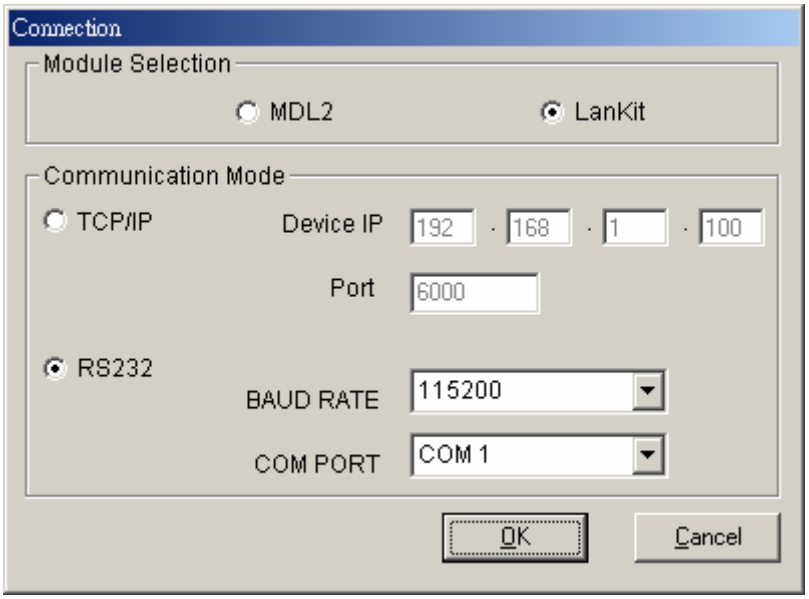
User's Manual

The demonstration program is a simple but helpful example that will help you to get acquainted with the features of the fingerprint device. Start the program by double-clicking on the **VB_Demo.exe** in the program directory of the SDK. The screen will show up as follow:



Select the module type (MDL2/ LanKit) first and then select the communication mode (TCP/IP or RS232).

1. While TCP/IP is selected, the correct Device IP must be entered to connect to the DSP board. The default device IP is "**192.168.1.100**".

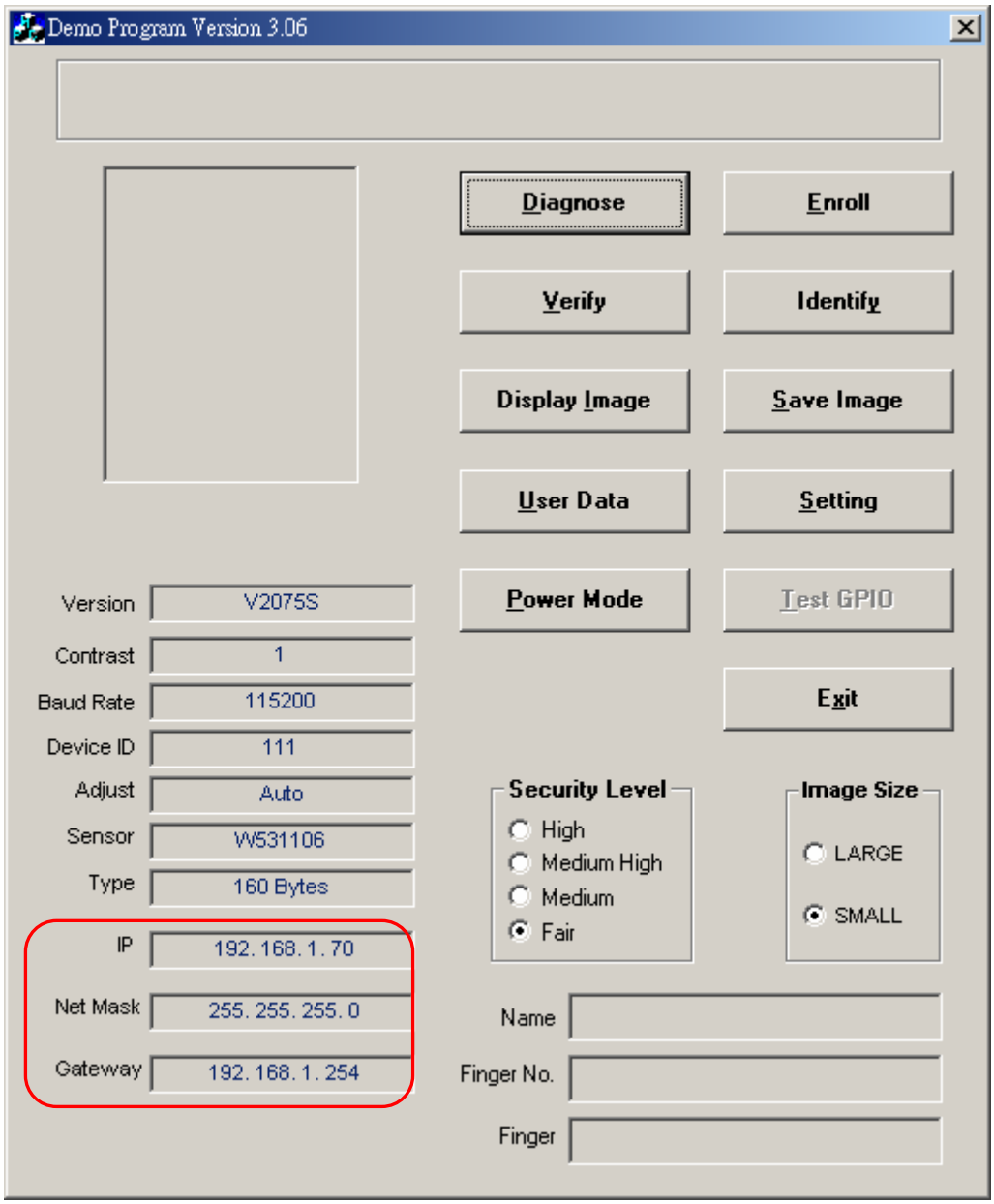
2. Select the Baud Rate (9600/19200/38400/57600/115200) and COM port (COM 1/COM 2) to connect to the DSP board. Please make sure that the internal baud rate setting of the DSP board is the same as the current selected baud rate. **The default baud rate shown on the screen is the available baud rate to communicate with the DSP board**. Click "OK" to start the connection. If the connection failed after a certain time of trying, an error message will be displayed.

