Federal Office
for Information Security

Technical Guideline TR-03122-1

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

Part 1: Framework

Version 5.3

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1. Changelog

The following tables present the changes introduced to this Technical Guideline since the last released version. The changelog lists the changes grouped per part (test cases) of this Technical Guideline:

- *Added* for new features

- *Changed* for changes in existing functionality

- *Deprecated* for soon-to-be removed features

- *Removed* for now removed features

- *Fixed* for any bug fixes

- *Security* in case of vulnerabilities

1.1. Changelog Version 5.3-draft1

This chapter includes all changes between Version 5.2 and Version 5.3-draft1.

1.1.1. Changelog BSI TR-03122, Part 1

Name	Type of Change	Change Description
-	-	*No Changes*

Table 1.1 Changelog BSI TR-03122, Part 1

1.1.2. Changelog BSI TR-03122, Part 3

Name	Type of Change	Change Description
TC-AS-FI-DC-001	Changed	Deleted expected results regarding image formats.
TC-AH-FI-DC-002	Added	Considering colour space requirement.
TC-AS-FP-SF-002	Added	Considering pre-qualification requirement.
TC-PAP-ACQ-FI-SV-2_002	Changed	Considering pre-selection and indication of best image.
TC-AH-FI-SSS2-003	Changed	Check for operation range. Deleted CTS Mode.
TC-AH-FI-SSS2-004	Changed	Changed ranges and added requirements.
TC-AH-FI-DC2	Added	All TC are new.
TC-AH-FI-ICS2	Added	All TC are new.
TC-AS-FI-DC2	Added	All TC are new.
TC-UI-FP-OP-002	Changed	Clarified: The fingers involved in the unexpected successful comparisons shall be pictorially displayed to the official.
TC-BIP-FI-GID-001	Changed	Updated image size and added inter eye distance.
TC-COM-FI-JPG-001	Changed	Updated image size.
TC-AS-FP-SF-001	Removed	Removed whole TC.

Name	Type of Change	Change Description
TC-AS-FP-SF-002	Changed	Modified Step 3, Expected Results 1 and 2. Renamed TC-AS-FP-SF-002 in TC-AS-FP-SF-001.
TC-AS-FP-MF-001	Removed	Removed whole TC.
TC-AS-FP-MF-002	Changed	Modified Step 3, Expected Results 1 and 2. Renamed TC-AS-FP-MF-002 in TC-AS-FP-MF-001.
TC-AS-FP-MF-003	Changed	Renamed TC-AS-FP-MF-003 in TC-AS-FP-MF-002.
TC-UI-FI-OP-001&002	Changed	Warning message is shown, if presentation attack was detected.

Table 1.2 Changelog BSI TR-03122, Part 3

1.2. Changelog Version 5.3-draft2

This chapter includes all changes between Version 5.3-draft1 and Version 5.3-draft2.

1.2.1. Changelog BSI TR-03122, Part 1

Name	Type of Change	Change Description
-	-	-

Table 1.3 Changelog BSI TR-03122, Part 1

1.2.2. Changelog BSI TR-03122, Part 3

Name	Type of Change	Change Description
TC-PAP-ACQ-FPS-SV-1_004	Added	Considering manual capture.
TC-PAP-ACQ-FPS-SV-1_005	Added	Considering manual capture.
TC-PAP-ACQ-FP2P-SV-1_002	Added	Considering manual capture.
TC-PAP-ACQ-FP2P-SV-2_002	Added	Considering manual capture.
TC-QA-FP-APP-003	Changed	Added resampling step.
TC-LOG-FP-GID2_5v0	Added	TC inserted from TC-COD-FP-GID.
TC-LOG-FI-GID2_5v0	Added	TC inserted from TC-COD-FI-GID.
TC-COD-FP-GID	Changed	TC moved to TC-LOG-FP-GID2_5v0.
TC-COD-FI-GID	Changed	TC moved to TC-LOG-FI-GID2_5v0.
TC-AH-FI-DC-002	Added	Considering colour space requirement.
TC-AS-FI-DC-001	Changed	CTS test case path adapted to the test case name.
TC-AS-FP-SF-002	Added	Considering pre-qulaification requirement.
TC-BIP-FI-DC-HQ	Changed	CTS test case path adapted to the test case name.
TC-COM-FI-JPG-001	Changed	CTS test case path adapted to the test case name.
TC-COD-FI-GSAT-001	Changed	CTS test case path adapted to the test case name.
TC-COM-FI-BCL-001	Changed	Added CTS Mode and test case path.
TC-COM-FP-BCL-001	Changed	Added CTS Mode and test case path.
TC-PAP-ACQ-FI-SV-2-001	Changed	CTS test case path adapted to the test case name.

