

# Windows® CE 6.0 Based X86 Embedded System

## Users Manual

*Trusted ePlatform Services*



## **Important Note: Read Carefully**

This product is protected by the "End-User License Agreement" (EULA). Please read it carefully before using the product.

## **Copyright Notice**

This document is copyrighted, 2003, by Advantech Co. Ltd. All rights are reserved. Advantech Co., Ltd. reserves the right to make improvements to the products described in this document at any time without notice.

No part of this document may be reproduced, copied, translated or transmitted in any form or by any means without the prior written permission of Advantech. Information provided in this document is intended to be accurate and reliable. However, Advantech assumes no responsibility for its use, nor for any infringements upon the rights of third parties which may result from its use.

Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries.

All brand and product names mentioned herein are trademarks or registered trademarks of their respective holders.

# Table of Contents

<b>CH 1 Introduction .....</b>	<b>5</b>
1.1 Advantech Windows CE 6.0 based Embedded System .....	5
1.2 Advantech Enhancement for Win CE 6.0 .....	6
1.2.1 New Functions in Windows CE 6.0 .....	7
1.2.2 New Kernel Provides Increased Functionality .....	7
1.2.3 Enabling New Business Opportunities .....	7
1.2.4 CE 6.0 Operating System Layout .....	7
1.3 The pricing model of Windows CE 6.0 .....	8
<b>CH 2 Installation and Setting .....</b>	<b>9</b>
2.1 DRAM Installation .....	9
2.2 Utility Programs .....	9
2.3 System files .....	10
2.3.1 Configuration file: bootcepc.cnf .....	10
2.3.2 Boot logo .pcx file: bootcepc.pcx .....	10
2.3.3 Kernel Image file (nk.bin) .....	10
<b>CH 3 Tutorial – Using Windows CE 6.0 .....</b>	<b>11</b>
3.1 Advantech Utilities .....	11
3.1.1 Advantech Persistent Registry Solutions & Settings .....	11
3.1.2 Advantech Flusher for Persistent Registry .....	11
3.1.3 Advantech Registry Editor Utility (regedit.exe) .....	12
3.1.4 Advantech Auto Run Application Solution .....	15
3.1.5 Advantech Memory Adjustment Solution .....	16
3.1.6 Advantech CE 6.0 Image Information Utility .....	17
3.1.7 Advantech Watchdog Timer Utility .....	18
3.1.8 IDE Hard Disk/Flash Disk/CompactFlash Disk .....	19
3.1.9 Advantech Audio Recorder Test Utility (optional) .....	20
3.2 Advantech Enhancement for Peripherals .....	21
3.2.1 Display Backlight Setting .....	21
3.2.2 Touch Screen Calibration Utility .....	21
3.2.3 Digital I/O .....	22
3.3 Basic Operation .....	23
3.3.1 Introduction to Taskbar Icons .....	23
3.3.2 Taskbar and Start Menu Properties .....	23
3.3.3 Protecting Important Information .....	24
3.3.4 Setting the Device Name .....	24

3.3.5	Task Manager .....	25
3.3.6	Command Prompt (CMD.EXE) .....	25
3.3.7	Reboot the system .....	26
3.3.8	Multimedia .....	27
3.3.9	Multimedia Support .....	27
3.3.10	Internet Explorer 6.0 for CE.....	28
3.4	Network and Dial-up Connections .....	29
3.4.1	Network (Ethernet) Setting: .....	29
3.4.2	Cable Connection Setting: .....	31
3.4.3	Microsoft UNC (Universal Naming Convention).....	33
3.4.4	net command .....	33
3.4.5	Communication Programs.....	33
3.5	Application Development Tools .....	34
3.5.1	Visual Studio 2005 .....	34
3.5.2	Platform SDK.....	34
3.5.3	Windows CE hands-on lab .....	34
3.5.4	Windows Embedded CE 6.0 Writing C# Managed Applications....	34
3.5.5	Windows Embedded CE 6.0 Writing MFC/Native Applications .....	35
<b>CH 4</b>	<b>Q&amp;A.....</b>	<b>37</b>
4.1	I purchased a Windows CE 6.0 License from a Microsoft Distributor. Am I authorized to use Advantech Windows CE 6.0 OS release? .....	37
4.2	Why are the Inbox and Pocket Word missing? .....	37
4.3	When I copied files to the root directory or \Windows directory and reset the system, they all disappeared. Why? .....	38
4.4	Does Advantech offer a Windows CE 6.0 system integration service? .....	38
4.5	What do I do to get a Windows CE 6.0 device driver for my add-on module? .....	38
<b>Appendix A</b>	<b>.....</b>	<b>41</b>
A.1	Null Modem Cable pin-out (DB-9 to DB-9) .....	41

# CH 1 Introduction

Microsoft Windows CE 6.0 is a compact, highly efficient, scalable operating system that is designed for a broad range of embedded systems and products. Its multi-threaded, multi-tasking, fully preemptive OS environment is targeted specifically toward hardware with limited resources. Its modular design enables embedded system and application developers to customize it for a variety of products, such as:

- PDA or mobile handheld devices
- Cell phone/smart phones
- Web Pads
- Internet appliances
- Media appliances
- Digital imaging devices
- Set-top boxes
- Residential gateways
- Industrial automation devices
- Retail Point-of-Sale devices
- Windows thin clients
- Tiny Kernels
- Custom Devices

By using Windows CE 6.0, developers can leverage their existing Windows-based programming skills. Windows CE 6.0 supports subset of Microsoft Win32 APIs and several additional programming interfaces.

## **1.1 Advantech Windows CE 6.0 based**

### **Embedded System**

All embedded systems come pre-configured with Windows CE 6.0 OS Image and Windows CE 6.0 license. There is no need to waste time developing on-board device drivers or using the Platform Builder to build a Windows CE 6.0 Image, we've done that for you! All you need to do is to develop your Windows CE 6.0 applications!

## **1.2 Advantech Enhancement for Win CE 6.0**

Advantech continues to develop Windows CE 6.0 optimized drivers, tools and components to further enhance the Microsoft Windows CE 6.0 package. The following are the key enhancements:

- A. Customizable DOS-less boot loader
- B. BIOS Loader
- C. Customizable boot logo
- D. Supports Memory up to 512 MB (Auto-Sizing)
- E. Reboot Utility
- F. Registry Flusher Utility
- G. Registry Editor Utility
- H. Auto Launch Application Solution
- I. Memory Adjustment Utility
- J. CE Image Information Utility
- K. Watchdog Timer Utility
- L. Enhanced IDE/ Flash Disk Speed (faster than standard CE release)
- M. Audio Recorder Test Utility (Optional)
- N. Resolution Utility
- O. Server Configuration Utility

### 1.2.1 New Functions in Windows CE 6.0

There are several newly added features to Windows CE 6.0

### 1.2.2 New Kernel Provides Increased Functionality

CE 6.0 features a re-designed kernel to increase functionality for a richer set of user experiences by enabling a larger number of applications to run simultaneously. CE 6.0 supports up to 32,000 simultaneous processes, with up to 2 GB of virtual memory space for each process. A new file system supports larger storage media, large file sizes and removable media encryption.