Once the DSP is successfully connected, the screen below will be popped up. The basic configuration information of the DSP board will then be shown on the screen. This information includes the **version** of the firmware、the **contrast** for the image、the connected **baud rate**, the **device id** the **auto-adjust flag,** the **template type** and **IP/net mask/gateway** (for LanKit only).

The **auto-adjust flag** always shows "Auto" and is reserved. The **Sensor** type includes "W531106"(CMOS)、"S531C50"(LTTC500) and "S531BMF"(BMF Chip Sensor). The **Type** indicates the template type of 160/320/480 bytes. This type will determine the template size used for the enrollment and will further influence the FRR of the later matching. Theoretically, larger size gives better FRR but slower speed.

The default security level is **Fair**. Set up the security level for matching by setting the verification threshold. **High** is the safest mode, providing an FAR less than 1/100,000. **Fair** is a looser mode, providing an FAR less than 1/1000. Be aware that higher threshold gives higher security but less convenience, i.e. higher rates of false rejection.

The default image size for displaying and saving the image is the **SMALL** mode, i.e. 128 x 160 for CMOS and 96 x 112 for Chip Sensor. If the **LARGE** mode is selected, the original size of the image will be used, i.e. 256 x 320 for CMOS, 192 x 224 for LTT Chip Sensor and 256 x 384 for BMF Chip Sensor.


