Fingerprint Scanning Trainer

Click on the web page below to access a brief training video that covers several different tips and suggestions on proper fingerprint scanning procedures. Review this information WITH EVERY PERSON that will be using the fingerprint system.
http://www.m2sys.com/training/scanning-techniques.htm

The Importance of Scanning Quality Prints
If you're familiar with the phrase, "Garbage in, garbage out," you should know that this same rule applies to fingerprint recognition technology. The accuracy of the recognition engine greatly depends on the quality of the initial fingerprints taken when enrolling a person for the first time and those taken for subsequent identification attempts.

The initial print templates are stored permanently in the database, and used for comparison each time a person places his/her finger on the sensor for identification. Consequently, if a poor quality image is taken during enrollment, the system may not recognize a person when attempting the identification process.

How to Enroll a Quality Print

Capture a FULL and CENTERED fingerprint image: The fingerprint matching system works by locating identical minutiae points, which are unique for each individual. If the system does not locate a high enough volume of similar minutiae when comparing the scanned and database prints, it will return a "no match found" result. For this reason, it is critical that you capture as full and centered a fingerprint image as possible when first registering a person in the system, and during subsequent identifications. The fingerprint should nearly fill the scan window, and be roughly centered within it.

YES

NO

Capture the CORE of the fingerprint: The core of the fingerprint is the center. If the core of the fingerprint is captured during enrollment, the system will extract unique minutiae points from this distinct area. Therefore, if the core is again captured during subsequent identification attempts, this greatly improves the accuracy of the identification process and limits the possibility of false rejection. The core of the print should ideally be captured during each and every fingerprint scan.

The core (center) of the fingerprint has a high concentration of minutiae points.

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Making Ministry Manageable.
Fingerprint Technologies
6801 N. Broadway, Suite 120 • Oklahoma City, OK 73116 • 800.337.6328 • 405.840.5177
rds@rdsadvantage.com • www.rdsadvantage.com

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Press the finger FLAT against the scanning surface: The fingerprint scanner captures a much better print when the finger is laid flat against its surface. If the user does not hold their finger flat against the scanner for at least one full second, the scanner may capture an incomplete print or may not capture anything at all. Pressing the finger with some pressure against the scanning surface helps to ensure both that the maximum surface area of the print is in contact with the scanner, and that the print has no “gaps” or “holes”. Hand moisturizer or ScanTastic! can be used for problematic dry skin.

What to Avoid:

Avoid capturing either side of a fingerprint or just the tip, Imagine during enrollment that you capture only the right side of a fingerprint. Then, during a subsequent identification attempt, the enrollee scans the left side of his/her fingerprint to be identified. The system will not find enough similar minutiae to accurately

Correct Finger Placement:

The resulting image should look like this:

Why does this illustrate perfect finger placement?

1) The **MIDDLE FINGER** is being used.
2) The finger is **FLAT** against the reader surface.
3) The **TIP** of the finger is placed against the **EDGE** of the scan area, leading to a **FULL** and **CENTERED** captured print.
4) A firm (but not excessive) amount of **PRESSURE** is being placed on the scanning surface.

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Incorrect Finger Placement:

Notice the finger is at a 45 degree angle to the scanning surface, where only the tip can be captured. This limits the captured surface area and number of minutiae points, leading to potential difficulty with identification. Notice the thumb is being used.

The thumb and index finger have been shown to be the most prone to damage and are thus the WORST fingers to use.

We recommend using the middle finger for consistent accuracy.

> **Note:** For children under the age of 5, we do recommend using the thumb to capture a larger surface area. Notice only 1 side of the finger is being placed on the scanning surface. This limits the captured surface area and number of minutiae points, leading to potential difficulty with identification.

System Limitations:

As with any software system using a hardware device to interact with users, there are certain limitations to be aware of. Recognizing these limitations and employing methods to help overcome them will greatly improve the performance of the system.

These limitations are in addition to the importance of image quality during enrollment and identification as explained earlier in this document:

1. **Damaged Fingers**
   Cuts, very rough, or very dry prints can sometimes have an effect on image quality.
   For very dry prints (e.g. cold weather), rubbing the fingers together to create warmth and friction, using lotion or a solution such as ScanTastic!™, or swiping the finger across the nose or forehead can improve quality.
   If a particular finger just will not work during enrollment, simply use a finger that does work.

2. **Elderly and Children**
   An evaluation of fingerprint quality across an elderly population by Purdue University revealed that certain attributes associated with elderly individuals correlate to lower fingerprint image quality: an increase in age and a decrease in fingerprint moisture content.
   Using methods described above to increase moisture content can improve quality.
   If you find that very small children are experiencing difficulty with the system, try utilizing their thumb to capture as large a surface area as possible.

> **Note:** If you have trouble scanning or entering a fingerprint, use the ScanTastic moistener.

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3. **Fingerprint Reader Hardware**

Must be physically connected to a USB port of Windows-based PC
USB can be extended through a powered adapter up to a distance of 150 ft.
The coating of the surface of the fingerprint reader provides protection from scratching and abrasion due to NORMAL CONTACT with the fingertips and any incidental contact with fingernails. Applications requiring protection from direct contact of sharp metal objects with the sensor surface should provide protection for the system, such as a sliding cover or some other means.

DAMAGE TO THE SENSOR DUE TO MISUSE IS NOT COVERED UNDER THE HARDWARE WARRANTY.

Cleaning the Fingerprint Reader:

1. Introduction

Key elements of image quality are the consistency within the actual image and the background of the image. Software algorithms are more accurate and generally faster when the image quality is consistent. This is best done when the image background is clean. Dirty residue, oils, or other material on the surface of the reader can obscure the image, which leaves parts of the image unrecognizable or creates false features within the image.

Regular use of the reader may leave residue or other foreign materials on the surface. Performance degradation in terms of False Match and False Non Match are indicative of such problems.

It is recommended that the sensor be visually inspected and periodically cleaned as described in section 2 below.

2. Periodic Cleaning

Dampen a lint-free cloth or cotton swab with alcohol or acetone. Gently rub the cloth across the sensor surface in a left and right direction. Move slowly down the sensor to cover the entire surface area. Repeat this process 2-3 times. Visually observe that no residual solution remains on the sensor.

Caution: Abrasive materials are not recommended for cleaning the reader.