DEVELOPER REFERENCE MANUAL

(Rev 1.0)

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1 OFIS SDK INTRODUCTION

The FingerTec® Online Fingerprint Identification System (OFIS) Developer Reference Manual guides developers how to quickly and easily integrated fingerprint authentication functionality in their Web-based applications as well as in their Windows-based application by using the OFIS SDK.

What's in This Guide

Following are description of each chapter in this guide:

Chapter 2 Ofis SDK Description describes the process of registration and verification of fingerprint template using FingerTec® Ofis Scanner. It explains how the fingerprint template is split into different pre-registered templates during the registration process and how the fingerprint template is verified by using the FAR (False Accept Rate) constraint.

Chapter 3 Ofis SDK Structure describes the features and specifications of the FingerTec® Biokey algorithm.

Chapter 4 Ofis SDK Overview describes the process and procedures of registration and verification when Ofis is invoked.

Chapter 5 Ofis Server Side Installation describes the process flow and procedures during installation of the Ofis Server Side setup.

Chapter 6 Ofis Client Side Installation describes the process flow and procedures during the installation of the FingerTec® Ofis Scanner Software 1.0 setup and the Ofis Client Side setup.

Chapter 7 Ofis SDK Control and Function (Server Side) describes the controls and functionality of the server side and its database format.

Chapter 8 Ofis SDK Control and Function (Client Side) describes the controls and functionality of the client side and its attributes.

Chapter 9 Ofis SDK Web-based SourceCode Testing describes the sample codes, which come with the package for further testings and development. There are 2 types of sample, web-based connected

to a local database and web based but not connected to a local database. These are sample code runs on asp script to invoke the Ofis interface during the registration and verification testing.

Chapter10 Ofis SDK Windows-based SourceCode Testing describes the sample codes available in the client-server application. This sample application demonstrates the communication between client and server model where the client registers fingerprint templates where as the server will perform verification and matching of the fingerprints. The sample applications come in different development platforms which are Delphi, Visual Basic 6.0 and Visual C++ 6.0. There are different samples to choose from at your convenience.

Chapter11 List of Ofis SDK Language Files describes the lists of available languages that can be invoked by the Ofis application.

Chapter12 Troubleshooting describes the common problem and how to troubleshoot the Ofis SDK.

Chapter13 Hardware Handling and Usage demonstrates how to plug the Ofis Scanner to computer and describes how to maintain and clean the Ofis Scanner

Appendix A Internet Information Services (IIS) Installation Guide describes the process flow during the installation of the IIS.

B Installing Ofis Components into Borland Delphi 7.0 describes the procedures to install the Ofis client and server components into Delphi IDE. These components need to be installed so developers can use the Ofis components to start development.

C Installing Ofis Component into Microsoft Visual Basic 6.0 describes the procedures to install the Ofis client and server components into Visual Basic 6.0 IDE. These components need to be installed for developers to use the Ofis components and start development.

D Installing Ofis Components into Microsoft Visual C++ 6.0, describes the procedures to install the Ofis client and server components into Visual C++ IDE. These components need to be installed for developers to use the Ofis components and start development.

Requisite Knowledge

In order to use this guide effectively, you should be familiar with the following subjects:

- A basic knowledge of Microsoft Internet Information Server is required to serve Web applications to users.
- The fundamental skills for scripting language such as JavaScript and MS Access for databases, tables, and fields required for OFIS.
- Ability to write code and implement Active X controls for Web application and Windows application.
- Fundamental skills to write Delphi, Visual Basic and C++ languages as well as other IDE languages.
- Have a basic understanding on client server model application.

Database Security

You should design methods that ensure database security and the privacy of the end-user when deploying Ofis server.

Following are a few suggested methods for ensuring security:

- For example, if we were to use Microsoft Access, the way to secure it is to set up user level security. When all are defined, all the workgroups are stored in the Microsoft Access Workgroup Information File. Every group has their own unique SID (Security ID). Thus, each of them has deferring permission to access the database. Whenever a user attempts any action on a Microsoft Object Access (Jet Engine), it will scan the database table by using the current user SID to verify the permission for further action.

- Store the database that is only accessible by a particular user who is authorized to have a full access to the database. This will reduce the risk of unauthorized access to the database. As an added security measure, a firewall should be installed to protect the database.

Support Resources

In addition to this guide, the following resources are provided for additional support:

- The Ofis Developer Reference Manual is provided in PDF file on the product CD. This manual is intended for developers that install this Ofis server to develop and integrate into their existing applications or systems.
- The FingerTec® Dealer Resou rce Center on the web site (http://www.fingertec.com) provides an online support for FingerTec dealers worldwide.
- E-mail support is available at **ofis@fingertec.com**.

Your Feedback Requested

The information in this guide has been thoroughly reviewed and tested. If you find errors or have suggestions for future publications, contact FingerTec at **ofis@fingertec.com**

2 OFIS SDK DESCRIPTION

Objective

To apply the fingerprint recognition technology in the browser/server environment (B/S = Browser/Server), where the system will allow user to register fingerprint templates online using an external scanner and via the Internet browser, these fingerprint templates will be transmitted to the backend server to be stored as well as to be used during the verification process.

Registration Process

The FingerTec® Ofis Scanner collects four images of the same finger and generates four temporary pre-registration templates. These are used to create a single registration template, which is then stored in a database with other user's information and later, the pre-registration templates are discarded.

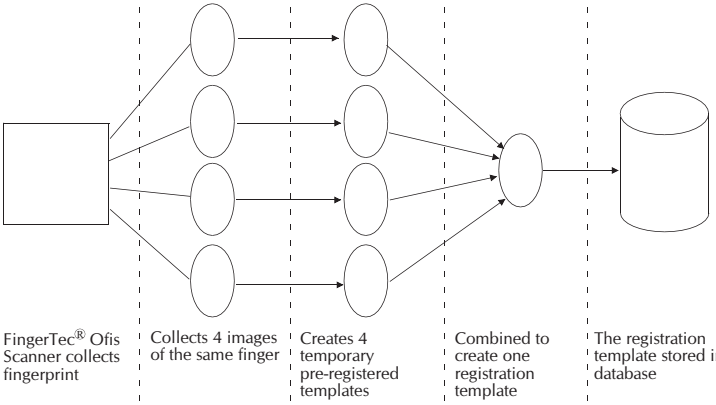

Figure 2-1: Diagram of Registration Process

Verification Process

A verification template is created when someone puts a finger on a sensor in order to be verified or identified. The fingerprint matching process uses a proprietary algorithm to calculate the probability that a verification template

and a registration template come from the same finger. It is mathematically impossible to say that two fingerprints match (or don't match) with 100% accuracy. Therefore, the current value of the False Accept Rate* (FAR) is used as a threshold. If the probability that two prints come from different fingers is less than the FAR, then they are declared a match.

On the client side, Internet Explorer (IE) is a browser to interact with the Ofis to gather the fingerprint of the user and the backend server will be using IIS (Internet Information Services) to carry out the verification process.

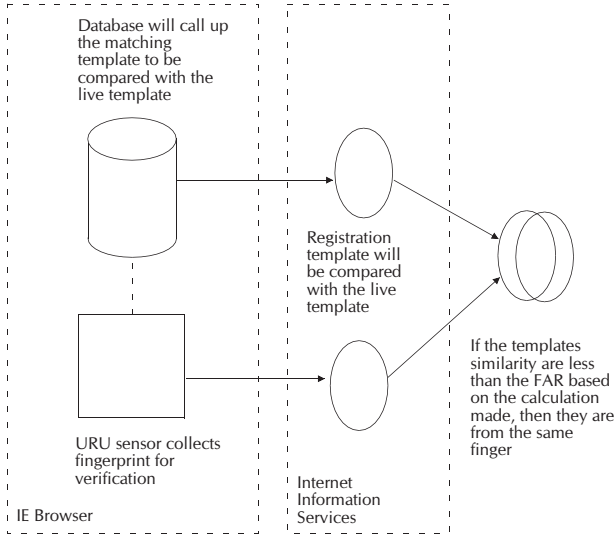

Figure 2-2: Diagram of Verification Process

NOTE

The False Accept Rate (FAR) is the probability that a finger will be incorrectly verified when compared to a different finger in the database. The FAR is used as a threshold in the verification process. The default value of FAR is 0.01% (0.0001), but it can be set to any value greater than 0% and less than 100%. The lower the FAR is set, the smaller the chance that someone will be incorrectly verified. The higher the setting, the greater the chance some people will have trouble being correctly verified.

3 OFIS SDK STRUCTURE

Ofis SDK is developed based on the FingerTec® Biokey calculation.

FingerTec® Biokey algorithm is a quick and accurate 1:1 and 1:N fingerprint identification algorithm, which is completely open to software developers and system integrators. If the FingerTec® Biokey algorithm is employed to identify fingerprints (2000-6000 pieces of fingerprints), the identification task can be easily completed within 1-5 seconds (the following tests require Pentium III 900MHz+ 128MB EMS memory) without categorizing fingerprints by names, PIN or any other categories in advance.

FingerTec® Biokey algorithm has the following features:

① FingerTec® Biokey software development package can be integrated to customers' systems easily, and it can support any scanner device and fingerprint sensor which has image quality of equivalent to 300dpi or more through open image process interface.

② By strainer mirrors and adequate valve values which are self-adaptive or can be easily matched, FingerTec® Biokey algorithm is able to weaken noise, increase the contrast degree of the bridge and vale, and to capture whole or partial feature points from fingerprint of bad quality which includes dirty, too dry or wet, broken, with wounds, scars and marks.

③ FingerTec® Biokey algorithm identification supports the translation of fingerprints (>=35% of the fingerprint size) and circumrotation for 360 degree. Exceptional technology is used to realize speedy verification when the fingerprint is translated or rotated 360 degree; the average speed is 3000 pieces/second, even when the fingerprint has few feature points such as 10 points or less.

④ FingerTec® Biokey algorithm does not require global feature points such as core point and triangular point, and identification can be completed with only using local feature points.

⑤ Through classification algorithm (fingerprints are classified into five categories: arch category, left loop category, right loop category, tine arch category, and vortex category), FingerTec® Biokey algorithm uses global features, which accelerate the process of fingerprint verification remarkably.

⑥ FingerTec® Biokey algorithm is concise, where the data only needs 350K memory, which allows it to be easily imported into embedded systems.

Ofis SDK requires the client and server to run on Windows Operating System.

Ofis SDK is using ActiveX to run on the Internet Explorer environment and a user can build a system into the web page of IE browser, or develop an application program to the sensor in the language of Visual Studio .NET, VC++, C++ Builder, Delphi, VB, and Visual Foxpro. The software in the server is provided as COM+ and groupware (IIS and ASP).

4 OFIS SDK OVERVIEW

There are two processes required when using Ofis.

- **The registration process** is to capture the end user fingerprint and generate a fingerprint template to be stored in the database.
- **The validation process** is to validate the fingerprint template from one user with the fingerprint template from the database.

The followings are the screenshots to illustrate the two processes:

Fingerprint Registration Process

During the process of registration, the Ofis interface will popup requiring user to select a finger to be enrolled into the system as displayed in Figure 4. Select a finger that you wish to enroll.

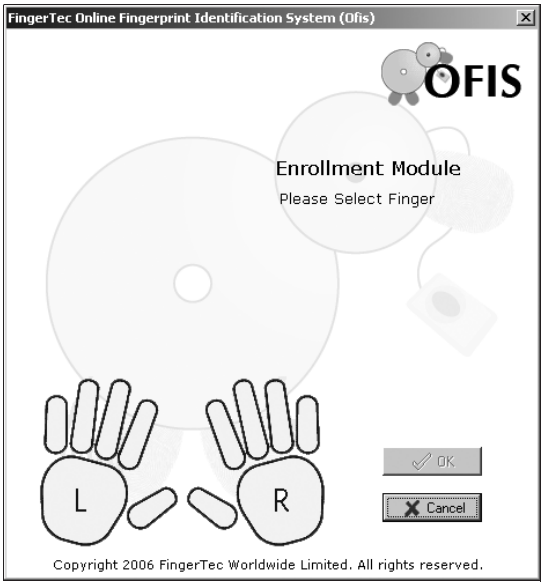

Figure 4-1

Place the selected finger repeatedly at the FingerTec® Ofis Scannerfor 4 times to capture your fingerprint templates. When the color bar is filled, your enrollment is complete.

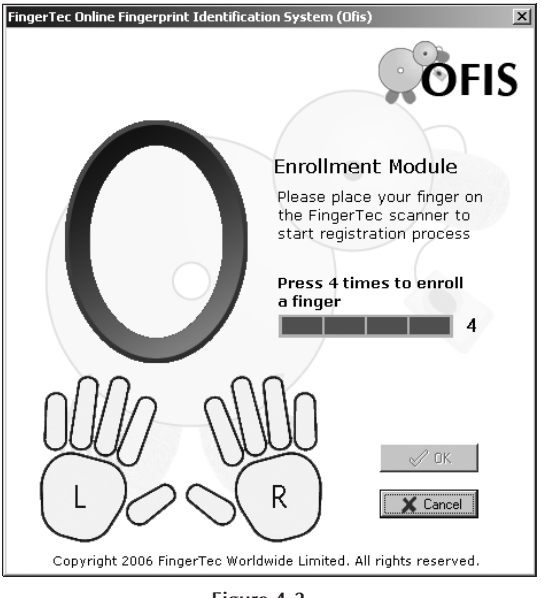

Figure 4-2

During the registration process, the finger must be placed correctly on the sensor. Failure to do so will prompt the following error message as displayed in Figure 6. You need to place your finger on the scanner again to recapture the fingerprint template.