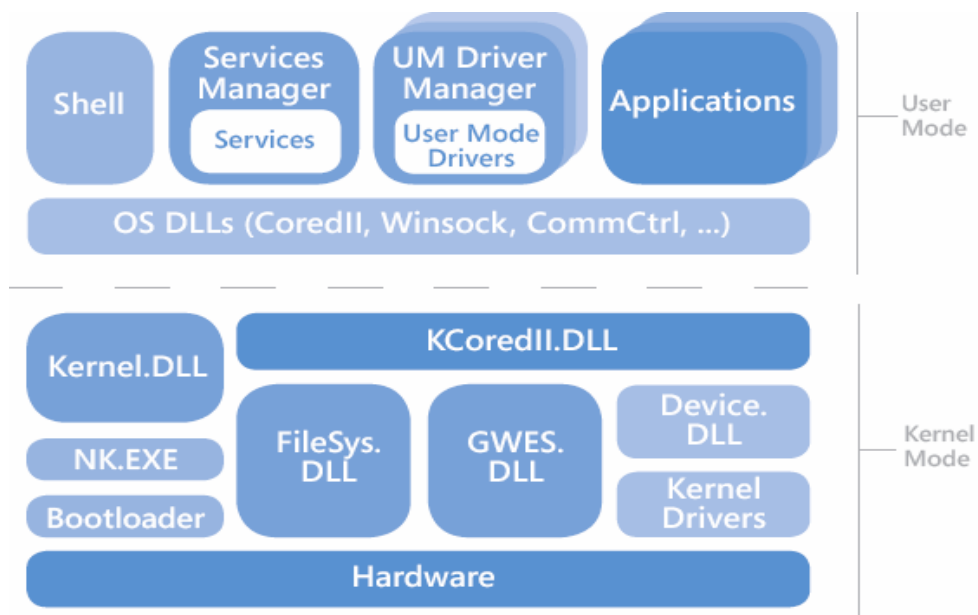
### 1.2.3 Enabling New Business Opportunities

The Cellcore Stack component helps devices establish data and voice connections over cellular networks.

The Windows Media Connect and Digital Video Recording components help devices consume media from Windows XP-based PCs and record, pause and rewind live video streams.

The Windows Network Projector component will make it easier for business meeting attendees to give a presentation from a Windows Vista-based PC.

### 1.2.4 CE 6.0 Operating System Layout



The CE 6.0 OS layout featuring the new unified kernel.

### **1.3 The pricing model of Windows CE 6.0**

The new pricing of Windows CE 6.0 gives device manufacturers enhanced levels of flexibility in utilizing the rich features of Windows CE 6.0 across the breadth of their product lines, while helping to reduce development and licensing costs. There are two runtime license options for Windows CE 6.0

License Versions	Description
<b>Windows CE 6.0 Core</b>	The Core run-time license provides a hard real-time operating system kernel with robust file system, extensive networking and communications technologies, advanced multimedia capabilities, digital rights management, as well as a powerful application development platform. The Core license is ideal for low-cost devices.
<b>Windows CE 6.0 Professional</b>	The additional programs and functions included in this package include Windows Messenger, WordPad, the Remote Desktop Protocol, and Internet Explorer 6. This software bundle is aimed toward devices requiring "the richest user interface, multimedia and browsing capabilities, including set-top boxes, advanced VoIP devices, mobile handhelds and digital media players."

## **CH 2 Installation and Setting**

Windows CE 6.0 is an embedded operating system, therefore it is not suitable for general purpose use. The Windows CE 6.0 Image that comes with the product is pre-configured for the dedicated hardware and settings for on-board devices. So in most cases, you may not change the related BIOS, jumper, IRQ, DMA, I/O address and memory address settings for the on-board devices. If you really need to change the settings, please write down the original setting before changing any settings.

### **2.1 DRAM Installation**

---

32 MB DRAM is usually too small to run the configured Windows CE 6.0 Image, you may encounter this warning message – “Program Memory is Critically Low”. We recommend 64 MB DRAM for most applications. Currently the system can support up to 512 MB.

### **2.2 Utility Programs**

---

Bigger Windows CE 6.0 image files (nk.bin) will consume more memory and make booting time longer. In order to save resources, some utility programs are not in the “Windows” directory. They are available on CD or Floppy, You may copy them to the Flash disk when you need it.

The embedded system you get should have Windows CE 6.0 software properly installed. Please be careful not to delete or modify the important systems files in the flash disk.

## **2.3 System files**

---

The following are located in the system files of the root directory of the Flash disk. Please don't delete them or the system may not boot or work normally.

### **2.3.1 Configuration file: bootcepc.cnf**

Boot loader needs this file to load images. Please don't delete this file or change the default settings.

### **2.3.2 Boot logo .pcx file: bootcepc.pcx**

You may replace the bootcepc.pcx with your own logo file, but the file name must be the same. Please backup this file before using your logo file. The resolution should be 640 x 480 and the color depth should be 256 colors.

### **2.3.3 Kernel Image file (nk.bin)**

This is the Windows CE 6.0 image file. **Please don't delete or modify it.**

**Note:** *Microsoft Windows CE 6.0 and Advantech software are protected by copyright laws. You need to get both Microsoft and Advantech licenses to legally utilize Advantech Windows CE 6.0 releases. Please don't make any illegal copies.*

## CH 3 Tutorial – Using Windows CE 6.0

### 3.1 Advantech Utilities

---

#### 3.1.1 Advantech Persistent Registry Solutions & Settings

The registry is a database that stores information about applications, drivers, system configuration, user preferences, and other data. The purpose of the Registry is to provide a single place for storing all the settings for the system, applications, and users. The registry is built on top of the internal heap, therefore, benefits from transaction and compression features.

##### **Ram-Based Registry**

For most handheld devices, the Windows CE registry data is always stored in RAM and is consequently volatile. If there is no registry available in RAM, Windows CE can regenerate a default from a file stored in ROM.

##### **Hive-Based Registry**

Most x86 system devices usually have a hard disk or a flash disk. Windows CE 6.0 will store registry data in a hive file that is located on the disk. When the system boots or shutdown; any change to the registry data will be written to the hive file that exists on the disk.

Advantech uses the **Hive-Based Registry** to store registry data for Windows CE 6.0. We developed two tools to periodically save the registry and edit the registry data.

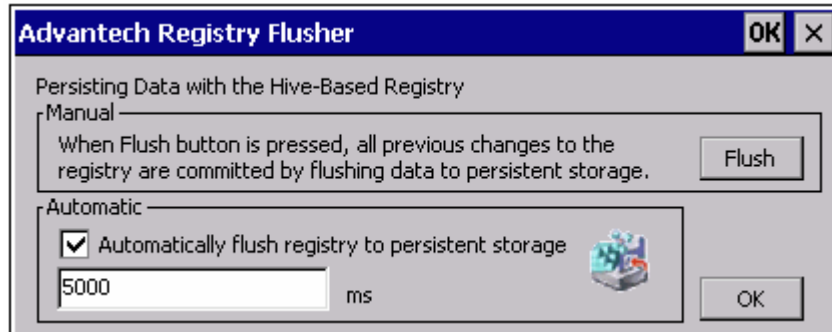
#### 3.1.2 Advantech Flusher for Persistent Registry

Advantech provides a Registry Flusher utility to help flushing registry data back to hive periodically to make sure your registry settings will be updated regularly without user intervention. The persistent registry solution needs a persistent storage (Flash disk or hard drive) to store the

backup registry.

