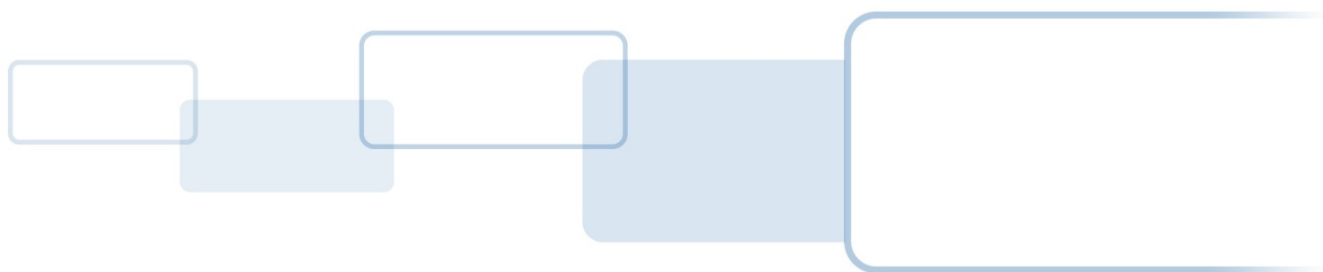




Lumidigm vCOM Example

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1 Overview

The vCOM Example Application is part of the vCOM Integration Kit and demonstrates a sample integration of the vCOM protocol over RS-232 and USB on multiple platforms. It contains the source code to a library which implements the vCOM protocol, as well as a client application that calls that library to perform a simple fingerprint verification test.

Note: The example code is not designed to be used in a production system. Rather, it was created to assist software developers in the design and implementation of their own production code.

2 System Requirements

This example application is supported by the following platforms: Microsoft® Windows® XP, Windows 7 x86/x64, Windows 8 x86/x64, Windows CE 5.0, Windows CE 6.0, and various Linux distributions. Please reference the *Lumidigm vCOM Integration Kit* document for a full description of the system requirements for this example.

3 Windows XP / Windows 7/8/10

This section covers what is required for configuring, building and using the example on systems using the Windows XP, Windows 7/8/10 platforms.

3.1 Installing Lumidigm Fingerprint Sensor Driver

Install the Lumidigm drivers for your operating system (Windows XP, Windows 7/8/10). Reference the *Lumidigm Drivers Install Guide* document for a full description of how to install the Lumidigm drivers on Windows XP, Windows 7/8/10.

3.2 Building the Example Code

A Visual Studio 2005 solution file is provided with the installation. Open the VCOMExample.sln file in the **<Install Dir>/Build/Win32** directory. Set the VCOMExampleApp project as the startup project. Select the configuration you are interested in building and build the solution.

The application has code to demonstrate general vCOM calls along with a separate example of using the Identification API.

Notes:

- Open Visual Studio as Administrator or copy the sample code to a writeable area on your system.
- MUST have WINDDK installed to build the USB Example Code. Make sure to set working directories properly to get the example to run.

4 Windows CE

This section covers what is required for configuring, building and using the example on systems using the Windows CE 5.0 and Windows CE 6.0 platforms.

Note: Only V30x and M30x sensors are supported on this platform.

4.1 Preparing PC for Windows CE Development

Integration efforts using WinCE 5.0 will require the installation of Windows Embedded CE 5.0 Evaluation Kit with Platform Builder. This can be downloaded here:

<http://www.microsoft.com/downloads/details.aspx?FamilyID=486E8250-D311-4F67-9FB3-23E8B8944F3E&displaylang=en>.

Integration efforts using WinCE 6.0 will require the installation of the Windows Embedded CE 6.0 plug-in for Visual Studio 2005. This can be downloaded here:

<http://www.microsoft.com/downloads/details.aspx?familyid=7E286847-6E06-4A0C-8CAC-CA7D4C09CB56&displaylang=en>.

Note: The installer will need a product key. To obtain a valid key for the installation click on the link above then click on the link in the first line of the page's Overview section.