Name	Type of Change	Change Description
TC-PAP-ACQ-FI-SV-2-002	Changed	CTS test case path adapted to the test case name.
TC-PAP-ACQ-FI-SV-2-003	Changed	CTS test case path adapted to the test case name.
TC-PAP-ACQ-FP2P-SV-1-001	Changed	CTS test case path adapted to the test case name.
TC-PAP-ACQ-FP2P-SV-2-001	Changed	CTS test case path adapted to the test case name.
TC-PAP-ACQ-FP10R-SV-1-001	Changed	CTS test case path adapted to the test case name.
TC-PAP-ACQ-FP10R-SV-1-002	Changed	CTS test case path adapted to the test case name.
TC-AH-FI-SSS2-004	Changed	Step 3 (minimum and maximum possible distance) split into Step 3 (minimum) and Step 4 (maximum).
TC-AS-FI-ICS2	Added	Creation of test cases TC-AS-FI-ICS2-001, TC-AS-FI-ICS2-002, TC-AS-FI-ICS2-003, TC-AS-FI-ICS2-004 and TC-AS-FI-ICS2-005 due to creation of FM AS-FI-ICS2.
TC-UI-FP-BSJ	Changed	Removed bullet points 1 and 2 as well as rephrased bullet point 3 in Step 4.
TC-UI-FI-BSJ	Changed	Added one precondition as well as added whole Step 4.
TC-LOG-ALL-GENERIC	Changed	Updated GID to schema version 5v1.
TC-LOG-FP-GENERIC	Changed	Updated GID to schema version 5v1.
TC-LOG-FI-GENERIC	Changed	Updated GID to schema version 5v1.
TC-COD-ALL-GENERIC	Changed	Updated GID to schema version 5v1.
TC-AH-FI-SSS2-004	Changed	Deleted former step 3 (minimum distance)
TC-LOG-FP-GID2_5v0	Changed	Replaced age condition (6 years) by FingerprintCaptureAllowed = true.
TC-COD-FI-GID2	Added	New TC.
TC-COD-FI-PRD	Added	New TC.
TC-COD-FI-ROR	Added	New TC.
TC-LOG-FP-GID	Removed	Removed TC.
TC-PAD-FI-APP	Added	Clarified the number of different artifacts per artifact class that shall be used for testing.
TC-AS-FP-MF-001	Modified	Outcome format BMP.
TC-AS-FP-MF-003	Added	Configuration pre-qualification.
TC-AS-FP-SF-001	Changed	Outcome format BMP.
TC-AS-FP-SF-002	Added	Configuration pre-qualification.
TC-COM-FI-JPG-001	Changed	Resolutions according to Volumes, format of test database.
TC-LOG-FP-BCL	Changed	Reworked the test case to include MultiPersonDetectionInformation.
TC-QA-FI-BCL-001	Changed	Added information regarding size of an image as well as total number of images in Preconditions of this Test Case.
TC-QA-FI-GID-001	Changed	Added information regarding size of an image as well as total number of images in Preconditions of this Test Case.
TC-QA-FI-ARE-001	Changed	Added information regarding size of an image as well as total number of images in Preconditions of this Test Case.
TC-QA-FI-IMA-001	Changed	Added information regarding size of an image as well as total number of images in Preconditions of this Test Case.
TC-QA-FI-GENERIC-001	Changed	Added information regarding size of an image as well as total number of images in Preconditions of this Test Case.

