WindowsCE .NET

Guide

For

Software Development

(Version 1.00)

CASIO Computer Co., Ltd.

June 2004

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Editorial Record

Manual Version no.	Date edited	Page	Content
1.00	June 2004		Original version

Preface

This reference guide provides technical information, tips and precautions you must be aware prior to development of application software and drivers that are to be installed in the WindowsCE .NET -based CASIO handheld terminals.

1. Development Environment

1.1 Application

Select one from the development environments described below to suite your software development environment.

- **Visual Studio 2003**

This environment in **Visual Basic .NET** enables you to develop application software using Compact Framework. Download first "WindowsCE Utilities for Visual Studio .NET 2003 Add-on Pack" of Microsoft of which its home page's URL is described in Chapter 6 to carry out the remote debug. Also, refer to **Readme.htm** that describes the method to download **Visual Studio .NET 2003**.

- **eMbedded Visual C++ 4.0 SP1**

eMbedded Visual C++ 4.0 SP1 can be used to develop application software. Development of application software running on the CASIO handheld terminals requires the respective SDKs (Software Development Kit) to be installed in each terminal prior to development.

1.2 Driver

For development of driver such as CF card driver, the following development environment can be used.

- **eMbedded Visual C++ 4.0 SP1**

With **eMbedded Visual C++ 4.0 SP1**, a driver can be developed. Development of drivers running on the CASIO handheld terminals requires the respective SDKs (Software Development Kit) to be installed in each terminal prior to development. To carry out debugging, an application software dedicated for the testing only or debug messages to be implemented needs because other debugging than one for DLL related to the application software is not allowed.

2. CPU

Various kinds of CPU type are integrated in the CASIO handheld terminals. See Table 2.1.

Table 2.1

Series of handheld terminals	CPU Type
DT-X10 and IT-500 series	ARMV4T
IT-3000 series	ARMV4I
DT-X5 series	SH3

Select an appropriate CPU type suitable to the handheld terminal that you wish to develop application software for. The compatibility on some CPU type (ex. "ARMV4I" with "ARMV4T") apparently becomes possible. However, some of the functions do not run as accurate as they should be according to the assessment tests performed by CASIO. Thus, module compiled once for the CPU compatible with **ARMV4I** must be recompiled for **ARMV4T** before installing.

3. Feature

With **Pocket PC 2002** operating system, all the features to be implemented in handheld terminals and PDAs are defined by Microsoft. Thus, the same features are implemented in any of **Pocket PC 2002** -based devices. However, **WindowsCE .NET** operating system is a general operating system that allows individual features to be selected and embedded as required by manufacturer for specific model of handheld terminal or PDA. This causes the features embedded in **WindowsCE .NET** -based devices not identical. It means also that software running on **Pocket PC 2002** -based devices cannot be guaranteed for the operability after porting it to other **WindowsCE .NET** -based devices.

Make sure always the functions required by the application software if the application software does not run properly after porting it from other **Pocket PC 2002** -based device. Check each function listed in the respective software manuals of the CASIO handheld terminals if it is operable on the specific model.

4. QFE

"QFE" is the abbreviation for **Quick Fix Engineering** that is an updated module released by Microsoft. It will be released if any bug is found in the OS.

A CASIO handheld terminal is always designed and developed with the latest **QFE** available from Microsoft at a time of the development initiation. This becomes automatically the version of the OS. Refer to Chapter 6.1 "Information List Of Terminals" for QFEs adopted for the latest CASIO handheld terminals.

5. Tips

5.1 Difference Between Pocket PC 2002 And WindowsCE .NET

Pocket PC 2002 has been developed based on WindowsCE 3.0 operating system while **WindowsCE .NET** was introduced after WindowsCE 4.0. Because of this background difference between the two original OS versions, there are remarks to be made in this chapter.

5.1.1 Driver

Individual driver for **Pocket PC 2002** and **WindowsCE .NET** has been built and is structurally different each other. Especially the network related drivers (for "ndis") implemented in **WindowsCE .NET** are different from those in **Pocket PC 2002**. This needs your exercise and care. Refer to a technical document released from Microsoft, and Help file of the respective operating systems.

5.1.2 Application

Pocket PC 2002 adopts the dedicated shell with features enhanced comparing with those available with **WindowsCE .NET**. This will restrict you to porting application programs that use the enhanced features without having any modification. For example, a source code that uses these functions declared in **aygshell.h** header file are all the enhanced functions in **Pocket PC 2002** cannot be used as is for **WindowsCE .NET**. Prior to use of the source code, a modification that disables the enhanced functions must be made.

5.1.3 CPU Type

The CPU type integrated for both operating systems is not the same. This causes modules compiled for **Pocket PC 2002** not to run under **WindowsCE .NET** without recompiling. You need to compile the modules again for **WindowsCE .NET**.

5.1.4   Calling Win32 API With Visual Basic .NET

Visual Basic .NET features with "Declare Function" that is a method to call external DLL. Using this method, the features of **WindowsCE .NET** not operable with Compact Framework can be called.
The following shows an example that declares the use of **API(RegOpenKeyEx)** function to open the registry key.

```
Declare Function RegOpenKeyEx Lib "coredll.dll" ( _
    ByVal hKey As Int32, _
    ByVal lpSubKey As String, _
    ByVal ulOptions As Int32, _
    ByVal samDesired As Int32, _
    ByRef phkResult As Int32) As Int32
```

To know actually from which DLL these functions are exported and with names, refer to Help file or header file of eMbedded Visual C++ Platform Builder. Most of the basic APIs are included in **coredll.dll**.

6. Appendices

6.1 Information List Of Terminals

Important information related to the CPU, OS, Compact Frame and QFE for the CASIO handheld terminals is described in the table below.

Table 6.1

Terminal	OS Version	CPU	Compact Frame	QFE (Note 1)
DT-X10	CE .NET 4.1	ARMV4T	1.0	QFEs released before January 31st 2003 (including Q812178). Q811925 is excluded (Note 2).
IT-500	CE .NET 4.1	ARMV4T	1.0	
IT-3000	CE .NET 4.1	ARMV4I	1.0	All QFEs released before Q4 of 2003.
DT-X5	CE .NET 4.1	SH3	1.0	All QFEs released before Q1 of 2004.

Notes:
1. For detail of each QFE, refer to "ReadMe" of the respective QFE packages by accessing the appropriate URL available on "Quick Fix Engineering (QFE) Updates" page.
2. "Q811925 (for the problem of hanging up the device when Wireless LAN is opened)" has not been implemented due to the contention with Intel's W-LAN Card driver.

6.2 URL

- To obtain further detail about **WindowsCE Utilities for Visual Studio .NET 2003 Add-on Pack**, access the URL below.
  http://microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=7EC99CA6-2095-4086-B0CC-7C6C39B28762

- To download the latest package of **Quick Fix Engineering (QFE) Updates**, access the URL below.
  http://www.microsoft.com/windows/Embedded/ce.net/downloads/updates/default.asp

6.3 Q & A

Q :

If you try to remote debug using **eMbedded Visual C++ SP1**, an error message detailed below will appear on the screen.

The [Name of the CPU] CPU does not support the [Application] [Active configuration] configuration.
The execute file cannot run on the terminal.
Do you wish to execute ?

<div align="center">Yes / No</div>

A :

Other terminal model not the one you wish to debug may be selected. Check the settings of active platform of **eMbedded Visual C++ SP1** and the active configuration.