Go to **Control Panel**

Click "**Registry Flusher**"



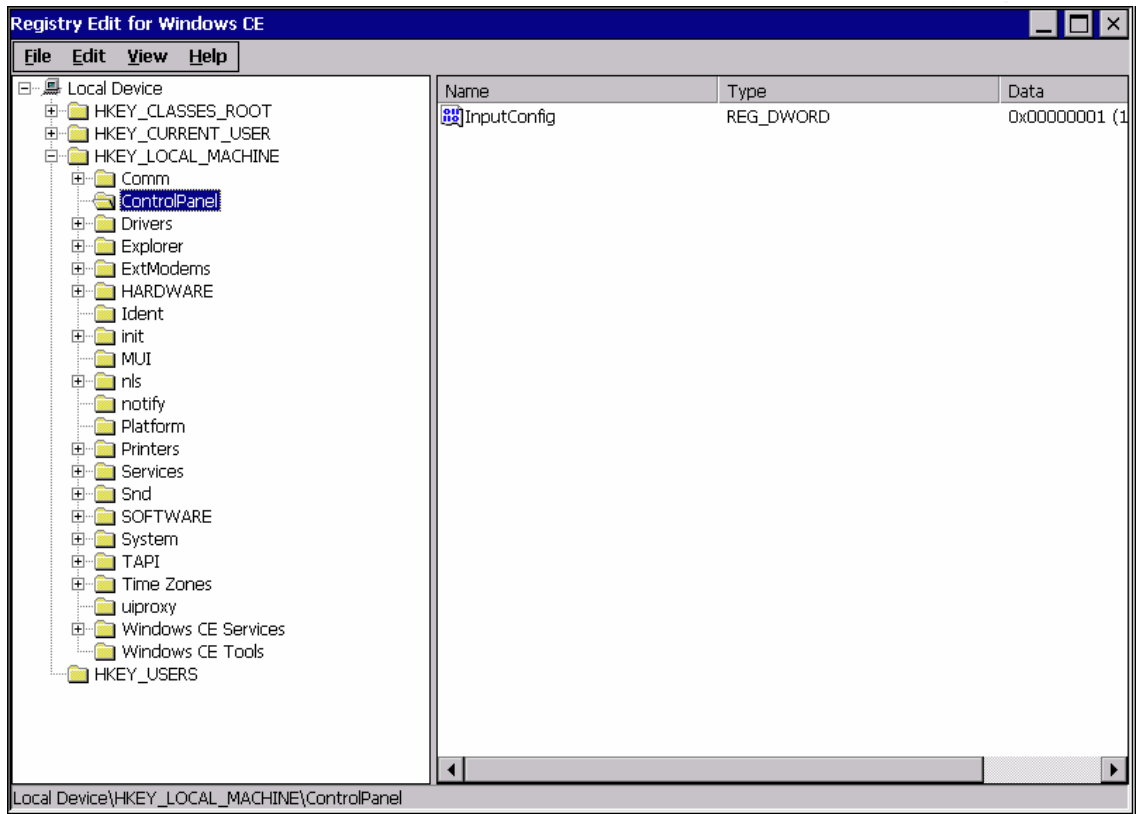
**Automatically:** Set time in milliseconds and check the enable box. The system will then save the persistent registry automatically.

**Manually:** Click the "Flush" button; it will save the registry right away.

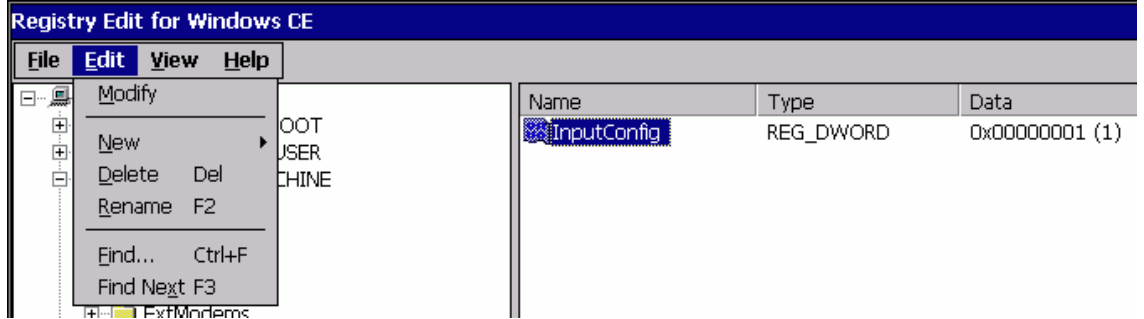
### 3.1.3 Advantech Registry Editor Utility (regedit.exe)

Below is an example showing how to modify the registry:

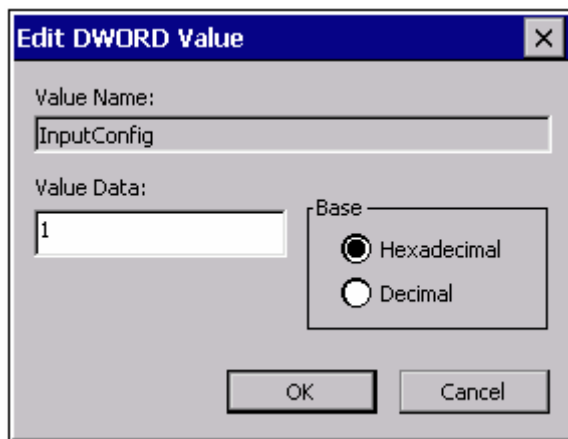
1. Go to **\Windows**
2. Click "**Regedit.exe**"



3. Choose **Edit** from the drop down menu.



4. Click "**Modify**" and the "Edit <Value Type> Value" dialog will popup



5. Choose an item and Click "**Rename**" from **Edit** menu.  
 Edit the name in-place.

P-6

Name	Type	Data
InputConfig	REG_DWORD	0x00000001 (1)

**Note 1:** There are other ways to change the Registry settings

1. Modify through the Control Panel: Some registry settings can be modified in the Control Panel.
2. Modify through the Remote Registry tool in Microsoft embedded Visual Tool.
4. Write your own application to call Registry related APIs  
 Example APIs: RegOpenKeyEx, RegQueryValueEx, RegSetValueEx and RegCloseKey.

**Note 2:** Windows CE Registry Limitations:

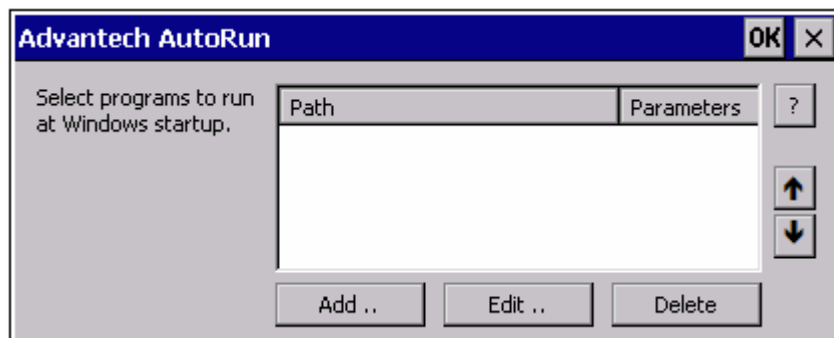
A key or value name cannot exceed 255 characters. The maximum size of the data associated with a value name is 4 KB. The maximum indentation level for keys is 16.

