
Morpho *Wave Compact*: Enrollment process



Introduction

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- **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.

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Enrollment overview

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For the right hand, or
switch to step 6

From 3 to 5 times



From 3 to 5 times

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Quality Setting

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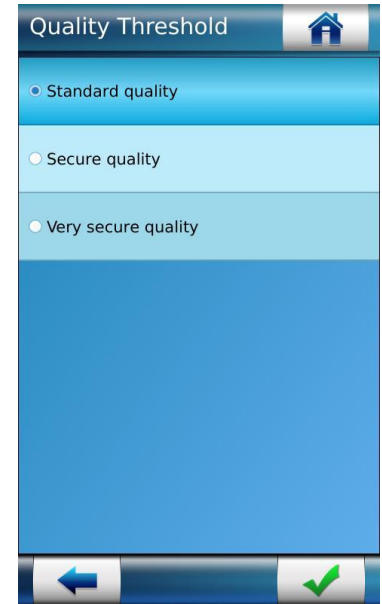
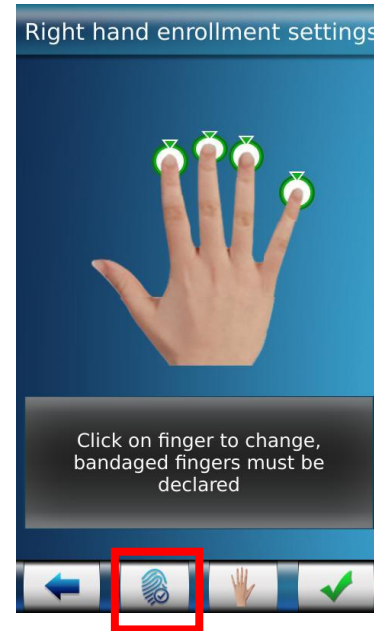
Quality threshold for the enrollment

- **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





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Select Missing Finger(s)

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Expected VERSUS missing fingers

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



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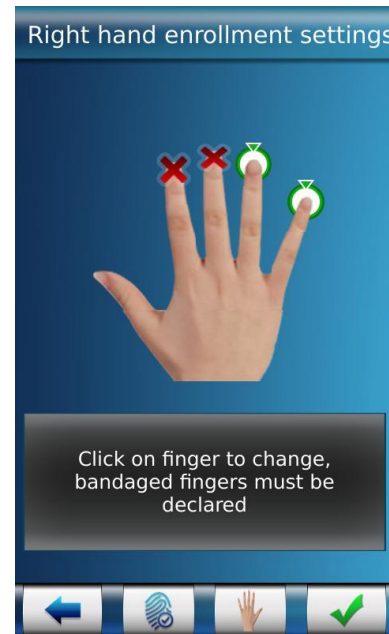
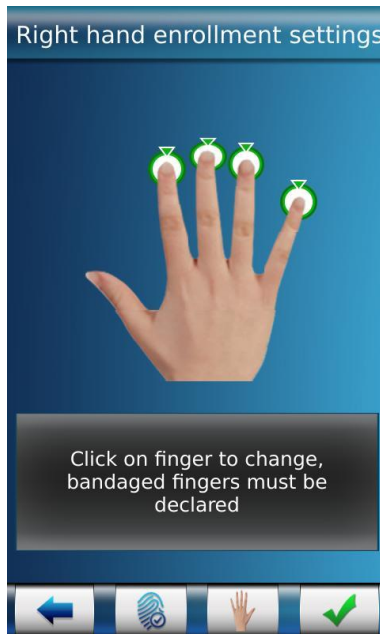
Selection of a missing finger

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





Missing Fingers: mismatch with scanned hand

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

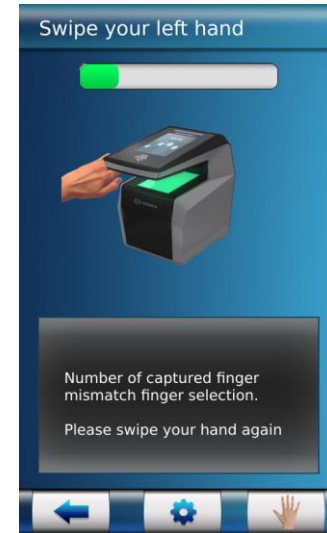
Missing Finger selection



Scanned hand



Error message



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Select Bandaged Finger(s)