Demo Program Version 3.06
Diagnose
Enroll
Verify
Identify
Display Image
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User Data
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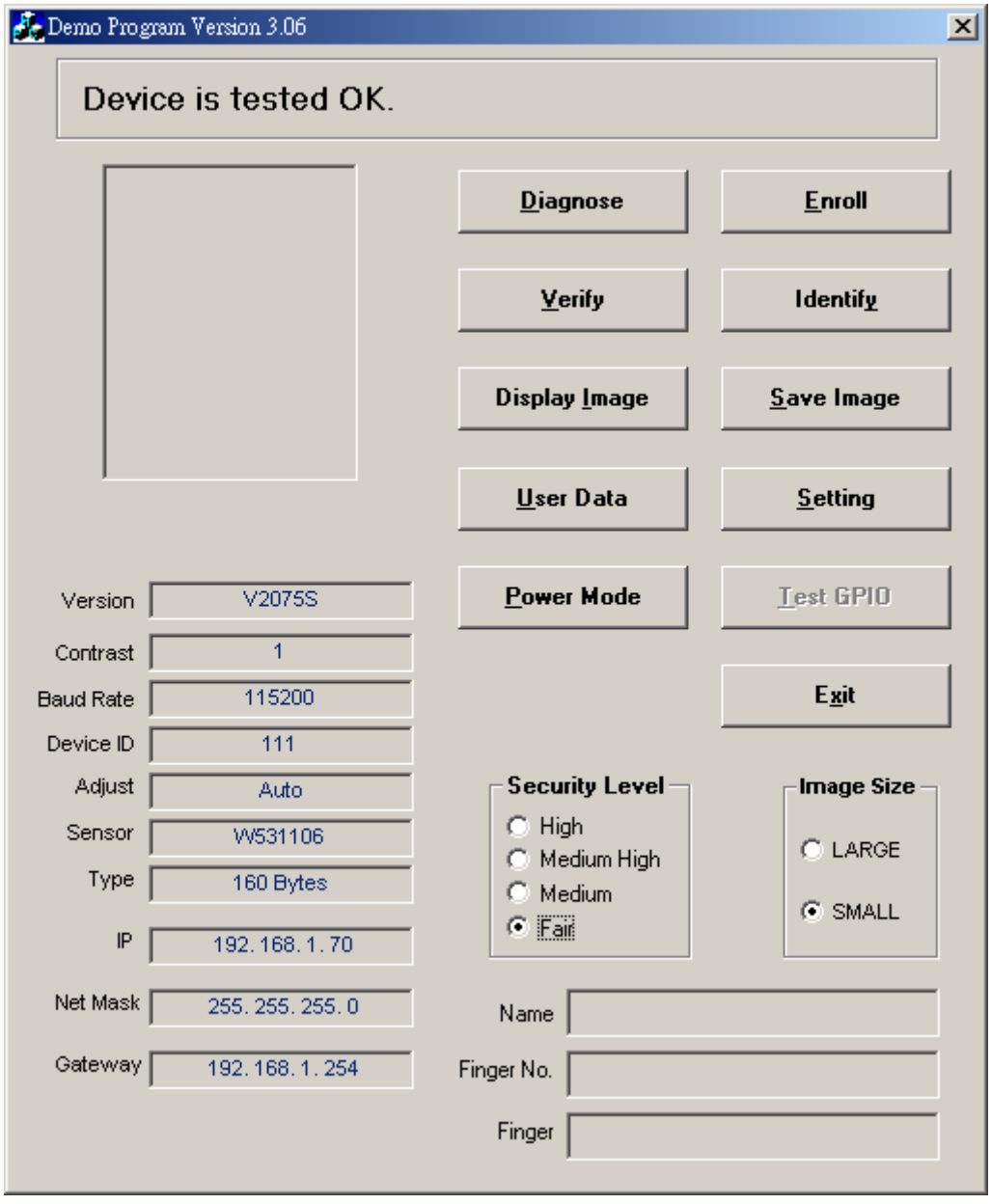
Power Mode
Test GPIO
Exit
Version
V2075S
Contrast
1
Baud Rate
115200
Device ID
111
Adjust
Auto
Sensor
W531106
Type
160 Bytes
IP
192.168.1.70
Net Mask
255.255.255.0
Gateway
192.168.1.254
Security Level
High
Medium High
Medium
Fair
Image Size
LARGE
SMALL
Name
Finger No.
Finger

a. Diagnose

The definition of **Diagnose** is to diagnose the fingerprint reader. If the result is not OK, please contact your dealer.

Before testing, please clean the prism, and when testing the device, **please make sure that there is no finger on the reader**.

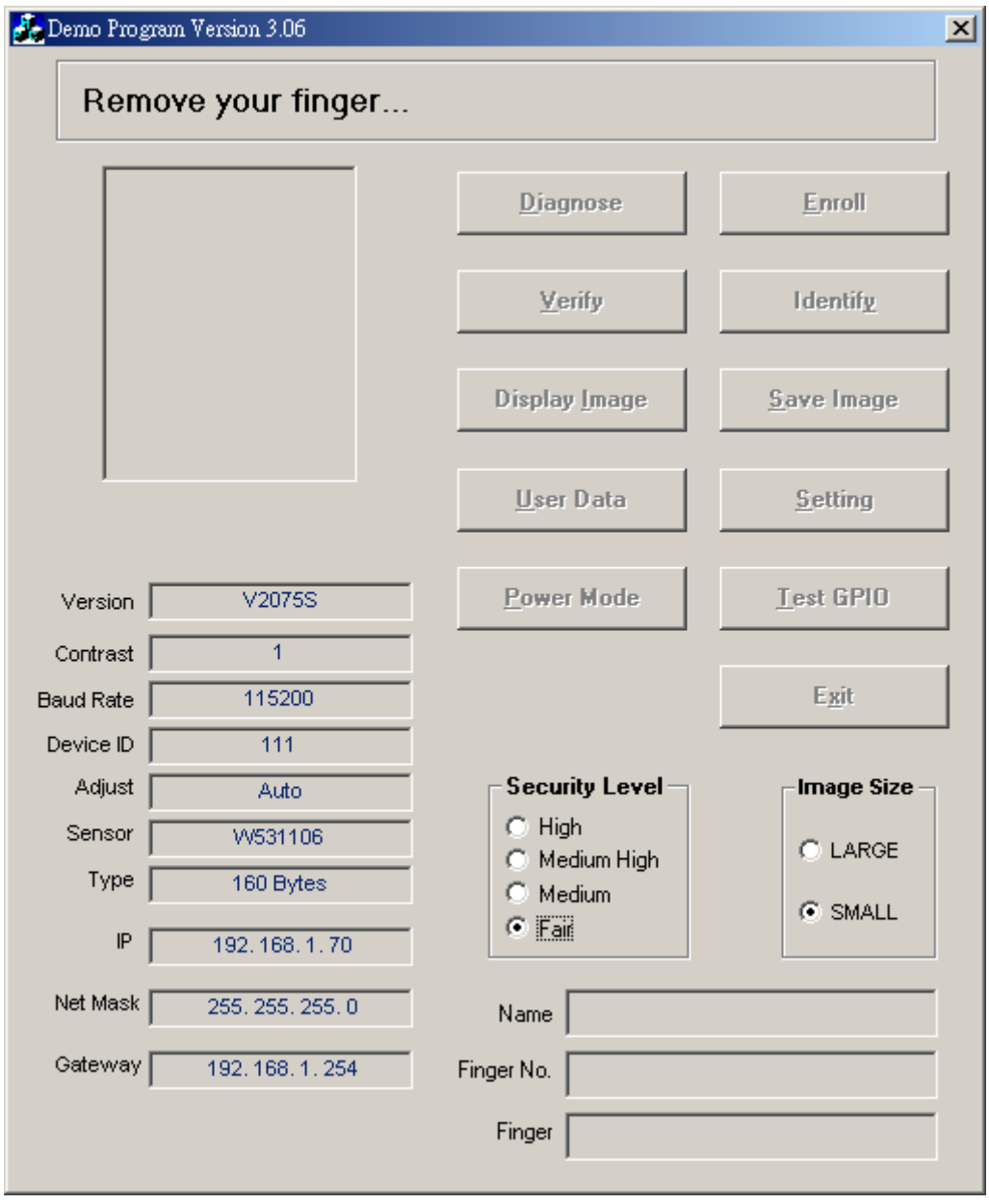
You can click the **Diagnose** by mouse or press the **ALT+D** by keyboard to enter the Diagnose mode. A message will be shown on the display window to tell if the diagnosis is OK.



