

Futronic Technology Company Ltd.

FS60 EBTS/F Certified ID Flat Fingerprint Scanner

Enrollment Kit

**User's Guide
Version 1.7**

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Section 1. Introduction

Thank you for using Futronic FS60 EBTS/F Certified ID Flat Fingerprint Scanner and enrollment kit.

We present you an innovative product based on biometric technology, which is developed on the basis of the latest developments and advanced technologies in the field.

FS60 is a professional fingerprint scanner from Futronic with 3.2x3.0 inch (81.28x76.20 mm) scanning area. Its advanced optical system can capture a high quality 4 fingerprints image in less then 1.0 sec. It can also capture fingerprint in a 1.6x1.5 inch (40.64x38.10mm) scanning area to create a rolling fingerprint image. The high quality image makes it qualified to the FBI's EBTS Appendix F certification. The outlook design of FS60 is compact and robust. It is suitable for use in various environments and applications including border control, electronic ID, passport issuing and electronic election enrollment and identification. Fully programmable LEDs, buttons and acoustic buzzer provide the largest degree of freedom to system developers to design an intuitive user interface. All these features make FS60 the most cost effective and affordable solution for large scale fingerprint identification system.

FS60 enrollment kit is user friendly, fully functional software that interface directly with FS60 scanner.

If you have any question about our product, please call 852-24087705 or email to inquiry@futronic-tech.com

Section 2. System Requirement

Processor: Pentium 4 1.7 GHz

RAM: 1GB

Display resolution: 1280 x 1024 (1920x1280 preferable)

USB: USB2.0 port (500mA)

Operating System: WinXP, Vista and Win 7

Section 3. Applications

3.1 Fully compliant with IAFIS standard

FS60 enrollment kit is specifically designed to be fully compliant with the fingerprint impression standards of FBI's Integrated Automated Fingerprint Identification System (IAFIS), the largest biometric database of criminals in the world. Clear, legible fingerprints form the foundation of the Fingerprint Master File, which continues to grow by approximately 13,000 records each day. Fingerprints submitted to the FBI must follow the proper procedures to make sure the recorded fingerprints meet FBI standards.

3.2 Fingerprint impression types

The following three fingerprint impression types are recognized by IAFIS.

Rolled fingers

In this mode, the whole finger bulb is captured one at a time. The subject must roll his/her finger from one side to the other during the capture. The image capture in this mode has sufficient ridge detail to allow classification in almost all cases. However, it is a slow capture process and required some training in order to obtain an optimum image quality.

Slaps

In this mode, multiple (up to four) fingers are captured simultaneously. Slaps are also known as four-finger simultaneous plain impressions. Slaps is faster and easier in practice than the traditional rolled finger. However, each slap fingerprint averages less than half of the area of a good-quality rolled fingerprint: slaps therefore have fewer minutiae, and are harder to classify.

A technique called segmentation is often used to separate the image into individual fingerprints.

Flat single fingers

In this mode, a single finger is captured each time without rolling motion of the finger. This is a rapid capture process that requires little training.



Fingerprint image obtained from: Rolled finger (left), Slaps (middle), Flat single finger (right)

3.3 Special Circumstances

The IAFIS standard has defined the following special circumstances:

1. Deformed or missing fingers

If the finger is deformed, every attempt should be made to record the fingerprint in both the rolled and plain impression blocks. If unable to record the image, simply place a notation in the fingerprint block.

Missing fingers are fingers physically present but cannot be recorded at the time of capture due to injury. Each missing finger should be designated via a notation in the fingerprint block (e.g., bandaged, injured, crippled, or paralyzed).

2. Fully amputated fingers

An amputated finger occurs when the finger's first joint is no longer physically present. Amputated fingers should be designated via a notation in the fingerprint block.

3. Tip-amputated fingers:

If a portion of the first joint is present, record the available fingerprint pattern area in both the rolled and plain impression blocks.

