User Manual for YC2440&UTU2440 WinCE 5.	Use	r Manual	for	YC2440	&UT	U2440	WinCE	5.	.(
---	-----	----------	-----	--------	-----	-------	-------	----	----

www.YouTiYou.com

User Manual for YC2440&UTU2440 WinCE 5.0

V2.0

Table of Content

1	Gene	ral	4
2	Insta	ll WinCE 5.0 Platform Builder	5
	2.1	Install .Net Framework 1.1	5
	2.2	Install WinCE 5.0 Evaluation Edition	5
	2.3	Install updates	7
3	Insta	BSP	8
4	Build	l WinCE image	11
	4.1	Use the provided project file.	11
	4.2	Create a new project.	12
5	Writ	e boot loaders – nboot1st.bin, nboot2nd.bin and umon.bin	19
	5.1	Install GIVEIO driver	19
	5.2	Make hardware connection	20
	5.3	Write nboot1st.bin, nboot2nd.bin and umon.bin into NAND Flash	20
	5.3.	Write nboot1st.bin into NAND Flash	20
	5.3.	Write nboot2nd.bin into NAND Flash	21
	5.3.	Write umon.bin into NAND Flash	22
	5.3.	4 Unplug the JTAG cable	22
6	Load	WinCE image and run	23
	6.1	Preparation	23
	6.2	Write NK.nb0 into NAND Flash	28
	6.3	Load NK.nb0 to SDRAM to run	31
7	Insta	ll and use ActiveSync	32
8	Gene	rate your own SDK	34
9	Exan	anles to use Platform Ruilder remote tools	41

9.1	Establish connection	41
9.2	Use Remote Registry Editor	41
9.3	Modify BSP	43
10 Buil	d applications using Visual Studio 2005	44
10.1	Install Visual Studio 2005 and .NET Compact Framework 2.0	44
10.2	Establish connection	44
10.3	Build a simple application	44
10.4	Three examples – SerialPort, Leds and Keys	49
11 How	to	51
11.1	How to change splash logo	51
11.2	How to make COM1 to be debugging output	51
11.3	How to run an application automatically after power-on	52

1 General

This manual applies to all series of YC2440 and UTU2440 with 4.3 or 7.0 inch LCD.

We suggest you to use a Windows XP system as your development host.

We provide WinCE 5.0 BSP for YC2440&UTU2440 and Windows utilities that we are going to use; however WinCE 5.0 Platform Builder, EVC++4.0 and its SP4, VS2005 are not included in the provided CD. They can be downloaded from Microsoft website for evaluation or purchase. The evaluation version has the full features of a licensed version.

The steps described in this manual are based on what we have done, and they are just some examples. Please go to

http://www.microsoft.com/windows/embedded/products/windowsce/default.mspx for further information.

2 Install WinCE 5.0 Platform Builder

2.1 Install .Net Framework 1.1

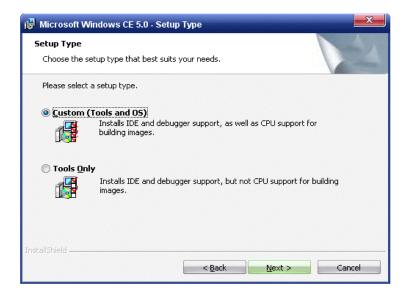
Download a .NET Framework version 1.1 redistributable package "**dotnetfx.exe**" at http://www.microsoft.com/downloads/details.aspx?FamilyId=262D25E3-F589-4842-8157-034D1E7CF3A3&displaylang=en if you have not installed it.

Double-click **dotnetfx.exe** to install it.

2.2 Install WinCE 5.0 Evaluation Edition

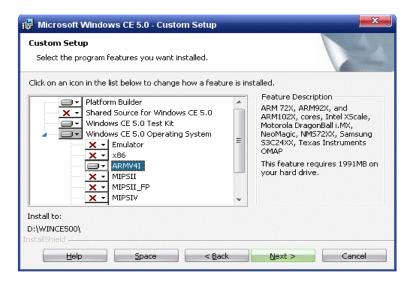
Download a WinCE 5.0 Evaluation Edition "**setup.exe**" at https://www.microsoft.com/downloads/details.aspx?familyid=486E8250-D311-4F67-9FB3-23E8B8944F3E&displaylang=en.

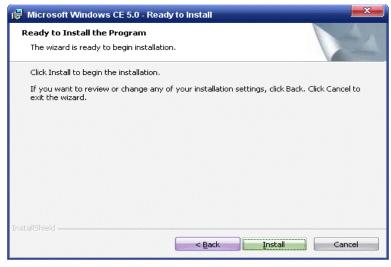
Double-click **setup.exe** to start installation. Follow its steps.

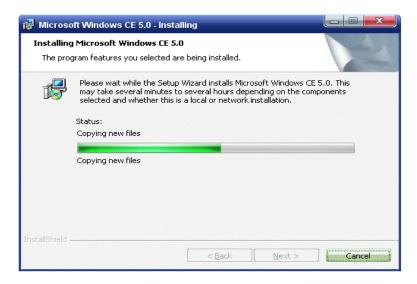




Click on the icons to select **ARMV4I** and unselect **X86** as shown below.









2.3 Install updates

Finally, install **WinCEPB50-071231-Product-Update-Rollup-Armv4I.msi**. This update can be downloaded at:

http://www.microsoft.com/downloads/details.aspx?familyid=A54779D5-F4A5-49F0-9E36-979D461F536C&displaylang=en.

Please note, do not install any other newer WinCE platform builder updates. They may or may not work because they have not been tested by us.

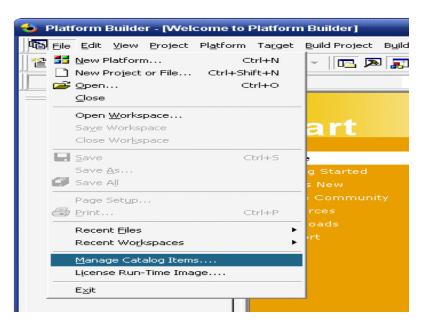
Now WinCE 5.0 packages have been installed in your system.

3 Install BSP

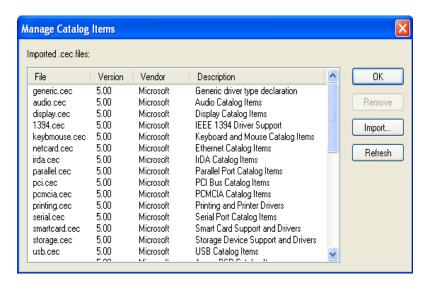
Create a directory **SMDK2440** in D:\WINCE500\PLATFORM (if you installed WinCE 5.0 packages in **D:\WINCE500**). Do not rename **SMDK2440**.

Extract smdk2440-wince5.0.rar, and you got a directory smdk2440. Copy all under smdk2440 into D:\WINCE500\PLATFORM\SMDK2440, and remove Read-only attributes of them.

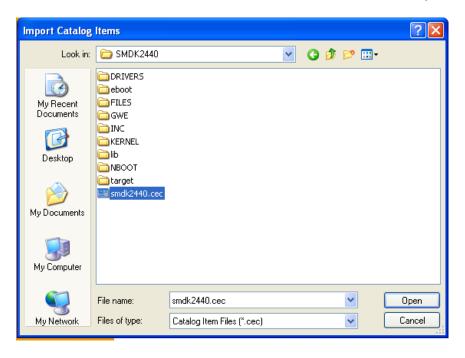
Click start->Programs->Microsoft Windows CE 5.0->Platform Builder 5.0, Click File->Manage Catalog Items.



