AuthenTec, Inc.
Personal Security for the Real World™

Aware Authentication Application

Minutiae
047 018 287
106 021 192
070 023 210
053 024 000
073 032 230
108 032 428
091 033 174
058 039 248
108 054 402
125 059 400
099 060 400
070 061 256
048 068 340
065 070 338
104 071 358
115 075 358
041 077 096
123 079 384
063 083 064
053 091 052
028 097 052
084 100 031
050 102 044
103 106 050
117 111 046
104 118 282

User's Guide

2055 Rev 1.4
December 7, 2000

AuthenTec welcomes your suggestions. We try to make our publications useful, interesting, and informative, and we hope you will take the time to help us improve them. Please send any comments or suggestions by mail or e-mail.

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Aware Authentication Application User's Guide
2055 Rev 1.4 (07DEC00)

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Introduction

The Aware™ authentication application is a fully-featured demonstration tool that was developed by AuthenTec engineers to acquaint potential users of the company's advanced fingerprint sensor integrated circuits with this innovative technology, and to help them evaluate the performance of the system in a number of different ways.

This program can:

♦ Display "raw" fingerprint images derived from the sensor IC.

♦ Enroll new users.

♦ Extract fingerprint templates from the raw images, and store them in a local database.

♦ Match live-scan fingerprints against the local database using AuthenTec's proprietary matching algorithms.

Getting Started

Install your Sensor Evaluation Kit in accordance with the instructions in the accompanying *Quick Start Guide*. There are several different installation procedures, depending on whether the sensor module is configured for RS-232 serial interface or USB (Universal Serial Bus) communications.

Additionally, a special installation method is used when installing a USB version with the Windows NT v4.0 operating system. A separate *Quick-Start Guide* covers each of these combinations. The *Aware* authentication application is automatically installed on your computer during the kit installation process.

Finger Placement

When placing a finger to be enrolled or identified on the sensor matrix surface as shown in the preceding illustration, use light, but firm and steady pressure.

Avoid moving your finger during the scan, and be sure that you are making contact with the **sensor matrix** and with the surrounding **drive ring** – the light-colored surface surrounding the matrix. *Aware* works best when it has a "core" image – the center of your
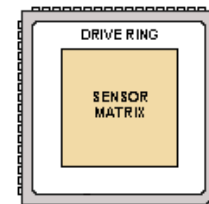
fingerprint, which is approximately opposite the line of the cuticle of your fingernail.

Scope

This guide is intended for the use of AuthenTec customers and evaluators who wish to understand the fingerprint authentication services offered by AuthenTec fingerprint sensor integrated circuits.

Applicability

This edition of the *Aware Authentication Application User's Guide* is Revision 1.4, and replaces all previous editions with extensive changes. Users should destroy all former editions of this document.

Reference

This publication is prepared and presented in accordance with the guidelines and conventions of the *Microsoft Manual of Style for Technical Publications*, Microsoft Press, Redmond WA USA. Other reference material includes the *Chicago Manual of Style*, University of Chicago Press, Chicago IL, and the *IBM Dictionary of Computing*, Information Development, Poughkeepsie NY.

Using Aware

An *Aware* shortcut icon like the one shown here has been placed on your desktop by the installation script.

♦   Double-click this icon to start the *Aware* application. The **Aware Main Menu** screen appears, as shown in the following illustration, offering a set of program options.