b. Enroll

The definition of **Enroll** is to enroll a New Fingerprint as Current User.

At least three fingerprints are required for enrollment. Please refer to the fingerprint snapping procedure. Put your finger on the reader at least three times, and check the enrolled quality. The enrollment will be finished when the enrolled quality comes out. Follow the message "**Remove your finger**" that shown on the screen each time your finger has been captured.



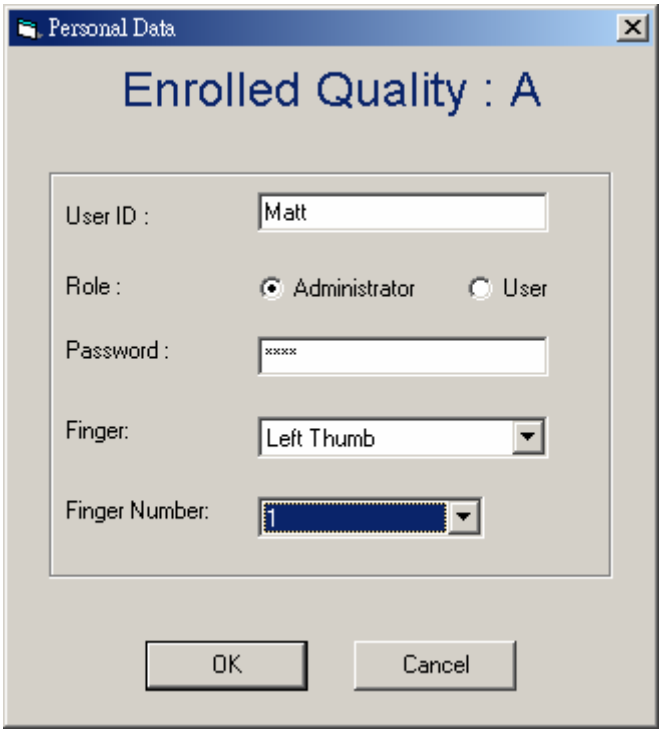
The fingerprint reader will take the common features of these fingerprints. After a few seconds of processing, the reader will inform you the enrolled result.

There are five conditions that may be occurred:

Quality A	This means enrollment of your fingerprint is successful and your fingerprint very clear, has stable features, and is suitable for later verification.
Quality B	This signifies a successful enrollment. Your fingerprint is clear, has stable features, and is suitable for later verification.
Quality C	A successful enrollment, indicating your fingerprint is average with enough stable features to make it suitable for later verification.
Quality D	Although Quality D indicates a successful enrollment, your fingerprint may not be very clear, or may not have very good features. In this case, the false rejection rate in identifying this kind of fingerprint may be higher than that for Quality A, Quality B, or Quality C fingerprints.
Failed	Indicates an unsuccessful enrollment, please try again. If the enrollment of this finger fails many times, try to enroll the other fingers, choose the one with the highest quality and try to enroll that finger.

You can click the **Enroll** by mouse or press the **ALT+ E** by keyboard to enter the enrollment mode. The screen is the same as the snap function. After enrolling fingerprint successfully, a dialog box will be popped up showing the enrolled quality and require the user to input the name and the password, choose the role, enrolled finger, finger number (1 indicates the first fingerprint to be enrolled and can be enrolled up to 3 fingers).