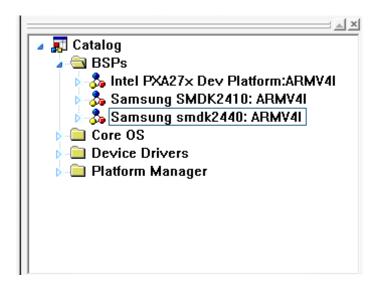
Click Import...



Select D:\WINCE500\PLATFORM\SMDK2440\smdk2440.cec, click **Open**.

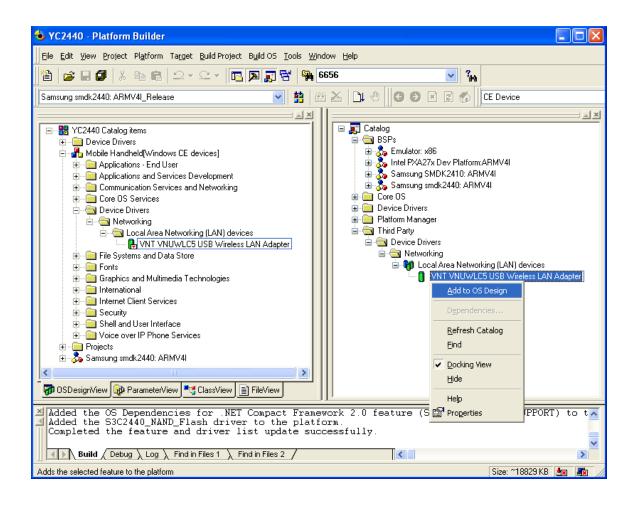


You will see Samsung smdk2440:ARMV4I in Catalog->BSPs.



If you want to use VT5565 USB wireless adaptor, double-click "6656_153_01_samsung2440.msi" to install VT5565 driver. After that, a third party driver "VNT VNUWLC5 USB Wireless LAN Adapter" appears in Catalog window as shown below. You can add it to your project afterwards.

Now BSP installation is completed.

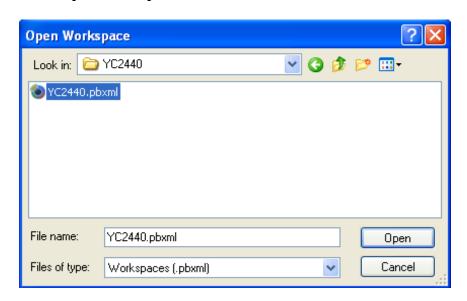


4 Build WinCE image

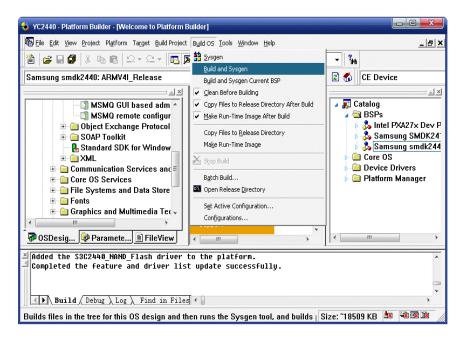
4.1 Use the provided project file.

Create a directory **YC2440** in D:\WINCE500\PBWorkspaces. Copy the provided project file **YC2440.pbxml** into this YC2440 directory.

Click start->Programs->Microsoft Windows CE 5.0->Platform Builder 5.0, Click File->Open Workspace...



Select D:\\WINCE500\PBWorkspaces\YC2440\YC2440.pbxml, click **Open**.

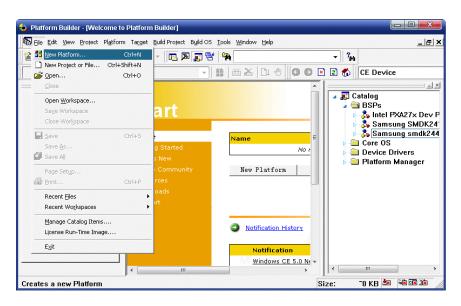


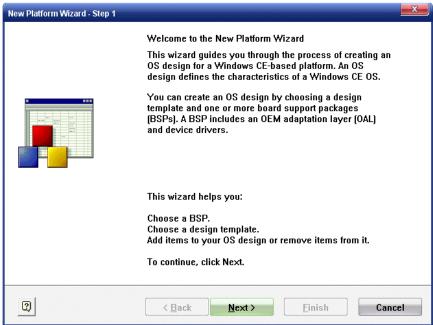
Click **Build OS->Build and Sysgen**. After a few minutes, you will find the image file **NK.nb0** in

D:\WINCE500\PBWorkspaces\YC2440\RelDir\smdk2440_ARMV4I_Release\ if there are no errors.

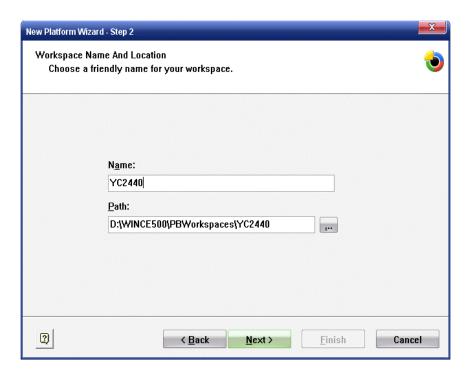
4.2 Create a new project

Click start->Programs->Microsoft Windows CE 5.0->Platform Builder 5.0, Click File->New Platform...

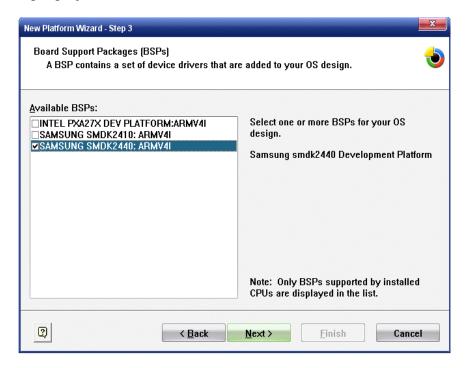




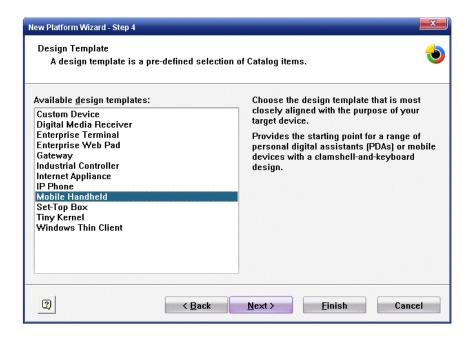
Click Next.



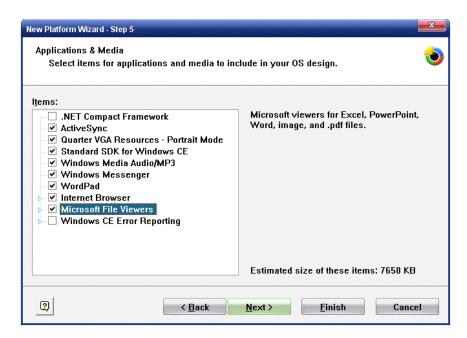
Input project name, and click Next.



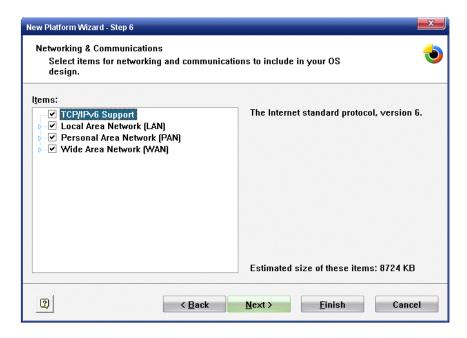
Tick SAMSUNG SMDK2440: ARMV4I, click Next.