4.2 Preparing Visual Studio 2005 for Windows CE Development

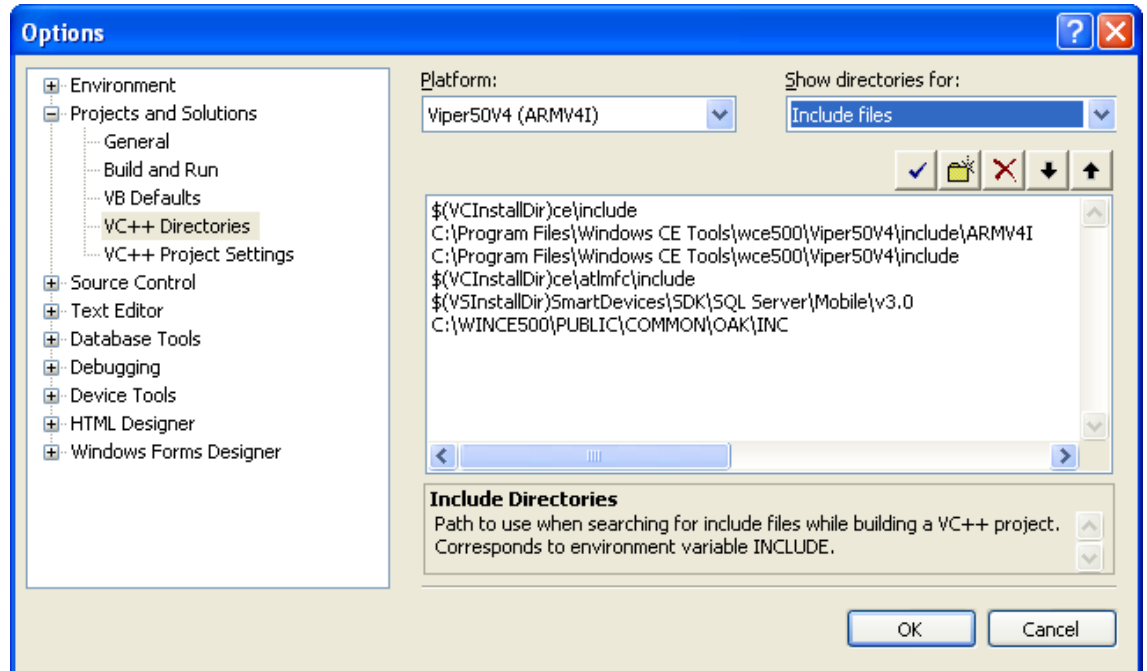
Set up Microsoft VS2005 for WinCE development on your machine. For this step you will need to know where you installed your Windows Embedded CE SDK.

Important: The solution provided will not build correctly until the appropriate Microsoft Windows Embedded CE SDK is installed and Visual Studio is set up properly using the instructions in this step.

The following example illustrates how to setup VS2005 for WinCE 5.0. The setup for 6.0 is the same, just replace WINCE500 with WINCE600:

1. Open VS2005 and select **Tools > Options** from the main menu.
2. Expand the **Projects and Solutions** section in the tree control.
3. Select **VC++ Directories**.
4. Select **Pocket PC 2003 (ARM4V)** from the Platforms dropdown menu.
5. Select Include Files in the **Show Directories for** dropdown menu.
6. Add the directories **WINCE500\PUBLIC\COMMON\OAK\INC** and **WINCE500\PUBLIC\COMMON\DDK\INC** to the list.
7. Switch the dropdown to libraries and add the directory **WINCE500\PUBLIC\COMMON\OAK\LIB\ARM4VI\RETAIL** to the list.
8. Select the platform your device supports from the **Platforms** dropdown. Note that this will become available when you install the SDK that comes with your device.
9. Select Include Files in the **Show Directories for** dropdown menu.

10. Add the directory **WINCE500\PUBLIC\COMMON\OAK\INC** to the list. An example of this is shown in the figure below.
11. Switch the dropdown to libraries and add the directory **WINCE500\PUBLIC\COMMON\OAK\LIB\<Platform>\RETAIL** to the list.



12. Verify that the paths include the directory and library directory to the SDK for the CE device were properly installed.

4.3 Installing Lumidigm Fingerprint Sensor Driver on WinCE Device

This step will setup the CE device to find and use the Lumidigm sensor driver correctly. The VX00DrvCe.reg file is supplied with your installation (in <Install Dir>/drivers/WinCE/VX00DrvCE/dat).

The file contains the registry settings that the WinCE device manager uses to know where the driver DLL for the Lumidigm sensor is located. This file contains the registry settings needed for V30x and M30x sensors. Reference the CE device's documentation on how to properly modify and persist the registry settings on the device.

Examples of changing the registry:

1. Copy the file to the top level directory of the device.
2. If the device has **Regedit** installed you can launch Regedit and import the **VX00DrvCE.reg** file from the **File** menu.
3. Alternatively, if the device has **Regpatch** installed you can follow these steps:
 - a. Open a command line prompt on the device.
 - b. Type the command **Regpatch VX00DrvCe.reg** on the command line.
 - c. Type the command **Savereg** on the command line to save the registry settings. Some manipulation of these steps may have to occur to apply the registry settings for the specific CE device that is targeted.