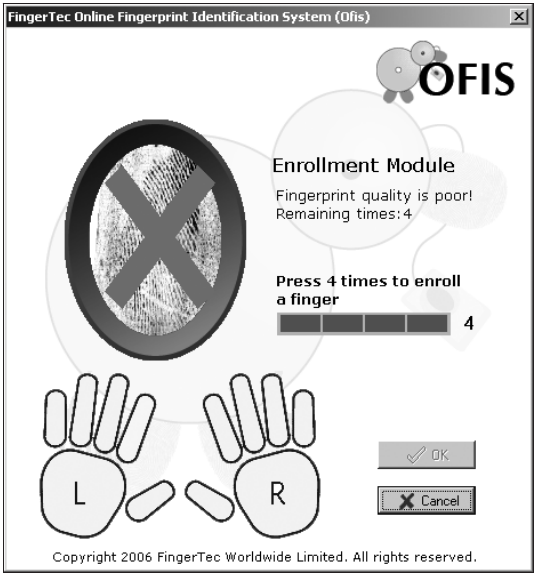

Figure 4-3

When the registration process is successful, the system will prompt "Registration is successful" message as shown in Figure 7. Click OK to close the Ofis window.

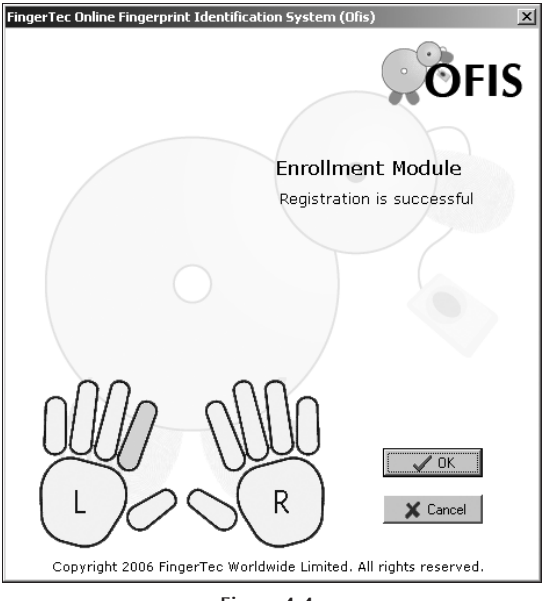

Figure 4-4

Fingerprint Verification Process

During the process of verification, the Ofis interface will popup requiring user to place the fingerprint at the FingerTec® Ofis Scanner.

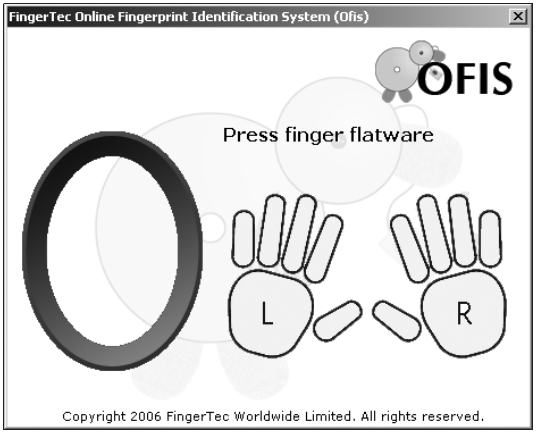

Figure 4-5

When the sensor has successfully captured your fingerprint template, it will display "Successful in receiving fingerprint template" and the windows will close automatically.

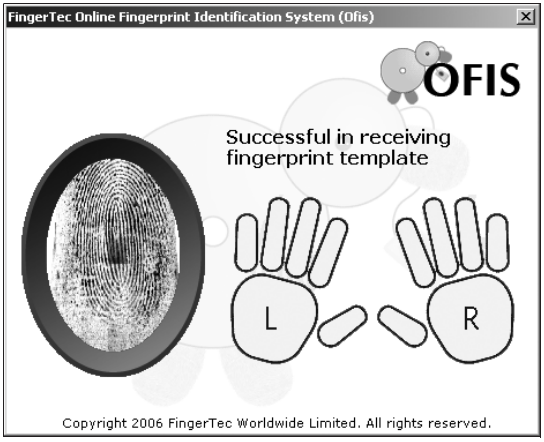

Figure 4-6

5 OFIS SERVER SIDE INSTALLATION

FingerTec® Ofis is working under browser/server environment, which requires some installations to be performed at the server level.

For Ofis server, installation of Internet Information Services (IIS), recommended version 6.0, is a requisite and the system must be running under Windows 2000 or above. Please upgrade the IIS at the Microsoft Windows Update if you are using an older version. For Internet Information Services (IIS) installation, please refer to **Appendix A**.

After the IIS has been successfully installed, the server needs to be installed with Ofis Server Side software. All the server side installation softwares are available on the Ofis Server Installation CD. The server installation process is as the following:

Screenshots of Ofis Server Side Software Installation

Double click on the icon Ofis Server Setup.exe. A window will pop up. Click Next to continue.

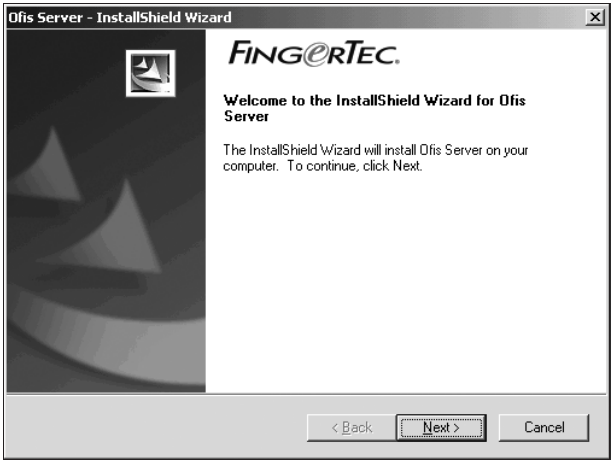

Figure 5-1

Please read the license agreement. You need to accept the terms of the license agreement to proceed to the installation process.

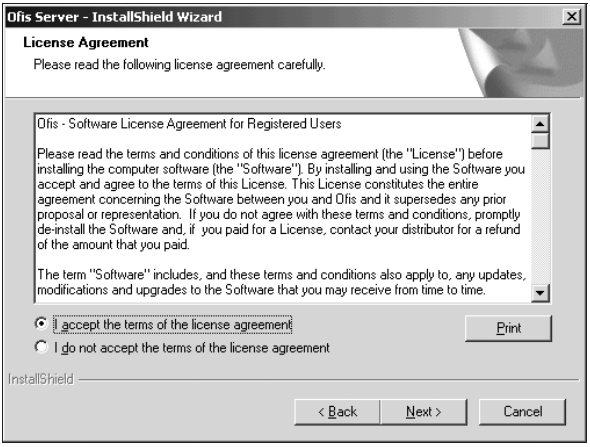

Figure 5-2

Enter your information and serial number. The serial number is available on the CD cover. When finished, click Next to proceed.

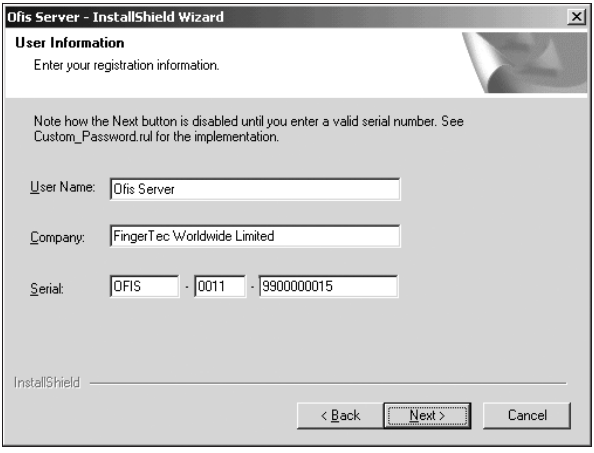

Figure 5-3

The installation process is currently running. Please wait until it is finished.

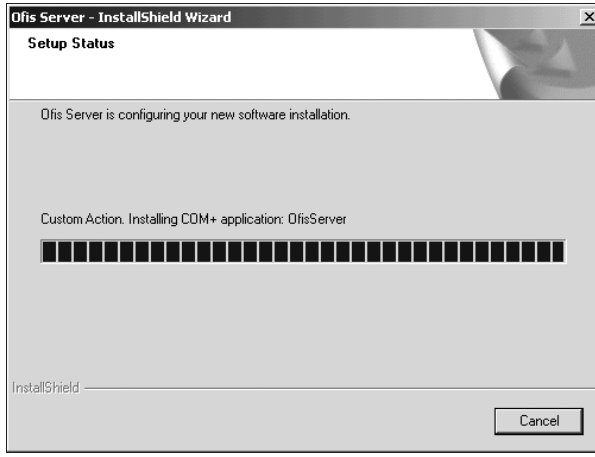

Figure 5-4

The installation of the Ofis Server is completed. Click Finish to exit the wizard. You may now start using the Ofis Server.

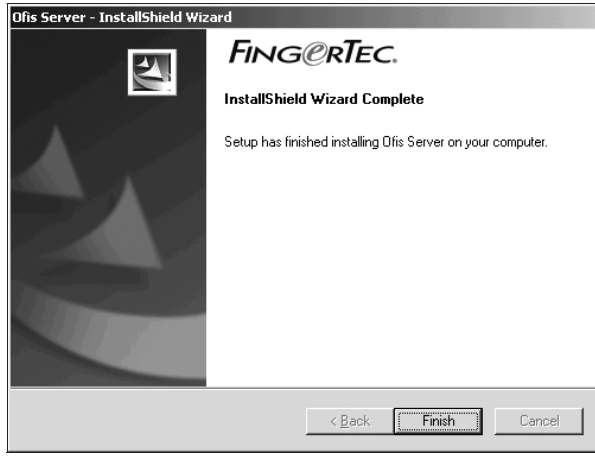

Figure 5-5

6 OFIS CLIENT SIDE INSTALLATION

To get the Ofis up and running at the client side, user needs to install two software (FingerTec® Ofis Scanner Driver and Ofis Client Side Software) which are available on the Ofis Client Installation CD.

Connection between the FingerTec® Ofis Scanner cannot be established before you installed the FingerTec ® Ofis Scanner driver. The operating system will not recognize the FingerTec ® Ofis Scanner if the driver is unavailable. The followings are the screenshots of the FingerTec ® Ofis Scanner driver installation:

Installing FingerTec® Ofis Scanner Software

Double click on the "FingerTec OFIS Scanner Software 1.0 setup.exe" in FingerTec_Ofis_Driver Folder. A window will pop up. Select your desired language and click OK to proceed. The languages available are English and Chinese Simplified.

Figure 6-1

Press Next to continue with the installation process.

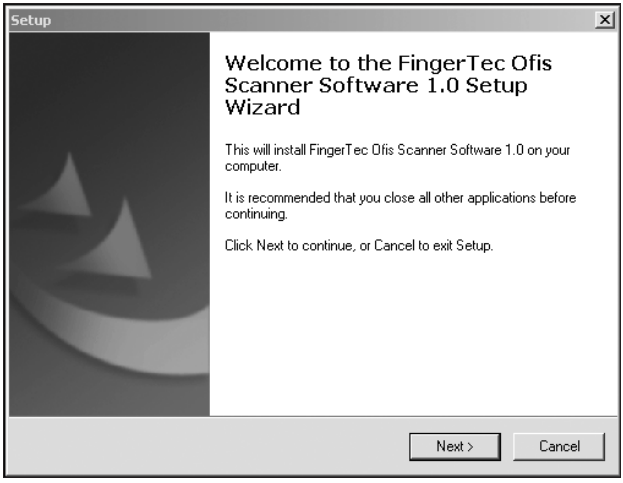

Figure 6-2

Please read the license agreement. You need to accept the terms of the license agreement to proceed to the installation process.

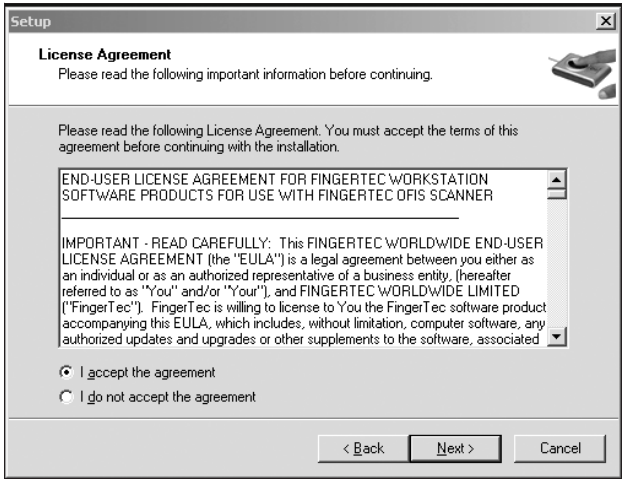

Figure 6-3

Please select the path to install. By default, it will install at the Program Files section. Click Next to continue.

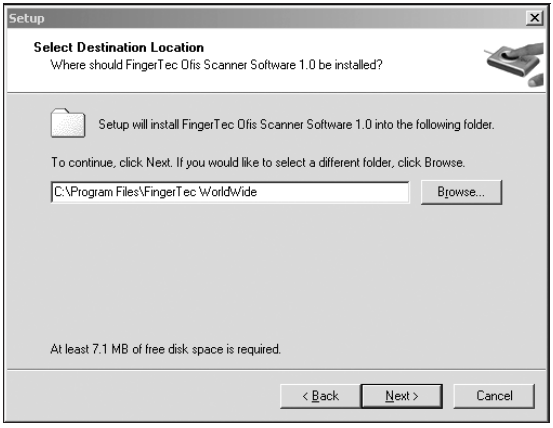

Figure 6-4

Press Next to continue the installation process. It is recommended for you to choose Full installation in order to install all components to make sure that the system works perfectly. Other types of installation include compact installation and custom installation

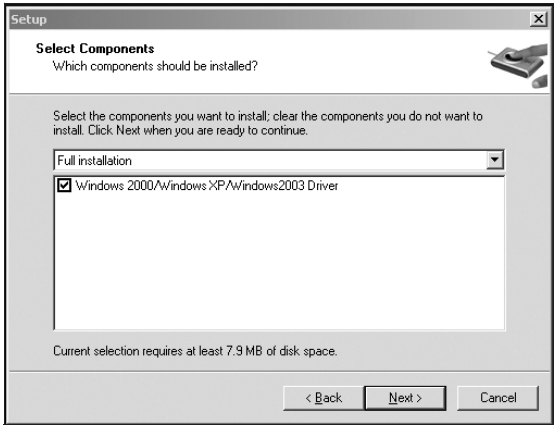

Figure 6-5

Press Install button to confirm installation.