Name	Type of Change	Change Description
TC-QA-FI-GENERIC-002	Changed	Added information regarding size of an image as well as total number of images in Preconditions of this Test Case.
TC-AH-FP-ALL	Added	Added this testcase as an alternative to TC-AH-FP-OPT in case of optical scanners and as a possible certification test case for capacitive scanners.
TC-AH-FI-ICS2	Added	Added test cases for body height requirements.

Table 1.4 Changelog BSI TR-03122, Part 3

1.3. Changelog Version 5.3

This chapter includes all changes between Version 5.3-draft2 and Version 5.3.

1.3.1. Changelog BSI TR-03122, Part 1

Name	Type of Change	Change Description
-	-	-

Table 1.5 Changelog BSI TR-03122, Part 1

1.3.2. Changelog BSI TR-03122, Part 3

Name	Type of Change	Change Description
TC-COM-FI-JP2-001	Changed	filesize: 18 kB +/-5% to 17 kB 0%/-5%.
TC-LOG-ALL-ARE-001	Changed	Added more precise information regarding "Issuance status of Arrival Attestation Document".
TC-COM-FI-BCL-001	Changed	Added provided formats.
TC-COM-FP-BCL-001	Changed	File size.
TC-COM-FP-IMA-001	Changed	File size.
TC-PAD-FP-APP-003	Changed	Added examination of correctness of finger codes in this Test Case.
TC-PAP-ACQ-FPS-USV-1	Changed	Added uniqueness check.
TC-PAP-ACQ-FP2P-USV-1	Added	New TC.
TC-PAP-ACQ-FP2P-USV-2	Added	New TC.
TC-AS-FP-ROLL-003	Added	New TC.
TC-AS-FI-BCL	Changed	Renamed all occurrences of AS-FI-BCL to AS-FI-ICS3.
TC-PAP-ACQ-FPS-SV-1-002	Changed	Added execution condition for test step 3 for Volume ARE.
TC-COD-ALL-ARE-*	Changed	Removed GSAT specific test steps, kept generic ones.
TC-COD-FP-GSAT-*	Removed	Removed test case for checking GSAT content.
TC-COD-FI-GSAT-*	Removed	Removed test case for checking GSAT content.
TC-PAD-FI-APP*	Changed	Added test case for checking CC-certificate.
TC-PAP-ACQ-FI-AUTO-1	Changed	Changed CTS Mode.
TC-PAP-ACQ-FI-SV-5	Changed	Changed CTS Mode.
TC-BIP-FI-DC-HQ	Changed	Changed CTS Mode.
TC-COM-FI-JPG	Changed	Changed CTS Mode.

Name	Type of Change	Change Description
TC-PAP-ACQ-FI-SV-2_001	Changed	Moved information about CTS Mode from Preconditions to CTS Mode and amended it.
TC-PAP-ACQ-FI-SV-2_002	Changed	Moved information about CTS Mode from Preconditions to CTS Mode and amended it.
TC-PAP-ACQ-FI-SV-2_003	Changed	Moved information about CTS Mode from Preconditions to CTS Mode and amended it.
TC-AH-ALL-SSS-001	Changed	CTS-Mode to interactive
TC-AS-FI-DC-001	Changed	CTS-Mode to interactive
TC-AS-FI-DC2-001	Changed	CTS-Mode to interactive
TC-AS-FI-ICS2-005	Changed	CTS-Mode to not supported
TC-AS-FP-ROLL-001	Changed	CTS-Mode to interactive
TC-CMP-FP-CC-002	Changed	CTS-Mode to interactive

Table 1.6 Changelog BSI TR-03122, Part 3

2. Introduction

This document is part one of the Conformance Test Specification (BSI TR-03122). It is the counterpart of BSI TR-03121-1 describing the framework of the conformance test documents for BSI TR-03121.

