
MorphoWave Compact: Enrollment process



Introduction

Confidential / Restricted / Public
Presentation or part title

- **Background**

- The enrollment phase of a user is critical in a biometric system, to later provide both security and accuracy
- While introducing the MorphoWave Compact, IDEMIA has improved the enrollment workflow for the MorphoWave Technology

- **Document purpose**

- Provide guidance for a user to get his / her fingerprints enrolled with MorphoWave Compact
- Provide integrators with an overview of the improved enrollment workflow for MorphoWave Technology. In order to help them design enrollment applications based on IDEMIA SDKs.

12/08/2019



Enrollment overview

Confidential / Restricted / Public
Presentation or part title

1- Set Quality threshold

2- Select
Missing
Finger(s)

3- Select
Bandaged
Finger(s)

4- Wave hand

5- Check
enrolled fingers

For the right hand, or
switch to step 6

From 3 to 5 times

6- Select left hand

2- Select
Missing
Finger(s)

3- Select
Bandaged
Finger(s)

4- Wave hand

5- Check
enrolled fingers

From 3 to 5 times

12/08/2019



Confidential / Restricted / Public
Presentation or part title

Quality Setting

1

12/08/2019



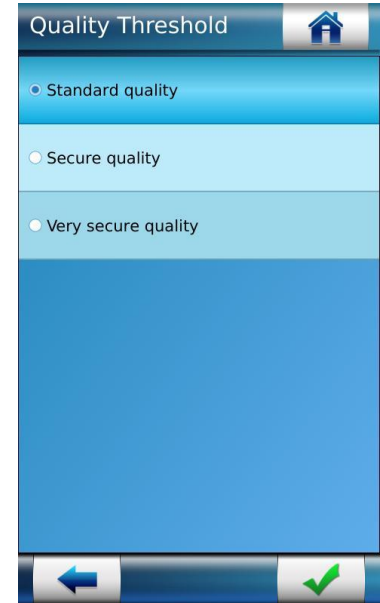
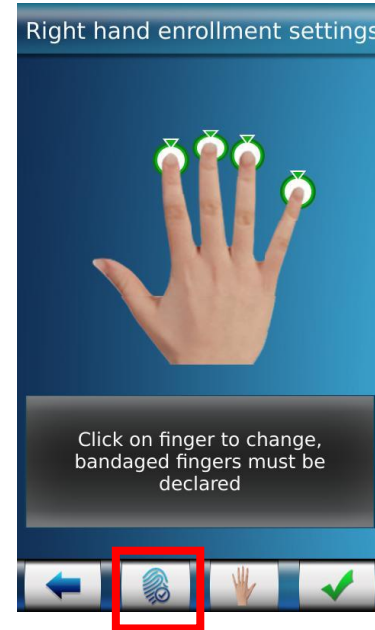
Quality threshold for the enrollment

- **Quality threshold**

- maximizes good quality fingerprints are acquired during the enrollment
- is changed using the fingerprint icon on the hand enrollment screen

- **Typical values:**

- For a high security site, please use Very Secure Quality
- For a standard site, to privilege fast access please use standard quality
- Secure Quality is a comprised between the two previous levels





Select Missing Finger(s)

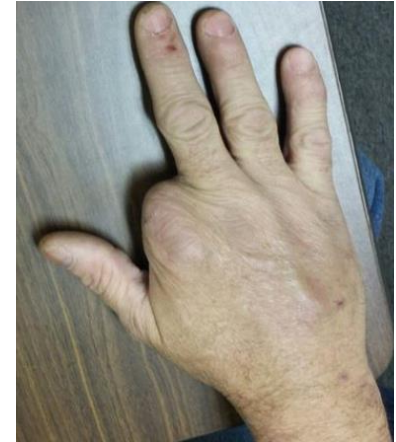
2



Expected VERSUS missing fingers

Confidential / Restricted / Public
Presentation or part title

- Prior to swiping the user hand, the enrollment operator defines what fingers will be scanned
- These are the fingers “expected” by the scanner