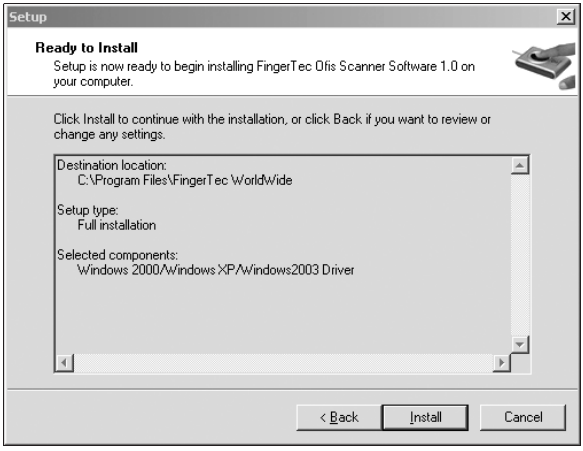

Figure 6-6

Installation process is running.

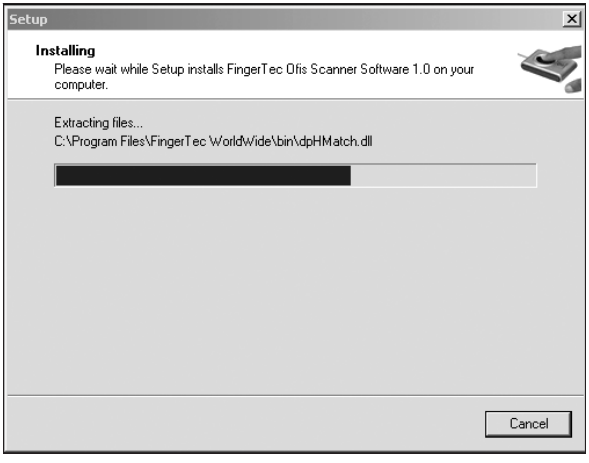

Figure 6-7

The FingerTec ® Ofis Scanner Software has finis hed installing. Restart computer to start using the device.

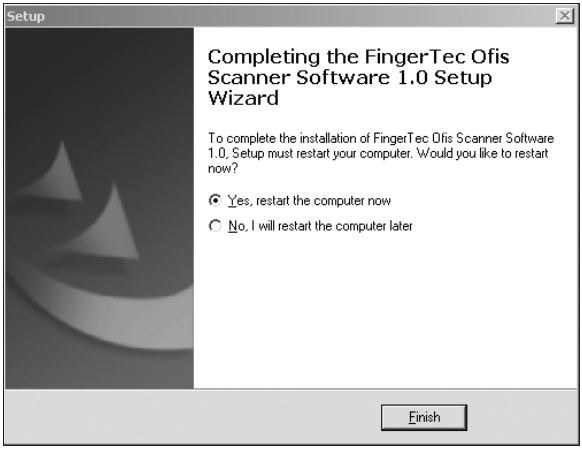

Figure 6-8

Installing Ofis Client Side Software

After the successful installation of the FingerTec® Ofis Scanner driver, you may start to install the Ofis client side software. The followings are the screenshots to install the Ofis client side sofware:

Double click on the icon of Ofis Client Setup.exe and it will prompt a window to pop up. Click Next to continue.

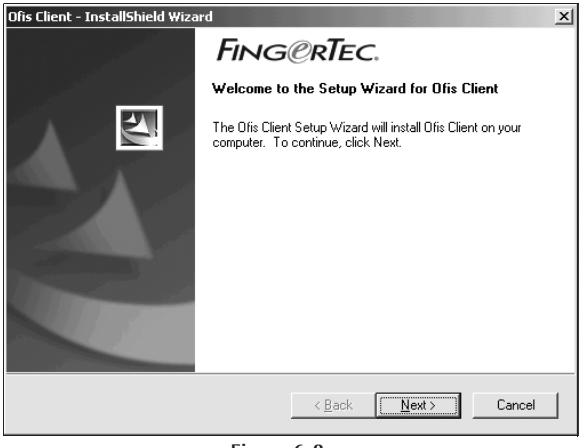

Figure 6-8

Read the license agreement. You need to accept the terms of the license agreement in order to proceed to the installation process.

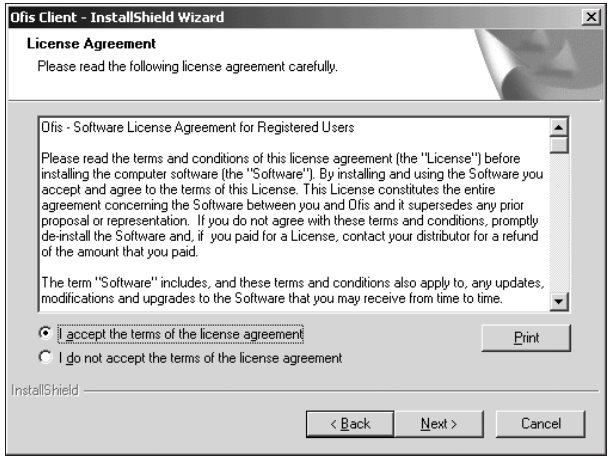

Figure 6-9

Enter your relevant information and click Next to proceed.

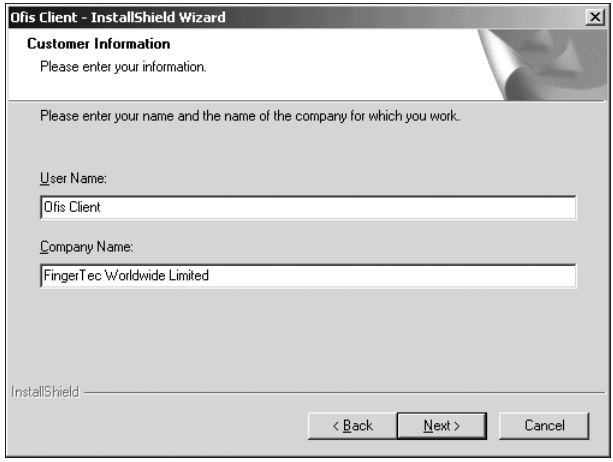

Figure 6-10

The information of installation will be displayed and click Next to confirm.

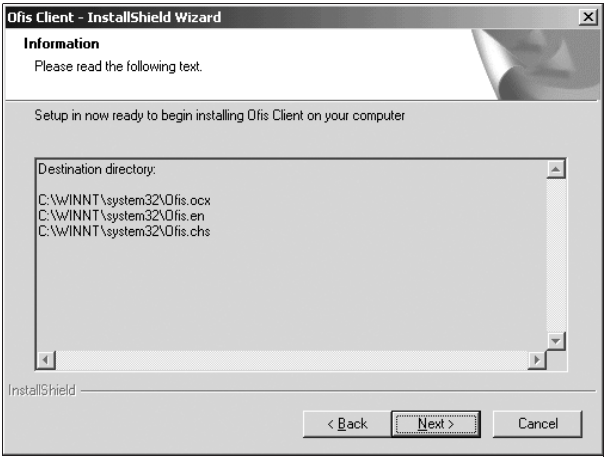

Figure 6-11

Click Install to start the installation process.

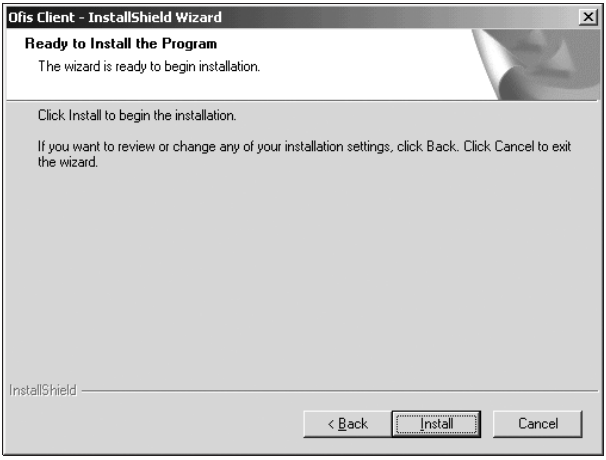

Figure 6-12

The installation process is running. Please wait until it is finished.

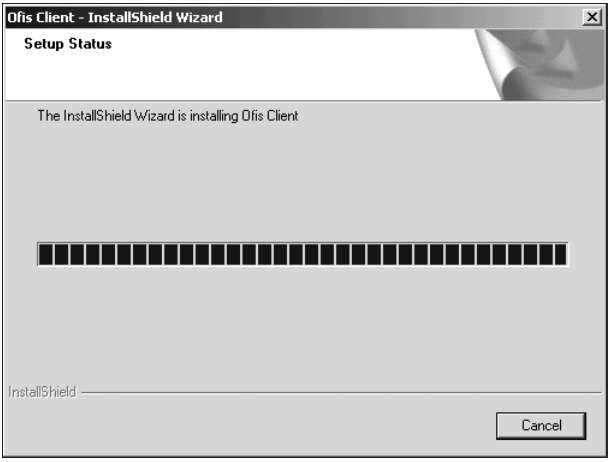

Figure 6-13

The installation of the Ofis client is complete. Click Finish to exit the wizard. You may now start to logon to the Ofis Client.

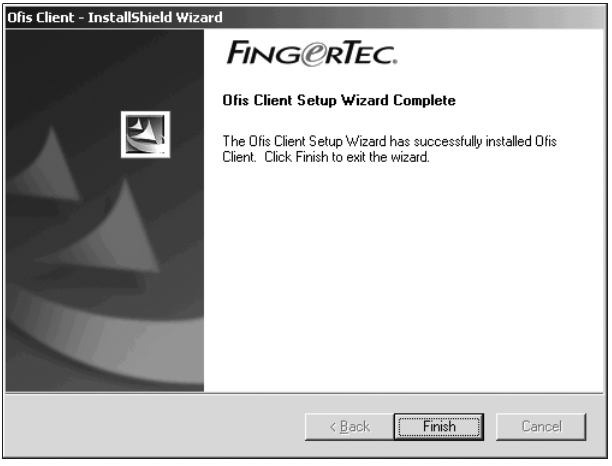

Figure 6-14

7 OFIS SDK CONTROL AND FUNCTION (Server Side)

Please make sure that you have already installed the Ofis Server Setup.exe before proceed to the following instructions. Under the IIS and ASP environment, you may use the sample code to invoke the OfisCOM object for fingerprint verification process.

```
Set OfisCOM = Server.CreateObject("OfisCOM.OfisCOM")
 if OfisCOM.Process(objRec("fingertemplate"), fingertemplate) then
     fingerpass = true
 end if
Set OfisCOM = Nothing
```

Function Description

Function Process (ARegTemplate As String, AVerTemplate As String) As Boolean
Used in fingerprint verification process, AregTemplate is the registered fingerprint template and AverTemplate is the fingerprint template for verification process. When successful, it will return TRUE and if it is failed, it will return FALSE.

Database Description

The database is using MS Access. You may change the database to your desired database structure. The basic database structure for Ofis is as the following:

Field	Type	Description
Id	Autonumber	Id which used as a primary key
Username	Text	Store the user's username
Userpass	Text	Store the user's password
Policy	Text	Store the policy e.g. "fingerprint only", "fingerprint and username" or "fingerprint and username and password"
Fingertemplate	Memo	Store the fingerprint template which is 2,048 bytes

8 OFIS SDK CONTROL AND FUNCTION (Client Side)

Ofis SDK is using an ActiveX component, Ofis.ocx. This ActiveX component can be invoked by using Javascript as the following description.

Function Explanation

- **Ofis.SetLanguageFile(Filename) As Boolean**
  Set the language of the client side interface. The language file available is English (Ofis.en), Chinese Simplified (Ofis.chs), Chinese Traditional (Ofis.cht). Word in () is the filename of the language file. Please refer to Section 9 List of Ofis SDK language File for more language file selection.

- **Ofis.Register()As Boolean**
  Start fingerprint registration process. Return TRUE if the registration is successful and return FALSE if the fingerprint registration is failed. Fingerprint template will be stored in the RegisterTemplate attribute.

- **Ofis.Verify() As Boolean**
  Start capturing a fingerprint template for matching. It will compare the fingerprint template with the RegisterTemplate return from Register function. Return TRUE if verified successful and FALSE if verified failed.

- **Ofis.GetVerTemplate() As Boolean**
  Start capturing the fingerprint template for backend server verification. It will return TRUE if successful and return FALSE if failed. Fingerprint template will be captured and stored in VerifyTemplate attribute if it has successfully captured the fingerprint template.

- **Ofis.MatchFinger(AregTemplate As String, AVerTemplate As String) As Boolean**
  Used in standalone fingerprint verification process. AregTemplate is the registered fingerprint template and AverTemplate is the fingerprint template for the verification process. Return TRUE if the verification is successful and return FALSE if the fingerprint verification failed.

Attribute Explanation

- **Ofis.VerifyTemplate As String**
  Attribute returned from GetVerTemplate() function.

- **Ofis.RegisterTemplate As String**
  Attribute returned from Register() function.

```
<OBJECT classid="clsid:E9A5302A-F08E-4929-9717-79CDC84F2490"
width=50 height=50 id=Ofis>
</OBJECT>

<COMMENT>
   <EMBED type="application/x-eskerplus"
      classid="clsid:E9A5302A-F08E-4929-9717-79CDC84F2490"
      codebase="ofis.ocx"
      width=2 height=2>
   </EMBED>
</COMMENT>
```

9 OFIS SDK SOURCE CODE TESTING

There are two different sets of source code available for developer to do testing and to understand the concept of Ofis SDK. The two sets of source code are Ofis SDK testing with database and Ofis SDK testing without using database.

Ofis SDK Testing with Database (Server Side Testing)

Ofis SDK testing with database is written using Active Server Page (ASP), MS Access and COM+ Object. In order to use this, the server must be installed with the Ofis Server Setup.exe and Internet Information Service (IIS).

Open the Ofis Server Installation CD and copy the folder named "sample_code_with_db" to the IIS running directory. You may access the fingerprint registration page by entering the path **"http://localhost/pathname_to_the_sample_code_folder/register.asp "** where "pathname_to_the_sample_code_folder" is the path in your respective directory. The fingerprint verification page is located at the **"http://localhost/pathname_to_the_sample_code_folder/login.asp"**. Username and password is an optional field.

