CASIO
IT-300 Series
Quick Start Guide

(Version 1.01)

CASIO Computer Co., Ltd.

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Editorial Record

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1.00	January 2011	all	Original version
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Preface

This guide clearly and concisely sets out the information developers need to know to get started with the CASIO IT-300 series handheld terminals with the integrated Windows Embedded Handheld 6.5 OS. The best methods of connecting to your development system are covered and step by step instructions for installing and testing the CASIO Basic Development Kit (BDK) are included.

The purpose of this guide is to get you to the point where you can start development; you should refer to the library manuals for detailed information on the specific APIs.

The words, "the terminal", "the IT-300", "the IT-300 series", and "IT-300 device", used in this reference manual mean IT-300 series handheld terminal with the integrated Windows Embedded Handheld as its OS unless otherwise noted.

1. Product Overview

1.1 Features at a Glance

The IT-300 has been designed using the new concept of the Human-centered Design Processes and is capable of performing a wide variety of powerful functions.

The following is a brief overview of the features available on the IT-300 series handheld terminals. For further detail on the hardware specifications, refer to IT-300 Series Hardware Manual.

Outstanding development environment

- Microsoft$^®$ Windows Embedded Handheld 6.5 English Version as the built-in OS
- Visual Studio 2008
- Visual Studio 2005

Various communication systems

- Built-in ultra-small WLAN module compatible with the IEEE802.11b/g standard
- Bluetooth$^®$ Version 2.0
- Serial interface with USB version 1.1 (Host/Client)

Small size, light weight

- Dimensions : Approx. 75.7 (W) x 154.6 (D) x 19.6 (H) mm
- Weight   : Approx. 212g

Improved durability

- Impact resistance   : 1.5 m in height *
- Dust/Water-splash proof   : IP54 level (compliant with IEC60529 International Standard)

* The drop durability height is a measured value resulting from actual testing. It does not necessarily guarantee the product from damage.

Scanning industrial standard bar code symbologies

- Readable bar code symbologies with laser scanner:
  EAN8, EAN13, UPC-A/E, Codabar (NW-7), CODE39, CODE93, CODE128/EAN128, ITF, MSI, IATA, Industrial 2of5, GS1 DataBar Omnidirectional (RSS-14), GS1 DataBar Limited (RSS Limited), GS1 DataBar Expanded (RSS Expanded), GS1 DatBar Stacked (RSS-14 Stacked), GS1 DataBar Expanded Stacked(RSS Expanded Stacked)

CPU, Memory

- High-performance CPU
  Marvell$^{®}$ PXA320 Application Processor (runs at maximum 624 MHz)
- Large-capacity memory
  RAM   : 256 MB
  F-ROM   : 256 MB

1.2 Library

The IT-300 Basic Development Kit ("BDK") provides various libraries including those listed in the table.

Table 1.1

Library	Description	C++	VB C#
System Library	Library that is used to control the system.	Yes	Yes
Laser Scanner Library	Library that is used to control the built-in laser scan engine.	Yes	Yes
JPEG Library	Library that is used to handle and manipulate JPEG image functions.	Yes	-
FLINK Library	Library that is used to control and carry out transmission/reception of files between PC and other device.	Yes	Yes
Bluetooth Library	Library that is used to control the built-in Bluetooth module.	Yes	Yes

Note:

The abbreviations used in the table are;

    C++   : Visual C++
    VB   : Visual Basic .NET
    C#   : Visual C# .NET

Table 1.2 shows each file name of the Dynamic Link Library and Dynamic Link Class Library.

Table 1.2

Library	Dynamic Link Library	Dynamic Link Library (Class Library)
System Library	SystemLib.dll	SystemLibNet.dll
Laser Scanner Library	OBReadLib.dll	OBReadLibNet.dll
JPEG Library	JpegCe.dll	None
FLINK Library	FlinkLib.dll	MoFlinkLib.dll
Bluetooth Library	BTLib.dll	BluetoothLibNet.dll

1.3　Development Manuals

The IT-300 Basic Development Kit ("BDK") provides various development reference manuals as described in the table below.

Table 1.3

Development Manual	Description
Quick Start Guide	This reference manual.
Software Manual	Reference manual that describes software specifications in detail for all the software integrated in IT-300 handheld terminal.
Hardware Manual	Reference manual that describes hardware specifications in detail on each dedicated option and IT-300 handheld terminal
System Library Manual	Reference manual that describes individual functions in detail for System Library.
Laser Scanner Library Manual	Reference manual that describes individual functions in detail for Laser Scanner Library.
JPEG Library Manual	Reference manual that describes individual functions in detail for JPEG Library.
FLINK Library Manual	Reference manual that describes individual functions in detail for FLINK Library.
Bluetooth Library Manual	Reference manual that describes individual functions in detail for Blueooth Library.

2. Prerequisites

2.1 Skills Required

The following skills are required by developers aiming to develop application software for the IT-300 terminal.

- Windows programming
- A good knowledge of one or more of the following.
    - Visual C++
    - Visual Basic .NET
    - Visual C#
    - Browser based applications (not covered in this guide)

The following skills or experience are also desirable.

- Windows CE devices
- ActiveSync
- Some networking experience

2.2 Hardware Required

The following models of the IT-300 series and dedicated options are available.

Table 2.1 List of available models

Model no.	Scanner	Extension slot	WLAN (802.11 b/g)	Bluetooth	Remarks
IT-300-15E	Laser	microSD	Yes	Yes	
IT-300-15C-CN	Laser	microSD	Yes	Yes	Chinese OS
IT-300E-35E*	Linear	microSD	--	Yes	

Notes
- "-CN" in the "Model no." box denotes that the model is dedicated for China only.
✧ Model with "*" at its model number is for USA and Canada only.

Table 2.2 List of options

Option	Product	Model no.	Remark
USB Unit		HA-J65US	
		HA-J65US-CN	for China
Mini USB cable		HA-J80USBM	
		HA-J80USBM-CN	for China
Mini USB Host conversion cable		HA-J81USBH	
		HA-J81USBH-CN	for China
Battery Pack		HA-D20BAT-A	
		HA-D20BAT-A-CN	for China
Dual Battery Charger		HA-D32DCHG	
		HA-D32DCHG-CN	for China
AC adaptor for Dual Battery Charger (for HA-D32DCHG)		AD-S42120B-N	without power cable accompanied
		AD-S42120BE-CN	for China
AC adaptor for USB Unit (for HA-J65US)		AD-S15050B-N	without power cable accompanied
		AD-S15050BE-CN	for China
Screen Protect Sheet		HA-J90PS5	
Power Cable (for AD-S42120B-N, AD-S15050B-N)		AC-CORD-EU	for Europe
		AC-CORD-US	for USA/Canada
		AC-CORD-TW	for Taiwan
		AC-CORD-KR	for Korea
		AC-CORD-AU	for Australia/New Zealand

Note:
"-CN" in the "Model no." box denotes that the model is dedicated for China only.

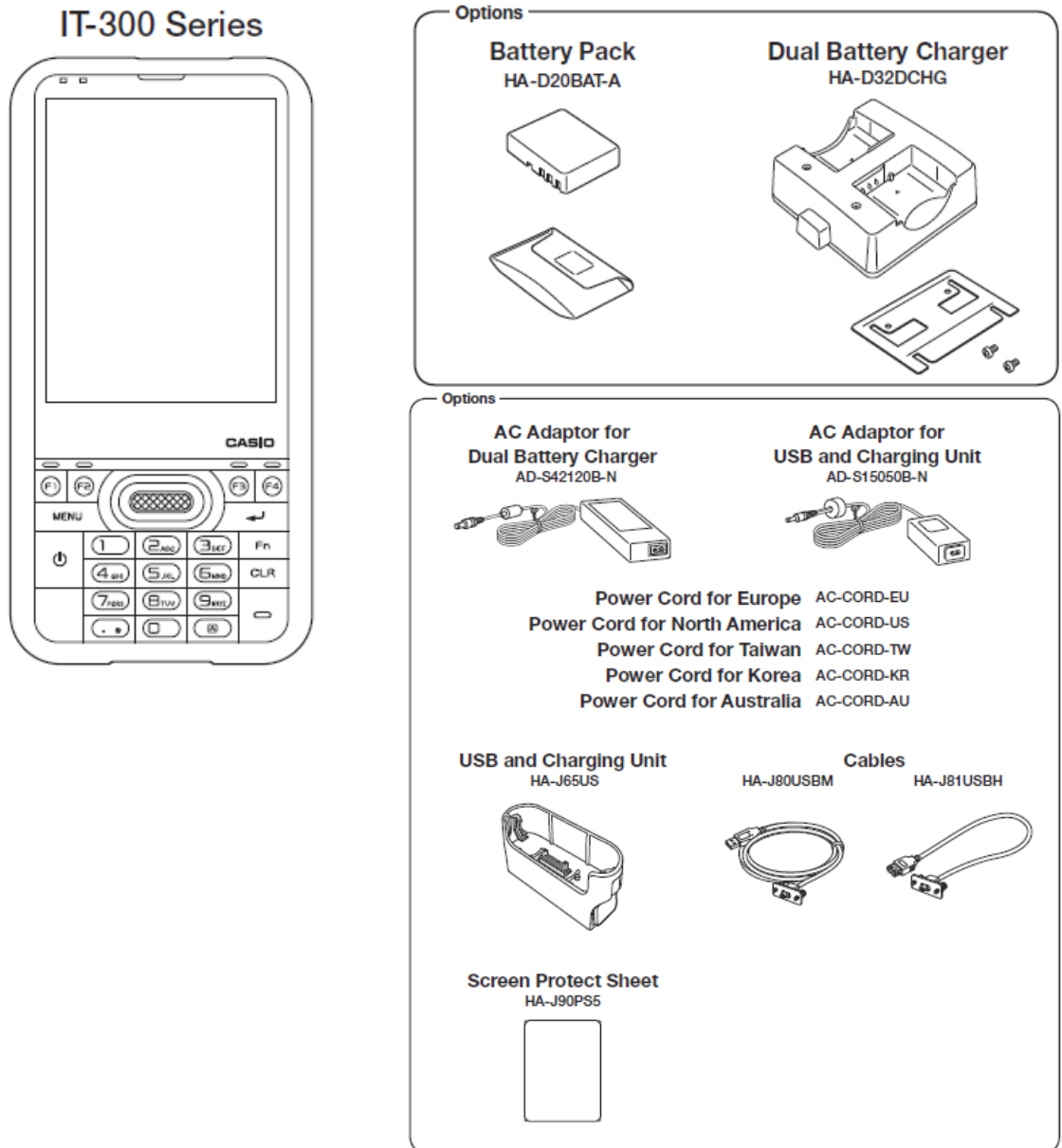**External views of IT-300 and dedicated options**

Figure 2.1

2.3 Software Required

The following software tools and libraries are required in order to develop software for the IT-300. Please ensure that you download or purchase the correct Microsoft tools as appropriate.