The Aware Main Menu

Figure: The Aware Main Menu
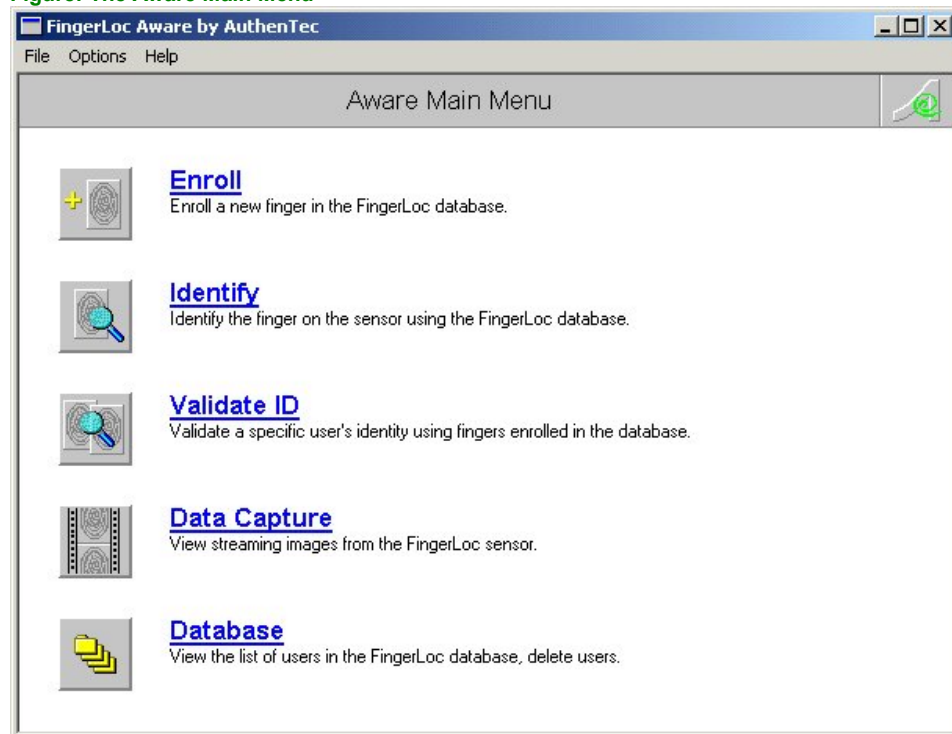
The Aware Menu Bar

In common with all of the menu screens in the *Aware* application, the menu bar of the **Aware Main Menu** contains three menu names, **File**, **Options**, and **Help**, each of which has one or more available commands. These selections perform the functions described in the following illustration.

Figure: Main Screen Menu Bar

File		
	Exit	Close *Aware* and return to the desktop.
Options		
	Save Images	Select to save all data from the chip to disc.
	Data Capture Resolution	Set the viewing density of the scanned images.
	250 DPI	
	375 DPI	
	500 DPI	This is the default scanning density.
	1000 DPI	
	Enable LED Controls	Factory use only.
Help		
	About…	Display copyright information about *Aware.*

The program options available from the body of the **Aware Main Menu** are described in detail in the following sections.

The Enroll Feature

When the **Enroll** option is invoked, a raw fingerprint image is acquired by the sensor IC, processed into its essential template data, then inserted into the *Aware* database, together with an associated User ID and other optional information.
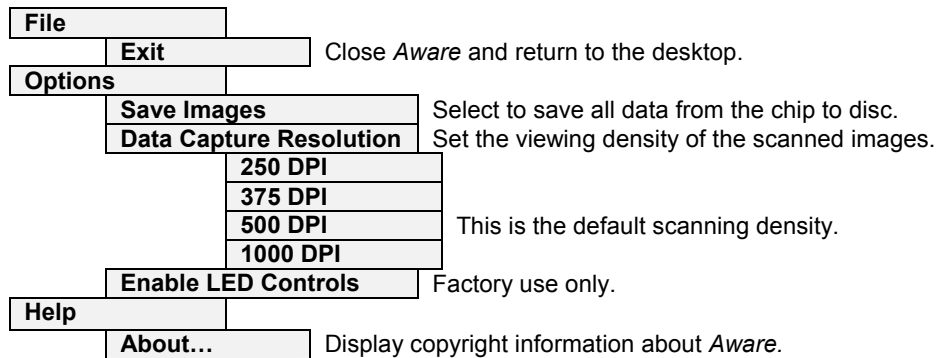
A new user can be enrolled, or the enrollment information for an existing user can be updated. If the user has already enrolled at least one finger into the database, he is re-enrolled, thus permitting current enrollment data to be updated (over-written), or fingers to be added to the template storage.