Please input the desired data and click "**OK**" button to save the data.



c. Verify

The definition of **Verify** is to verify a live-scanned fingerprint from the current user. It does only one-to-one matching.

The matching compares a live-scanned fingerprint image against the previously enrolled fingerprints, checking if they came from the same finger. Please put your finger on the reader, and the fingerprint reader will check it out automatically according to the security level settings.

The objects to be compared are the live-scan fingerprint and the final fingerprint template - EnrlTemplate, which is the saved data in the enrollment. After a successful snapping, the live-scan fingerprint image data is kept in the main memory. You can choose the EnrlTemplate by clicking **User Data** and select a user or create a new user through the enrollment.

You can click the **Verify** by mouse or press the **ALT+V** by keyboard to enter the matching fingerprint mode. Before clicking the **Verify** button, you must first select a user. Otherwise the following screen will appear.

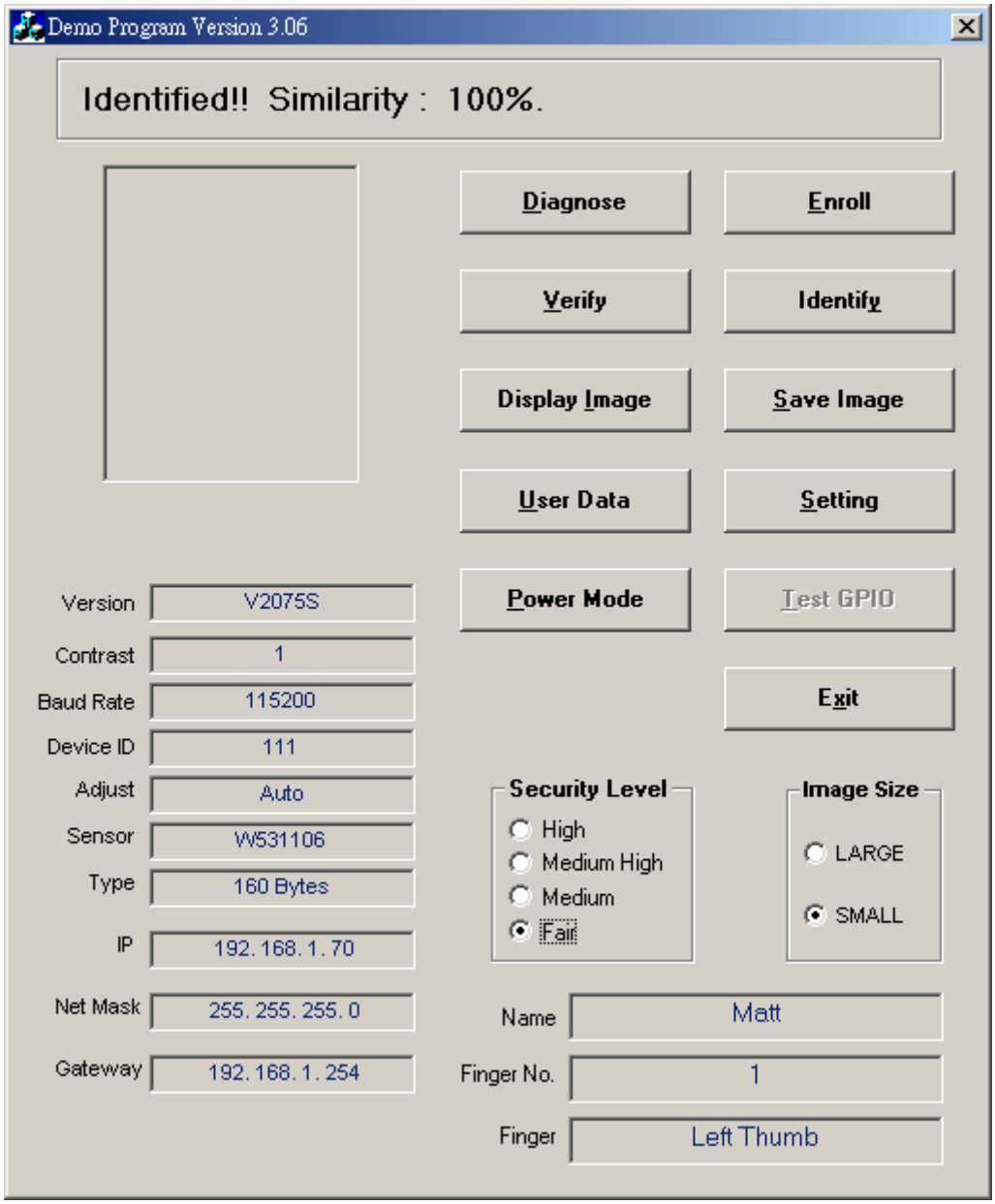
After verification, the score will be displayed on the screen to show if the verification is matched or failed. See **Identify** for details.

d. Identify

The definition of **Identify** is to identify a live-scanned fingerprint from the database. It does one-to-many matching.

