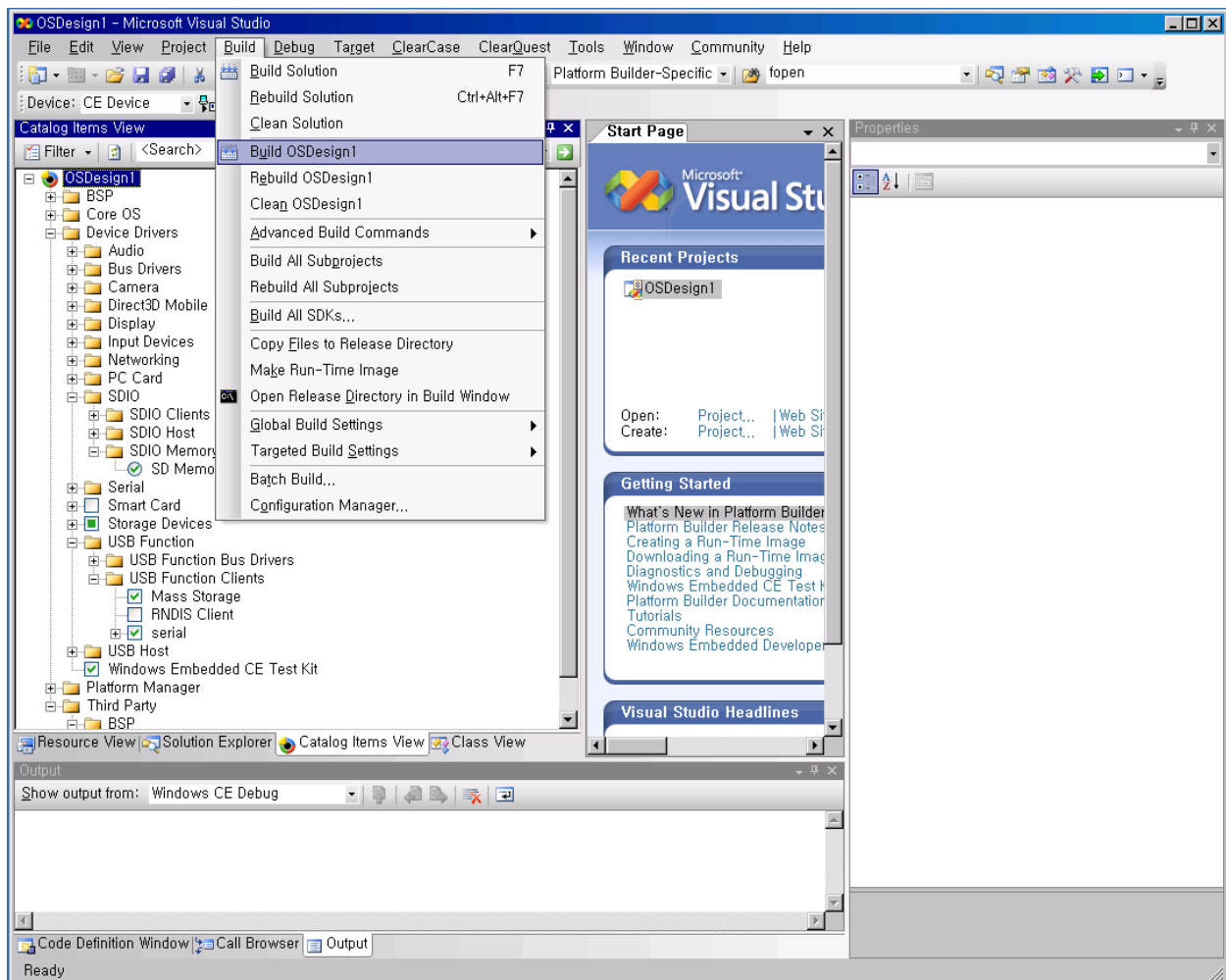


Figure 7-14 Build OSDesign

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, block0img.nb0, 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 NAND Flash via USB in this documentation. And fuse to NAND Flash along to Step 34 from Step 1 in Chapter 6.
6. After reset the Board, the following messages appear in the DNW window.

