



AMERICAN BIOMETRIC COMPANY

BioMouseTM

Desktop Fingerprint Scanner

Reference Guide

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This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that this interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient or relocate the receiving antenna.
- increase the separation between the equipment and the receiver.
- connect the equipment into an outlet or circuit different from that to which the receiver is connected.
- consult the dealer or an experienced radio/TV technician for help.
- changes or modifications not expressly approved by DEW Engineering & Development Ltd. could void the user's authority to operate the equipment.

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The BioMouse Scanner

Overview

The BioMouse Desktop Fingerprint Scanner is a livenesscan fingerprint imaging device designed specifically for computer system security. By capturing an image of a fingerprint and comparing it to previously recorded information about the print, the BioMouse scanner and software can provide or deny access to computer systems.

This document provides general information required to use the BioMouse. For help with a specific BioMouse application, consult the electronic help file in your online manual supplied with your BioMouse.

The BioMouse scanner replaces passwords - the weakest link in computer security - replacing or augmenting the password security with fingerprint authentication. The fingerprint is ideal for authenticating users logging onto computer systems, as the fingerprint cannot be lost, borrowed or forgotten.

Authentication Performance and Security Levels

The ABC fingerprint recognition algorithm used in the BioMouse software was accuracy tested by a NIST approved Information Technology Security Laboratory (NVLAP CODE #200017-0).

The tests provide certification of the algorithm for levels of security from 1:1,000 (FAR) to 1:1,000,000 (FAR).

The False Acceptance Rate (FAR) refers to the chance that the system will fail to reject an imposter attempting to gain access to the system. The BioMouse software provides the highest degree of security when set to 1 in 1,000,000.

Caution: Using the higher security levels may make it harder for some enrolled individuals to access their system.

BioMouse Aware Products

ABC is working together with leading technology companies to integrate biometric user authentication into their products. Watch for BioMouse aware products from ABC partners appearing soon. A BioMouse API toolkit is available to enable qualified companies and developers to integrate biometric user authentication using the BioMouse scanner into their systems and applications. For more information contact ABC at 1-888-BIO-MOUSE and ask for developer relations.

Getting Started

System Requirements

The following are the minimum system requirements required to use the BioMouse scanner.

- 486/66 or Pentium processor (Pentium recommended for Windows NT.)
- Windows 95, or Windows NT 4.0 installed.
- 8MB of RAM (16 MB for Windows NT) and 1 MB of free disk space.
- At least one parallel (printer) port. The BioMouse is able to share the parallel port with most other devices such as printers and tape backups.

What's Inside the Box

Your BioMouse box contains the following items in addition to this manual. If any items are missing please contact ABC customer support at 1-888-BIO-MOUSE.

- BioMouse Desktop Fingerprint Scanner with parallel port cable attached.
- AC Power adapter.
- Envelope containing a software installation disk and an online manual diskette.

Note: You must accept the terms of the software license agreement before you open the software envelope. The AC Power adapter is designed to plug into a 120V-60Hz wall outlet and supplies the BioMouse with 12V AC, 500mA. Please use a transformer if your regional power ratings are different than the requirements of the Biomouse.

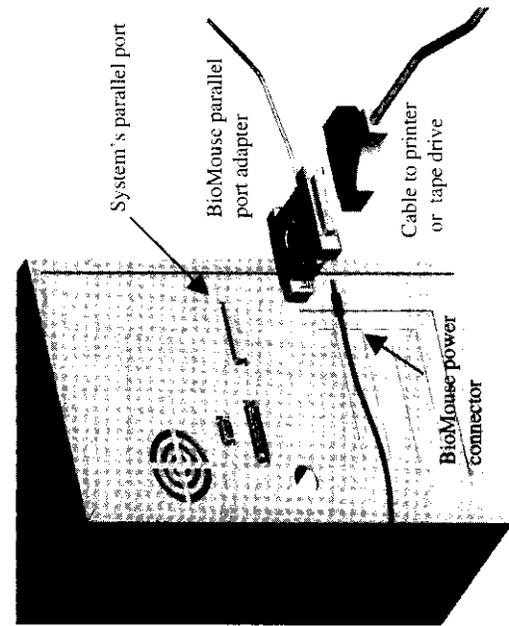
Hardware Installation

Note: The steps in this section must be completed BEFORE the BioMouse software is installed.