PC Operating System
- Microsoft Windows 2000 Professional Service Pack 4 or later
- Or Microsoft Windows 2000 Server Service Pack 4 or later
- Or Microsoft Windows XP Professional Service Pack 2 or later
- Or Microsoft Windows 2003 Server Service Pack 1 or later
- Or Microsoft Windows Vista (Business / Ultimate)
- Or Microsoft Windows 7
- Or Microsoft Windows Server 2008

Development platform

Table 2.1

Programming Language	Development Platform
Visual C++ Visual Basic .NET Visual C#	Microsoft Visual Studio 2005 + SP1 or later Microsoft Visual Studio 2008 + SP1 or later

Communication Software
- Microsoft ActiveSync 4.5 (or later)
  Download for free from;
  http://www.microsoft.com/downloads/details.aspx?familyid=9E641C34-6F7F-404D-A04B-DC09F8141141&displaylang=en
- Microsoft Windows Mobile Device Center 6.1 (for Windows Vista or later)
  Download for free from;
  http://www.microsoft.com/downloads/details.aspx?familyid=46F72DF1-E46A-4A5F-A791-09F07AAA1914&displaylang=en

SDK
- Microsoft Windows Mobile 6 Professional SDK (Mandatory)
  Download for free from;
  http://www.microsoft.com/downloads/details.aspx?familyid=06111A3A-A651-4745-88EF-3D48091A390B&displaylang=en
- Windows Mobile 6.5.3 Professional DTK (Mandatory)
  http://www.microsoft.com/downloads/en/details.aspx?FamilyID=c0213f68-2e01-4e5c-a8b2-35e081dcf1ca&displaylang=en
- Microsoft Windows Mobile 6.5 Developer Tool Kit (Not mandatory)
  http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=20686a1d-97a8-4f80-bc6a-ae010e085a6e

CASIO IT-300 BDK

Download the IT-300 BDK from
http://www2.casio.co.jp/system_en/pa/PADealer/
(The site requires your user name and password. Enter your user name and password as issued by CASIO.)

3. Installing BDK to PC

3.1 Application Development

This chapter explains about what you need to set up for the development environment before starting your application development.

1. Installing Development Platform
   Install Microsoft's development platform which supports Visual Studio 2008 and Visual Studio 2005.
   Install SDK (Microsoft Windows Mobile 6 Professional SDK)
   For detail, refer to Chapter 2.3 "Software Required".
   Install DTK (Microsoft Windows Mobile 6.5.3 Professional DTK)

2. Installing CASIO BDK to PC
   Install CASIO's BDK ("Basic Development Kit") and various libraries if necessary. For installation method, refer to Chapter 3.2 "Installing CASIO BDK Files".

3. Connecting IT-300 to PC (via either ActiveSync or Windows Mobile Device Center)
   Connect the IT-300 to PC via Microsoft's ActiveSync (for Windows XP or any other OS before Windows XP) or via Windows Mobile Device Center (for Windows Vista). For connection method, refer to Chapter 5 "Connecting the IT-300 to PC".

4. Setting up the Development Environment
   Transmit the CASIO's libraries to the IT-300.
   For detail, refer to Chapter 6 "Setting Up the Development Environment".

5. Installing the Device Emulator
   Install the Device Emulator for the IT-300. For installation method, refer to Chapter 7 "Device Emulator". If not necessary to install, go to "6. Application Development" below.

6. Application Development
   Now, the application development environment is set up and your development with the development platform can be started. After application is developed, transmit it to the Device Emulator or an actual terminal of the IT-300 via ActiveSync or Windows Mobile Device Center for check on the operability. For application development method and transmitting your application, refer to Chapter 8 "Visual Studio".

3.2 Installing CASIO BDK Files

Download the **CASIO IT-300 BDK** installation CD image file from the following site and write it to a CD-ROM media.

http://www2.casio.co.jp/system_en/pa/PADealer/

(The site requires your user name and password. Enter your user name and password as issued by CASIO.)

Notes:

- If you had already installed IT-300 BDK Ver. 1.xx, be sure to uninstall it before installing Ver. 2.xx.
- If any file of the IT-300WM BDK Ver. 1.xx is remained in the following folders after uninstalling, delete it manually.

> C:\Program Files\CASIO\MBSYS
> C:\Program Files\Windows CE Tools\wce500

- If your PC runs in the Windows Vista or later OS, first you must disable the User Account Control ("UAC") by following the process below before installing the CASIO BDK Files.
    - Navigate to **Control Panel → User Accounts → Enable or Disable the User Account Control**. Remove the check on **User Account Control (UAC)** to protect your PC, and then click **OK** button.

Installation Steps

1. When the **CASIO IT-300 BDK** CD-ROM is inserted in the drive of PC, the following menu screen appears automatically.

Figure 3.1

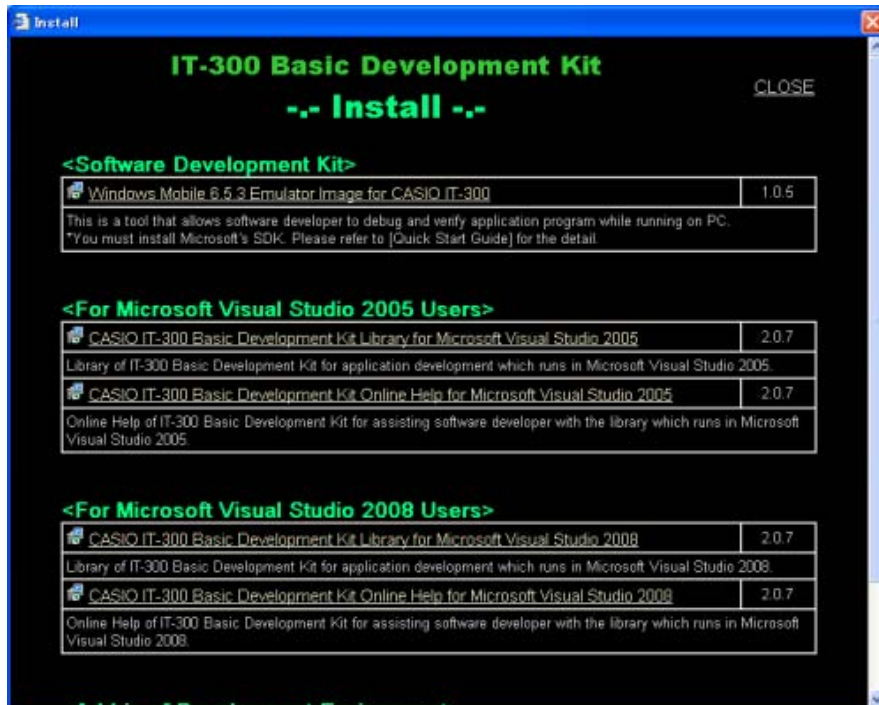2. Click **Installation List** in Figure 3.1. The installation screen appears.

Figure 3.2

3. Choose the component you wish to install in the screen.

3.3 Installing Library

The IT-300 Library is available for the below development platforms.

- Microsoft Visual Studio 2008
- Microsoft Visual Studio 2005

Notes:
1. The Library header file (*.h) and the Import library file (*.lib) are installed in the following folders respectively.
   - C:\Program Files\CASIO\MBSYS\include : Header file
   - C:\Program Files\CASIO\MBSYS\lib\ARMV4I : Import library file
2. The Class library DLL file (*.dll) is installed in the following folder.
   - C:\Program Files\CASIO\MBSYS\WindowsCE
3. When the Library is installed in PC, the Help file (*.chm) is installed in the following folder.
   - C:\Program Files\CASIO\MBSYS\HELP

The Help file can be accessed by navigating to **Start** menu → **All Programs** → **CASIO Basic Development Kit** → **Help**

3.4 Installing Online Help

Besides the Help file described in the previous page, the Online Help is also available for the below development platforms. The installation of the Online Help is initiated in the **Installation List**.

- Microsoft Visual Studio 2008
- Microsoft Visual Studio 2005

After the installation is complete, Microsoft Visual Studio starts up. The Online Help file can be accessed by navigating to **Help → Contents** menu.

4. Connecting to USB and Charging Unit

4.1 HA-J65US

Power to IT-300 supply from USB and Charging Unit.

1. Insert USB and Charging Unit into IT-300 bottom connection
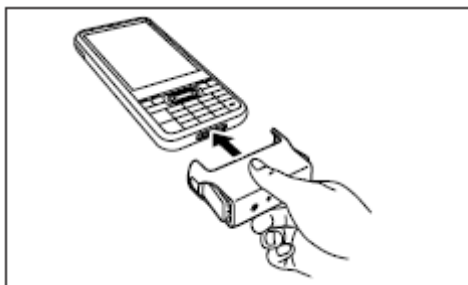
Figure 4.1

2. After connection, please confirm exactly lock IT-300 by both of stoppers.
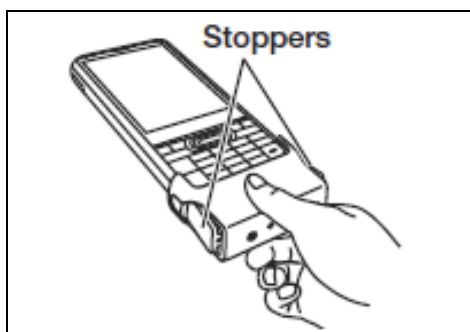

Figure 4.2

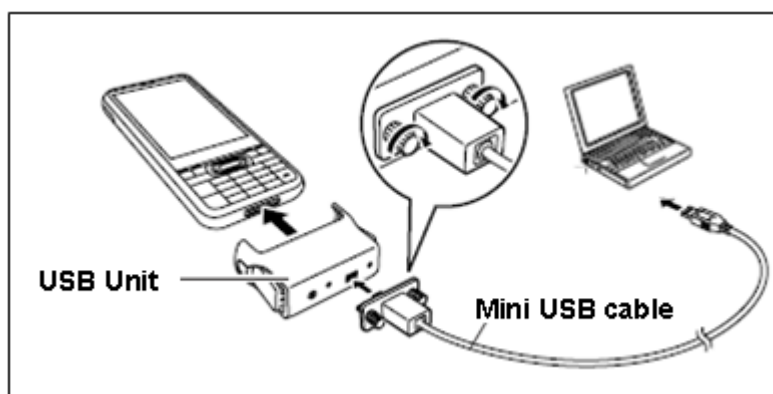3. Connect mini USB cable with USB Unit, then connect to PC.