Select Mobile Handheld, click Next.



Tick the above checkboxes, click Next.



Click Next.

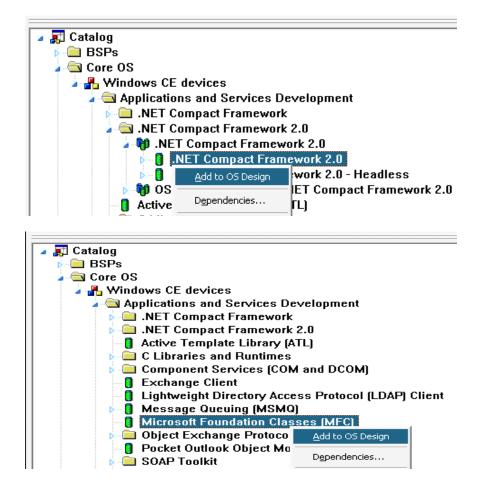


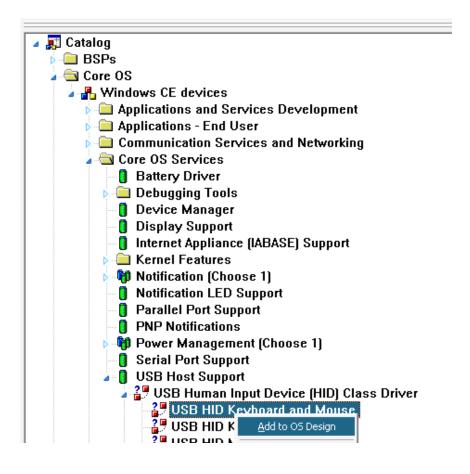
Click Next.



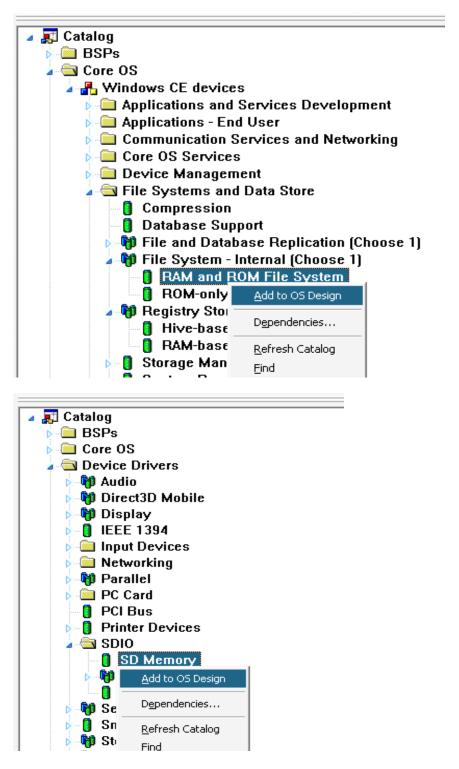
Click Finish.

Now you can add some features to your project as below.









Click **Build OS** -> **Build and Sysgen**. After a few minutes, you will find the image file **NK.nb0** in

D:\WINCE500\PBWorkspaces\YC2440\RelDir\smdk2440_ARMV4I_Release\ if there are no errors.

5 Write boot loaders – nboot1st.bin, nboot2nd.bin and umon.bin

The nboot1st.bin is first loaded after power-on, and then it will load either nboot2nd.bin or umon.bin.

The nboot2nd.bin is the WinCE boot loader with a logo. It will be loaded by nboot1st if "u" is not pressed at DNW – a windows utility.

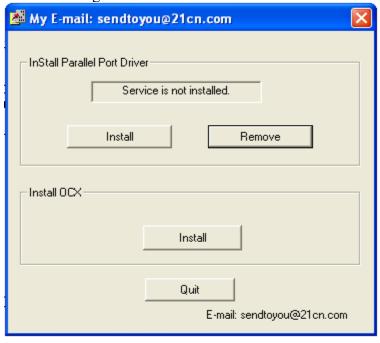
The umon.bin is a program to load a WinCE image NK.nb0 into RAM or NAND Flash through USB.

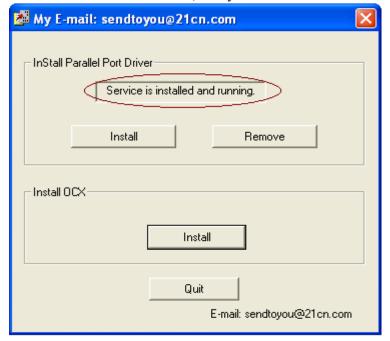
These 3 files can be found in the directory \WINCE5.0\Images. They are written into NAND Flash using a windows utility – **SJF2440.EXE**, which can be found in \Windows Utilities\.

5.1 Install GIVEIO driver

To run SJF2440.EXE, a GIVEIO driver has to be installed first.

Find \Windows Utilities\GIVEIO driver directory on the provided CD, double click install.exe to get to this window.





Click those 2 Install buttons, and you will see the driver installed.

Click **Quit** button to close the window. Now GIVEIO driver is installed.

5.2 Make hardware connection

PC parallel port <-> Provided Parrallel Cable <-> Wiggler Board <-> 20 Lines JTAG Cable <-> JTAG connector of 2410(or 2440) board.

Power-on the board. It does not matter if the board is now running WinCE/Linux or not.

5.3 Write nboot1st.bin, nboot2nd.bin and umon.bin into NAND Flash

Copy \Windows Utilities\sjf2440.exe to C:\.

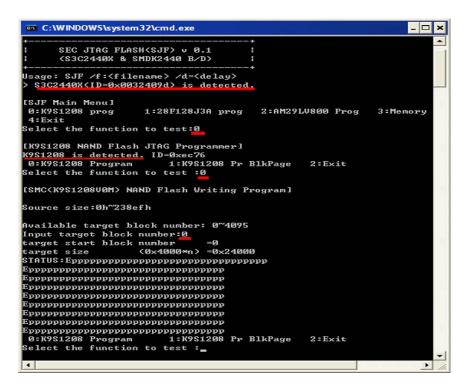
Copy nboot1st.bin, nboot2nd.bin and umon.bin to C:\.

Open Command Prompt by clicking Start->Programs->Accessories->Command Prompt, and then go to C:\ by typing: cd \

5.3.1 Write nboot1st.bin into NAND Flash

C:\>sif2440.exe /f:nboot1st.bin

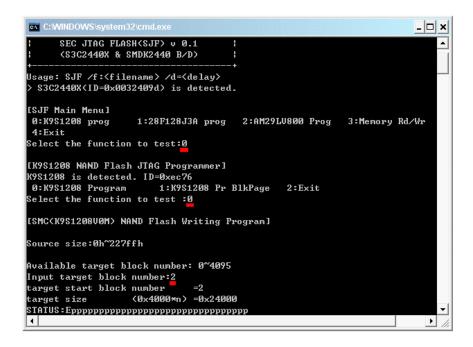
Here comes the following window. You need to type "0" 3 times as shown below to complete the process.



5.3.2 Write nboot2nd.bin into NAND Flash

C:\>sjf2440.exe /f:nboot2nd.bin

Here comes the following window. You need to type "0", "0" and "2" as shown below to complete the process.