This source code will perform registration of fingerprint into the MS Access, capturing the fingerprint, verifying the fingerprint as well as retrieving the fingerprint from the MS Access. MS Access does not need to be installed in the server. It uses the windows default connector, Microsoft.Jet.OLEDB.4.0 to connect to the MS Access.

Testing Ofis Server Side Software

In order to test the Ofis Server Side software, the server needs to install Ofis Client Setup.exe and FingerTec® Ofis Scanner driver in order to perform the registration and verification process

Open the Ofis Server Installation CD and copy the folder named "sample_code_with_db" to the IIS running directory. You may access to the testing page by entering the path **"http://localhost/pathname_to_the_**

sample_code_folder/register.asp" and "pathname_to_the_sample_code_folder" is the path in your respective directory.

The following is the explanation about the server side software interface

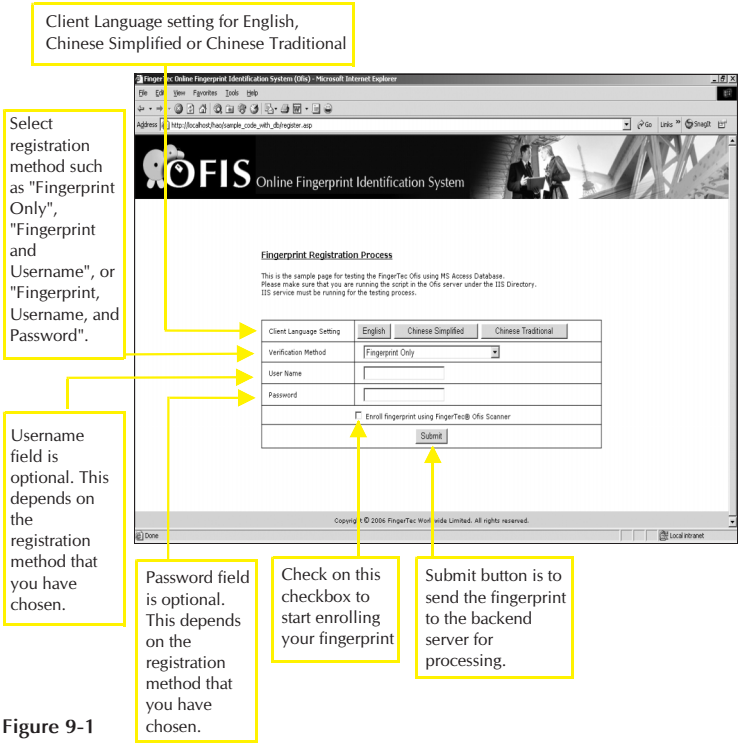

Figure 9-1

Fingerprint Registration Process

Access the register.asp in the IIS directory and you will get the following interface. You may click on the language setting button to choose your desired language. You may also select your registration method such as "Fingerprint Only", "Fingerprint and Username", or "Fingerprint, Username, and Password". Then, check on the Enroll fingerprint using FingerTec® Ofis Scanner checkbox.

A popup window like the following will appear. You may start to perform your fingerprint registration like the steps illustrated in the Ofis SDK Overview section.

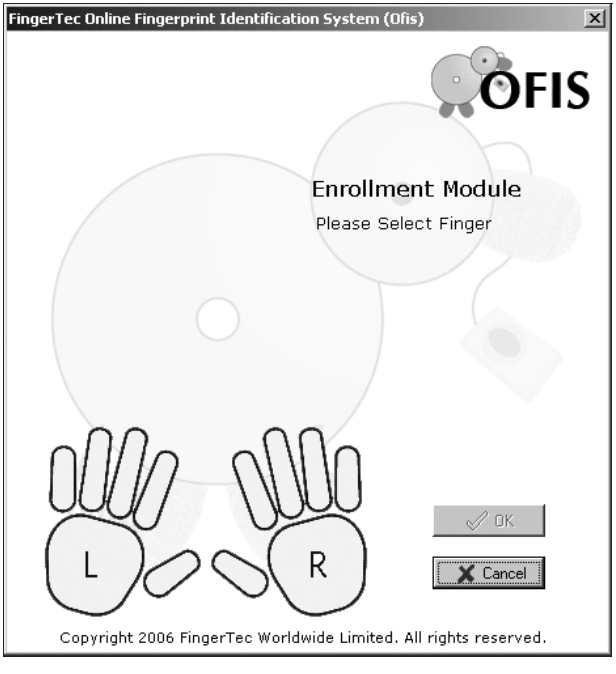

Figure 9-2

After the registration is completed, click the Submit button on the register. The fingerprint will then be registered to the database and a message will be displayed.

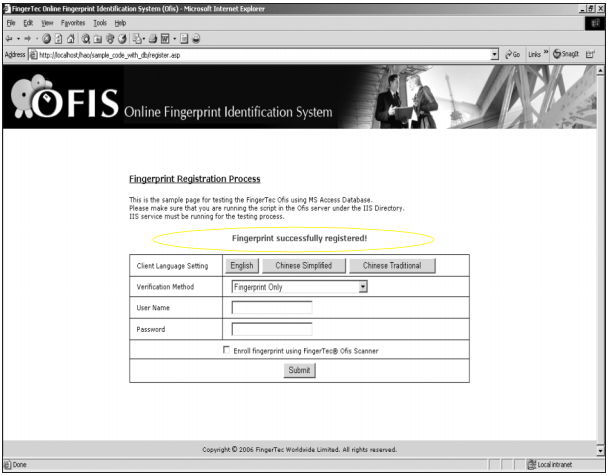

Figure 9-3

Fingerprint Verification/Login Process

Access to the login.asp in the IIS directory and you will get the following interface. Verification method needs to be the same value as what you have selected for registration method earlier.

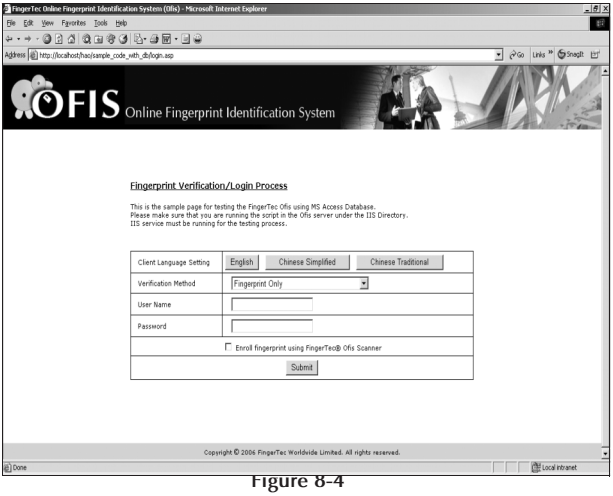

Figure 8-4

Then, check on the Enroll fingerprint using FingerTec® Ofis Scanner checkbox. The Ofis Client side interface will appear to capture your fingerprint for verification. This window will close automatically after it has captured your fingerprint.

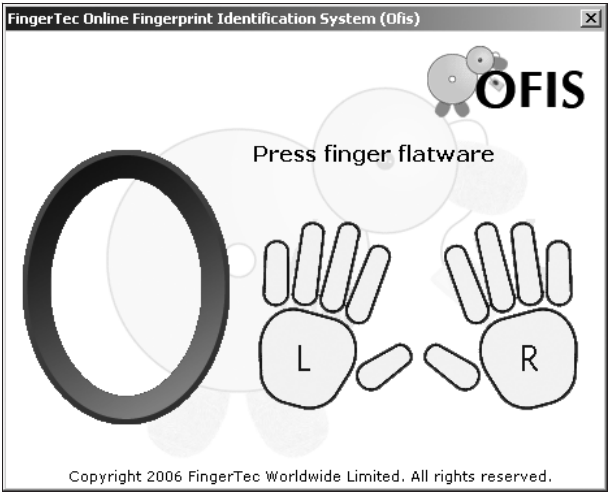

Figure 9-5

After the verification process is completed, click the Submit button on the login.asp. The fingerprint will be sent to the backend server for verification and a message will be displayed if the fingerprint matches. policy

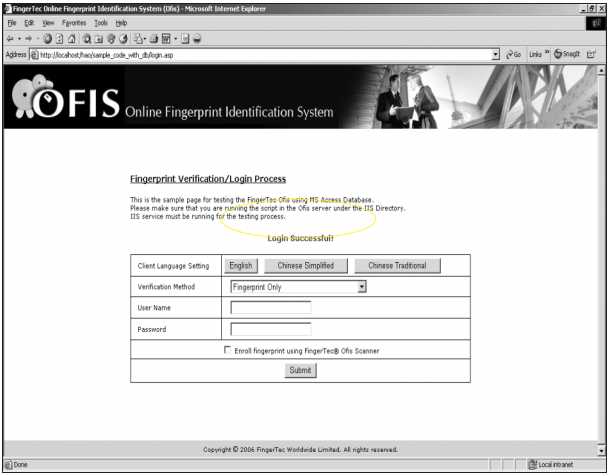

Figure 9-6

Ofis SDK testing without using database (Client side testing)

Ofis SDK testing without using database is written using HyperText Markup Language (HTML) and Javascript to run on the Microsoft Internet Explorer (IE). You can get this file at the Ofis Server Installation CD. The file is located in the folder sample_code_without_db, a filename called index.html.

The client needs to install Ofis Client Setup.exe and FingerTec® Ofis Scanner driver in order to run the index.html. In the index.html, there are a few options for the user to test the functionality of Ofis. The user can set the Ofis language to English, Chinese simplified or Chinese traditional by clicking on the respective button. To invoke the registration process, the user may click on the Register button. To verify the fingerprint locally, the user can click on the Local Verify button. The Local Verify button can only be activated if the user has completed the registration process. To acquire fingerprint template only, the user may click on the Acquire Fingerprint Template button to capture the fingerprint template.

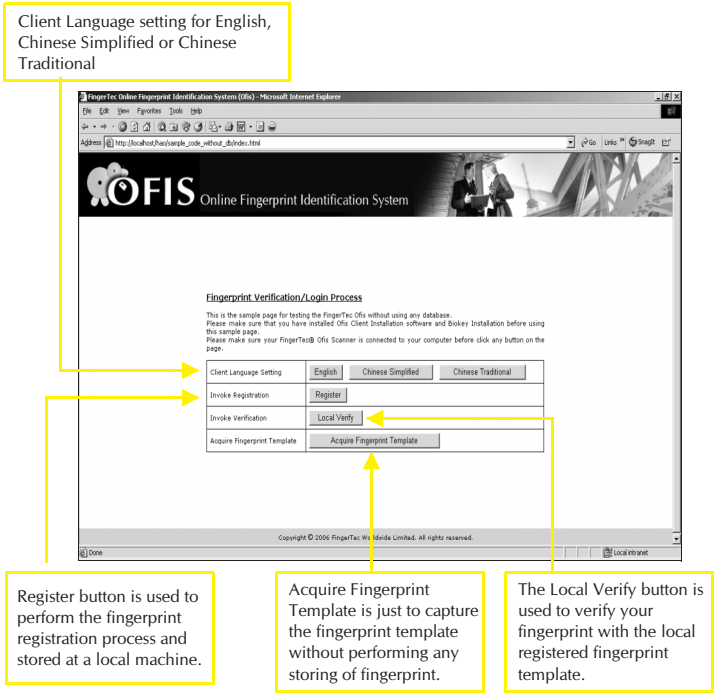

Figure 9-7

In the index.html, it uses a few Ofis SDK function like SetLanguageFile (), Register (),Verify () and GetVerTemplate (). All the descriptions of these functions can be found at the Ofis SDK control and function (Client Side) Section.

Ofis Client Side Software

Double click on the index.html. A Web browser (using Microsoft Internet Explorer) will be showing the following contents.

Set your preferred language by clicking on the language button. If successful, it will prompt "Set Language Successful".

If failed, it will display "Set Language Failed".

Figure 9-8

Figure 9-9

Click the Register button and a window will popup. You may start to perform your fingerprint registration as illustrated in the steps in the Ofis SDK Overview section.

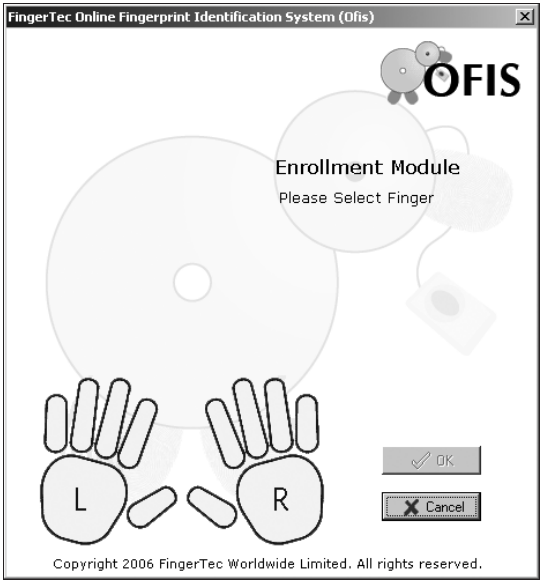

Figure 9-10

After finished performing the registration process, you may click on the Local Verify button. A window will pop up requiring you to scan your fingerprint. Your fingerprint template will be used to compare with the fingerprint that you have registered previously.

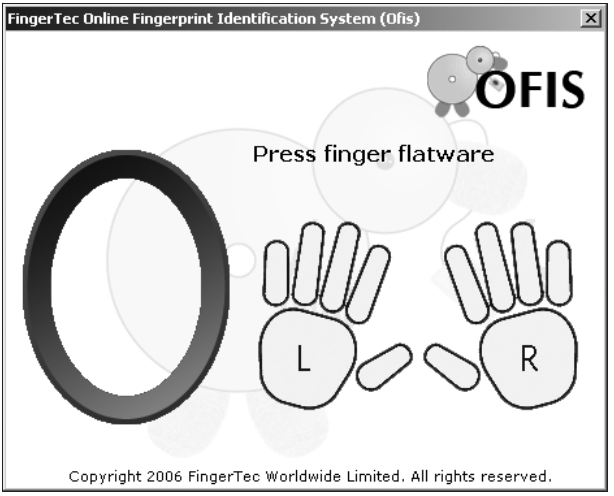

Figure 9-11

If the fingerprint does not match, it will display "Failed in verifying fingerprint" and refuiring you to scan your fingerprint again.