The Enroll Feature (continued)

Step 1…

♦ Click **Enroll** to display the **Enroll User** screen. The **User Identification** dialog box, shown in the following illustration, appears automatically.

Figure: The User Identification Dialog Box
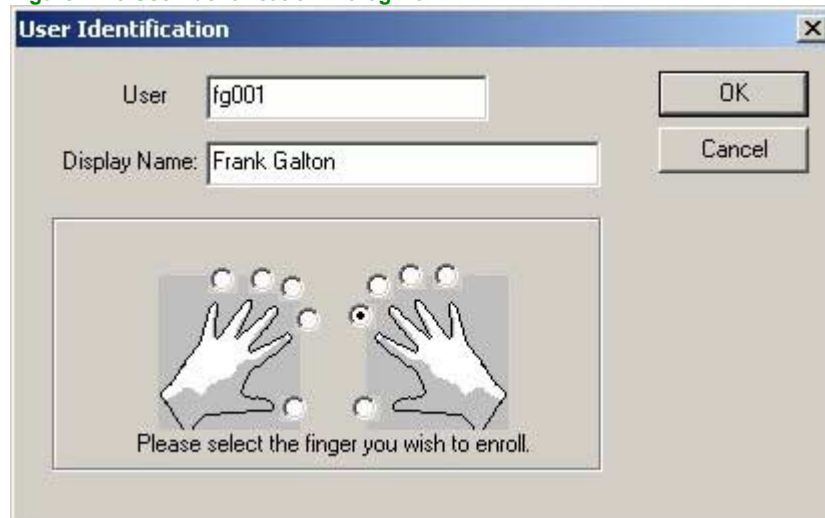
♦ In this box, complete the following steps…

♦ Type an identifying string (a "User ID") into the **User** text field. This mandatory entry may be composed of any combination of letters, numbers, or symbols (but <u>no</u> spaces), and must be from 1 to 23 keystrokes in length. If this is an initial enrollment, the User ID must be unique in order to be appended to the *Aware* database. If you wish to add another finger to an existing User ID (you can also overwrite the data for a finger that has already been enrolled) type the existing User ID into this field.

♦ Type an easily remembered identifier (such as a name, a nickname, or other mnemonic) into the **Display Name** text field. This entry may use any combination of letters, numbers, symbols, or spaces, and must be from 0 to 73 keystrokes in length. This text field may be left blank, but we strongly recommend its use.

♦ In the graphic field showing a picture of two hands, select the option button adjacent to the finger (or thumb) to be enrolled. The default selection is the right index finger.

♦ Click **OK** to close the **User Identification** dialog box. This reveals the **Enroll User** screen, which is used to initiate the enrollment process.
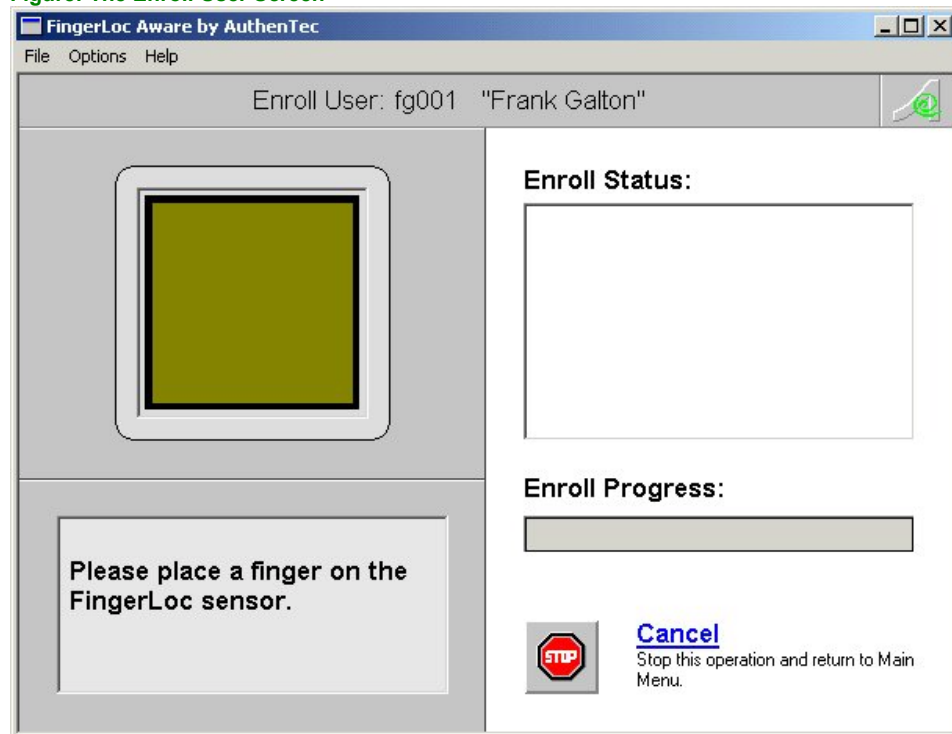
The Enroll Feature (continued)