### 3.1.4 Advantech Auto Run Application Solution

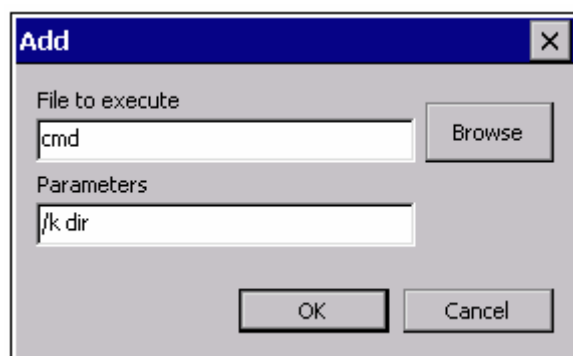
The default way to launch applications during Windows CE 6.0 bootup is to put your applications in a special Registry key and rebuild the Windows CE 6.0 Image. But this is too complicated and not flexible enough for most application developers.

To solve this problem, Advantech has developed the "Auto Run" solution. With this solution, you can let the system run your applications without rebuilding the Windows CE 6.0 Image.

1. Go to **Control Panel**
2. Click "**Auto Run**"



**Add:** Add the application file name and parameter.



**Delete:** Delete the application setting string.

**Modify:** Modify the application setting string.

**Up & Down Arrow:** Use "Up Arrow" & "Down Arrow" to re-arrange the application launching order.

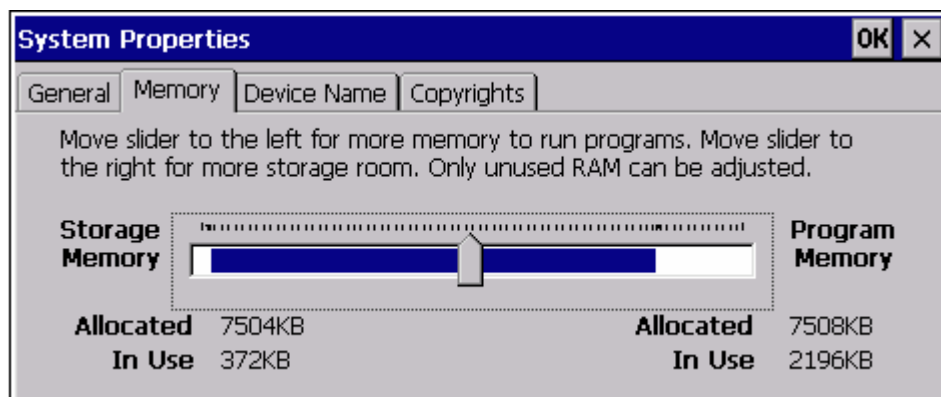
Once you have setup properly, your target application(s) will be launched automatically next time when you restart your Windows CE 6.0.

### 3.1.5 Advantech Memory Adjustment Solution

The Windows CE 6.0 default settings for Storage Memory and Program Memory ratios are fixed. Even though you can change the memory setting during runtime; this setting will revert to default after resetting the system. Because the x86 platform does not have a battery to backup the setting in DRAM, these settings will not be kept in the registry, and you will have to rebuild your Windows CE 6.0 OS image if you want to fix the memory setting by default.

Advantech has developed fix to the solution and integrated it into the pre-configured Windows CE 6.0 Image. Just follow these procedures to change the setting.

1. Go to **Control Panel > System**
2. Click **"Memory"**

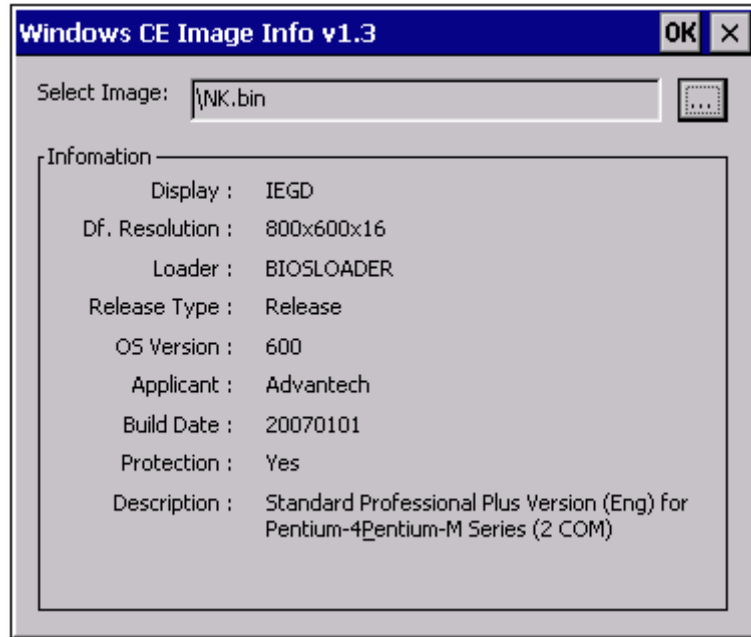


3. Move slider to the left for more memory to run programs, move slider to the right for more storage room.
4. Advantech's background service will automatically keep the setting, and use the setting when you reboot the system.

P.S. The maximum "storage memory" is 128 MB.

### 3.1.6 Advantech CE 6.0 Image Information Utility

Windows® CE 6.0 often releases new versions or service packs, so the Advantech Windows CE development team will always prepare the latest CE 6.0 images for our customers. To help we've put the utility "imginfo.exe" into the windows directory. You can check your CE 6.0 image version to see if you need to upgrade or not.



**Loader:** Advantech has designed a special loader for specific boards. These loaders speed up the average booting period and can also be customized for special purposes. This shows the version of your current loader.

**Image Version:** Version of Advantech CE 6.0 Image.

**Release Type:** Release purpose type.

**OS Version:** Version of Microsoft CE 6.0.

**Platform:** Refer to Advantech boards.

**Build Date:** CE 6.0 Image creation date.

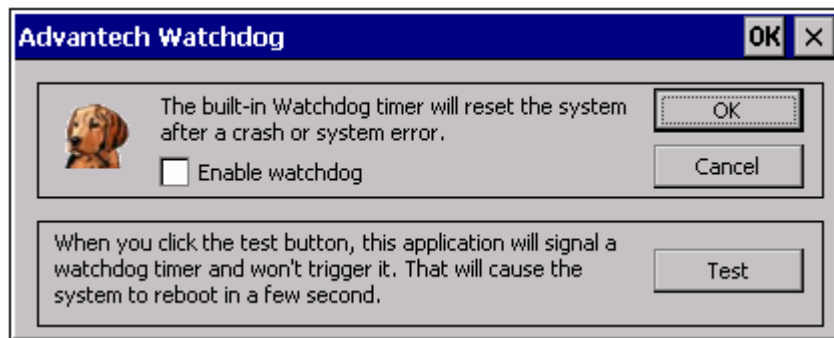
**Description:** CE 6.0 Image detail information, Including language and some special features.

### 3.1.7 Advantech Watchdog Timer Utility

The Watchdog Timer is designed to overcome the problems associated with PCs locking up. If the controlling software hangs or crashes, the watchdog will time out and reboot the host machine (just like hitting the reset button).