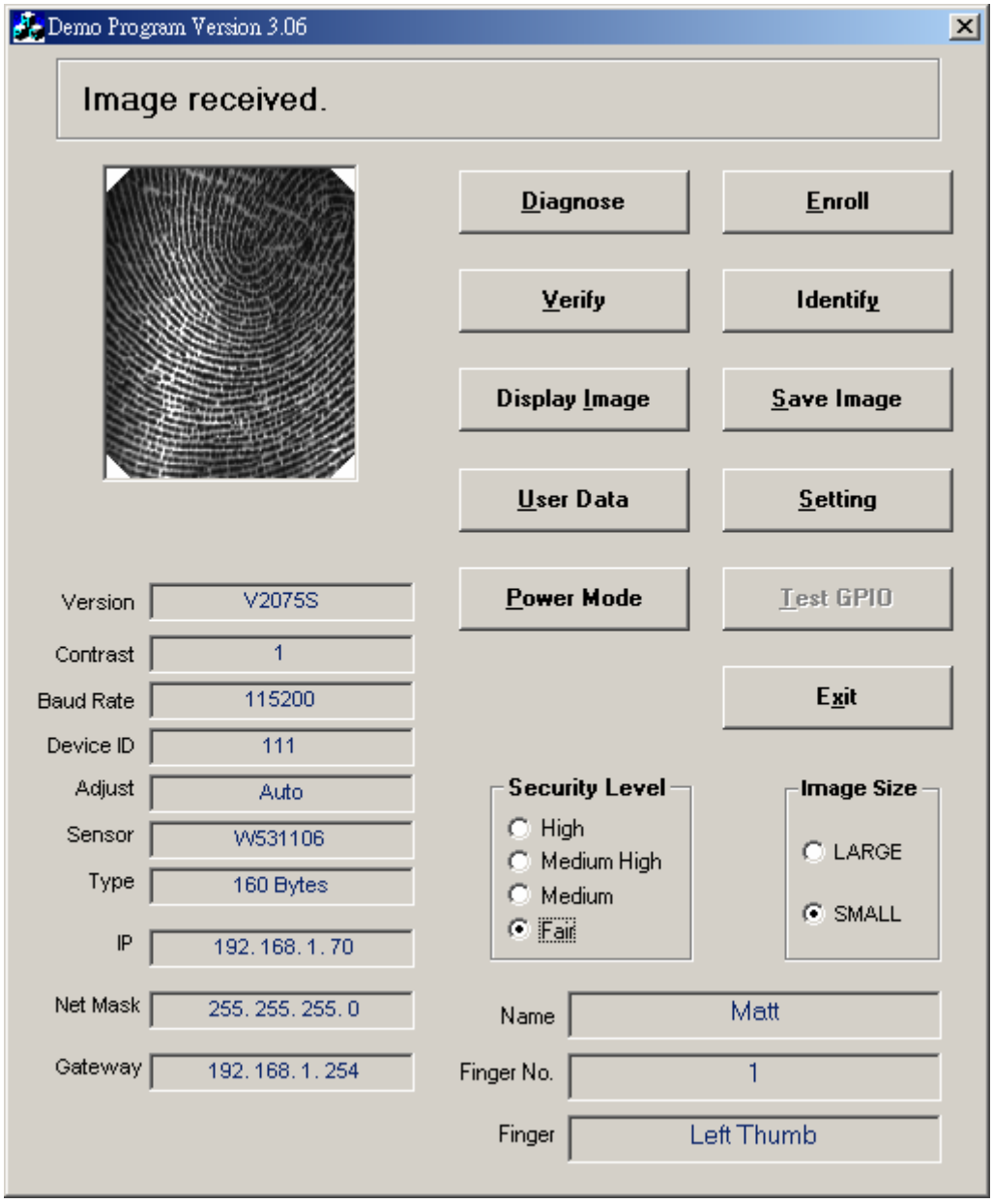
The matching compares a live-scanned fingerprint image against the previously enrolled database. Please put your finger on the reader, and the fingerprint reader will check it out automatically according to the security level settings.