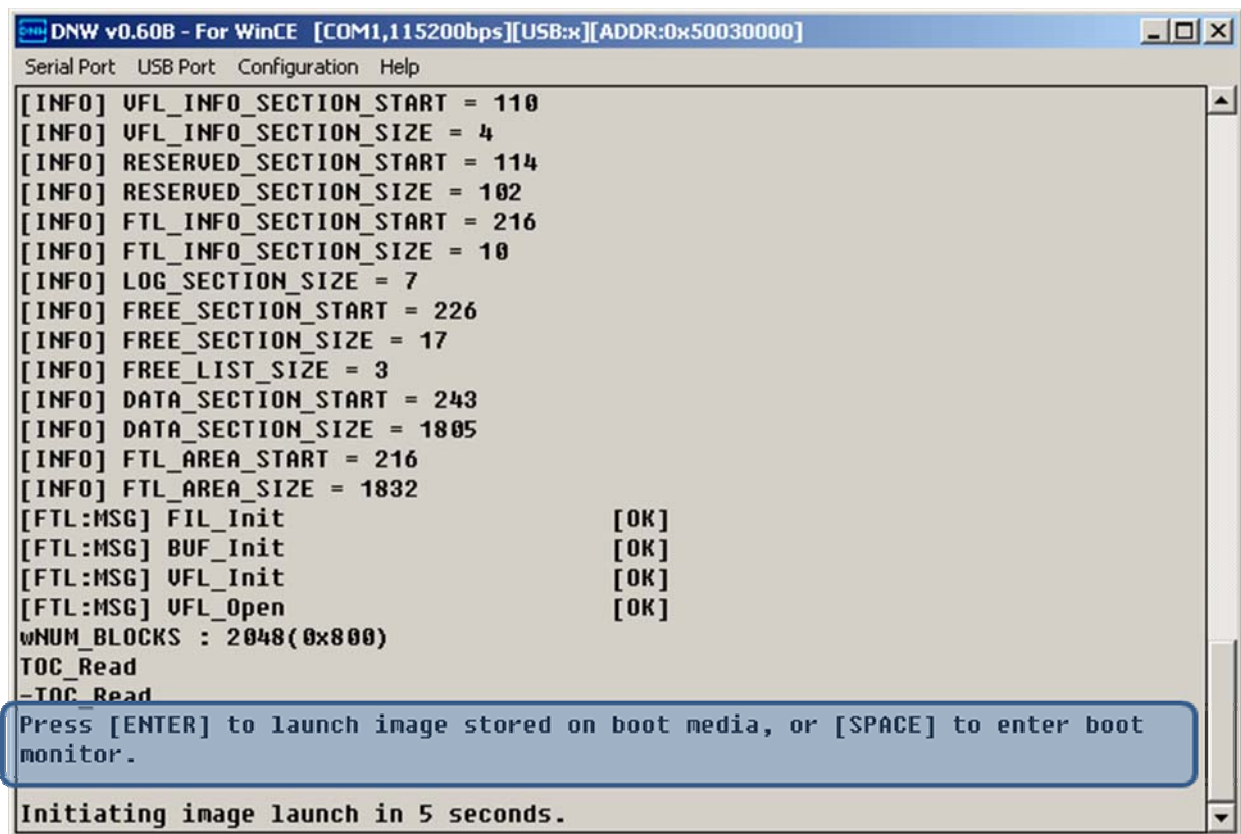


Figure 7-15 After Reset the Board

7. 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:

- Configure IP Address and Network Properties as your network environment properly
- Keep KITL Configuration: **ENABLED**
- Enter [L] to LAUNCH existing Boot Media image