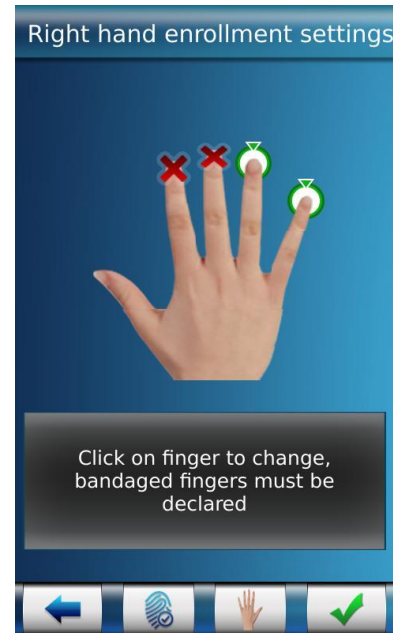
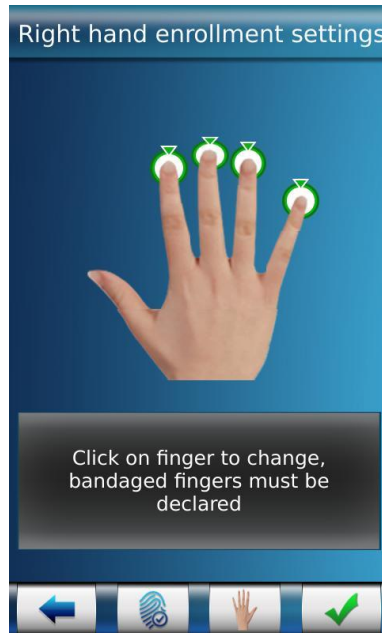


12/08/2019



Selection of a missing finger

- Select the missing fingers clicking on the associated nail
- A red cross highlights a missing finger



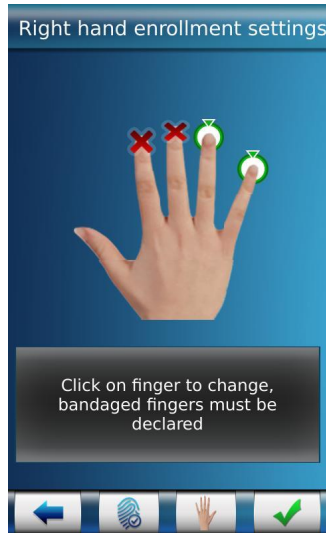


Missing Fingers: mismatch with scanned hand

Confidential / Restricted / Public
Presentation or part title

The enrollment will be successful only if the number of scanned fingers matches the number of expected fingers

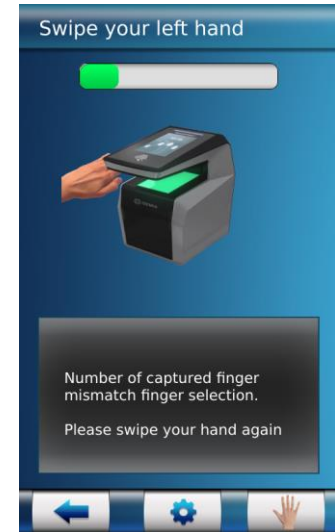
Missing Finger selection



Scanned hand



Error message





Select Bandaged Finger(s)

3



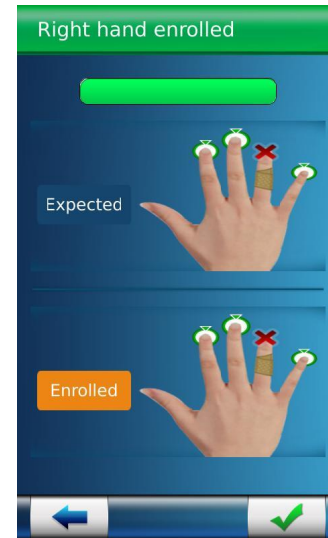
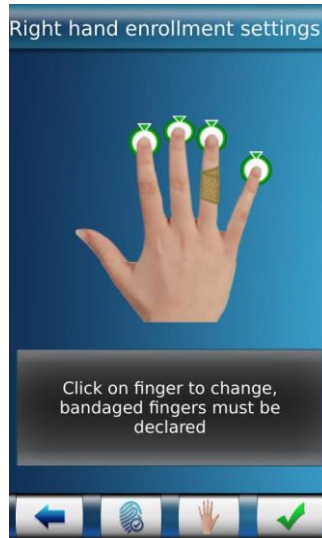
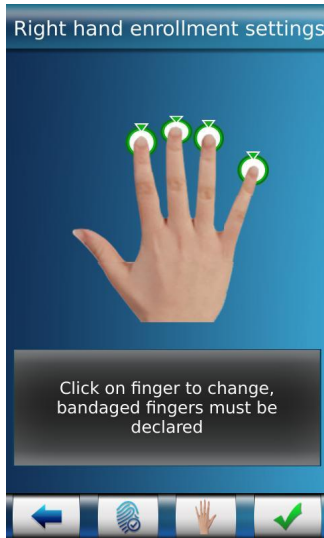
Bandaged fingers