4. Extra fingers:

When fingerprinting an individual with an extra finger, record only the thumb and the next four fingers. Do not record the extra finger as either a rolled or plain impression.

5. Scarred fingers:

Record scarred fingers in both the rolled and plain impressions without a notation.

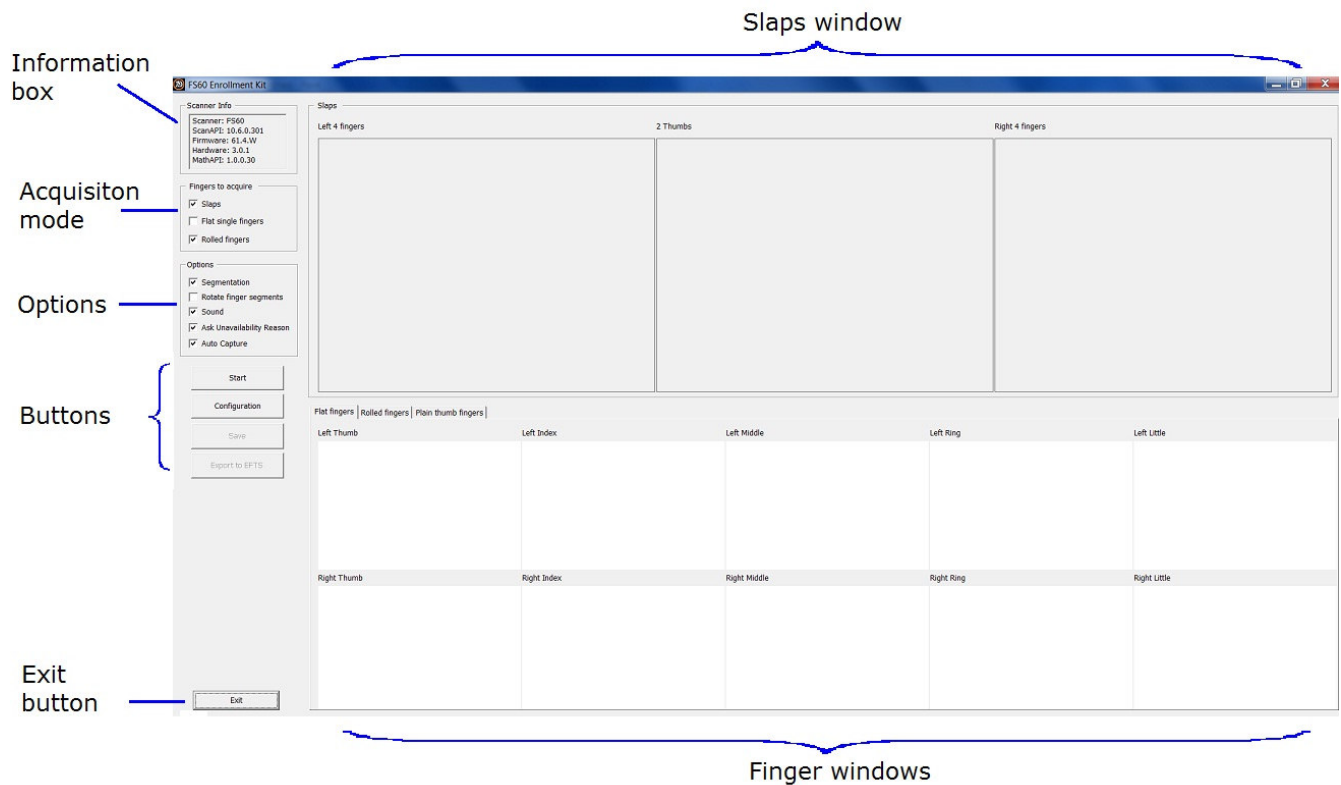
6. Worn fingerprints:

An individual, by the nature of their work or age, may have very thin or worn ridges in the pattern area.