Figure 4.3

5. Connecting the IT-300 to PC

To make connection establishment with PC, use one of the methods, depending on the OS your PC runs, described below.

- ActiveSync 4.5 or a later version (for Windows XP or any other OS earlier)
  Use the ActiveSync to connect the IT-300 to PC if the PC runs in Windows XP or other OS earlier than Windows XP. The ActiveSync can be downloaded at the URL below.
  http://www.microsoft.com/downloads/details.aspx?familyid=9E641C34-6F7F-404D-A04B-DC09F8141141&displaylang=en

- Windows Mobile Device Center 6.1 or a later version (for Windows Vista or later)
  Use the Windows Mobile Device Center to connect the IT-300 to PC if the PC runs in Windows Vista OS. The Windows Mobile Device Center ("WMDC") can be downloaded at the URL below.
  http://www.microsoft.com/downloads/details.aspx?familyid=46F72DF1-E46A-4A5F-A791-09F07AAA1914&displaylang=en

5.1 Connection via USB Cradle

Before making connection using ActiveSync or Windows Mobile Device Center, check the USB Connection settings on the terminal.

Follow the steps below:

1. Navigate to **Start** → **Settings** → **System** tab → **USB Connection**.
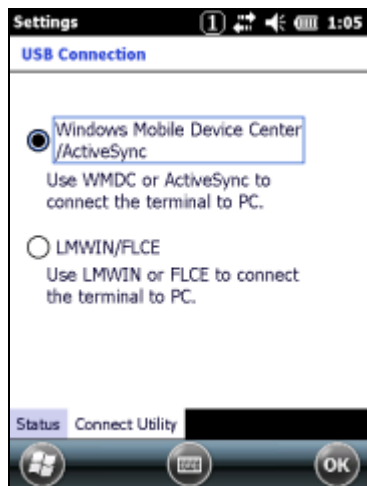2. Tap **Connect Utility** tab.

Figure 5.1

3. Confirm that "Windows Mobile Device Center/ActiveSync" is selected. If not, select the radio button and tap **ok**.

5.1.1 ActiveSync via USB

To establish connection via USB interface with PC runs in Windows XP or any other OS earlier than Windows XP, use ActiveSync.

Follow the steps below:
1. Install ActiveSync to the PC, if not installed.
2. Connect the USB cable to the PC and the other end to the USB Cradle and also the AC adaptor to the USB Cradle.
3. Make sure the selector switch on the back of the cradle is set to position B.
4. Put the IT-300 on the cradle and confirm that the green LED on the front of the cradle is lit. If not, be sure the IT-300 is positioned firmly on the cradle.
5. Follow a message appeared in the ActiveSync on the PC.

5.1.2 Windows Mobile Device Center via USB

To establish connection via USB interface with PC runs in Windows Vista, use Windows Mobile Device Center ("WMDC").

Follow the steps below:
1. Install WMDC to the PC, if not installed.
2. Connect the USB cable to the PC and the other end to the USB Cradle and also the AC adaptor to the USB Cradle.
3. Make sure the selector switch on the back of the cradle is set to position B.
4. Put the IT-300 on the cradle and confirm that the green LED on the front of the cradle is lit. If not, be sure the IT-300 is positioned firmly on the cradle.
5. Follow a message appeared in the WMDC on the PC.

5.2 Connection via WLAN

To establish communication between the IT-300 with WLAN module integrated (see Table 2.1 for applicable models) and PC via WLAN configuration, follow the steps, 1 to 6, below to set up a WLAN configuration on the IT-300. After setting up the configuration, be sure to perform a site survey prior to starting communication via WLAN.

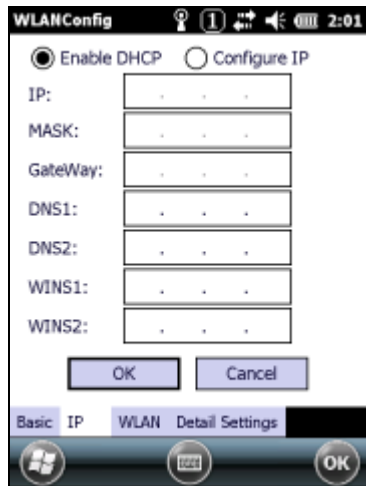1. Navigate to **Start → Settings → Connection** tab→ **WLANConfig** and then tap **IP** tab.

Figure 5.2

Table 5.1

Parameter	Description
Enable DHCP or Configure IP	Determines "Enable" or "Disable" for DHCP.
IP	Determines IP address.
MASK	Determines subnet mask.
GateWay	Determines default gateway.
DNS1	Determines primary DNS address.
DNS2	Determines secondary DNS address.
WINS1	Determines primary WINS address.
WINS2	Determines secondary WINS address.

If any of the settings in Figure 5.2 is omitted, the process described in the following table will automatically take place in the field.

Table 5.2

Parameter	Nothing is set (DHCP)	"Configure IP" is set
Enable DHCP or Configure IP	"Enable DHCP" is assumed.	"Configure IP" is set.
IP	Does not determine IP address.	Entered address is set as is.
MASK	Does not determine subnet mask.	Entered address is set as is.
GateWay	Does not determine gateway.	Entered address is set as is.
DNS1	Does not determine primary DNS address.	Entered address is set as is.
DNS2	Does not determine secondary DNS address.	Entered address is set as is.
WINS1	Does not determine primary WINS address.	Entered address is set as is.
WINS2	Does not determine secondary WINS address.	Entered address is set as is.

2. Tap **Basic** tab. Set up each parameter in the tab by referring to the descriptions for the parameters in Table 5.3.
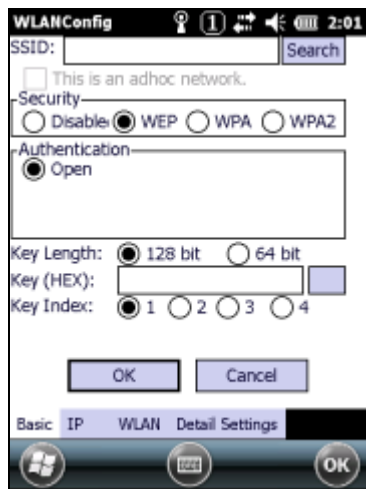

Figure 5.3

Table 5.3

Parameter		Description
SSID		Enter the SSID of the network you want to connect to.
Security	Disable	None.
	WEP	**Open** in Authentication field.
	WPA WPA2	**PSK** in Authentication field (if selected, the Key field must be set also.) **EAP-PEAP** in Authentication field **EAP-TLS** in Authentication field
Key		Enter 26 (maximum) alphanumeric digits (13 hex pairs) in the Key field if **128 bit** radio button is selected. Or, enter 10 (maximum) alphanumeric digits (5 hex pairs) in the Key field if **64 bit** radio button is selected. The field displays the number of characters that have been entered. ***** in the field implies that the key has been extracted from the ini file. If ***** in the field is edited, a new key has been deemed to be set. Or, if it has never been edited, the key extracted from the ini file becomes effective as is.

If **EAP-PEAP** radio button in Authentication field is selected, tap the **EAP-Properties** button that appears when selecting the **EAP-PEAP** radio button to set also the following parameters.

Table 5.4

Parameters in EAP-Properties screen	Description	Default
User name	Input a user name in alphanumeric (maximum 100 alphanumeric).	None
Password	Input a password in alphanumeric (maximum 100 alphanumeric). ***** in the field implies that the password has been extracted from the ini file. If ***** in the field is edited, a new password has been deemed to be set. Or, if it has never been edited, the password extracted from the ini file becomes effective as is.	None
Domain	Input a domain in alphanumeric (maximum 100 alphanumeric).	None
Validate server certificate	Set up the requisition for server certificate. With check mark : certificate is required. Without check mark: certificate is not required.	Certificate is not necessary

If **EAP-TLS** radio button in Authentication field is selected, tap the **EAP-Properties** button that appears when selecting the **EAP-TLS** radio button to set the following settings.

Table 5.5

Parameters in EAP-Properties screen	Description	Default
User name	Input a user name in alphanumeric (maximum 100 alphanumeric).	None
Certificate	Select a client certificate installed already (maximum 100 alphanumeric). **Search** button in the field will display a list of installed client certificates. Select one by highlighting it.	None
Domain	Input in alphanumeric (maximum 100 alphanumeric)	None
Validate server certificate	Set up the requisition for server certificate. With check mark : certificate is required. Without check mark : certificate is not required.	Certificate is required.