♦ Click **Cancel** or the stop-sign icon to return to the **Aware Main Menu**.

Step 2…

The User ID that will be used to identify the enrollment of the specified finger is shown in the **Enroll User** screen title bar.

Figure: The Enroll User Screen

The Enroll Feature (continued)

♦ On the Sensor's surface, lightly but firmly place the finger that was previously specified in the **User Identification** dialog box. You will be prompted to lift and replace this finger several times as the Fingerprint Acquisition System software acquires the image and builds a template of it. An **Enroll Progress** indicator displays the stage of completion of this process.

> **Note:** During the *Enroll* process, the target finger will be scanned at least three times, but not more than five times in any given attempt. If *Aware* cannot build a valid image with which to *Enroll* the finger please review the suggestions on Finger Placement in the Getting Started section of this document.

♦ Click **Cancel** or the stop-sign icon to terminate the enrollment process and return to the **Aware Main Menu**.

Figure: The Enroll User Screen – In Process

**Aware Authentication Application User's Guide**
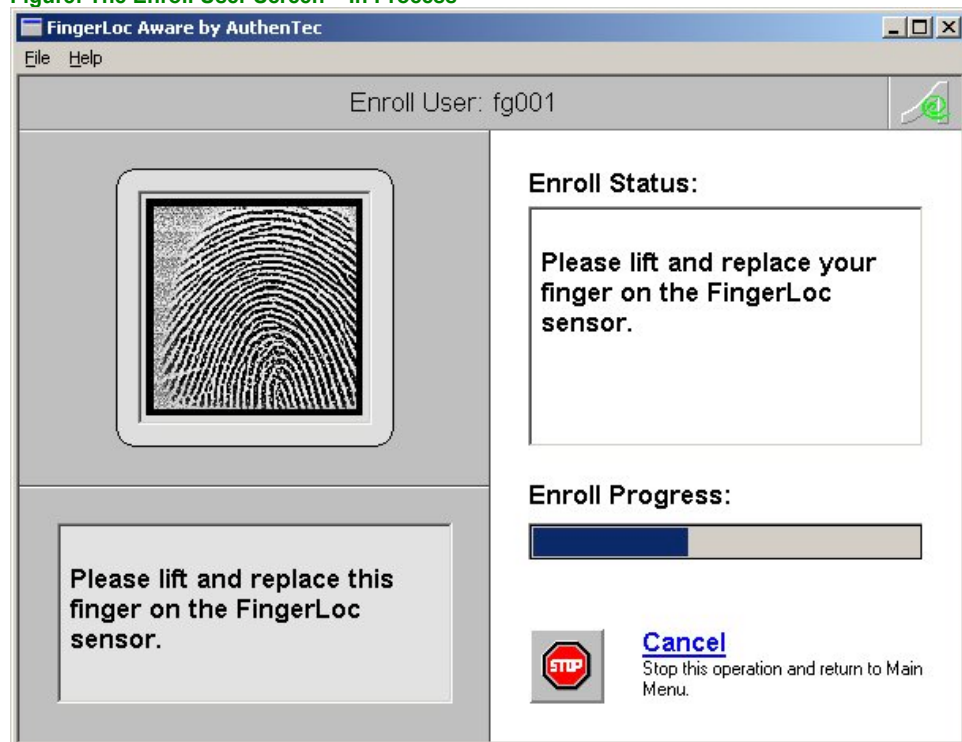