For more information about recording legible fingerprints, please visit their website at www.fbi.gov/hq/cjisd/ident.htm.

Section 4. Main Window

After starting the FS60 enrollment kit, the main window will be displayed:

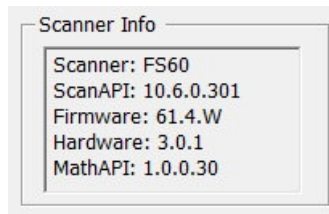


The main window is divided into six main fields:

- 1. Information box;**
- 2. Acquisition mode;**
- 3. Options;**
- 4. Buttons;**
- 5. Slaps window;**
- 6. Finger window**

The functions of each field are described in the following sections.

4.1 Information box



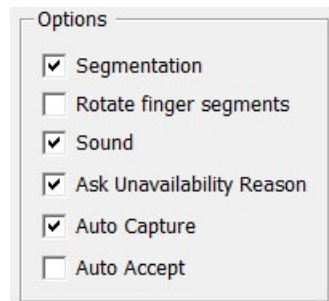
The information box provides information on the versions of the APIs, firmware and hardware.

4.2 Acquisition mode



Check/uncheck individual checkbox to enable/disable the particular acquisition mode (slaps/flat single finger/rolled fingers). Multiple selections can be made. For information about the acquisition modes, please refer to section 3.2.

4.3 Options



Check/uncheck the individual checkbox to select/deselect the particular options. Multiple selections can be made. Certain options are only valid under a particular acquisition mode. Please refer to the table below.

	Segmentation	Rotated finger segments	Sound	Ask unavailability reason	Auto Capture	Auto Accept
Slaps	✓	✓	✓	✓	✓	✓
Flat single finger			✓			✓
Rolled fingers			✓	✓		✓

Segmentation: Enable/disable the segmentation option. This option is only valid under Slaps mode.



Left: *Segmentation OFF*; Right: *Segmentation ON*

Rotate finger segments: Enable/disable the automatic rotation of segmented image. This option is only valid when under Slaps mode with segmentation option checked.



Left: *Rotate finger segment OFF*; Right: *Rotate finger segment ON*

Sound: Enable/disable the buzzer alert.

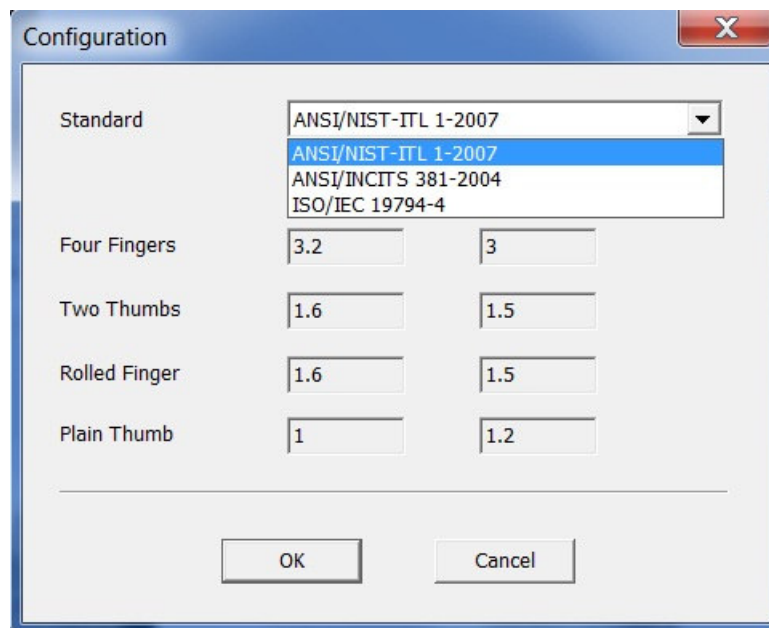
Ask unavailability reason: Enable/disable the *unavailability reason* window option.