You can click the **Identify** by mouse or press the **ALT+Y** by keyboard to enter the matching fingerprint mode. After identification, the score will be displayed on the screen to show if the identification is matched or failed. If the identification succeeds, the user information will also be shown on the screen.



e. Display Image

Click on the **Display Image** button to enter the Display Image mode. This function is to display the currently captured image in the DSP board on the screen. The image will be 256 x 320(LARGE) or 128 x 160(SMALL) in size for CMOS, 192 x 224(LARGE) or 96 x 112(SMALL) in size for LTT Chip Sensor and 256 x 384(LARGE) or 128 x 192(SMALL) in size for BMF Chip Sensor. It will take some time to download the image from the DSP board. The speed will depend on the connected baud rate.



f. Save Image

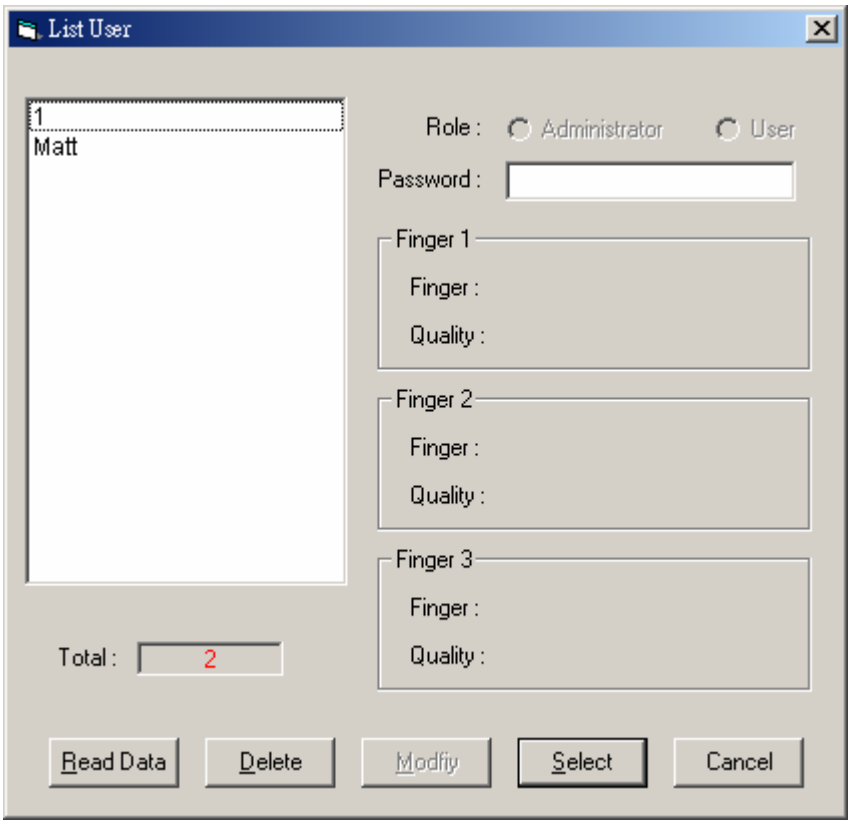
The definition of **Save Image** is to save the fingerprint image to a BMP file.

After a successful fingerprint snapping, the fingerprint image will be kept in the main memory of the DSP board. You can save the fingerprint image with this function.

Click on the **Save Image** button to enter the Save Image mode. This image will be saved as "finger.bmp" in the current working directory. The image will be 256 x 320(LARGE) or 128 x 160(SMALL) in size for CMOS, 192 x 224(LARGE) or 96 x 112(SMALL) in size for LTT Chip Sensor and 256 x 384(LARGE) or 128 x 192(SMALL) in size for BMF Chip Sensor. It will take some time to download the image from the DSP board and the speed will depend on the connected baud rate.