1. Turn your system off and remove the BioMouse from its packaging.
2. Locate a parallel port on the back of your computer (a 25-pin female connector).
If a printer or other device is attached to the port, you will have to temporarily detach it from your system to install the BioMouse scanner.
3. Plug the male end of the parallel port adapter on the BioMouse cable into your parallel port and secure it to your system with the adapter's screws.
4. If you unplugged another parallel port device in step 2, you may now plug the cable you removed into the female end of the BioMouse parallel port adapter.
5. Locate the AC power adapter that came with your BioMouse. Plug the power connector into the socket on the side of the BioMouse parallel port adapter and plug the power adapter into a standard wall socket.

Warning: Using a power adapter other than the adapter that came with your BioMouse may seriously damage your BioMouse scanner and / or your computer.

6. You are now ready to install the software for your BioMouse scanner.



Using the BioMouse Scanner

Getting Comfortable

The BioMouse scanner is designed to be ergonomic and easy to use. The scanner is designed to sit on your desk as shown in the photo below. Legs on the underside of the BioMouse scanner can be folded out to raise the scanner surface for more comfortable finger placement.



We recommend the primary user of the BioMouse scanner choose the desk placement that is most comfortable for him/her. Changing the location of the BioMouse scanner after you have enrolled fingers may change the way you place your finger on the scanner surface. This could affect the performance of the BioMouse scanner during fingerprint authentication, particularly at higher security levels.

Which Finger?

ABC recommends that each user enroll a thumb and at least one additional finger. For additional enrollments we recommend you select a finger which is comfortable to place flat on the scanner surface without the need to reposition the scanner on your desktop. A user may enroll all 10 fingers if desired.

Finger Placement

It is important that the BioMouse captures good quality images of your fingerprint to ensure accurate authentication and enrollments. On the fingerprint authentication screens the BioMouse software will provide a crosshair over the live scan image to help you place your finger on the BioMouse scanner's surface. When using the BioMouse scanner, it is important that the center or 'core' of the fingerprint is placed near the center of the crosshairs on the screen. The core of the fingerprint is the area where the print's ridges tend to swirl. The images below show the most common patterns on fingerprints and their best placement on the BioMouse scanner.



Arch Pattern



Loop Pattern



Whorl Pattern

The amount of pressure applied to the scanner can also affect the quality of the image. The images below demonstrate how varying the pressure of your finger on the BioMouse can change the image quality.



Good pressure
Perfect image



Too little pressure causes
a broken and inconsistent
image



Too much pressure causes
a dark or "washed out"
image

A few minutes of practice is all that it takes to become an experienced user of the BioMouse scanner. After a few successful authentications you should find that properly placing a finger on the scanner becomes 'second nature'.

Care and Maintenance

The BioMouse scanner may require periodic cleaning of the scanning surface. We recommend using a soft cloth dampened with water. Avoid using abrasive cleaning materials as the scanning surface may be damaged and render the BioMouse unusable. For persistent dirt and grime we recommend a light wipe with an alcohol based computer wipe.

Software Setup

For detailed instructions on setting up the BioMouse on Win NT and Win95 please install the HTML On-line Manual included with your BioMouse package. (Insert the diskette labeled 'BioMouse User's Guide' and select RUN from the start menu. Type A:\SETUP.EXE in the RUN dialog box and click OK to run the setup program.)



Note: The BioMouse scanner must be connected to your computer before you install the software. Go to page 3 for hardware installation instructions.

1. Turn your PC on and start Windows.
2. Locate the envelope included with your BioMouse which contains the installation floppy disk. Read the software license agreement and open the envelope if you accept the terms. Insert the installation disk into your floppy disk drive.
3. Select RUN from the start menu and type A:\SETUP.EXE in the RUN dialog box. Click OK to run the setup program.
4. Click the next button to advance through the setup screens. The setup program will display the ABC license agreement and a README file which details any changes made to this manual or the software after the manual was printed.
5. You will be asked to choose an installation directory for the BioMouse software.
6. The setup program will ask you what you would like the program group or

Start menu folder to be named. We recommend you choose the default setting of BioMouse Scanner.