4.4 Buttons

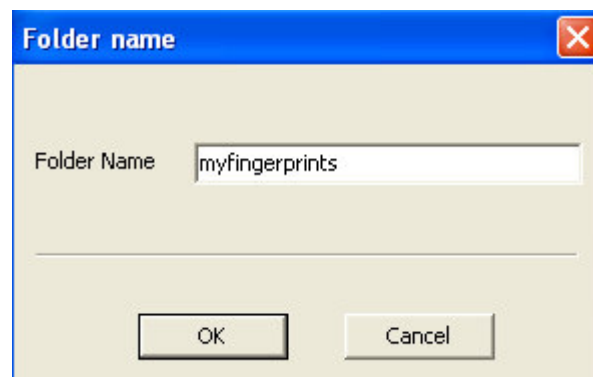


Start: When clicked, the acquisition window will be opened to start the acquisition process.

Configuration: When clicked, the configuration window will be opened which displays the standard size of the fingerprint images.



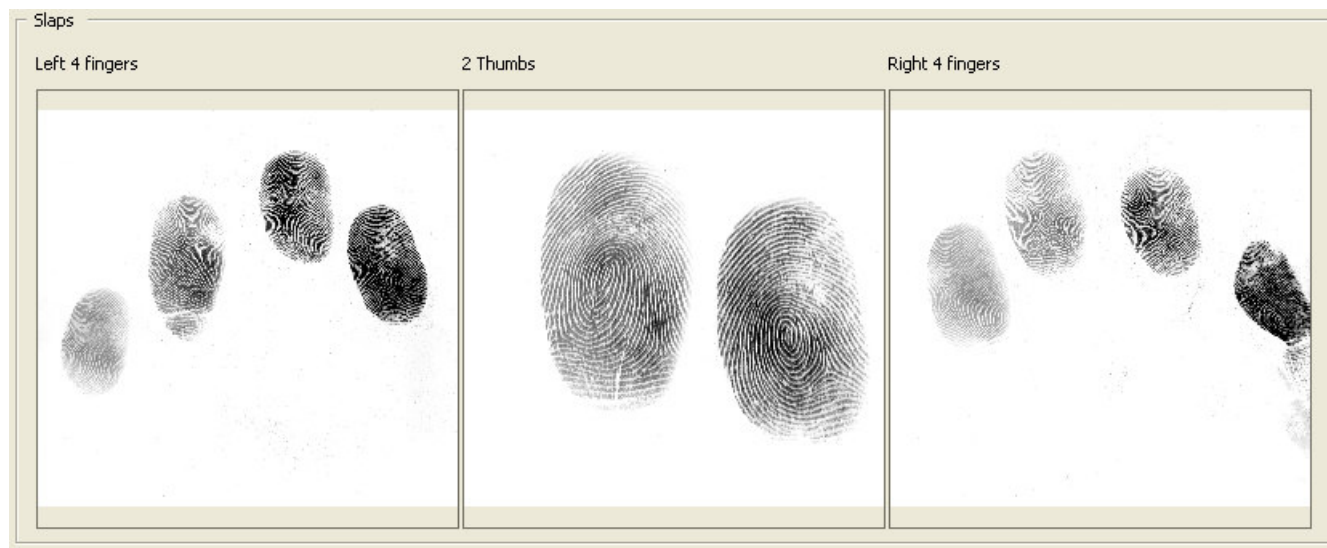
Save: When clicked, the save window will be opened. User can specify the folder in which the fingerprint images will be saved to.



Export to EFTS: Export the fingerprint data to Electronic Fingerprint Transmission Specification format (.bin).