The Identify Feature

The **Identify** option is used to compare the finger presented to the sensor against all of the other fingerprints currently entered in the database (this is called a *one-to-many* search).

♦ Click **Identify** to display the **Identify User** screen, as shown below. Place a finger on the sensor. When the Fingerprint Acquisition Software acquires the image, the message "Finger detected" appears in the **Identification Status** message field.

Figure: The Identify User Screen
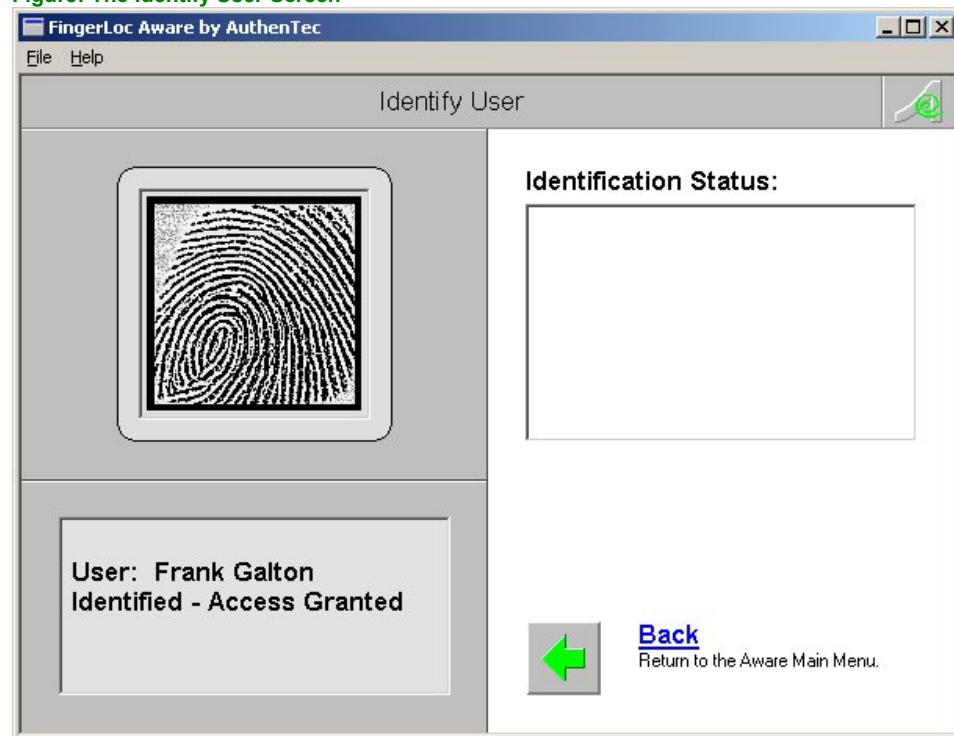
The application will search the database of enrolled *Aware* users in an attempt to find the individual who is associated with the presented finger. When the match is made, the found enrollee's User ID or Display Name is shown in a secondary message field.

If a valid image is acquired but no database match is made, the message "No Match – Access Denied" is shown in the secondary field. If *Aware* cannot build a valid image with which to *Identify* the finger, please review the suggestions on Finger Placement in the Getting Started section of this book.

The program will repeat the identification process and report approximately every second until the finger is removed from the Sensor.

