



# SecuGen Fingerprint Device User Guide

## Why is the image quality of fingerprints important?

SecuGen fingerprint recognition technology is based on minutiae, the feature points found in a fingerprint. When a fingerprint image is captured, a sampling of minutiae are extracted and processed into a template, which will be used for the biometric software functions of enrollment and matching. If the captured image is not clear or does not have enough contrast, the minutiae may be inconsistently sampled, thus resulting in less accuracy and poor performance.

Certain environments and skin conditions, such as wet, dry, or aged skin, can initially cause a fingerprint image to appear too light or dark. By adjusting the image quality for your device, it is possible to overcome the enrollment or matching problems that have commonly occurred with fingers that “don’t seem to work”.

## Proper placement is the key to good results

SecuGen's fingerprint extraction algorithm is capable of extracting the correct minutiae even without benefit of a perfect print. However, the proper placement of your finger during fingerprint input can help produce more consistent results for any biometric application. The following tips on usage and care will help you obtain an optimal fingerprint image quality that ensures better performance and reduces the chances for failure to enroll and match correctly.

### Important Notes:

- ***Fingerprint images are never stored***

SecuGen fingerprint technology is based on minutiae, the feature points around the core of your fingerprint. When a fingerprint is captured, only a portion of the minutiae are sampled, and then processed by an extraction algorithm and converted into a secure template. After the template is formed, the fingerprint image is deleted. All fingerprints are used in the form of templates enrollment and matching.

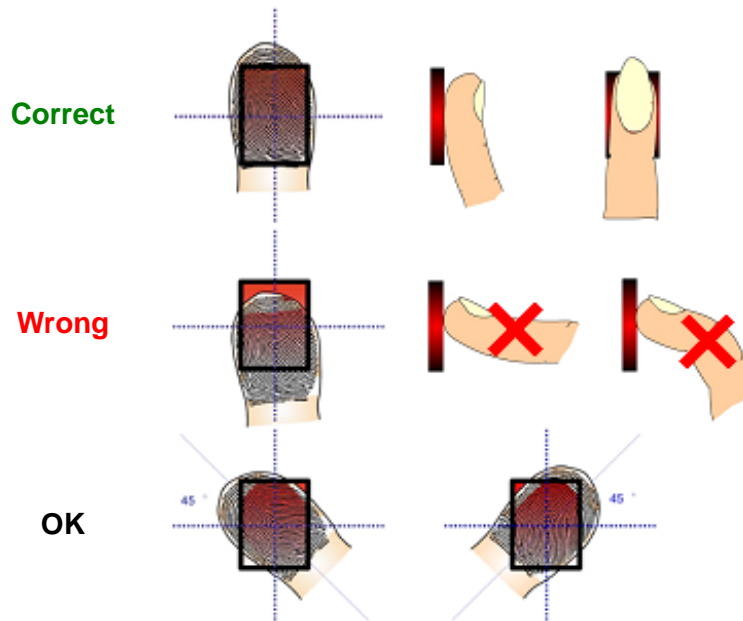
- ***Fingerprint images cannot be reconstructed from minutiae or templates***

The minutiae sampled from a fingerprint do not have enough information to recreate an image of the fingerprint. Additionally, minutiae cannot be extracted from a template because the mathematical conversion from minutiae to template is irreversible. As a final measure of security, templates are secured using advanced encryption to prevent data from being “hacked.”

## Usage Tips

### Place the pad of your finger at the center of the sensor

The pad is the fleshy part of the finger, located near the middle of the first segment of the finger. Be sure that the pad (not the tip) covers as much of the sensor window as possible so that the core of your fingerprint can be scanned. It is okay to place your finger at an angle.



### Apply light pressure

Apply pressure lightly and evenly during the capturing process. You only need to apply as much pressure as is required to hold a piece of paper between your fingers. Pressing too hard may result in an overly dark or blurred image.

### Keep your finger still

Wait for the red LED to light up, indicating the device is activated, and keep your finger in place while the fingerprint is captured.

### How to find the core of your fingerprint

The fingerprint generally consists of lines (or ridges) that form a pattern. The core of a fingerprint is defined as the topmost point on the innermost ridge that curves downward. The core can usually be found at or just below the center of the first segment of your finger. The following image shows examples of core points on different fingerprint patterns.



## To avoid problems if you cut or injure your finger

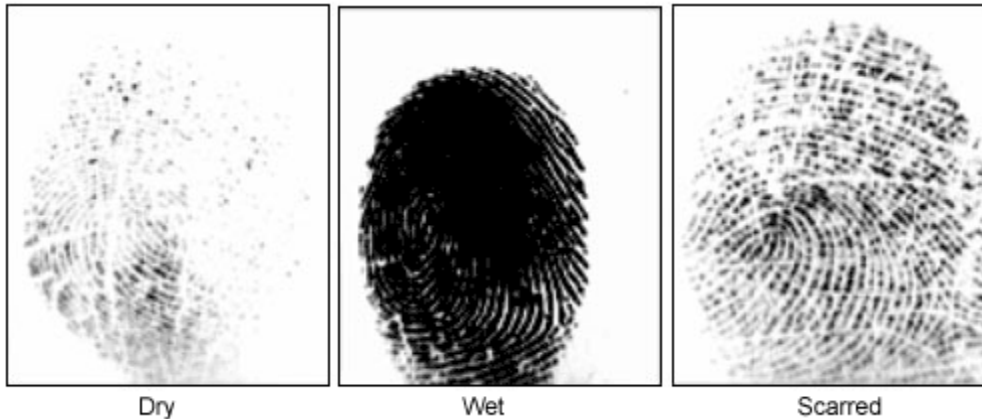
As a preventative measure, it is best to enroll more than one finger so that if one finger becomes unavailable for authentication, you will have an alternate finger to use. For this reason, many biometric products, including SecuGen software, provide the option of multiple finger enrollments.

If your biometric product features a password or PIN back-up, you can use this feature in case no finger or fingerprint device is available.

If none of the above options work, please contact your IT administrator or technical support provider for help.

## Problematic fingerprints

By following the above guidelines, you should be able to get consistently good results. Sometimes, however, certain skin conditions or environments may cause poor fingerprint images. Damp skin may cause fingerprints that are too dark or smudged, but can be remedied by wiping fingers before input. If your finger is dry (especially after washing), you may moisturize it by breathing on it or touching it to your forehead to pick up surface oil before input. Alternatively, if these problems are persistent, you can by adjust the brightness settings for your device to get the best contrast and brightness levels.



## Care Tips

Normal oil, residue or smudges on the fingerprint sensor window will not cause problems or interfere with capturing fingerprints. The sensor window was designed to withstand heavy use and extreme conditions including heat and cold. It does not have any coatings and is made of a hard, quartz-like material that resists scratches, etching, and damage from environmental elements.

### If you wish to clean the surface of the sensor window

- You may use a dry or wet paper towel or cloth to wipe off the window. To remove stubborn dirt, you can rub the window with paper towel or cloth soaked with a soap solution.
- Cleaning agents like glass cleaners and anti-bacterial wipes may be used without harming the sensor. However, the plastic housing of the unit may be damaged if strong solvents, acids or caustic solutions are used.
- Do not pour liquids directly onto the sensor or device, as the liquid might seep into the underlying components and cause damage.