



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 6.0



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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 5.4-draft1

This chapter includes all changes between Version 5.3 and Version 5.4-draft1.

1.1.1 Changelog BSI TR-03122, Part 1

Name	Type of Change	Change Description
-	-	-

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-BIP-FI-GID-001	Modified	Added de-rotation
TC-AS-FI-ICS2-006	Added	New TC
TC-PAP-ACQ-FPS-SV-1_003	Changed	HTTP method changed to GET
TC-PAP-ACQ-FPS-SV-1_005	Changed	HTTP method changed to GET
TC-PAP-ACQ-FI-SV-4-001	Changed	HTTP method changed to GET
TC-PAP-ACQ-FI-SV-2_001	Changed	HTTP method changed to POST
TC-LOG-ALL-GENERIC-*	Changed	Updated to new schema 5v1 and reduced listing of requirements.
TC-LOG-ALL-GID-*	Changed	Updated to new schema 5v1 and reduced listing of requirements.
TC-LOG-ALL-ARE-*	Changed	Updated to new schema 5v1 and reduced listing of requirements.
TC-LOG-ALL-BCL-*	Changed	Updated to new schema 5v1 and reduced listing of requirements.
TC-LOG-ALL-IMA-*	Changed	Updated to new schema 5v1 and reduced listing of requirements.
TC-LOG-FI-GENERIC-*	Changed	Updated to new schema 5v1 and reduced listing of requirements.
TC-LOG-FI-BCL-*	Changed	Updated to new schema 5v1 and reduced listing of requirements.
TC-LOG-FI-GID2-*	Changed	Updated to new schema 5v1 and reduced listing of requirements.
TC-LOG-FP-GENERIC-*	Changed	Updated to new schema 5v1 and reduced listing of requirements.
TC-LOG-FP-GID2-*	Changed	Updated to new schema 5v1 and reduced listing of requirements.
TC-LOG-FP-BCL-*	Changed	Updated to new schema 5v1 and reduced listing of requirements.
TC-AH-FI-ICS-*, TC-AH-FI-ICS2-*	Changed	Updates test cases in regard to feedback screens. The IUT in question shall provide a feedback screen (digital mirror). This is checked within the technical specifications of the system in question.

Name	Type of Change	Change Description
TC-PAP-*	Changed	In PAPs with facial image or fingerprint acquisition, the preconditions were extended: If HLBS is used, the corresponding service definition shall be implemented by the IUT.

Table 1.2 Changelog BSI TR-03122, Part 3

1.2 Changelog Version 5.4-draft2

This chapter includes all changes between Version 5.4-draft1 and Version 5.4-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-AH-FI-ICS2	Changed	Added sitting position for SSS in TC-AH-FI-ICS2 (used only in context GID). The test case now offers two alternative test steps: TC-AH-FI-ICS2-004 specifies requirements for a standing position while TC-AH-FI-ICS2-005 describes requirements for a sitting position.
TC-AH-FI-ICS2	Changed	Added clarification, that adaption to environmental lighting conditions is only expected within common environmental setting and with normal lighting conditions (no direct light from windows etc.).
TC-AH-FI-ICS2	Changed	TC-AH-FI-ICS2 is not testing for the presence of a feedback screen (digital mirror) anymore as this requirement was set to optional. Respective test-case was deleted.
TC-PAD-FI-APP/APP1 and TC-PAD-FP-APP/APP1	Changed	Number of bona fide tests was increased to 60 (three subjects with 20 tests each). A device failed if more than three of the bona fide tests are not recognized as bona fide. This tests for a false-alarm-rate of 5% which is more relaxed than the requirement of the respective FM (2%). The rate of 2% is tested on operational data only.
TC-PAD-FI-APP/APP1	Changed	List of artefacts has been further detailed to make tests clearer. Also, additional requirements for the selection of electronic test devices was added.
TC-COD-FI-PRD	Changed	Changed image format from JPEG to JPEG 2000 since facial images will be transported to central document production in JPEG 2000.
TC-QA-FP-APP	Changed	Added -004 for quality assessments of single slaps.
TC-AS-FI-ICS3	Changed	Added distinction between application context Border Control and German Identity Documents. Distance data were adjusted to the respective scenarios.
TC-AS-FI-FBS	Changed	The expected result "image is uncompressed" was sharpened to the effect, that this excludes the compression of JPEG itself.
TC-ACQ-FI-AUTO-1	Changed	Added distinction between application context Border Control and German Identity Documents regarding time limits of the acquisition process.
TC-PAD-FP-APP-002	Changed	Added option to not use CTS and FingerAcquisition XML for stand alone tests of PAD.
TC-PAP-ACQ-FPS-USV-1	Changed	Add check retry option for wrong slap.
TC-PAP-ACQ-FPS-USV-1	Changed	Add check for sequence error function.
TC-PAP-ACQ-FP2P-USV-2	Changed	Add check for sequence error function.