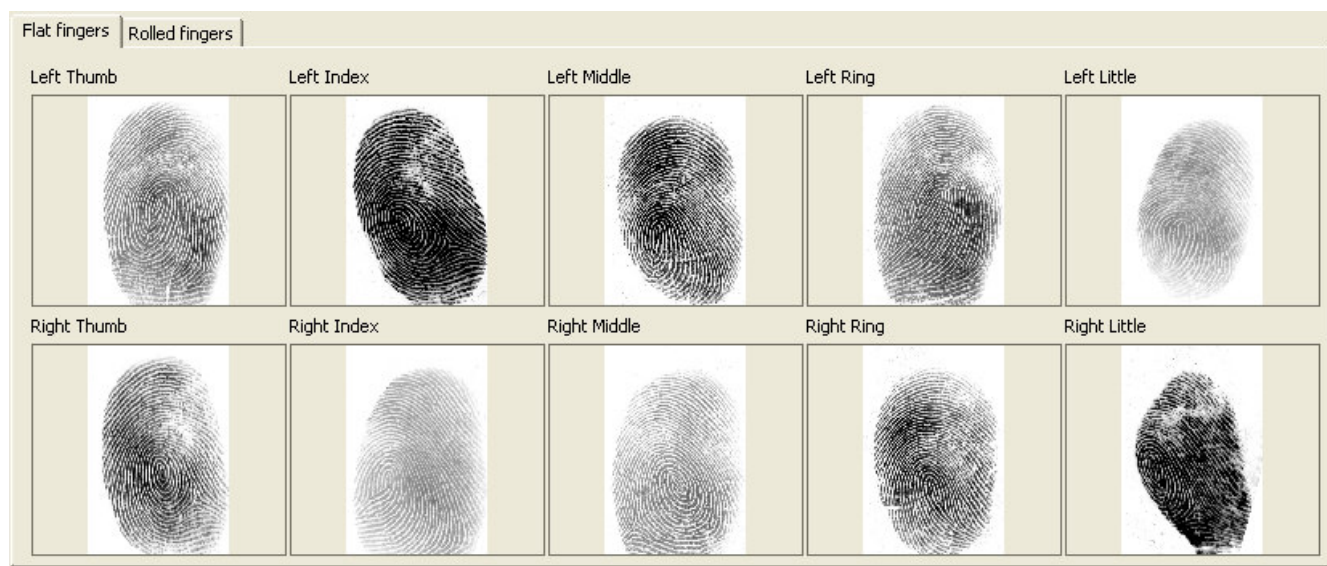
4.5 Slaps window

The slap window displays the captured slap fingerprint images.