5.3.3 Write umon.bin into NAND Flash

C:\>sjf2440.exe /f:umon.bin

Here comes the following window.

```
C:\WINDOWS\system32\cmd.exe
     SEC JTAG FLASH(SJF) v 0.1
     ($3C2440X & $MDK2440 B/D)
Usage: SJF /f:<filename> /d=<delay>
> $3C2440X(ID=0x0032409d) is detected.
[SJF Main Menu]
0:K9$1208 prog
                   1:28F128J3A prog
                                     2:AM29LV800 Prog
                                                        3:Memory Rd/Wr
4:Exit
Select the function to test:0
[K9S1208 NAND Flash JTAG Programmer]
K9S1208 is detected. ID=0xec76
0:K9S1208 Program
                       1:K9S1208 Pr BlkPage
                                             2:Exit
Select the function to test :0
[SMC(K9S1208V0M) NAND Flash Writing Program]
Source size:0h~7a9bh
Available target block number: 0~4095
Input target block number:12
target start block number
                             =12
                  (0x4000*n) =0x8000
target size
```

If you have 3.5"LCD, type "0", "0" and "8" as shown above to complete the process.

If you have 4.3"LCD, type "0", "0" and "12" as shown above to complete the process.

If you have 7.0"LCD, type "0", "0" and "27" as shown above to complete the process.

5.3.4 Unplug the JTAG cable

After it is complete, power-off the board, unplug the JTAG cable.

You only need to do the above one time.

6 Load WinCE image and run

The WinCE image NK.nb0 is what you built at **4 Build WinCE image**. You can also find a pre-built WinCE image in \WINCE5.0\Images.

6.1 Preparation

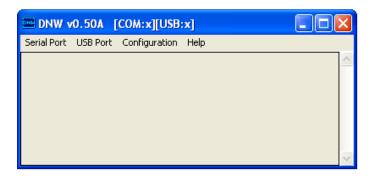
Disconnect the JTAG cable if you have not done so.

Connect PC's COM1 to your target board's COM0.

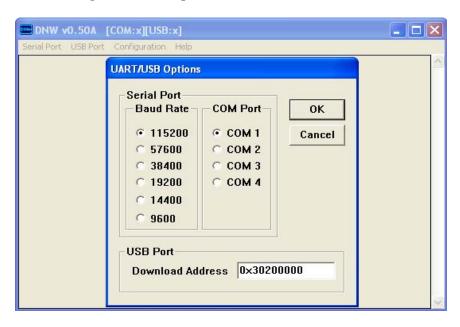
Connect power.

Do not connect USB cable to your target board's USB device port at this moment.

Run a Windows utility **DNW.EXE** which can be found in \Windows Utilities.



Click Configuration—>Options.

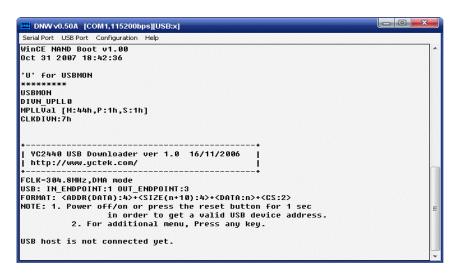


Select as shown above and click **OK**.

Click **Serial Port**—>**Connect**, you will see as below. It displays "COM1, 115200bps".



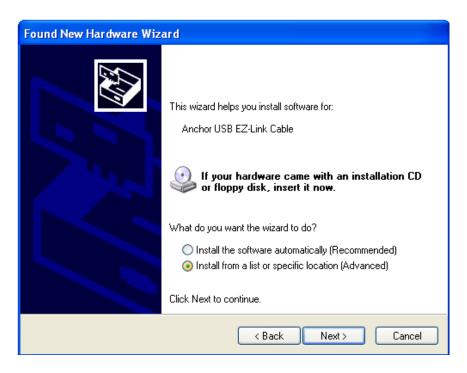
Power-on the target board, and immediately press "u" key. At this time, it displays "USB host is not connected yet" at the end.



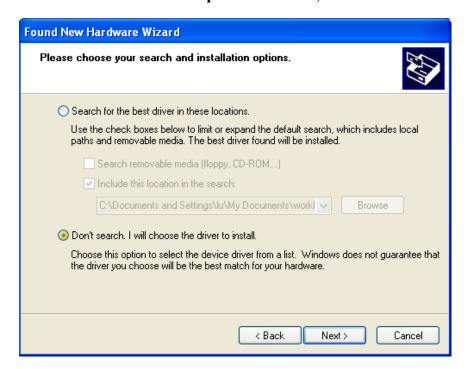
Now connect the target board's USB device port to PC's USB port using the provided USB cable. The PC shows that it found a new USB device.



Tick "No, not this time", click Next.



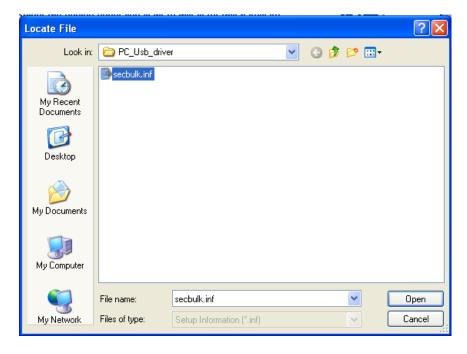
Tick "Install from a list or specific location", click Next.



Tick "Don't search", Click Next.



Click "Have Disk..." to locate the driver.

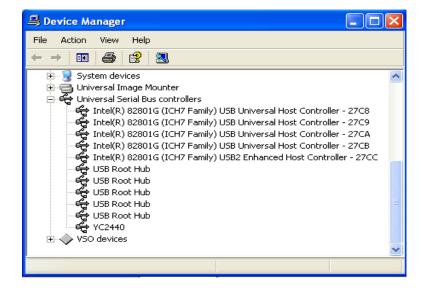


The driver is in \Windows Utilities\DNW\PC_Usb_driver. Click **Open**.

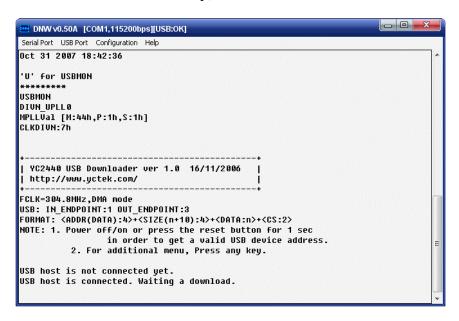




Click Finish. Now you will see "YC2440" in Device Manager.



Back to DNW, you will see "USB:X" becomes "USB:OK", and it also displays "USB host is connected. Waiting a download." If this "USB host is connected. Waiting a download." does not show up, disconnect the USB cable and then reconnect it.



Press any key, and it comes to a "Select Menu".

```
USB host is not connected yet.
USB host is connected. Waiting a download.

###### Select Menu ######

[0] Download & Run

[1] Download Only

[2] Test SDRAM

[3] Change The Console UART Ch.

[4] Clear unused area in SDRAM
```

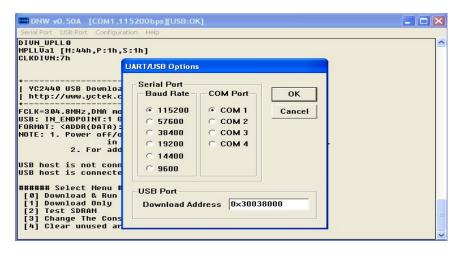
Every time you want to load WinCE image either to NAND Flash or to SDRAM, you **must** come to this "**Select Menu**", although you don't have to install the USB driver next time.