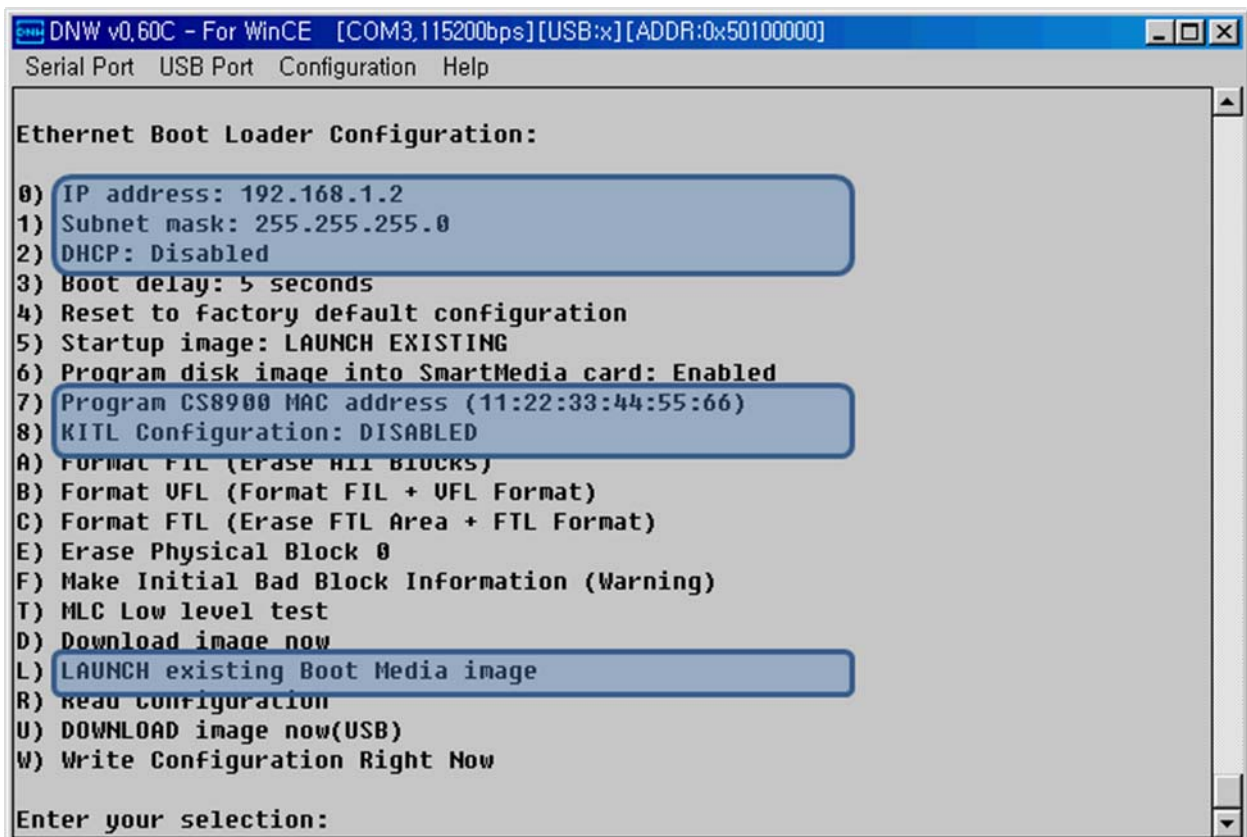


Figure 7-16 Ethernet Boot Loader Configuration

- 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 7-17.