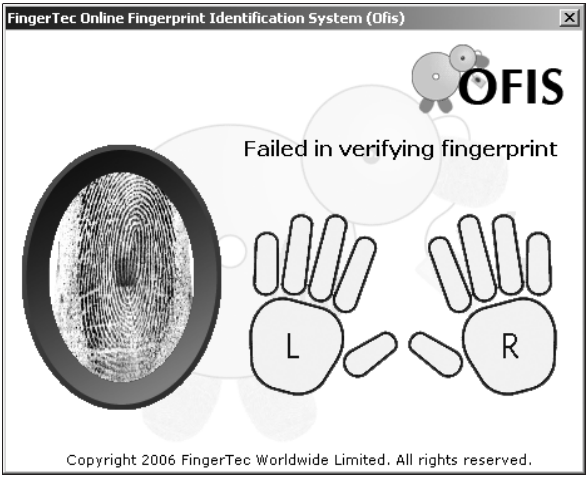

Figure 9-12

If the fingerprint is successfully verified, it will close the Ofis interface and prompt "Verify Successful".

Figure 9-13

For the Acquire Fingerprint Template button, it will display the following screenshot. The function will not perform fingerprint verification; it will just capture the fingerprint template.

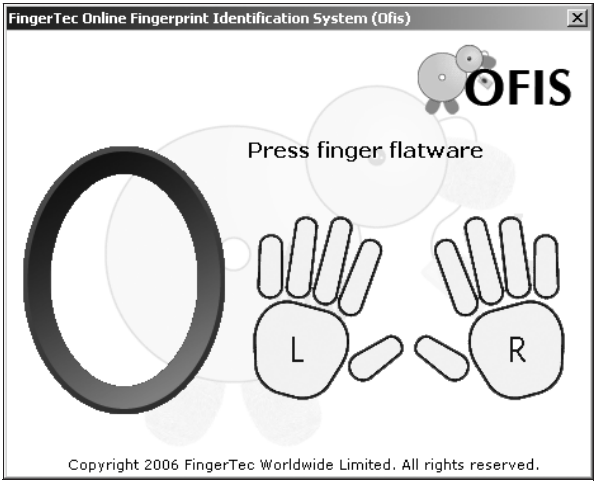

Figure 9-14

If the fingerprint quality is poor, it will prompt an error and require you to capture the fingerprint template again.

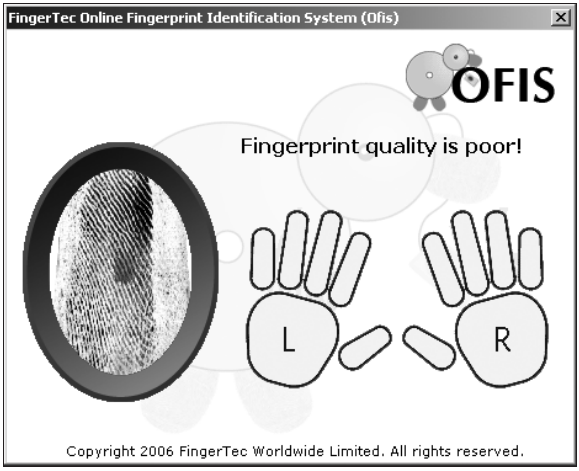

Figure 9-15

After successfully capturing the fingerprint template, it will automatically close the window and pop-up a dialog box displaying "Successfully acquiring fingerprint template!"

Figure 9-16

10 OFIS SDK WINDOWS-BASED SOURCE CODE TESTING

Overview of the Standalone Model

Below is the example of the standalone model that has been developed by FingerTec®. This is a sample of the model application to demonstrate how Ofis can be implemented in a standalone application. Here the standalone application in 3 different IDE have been developed on Windows 2000 platform.

- Borland Delphi 7.0
- Microsoft Visual Basic 6.0
- Microsoft Visual C++ 6.0

All of the 3 sample projects will be provided to you for your reference. Below are the figures of the samples of standalone application.

Start the client.

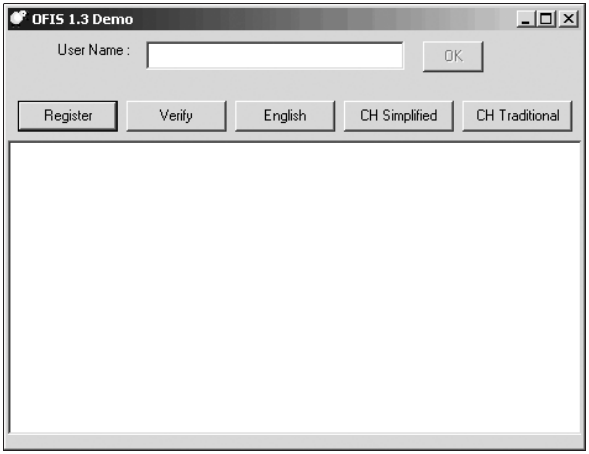

Figure 10-1

Click register and Ofis registration interface will be prompt to allow you to register fingerprint.

Figure 10-2

Register your fingerprint by scanning it four times followed by pressing OK.

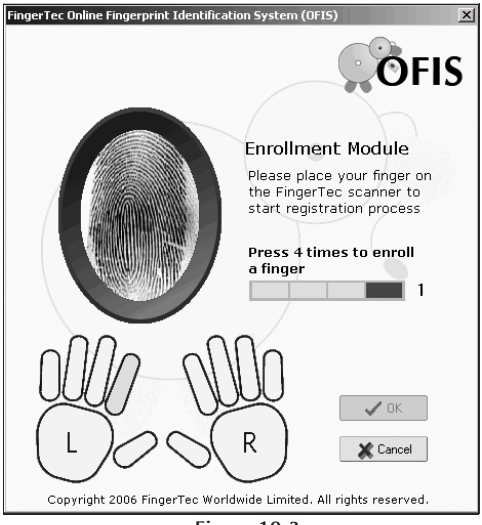

Figure 10-3

Next the client will prompt you to enter your username.

Figure 10-4

Enter your username and press OK. The client will prompt you that the username and its fingerprint template have been registered.

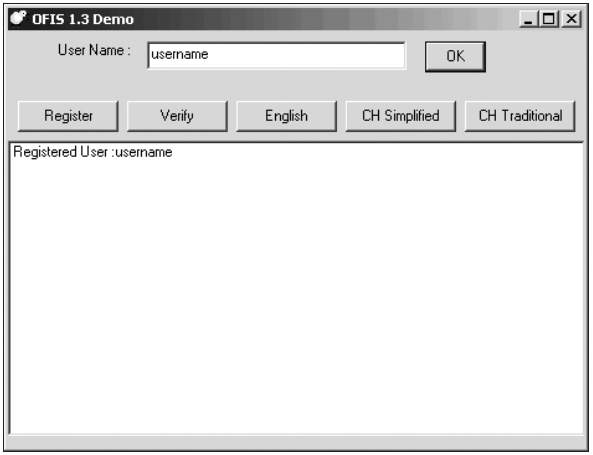

Figure 10-5

To verify the registered fingerprint, click verify and the Ofis verification interface will prompt you to acquire your fingerprint.

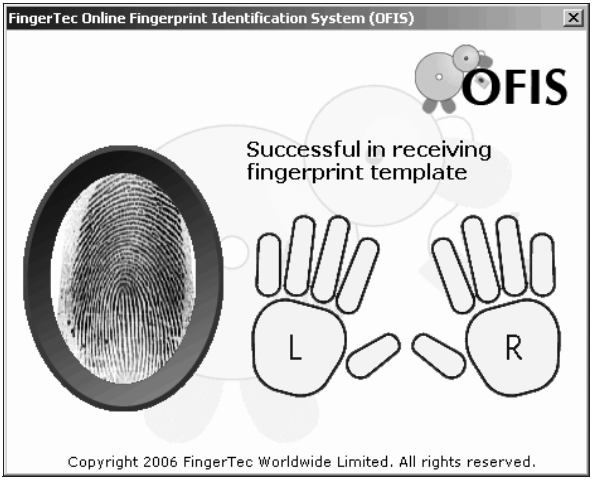

Figure 10-6

You can view the result in the text box.

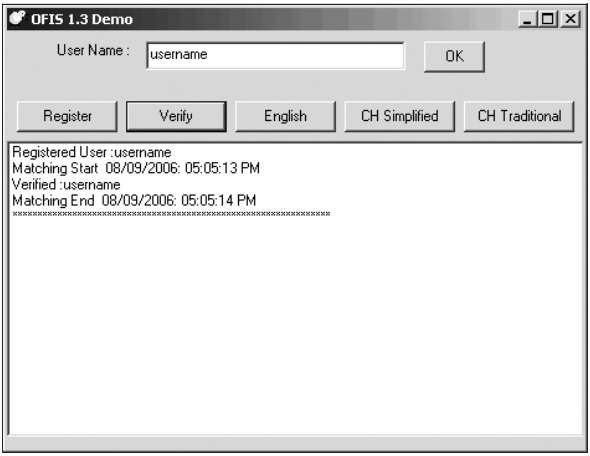

Figure 10-7

Overview of the Client Server Model

Below is the example of the client server model that have been developed by FingerTec®. This is a sample of the model application to demonstrate how Ofis can be implemented in a client server application. Here the client server application in 3 different IDE have been developed on Windows 2000 platform.

- Borland Delphi 7.0
- Microsoft Visual Basic 6.0
- Microsoft Visual C++ 6.0

All of the 3 sample projects will be provided to you for your reference. Below are the figures of the sample of client server application.

Start the server.

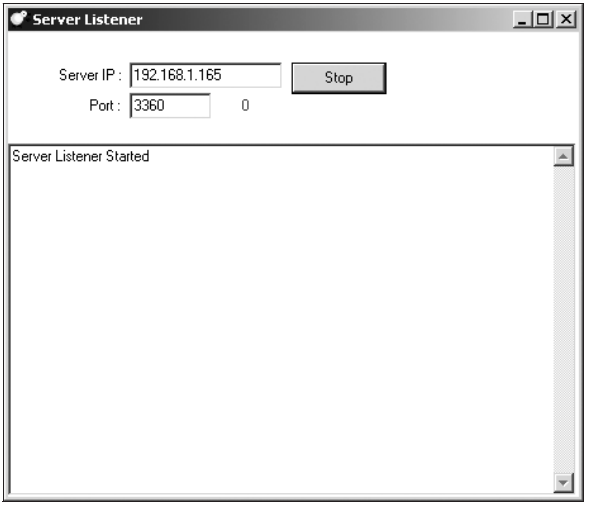

Figure 10-8

Start the client and connect to the server.

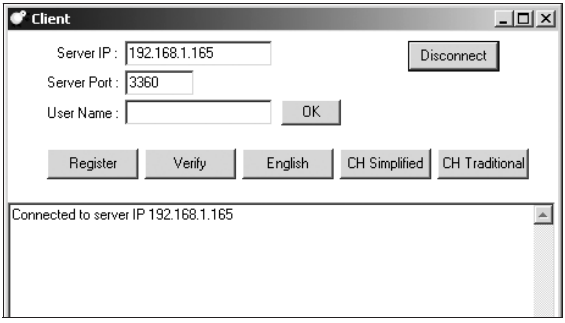

Figure 10-9

Click register and Ofis registration interface will be prompted to allow you to register fingerprint.

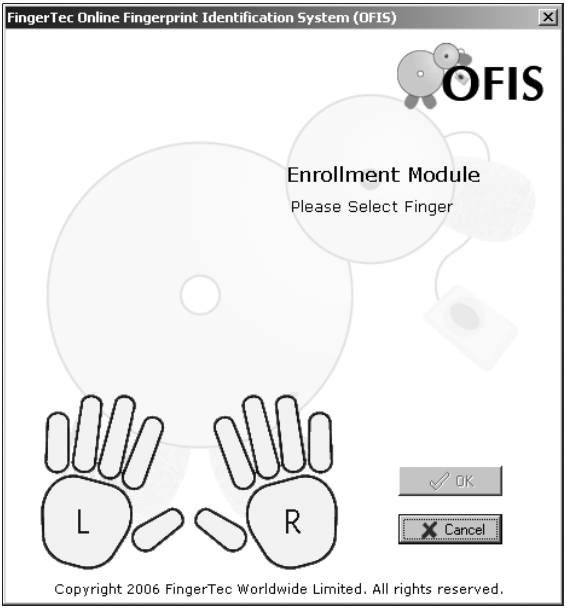

Figure 10-10

Register your fingerprint by scanning it four times followed by pressing OK.

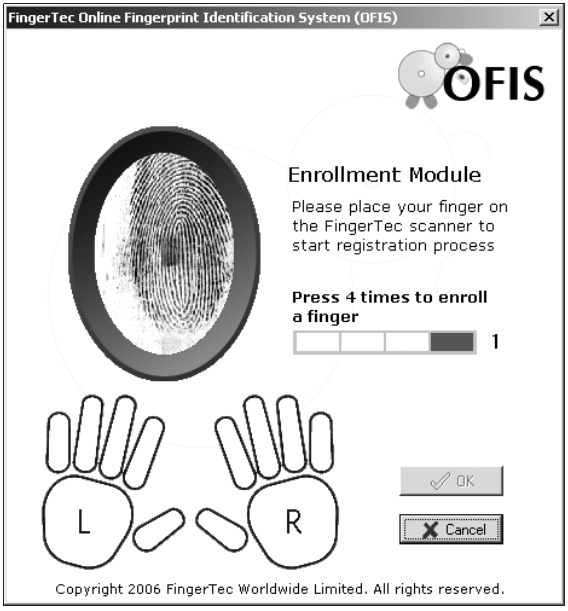

Figure 10-11

Next the client will prompt you to enter your username.

Figure 10-12

Enter your username and then press OK. The client will prompt you that the username and its fingerprint template has been registered.