♦ Click **Back** or the left-arrow icon to return to the **Aware Main Menu**.

The Validate ID Feature

The **Validate ID** option is used to perform a *one-to-one* verification to ascertain if the person whose finger is placed on the sensor is in fact the same as the person enrolled under a particular User ID.

♦ Click **Validate ID** to display the **Validate User ID** screen. The **Select User ID** dialog box, as shown in the following illustration, automatically appears. All users with one or more fingers currently enrolled in the database are shown in a list box.

♦ Highlight a User ID in the list, then click **OK** (or double-click it) to submit it to the *Aware* validation process, or click **Cancel** to exit to the **Aware Main Menu** without effect.

Figure: The Select User ID Dialog Box

♦ With a target User ID selected, that person places a finger on the sensor. The *Aware* search engine searches the database for a match with the User ID.

Figure: The Validate User ID Screen
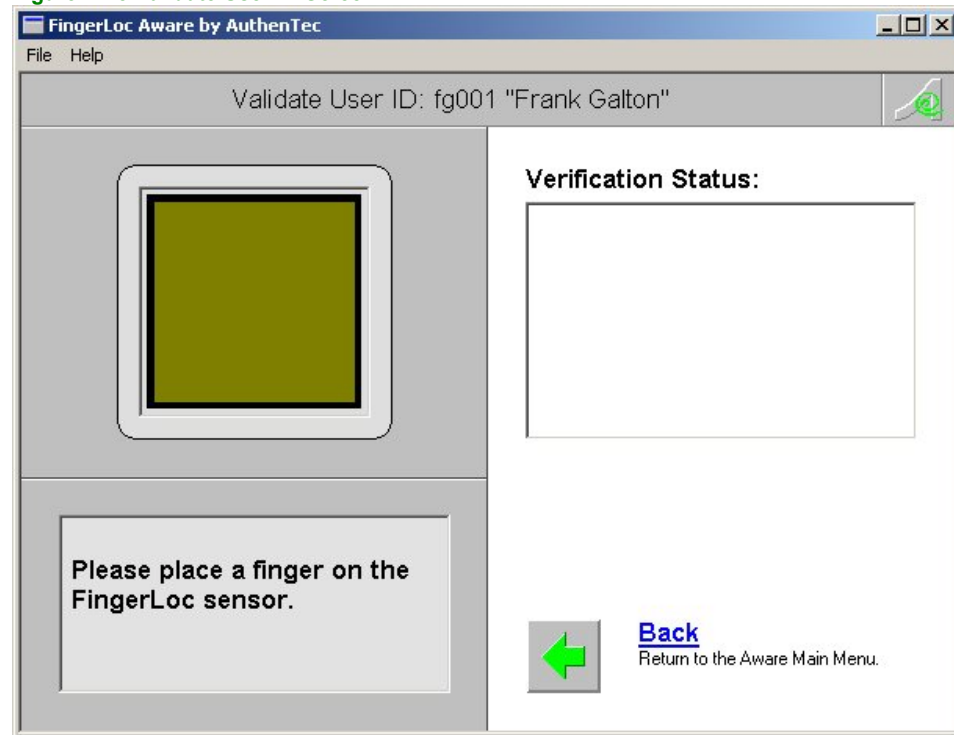
♦ If the match is found, a **Validation Report** dialog box appears:

Figure: The Validation Report Dialog Box - Match
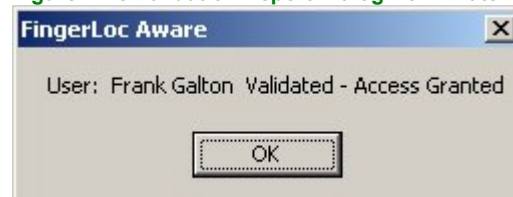
◆ If no match is made, the dialog box reports the failure:

Figure: The Validation Report Dialog Box – No Match

The Data Capture Feature

The **Data Capture** option is primarily a viewing facility that is used to display (or capture) a continuous series of real-time images of a fingerprint.

