Federal Office
for Information Security

Technical Guideline TR-03122-3

Conformance Test Specification for BSI TR-03121 Biometrics for Public Sector Applications

Addendum Part 3: Additional Test Cases for FM AH-FI-DC2

Version 6.0

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Table of Content

1 Test Cases Function Module TC-AH-FI-DC2 1

1 Test Cases Function Module TC-AH-FI-DC2

The following section defines additional test cases for FM AH-FI-DC2 which shall be executed in case a smartphone or similar device is used instead of the DSLR or system camera originally intended by the FM. Note, the requirement to not use a wideangle-lens still applies.

Test Case ID: TC-AH-FI-DC2-003	
Scope	Examination of the documents describing the image capturing features of the digital camera used to obtain facial biometrics. This test case covers the requirements for focal length (depending on the size of the camera sensor) as described in [BIB_ICAO_TR_Portrait_Quality] (chapters 5.2.1 and 5.2.2).
Applicability	This TC applies to IUT which use a smartphone or a similar device instead of the DSLR or system camera originally intended by the FM. Note: This TC does not extend to digital cameras which only support a wide-angle lens (e.g. webcams).

Preconditions	• Product documentation of the camera model (i.e. smartphone or similar device) provides reliable information regarding focal length and sensor size.
	• The following test resources are necessary:
	  • Product documentation of IUT is at hand (e.g. data sheet, manual).
	  • Product documentation of camera model is at hand (e.g. data sheet, manual).

CTS Mode	• not_supported
Description	**Step** / **Description / Expected Result**
	1 — *Description:* • Examination of the provided product documentation regarding permitted camera-to-subject-distance. *Expected Result:* • The permitted placement options of the biometric subject are limited in a way that the optical path of the image capturing system is at minimum 1 m and at maximum 4 m.
	2 — *Description:* • Examination of the provided product documentation regarding effective focal length f_{eff}. If the document does not explicitly specify the used effective focal length (compared to a 35 mm full frame), calculate the used effective focal length via $f_{\text{eff}} = f/c_f$ where f is the used focal length and c_f the crop factor (the crop factor may be calculated from the sensor's physical dimensions). If the camera model uses different lenses, additional evidence on which lense is actually being used shall be collected. Note: In some cases the effective focal length may also be extracted from the EXIF data. *Expected Result:* • The used effective focal length $f_{\text{eff}} = f/c_f$ is above 50 mm and below 130 mm.

Table 1.1 Test Case ID: TC-AH-FI-DC2-003

Note: For test case 004, the usage of the CTS is OPTIONAL. When not using the CTS the results (i.e. images taken with the IUT in the desired configuration) are allowed to be provided in other ways than the defined bio:FaceAcquisition XML.

Test Case ID: TC-AH-FI-DC2-004	
Scope	Examination of the image quality of the digital camera used to obtain facial biometrics. This test case covers the requirements for focal length (depending on the size of the camera sensor) as described in [BIB_ICAO_TR_Portrait_Quality] (chapters 5.2.1 and 5.2.2).
Applicability	This TC applies to IUT which use a smartphone or a similar device instead of the DSLR or system camera originally intended by the FM. Note: This TC does not extend to digital cameras which only support a wide-angle lens (e.g. webcams).

Test Case ID: TC-AH-FI-DC2-004

Preconditions

- The IUT is in operation, required modules are loaded.
- Product documentation of the camera model provides information regarding permitted camera-to-subject distances and zoom settings.
- The IUT implements an interface for conformance testing where a single image of the target (cf. [BIB_ICAO_TR_Portrait_Quality]) can be captured.
- The target is lit evenly from the front. A strong lightsource (i.e. softbox) is placed approximately 35° atop of the imaginary line between camera and target.
- The following test resources are necessary:
  - A conformant test-target.
  - An image-processing programm which allows to rotate a picture and crop it without quality loss.
  - A script which allows to measure the size of a square in a picture.
  - Product documentation of IUT is at hand (e.g. data sheet, manual).

CTS Mode

- interactive
- no provision of pre-defined input data
- `HTTP method: GET`
- test case variants:

`/TR03122/TC-AH-FI-DC2-004/1`

Table 1.3 TC-AH-FI-DC2-004 Test Case Variants

Description

Step	Description / Expected Result
1	*Description:* • The target is positioned directly in front of the camera at the desired working distance (cf. Evaluation Step). Camera and target are at the same height. • The IUT including camera system is configured according to the documentation. • Initiate test case by calling the IUT via the test interface. • A single image of the target is acquired. *Expected Result:* • The IUT delivers a response that is conformant to the schema file trbio5v1.xsd. • The response contains the correct number of elements based on the XPath expression `/bio:FaceAcquisition/bio:Records/bio:BinaryRecord[@type="BMP" or @type="JPEG"]/tradd:BinaryData/tradd:Value/node()`. Exactly 1 element is expected in accordance to the acquistion process.
2	*Description:* • Examine the response returned by the IUT via the test interface. *Expected Result:* • The image depicts the target. • In all depicted squares the 0.5 mm lines shall be distinguishable. • The depicted straight lines of the target (especially the lines further away from the center) shall appear straight to a human observer. The squares on the target shall be depicted with right angles to a human observer. No barrel distortion is visible.

Test Case ID: TC-AH-FI-DC2-004		
	3	*Description:* • The acquired images are prepared in a suitable way using the image processing program: If necessary, the images may be rotated slightly to appear vertically upright in the picture. • The acquired image is horizontally divided into four lines of three pictures containing a single pattern s.t. each of the patterns is depicted. Each line is then divided into two groups of images: One group containing the leftmost and center pattern, the other containing the center and rightmost pattern. • For each of the groups: measure the magnification distortion, i.e. the differences in height of the left/rightmost pattern in comparison to the center pattern. Note: To ensure comparability between different measurements a script shall be used for support. *Expected Result:* • The average radiation distortion on the left and on the right are below 5%.
Evaluation	**Evaluation Step**	**Description / Evaluation Result**
	1	*Description:* • If the product documentation permits several different CSD or zoom settings, the TC shall be repeated for all of them. Alternatively, if this is not practicable, the TC shall be repeated for each combination of the respective minimum, medium and maximum values. *Expected Result:* • For each combination of CSD and zoom setting the expected results are met.

Table 1.2 Test Case ID: TC-AH-FI-DC2-004