Confidential / Restricted / Public
Presentation or part title

12/08/2019

11

- Enrolling a non-finger object will lead to poor accuracy of the system
- Bandaged fingers are to be selected prior to swiping the user hand, so that the associated data are not stored
- Select the bandaged fingers clicking on the middle of the finger
- A red cross highlights a bandaged finger in the expected and enrolled result display





Confidential / Restricted / Public
Presentation or part title

Wave hand

4

12/08/2019



Wave hand: Ideal acquisition procedure



Insert your hand flat,
palm down,
from the front of the scanner



Slightly spread
apart your fingers



Place your hand
between the cover
and the optical sensor



Slide your hand
from right to left or left to right

- **For enrollment, fore finger should be presented first**
 - Right hand should be swiped from the right to the left, left hand from the left to right
 - For identification and authentication, hand can be presented from either side



Wave hand: Improper use



Do not touch the cover



Do not place your hand on the optical sensor



Do not place your hand on the edge of the optical sensor



Do not place your hand too far up on the optical sensor



Do not place your hand upside down



Do not place 2 hands inside



Do not tilt your hand (left to right or fingertip to palm)



Do not insert your hand fingers first from either the left or right side of the scanner



Do not cross your fingers



Do not place your hand with fingers spread wide



Confidential / Restricted / Public
Presentation or part title

Check enrolled fingers

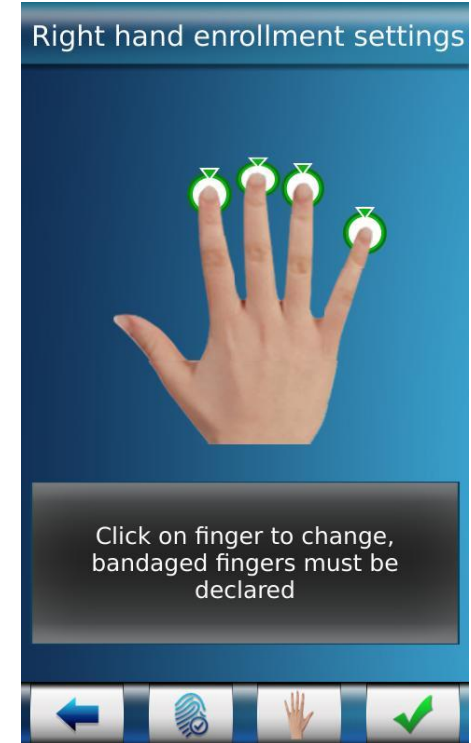
5

12/08/2019



Enrollment: first valid wave

- Enrollment needs between 3 and 5 valid waves, to progressively acquire as much biometric data as possible
- A valid wave is a wave where the number of detected fingers is matching with the number of expected fingers.
- The progress bar reaches 30% after the first valid wave



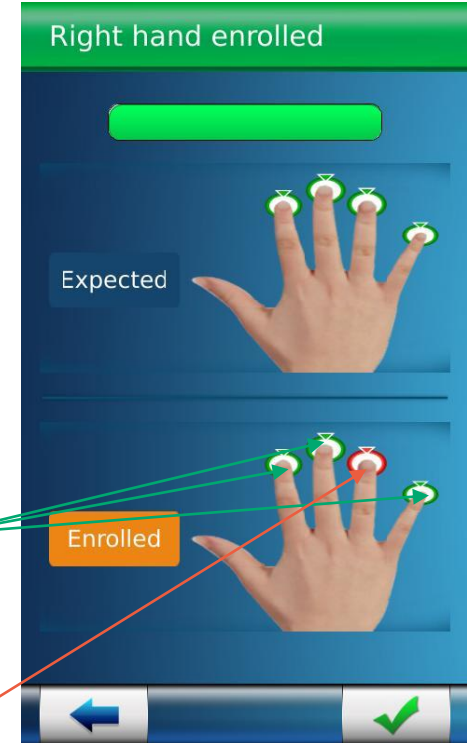


Enrollment: Matching result

- Starting from the second wave, biometric matching operation is done between fingers captured in each valid wave.
- A finger's template is acquired when a matching operation is successful between 2 fingerprints from different waves.
- A finger's template is expected if the finger is not declared as missing or bandaged.