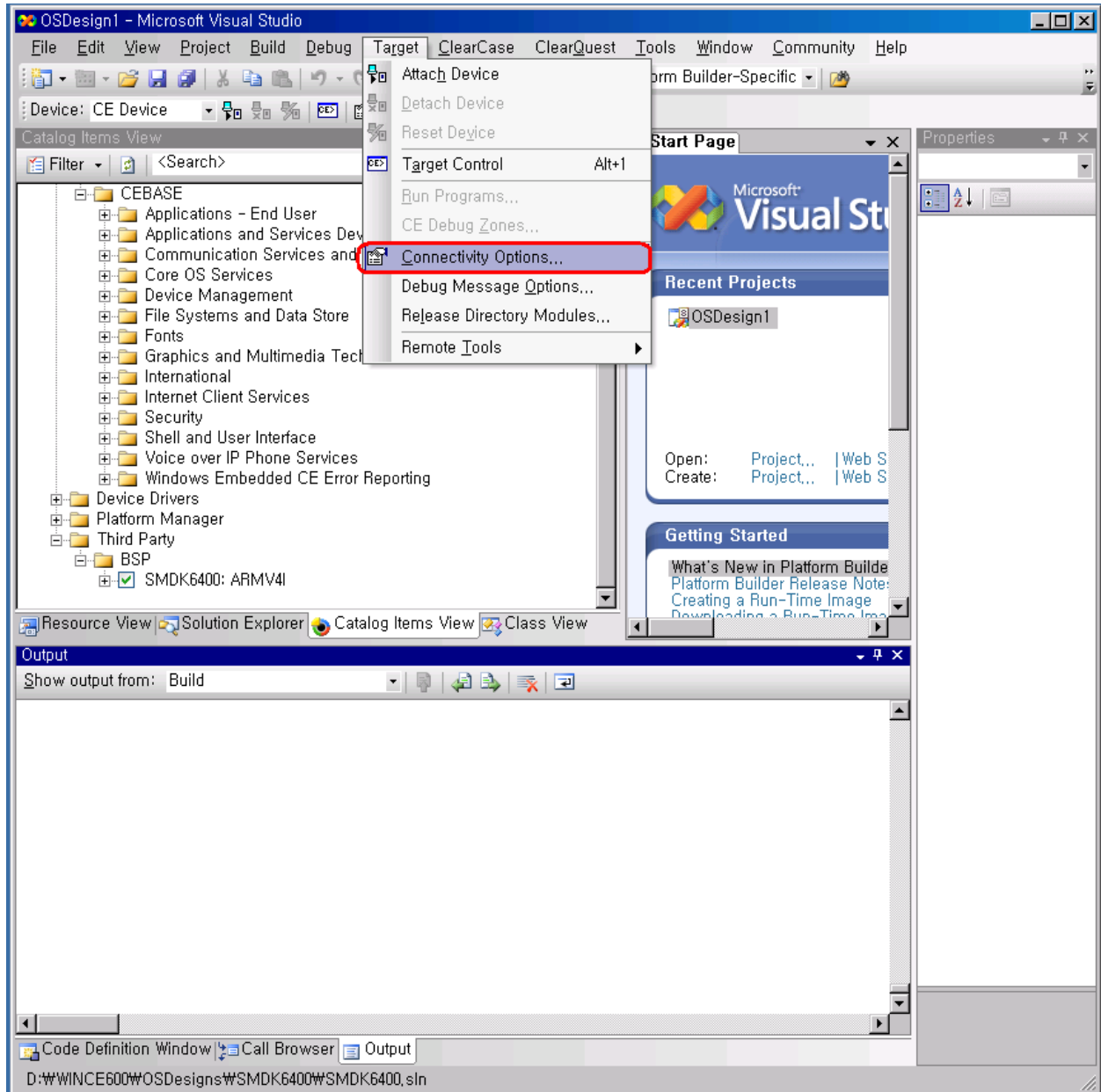


Figure 7-17 Target Connectivity Option

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

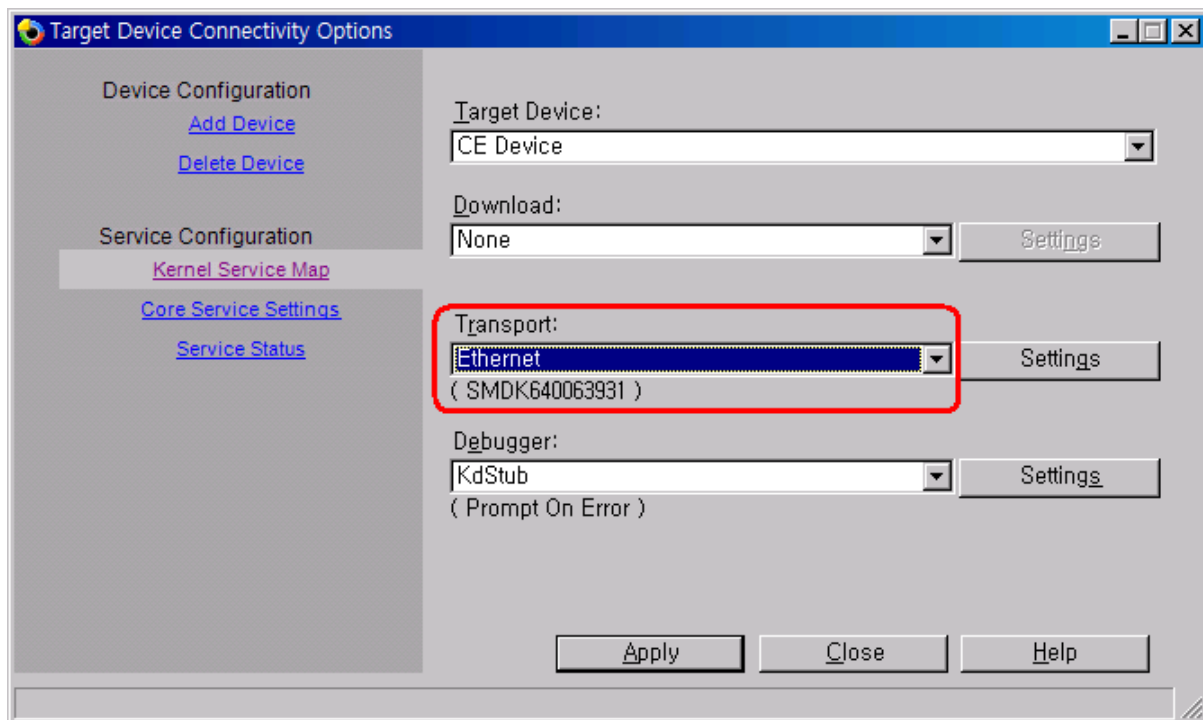


Figure 7-18 Target Device Connectivity Options Window after Transport Select

10. Configure the KdStub option in Debugger drop down menu box. And click **Apply** button

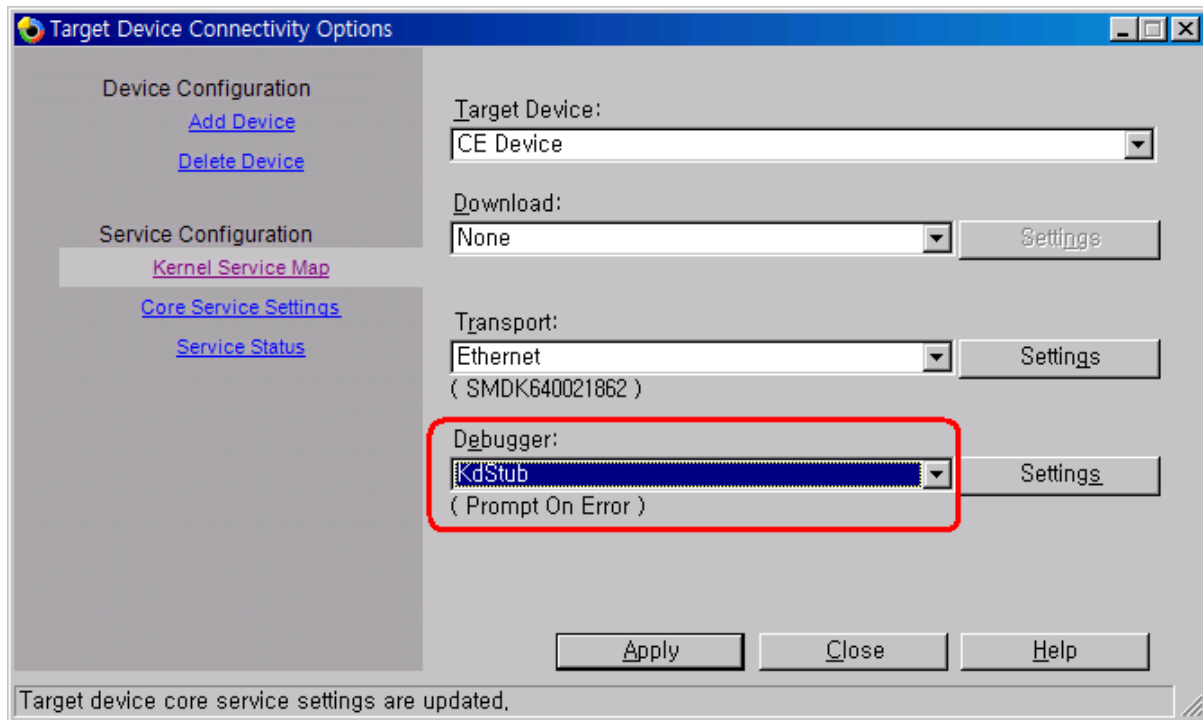


Figure 7-19 Target Device Connectivity Options Window After Debugger Select