7. You will be asked to confirm the information you entered previously. Click NEXT to start installing the BioMouse software onto your hard disk. If you would like to change the information you have entered, click the BACK button until the information you wish to change appears.
8. When the setup program finishes copying files to your hard disk, you will be asked to click the FINISH button to complete the installation. You have the option of launching the BioMouse Enroll program immediately by selecting the check box on this screen. The Enroll program allows you to enroll fingerprints and manage users.

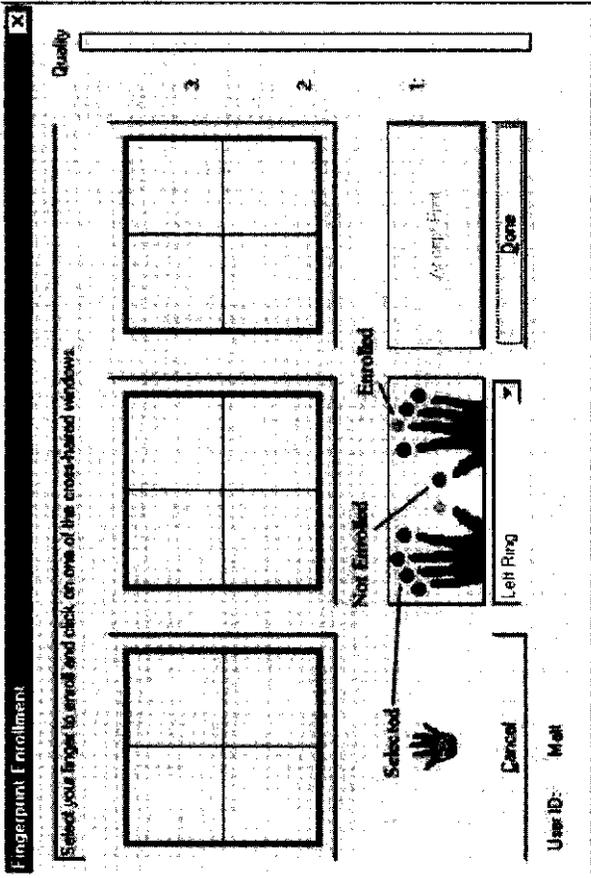
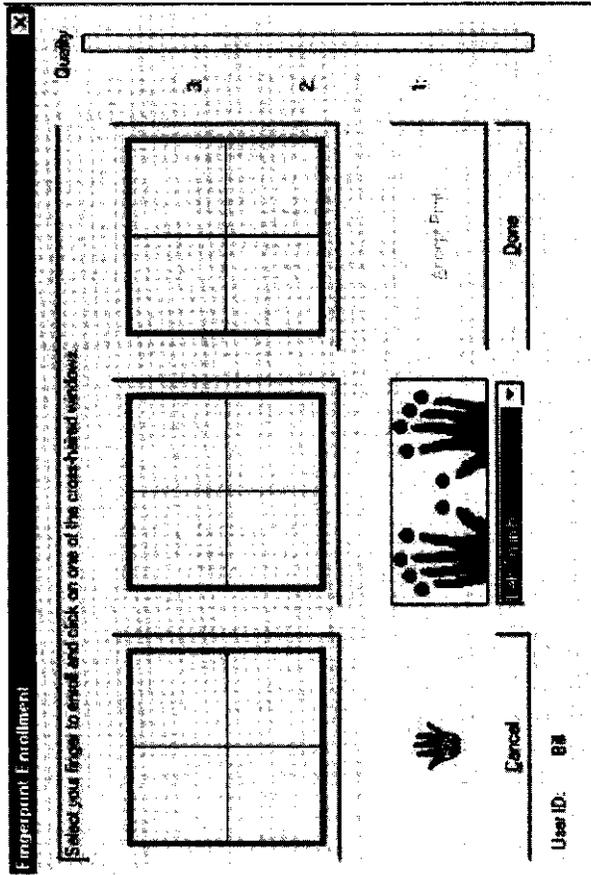


Note: The Enroll program will start automatically any time fingerprint authentication is required and no users are enrolled. (Win 95)

ABC recommends reading Using the BioMouse Scanner on page 4 before starting to use the BioMouse software.