Successful matching

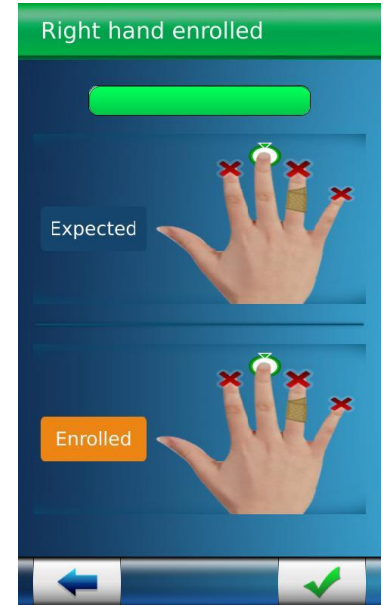
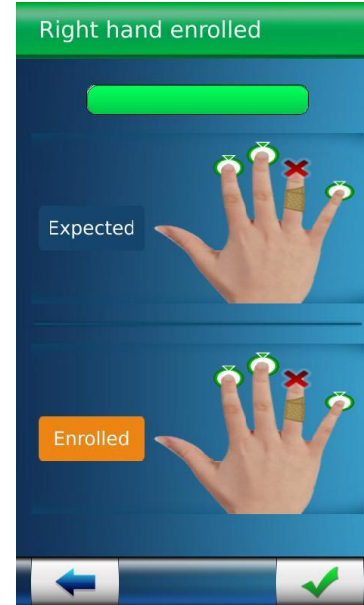
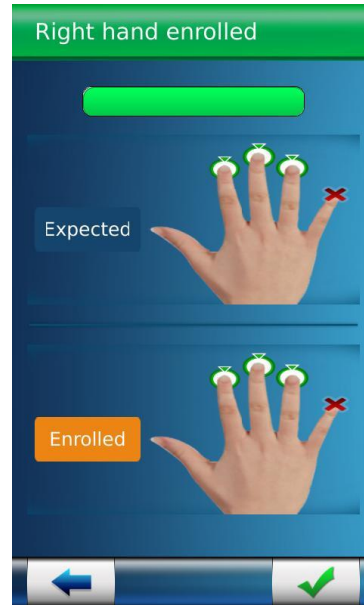
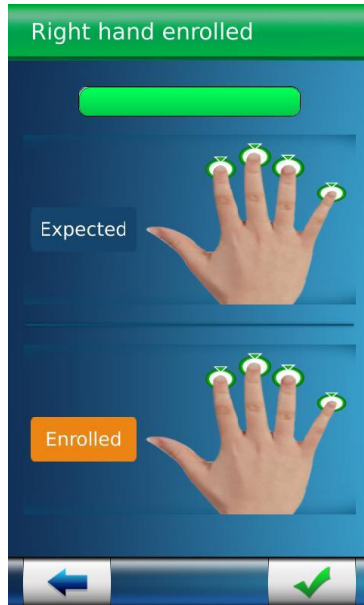
Unsuccessful matching





Enrollment validation

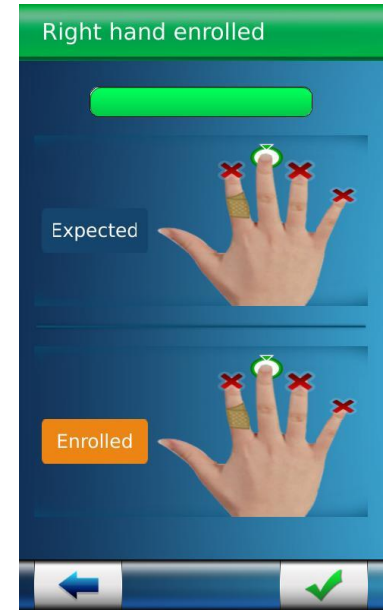
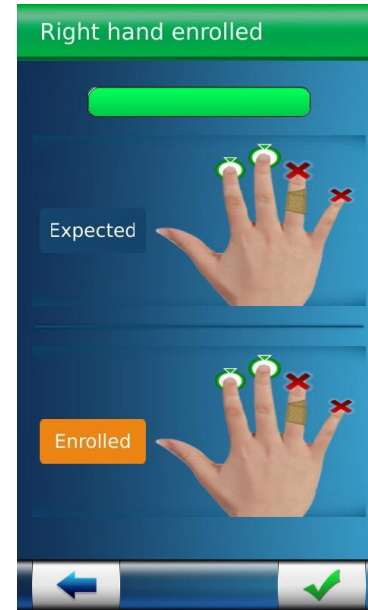
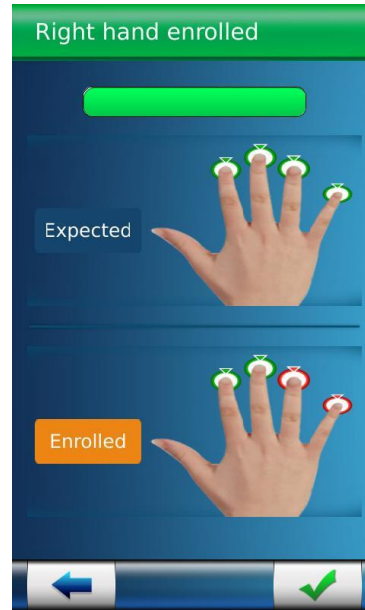
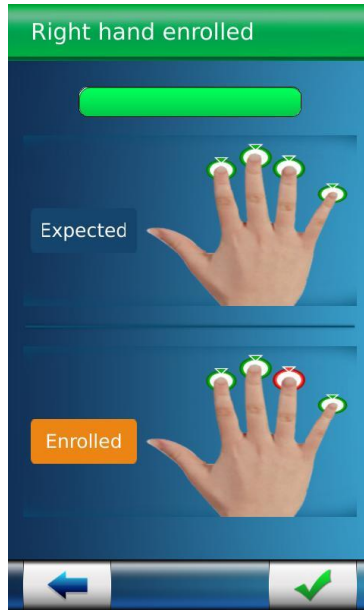
- At the end of the enrollment, administrator has the possibility to accept the enrolment result or replay it.