3. Tap **WLAN** tab.
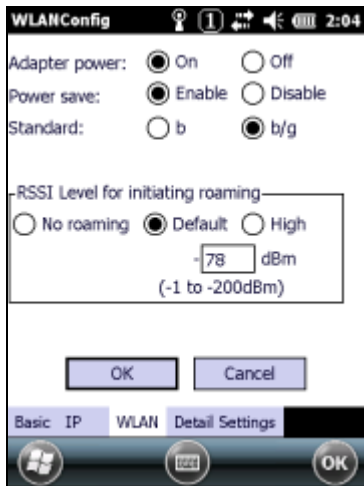
Figure 5.4

Table 5.6

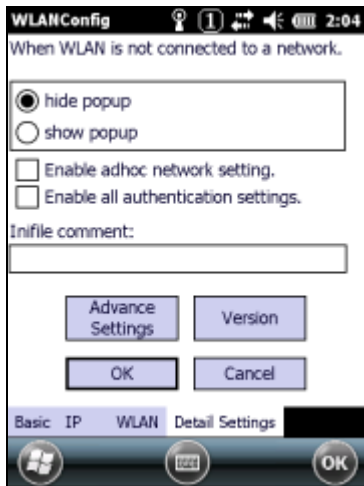| Field / Radio Buttons		Description	Default
Adapter power	On	Enable power to the integrated WLAN module.	Yes
	Off	Disable power to the integrated WLAN module.	
Power save	Enable	Enable power save mode for the WLAN module.	Yes
	Disable	Disable power save mode for the WLAN module.	
Standard	b	Set up IEEE802.11b standard effect.	
	b/g	Set up IEEE802.11b/g standard effect.	Yes
RSSI Level for initiating roaming	No roaming	Set up "-100 dBm" for roaming starting threshold level, a level where communication via WLAN is practically impossible, so that roaming should not be carried out.	
	Default	Set up "-78 dBm" for the roaming starting threshold level.	Yes
	High	Set up "-72 dBm" for roaming starting threshold level, for faster (more frequent) roaming	

4. Tap **Detail Settings** tab.

Figure 5.5

Table 5.7

Field / Radio Buttons		Description	Default
When WLAN is not connected to a network	hide popup	Hides popup window when WLAN is not connected to a network.	Yes
	show popup	Shows popup window when WLAN is not connected to a network.	
Enable AdHoc network setting		With check mark : enable the setting.	
		Without check mark : disable the setting.	Yes
Enable all authentication settings		With check mark : enable the setting.	
		Without check mark : disable the setting.	Yes
Inifile comment		Enter a comment of up to 100 characters to be written in the ini file.	None

5. If **OK** button is clicked, the screen in Figure 5.6 appears. Tap **OK** button to perform a reset on the terminal so that the setting takes effect.
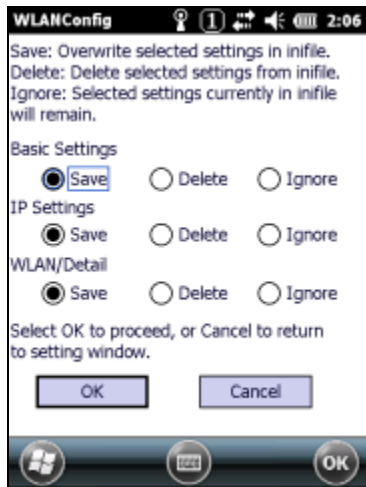
Figure 5.6

6. Check to make sure that the connection has been established using the **NetSearch** utility, and then navigating to the **Ping** function in there. Enter HostName first and then tap **Ping** to check that you are connected to the network correctly.

5.3 Accessing Shared Network Drive on Your LAN

Assuming you have a valid network connection established, you can access shared drives on your PC from the **File Explorer** on the IT-300. The following shows the steps to initiate this.

1. Configure a network connection on the IT-300.
2. Double tap My Device.
3. Type \\xxxx\ where xxxx is the network name of the PC.
4. A network logon dialog box will appear. Enter a valid User ID, Password and Network Domain.
5. Any shared network drives on the target PC will be displayed and you will be able to copy files freely between them and the IT-300.

5.4   Direct TCP/IP Connection from Visual Studio

If you have a network connection to the IT-300 (for example, via WLAN) then you can establish a direct link to the development PC without using ActiveSync.

For Visual Studio 2005

1. Download the files listed below to the IT-300.
    - Clientshutdown.exe
    - ConmanClient2.exe
    - CMAccept.exe
    - DeviceDMA.dll
    - eDbgTL.dll
    - TcpConnectionA.dll

    The source folder in the PC:
      C:\Program Files\Common Files\Microsoft Shared\CoreCon\1.0\Target\wce400\armv4i
    The destination folder in the IT-300:
      \Windows

2. Run **ConmanClient2.exe** on the IT-300.
3. Set the device IP address in Visual Studio 2005.
4. Navigate to **Tools** in the main menu of Visual Studio 2005 → **Options…** → **Device Tools** → **Devices**.
5. Choose **Windows Mobile 6 Professional Device** in the pull-down menu of **Devices:** and click **Properties…**.
6. Click **Transport:** to access **Configure…** and set up **Device IP address** as shown in Figure 5.7.
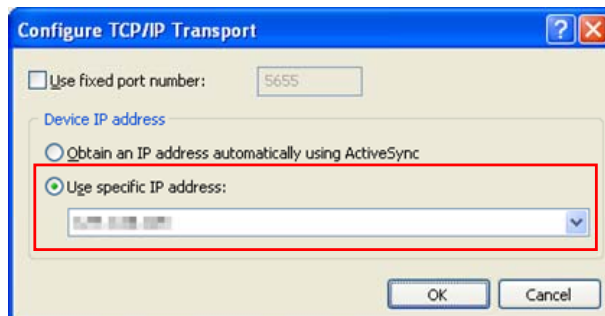
Figure 5.7

7. Run **CMAccept.exe** on the IT-300.
8. Navigate to **Tools** in the main menu of Visual Studio 2005 → **Connect to Device…**.

9. Choose **Windows Mobile 6 Professional Device** in the list of **Devices:** and click **Connect** button. The screen in Figure 5.8 if appear indicates the success of connection establishment.
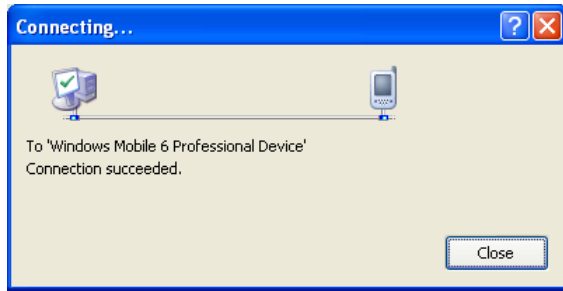

Figure 5.8

6. Setting Up the Development Environment

6.1 Installing CAB Files

1. After installing the library files, the CAB files in Table 6.1 will be installed in the folder below.

      C:\Program Files\CASIO\MBSYS\CAB

Table 6.1

Library	CAB file	Preinstalled
System Library	en_SystemLibWM.ARMV4I.CAB	Yes
Laser Scanner Library	en_OBReadLibWM.ARMV4I.CAB	Yes
JPEG Library	enJPEGWM.ARMV4I.CAB	Yes
FLINK Library	en_FlinkWM.ARMV4I.CAB	Yes (note 2)
Bluetooth Library	BTLIBIT800WME.100.CAB	No (note 3)

Notes:
1. The library with "Yes" in "Preinstalled" column is preinstalled in the IT-300 and in the Device Emulator. Thus, it is not necessary to install it, unless it has been updated or changed.
2. The CAB file, en_FlinkWM.ARMV4I.CAB, in the table does not operate for the IT-300. Use the FlinkLib.dll installed by default in the terminal.
3. BTLIBIT300WME.100.CAB file will be released as IT-300 Bluetooth patch file.

2. Copy all the CAB files in Table 6.1 to any folder on the IT-300 via ActiveSync.
3. Carry out each CAB file.
4. When the installation starts, the installation status will appear.

6.2   Visual Studio 2005

Follow the steps in Chapter 5 "Connecting the IT-300 to PC" before checking the steps below to confirm that you can connect to the IT-300 from Visual Studio 2005.

1. Establish connection with the IT-300 via ActiveSync.
2. Open the application project for VB or C# in Visual Studio 2005.
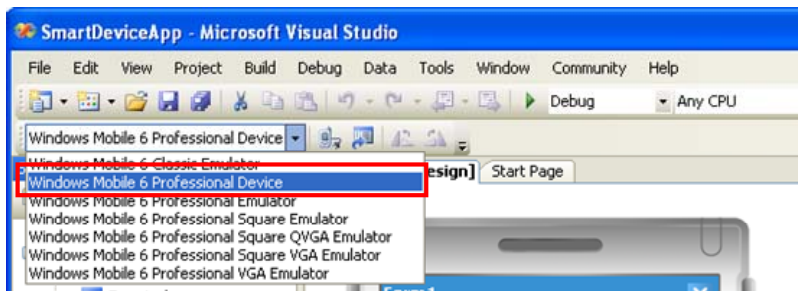3. Choose **Windows Mobile 6 Professional Device** in the pull-down menu box.

Figure 6.1

4. Click the button shown in the red box below (see Figure 6.2) to make sure that Visual Studio 2005 has recognized the connection established with the IT-300 via ActiveSync. If it does not, start up ActiveSync again to establish connection.
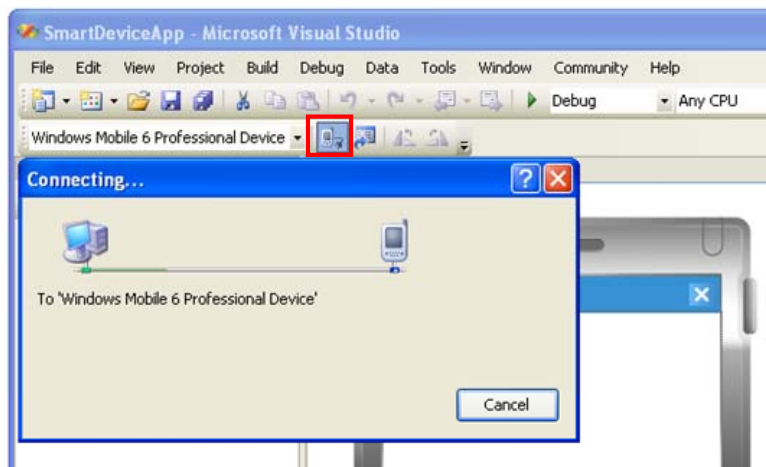
Figure 6.2

5. You will now be able to deploy solutions and also debug applications on the attached IT-300 using the Visual Studio 2005 debugging features.

7. Device Emulator

The **Device Emulator** provides application developers with an environment that, without having the actual terminal available, allows them to debug basic functions and performance of an application at source level by stepping through the code.

7.1 Software Required

The **Device Emulator** requires the software(s) listed below before installing the emulator.