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

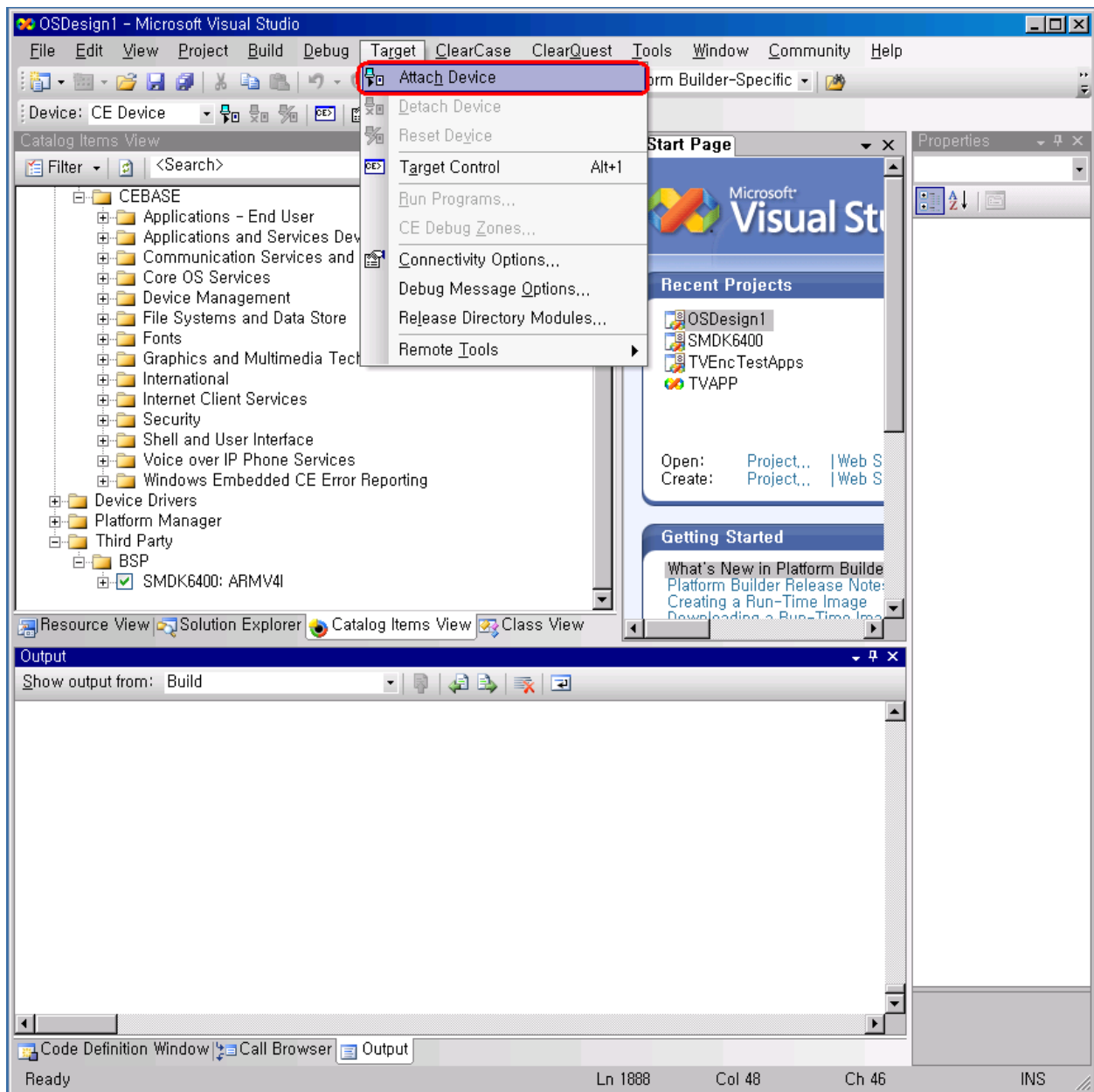


Figure 7-20 Attach Device

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

```

[KNW] ++OEMKitlStartup()
[KNW] KITL: Ethernet CS8900A
[KNW] KITL: Ethernet Configured as default value
[KNW] InitSRAMC_cs8900a() SRAMC initialized for cs8900a at nCS1
[KNW] InitEINT_cs8900a() : Enable IRQ_EINT10 for Ethernet
DeviceId..... SMDK640021862