These will cause unpredictable damages or loss. So Advantech developed this simple utility to prevent this kind of event.

1. Go to **Control Panel**
2. Click "**Watchdog**"
3. Check the box "**Enable Watchdog**"



Advantech Watchdog software will reset every chip's counter timeout period to prevent the watchdog from rebooting the computer.

4. Click the "**Test**" icon to reboot the system in a few seconds.

**Note:** You may use Advantech's CE Library to trigger the watchdog timer in your Windows CE 6.0 application. Different CPU boards may have different ways to enable/disable the watchdog timer. For more details, please refer to the Advantech CE Library. If the target hardware does not support the watchdog timer function, please skip this session.

### **3.1.8 IDE Hard Disk/Flash Disk/CompactFlash Disk**

If the target hardware does not support IDE devices, please skip this section. The IDE driver built in for the pre-configured Windows CE 6.0 Image supports IDE Interface Hard Drives, Flash disks and CompactFlash™ Cards.

**Directory Name:** There is no drive letter (C:, D:, or E:) in Windows CE 6.0. All data is accessed using one unique namespace. For instance, the equivalent of C:\Windows in Windows CE is \Windows.

The directory name for the IDE disk is:

**Hard Disk,  
Hard Disk1,  
Hard Disk2, ...**

**Note:** For the 256 MB cards below: Advantech PCD-100A, PCD-250A, PCD-350A, PCD-1240V and PCD-1244H (CompactFlash and IDE Flash disks), the BIOS setting must be under "Normal" mode. Or the system may not get the correct Cylinder/Head/Sector data and cause errors.

#### **DiskOnChip**

The M-Systems DiskOnChip driver is built into the pre-configured Windows CE 6.0 Image if the CPU board has onboard DiskOnChip socket. Please skip this session if the target hardware does not have DiskOnChip socket.

Note: You must not change the memory jumper setting for DiskOnChip, or the system will not work.

**Directory:** There is no drive letter (A:, C:, and D:) in Windows CE 6.0. The directory name for DiskOnChip is \DiskOnChip.

### 3.1.9 Advantech Audio Recorder Test Utility (optional)

This utility is for sound quality testing.

Go to **Windows\**

Click "**record.exe**"



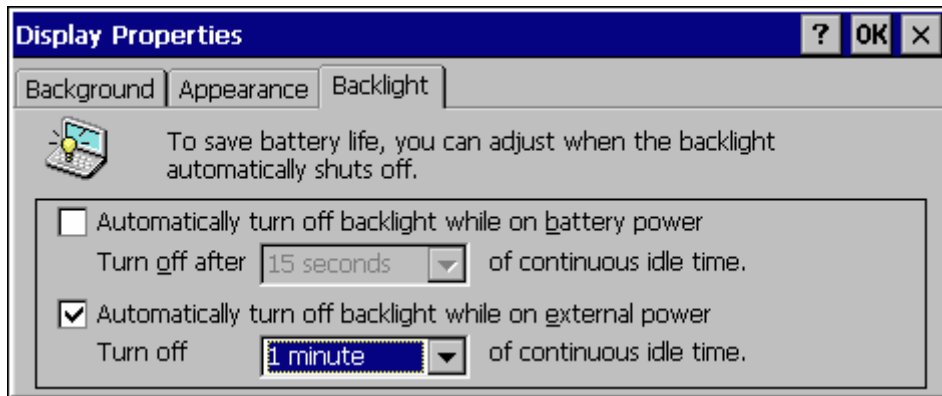
1. Connect the microphone and speaker
2. Run record.exe
3. Select sample rate
4. Record your sound
5. Play the sound

**Note:** If there is any problem, please check the audio chip IRQ, I/O and DMA BIOS or hardware settings are the same as the Registry settings. For Image size considerations, it can be provided on a CD rather than Windows CE 6.0 Image.

## **3.2 Advantech Enhancement for Peripherals**

### **3.2.1 Display Backlight Setting**

1. Go to **Control Panel > Display > Backlight**
2. Check the box: Automatically turn off backlight while on external power.
3. Select the idle time from 15 seconds to 30 minutes.



**Note:** If your system is powered by battery, please check the Battery power.

### **3.2.2 Touch Screen Calibration Utility**

If the target hardware does not come with a touchscreen, please skip this session. Touchscreens are optional on most Panel PCs. For other CPU board platforms, the default pre-configured Windows CE 6.0 Image does not include a touchscreen driver and the serial port is available for other devices. To add a touchscreen to the Windows CE 6.0 platform, the Windows CE 6.0 Image needs to be rebuilt with the touchscreen driver. The touchscreen calibration utility is in the Control Panel.

You need to calibrate at least once for each system. Here is the procedure:

1. Run the calibration utility for touchscreen
2. Follow the instruction to calibrate.
3. Save the registry.
4. Reboot the system.

### 3.2.3 Digital I/O

If the target hardware does not support Digital I/O function, please skip this session.

You may use `_inp()`, `_inpw()`, `_outp()` and `_outpw()` functions in your Windows CE 6.0 application to access the I/O address directly.

#### **Advantech I/O Port Test Utility (ioport.exe)**

You may use the utility to read and write data of I/O ports and test the digital I/O functions.


### 3.3 Basic Operation

Here are the basics of CE 6.0. For other operations, please refer to CE 6.0 online help.



#### 3.3.1 Introduction to Taskbar Icons

The following icons may appear in the status area of your device taskbar, depending on your manufacturer.

##### Power Status Icons

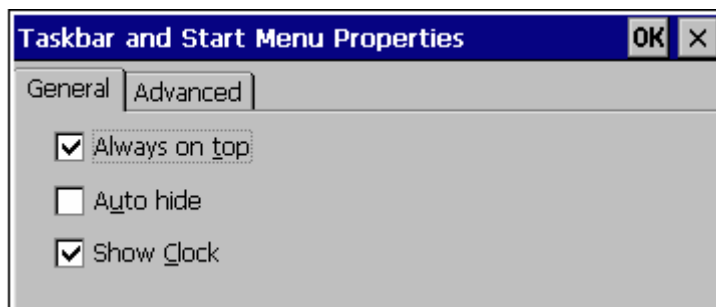
Icon	Definition
	External (AC) power source is connected

##### Connection Status Icons

Icon	Definition
	Dial-up connection
	Direct connection

#### 3.3.2 Taskbar and Start Menu Properties

1. Select **Start > Setting > Taskbar and Start Menu...**
2. Setup the properties



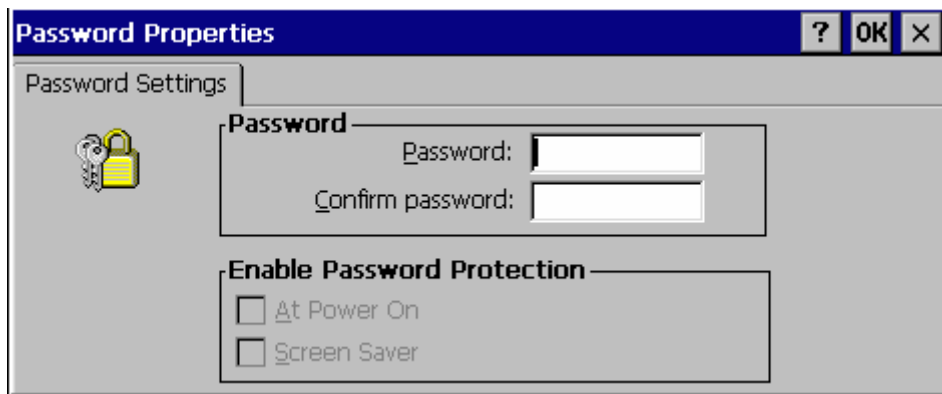
### 3.3.3 Protecting Important Information

You can password protect valuable data on your device, such as names and phone numbers of important contacts, credit card numbers, and confidential documents.