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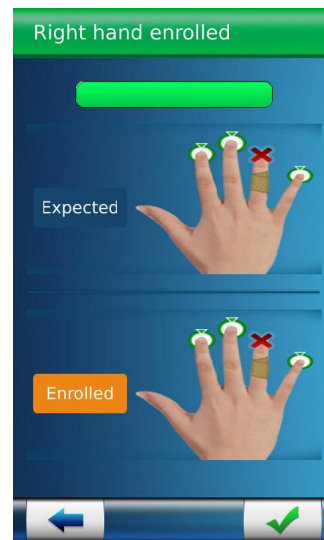
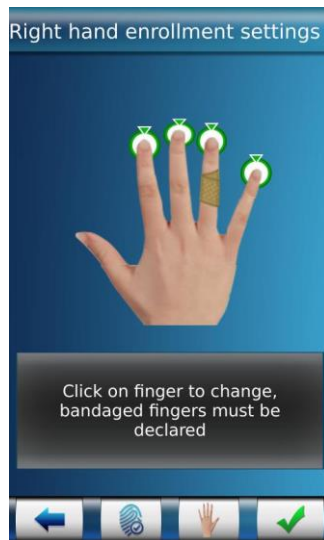
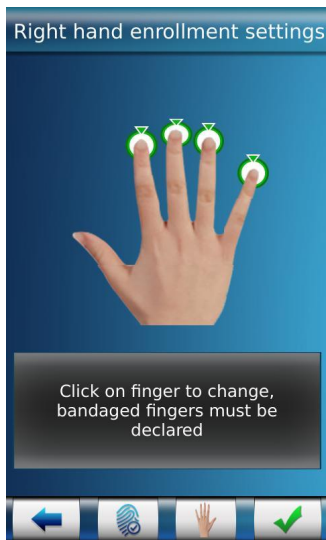
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Bandaged fingers

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- 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



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Wave hand

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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

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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

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Check enrolled fingers

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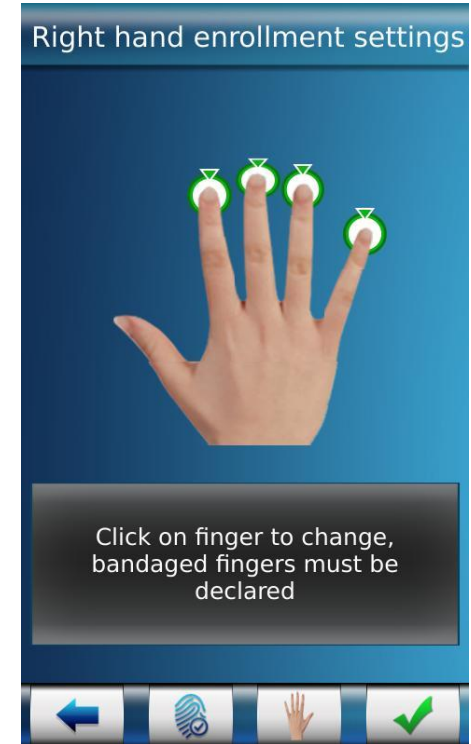


Enrollment: first valid wave

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- 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

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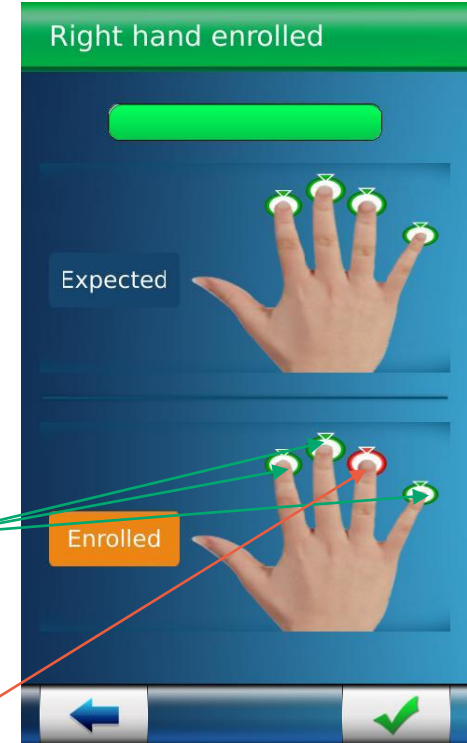


Enrollment: Matching result

- Starting from the second wave, biometric matching operation is done between fingerprints 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

