



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 5.0



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1. Introduction ..... 1

1.1. Motivation and Objectives of the Conformance Test Specification ..... 1

1.2. Target Audience ..... 1

1.3. Structure of the Conformance Test Specification ..... 1

1.4. Test Case Specification for Function Modules ..... 1

1.5. Conformance Test Interfaces ..... 2

1.5.1. Interface description ..... 2

List of Abbreviations ..... 6

Bibliography ..... 7

## List of Tables

1.1. Example of the Structure of a Test Case .....	2
1.2. Possible Status Codes Used by the IUT .....	4

# 1. Introduction

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

## 1.1. Motivation and Objectives of the Conformance Test Specification

The Technical Guideline Biometrics for Public Sector Applications (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 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 assurance 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.

## 1.2. 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.

## 1.3. Structure of the Conformance Test Specification

The Conformance Test Specification consists of the following parts:

- Part 1: Framework (TR-03122-1)
  - TR-03122-1 is the framework document of the conformance test specification.
- Part 2: Software Architecture – BioAPI Conformance Testing (TR-03122-2)
  - The second part defines the architecture model for Software Architecture conformance testing. Essential topics are the description of the BioAPI Conformance Test Suite (CTS) as well as the Testing Methodology for BioAPI components.
- Part 3: Test Cases for Function Modules and Processes (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.

## 1.4. 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 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. P-FP-GID.

2. As a result the corresponding test cases can be selected in 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#P#FP-GID-001.
3. In general, a test case in TR-03122-3 is structured in three parts as shown in Table 1.1.

Test Case ID: TC-P-FP-GID-001	
Scope	
<ul style="list-style-type: none"> <li>• Short overview of the test case</li> </ul>	
Precondition	
<ul style="list-style-type: none"> <li>• Requirements that need to be fulfilled before the test case can be executed</li> </ul>	
Description	
1. Listing of every single test step	
Expected Result	<ul style="list-style-type: none"> <li>• Description of the expected result for the corresponding test step</li> </ul>

Table 1.1. 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.

## 1.5. Conformance Test Interfaces

Conformance testing in the context of 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 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 TR-03121. The schema definition can be found in the file "biocts4v2.xsd". An example can be found in the file "biocts-testsetup.xml".

### 1.5.1. 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 TR-03121, which further may include an embedded, application specific format (e.g. German Standard for AFIS Transactions (GSAT) XML). The specific data format and URI for test case initiation is described further in each test case definition of 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.

### 1.5.1.1. 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
<aad:aad-app [...]
<bio:Records>
<bio:XMLRecord type="gsat-xml" purpose="enrolment" id="id_1234" size="5687">
[...]
</aad:aad-app>
```

### 1.5.1.2. 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 [...]
```

### 1.5.1.3. Response Codes

Table 3-1 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.



Status Code	Status Message	Description
500	Internal Server Error	An internal, technical error occurred in the IUT during processing the request.

Table 1.2. Possible Status Codes Used by the IUT

## List of Abbreviations

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

# Bibliography