- ActiveSync 4.5 or a later version (If required)
  http://www.microsoft.com/downloads/details.aspx?familyid=9E641C34-6F7F-404D-A04B-DC09F8141141&displaylang=en
- Visual Studio 2008 or Visual Studio 2005 (Mandatory)
- Microsoft Device Emulator 3.0 (If required)
  http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=a6f6adaf-12e3-4b2f-a394-356e2c2fb114
- Windows Mobile 6 Professional SDK Refresh
  http://www.microsoft.com/downloads/details.aspx?familyid=06111A3A-A651-4745-88EF-3D48091A390B&displaylang=en
- Windows Mobile 6 Emulator Image for CASIO IT-300 (Mandatory)
- IO Simulator (Mandatory)

Case of using after Windows Vista OS

If you use OS after Windows Vista (Windows 7 or Windows Server 2008), please set device emulation and I/O simulator as administrator.
Please check "Run this program as an administrator" of property from opening Explorer.
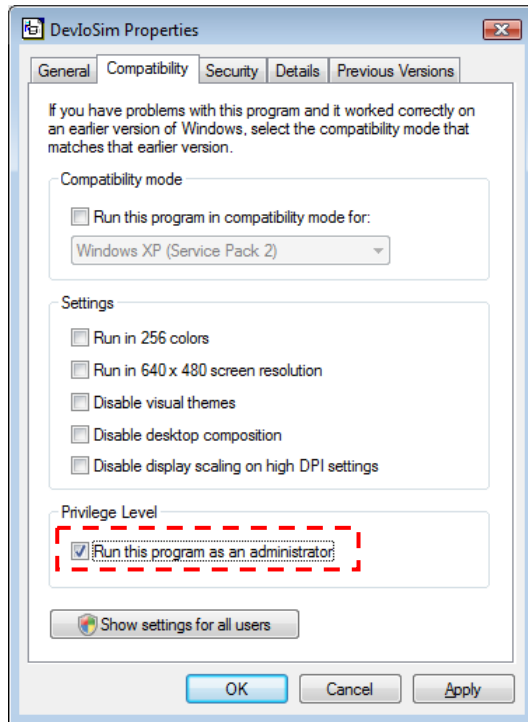(Ex. Execute I/O simulator in Windows Vista as administrator.)

Figure 7.1

These program have installed the following location as default setting.
- Device emulator
  C:\Program Files\Microsoft Device Emulator\1.0\DeviceEmulator.exe
- I/O simulator
  C:\Program Files\Common Files\CASIO\Emulator\DevIoSim.exe

7.2 Starting Up the Device Emulator

After installing all required software described in Chapter 7.1, follow the steps below to start up the **Device Emulator** on your PC.

1. Navigate to Start menu → **All Programs** → **CASIO Device Emulator** and click **IT-300WM**.
2. Make sure that the **IT-300WM Device Emulator** has started up on the screen. See Figure 7.2.
3. Navigate to Start menu → **All Programs** → **CASIO Device IO Simulator** and click **IO Simulator**.
4. Make sure that the **IO Simulator** has started up on the screen. See Figure 7.3.
5. When both Figure 7.2 and Figure 7.3 appear on your PC, you are ready to use the emulator.

Figure 7.2   IT-300WM Emulator   Figure 7.3   I/O Simulator
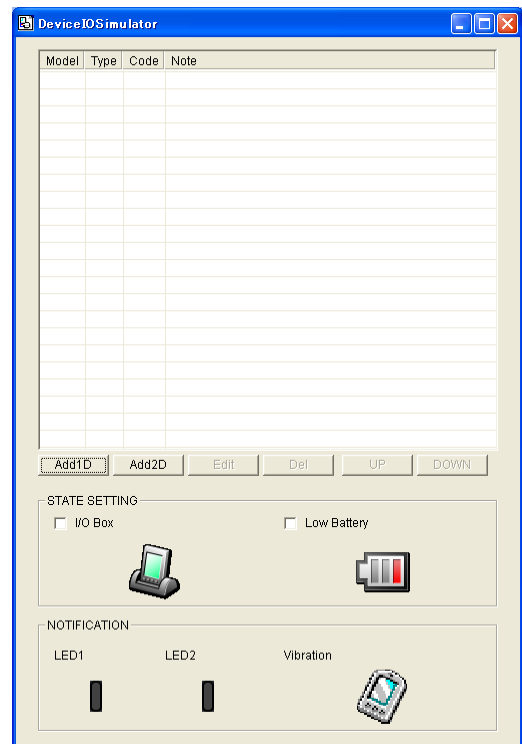
Terminology of **Emulator** and **Simulator**;
The **Emulator** described in this reference manual is a software application that behaves in a very similar way to the actual device by imitating individual hardware components or protocols present in the actual hardware.
On the other hand, the **Simulator** is also a software application that logically integrates application programming interfaces ("API") and certain other functions to allow debugging of the application program using external events. The **Emulator** performs in a pseudo CPU and hardware environment and it is impossible for the application to recognize whether it is in the actual device environment or pseudo environment. However, actions carried out by the **Simulator** are not as alike to those performed by actual components but merely mimic them very closely.

7.3 Using the Device Emulator

7.3.1 IT-300WM Device Emulator

The **IT-300WM Device Emulator** emulates various operations carried out by the actual IT-300 on the PC's screen such as mouse operation, input on PC's keyboard, displaying execution of applications, and operations by actual devices such as the scanner. Figure 7.4 shows an emulated IT-300 on the screen of a PC.

Figure 7.4

Key Input
The emulator offers key input capability similar to that of the actual IT-300. For instance, a key on the emulated keyboard of IT-300 on the screen (see Figure 7.4) can be clicked with PC mouse as well as key input made directly on the PC's keyboard.

Reading Bar Codes
The emulator enables bar codes pre-registered in the I/O Simulator (see Figure 7.3) to be input when clicking Trigger key on the emulated keyboard (see Figure 7.4). Note however that the Trigger key must be continuously pressed for a second or more otherwise an incorrect key input may result.

Sound
The emulator offers beep and sound capability similar to that of the actual IT-300.

7.3.2 I/O Simulator

The **I/O Simulator** simulates registration of bar codes, generation of low battery warning, detection of terminal being mounted on the cradle.

Registration of bar code symbologies

1. Registration
    Click **ADD1D** or **ADD2D** button (circled in red in Figure 7.5) to go into the bar code registration mode.
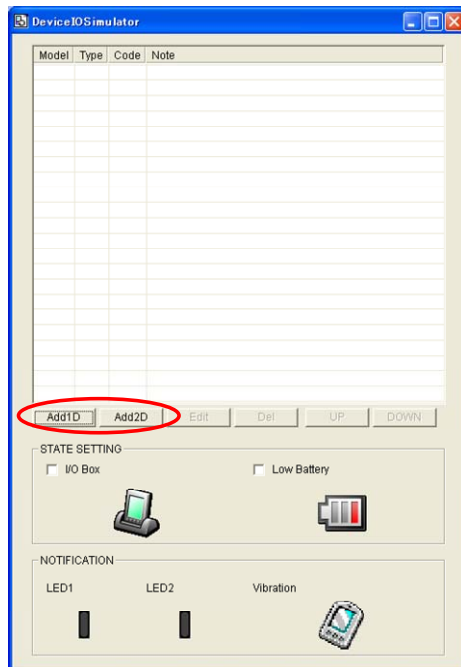

Figure 7.5

2. Bar code registration
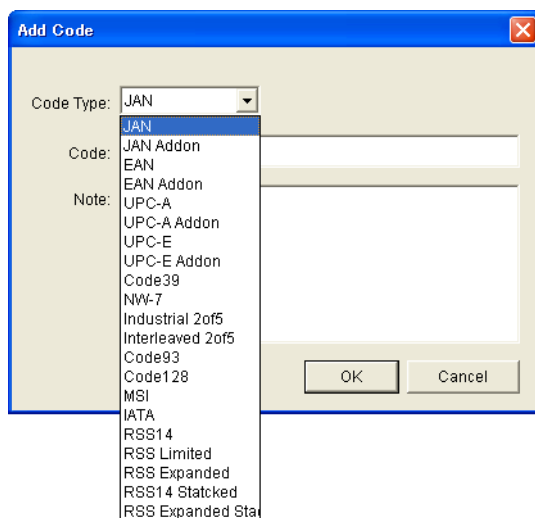   Choose a bar code symbology in the **Code Type** pull-down menu that you wish to register in the **I/O Simulator**.

Figure 7.6

3. Registration of bar code and note

Enter bar code data in the **Code** field (see Figure 7.7) and a note about the bar code in the **Note** field if necessary. Click **OK** button to complete the bar code registration.

Figure 7.7

4. Completion of registration

After completion of the bar codes registration, the screen in Figure 7.8 shows a list of bar codes that have been registered in the **I/O Simulator**. Prior to debugging with the **Device Emulator**, make sure that you register all bar codes you wish to use in debugging.

Figure 7.8

5. Editing registered bar code content
   Highlight a bar code in the list of registered bar codes (see Figure 7.8) and click **Edit** button.
   Figure 7.9 appears for editing the bar code and its information.
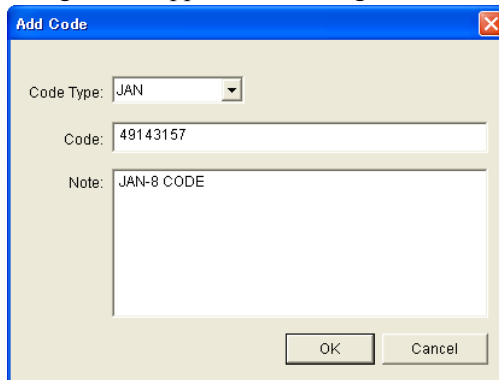
Figure 7.9

6. Deleting registered bar code content
   Highlight a bar code in the list of registered bar codes (see Figure 7.8) and click the **Del** button.
   Dialogue screen in Figure 7.10 appears for you to confirm the deletion. If it is okay to delete,
   click **Yes** button, otherwise click **No** button.
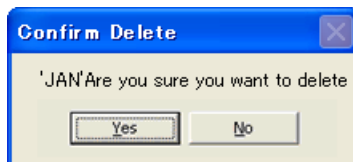
Figure 7.10

Detection of Terminal in Cradle and Low Battery Warning

If you check the **I/O Box** and **Low Battery** boxes in STATE SETTING field (see Figure 7.11), the Simulator simulates the respective events in the emulator.
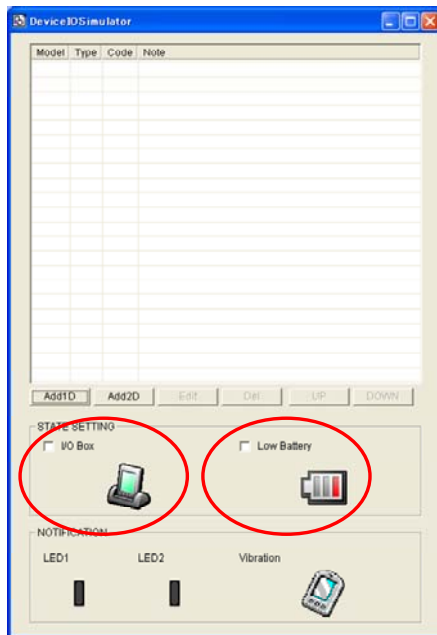
Figure 7.11

I/O Box

If this box is checked, a notification is issued that the connection between the **IT-300WM Device Emulator** and USB Unit has been established. This notification can be utilized by the application.