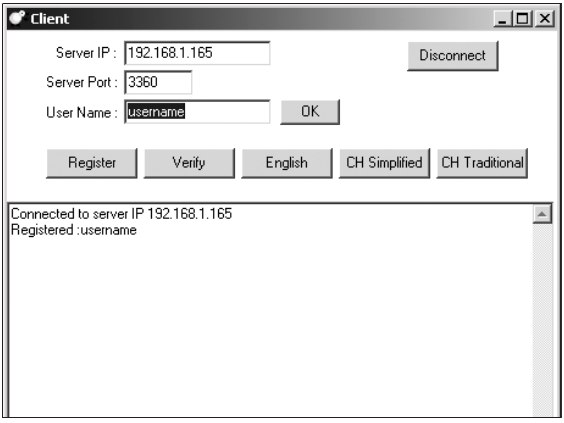

Figure 10-13

To verify the registered fingerprint, click verify and the Ofis verification interface will prompt you to acquire your fingerprint.

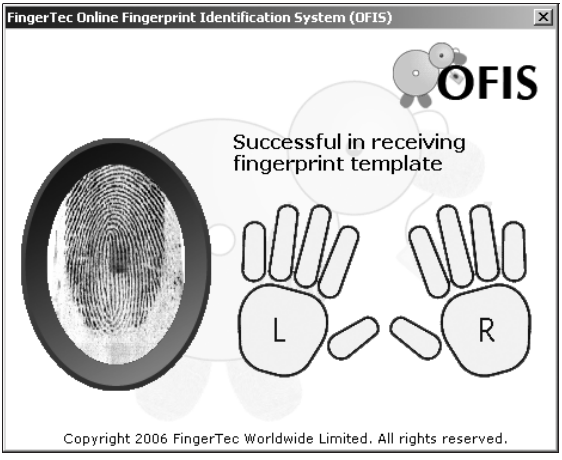

Figure 10-14

Next, a message box will prompt the username, which corresponds with the correct fingerprint template stored in the database.

Figure 10-15

At the client side, you can view the verified username prompt in the text box.

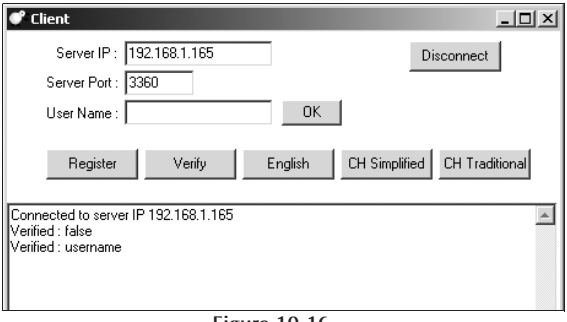

Figure 10-16

At the server side, you can view the messages shown in the textbox, which shows you the time and date; the client is connected to the server, the registration and verification process.

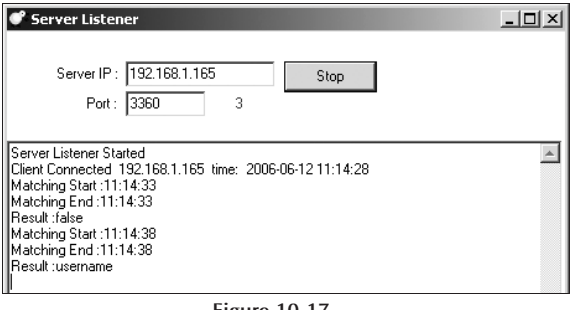

Figure 10-17

Borland Delphi 7.0 Requirement

Please make sure to install the components of Ofis client and server into Delphi 7.0 before starting to develop the system. Please refer Appendix B for more information.

- **Standalone Model**
  The source code for standalone application, which is developed in Delphi 7.0 platform, can be obtained in the "Standalone - SourceCode" folder, which is located in the Ofis Server CD. The location is [DRIVE:\>Delphi\Standalone - SourceCode]. The project filename is OFIS_1_3.dpr.

- **Client-Server Model**
  The source code for client server application, which is developed in Delphi 7.0 platform, can be obtained in "ClientServer - SourceCode" folder, which is located in Ofis Server CD. The location is [DRIVE:\>Delphi\ClientServer - SourceCode]. There are two projects available which is one for the client and the other for the server. The client project filename is Client.dpr while the server project filename is Server.dpr. Remember, before you can start compiling and debugging these projects, you must install the OFIS Client 1.3 and OFIS Server 1.2 setup as well as installing the Ofis components into your Delphi 7.0. Together with the project source files, 2 executable files are also included, which are the Client.exe (Refer figure 10-9 above) and Server.exe (Refer figure 10-8 above).

Microsoft Visual Basic 6.0 Requirement

Before you can start development, you need to install the last update for Visual Basic 6.0 to service pack 6. You may download the updates at the following URL http://msdn.microsoft.com/vstudio/downloads/updates/sp/vs6/sp6/default.aspx.

After you update your Visual Basic, please download the latest MDAC 2.8. Microsoft Data Access Components (MDAC) 2.8 that contains core Data Access components such as the Microsoft SQL Server, OLE DB provider and ODBC driver. These are used to create database connection. You may download the installer at the following URL http://www.microsoft.com/downloads/details.aspx?FamilyID=6C050FE3-C795-4B7D-B037-185D0506396C&displaylang=en.The updates will also be provided in the Ofis Server CD under the folder name "Visual Basic 6.0 updates". The location is [DRIVE:\>Visual Basic 6.0\Visual Basic 6.0 updates].

Always remember that before you start development, you need to install the components of Ofis client and server into Visual Basic 6.0. Please refer Appendix C for more information.

- **Standalone Model**
  The source code for standalone application, which is developed in Visual Basic 6.0 platform, can be obtained in the "Standalone - SourceCode" folder, which is located in the Ofis Server CD. The location is [DRIVE:\>VisualBasic6.0\Standalone - SourceCode]. The project filename is OFIS_1_3.vbp.

- **Client-Server Model**
  The source code for client server application, which is developed in Visual Basic 6.0 platform, can be obtained in "ClientServer - SourceCode" folder, which is located in Ofis Server CD. The location is [DRIVE:\>VisualBasic6.0\ClientServer - SourceCode]. There are two projects available one for the client and the other for the server. The client project filename is Client.vbp while the server project filename is Server.vbp. Remember, before you can start compiling and debugging these projects, you must install the OFIS Client 1.3and OFIS Server 1.2 setup as well as installing the Ofis components into your Visual Basic 6.0. Together with the project source files, 2 executable files are also included, which are the Client.exe (Refer figure 10-9 above) and Server.exe (Refer figure 10-8 above).

Microsoft Visual C++ 6.0 Requirement

Before you can start development, please download the latest MDAC 2.8. Microsoft Data Access Components (MDAC) 2.8 contains core Data Access components such as the Microsoft SQL Server OLE DB provider and ODBC driver. It is used to create database connection. You may download the installer at the following URL http://www.microsoft.com/downloads/details.aspx?FamilyID=6C050FE3-C795-4B7D-B037-185D0506396C&displaylang=en.The updates will also be provided in the Ofis Server CD under the folder name "Visual C++ updates". The location is [DRIVE:\>Visual C++\Visual C++ updates]. Always remember that before start to develop, you need to install the components of Ofis client and server into C++ 6.0. Please refer Appendix D for more information.

- **Standalone Model**
  The source code for standalone application, which is developed in Visual C++ 6.0 platform, can be obtained in the "Standalone - SourceCode" folder, which is located in the Ofis Server CD. The location is [DRIVE:\>Visual C++\Standalone - SourceCode]. The project filename is OFIS_1_3.dsw. The executable file for the standalone application is located in [DRIVE:\>Visual C++\Standalone - SourceCode\Debug].

- **Client-Server Model**
  The source code for client server application, which is developed in Visual C++ 6.0 platform, can be obtained in "ClientServer - SourceCode" folder, which is located in Ofis Server CD. The location is [DRIVE:\>Visual C++\ClientServer - SourceCode]. There are two projects available which is one for the client and the other for the server. The client project filename is CSocketcli.dsw located in the client folder [DRIVE:\>Visual C++\ClientServer - SourceCode\Client], while the server project filename is CSocket.dsw located in server folder [DRIVE:\>Visual C++\ClientServer - SourceCode\Server].

The executable file for client is located in [DRIVE:\>Visual C++\ClientServer - SourceCode\Client\Debug] and the server at [DRIVE:\>Visual C++\ClientServer - SourceCode\Server\Debug]. Remember, before you can start compiling and debugging these projects, you must install the OFIS Client 1.3 and OFIS Server 1.2 setup as well as installing the Ofis components into your Visual C++ 6.0.

11 LIST OF OFIS SDK LANGUAGE FILES

Below are the lists of language files available to be invoked by Ofis application

Ofis.en = English Language File
Ofis.chs = Chinese Simplified Language File
Ofis.cht = Chinese Traditional Language File

12 TROUBLESHOOTING

If your FingerTec® Ofis Scanner is not connected to your computer, the Ofis window will prompt you the following errors. Please close the Ofis window, plug the FingerTec® Ofis Scanner properly to the computer and start the Ofis application again.

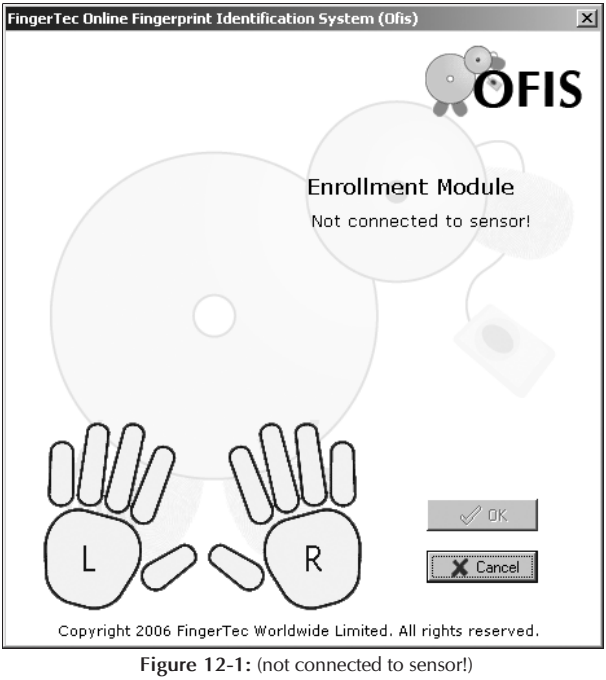

Figure 12-1: (not connected to sensor!)

If your fingerprint quality is poor, the Ofis window will prompt the following error. Place your finger properly on the FingerTec® Ofis Scanner during enrollment and verification process to get accurate reading everytime.


FingerTec Online Fingerprint Identification System (Ofis)
OFIS
Enrollment Module
Fingerprint quality is poor!
Remaining times:1
Press 4 times to enroll a finger
1
L
R
OK
Cancel
Copyright 2006 FingerTec Worldwide Limited. All rights reserved.

Figure 12-2

13 HARAWARE HANDLING AND USAGE

Plugging The FingerTec® Ofis Scanner To A Computer

Plug the FingerTec® Ofis Scanner into the USB port of your computer. The USB port is normally located at the back of your CPU. The location of the USB port may vary depending on type of computer.

Figure 13-1: The FingerTec® Ofis Scanner with USB interface.

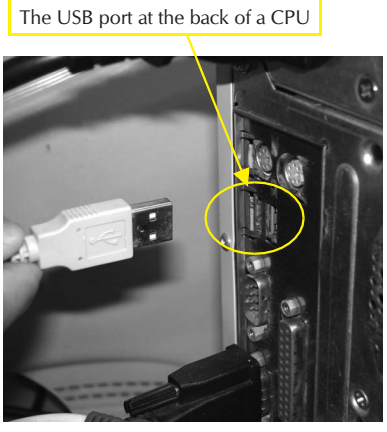

Figure 13-2:
Plug the USB interface into the USB port at the back of your computer.

Figure 13-3:
Successful plugging of the FingerTec® Ofis Scanner at a computer.

Recognition Performance and Reader Usage of Fingerprint

This provides reader usage and maintenance guidelines to maximization fingerprint enrollment and verification performance. It is crucial to achieve optimal fingerprint recognition performance with proper use of the FingerTec® Ofis Scanner during fingerprint enrollment and verification, as well as a well-maintained reader,

It also describes the proper methodology to use the reader to register and verified fingerprints. Then followed by the reader maintenance instructions, provided in "Clean the Reader".

Appropriate Handling of Fingerprint Reader

Place your finger flat on the reader when enrolling and verifying fingerprints to reduce the False Rejection Rate (FRR). During both processes, you must place the finger's midpoint not the tip or the side-in the center of the reader's fingerprint sensor in order to maximize the area of the finger that touches the reader window.

Pressure is applied evenly. Pressing either too hard or light will produce an unusable and faint scan. Do not "roll" your finger. To complete the fingerprint scanning, hold your finger on the sensor until the reader light is blinking. This may take longer time if the skin is dry. Beep is raised when the light blinks and fingerprint is captured. Lift your finger. If the reader is capturing your fingerprint scan as indicated by the reader blink, but FingerTec® software rejects it consistently, you may need to re-register that finger by first delete it and then register it.

Clean the Reader

The condition of the reader sensor affects enormously on the ability of the reader to achieve a good quality scan of a fingerprint. It depends on the amount of user, the reader sensor may need to be cleaned frequently. Apply the glutinous side of a piece of adhesive cellophane tape on the sensor and peel it away.

Under frequent usage, the sensor coating may turn dull caused by the sodium in perspiration. In this case, gently wipe the window with a fabric (not paper) dampened with a mild ammonia-based glass cleaner.

Reader Maintenance Warnings

There are several things that shouldn't be done when cleaning or using the reader:

- Do not shower the glass cleaner directly on the reader sensor.
- Do not apply alcohol-based cleaner.
- Do not submerge the reader in liquid.
- Do not rub the window with rough material, including paper.
- Do not poke the sensor coating with fingernail or any other sharp objects, such as a pen.

The fingerprint reader is meant for indoor home or office use only.

APPENDIX A

Internet Information Services (IIS) Installation Guide

To set up the Ofis Server, you need to install the IIS 6.0. Please make sure your operating system for Ofis Server is Window 2000, Window XP Professional or Window 2003. The steps for IIS installation are as the followings:

Place the Window 2000, Windows XP Professional, or Window 2003 CD-Rom into your CD-ROM Drive.