#### 1. Use a Device Lock password

Select **Start** > **Setting** > **Control Panel**

Open the **Password** icon



**Note:** Please remember your password. If you lose it, you must perform a full reset to use your device again. This will erase all your data!

#### 2. Back up your data

Create and maintain a back up file that contains your device program data.

### 3.3.4 Setting the Device Name

Go to **Control Panel**

Click "**System**" icon

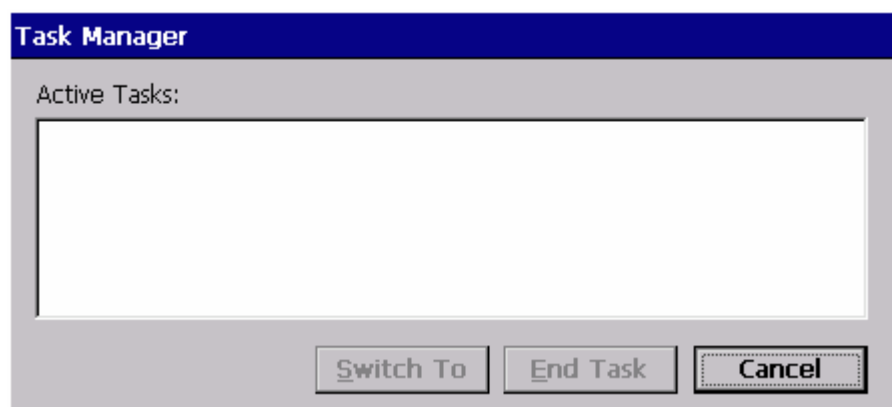
In the **Device Name** tab, enter a device name



**Note:** This device name will be used to identify your Window CE device to other computers

### 3.3.5 Task Manager

Press **Alt+Tab** key to run Task Manager



Button description:

**Switch To:** You can use arrow keys to select the task.

**End Task:** You can stop the selected task.

**Cancel:** Exit Task Manager

### 3.3.6 Command Prompt (CMD.EXE)

The command prompt provides similar commands as the DOS prompt. You will be able to copy, delete, move and execute files.

Type **Help** for a list of commands.

Select **Start > Programs > Command Prompt** or just run **cmd.exe**.

### 3.3.7 Reboot the system

Unlike other Windows Operating Systems, there is a shut down button. The Windows CE 6.0 default shell is designed for hand held PCs, the suspend button does not work for x86 Windows CE 6.0 Embedded Systems. To shut down the x86 Windows CE 6.0 system, you have to close all applications. Then turn off the power supply or reset the system. When you push the Reboot button, the system will close all device drivers and then restart safely.

### 3.3.8 Multimedia

The Windows Media Technologies feature for Windows CE 6.0 allows you to provide multimedia streaming capabilities to Windows CE devices. This includes support for the various protocols and streaming formats required for audio and video playback of either local files or streamed data over a network connection.



### 3.3.9 Multimedia Support

Windows CE 6.0 provides support for the following multimedia technologies:

DirectDraw	DirectSound® 6.1
Direct3D	Legacy Video Playback
DirectDVD	MIDI Playback
DirectMusic 7	MP3 Playback
DirectShow 6.1	MPEG-1 Video Playback
Digital Rights Management (DRM)	

**Note:** You might not have all the components. It depends on your CE 6.0 Image. If you need more components that your image doesn't have, Advantech can help you. Please: [ess@advantech.com.tw](mailto:ess@advantech.com.tw)

### 3.3.10 Internet Explorer 6.0 for CE

Microsoft® Internet Explorer 6.0 for Microsoft Windows® CE 6.0 is a highly compatible, feature-rich browser control. Web developers, OEMs, independent software vendors (ISVs), and independent hardware vendors (IHVs) can use the technologies provided by Internet Explorer 6.0 for Windows CE to build a custom browser for a specific device or market. Internet Explorer 6.0 for Windows CE supports the same features as the Microsoft Win32® version of Internet Explorer 6.0, except for the following:

- Downloadable Microsoft ActiveX® controls
- Gopher protocol
- Recreation Software Advisory Council on the Internet (RSACi) rating system
- Filters (other than image filters) and transitions
- Default behaviors other than client capabilities



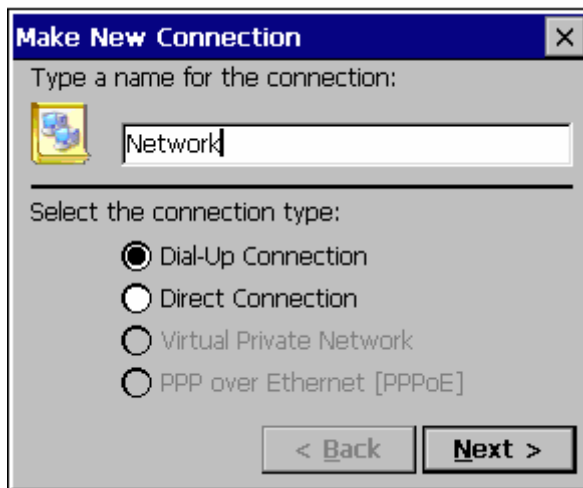
## **3.4 Network and Dial-up Connections**

You can connect directly to a network through a network (Ethernet) or dial-up connection. Windows CE 6.0 provides four types of connections, where you can setup by hardware type. You need to change the Device Name in the Control Panel before using the network functions.

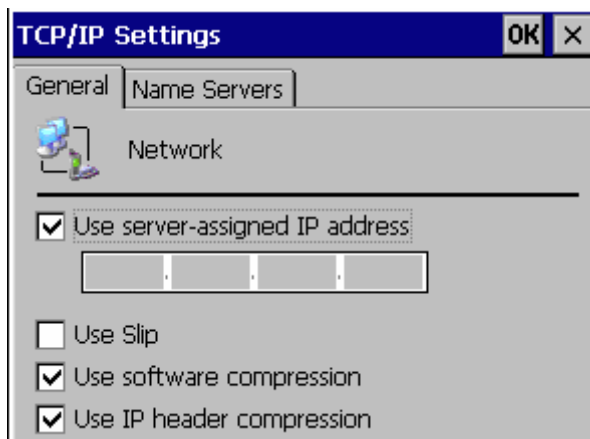
1. Go to **Control Panel**
2. Click "Network and Dial-up Connections"