Enrollment validation

- Valid enrolment contains at least one fingerprint template





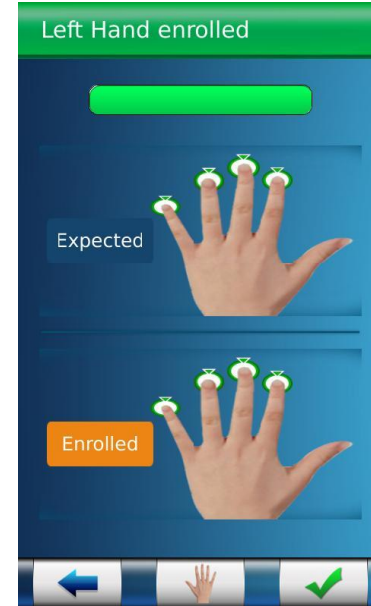
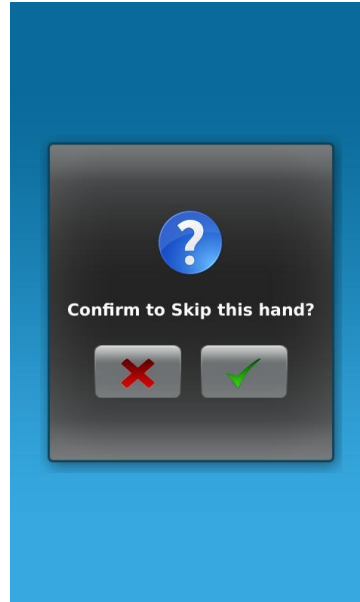
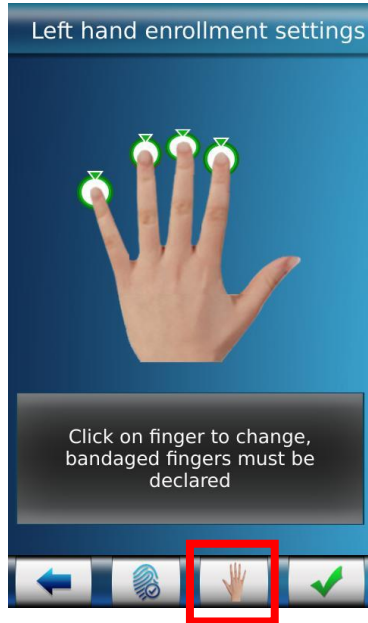
Select Left Hand

6



Enrollment: Left hand

- After successfully enrolled right hand, next step is enrolling left hand
- This step could be bypass by selecting hand icon. Confirmation will be requested
- Else same process that for right hand is executed





Which type of template to use

6



Recommended templates

For best performance, IDEMIA recommends to use the following template formats:

Use Case	Recommended template format	Comment
Template on device	pklite	Best accuracy
Templates on card	pkcompv2	Best trade-off between memory size and accuracy

Other template formats can be used to leverage existing databases; it is recommended not to use them for new enrollment.