Low Battery

If this box is checked, a notification that a low battery state has occurred is raised. The icon in the Toolbar in the emulated screen appears, too. The notification can be utilized by the application to recognize the low battery state in the hardware.

Indications

The **I/O Simulator** expresses a change of state that occurred in the **IT-300WM Device Emulator**.

LED

When the **IT-300WM Device Emulator** turns on the LED, the LED icon (LED2) in the **I/O Simulator** also turns on. See Figure 7.12.

Vibration

When the **IT-300WM Device Emulator** vibrates, the vibration icon in the **I/O Simulator** also turns on. See Figure 7.12.
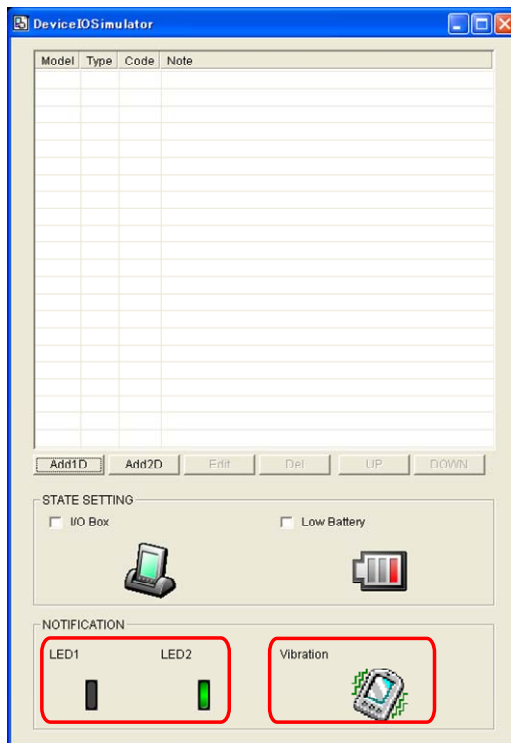

Figure 7.12

7.3.3 Connecting via ActiveSync

If debugging with the **IT-300WM Device Emulator** is carried out in Visual Studio 2008 or Visual Studio 2005, or transmission/reception of a file with the **Device Emulator** is carried out, **ActiveSync** must be used.

Setting ActiveSync

1. Start up **ActiveSync** and then navigate to **File → Connection Settings …**.
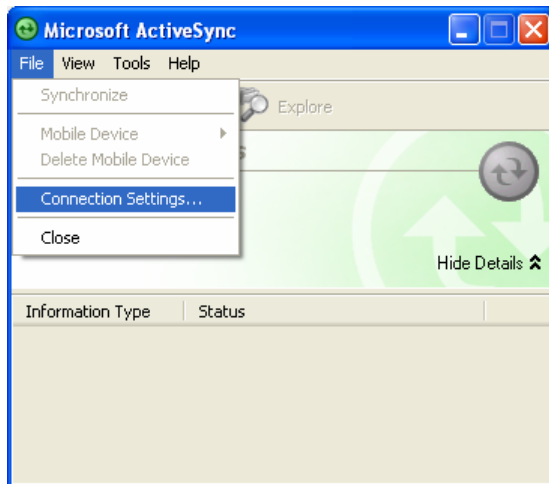
Figure 7.13

2. In **Connection Settings** screen, check in the **Allow connections to one of the following** box and choose **DMA** in the pull-down menu. See Figure 7.14.
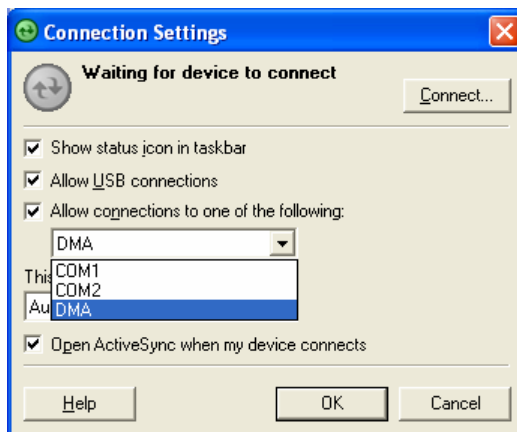
Figure 7.14

Connection via ActiveSync

The way to establish connection of the **Device Emulator** via **ActiveSync** is;

1. Start up the **Device Emulator** by referring to Chapter 7.2 "Starting Up the Device Emulator".
2. Start up Visual Studio 2008 or Visual Studio 2005, and then navigate to **Tools → Device Emulator Manager**. Right-click **IT-300WM Emulator** in the list and then choose **Cradle** in the popup menu. See Figure 7.15.

Figure 7.15

3. Make sure ActiveSync has started up and the ⊞ icon in the status bar changes to the ⊞ icon. See the emulated screen of IT-300WM in Figure 7.16. The icon indicates that the connection via ActiveSync has been established.
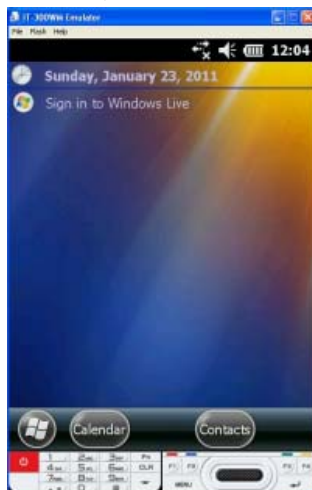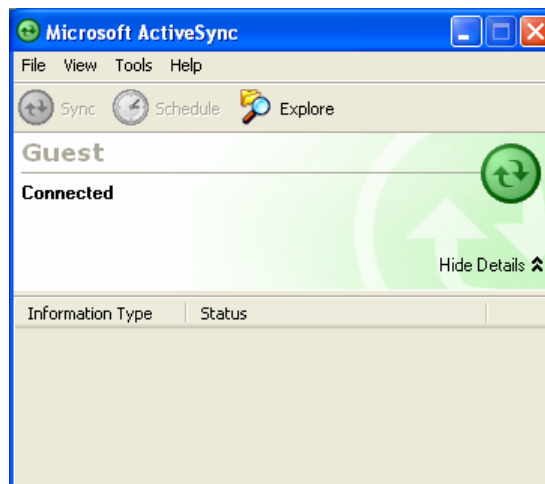

Figure 7.16   Figure 7.17

7.4   Debugging Applications

This chapter describes how to debug your application using the **Device Emulator**. Before starting to "Build", establish a connection between the **IT-300WM Device Emulator** and your PC via ActiveSync by referring to Chapter 7.3 "Using the Device Emulator".
For the basic order of developing an application, refer to Chapter 8 "Visual Studio".

Setting Build Configuration

Choose **Debug** in the Solution Configurations pull-down menu in Visual Studio 2008 or Visual Studio 2005 and **IT-300WM Emulator** in the target device pull-down menu. See Figure 7.18.
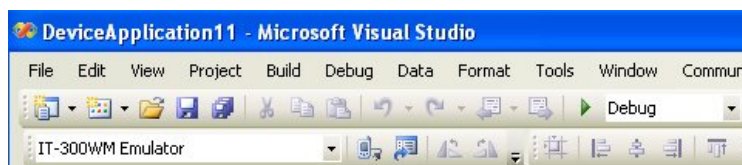

Figure 7.18

Debugging Applications

Basic Debug Operation

The debug operation used for the **Device Emulator** in Visual Studio 2008 or Visual Studio 2005 is the same as an ordinary debug operation using the actual terminal.

Debugging with the Device Emulator

With the **Device Emulator**, it is possible to set a break point in the source code of the application for step-by-step debugging.

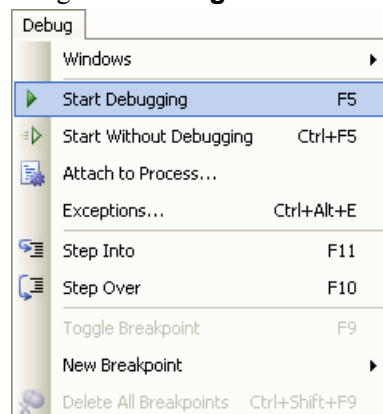1. Navigate to **Debug** menu → **Start Debugging** to start up the debugger.

Figure 7.19

2. Similar to ordinary debugging operations with an actual IT-300, the **Device Emulator** allows break point setting (circled in red in Figure 7.20) in the source code and step-by-step debugging.
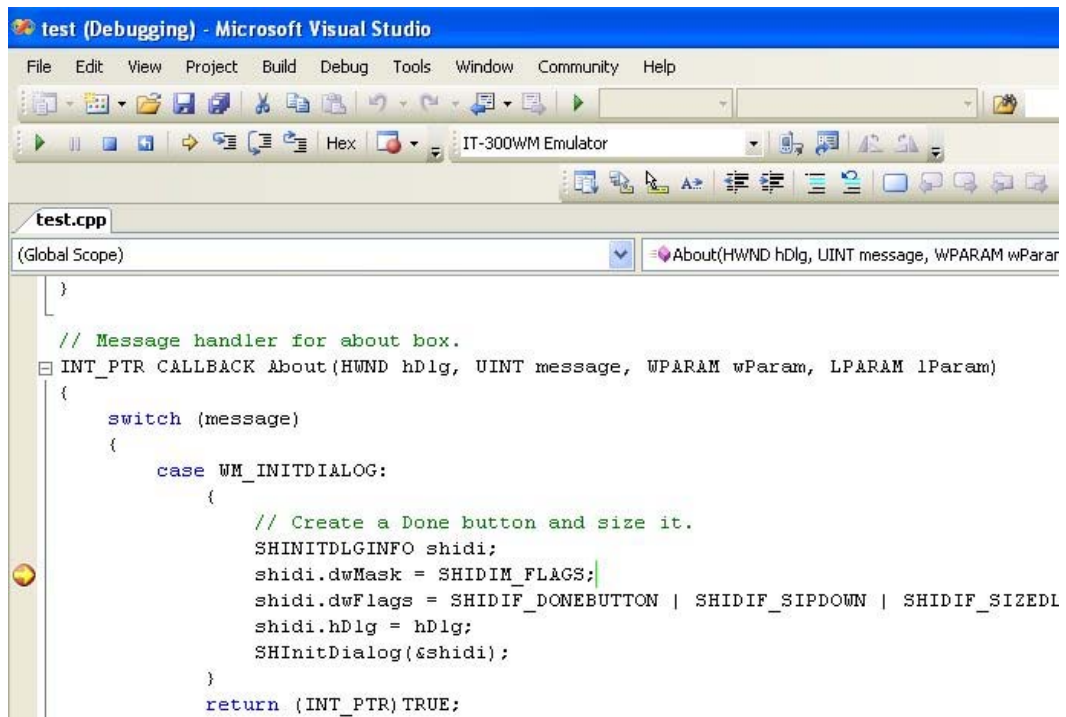

Figure 7.20

8. Visual Studio

This chapter describes application development steps in Visual Studio 2008 or Visual Studio 2005 to create an example program. The example program referred to in this chapter is an application program developed in three development environments - C++, Visual Basic and C# - using the CASIO Common Device Control Library or Common Device Control Class Library. The example program for all three environments repeats turning on and off the LED to brink for a period of 5 seconds. See Chapters 8.1 "Developing in C++", 8.2 "Developing in VB" and 8.3 "Developing in C#" for each development environment.