### **3.4.1 Network (Ethernet) Setting:**

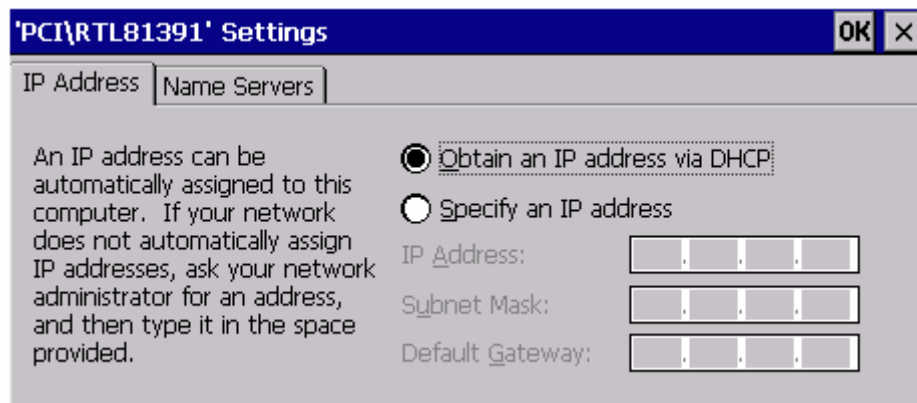
1. Choose "Dial up Connection"



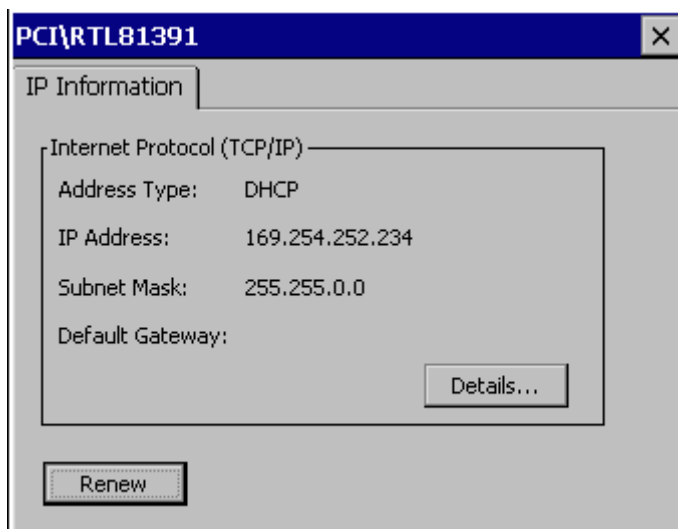
2. Setup TCP/IP value



3. The default IP setting is to obtain an IP address via DHCP. You may change to static IP.



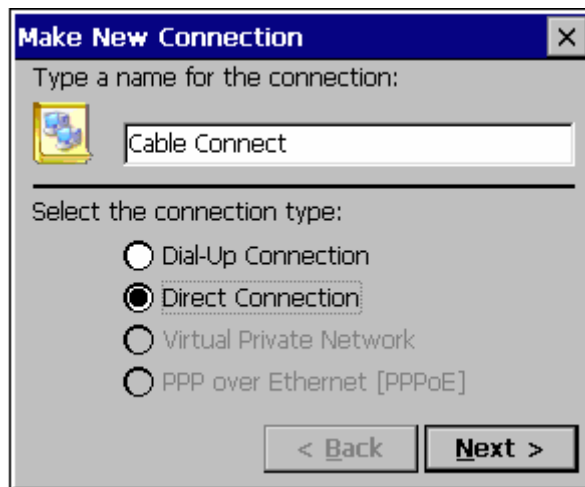
4. The Connection Status will show up in the lower right status bar.



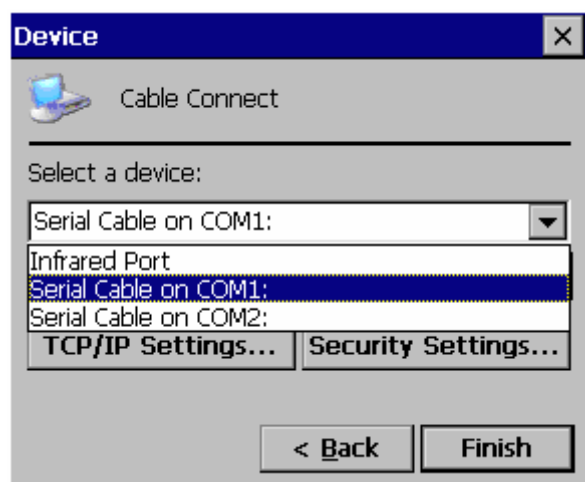
You can use **net** command and **UNC** to access Windows 95/98/NT/2000/XP share directories and files. However, Windows CE 6.0 does not support Windows 95/98/NT/2000/XP to view or access files on Windows CE 6.0 device. You may develop an application, such as FTP applications to help out with this solution.

### 3.4.2 Cable Connection Setting:

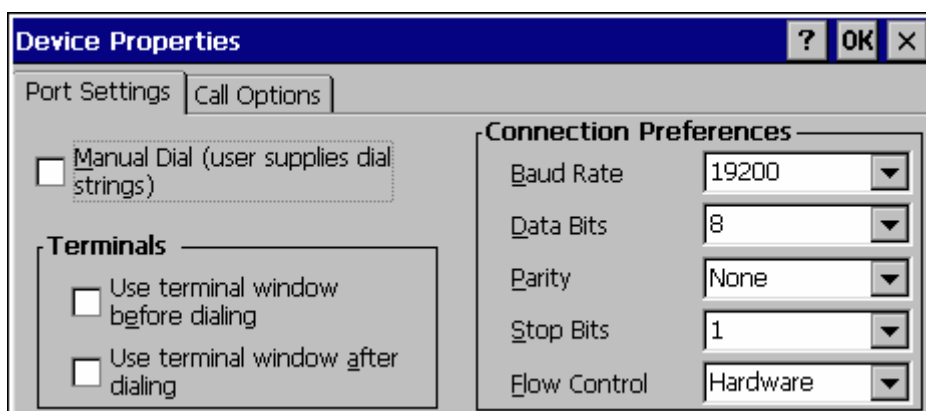
Choose "Direct Connection"



Select a Device



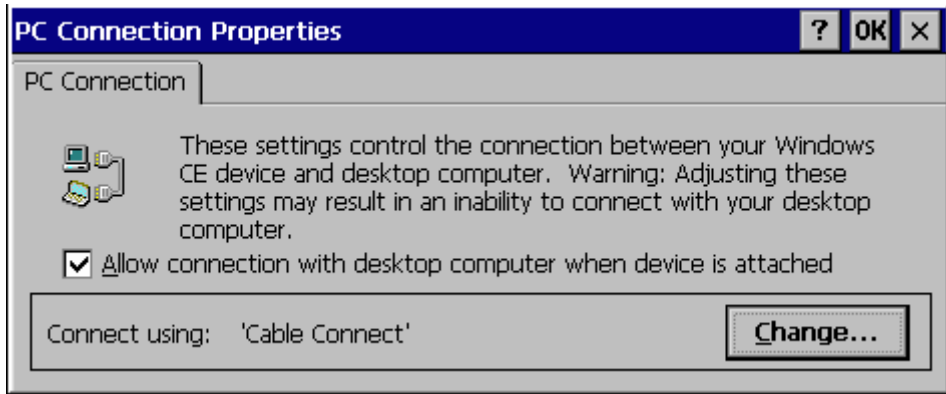
Click "Configure" to Setup Device Property value



Go to **Control Panel**

Click "**PC Connection**"

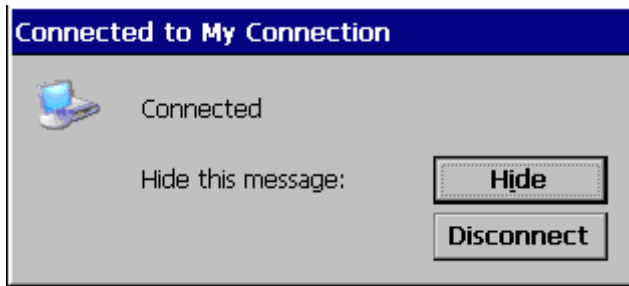
Click "**Change**" to use the connection you created.