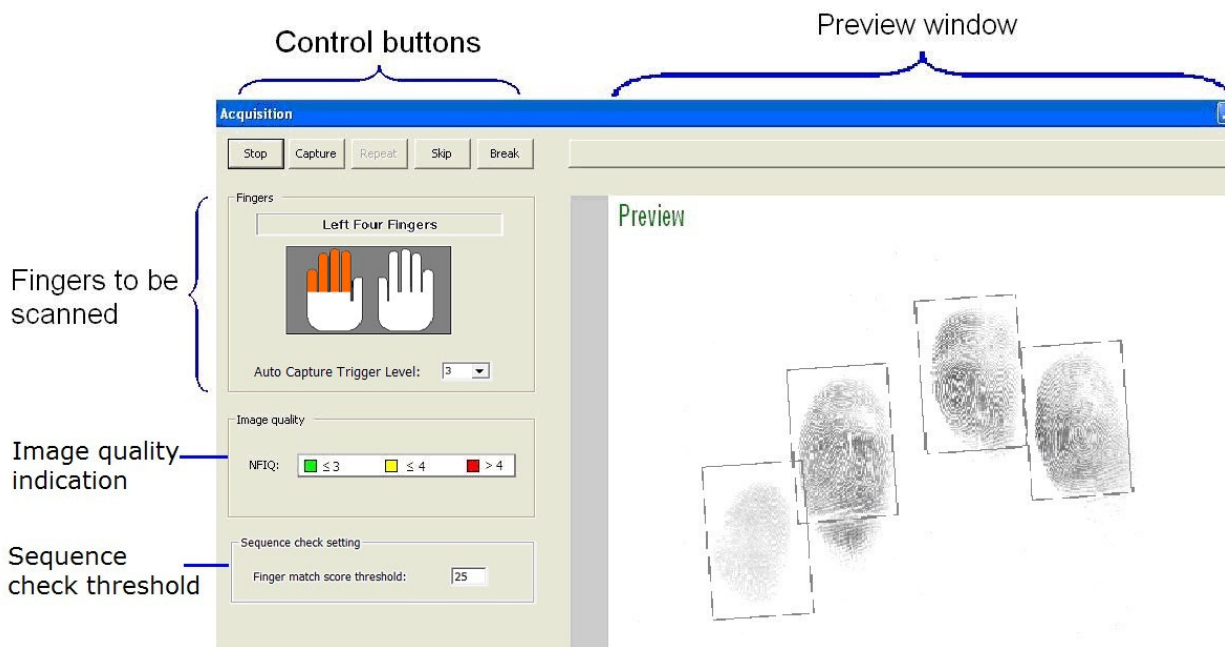


4.6 Finger window

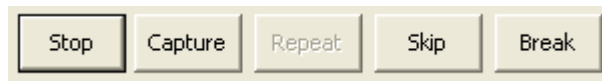
The finger window displays the captured fingerprint images obtained from segmented slaps fingers, flat fingers and/or rolled finger. Click on the tab "*Flat fingers*" and "*Rolled fingers*" to switch between the images obtained from the two modes.



Section 5. Acquisition Window



5.1 Control Buttons



Stop: Stop the acquisition

Capture: Capture the preview image. If the option “Auto Capture” is checked, it will be captured automatically if the preview image is good enough. The Auto Capture Trigger Level can be set in range of 1 – 7, it is easier for auto capture to be triggered with lower value, but image quality may not be good enough. Level 3 is suitable for most case.

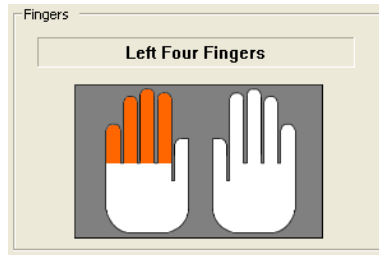
Repeat: Repeat the acquisition of the same set of finger(s)

Skip: Skip the acquisition of the current finger(s). If the *Unavailability Reason* option is enabled, the *Unavailability Reason* window will be displayed after this button is clicked. User should choose the unavailability reason (Amputated/Bandaged).



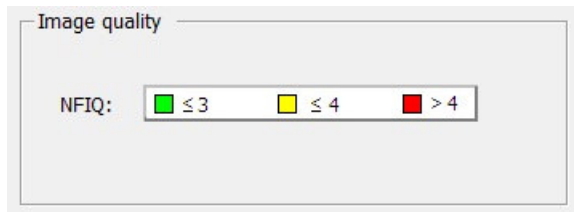
Break: Close the acquisition window, return to main window

5.2 Fingers to be scanned



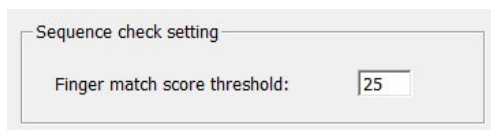
Give hint to the user which finger(s) to put onto the scanner.

5.3 Image quality indication



NFIQ value indication.

5.4 Sequence check setting



The fingerprint match score threshold, used in the sequence check. The larger value means lower FAR.

5.5 Preview window

Display the image being scanned.