Managing BioMouse Users Enrolling Fingerprints for a User

1. Whenever fingerprint enrollments need to be created or modified for a particular user, the following screen will appear.



The identifier of the user whose fingerprint enrollments are being updated is shown at the bottom of this dialog. The picture of the hands indicates the current state of this user's enrollments. This graphic is also a selector and can be used to specify fingers. The color of the circles above each finger have the following meanings:

BLACK: The finger is not enrolled

GREEN: The finger is enrolled

RED: The finger is currently selected

This is illustrated in the following example:

2. To select a finger, simply click the left mouse button, near the finger tip or circle of the desired finger. Alternatively, the drop down list below the graphic can be used.

3. To enroll a fingerprint, three images of the SAME finger print must be provided. There is a window for each of the required samples.

4. To capture a fingerprint image, click directly on the image window (or if the focus is on the window, the SPACE bar may be used). This will start displaying live images from the BioMouse. Place the finger to be enrolled on the BioMouse scanner and try to position the core of the fingerprint on or near the crosshairs. Go to page 5 for information on how to properly place your finger and identify the core of your fingerprint.

5. Holding your finger steady on the BioMouse scanner for one or two seconds will activate the software's auto-detection feature. The frame and crosshairs of the capture window will change color to show the status of the auto-detection.

BLACK – No print detected

RED – Print detected but is moving or unstable

YELLOW – Print is stable

GREEN – Print has been captured (scanning steps)

Please see “Setting Preferences” in the HTML On-Line user reference guide for information on adjusting the auto-detection parameters. You may either wait for the auto-detection feature to “freeze” the print, or you can click on the image window (or use the SPACE bar) while the BioMouse is scanning.

6. Repeat above capture procedure for each of the remaining two image windows.

Note: It is important to lift the finger off the BioMouse between captures of each sample because doing so will give a better measure of enrollment quality.

Remember to use the same finger for all three samples.

7. Once three images of the fingerprint have been captured, the quality of the enrollment will be shown as a green bar on the right hand side of the screen. Also the best fingerprint image will be selected and remain highlighted in green.

8. The QUALITY bar must show a quality level equal or greater to the current security level setting. Quality 1 equates to the 1 in 10,000 security level, 2 equates to 1 in 100,000 and 3 equates to 1 in 1,000,000. Please see “Setting Preferences” in the HTML On-Line user reference guide for more information on setting security levels.

If the QUALITY level is not high enough for the current level or security, then the ACCEPT PRINT button will not be enabled. In this case, one or more of the samples must be updated before the print can be accepted. Any sample may be updated as many times as desired. After each update, a new quality will be calculated and displayed. In some cases, all three samples may have to be updated to get a satisfactory level.

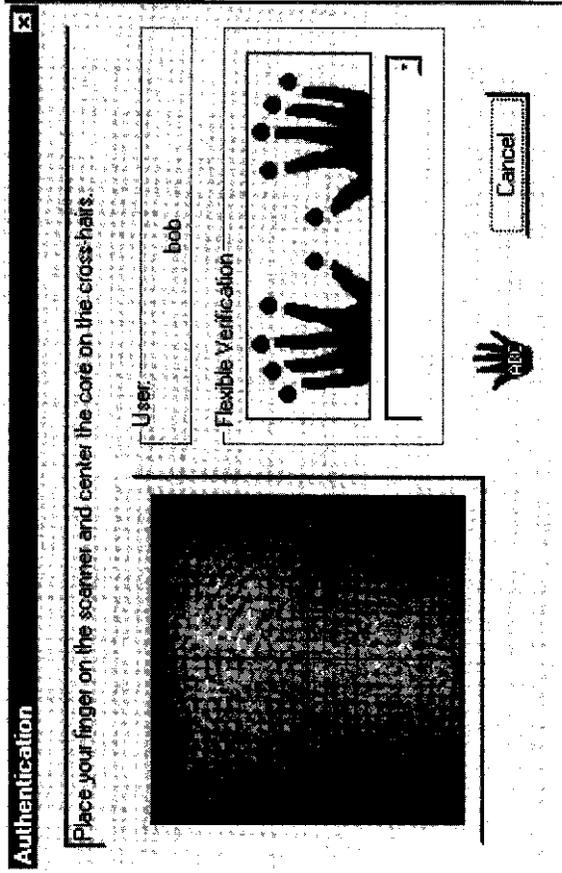
If the quality level remains low, use the following troubleshooting steps to help improve the quality.