kitlArgs.flags..... 0x00000009
kitlArgs.devLoc.Ifctype.... 0
kitlArgs.devLoc.LogicalLoc. 0x18800300
kitlArgs.devLoc.PhysicalLoc 0x00000000
kitlArgs.devLoc.Pin..... 0
kitlArgs.ip4address..... 192.168.1.2
[KNW] Call OALKitlInit()

DeviceId..... SMDK640021862

pArgs->flags..... 0x9
pArgs->devLoc.Ifctype.... 0
pArgs->devLoc.LogicalLoc. 0x18800300
pArgs->devLoc.PhysicalLoc 0x0
pArgs->devLoc.Pin..... 0
pArgs->ip4address..... 1
pDevice->Name..... s
pDevice->ifctype..... 0
pDevice->id..... 0x18800300
pDevice->resource..... 0
pDevice->type..... 2
pDevice->pDriver..... 0x81ABE050

KITL: *** Device Name SMDK640021862 ***

-OALIntrRequestSysIntr(irq = 10, sysIntr = 18)
KITL: using sysintr 0x12

UBridge:: built on [Sep 6 2006] time [19:28:11]

UBridgeInit()...TX = [16384] bytes -- Rx = [16384] bytes

Tx buffer [0xA1AF4E00] to [0xA1AF8E00].

Rx buffer [0xA1AF8E20] to [0xA1AFCE20].

UBridge:: NK add MAC: [11-22-33-44-55-66]
  