Sometimes "USB host is connected, Wait a download" doesn't show up even though your USB cable is connected correctly between PC and the target board. In this case, you can disconnect the USB cable and then re-connect it, or just restart the target board.

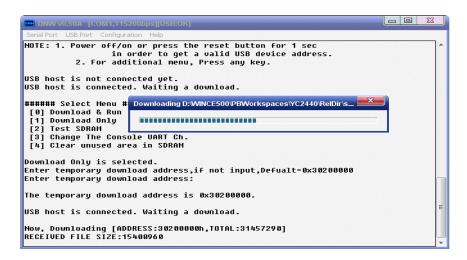
6.2 Write NK.nb0 into NAND Flash

First follow the steps shown in **6.1** to the "Select Menu". You will not be prompted to install the USB driver if you did it previously.

Click **Configuration->Options** to open UART/USB Options window, and make sure the USB Port Download Address is **0x30038000**. Click **OK** and return to DNW window.



Press "1", and then press "Enter". Click **USB Port** -> **Transmit**, and then select your NK.nb0. It will start loading NK.nb0 to SDRAM temporary location 0x30200000. If you use USB-to-COM or PCI-to-COM Adaptor, loading may fail. Please use on-board COM ports.

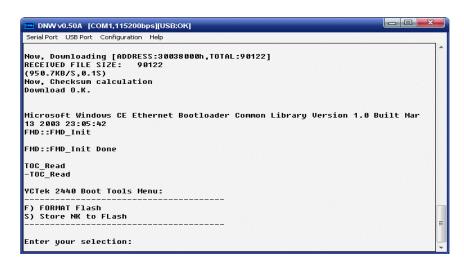


After it is finished, it will display as below:

```
Now, Downloading [ADDRESS:30200000h,TOTAL:31457290]
RECEIVED FILE SIZE:31457290
(944.0KB/S,33.3S)
Now, Checksum calculation
Download O.K.

###### Select Menu ######
[0] Download & Run
[1] Download & Run
[1] Download Only
[2] Test SDRAM
[3] Change The Console UART Ch.
[4] Clear unused area in SDRAM
```

Press "0". Click **USB Port->Transmit**, select eboot.nb0. It will load eboot.nb0 to SDRAM and then run. In a few seconds, it comes to "YCTEK 2440 Boot Tools Menu".



Press "F" and wait 5 minutes until "YCTEK 2440 Boot Tools Menu" comes out again.

Press "S" to write WinCE image to NAND Flash.

```
DNWV0.50A [COM1,115200bps]|USB:OK|

Serial Port USB Port Configuration Help

sgList[0].dwLength: 0xE000
chainInfo.dwLoadAddress: 0x00000000
chainInfo.dwFlashAddress: 0x000000000
chainInfo.dwLength: 0x000000000
chainInfo.dwLength: 0x000000000
chainInfo.dwLength: 0x000000000

Jumping to image at virtual address 0x8C200000h
+ToPhysicalAddr:0x8C200000
-ToPhysicalAddr:0x302000000

::: Physical Launch Address: 0x30200000h
Windows CE Kernel for ARM (Thumb Enabled) Built on Jun 24 2004 at 18:25:00
ProcessorType=0920 Revision=0
sp_abt=ffff5000 sp_irq=ffff2800 sp_undef=ffffc800 0EMAddressTable = 8c2013bc
Windows CE Firmware Init
INFO: Initializing system interrupts...
INFO: Initializing system clock(s)...
INFO: Initializing driver globals area...
LCD OUTPUT MODE 480*272.
SDMMC config set rGPGCON: fd86edba
DEMInit Done...
```

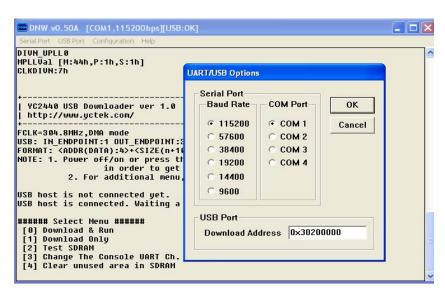
After it is finished, it will automatically start to run at your target board. Now WinCE image is in NAND Flash.

6.3 Load NK.nb0 to SDRAM to run

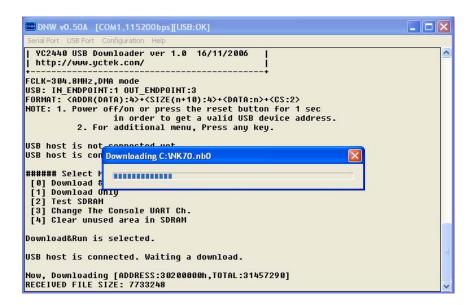
You may want to test WinCE image (NK.nb0) before you write it to NAND Flash. It only takes about 20 seconds.

First follow the steps shown in **6.1** to the "Select Menu". You will not be prompted to install the USB driver if you did it previously.

Click **Configuration->Options** to open UART/USB Options window, and make sure the USB Port Download Address is **0x30200000**. Click **OK** and return to DNW window.



Press "0". Click **USB Port->Transmit**, and then select your NK.nb0. It will start loading NK.nb0 to SDRAM.

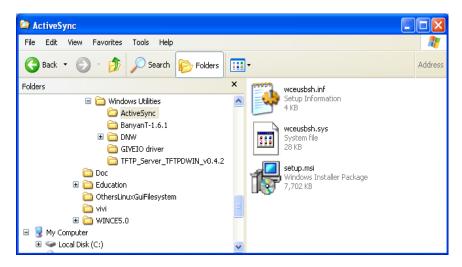


After it finishes loading, it will automatically start to run at your target board.

7 Install and use ActiveSync

ActiveSync is a synchronization program developed by Microsoft. It allows a mobile device to be synchronized with a desktop PC running Windows XP.

It is freely downloadable from Microsoft website. There is a copy of ActiveSync4.5.0 installation file in \Windows Utilities\ActiveSync. In this directory, you can also find the USB driver for our target board's USB device port.



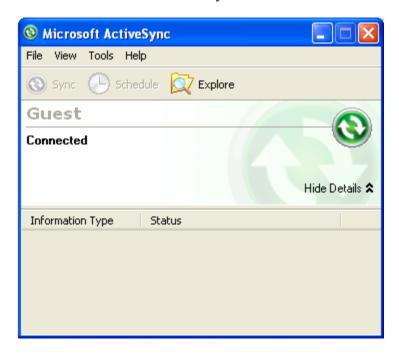
To install it, double-click **setup.msi**. Follow the instructions to complete the installation.

Use the provided USB cable to connect PC to the USB device port of your target board. Power-on the target board to start WinCE.

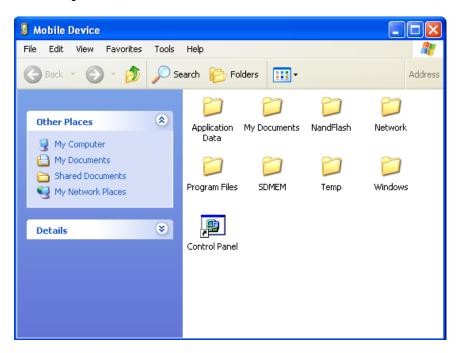
Your PC will claim that a new device has been found. Locate the driver in \Windows Utilities\ActiveSync and install it. When the following window pops up, tick "No" and then click Next.



Here comes Microsoft ActiveSync window.



Click Explore in its tool bar.