2.1. Motivation and Objectives of the Conformance Test Specification

The Technical Guideline Biometrics for Public Sector Applications (BSI TR-03121) specifies requirements and recommendations for the use of biometric data within the scope public sector applications. The requirements on specific Function Modules, as defined in BSI TR-03121-3, can be implemented for different public sector applications through hardware and software components from various vendors.

The objective of this Technical Guideline is to offer a base for consistent and comparable quality assessment regarding the different components that will be applied in order to fulfil these requirements. This conformance test specification

- specifies tests for the Software Architecture (in particular in regard to conformance testing),

- defines all test cases being relevant to verify the conformance for the different requirements described in the Function Modules.

2.2. Target Audience

Audience for this guideline are institutions that are dealing with projects using biometrics in public sector applications that require certified modules, hardware, and/or software. These include:

- Vendors of hardware or software products that want to present their solutions for conformance test and acquire to be compliant to this Technical Guideline.

- Evaluation laboratories that check the conformance of hardware and/or software modules that are used within the scope of biometrics and electronic identity documents in public sector applications.

2.3. Structure of the Conformance Test Specification

The Conformance Test Specification consists of the following parts:

- Part 1: Framework (BSI TR-03122-1)

  TR-03122-1 is the framework document of the conformance test specification.

- Part 3: Test Cases for Function Modules and Processes (BSI TR-03122-3)

  The third part defines test cases for hardware and software components as well as processes according to their specification in TR-03121-3.

2.4. Test Case Specification for Function Modules

1. The requirements for an electronic identity document and the connected public sector application are combined in several Function Modules within BSI TR-03121-3. If the conformance to one or more specific Function Modules has to be checked, the reader has to identify at first the relevant Function Modules with the according abbreviation e.g. LOG-FP-GID.

2. As a result the corresponding test cases can be selected in BSI TR-03122-3 under the same identification while the prefix 'TC-' indicates the according test case. Depending on the number of defined test cases the abbreviation is followed by an ascending numbering e.g. TC#LOG#FP-GID-001.

3. In general, a test case in BSI TR-03122-3 is structured in three parts as shown in ▶Table 2.1.

Test Case ID: TC-LOG-FP-GID-001	
Scope	
Short overview of the test case	
Precondition	
Requirements that need to be fulfilled before the test case can be executed	
Description	
Enumerated listing of every single test step	
Expected Result	Description of the expected result for the corresponding test step

Table 2.1 Example of the Structure of a Test Case

Conformance to the specification of a Function Module can be established if all test cases for that Function Module are completed successfully and the requirements of the test methodology are satisfied.

Several test cases can be assigned to one Function Module each containing one or multiple test steps.

Note, that the Conformance Test Specification does not define requirements for the object to be tested except the interfaces for conformance testing.

2.5. Conformance Test Interfaces

Conformance testing in the context of BSI TR-03121 is based on an interface compliant to Representational State Transfer (REST). This interface is described in the following sections.

The Implementation Under Test (IUT) must provide an external interface as REST service accessible to the Conformance Test Suite (CTS), through which conformance testing is performed. Using this interface, the IUT is able to output generated data to the CTS during the test execution of the regular process which is performed by the operator of the evaluation laboratory.

Additionally, the interface can be used to provide pre-defined input from the CTS to the IUT in order to be able to verify its output in a defined state.

In opposite to the standard workflow, this request is used as an alternative point of entry so that the standard steps for the acquisition of the biometric image (e.g. facial image or fingerprint image), further processing of the image and/or compression of the image can be skipped.

In case pre-defined input data is required for a test case, the IUT is provided with external test data through the interface by the CTS. The input data is provided as XML data with root element "`biocts-testsetup`" as defined in the XML schemata of BSI TR-03121. The schema definition can be found in the file "`biocts4v7.xsd`". An example can be found in the file "`biocts-testsetup.xml`".