These images are ephemeral – they are not actually permanently captured unless the **Options** > **Save Images** command on the **Aware Main Menu** is selected. In that case, a series of image files in Microsoft bitmap (**.bmp**) format will be written to the current directory, probably…

```
c:\Program Files\AuthenTec\bin
```

where **c:** is the name of the appropriate hard drive. Each of these files is 16,384 bytes in size. Individual files will be named in ascending numerical order starting with…

```
datacapture000.bmp
```

There is no limit to the number of fingerprint image files that can be captured and stored, other than available space on your hard drive. *Aware* does not currently provide a removal facility, so these files must eventually be manually deleted.

Figure: The Data Capture Screen
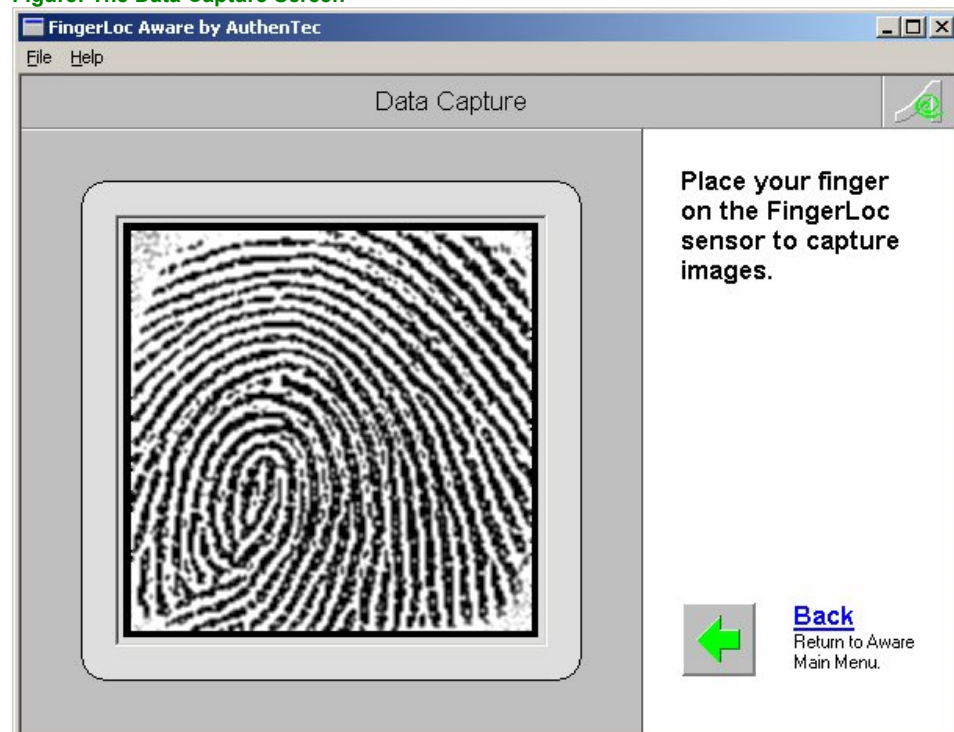
The rate at which images appear on the monitor screen depends on the speed of the supporting CPU, and to some extent on the viewing density that can be set with the **Options** > **Data Capture Resolution** command on the **Aware Main**

Menu (the default density is 500 dots per inch). Typical frame display rates may vary from as few as one to as many as six, or even more, frames per second.

♦ Click **Data Capture** to display the **Data Capture** screen as seen in the preceding illustration.

♦ Place a finger on the sensor matrix. The sensor will detect its presence and begin to transmit a stream of raw images to the *Aware* application.

♦ Click the left-arrow icon to return to the **Aware Main Menu**.

The <u>Database</u> Feature

The **Database** option is used to review, delete, and otherwise manage the contents of the *Aware* database.

♦ Click **Database** to display the **User Database** screen.