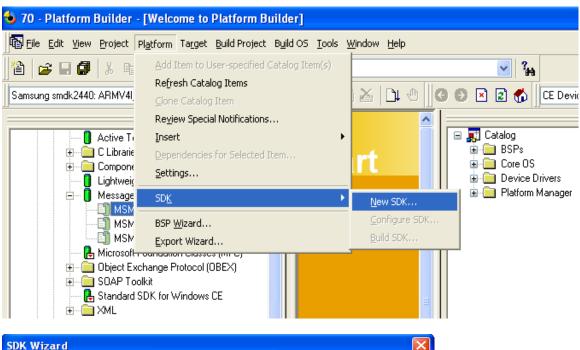


Now you can see the directories and files of your target board.

8 Generate your own SDK

Run Platform Builder, open your workspace project file.

Click **Platform->SDK->New SDK** as below.

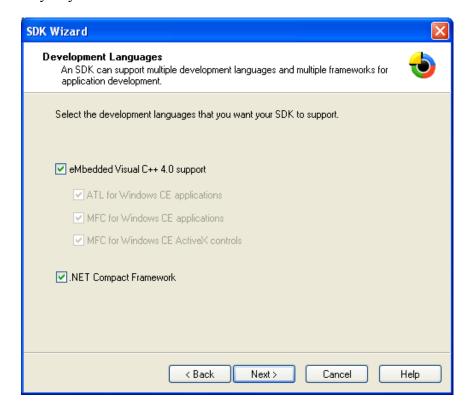




Click Next.



Key in your Product name and Manufacture name.

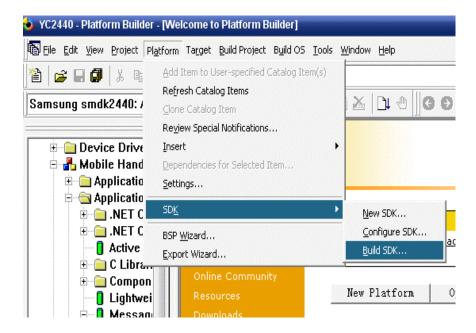


Tick the 2 checkboxes, and click **Next**.

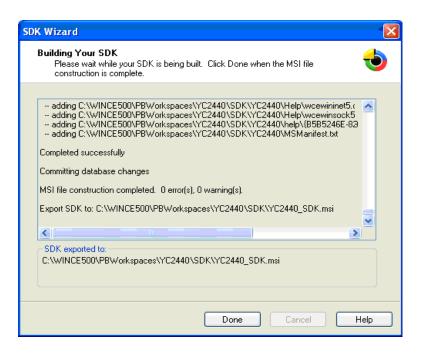


Click **Finish** to complete the SDK Wizard.

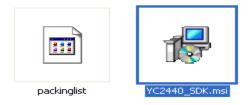
Now start to build SDK. Click Platform->SDK->Build SDK...



It will start to build your SDK. Wait a few minutes.



After it is finished, click **Done**. You will see your SDK file YC2440_SDK.msi in the directory \WINCE500\PBWorkspaces\YC2440\SDK.



Double-click this file to install it.



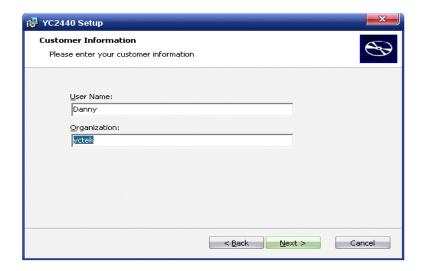
Click Next.



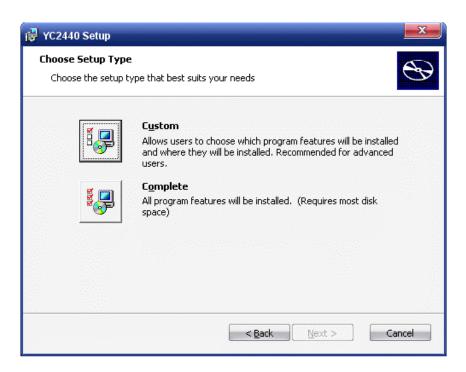
Click Close.



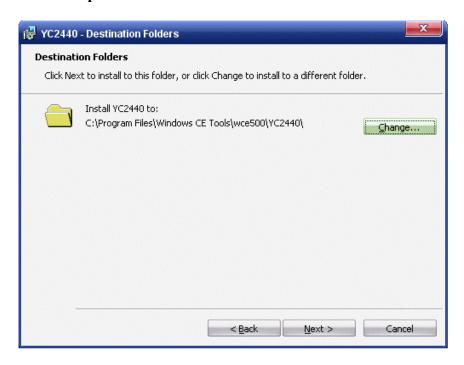
Select Accept, and Click Next.



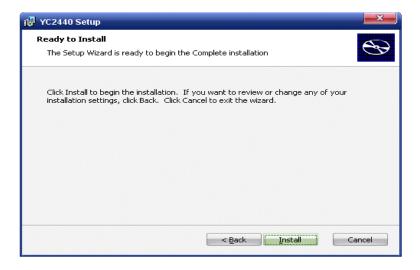
Fill in the User Name and Organization, and click Next.



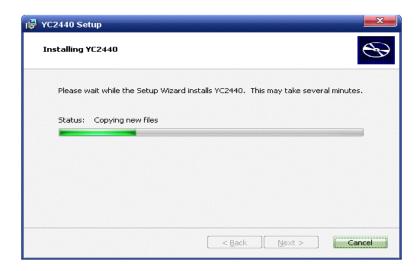
Click Complete.



Click Next.



Click Install.





Click Finish.

9 Examples to use Platform Builder remote tools

With remote tools you can use your development PC to remotely perform a variety of programming tasks on your target board.

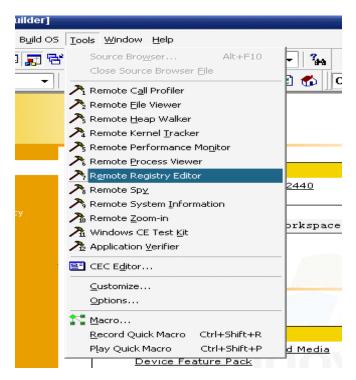
The following is an example how to edit the touch screen calibration data in the Registry Table.

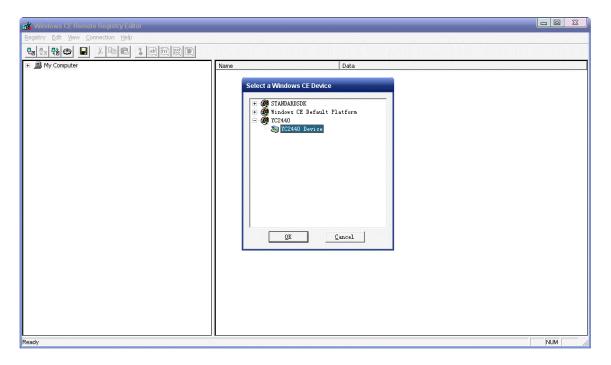
9.1 Establish connection

- Set your target board obtain an IP address automatically
- SDK has been installed
- ActiveSync works properly
- Complete touch screen calibration and leave it powered on.