2.5.1. Interface description

In the conformance test scenario, a client-server architecture is at hand. The IUT represents the server providing a HTTP-based REST-interface to the CTS which acts as the client.

A test case is triggered by an HTTP request sent by the CTS to the IUT. The path as part of the requestUniform Recourse Identifier (URI)specifies the test case ID as defined in part 3 of this guideline:

```
/TR03122/{testcase-id}/{version}
```

The version indicates the revision of the specification for this test case and is typically incremented when the test case's interface requirements are changed.

The HTTP request method (relevant are GET and POST) depends on whether the test case requires input data. As described above, any input data for the IUT must be embedded in XML data (`biocts-testsetup`) within the request.

The result generated by the IUT must also be returned as XML data to the CTS. Depending on the test case at hand, the result consists of XML data conforming to BSI TR-03121, which further may include an embedded, application specific format (e.g. German Standard for AFIS Transactions Version 3 (GSAT3) XML). The specific data format andURIfor test case initiation is described further in each test case definition of BSI TR-03122 Part 3.

Since performing a test case may comprise manual interaction within the IUT and hence can take accordingly long, the communication timeout has to be considered and set adequately high.

2.5.1.1. Test Cases Not Requiring Pre-Defined Input Data

In case a test case does not require any input data a priori, the CTS sends a GET request to the IUT . The IUT is triggered upon receiving the request and performs the test case (e.g. facial image capture and encoding).

Subsequently, the result data is returned to the CTS within the response body. The response header must be set to "`Content-Type: application/xml; charset=utf-8`" and include the message length of the response body.

Example:

Request (CTS → IUT):

```
GET /TR03122/TC-COD-PH-GSAT3-001/1 HTTP/1.1
```

```
Content-Type: application/xml; charset=utf-8
```

Response (IUT → CTS):

```
HTTP/1.1 200 OK
```

```
Content-Type: application/xml; charset=utf-8
```

```
Content-Length: 12345
```

```
<are:aad-app [...]
```

```
<bio:Records>
```

```
<bio:XMLRecord type="gsat-xml" purpose="enrolment" id="id_1234" size="5687">
```

```
[...]
```

```
</are:aad-app>
```

2.5.1.2. Test Cases Requiring Pre-Defined Input Data

Should a test case require initial provision of data, the CTS sends a POST request to the IUT including this data. The request header must be set to "`Content-Type: application/xml; charset=utf-8`" and include the content length. Any input data is provided within the message body as XML (UTF-8 encoded).

The result data is returned to the CTS within the response body including a response header set to "`Content-Type: application/xml; charset=utf-8`" and respective content length.

Example:

Request (CTS → IUT):

```
POST /TR03122/TC-QA-PH-SB-001/1 HTTP/1.1
```

```
Content-Type: application/xml; charset=utf-8
```

```
Content-Length: 12345
```

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
[...]

<biocts:Parameter type="face" format="bmp">

VghpcyBmaWVQLg==</biocts:Parameter>

</biocts:biocts-testsetup>
```

Response (IUT → CTS):

```
HTTP/1.1 200 OK

Content-Type: application/xml; charset=utf-8

Content-Length: 67890

<?xml version="1.0" encoding="UTF-8"?>

<FaceQuality [...]
```

2.5.1.3. Response Codes

▸Table 2.2 lists the possible HTTP status codes which must be returned by the IUT to indicate the status to the CTS.

Status Code	Status Message	Description
200	OK	The request was successfully processed. Test case result data is included in the response body.
400	Bad Request	The IUT could not process the request due to defective input data.
404	Not Found	The IUT cannot perform the test case, e.g. due to missing implementation.
500	Internal Server Error	An internal, technical error occurred in the IUT during processing the request.

Table 2.2 Possible Status Codes Used by the IUT

List of Abbreviations

Abbreviation	Description
CTS	Conformance Test Suite
GSAT3	German Standard for AFIS Transactions Version 3
IUT	Implementation Under Test
REST	Representational State Transfer
URI	Uniform Recourse Identifier

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