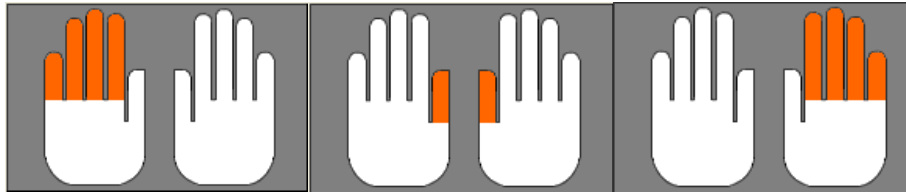


Section 6. Detail Operation

6.1 Slaps

6.1.1 Capturing Sequence

1. Left hand four fingers 2. Two Thumb 3. Right hand four fingers



6.1.2 Detail Procedures

A. Check the checkbox “*Slaps*” to select slaps capture mode

B. Select options:

- Check/uncheck the checkbox “*Segmentation*” to enable/disable the segmentation option.
- Check/uncheck the checkbox “*Rotate finger segments*” to enable/disable the automatic rotation of fingerprint segments.
- Check/uncheck the checkbox “*Sound*” to enable/disable the buzzer.
- Check/uncheck the checkbox “*Ask Unavailability Reason*” to enable/disable the “Unavailability Reason” pop up window.

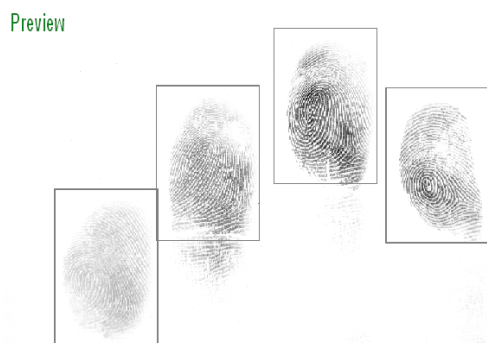
C. Acquisition

- Click the “*Start*” button to open the acquisition window.
- The acquisition window will open. After message “ PLASE REMOVE FINGER” disappeared, press the 4 fingers (no thumb) on your left hand simultaneously, keeping the fingers together onto the surface of the scanner.

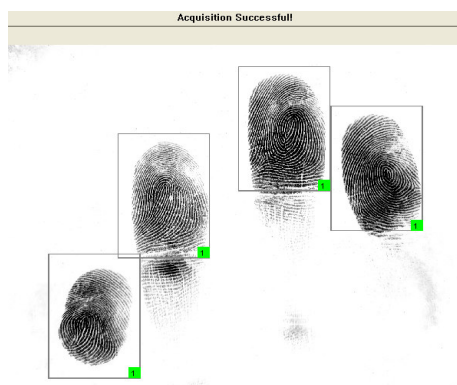


- Apply pressure evenly onto each finger until the fingerprint

images of 4 fingers are clearly visible on the acquisition screen. Care should be taken to capture all fingers in the allotted space. Reposition your fingers if any fingerprint(s) is/are invisible on the preview window. When the *segmentation* option is ON, fingerprint from all four fingers should be enclosed by a rectangular box.



- Click the “*Capture*” button to start the capture. If the capture was successful, the message “Acquisition Successful!” will appear and the NFIQ value of each fingerprint will be displayed. The higher the NFIQ, the higher the quality of the image.



- If you are satisfy with the quality of the fingerprint images, click “*Accept*” button to save the images to your computer. Otherwise, click “*Repeat*” to repeat the capture.
- Repeat the above steps for “Two thumbs” and “Right four finger”. Refer to the pictures below on how to position your fingers.



Left: “Right four finger; Right: “Two thumbs”