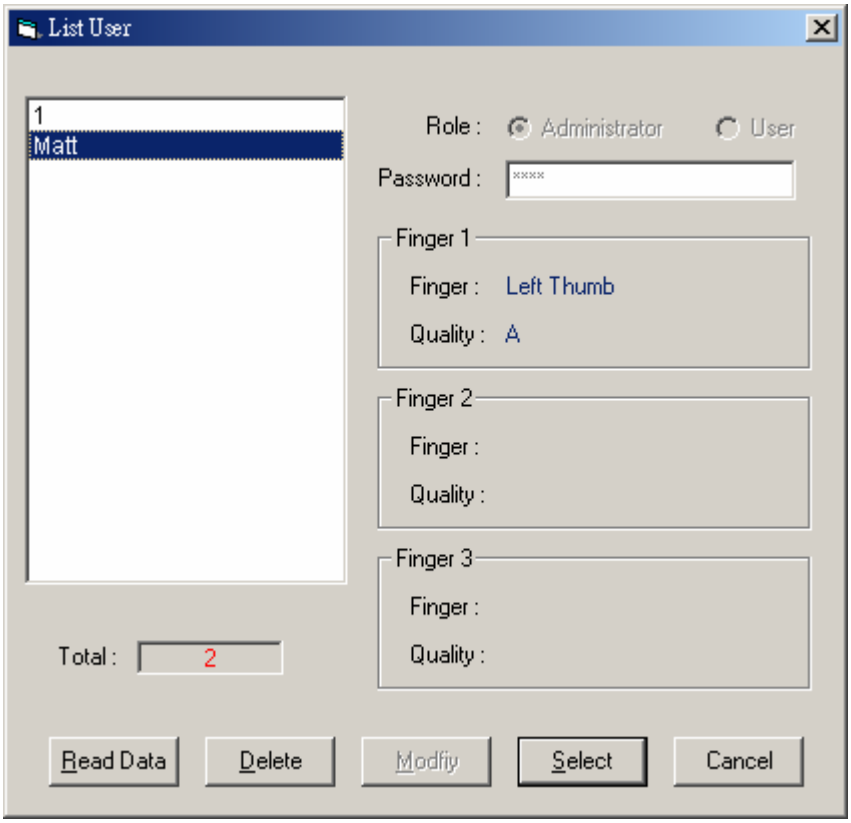
g. User Data

You can click the **User Data** by mouse or press the **ALT+U** by keyboard to enter the User Data mode. The following screen will appear showing the user list.



Click on the desired user and choose the action from one of the button below:

i. **Read Data:** Click "**Read Data**" or simply double-click on the selected user, the details of the selected user will be shown on the right side of the window.



ii. **Delete:** This will delete the user from the DSP board.

iii. **Modify:** This function is reserved and not open yet.

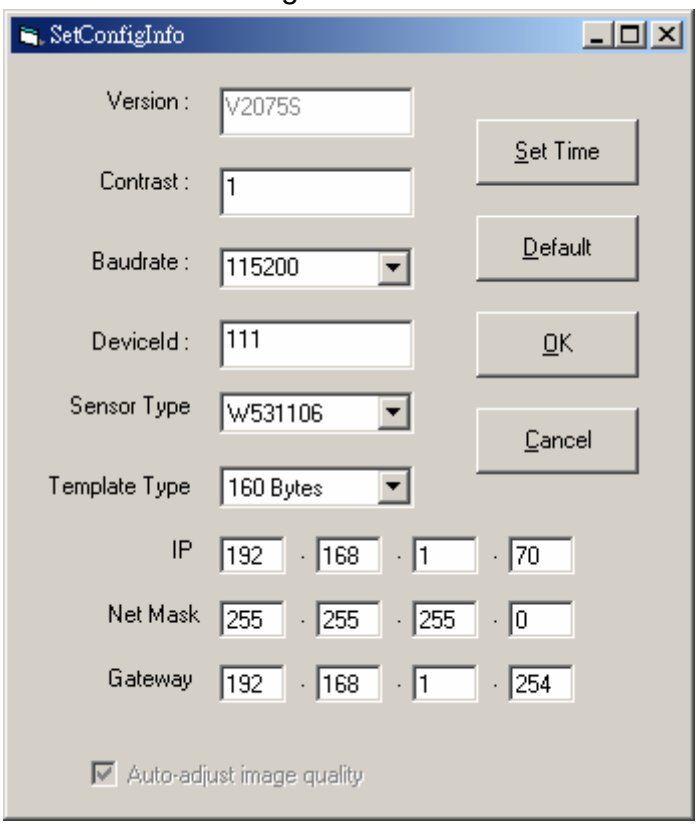
iv. **Select:** The user data files are created after enrollment. Once you have selected a user, it will become the target to be verified, and the name of the user will be displayed on the screen of the demonstration program. Two ways you can change the target that is to be verified:

- Select user from the function of **Select**.
- After enrollment, the enrolled user will become the new target of matching automatically.

v. **Cancel:** To cancel this operation.

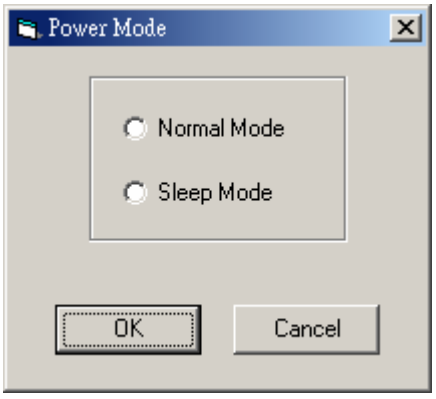
h. Setting

You can click the **Setting** by mouse or press the **ALT+S** by keyboard. Input the desired value to the corresponding item and Click "OK" to use the new setting or click "Cancel" to remain unchanged. You can click on the "Default" button to reset the DSP board to its default settings.



i. Power Mode

You can click the **Power Mode** by mouse or press the **ALT+P** by keyboard. Select a mode from the screen and click "OK" to set. Once set, the DSP will go to a power-saving mode and will be waken up by any RS232 protocol.



j. Test GPIO

~~You can click the **Test GPIO** by mouse or press the **ALT+T** by keyboard. Select a value from the combo list and click "Set" to test. This value is the combination of the 8-GPIO port. See the Programmer's Guide for details.~~

Reserved feature.

k. Exit

The definition of **Exit** is to terminate the demonstration program.

You can click the **Exit** by mouse or press the **ALT+X** by keyboard to terminate the demonstration program.