- Look at the three fingerprints in the image windows. They should resemble each other. If one looks out of place then the wrong finger may have been used for one of the captures. Update the image in that window.
- Is the core of the print near the center of the window in each of the three images? If the core of the print is near the edge of the windows in any of the samples, try and update those samples with better core placement.

- If one of the images looks visibly rotated or distorted then that sample should be updated.
 - Are the ridges of the fingerprints broken or faded? Your skin could be too dry. Try lightly moistening your finger before you place it on the BioMouse. You could also try applying a bit more pressure when using the BioMouse.
 - If the image appears “bloomed” out, your hand may be too moist or you may be applying too much pressure when using the BioMouse. Try drying your finger or perhaps using less pressure.
 - Check that the scanning surface of the BioMouse is clean. If it is not, then go to page 6 for instructions on cleaning the scanning surface.
9. Once the QUALITY level is acceptable (the ACCEPT PRINT button is enabled) and you are satisfied with the quality, then the enrollment can be saved by pressing the ACCEPT PRINT button. Before pressing the ACCEPT PRINT button, ensure that the correct finger has been selected on the graphical hands.
 10. To delete an enrollment, use the right mouse button and click on or near the finger to be removed on the graphical hands.
 11. The enrollment process outlined above may be repeated for as many fingers as desired. When exiting this dialog, the DONE button will save any enrollment changes. If you do not want any of these updates the CANCEL button will exit the dialog and restore the enrollments to their original state at the start of this dialog. If CANCEL is selected, you will be prompted for confirmation before the dialog exits.

Using the Authentication Dialog

Most BioMouse applications will show a dialog like the following whenever a user's identity requires authentication.



BLACK - No print detected

RED - Print detected but is moving or unstable

YELLOW - Print is stable

GREEN - Print has been captured (scanning stops)

Please see "Setting Preferences" in the HTML On-Line user reference guide for information on adjusting the auto-detection parameters. You may either wait for the auto-detection feature to "freeze" the print, or you can click on the image window while the BioMouse is scanning.

3. Once a fingerprint image has been captured, a fingerprint comparison will be performed immediately. If the authentication was successful then the dialog will exit and the application will proceed.
4. If the comparison was not sufficient to authenticate at the current security level, then an "ACCESS DENIED" message will be displayed briefly. The dialog will then continue scanning to allow for another attempt.

When this dialog appears, it will continuously scan and capture fingerprint images until the user's identity has been verified, or the CANCEL button was pressed. The dialog will eventually timeout if no finger is presented.

Some applications will require a password as well as a biometric. When this is the case, a password field near the bottom of the dialog is presented and should be filled before a fingerprint is presented to the BioMouse for authentication.

Regular Verification

Most of the time, a user needs only to supply one finger for verification and it may be any of the fingers that the user has enrolled. In this mode (Regular Verification) none of the fingers on the graphical hands are highlighted (all of the circles are black). This is the default mode for this dialog.

Use to following steps to authenticate using regular verification.

1. Place one of the fingers you enrolled on the BioMouse scanner, making sure the core of your fingerprint is near the crosshairs of the image window.
2. Holding your finger steady on the BioMouse scanner will activate the software's auto-detection feature. The frame and crosshairs of the capture window will change color to show the status of the auto-detection.

Flexible Verification

Flexible Verification is a mode where users may provide multiple samples of fingerprints for comparison. This feature is most useful for users who may have trouble accessing the system at the set security level due to a single fingerprint being unreliable. (Causes may be such things as peeling skin, scars, or poor finger placement).