6.2 Flat Single Finger

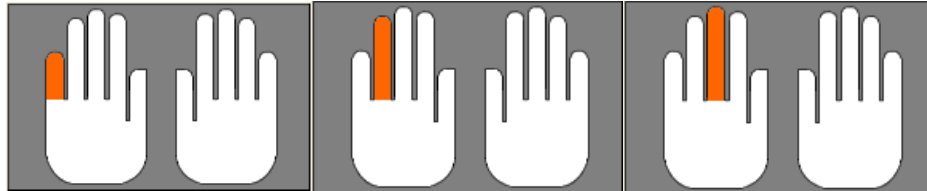
6.2.1 Capture Sequence

Left Hand

1. Little finger

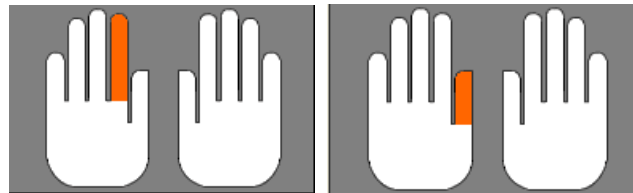
2. Ring Finger

3. Middle finger



4. Index Finger

5. Thumb

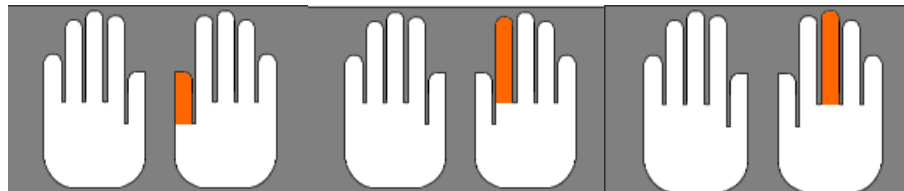


Right Hand

1. Thumb

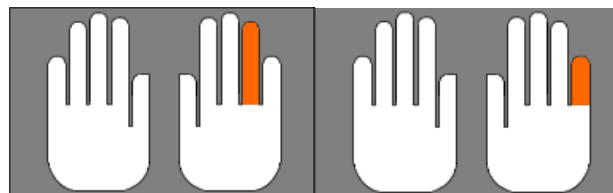
2. Index Finger

3. Middle finger



4. Ring Finger

5. Little Finger



6.2.2 Detail Procedures

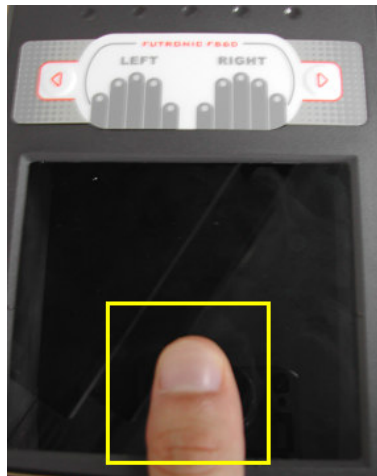
A. Check the checkbox “*Flat single fingers*”.

B. Options:

- Check/uncheck the checkbox “*Sound*” to enable/disable the buzzer.
- Check/uncheck the checkbox “*Ask Unavailability Reason*” to enable/disable the “Unavailability Reason” pop up window.

C. Acquisition

The steps of the acquisition are essential similar as in Slaps mode except the capture sequence is different. Take precaution here to place fingers only onto the middle of the lower half of the glass panel (inside yellow box).



6.3 Rolled Fingers

6.3.1 Capture Sequence

The capturing sequence of rolled fingers is identical to that of flat single fingers. Please refer to section 6.2.1 for the details.

6.3.2 Detail Procedures:

A. Check the checkbox “*Rolled fingers*”.

B. Options:

- Check/uncheck the checkbox “*Sound*” to enable/disable the buzzer.
- Check/uncheck the checkbox “*Ask Unavailability Reason*” to enable/disable the “Unavailability Reason” pop up window.

C. Acquisition

The steps of the acquisition is essential similar as in Slaps mode. The only difference here is that user must roll his/her fingers from one side to the other during the capture.



When taking the rolled impression, the side of the finger bulb is placed on the scanner surface. The finger is then rolled to the other side until it faces the opposite direction. Care should be exercised so the bulb of each finger, from tip to below the first joint, is rolled evenly.

In order to take advantage of the natural movement of the forearm, the hand should be rotated from the more difficult position to the easiest position. This requires the thumbs be rolled toward and the fingers away from the center of the individual's body. Roll each finger from nail to nail in the appropriate space, taking care to lift each finger up after rolling to avoid smudging.