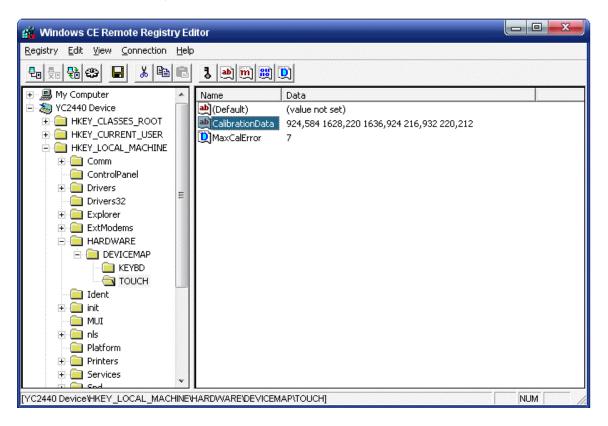
9.2 Use Remote Registry Editor

Click Tools->Remote Registry Editor.





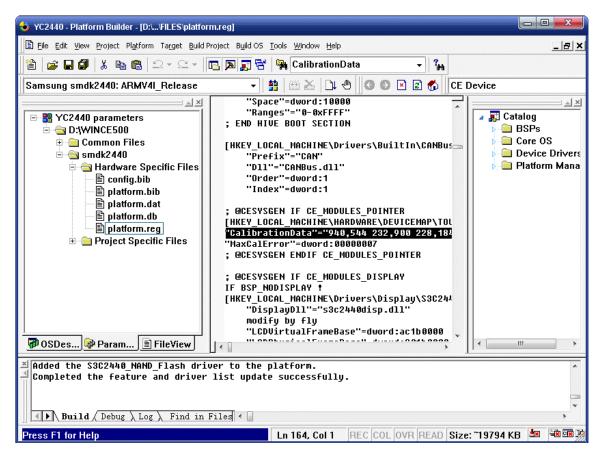
Select YC2440 Device, click OK.



Find CalibrationData as above. Write down those calibration data.

9.3 Modify BSP

Modify CalibrationData in BSP with the above data.



Build your NK.nb0 again, and then load it into your target board. Next time, your touch screen will work properly after boot-up.

10 Build applications using Visual Studio 2005

10.1 Install Visual Studio 2005 and .NET Compact Framework 2.0

Microsoft Visual Studio 2005 is a very good tool to develop WinCE 5.0 applications. You can use Visual C++ to develop native-code applications and use Visual Basic or Visual C# to develop managed-code applications.

First of all, you need to install "VS2005" and ".NET Compact Framework 2.0 Service Pack 2 Redistributable".

In this manual, we only illustrate to write managed-code applications using Visual Basic.

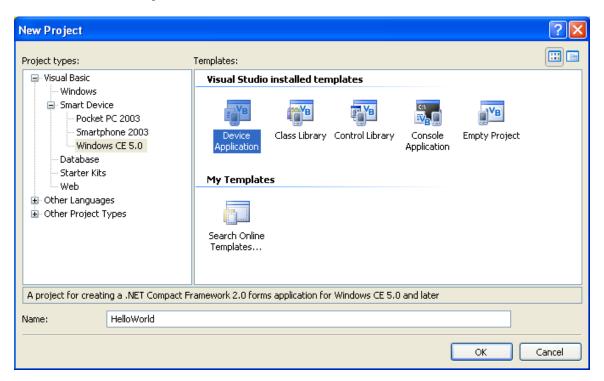
10.2 Establish connection

Do the same as **9.1 Establish connection.**

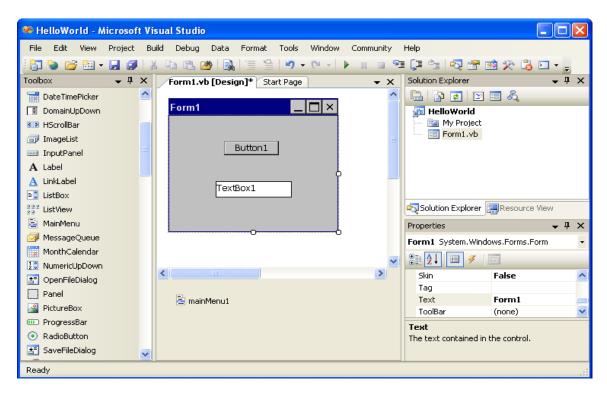
10.3 Build a simple application

Run VS2005.

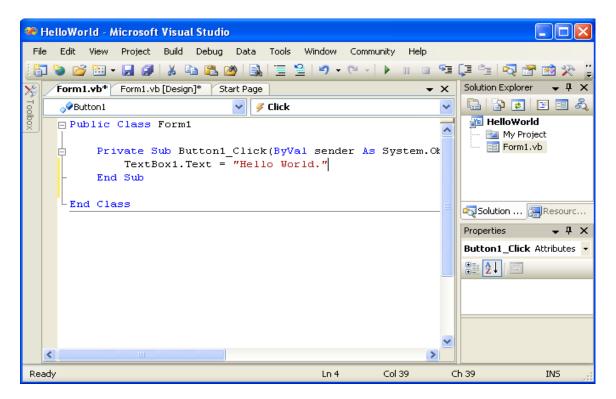
Click File->New Project...



Select Visual Basic->Windows CE 5.0->Device Application. Name it to be HelloWorld. Click OK.

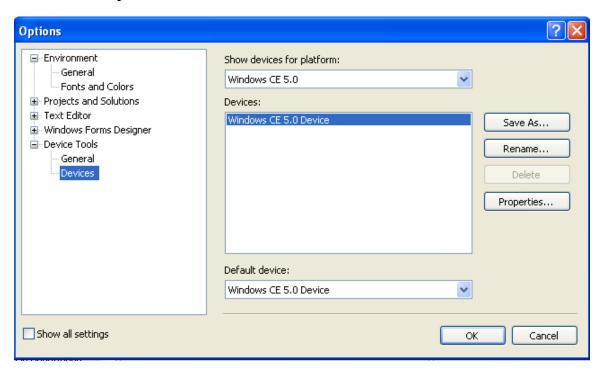


Add a **button1** and a **textbox1** to the **Form1**.

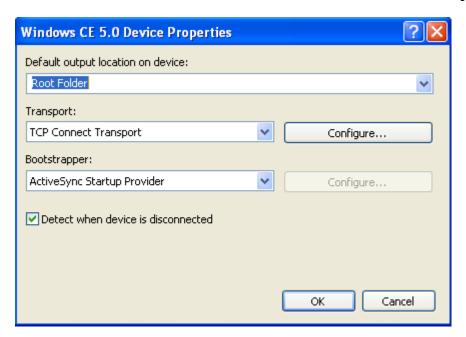


Double-click **button1**, add a line as above.

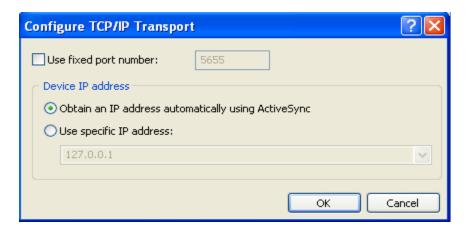
Click Tools->Options...



Select Device Tools->Devices->Windows CE 5.0 Device. Click Properties...

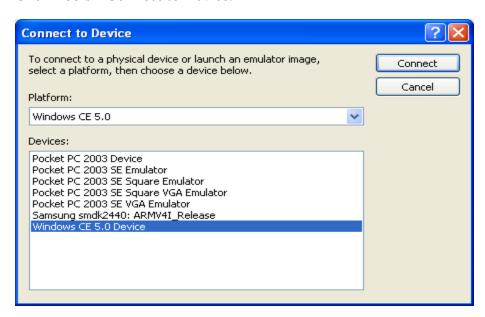


Select as above. Click Configure...