When multiple fingers are supplied for verification, an aggregate comparison is performed against the corresponding multiple enrollments. Since more biometric information is supplied, the chances of being falsely rejected are reduced. Of course, the selected fingers must be enrolled for flexible verification to work.

Note: Flexible verification does not compromise the current security level settings.

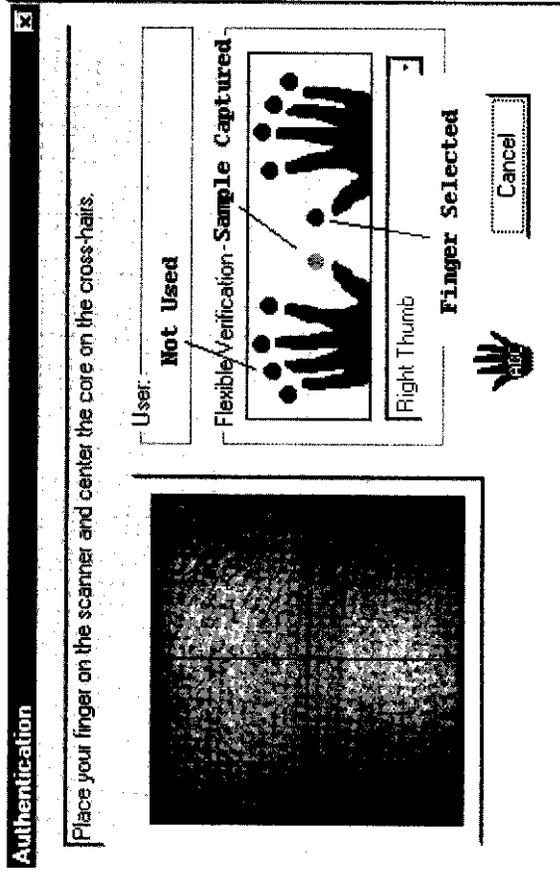
1. To enter flexible verification mode, simply select an enrolled finger from the graphical hands selector. The picture of the hands also indicates the current state of this user's authentication. The color of the circles above each finger have the following meanings:

BLACK: The finger is not being used

GREEN: A sample for this finger has been captured

RED: The finger is currently selected

This is illustrated in the following example:



The drop down list below the graphic may also be used for selecting.

2. Once a finger is selected, use that finger on the BioMouse to capture a sample image. Capturing a sample is done the same way as in Regular Verification (see above).

Note: The user must know which fingers he/she has enrolled. This information is not displayed.

3. Once a fingerprint image has been captured, a comparison will be performed immediately. This comparison will also include other fingers that have currently captured samples (with green circles). If the authentication was successful then the dialog will exit and the application will proceed.

4. If the authentication was not successful, the message "CAPTURED" will appear briefly, indicating that a sample image for the currently selected finger has been captured. At this point, the BioMouse will continue scanning and the user is free to go on and select another finger for capture.

Note: A previously captured finger may be repeated for capture. In this case the most recent sample for that finger will be used and the previous sample will be discarded.

5. The user may try as many samples as desired, however if more than three fingers are captured, then only the most recent three samples will be used for the comparison and the extras will be discarded. The samples used for comparison are indicated in the graphical hands with green colored circles.

Note: If a finger is not enrolled but has been used for comparison, then the authentication will fail for flexible verification.

6. The user may remove a finger from flexible verification by using the right mouse button on a captured sample finger on the graphical selector.

Deleting a User

To delete a user, select the username to be deleted from the list of usernames on the Enroll program's main window and click the delete user button. The program will ask for a confirmation before the record is deleted.

Removing Finger Enrollments

To remove finger enrollments from the system, use the following procedure:

1. Start the Enroll program and select the username of the person you wish to modify.
2. Click the UPDATE button to open the Add Finger Record window.
3. Select the finger you wish to delete the enrollment for from the FINGER list box.
4. Click the REMOVE button to delete the selected finger enrollment.
5. Click the DONE button to return to the Enroll program's main window.