For the list of the libraries provided by the IT-300WM BDK, refer to Chapter 1.2 "Library". For detail about each function of the Common Device Control Library and Common Device Control Class Library, refer to Common Device Control Library Manual.

The example program in this chapter runs also in the Device Emulator. To use the emulator, rename **IT-300 Device** to **IT-300 Emulator**.

Notes:
- Functions of the Common Device Control Library which control various individual devices integrated in the IT-300 have different name spaces and names from those available for the previous CASIO handheld terminals. They are not compatible with the ones in the previous CASIO library. The exceptions are DT-X7, DT-X11, and IT-600 that use the same libraries.
- Applications developed with any functions of CASIO dedicated library must be rewritten by replacing the dedicated functions with the appropriate functions from the Common Device Control Library.
- Take care when using Visual Studio 2008 or Visual Studio 2005 to upgrade an existing application and always keep a backup of your existing project.

8.1   Developing in C++

This chapter describes necessary steps to develop the example application program (see Chapter 8) in C++ environment using the Common Device Control Library.

Before proceeding to creating the project, check if the installation folder for the Common Device Control Library has been registered in Visual Studio 2008 or Visual Studio 2005 by following steps, 1 to 8, below.

1. Navigate to **Tools → Options …** and open **Options** screen.
2. Navigate to Projects and Solutions → Directories.
3. Choose Windows Mobile 6 Professional SDK (ARMV4I) in Platforms.
4. Choose Include files in **Show directories for:**.
5. If the installation folder has not been registered, append the following.
       C:\Program Files\CASIO\MBSYS\include
6. Choose Library files in **Show directories for:**.
7. If the files have not been registered, append the following.
       C:\Program Files\CASIO\MBSYS\lib\ARMV4I
8. Click **OK** button to close the screen.

Application Development Procedure

Subsequent steps show how to create and start up a simple program using one of the system functions. When running the program, the LED will blink in red for 5 seconds.

1. First, create **Win32 Smart Device Project** with its device name **SmartDeviceApp** for Visual C++ in Visual Studio 2008 or Visual Studio 2005.
2. Choose **Pocket PC 2003** in the Selected BDKs (SDKs in the screen) field in the Platforms of Win32 Smart Device Project Wizard and click **<** button.
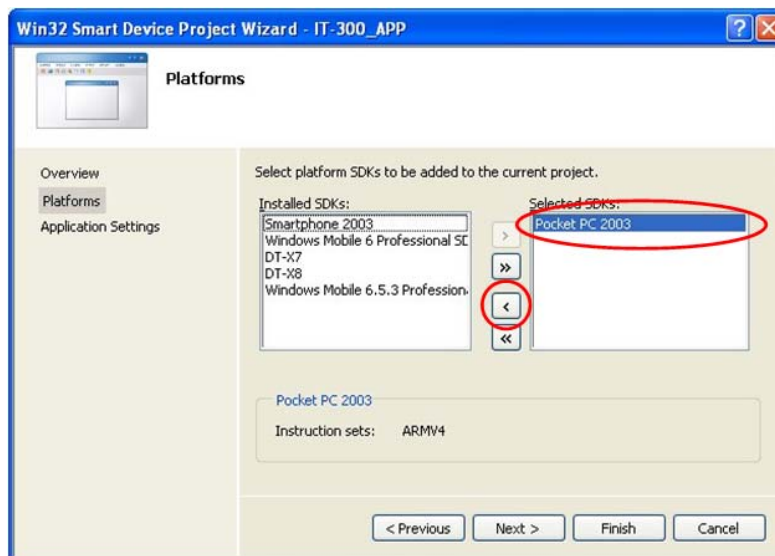

Figure 8.1

Choose **Windows Mobile 6.5.3 Professional SDK** in the **Installed SDKs** field and click **>** button.
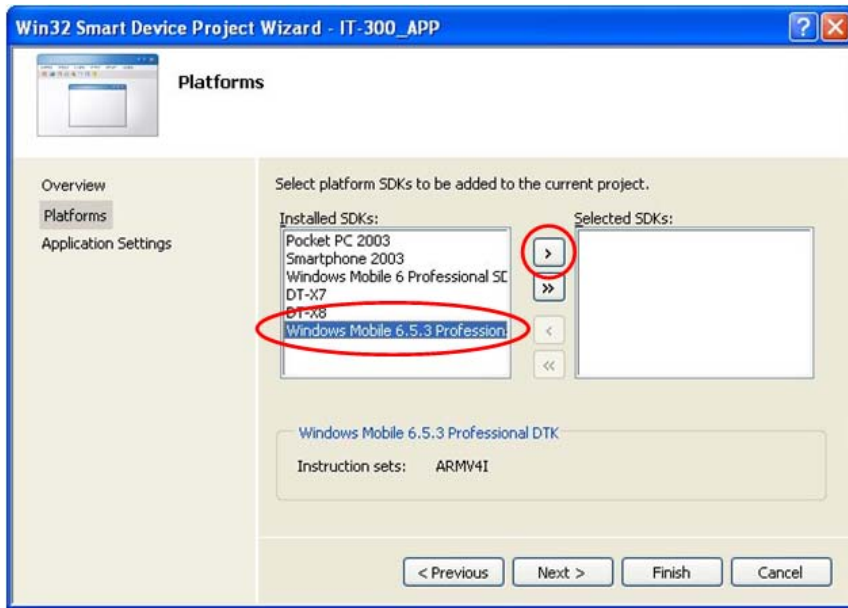

Figure 8.2

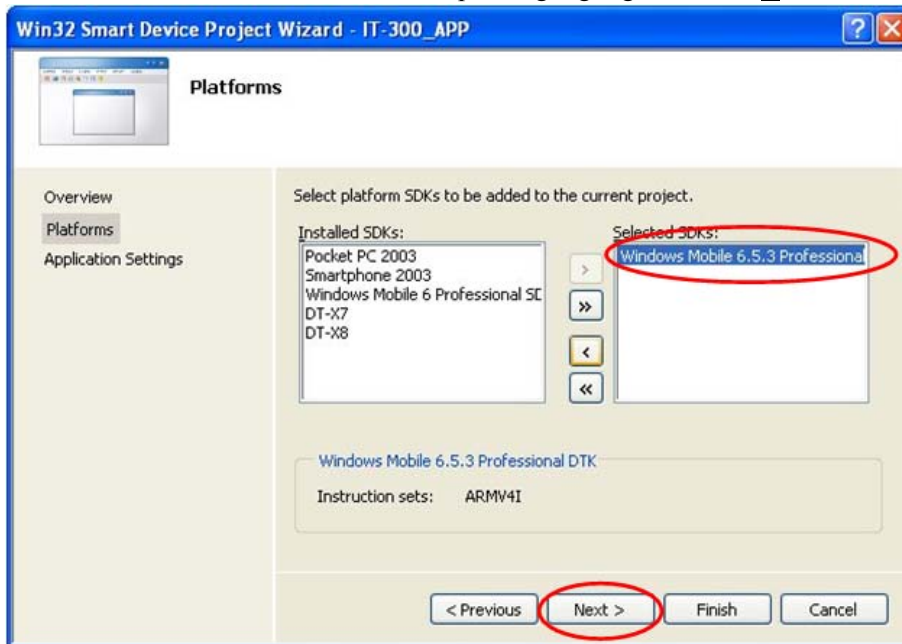3. Click **Next >** button while **IT-300** is kept being highlighted in the **Selected SDKs** field.