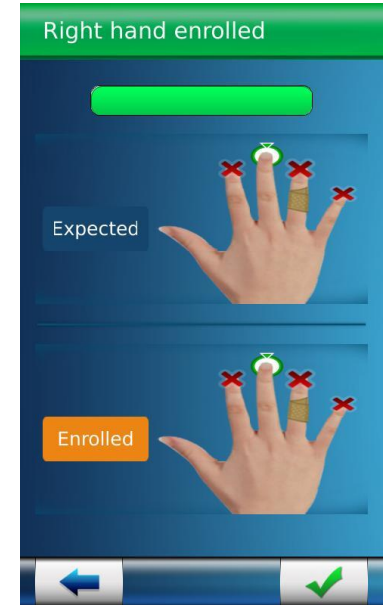
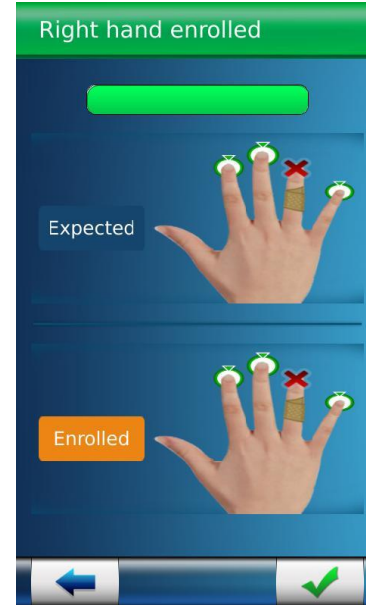
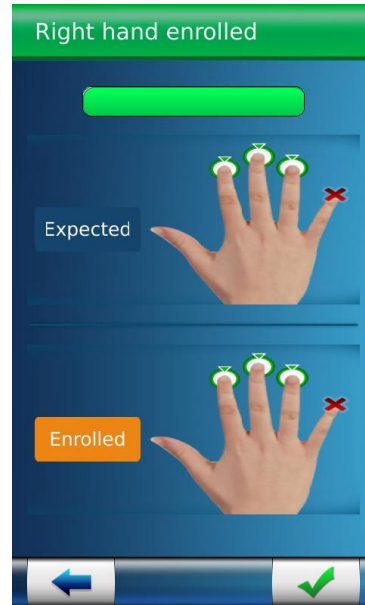
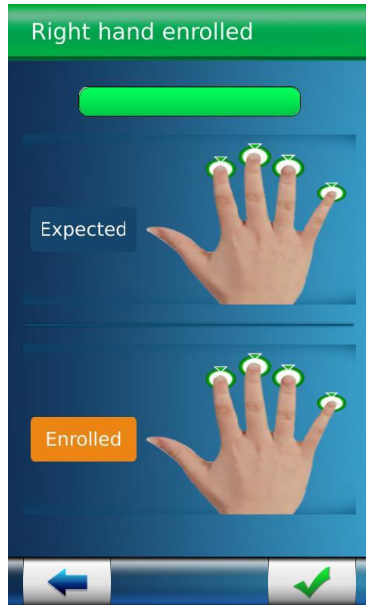
Unsuccessful matching