4.4 Configuring Projects for Your WinCE Device

The solution contains default configurations for Pocket PC 2003, Eurotech Viper WinCE 5.0 ARM4VI, and Eurotech BitsyXb WinCE 6.0 ARM4VI devices. If your WinCE device is something other than the aforementioned, you will need to create a configuration for your WinCE device.

Install the SDK that came with the WinCE device. Add the new platform to the Configuration Manager by following these steps:

1. Open the Configuration manager (**Build > Configuration Manager**)
2. Select **Active solution platform > New**
3. In the **New Solution Platform** window, there should be an option for your platform in the new platform dropdown menu.
4. Select your platform.
5. For WinCE 5.0 devices select **Copy Settings from > Viper50V4 (ARM4VI)**.
6. For WinCE 6.0 devices select **Copy Settings from > EuroTech_CE_6.0 (ARM4VI)**.
7. Click **OK**.

4.5 Building the Driver Source

1. Open the VX00DrvCE.sln file in the **<Install Dir>/drivers/WinCE/VX00DrvCE/Build/WinCE** directory.
2. Select the Release configuration.
3. Select the appropriate Solution Platform (i.e., *SomeDevice(ARM4VI)*) for your device.
4. Build the solution.
5. If you have a connection to the device, deploy the DLL by selecting **Build > Deploy Solution**. This will copy the driver DLL over to the device.

The VX00DrvCE solution/project ONLY builds the Lumidigm sensor driver DLL for the specified WinCE device. The generated DLL has to be deployed to the WinCE device every time the CE device reboots. The VX00DrvCE project can be included into the VCOMExample solution (or vice versa) if it is desired to deploy all three components at the same time. The deployment assignment is listed under the project properties under Configuration Settings and then Deployment.

4.6 Building the Example Code

1. Open the VCOMExample.sln file in the **<Install Dir>/Build/WinCE** directory.
2. Select the Release configuration.
3. Select the appropriate Solution Platform (i.e., *SomeDevice(ARM4VI)*) for your device.
4. Build the solution.
5. If you have a connection to the device, deploy the library and executable to the device by selecting **Build > Deploy Solution**. This will copy the VCOMExample.dll and the VCOMExampleApp.exe over to the device.

4.7 Troubleshooting Tips

- Make sure to set the deployment directories properly to get the example to run. Check this in Project Properties under Deployment.
- Make sure the correct platform is selected before building and deploying the projects.
- If you are not connected to the device using ActiveSync or some other method, you will have to manually copy the files to the device in some other way.
- Make sure that the **Additional Options** in the command line section of the linker project properties is set to the appropriate version of WinCE you are running.
- Building the driver project in Debug mode will produce a log file in the temp directory of the WinCE device that may provide some information on what problems the driver is having.

5 Linux

This section covers what is required for configuring, building and using the example on systems using the various supported Linux platforms.

5.1 Installation

Unzip the file VCOM-Integration-Kit_v6.00.xx.gz (where xx is the specific build of the installer) then extract the tar file included in the zip.

```
tar -xvf VCOM-Integration-Kit_v6.00.xx.gz
```

5.1.1 Install the Driver

This needs to be done once per system. Run the installation script in the driver folder to build and install the kernel mode driver onto the system. You must be in a **root** user shell for the driver installation to work properly. Either login to the system as **root** or type **su -** to login. Alternatively (or on Ubuntu) run the script with **sudo**.

```
sudo ./install.sh
```

5.2 Building the vCOM Library and Example Code

A build script is provided to build the entire package. Just type **./build.sh** to execute the script.

Follow these instructions to independently build the vCOM Library and example code on the system:

1. Navigate to the installation directory, then down to **<Install Dir>/SampleCode/VCOMExampleApp**.
2. Type make from this directory:
 - a. This will build the vCOM libraries then the VCOMExampleApp
 - b. The library will be put into the *<Install Dir>/VCOMExample/lib* directory and will be statically linked into the VCOMExampleApp. This will also build a shared object library located in the *<Install Dir>/bin* directory
 - c. The executable will be located in the *<Install Dir>/bin* directory
3. Plug in a Lumidigm sensor and run the test program.
 - From the *<Install Dir>* type **./bin/VCOMExampleApp** on the command line and follow the instructions on the screen