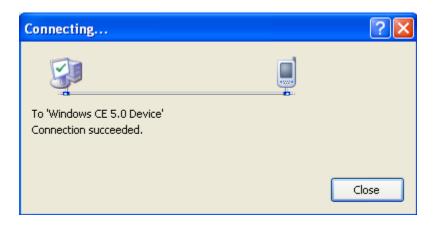


Select as above. Click several **OK** to return to main window.

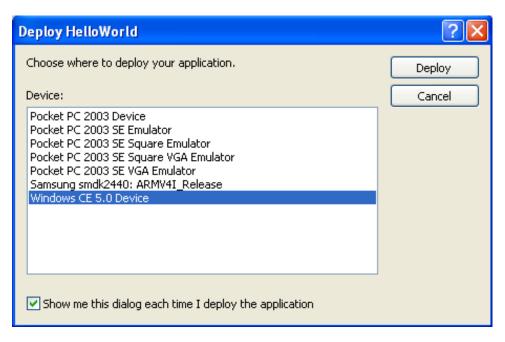
Click Tools->Connect to Device.



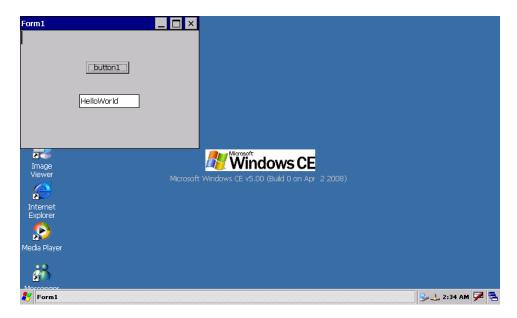
Select **Windows CE 5.0 Device**, click **Connect**. After a while, the connection will succeed.



Click **Debug->Start Debugging**.



Select **Windows CE 5.0 Device**. Click **Deploy**. It will start to compile the application, and then deploy it to your target board. It will probably take several minutes before you can see it running at your target board. Click the **button1**, **HelloWorld** will be displayed in the textbox.

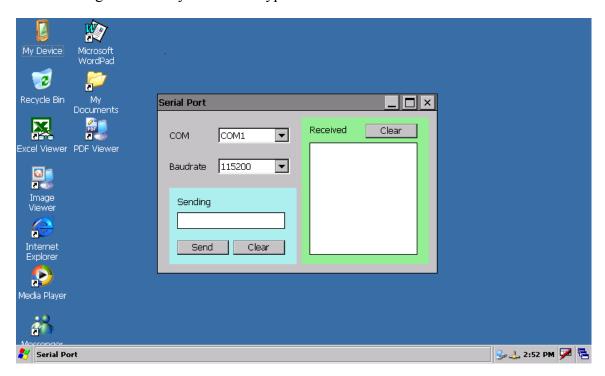


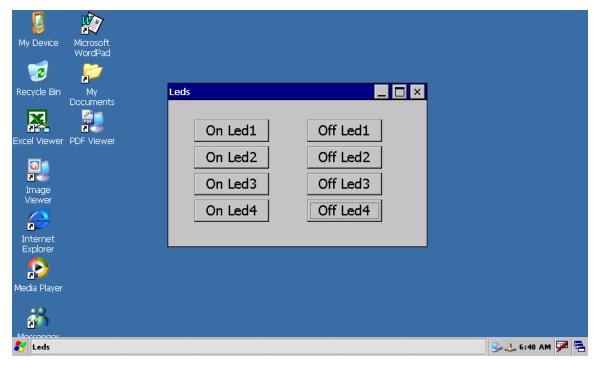
10.4 Three examples – SerialPort, Leds and Keys

Inside the provided CD, there are 3 examples, "SerialPort", "Leds" and "Keys". The below is their screenshots on the LCD. They are in the directory \WinCE VB application examples.

For the projects "SerialPort" and "Keys", the underlying device drivers are included in the BSP, and their support of .NET Compact Framework is amazingly ready.

For the project "Leds", you need to install **Smart Device Framework 2.2 Community Edition** from http://www.opennetcf.com/, so that the VB application can use its SFD2.2 classes to directly drive GPIOs. We believe the SDF2.2 is useful to write .Net Compact Frame managed-codes if you want to bypass some P/Invoke calls to Win32 API.







11 How to

11.1 How to change splash logo

The steps to change the splash logo are detailed below. Please note, we do not provide ADS1.2, which is a product of ARM.

- Run uC-GUI-BitmapConvert.exe in BMP to C directory
- Open your splash logo file, which should be 256-color, bmp format and correct size.
- Click Image->Convert Into->8 bit Color 323 (8BPP)
- Click File->Save As, save it as a C file.
- Find "const unsigned char ac" in the C file, copy the inside data and replace those in "const unsigned char acki[]" of k.h in NBOOT2nd directory
- Use ADS1.2 to open the project nboot.mcp in NBOOT2nd directory. Click Project->Remove Object Code...->OK, then click Project->Make. Once it succeeds, you will find NBOOT2nd.bin in directory nboot_Data\DebugRel.
- Load this NBOOT2nd.bin into flash as described in **5.3.2**.

11.2 How to make COM1 to be debugging output

- The COM1 is a conventional COM port by default. It can be turned into a debugging output so that WinCE kernel debugging messages can be output to DNW/HyperTerminal. The following steps are to turn COM1 to be a debugging output.
- Open WinCE image project using Platform Builder, YC2440.pbxml in my case.
- Open C:\WINCE500\PLATFORM\SMDK2440\KERNEL\HAL\cfw.c. Find a line "DebugConsoleEnabled = 0", change it to "DebugConsoleEnabled = 1".
- In the Workspace window, choose the ParameterView tab. Expand the root node of the parameters tree, navigate to the platform.reg file, and double-click to open it.
- Edit platform.reg. Find and mask those lines as below.
 IF BSP_NOSERIAL!
 ;[HKEY_LOCAL_MACHINE\Drivers\BuiltIn\SER2440]

```
"DeviceArrayIndex"=dword:0
 "Irq"=dword:03
 "IoBase"=dword:50000000
 "IoLen"=dword:2C
 "Prefix"="COM"
 "D11"="SER2440.D11"
 "Order"=dword:1
 "Priority"=dword:0
 "Port"="COM1:"
 "DeviceType"=dword:0; null modem
 "FriendlyName"="S2440 COM1"
 "Index"=dword:1
 "IClass"="{A32942B7-920C-486b-B0E6-92A702A99B35}"
    "Tsp"="Unimodem.dll"
    "DevConfig"=hex: 10,00, 00,00, 05,00,00,00, 10,01,00,00, 00,4B,00,00,
00,00, 08, 00, 00, 00,00,00,00
```

Click Build OS->Build and Sysgen to build the image.

11.3 How to run an application automatically after power-on

- Copy MyApp.exe into the directory %_PROJECTOAKROOT%\Files, as in my case, it is
 C:\WINCE500\PBWorkspaces\YC2440\WINCE500\smdk2440_ARMV4I\OAK\f iles.
- Open WinCE image project using Platform Builder, YC2440.pbxml in my case.
- In the Workspace window, choose the ParameterView tab. Expand the root node of the parameters tree, navigate to the Project.bib file, and double-click to open it.
- Edit the FILES section of Project.bib to add an entry, and save it. FILES

- In the above parameters tree, navigate to the Project.reg file, and double-click to open it.
- Edit the FILES section of Project.reg to add an entry, and save it.
 [HKEY_LOCAL_MACHINE\init]
 "Launch81"="MyApp.exe"
 "Depend81"=hex:1e,00

• Click Build OS->Build and Sysgen to build the image. Once it is complete, the NK.nb0 contains MyApp.exe that will be run automatically after power-on.