The Administrator Account

The Administrator account allows you to control access to the Enroll program in Windows 95. This account can be used to prevent unauthorized access to the Enroll program where security options can be changed and users can be added, deleted, or updated.

If no Administrator account is present, any enrolled user will be able to enter their user ID and access the Enroll program following a successful fingerprint authentication. Once the Administrator account is present and at least one finger is enrolled, only that account will be able to gain access to the Enroll program.

To add an Administrator account follow the steps on page 7 for adding a user and enrolling fingerprints, entering 'Administrator' for the User ID when required.

In Windows NT, any account with Administrator privileges can access the Enroll program.

We recommend that you enroll at least two fingers for the Administrator account.

Troubleshooting Guide

This section exists to provide our customers with the answers to most questions they may have regarding the BioMouse and it's software. For extended technical support, call our support staff at 1-888-BIO-MOUSE, or visit our web page at www.biomouse.com.

Q1- The BioMouse will not turn on.

A1- If the red light under the scanner window is not on then there is no power going to the BioMouse. Check both ends of the power cable to ensure that they are firmly attached. If the power still does not turn on, try inserting the power adapter into another wall socket. If the BioMouse is plugged into a power bar, ensure that the power bar's switch is in the on position, and press the reset button on the power bar if one exists.

Q2- I get an error message when I try to run the BioLock Screensaver.

A2- Before you can run the BioLock screensaver, you must have at least one user enrolled. Ensure that this is done before choosing to use the BioLock screensaver.

Q3- When I run the BioLock screensaver, it crashes my computer.

A3- If you have set the BioLock screensaver to run alongside another screensaver (by choosing "other" from the BioLock config dialog), the BioLock screensaver may crash. This is because some screensavers conflict with BioLock. Try switching to another screensaver, or use one of the three that is included with the BioLock screensaver.

Q4- I get an error message when I try to run Enroll.

A4- There are three types messages you may receive:

1. Failure to detect BioMouse

The BioMouse is not connected correctly to the computer. Ensure that the BioMouse is plugged in (see question 1) and that the parallel cable is attached firmly into your computer's parallel port as opposed to a serial port.

2. You do not have sufficient privileges to access the database or the product has not been installed correctly. You have not installed the correct software for your operating system. This can be corrected by obtaining the correct BioMouse software for your computer. In Windows NT, you may not be logged on with an account that has sufficient privileges or the software is trying to access a database that is unavailable.

3. You cannot access the userlist during the enrolment procedure. (Windows NT). You may not be logged on with an account that has sufficient privileges or the software is trying to access a userlist from a machine that is not available. Check the following path in the registry to make sure that your computer is accessing the correct userlist:

```
HKEY_LOCAL_MACHINE\SOFTWARE\American  
Biometric\Biomouse Enroll\1.0
```

If you do not have sufficient network privileges, the value of the ServerName entry should be a string value specifying your local computer name (ie. ServerName="\\ComputerName") – please include the backslashes. If you are a network administrator and wish to access the network userlist, this value should be left blank (ie. ServerName="").

Q5- I have enrolled myself with the BioMouse, but now I can't authenticate.

A5- Ensure that the finger you are attempting to authenticate with has been enrolled correctly. If it is, ensure that you are placing the finger correctly on the BioMouse scanner (detailed in the manual). Also if any cuts, burns or blisters were created on your finger after you enrolled, you may not be able to authenticate with it. In this case, try using an alternate enrolled finger.

Q6- I cannot authenticate with flexible verification.

A6- If you are attempting to authenticate using flexible verification, ensure that you are using the finger that is highlighted in red in the upper portion of the screen. Also ensure that the fingers you are using have been enrolled.

Q7- Whenever I enroll a finger, it is always at a low quality level.

A7- If you can't enroll your fingers at a high quality level, you may be placing your fingers incorrectly on the scanner window. Ensure that the 'core' of your fingerprint is located at the center of the scanner image, and that you are placing your finger in the same manner for all three windows.

Q8- Why does the BioMouse not move my mouse pointer?

A8- Despite the name, the BioMouse is actually not a pointing device. Your cursor is still controlled by your default pointing device. The BioMouse gets it's name from its appearance.