Name	Type of Change	Change Description
TC-LOG-FI-GID2 and TC-LOG-FP-GID2	Changed	Renamed to TC-LOG-FI/FP-GID to match renaming of function modules.
TC-AS-FI-ICS2	Changed	Added clarification of the uniform background greyscale in case of replacing the original background.

Table 1.4 Changelog BSI TR-03122, Part 3

1.3 Changelog Version 6.0

This chapter includes all changes between Version 5.4-draft2 and Version 6.0.

1.3.1 Changelog BSI TR-03122, Part 1

Name	Type of Change	Change Description
Structure of the Conformance Test Specification	Changed	Added link to new part 2 document.

Table 1.5 Changelog BSI TR-03122, Part 1

1.3.2 Changelog BSI TR-03122, Part 2

Name	Type of Change	Change Description
Entire document	Added	Added test cases for HLBS servers.

Table 1.6 Changelog BSI TR-03122, Part 2

1.3.3 Changelog BSI TR-03122, Part 3

Name	Type of Change	Change Description
TC-AS-FI-ICS3	Changed	Replaced the distance measurement by a face recognition property: process terminates if a face completely leaves the capture area.
TC-PAP-ACQ-FI-AUTO-1	Changed	Deleted duplicates
TC-AH-FI-SSS2	Changed	Explained the concept of distance as the length of the optical path.
TC-AH-FI-ICS2	Changed	Modified prerequisites for capturing facial images of seated people.
TC-AS-FI-FBS	Changed	Clarification of the non-existence of further compression in JPEG
TC-LOG-FI-GENERIC	Changed	Added explanation in case of self-service systems.
TC-PAD-FI-APP	Changed	Added preconditions regarding artefacts.
TC-AS-FI-ICS2	Changed	Added reference to 'ICAO Technical Report Portrait Quality' regarding uniform background.
TC-AS-FI-ICS2	Changed	Added new test cases -007 and -008 for testing of background elimination.
TC-LOG-FP-GID	Changed	Updated testcase to current schema.
TC-COD-FI-ROR	Changed	Renamed to COD-FI-ROD (Register of Documents).
TC-LOG-FI-GID	Changed	Updated testcase to current schema.
TC-PAD-FP-APP/1	Changed	Further detailed requirements for fingerprint artefacts (no mixing of materials, usage of glycerol and graphite) and added new artefact class 'latex with window painting'.
TC-PAD-FI-APP/1	Changed	Added test instruction that presentations that are not accepted are counted as 'detected'.

Name	Type of Change	Change Description
TC-UI-FI-OP	Changed	Added requirements regarding what is displayed to the operator in test cases -001 and -002.
TC-PAP-ACQ-FI-SV-5	Changed	Added that teststeps for manual mode may be omitted if IUT does not support manual mode (only in application context GID).
TC-QA-FP-APP	Changed	Fingerprints with 1000 ppi are only tested if IUT captures fingerprints with 1000 ppi. Otherwise, testcase is limited to 500 ppi.
TC-PAD-FI-APP/1	Changed	Changed PAD score interpretation according to changed requirements of BSI TR-03121.
TC-PAD-FP-APP/1	Changed	Changed PAD score interpretation according to changed requirements of BSI TR-03121.

Table 1.7 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)

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

- Part 2: Test Cases for High Level Biometric Services (HLBS) (BSI TR-03122-2)

The second part defines test cases for servers and clients implementing the High Level Biometric Services interface.

- 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	
Preconditions	
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 “`biocts5v1.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 request Uniform Resource 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 and URI for 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