Click on the Start menu and select the Control Panel.

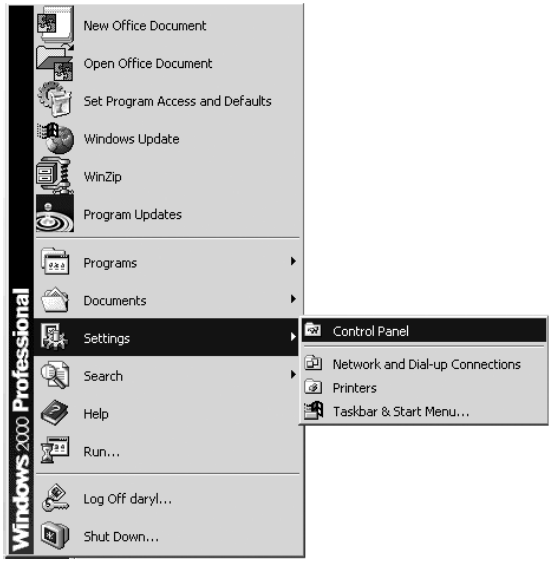

Figure A-1

A window will pop up after the control panel is open. Click on the Change/Remove Programs to proceed.

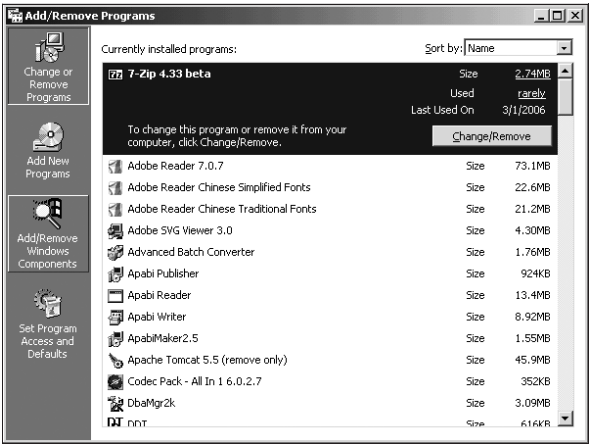

Figure A-2

The Add/Remove Programs window will pop up and please click on the Add/Remove Components button.

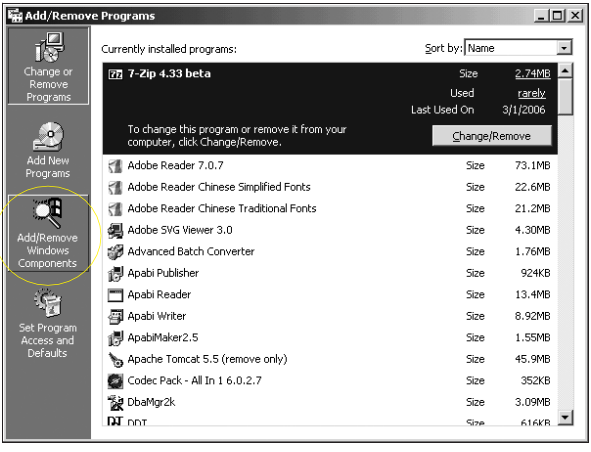

Figure A-3

Select the Windows components to be added to your computer system.

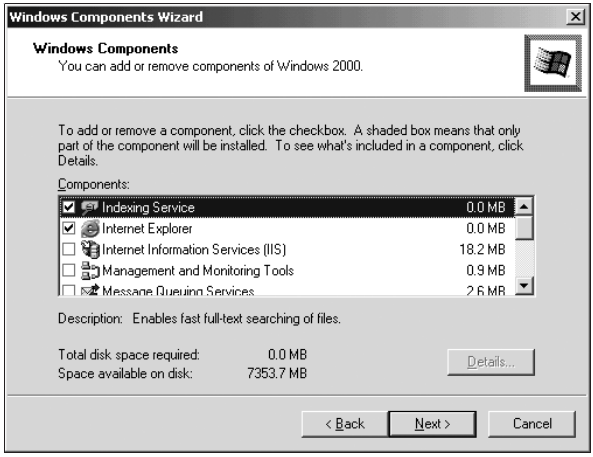

Figure A-4

Put a check mark on the Internet Information Services (IIS) and click Next button to proceed.

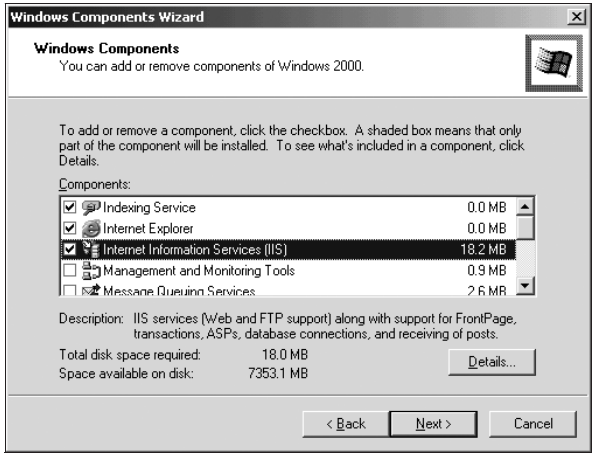

Figure A-5

The installation progress will be initiated and please wait for several minutes for the installation process to complete.

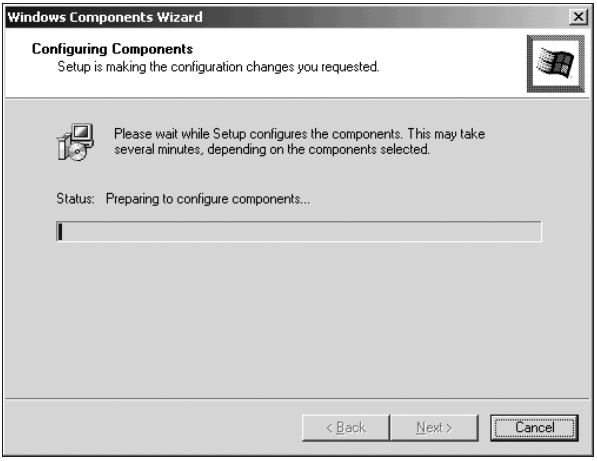

Figure A-6

When the installation is complete, click on the Finish button.

Figure A-7

APPENDIX B

Installing Ofis components into Borland Delphi 7.0

Server Setup

1) Open the Borland Delphi 7.0 application.
2) Remember to install the Ofis Server Software Installation before development.
3) You can open the sample source project and the file name is Server.dpr. All the source code and the components will be loaded automatically.
4) If you choose to do from scratch, you need to add a few components into your Delphi IDE.
5) Go to component tab and select Import Active X Control. A new window will pop up. Please refer figure B-1 below:

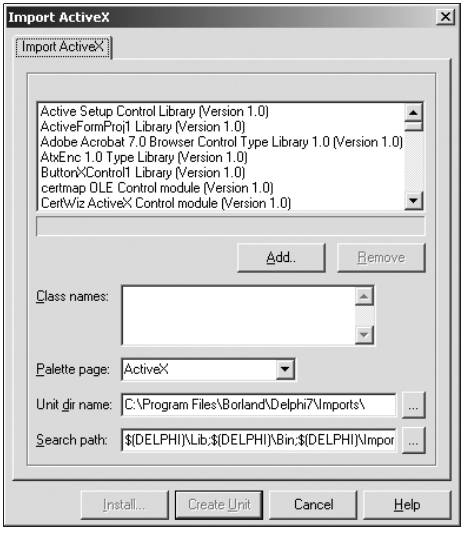

Figure B-1

6) Click the button Add where a window will prompt you to select a file. Select the OfisServer.ocx file and click Open. The OfisServer.ocx can be obtained in your windows system32 folder. The location is [DRIVE:\>WINNT\system32\]. **Attention: if you purchase a Trial Package, the filename would be OfisServerTrial.ocx, which is also located in your windows system32 folder. Please refer figure B-2 below:

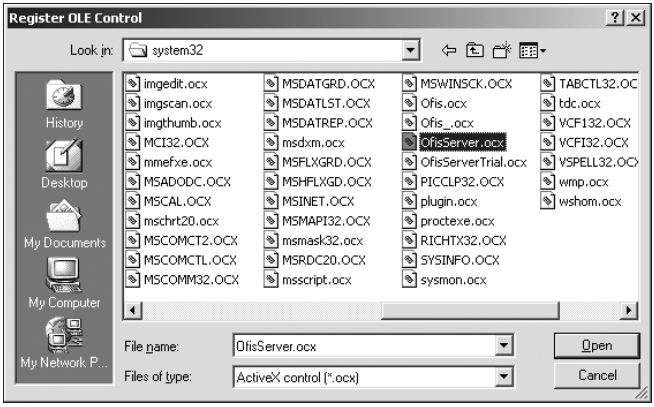

Figure B-2

7) The OfisServer Library will be displayed in the list box and all the information regarding about the library such as the Class Names and Palette Page. The class names will be TOfisServerX and the controls will be located at the Active X palette page. Click Install to install the OfisServer.ocx. Please refer figure B-3 below:

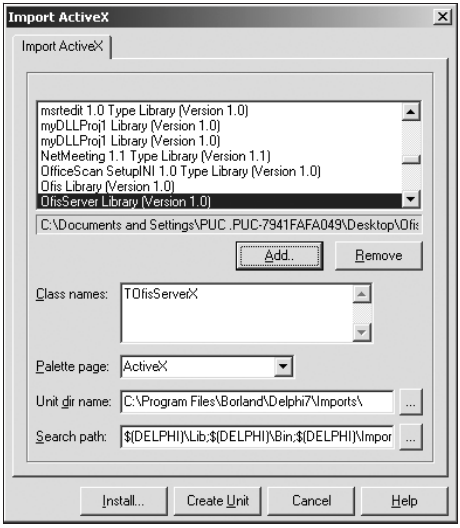

Figure B-3

8) Next, a window will show you that the OfisServer.ocx will be installed into the dclusr.dpk package. Click OK to continue. Please refer figure B-4 below:

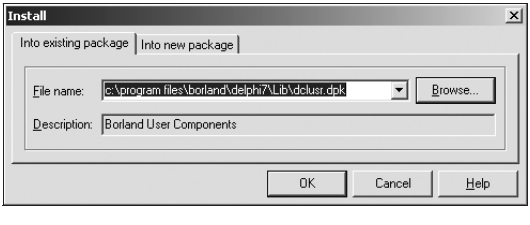

Figure B-4

9) Later a window will prompt that the package will be rebuilt. Click Yes to continue. Please refer figure B-5 below:

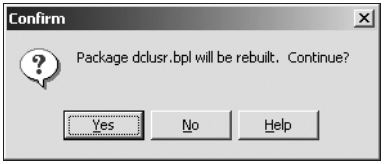

Figure B-5

10) Another information is prompt to inform you that the component palette page has been updated and OfisServer_TLB.TOfisServerX have been registered. Click OK to continue. Please refer figure B-6 below:

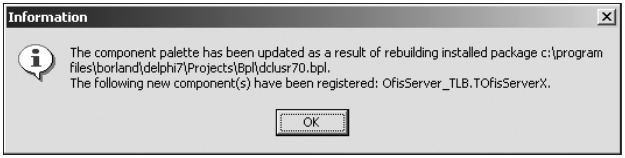

Figure B-6

11) Next, the package window will be displayed to show you that all the files that are contained in the package. Please refer figure B-7 below:

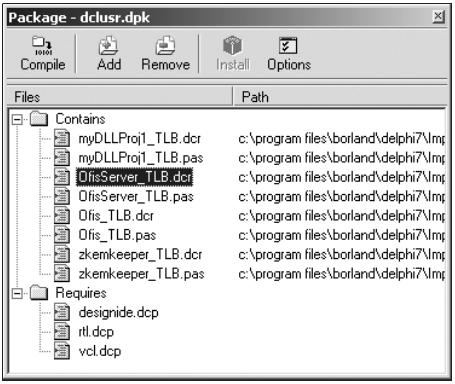

Figure B-7

12) Close the window and it will prompt you to save changes to the package. Click Yes to continue. Please refer figure B-8 below:

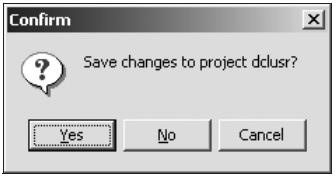

Figure B-8

13) Next go to your Active X component palette and now the OfisServerX control is visible and ready to use. Please refer figure B-9 below:

Figure B-9

Client Setup

1) Follow steps 1-5 as in the Server Setup above in appendix B. Sample source project file name is Client.dpr. Please refer figure B-1.
2) Click the button Add where a window will prompt you to select a file. Select the Ofis.ocx file and click Open. The Ofis.ocx can be obtained in your system32 folder. Please refer figure B-10 below:

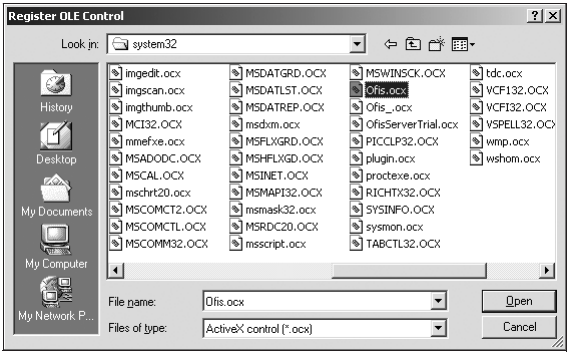

Figure B-10

3) The Ofis Library will be displayed in the list box and all the information regarding about the library such as the Class Names and Palette Page. The class names will be TOfisMain and the controls will be located at the Active X palette page. Click Install to install the Ofis.ocx. Please refer figure B-11 below:

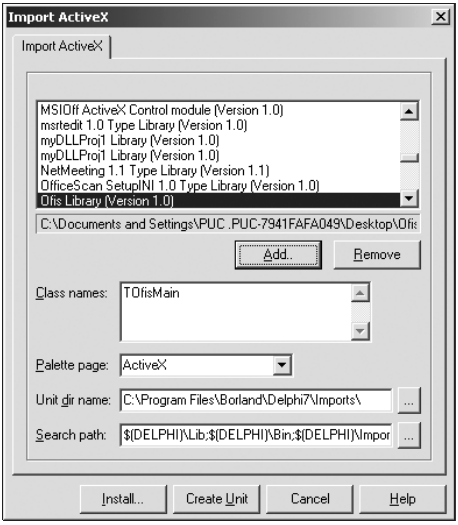

Figure B-11

4) Next, a window will show you that the Ofis.ocx will be installed into the dclusr.dpk package. Click OK to continue the process. Please refer figure B-12 below:

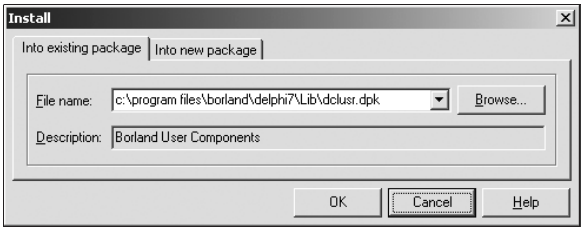

Figure B-12

5) Later a window will prompt that the package will be rebuilt. Click Yes to continue. Please refer figure B-13 below:

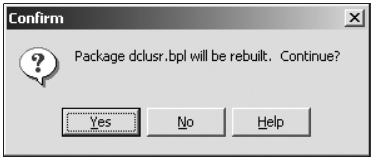

Figure B-13

6) Another information is prompt to inform you that the component palette page has been updated and Ofis_TLB.TOfisMain have been registered. Click OK to continue. Please refer figure B-14 below:

Figure B-14

7) Next, the package window will be display to show you that all the files that are contain in the package. Please refer figure B-15 below:

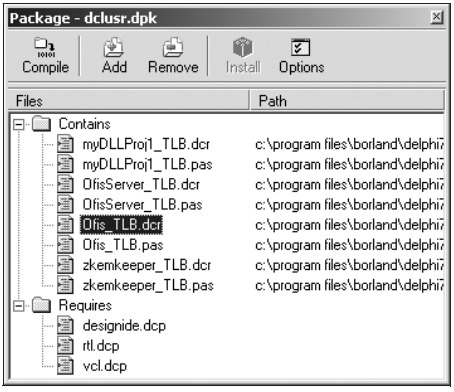

Figure B-15

8) Close the window and it will prompt you to save changes to the package. Click Yes to continue. Please refer figure B-16 below:

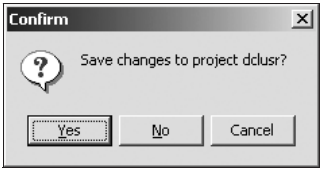

Figure B-16

9) Next go to your Active X component palette and now the OfisMain control is visible and ready to use. Please refer figure B-17 below:

Figure B-17

APPENDIX C

Installing Ofis components into Microsoft Visual Basic 6.0

Server Setup

1) Open Microsoft Visual Basic 6.0
2) Remember to install the Ofis Server Software Installation before development.
3) You can open the sample source project and the file name is Server.vbp. All the source codes and the components will be loaded automatically.
4) If you choose to do from scratch, you need to add a few components into your Visual Basic IDE.
5) Right click on the components tab and select component option. Please refer figure C-1 below:

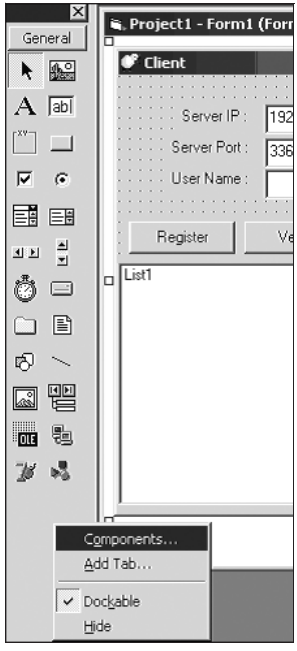

Figure C-1

6) A pop up window will show you the list of the components available. Please select OfisServer Library and Microsoft Winsock Control 6.0 and then click Apply. The reason Winsock is chogen because it provides the communication and resource sharing between distributed server and its clients. The OfisServer.ocx can be obtained in your windows system32 folder. The location is [DRIVE:\>WINNT\system32\]. **Attention: if you purchase a Trial Package, the filename would be OfisServerTrial.ocx, which is also located in your windows system32 folder. Please refer figure C-2 below:

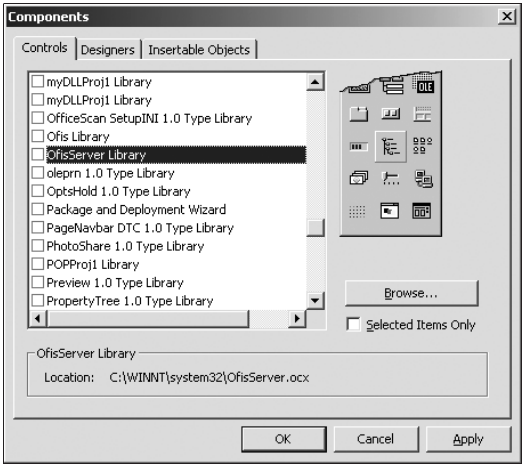

Figure C-2

7) Now you can view the components OfisServerX and Winsock in your components tab. It is now ready to be used. Please refer figure C-4 and figure C-3 below:

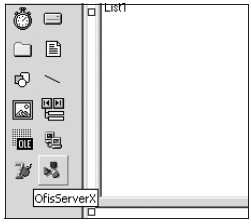

Figure C-3

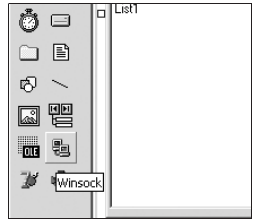

Figure C-4

Client Setup

1) Follow steps 1-5 in the Server Setup above in appendix C. Sample source project file name is Client.vbp. Please refer diagram C-1.
2) A pop up window will show you the list of the components available. Please select Ofis Library and Microsoft Winsock Control 6.0 and then click Apply. The reason Winsock is chosen because it provides the communication and resource sharing between distributed server and its clients. The Ofis.ocx can be obtained in your system32 folder. Please refer figure C-5 below:

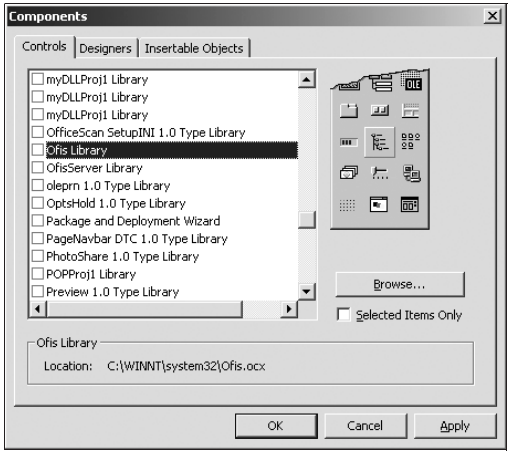

Figure C-5

3) Now you can view the components OfisMain and Winsock in your components tab. It is now ready to be used. Please refer figure C-4 and figure C-6 below:

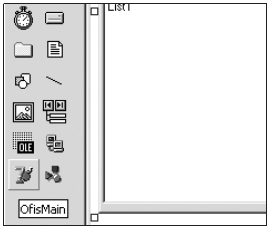

Figure C-6

APPENDIX D

Installing Ofis components into Microsoft Visual C++ 6.0

Server Setup

1) Open Microsoft Visual C++ 6.0
2) Remember to install the Ofis Server Software Installation before development.
3) You can open the sample source project and the filename is CSocket.dsw. All the source code and components will be loaded automatically.
4) If you choose to do from scratch, you need to add a few components into your Visual C++ IDE.
5) Goto Project tab, goto Add To Project and select Components and Controls.
6) A pop up window will show you the Components and Controls Gallery. Please refer figure D-1 below:

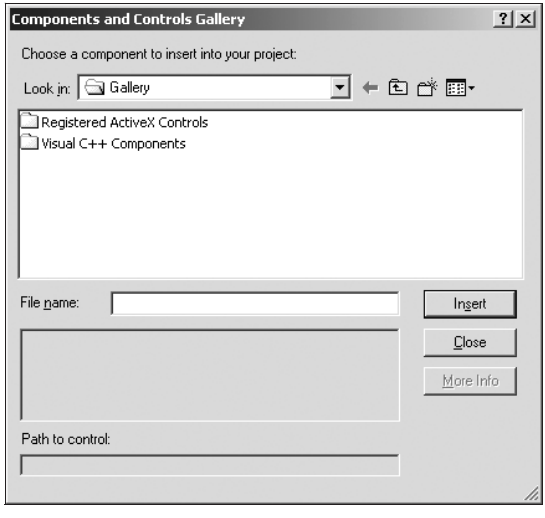

Figure D-1

7) From that window select Registered ActiveX Controls folder. The OfisServer.ocx can be obtained in your windows system32 folder. The location is [DRIVE:\>WINNT\system32\]. **Attention: if you purchase a Trial Package, the filename would be OfisServerTrial.ocx, which is also located in your windows system32 folder. Select the name OfisServerX Control. Please refer figure D-2 below:

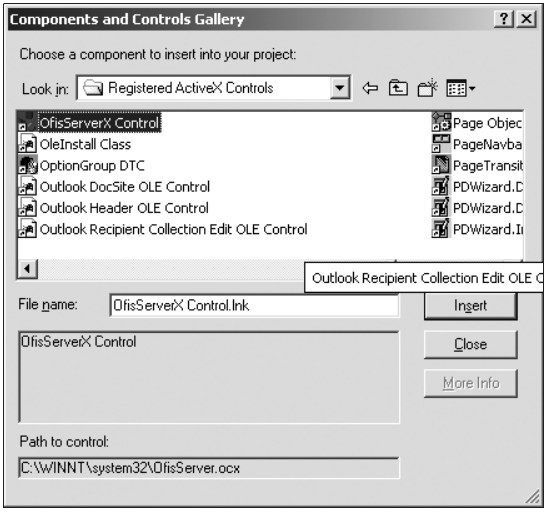

Figure D-2

8) Next, it will prompt you to insert this component. Click OK to continue. Please refer figure D-3 below:

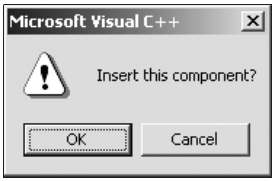

Figure D-3

9) Later, a window shows you to confirm the updated classes. Click OK to continue. Please refer figure D-4 below:

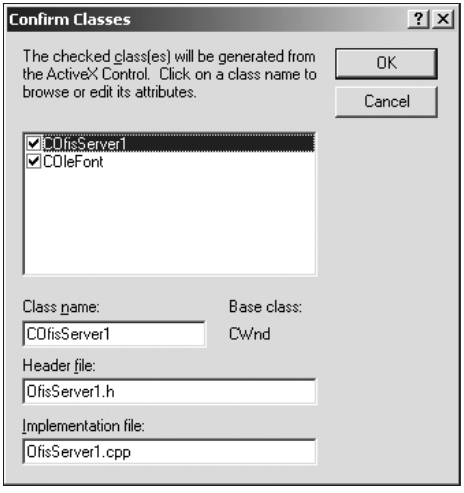

Figure D-4

10) Now in your control the OfisServerX is visible and ready to use. Please refer figure D-5 below:

Figure D-5

Client Setup

1) Follow steps 1-6 in the Server Setup above in appendix D. Sample source project file name is CSocketcli.dsw. Please refer diagram D-1.
2) From that window select Registered ActiveX Controls folder. Select the name OfisMain Control. The Ofis.ocx can be obtained in your system32 folder. Please refer figure D-6 below:

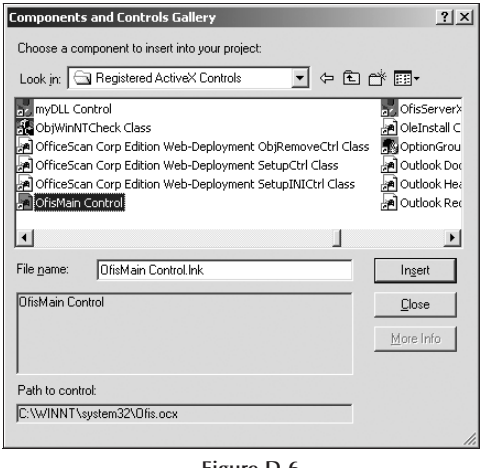

Figure D-6

3) Next, it will prompt you to insert this component. Click OK to continue. Please refer figure D-7 below:

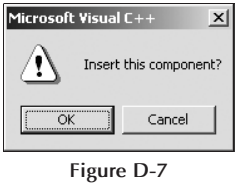

Figure D-7

4) Later, a window shows you to confirm the updated classes. Click OK to continue. Please refer figure D-8 below:

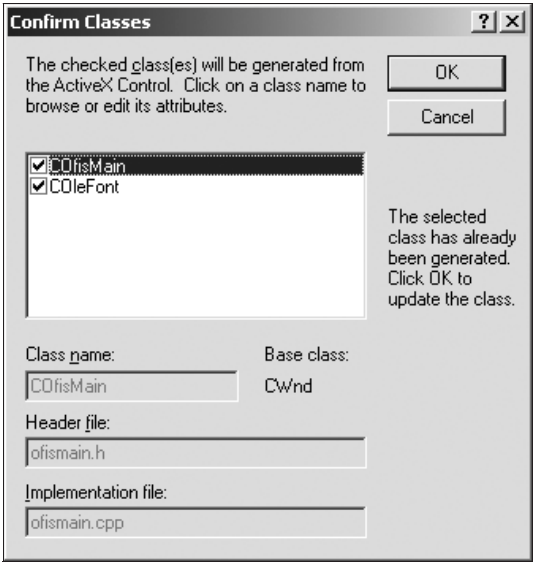

Figure D-8

5) Now in your control the OfisMain is visible and ready to use. Please refer figure D-9 below:

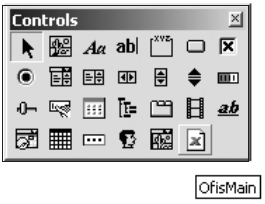

Figure D-9

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