Enrollment validation

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

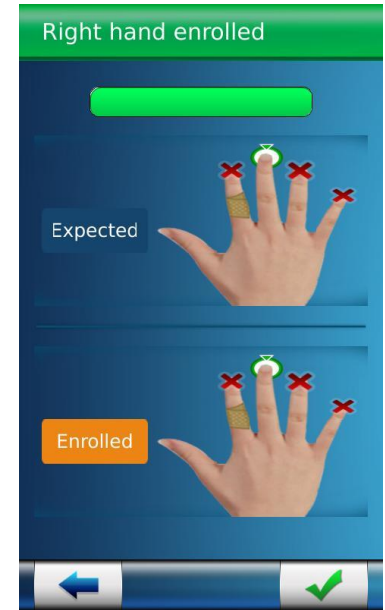
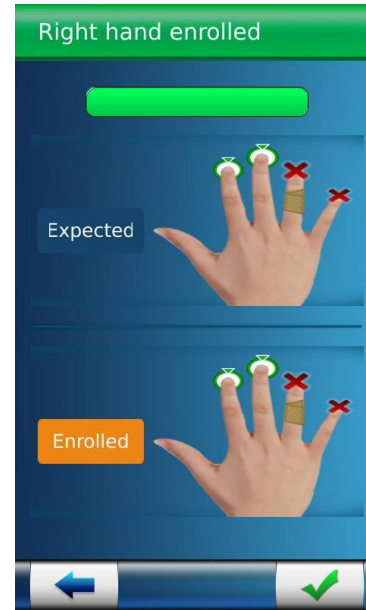
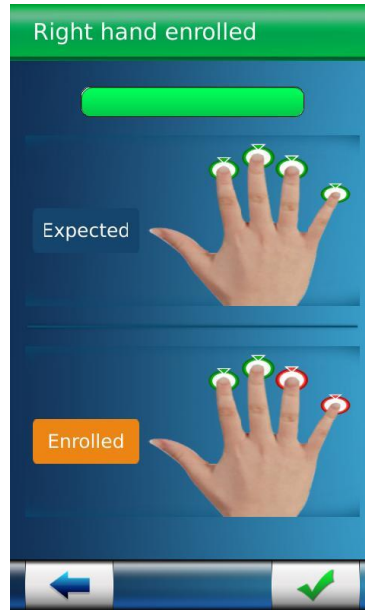
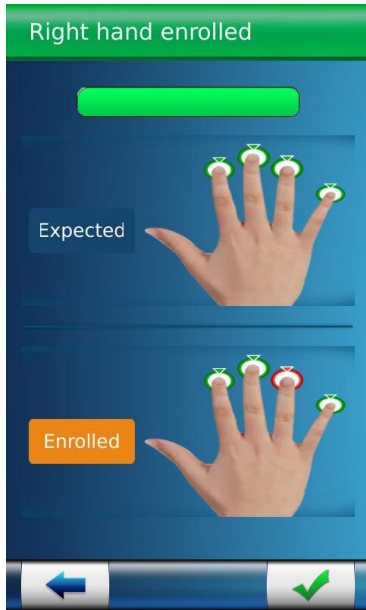




Enrollment validation

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- Valid enrolment contains at least one fingerprint template



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Select Left Hand

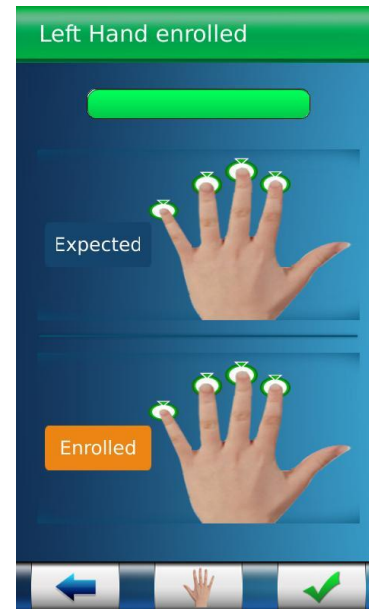
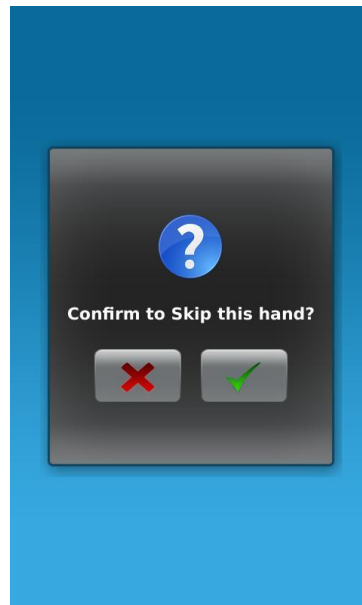
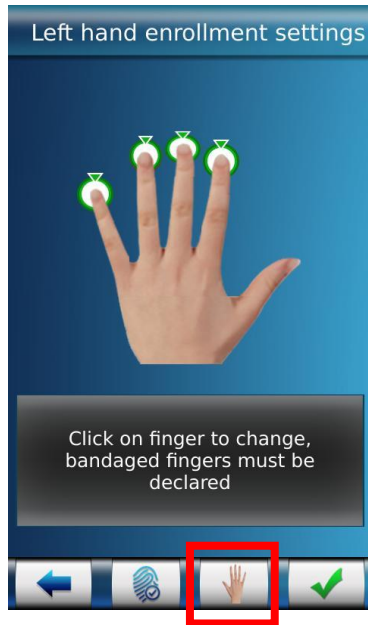
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Enrollment: Left hand

- 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





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Which type of template to use

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Recommended templates

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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.

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