Figure 8.3

4. Choose Console Application for the Application type in the Application Settings menu, and click **Finish** button.
5. In Solution Explorer, click **SmartDeviceApp.cpp** and then append the source code below subsequent to "#include <commctrl.h>".

```
#include <SystemLib.h>
#if !defined(_countof)
#define _countof(_Array) (sizeof(_Array) / sizeof(_Array[0]))
#endif
```

6. Append the source code below in the main function of **SmartDeviceApp.cpp**.

```
DWORD result;
TCHAR msg[16];

result = SysSetLED(LED_RED, 5, 8, 8);

if(result == TRUE)
{
    result = SysGetLED();
    switch(result & 0x0000000F) {
    case LED_OFF:
        wcscpy_s( msg, _countof(msg), TEXT("LED_OFF") );
        break;
    case LED_RED:
        wcscpy_s( msg, _countof(msg), TEXT("LED_RED") );
        break;
    case LED_GREEN:
        wcscpy_s( msg, _countof(msg), TEXT("LED_GREEN") );
        break;
    case LED_ORANGE:
        wcscpy_s( msg, _countof(msg), TEXT("LED_ORANGE") );
        break;
    case LED_BLUE:
        wcscpy_s( msg, _countof(msg), TEXT("LED_BLUE") );
        break;
    case LED_CYAN:
        wcscpy_s( msg, _countof(msg), TEXT("LED_CYAN") );
        break;
    case LED_MAGENTA:
        wcscpy_s( msg, _countof(msg), TEXT("LED_MAGENTA") );
        break;
    default:
        wcscpy_s( msg, _countof(msg), TEXT("LED_UNKNOWN") );
        break;
    }
    MessageBox(NULL, msg, TEXT("LED"), MB_OK);
}
```

7. Choose **Properties** in the Project of Visual Studio 2008 or Visual Studio 2005, and navigate to **Configuration Properties** → **Linker** → **Input** → **Additional Dependencies** and then append **SystemLib.lib** (see red circle in Figure 8.4).
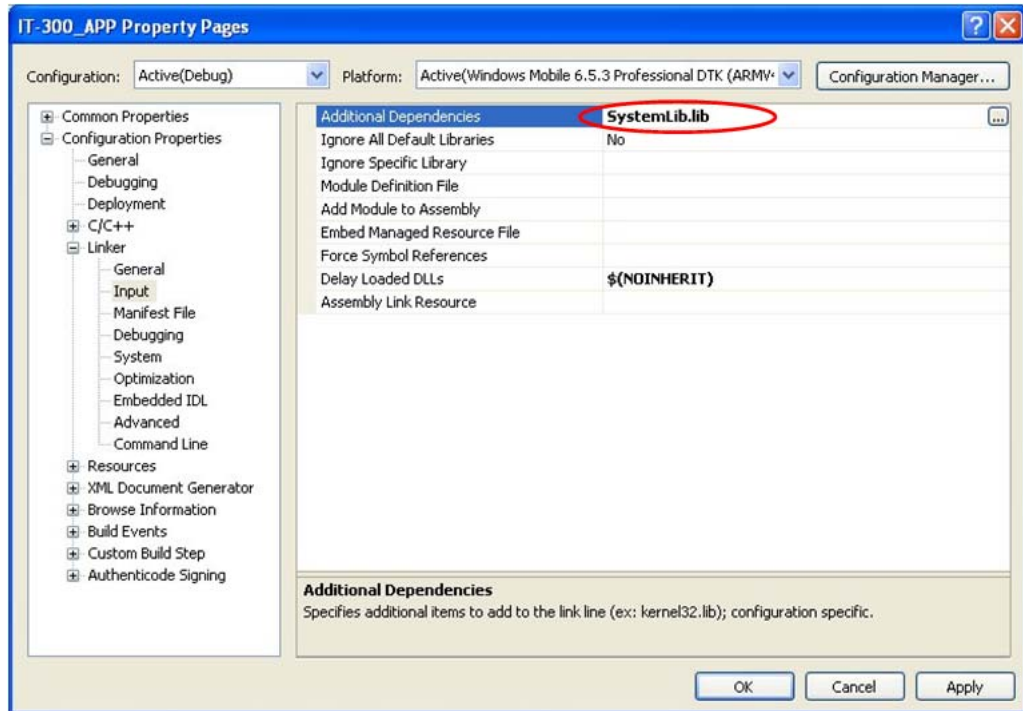

Figure 8.4

8. Choose **Windows Mobile 6.5.3 Professional Device** for the Target Device to establish connection with the PC.
9. Choose Debug in Visual Studio 2008 or Visual Studio 2005 and then click either Start Debugging or Start Without Debugging.
10. The project will be built and copied to the "\Program Files\<name of project>" folder by default in the IT-300.
11. Check that the program runs correctly on the IT-300.

8.2 Developing in VB

This chapter describes necessary steps to develop the example application program (see Chapter 8) in VB environment using the Common Device Control Class Library.

Application Development Procedure

Subsequent steps show how to create and start up a simple program using one of the system functions. When running the program, the LED will blink in red for 5 seconds.

1. Create a new VB Smart Device Application in Visual Studio.
2. In Solution Explorer, right-click **References** and click **Add Reference…**
3. Click **Browse** and navigate to the folder where you have stored the CASIO .NET library files. Highlight **SystemLibNet.dll** and click it to open. Click **OK** button.
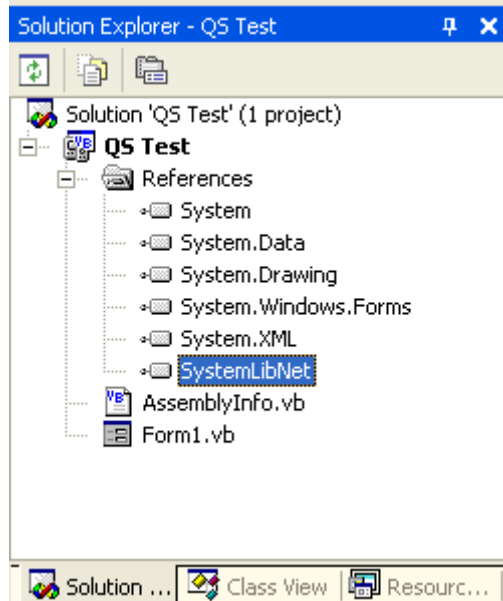

Figure 8.5

4. Add a button to the form, rename it **LED**, and double click it.

5. In the event function for the button to click, add the following code.

```
Dim result As Int32
Dim msg As String

result = Calib.SystemLibNet.Api.SysSetLED( _
        Calib.SystemLibNet.Def.LED_RED, 5, 8, 8)

'.NET vales of "true" and "false" are "-1" and "0" respectively.
If result = -1 Then
    result = Calib.SystemLibNet.Api.SysGetLED()
    Select Case (result And &HF)
        Case Calib.SystemLibNet.Def.LED_OFF
            msg = "LED_OFF"
        Case Calib.SystemLibNet.Def.LED_RED
            msg = "LED_RED"
        Case Calib.SystemLibNet.Def.LED_GREEN
            msg = "LED_GREEN"
        Case Calib.SystemLibNet.Def.LED_ORANGE
            msg = "LED_ORANGE"
        Case Calib.SystemLibNet.Def.LED_BLUE
            msg = "LED_BLUE"
        Case Calib.SystemLibNet.Def.LED_CYAN
            msg = "LED_CYAN"
        Case Calib.SystemLibNet.Def.LED_MAGENTA
            msg = "LED_MAGENTA"
        Case Else
            msg = "LED_UNKNOWN"
    End Select
    MessageBox.Show(msg, "LED")
End If
```

Note:
If you type this code manually you should see the IntelliSense offer you suitable options as appropriate. If you do not, make sure you review steps 1 to 5 to make sure you have added the reference correctly.

6. Choose **Windows Mobile 6 Professional Device** for the Target Device to establish connection with the PC.
7. Choose Deploy <name of project> on Build menu.
8. The project will be built and copied to the IT-300. By default, it will be copied to **\Program Files\<name of project>** folder. **SystemLibNet.dll** will be deployed to the same folder.
9. Check that the program works correctly on the IT-300.

8.3 Developing in C#

This chapter describes necessary steps to develop the example application program (see Chapter 8) in C# environment using the Common Device Control Class Library.

Application Development Procedure

Subsequent steps show how to create and start up a simple program using one of the system functions. When running the program, the LED will blink in red for 5 seconds.

1. Create a new C# Smart Device Application in Visual Studio .NET.
2. In **Solution Explorer**, right click **References** and click **Add Reference…**
3. Click **Browse** and navigate to the folder where you have stored the CASIO .NET library files. Highlight **SystemLibNet.dll** and click **Open**. Click **OK** button.
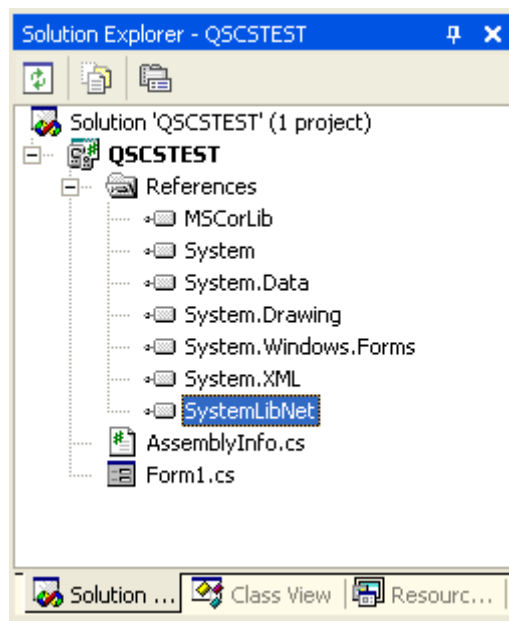

Figure 8.6

4. At the top of your source file add the following code.

```
using Calib;
```

5. Add a button to your form, rename it **LED** and double click it and then add the following code:

```
Int32 result = new Int32();
string msg;


result = SystemLibNet.Api.SysSetLED(SystemLibNet.Def.LED_RED, 5,
8, 8);


// .Net values "true" and "false" are "-1" and "0" respectively.
if(result == -1)
{
    result = SystemLibNet.Api.SysGetLED();
    switch(result & 0x0000000F)
    {
        case SystemLibNet.Def.LED_OFF:
            msg = "LED_OFF";
            break;
        case SystemLibNet.Def.LED_RED:
            msg = "LED_RED";
            break;
        case SystemLibNet.Def.LED_GREEN:
            msg = "LED_GREEN";
            break;
        case SystemLibNet.Def.LED_ORANGE:
            msg = "LED_ORANGE";
            break;
        case SystemLibNet.Def.LED_BLUE:
            msg = "LED_BLUE";
            break;
        case SystemLibNet.Def.LED_CYAN:
            msg = "LED_CYAN";
            break;
        case SystemLibNet.Def.LED_MAGENTA:
            msg = "LED_MAGENTA";
            break;
        default:
            msg = "LED_UNKNOWN";
            break;
    }
    MessageBox.Show( msg, "LED");
}
```

Note:
If you add this code manually you should see the IntelliSense offer you suitable options as appropriate. If you do not see this, then review steps 2 to 4 in the previous page to make sure you have not made a mistake.

6. Choose **Windows Mobile 6 Professional Device** for the Target Device to establish connection with the PC.
7. Select Deploy <name of project> on Build menu.
8. The project will be built and copied to the IT-300. By default, it will be copied to \Program Files\<name of project> folder. **SystemLibNet.dll** will be deployed to the same folder.
9. Check that the program works correctly on the device.

9. Resources

Microsoft's own http://msdn.microsoft.com/mobility/ is an extremely comprehensive resource for programmers targeting WindowsCE .NET based devices. It includes links to most other useful web based resources. You will find detailed Software and Library manuals on http://world.casio.com/system/pa.