```

Figure 7-21 Messages via UART Port

13. Windows Embedded CE 6.0 boots on the target board and platform builder window appears as shown below.

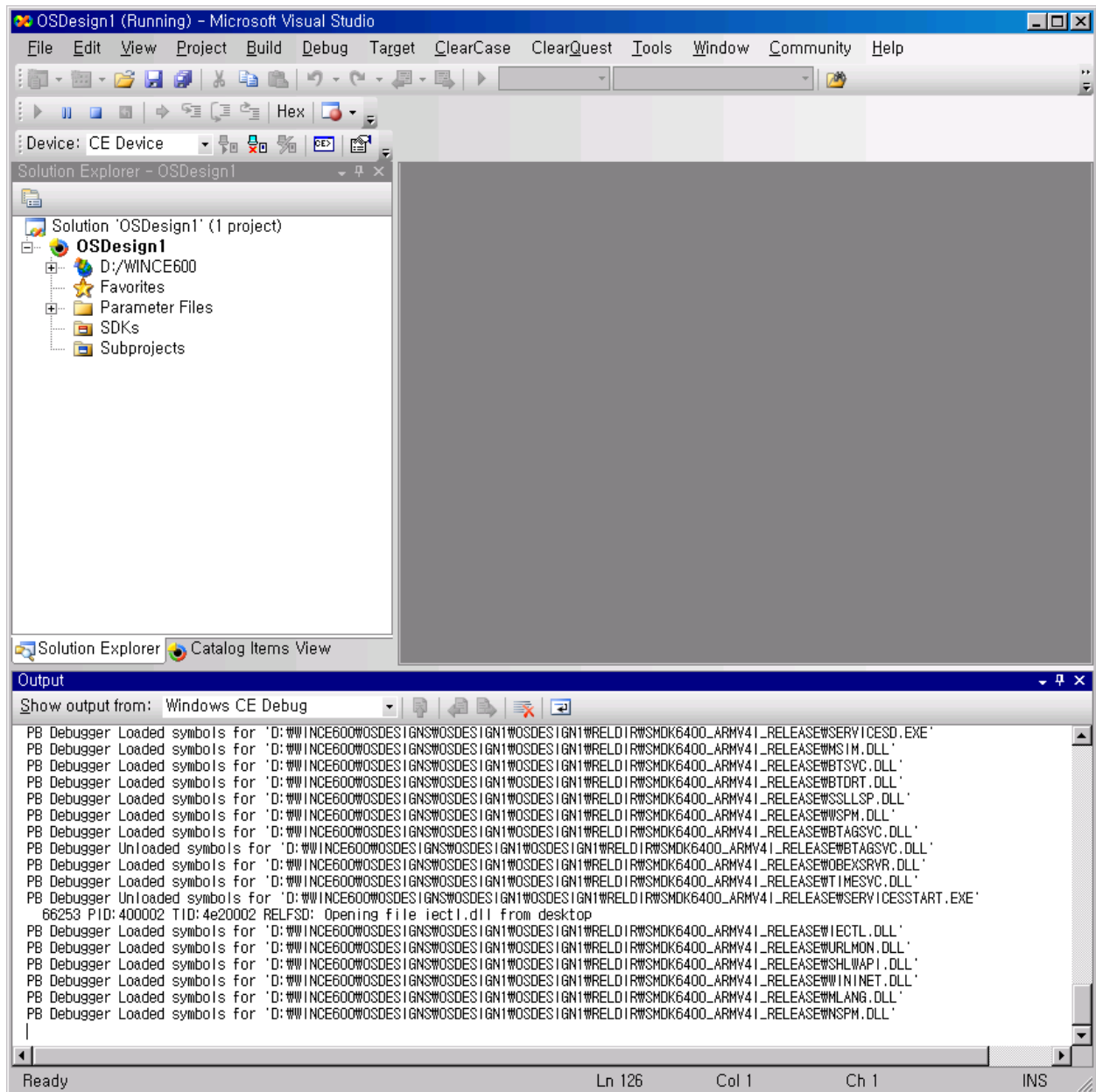


Figure 7-22 Visual Studio 2005 Window after Ethernet KITL connected

Appendix I – DIP Switch Settings for Booting Mode

Table 9-1 and 9-2 explains the DIP Switch configuration on the SMDK6410 board for Booting mode.

AMD NOR/SROM Boot

<i>Description</i>	CFG0[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

<i>Description</i>	CFGB1[4:1]		
	[3]	[2]	[1]
Connected NorFlash to Xm0CSn0	OFF	OFF	ON
Connected SRAM to Xm0CSn0	OFF	ON	OFF

Table 0-1 DIP Switch setting for AMD Flash Boot (NOR Flash)

NAND Boot

<i>Description</i>	CFG0[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>	CFGB3[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 0-2 DIP Switch setting for NAND Flash Boot

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