Q9- Why does my BioMouse run very slow?

A9- Check your Control Panel for any enabled Power Save features and disable them. If this does not remedy the problem, you may have a printer cable attached to the BioMouse pass-through connector, with no printer on the other end.

Appendix 1 - Contacting ABC

Technical Support

Should you require any technical assistance with your BioMouse scanner or software, see the README.TXT file on your installation floppy disk for updated troubleshooting notes.

ABC technical support personnel can be reached at 1-888-BIO-MOUSE or by sending e-mail to support@abio.com. Please have details of your system configuration ready or include them in your e-mail message.

World Wide Web and E-Mail

If you have an internet connection, information about the company and our products are available on the ABC web site at <http://www.biomouse.com>.

software updates and technical notes will be made available to registered customers on our web site as they are released.

E-Mail can be sent to info@abio.com for general inquiries.

Other Inquiries

For ABC office locations, sales, developer support, and other inquiries please call 1-888-BIO-MOUSE for more information.

Appendix 2 - Uninstalling the BioMouse software

Uninstalling the BioMouse under Windows NT

Only users with administrator privileges can successfully uninstall BioMouse for Windows NT. Attempting to uninstall the package without administrator privileges will not work properly and could leave your machine in an unusable state.

Follow the steps below to remove BioMouse for Windows NT.

1. Become an administrator
2. Run the BioMouse Enroll program and disable BioMouse GINA from the settings dialog.
3. Exit the BioMouse Enroll program and any other applications that

may be open.

4. Shutdown the machine and restart. (upon restart the default GINA should be restored)
5. Open the Control Panel and double click on Add/Remove Programs.
6. Select BioMouse NT 4.0 and click the Add/Remove button.
7. Disconnect the BioMouse scanner from your computer.

Uninstalling the BioMouse under Windows 95

Follow the steps below to remove the BioMouse software under Windows 95. Do not disconnect the BioMouse scanner from your computer until the software has been successfully uninstalled.

1. Open the Control Panel and double click on Add/Remove Programs.
2. Select BioMouse 95 Software from the list of applications and click the Add/Remove button.
3. When the uninstall is complete, we recommend that you re-start your computer.
4. Disconnect the BioMouse from your computer.

Appendix 3 - ABC License Agreement

THIS AGREEMENT CONSTITUTES A LEGAL AGREEMENT BETWEEN YOU, THE END USER, AND AMERICAN BIOMETRIC COMPANY ("ABC") YOU SHOULD READ THIS CAREFULLY AND AGREE TO ALL THE TERMS AND CONDITIONS BEFORE INSTALLING THIS PRODUCT. IF YOU DO NOT AGREE TO THESE TERMS AND CONDITIONS, PROMPTLY RETURN THE UNUSED SOFTWARE AND HARDWARE FOR A REFUND (SEE 12 BELOW). IF YOU DO NOT RETURN THE UNUSED SOFTWARE AND HARDWARE, YOU SHALL BE DEEMED TO HAVE AGREED TO THE TERMS IN THIS AGREEMENT.

1. **GRANT OF LICENSE.** ABC grants you the right to use one copy of the software program (the "Software") on a single computer and not on a network, with an attached ABC BioMouse(tm) fingerprint scanner (the "Hardware"). Use of this software without the Hardware or any tampering with or damaging of the Hardware violates this Agreement.
2. **COPY RESTRICTIONS; TITLE.** You own the media on which the Software is recorded. ABC retains title to the software including copies, regardless of form or media, and to all copyrights therein. The Software and accompanying written materials are copyrighted. You may either (a) transfer the Software to a single hard disk and retain the original Software for backup purposes, or (b) make one copy of the Software solely for backup or archival purposes.
3. **TRANSFER RESTRICTIONS.** You may transfer the Software with a copy of this Agreement to another party only on a permanent basis and only if the other party accepts the terms and conditions of this Agreement. Upon such transfer, you must transfer all accompanying written materials and either transfer or destroy all copies of the Software. You may not lease, rent, merge, reverse engineer, decompile or disassemble the Software.
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