Go to \Windows  
 Click "**repllog**", and CE 6.0 will establish the connection to your PC.



Connection Status will show up in the lower right status bar.



**Note:** Remember to install ActiveSync in your PC, and use null modem to connect each other first.



### 3.4.3 Microsoft UNC (Universal Naming Convention)

To access files on the network, you may need UNC. It is "\\ + Server Name + \" + Share Name. For more details, please refer to Microsoft document.

### 3.4.4 net command

The net command is helpful to view or access files on Windows98/NT/2000/XP.

The Help information is available by: net /?

```
net view <computername> | /DOMAIN: <domainname>
```

```
net use [<local name>|*] [<remote name>] [/user:<username>] [/d]
```

Example:

```
net view \\MyServer\MyShareDirectory
```

```
cd "\\My Server\My Document"
```

```
cd \\MyServer\MyShareDirectory
```

### 3.4.5 Communication Programs

Select **Start > Programs > Communication** to run the programs. Select **Remote Connections**.

The on-line Help information is in **Start > Help**.

**Remote Networking (remnet.exe)**: See Topics about "Connecting to an ISP", "Connection to a Network" and "Adjusting Remote Connection Properties".

**Terminal (pegterm.exe)**: Select Using Terminal

## **3.5 Application Development Tools**

---

### **3.5.1 Visual Studio 2005**



Visual Studio 2005 now comes with Platform Builder 6.0  
<http://www.microsoft.com/taiwan/vstudio/>

### **3.5.2 Platform SDK**

To develop Windows CE 6.0 applications for the Advantech x86 platform, you may now use the standard x86 SDK from Platform Builder 6.0 or download the latest SDK from our website at

[http://www.advantech.com.tw/solutions/ess/Download.asp?Category\\_ID=1-EE5PM](http://www.advantech.com.tw/solutions/ess/Download.asp?Category_ID=1-EE5PM)

Here are the latest available DSK:

[Windows® CE 6.0 SDK](#)

### **3.5.3 Windows CE hands-on lab**

Windows CE is a small footprint, componentized, hard real-time, embedded operating system that runs on multiple processor architectures (ARM, MIPS, SH4, x86). Both platforms enable you to use off the shelf hardware, drivers, and applications to rapidly build and ship embedded devices.  
<http://msdn.microsoft.com/virtuallabs/winxpembed/default.aspx>

### **3.5.4 Windows Embedded CE 6.0 Writing C# Managed Applications**

In this lab you will step through the process of creating a CE 6.0 operating system image that supports .NET Compact Framework application development and use Visual Studio 2005 to write and deploy a simple .NET Compact Framework application to a running CE 6.0 operating system image.

### **3.5.5 Windows Embedded CE 6.0 Writing MFC/Native Applications**

In this lab you will step through the process of creating a CE 6.0 operating system image that supports Win32 and MFC (Microsoft Foundation Classes) application development, this includes building a custom SDK (Software Development Kit) to support application development against your custom operating system image and will also use Visual Studio 2005 to write and deploy a simple MFC application to a running CE 6.0 operating system image.



## CH 4 Q&A

### 4.1 I purchased a Windows CE 6.0 License from a Microsoft Distributor. Am I authorized to use Advantech Windows CE 6.0 OS release?

Every Advantech Windows CE 6.0 OS binary contains some Advantech intellectual properties that are not automatically licensed to Windows CE 6.0 licensee. Customers have to be licensed by Advantech independently to utilize Advantech Windows CE 6.0 OS release. Advantech Normally grants customers the right to use Advantech intellectual properties that come with Advantech Windows CE 6.0 OS release if one purchases Windows CE 6.0 license from Advantech.

The following figure describes the benefits of buying CE 6.0 license from Advantech

Buy license from	Advantech	CE distributor
Price	similar	similar
OS image provided	YES	NO
Has the right to use Advantech OS image	YES	NO
OS Image include all necessary device drivers	YES	NO
Drivers are either developed or modified to be bug-free	YES	NO
DOS-less bootloader	YES	NO
Customizable boot logo	YES	NO
Application autolaunch	YES	NO
Save memory control panel settings	YES	NO
Floppy mount utility	YES	NO
Various device test utility	YES	NO
Device Driver development	YES	NO
Integration service	YES	NO

### 4.2 Why are the Inbox and Pocket Word missing?

That's because most embedded applications do not need Inbox and Pocket Word. So, we choose this version as the default Windows CE 6.0 license. For Microsoft Inbox and Pocket Word applications, the "Professional Version License" is needed.

### **4.3 When I copied files to the root directory or \Windows directory and reset the system, they all disappeared. Why?**

Windows CE 6.0 uses a RAM based file system. So, directories such as Root and \Windows are actually loaded in RAM. For the x86 platform, there is no battery to backup the data in RAM. The data will be lost after the power is off. If you need to store your files, you may have to copy them to the following storage devices:

Floppy, DiskOnChip or IDE Flash disk/CompactFlash™ Card/Hard Drive

### **4.4 Does Advantech offer a Windows CE 6.0 system integration service?**

Yes, we do provide a complete Windows CE 6.0 Embedded system integration service based on your requirements. You simply choose the Advantech hardware and Windows CE 6.0 configuration; we build the customized Windows CE 6.0 Image. The Windows CE 6.0 Embedded systems we ship to you will include Advantech hardware, Flash disk with pre-installed Windows CE 6.0 Image and Windows CE 6.0 license.

Our Windows CE 6.0 experience and strong customer focus enables us to understand your requirements and specifications. By utilizing the core technology and intellectual property derived from our past projects, we may already have the solution to your toughest problems solved before we even start. By using these proprietary technologies as a foundation to your solution, we can minimize the actual customization work - saving you time and money.

With this total solution, you can focus on what is most important to you – your creative application.

### **4.5 What do I do to get a Windows CE 6.0 device driver for my add-on module?**

Windows CE 6.0 is tied directly to the hardware, so many of the

standard PC peripherals requiring drivers have been left out. Advantech has developed hardware-specific drivers for on-board functions such as network, VGA, I/O ...of its specific single board computers. All these drivers are well ported into the Windows CE 6.0 image file to be shipped together with the single board computer or Panel PC.

Windows CE 6.0 is different from Windows 98 or NT in that you can get the driver from the chip or board vendors and install the device drivers. In most cases, the Windows CE 6.0 image needs to be re-built with the add-on PC/104, ISA or PCI devices' Windows CE 6.0 drivers. Usually, the add-on devices do not come with a Windows CE 6.0 driver. So, you may have to develop or purchase one from a third party.



# Appendix A

## A.1 Null Modem Cable pin-out (DB-9 to DB-9)

1 and 6 short	4
2	3
3	2
4	1 and 6 short
5	5
7	8
8	7

Please make sure your Null Modem cable pin-out is correct, or the ActiveSync connection will fail.