Figure: The Database Screen
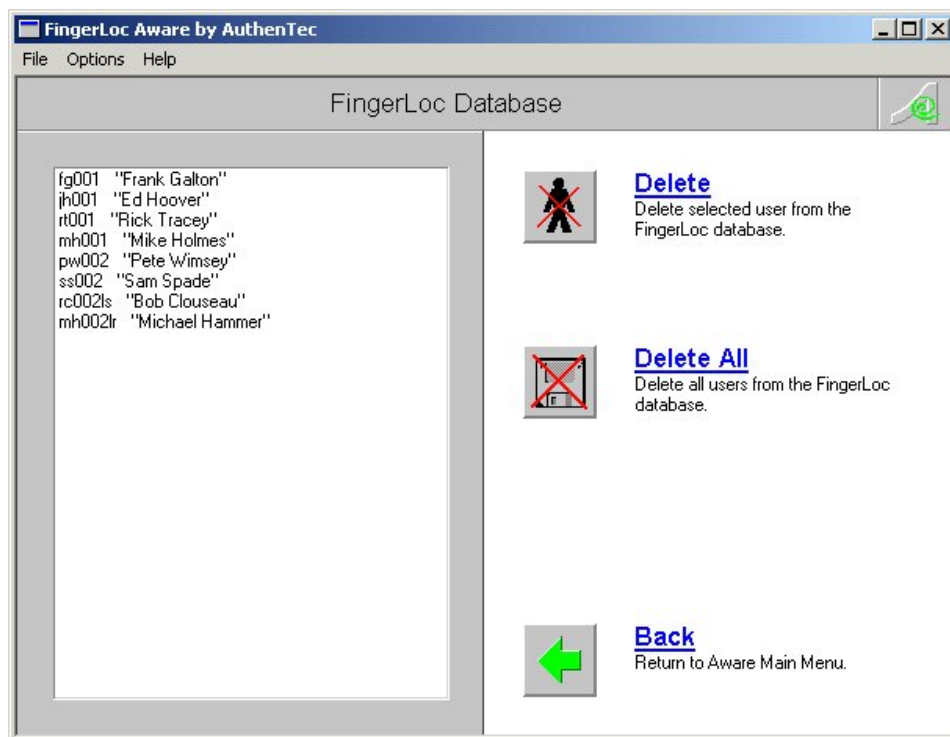
♦ Click **Delete** or the associated icon to permanently remove a highlighted database entry, or click **Delete All** (or its icon) to permanently remove the entire contents of the database.

> **Caution:** The Delete and Delete All commands are not reversible. All identified data will be irrevocably lost!

♦ Click **Back** or the left-arrow icon to return to the **Aware Main Menu**.

For Further Assistance

Troubleshooting

Most of the problems experienced by users of *Aware* result from errors in connecting the hardware or installing the software. Check to be sure that the cable is properly connected and that the system is powered up. If the problem persists, uninstall the entire AuthenTec software suite (using the **Add/Remove Programs** facility in the Windows **Control Panel**) and reinstall it.

The other common source of problems is improper placement of the finger on the surface of the Sensor. If the equipment and software is apparently properly installed, but difficulties in enrollment or identification are encountered, please reread the comments in *Finger Placement* in the Getting Started section of this document. Incorrect finger placement will often result in the display of the following dialog box:

Figure: Finger Placement Dialog Box

Various informative files can be found on the compact disc supplied with your Fingerprint Sensor kit. Late-breaking news, known bugs, work-arounds, and other additions, deletions, or discrepancies in the *Aware* program are documented in a file named:

    ReadmePGM.txt

Customer Support

If you have any questions about this application, or if you encounter a problem during installation you can get technical support from AuthenTec's application engineers at the Florida headquarters.

Contact our Applications Engineering Group by e-mail at apps@authentec.com, or by telephone at 321-308-1300. Telephone support is available from Monday through Friday, from 8 A.M. to 4 P.M. Eastern Standard Time.

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