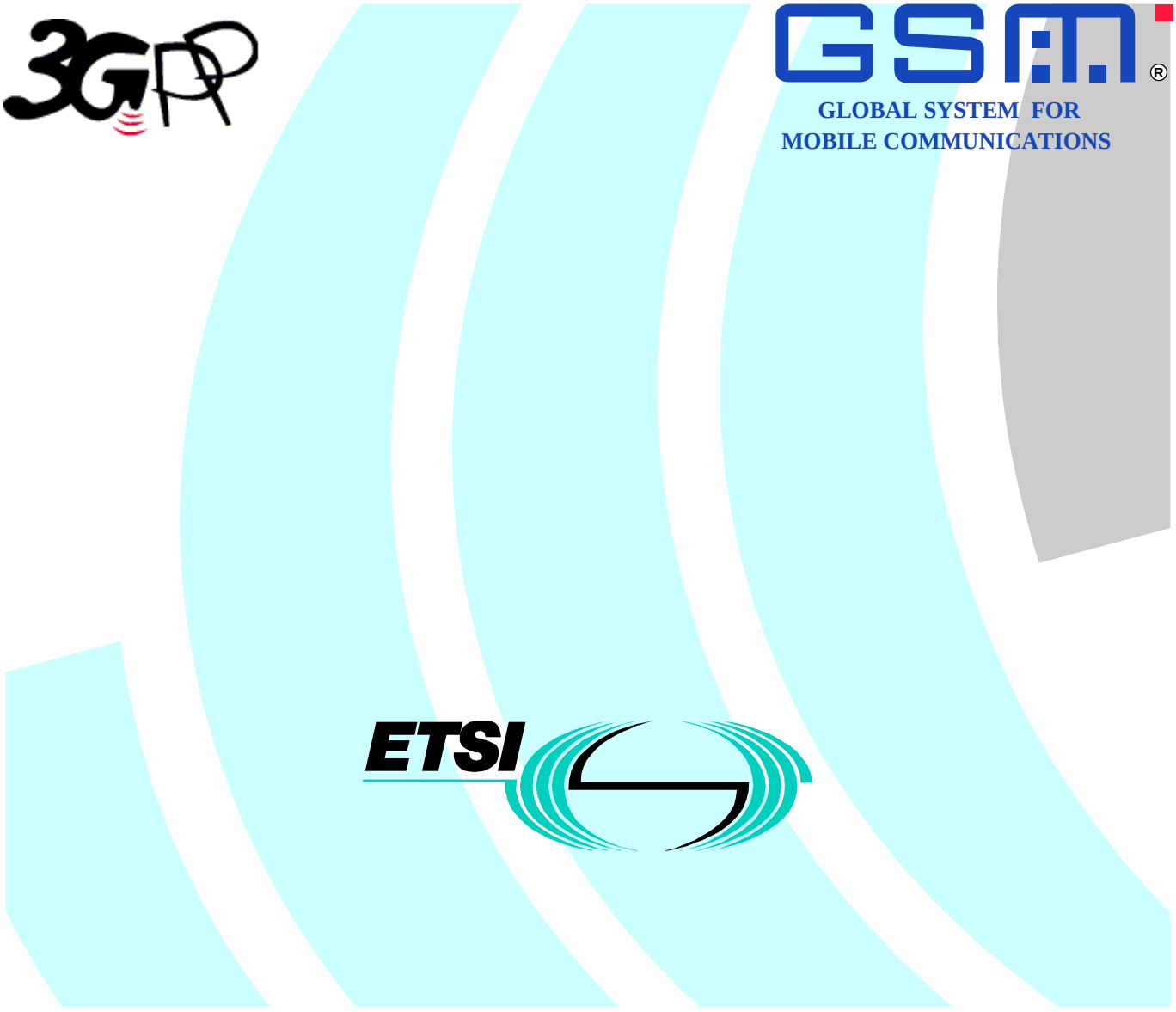
ETSI TS 101 955 V7.0.1 (2001-05)

Technical Specification

Digital cellular telecommunications system (Phase 2+);
Test specification for SIM API for Java card
(3GPP TS 11.13 version 7.0.1 Release 1998)



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Foreword

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Contents

Foreword

This Technical Specification (TS) has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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1 Scope

The present document covers the minimum characteristics considered necessary in order to provide compliance to GSM 03.19 "SIM API for Java Card ™" [7].

The present document describes the technical characteristics and methods of test for testing the SIM API for Java Card (TM) [7] implemented in the subscriber identity modules (SIMs) for GSM. It specifies the following parts:

- test applicability
- test environment description
- tests format
- test area reference
- conformance requirements
- test auite files
- test procedure
- test coverage and,
- a description of the associated testing tools that shall be used.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] (void)

[2] (void)

[3] GSM 11.11: "Digital cellular telecommunication system (Phase 2+); Specification of the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface".

[4] GSM 11.14: "Digital cellular telecommunications system (Phase 2+); Specification of the SIM application toolkit for the Subscriber Identity Module – Mobile Equipment (SIM – ME) interface".

[5] GSM 11.17: "Subscriber Identity Module" (SIM) conformance test specification".

[6] (void)

[7] GSM 03.19 version 7.4.0: "Digital cellular telecommunications system (Phase 2+); Subscriber Identity Module Application Programming Interface (SIM API); SIM API for Java Card™; Stage 2".

[8] GSM 03.48 version 8.4.0: "Digital cellular telecommunications system (Phase 2+); Security Mechanisms for the SIM application toolkit; Stage 2"

[9] ISO/IEC 7816-3 (1997) " Identification cards - Integrated circuit(s) cards with contacts, Part 3: Electronic signals and transmission protocols"

[10] GSM 02.19 "Digital cellular telecommunications system (Phase 2+, Release 98); Subscriber Identity Module Application Programming Interface (SIM API); Service description; Stage 1"

[11] SUN Java Card Specification "Java Card 2.1 API Specification "

[12] SUN Java Card Specification "Java Card 2.1 Runtime Environment Specification"

[13] SUN Java Card Specification "Java Card 2.1 VM Architecture Specification"

[14] ETSI TS 101 220 v3.0.0 "Numbering System for Telecommunication IC card applications"

[15] GSM 11.10-1: "Digital cellular telecommunication system (Phase 2+);
Mobile Station (MS) conformance specification; Part 1: Conformance specification".

3 Definitions and abbreviations

3.1 Definitions

The definitions specified in GSM 11.10-1 [15] clause 3.3 shall apply, unless otherwise specified in the present clause.

Applet: An Applet is an application built up using a number of classes which will run under the control of the Java Card virtual machine.

Applet installation parameters: Default values for applet installation parameters.

Applet loading script: File containing the APDU commands that will load and install the test applet in the card.

CleanUp Script file: File containing the APDU commands that will restore the Default Initial Conditions on the SIM

Conformance Requirement Reference: Description of the expected card behaviour according to 03.19 specification.

Expected state: the state in which the SIM is supposed to be after the execution of the test procedure applied on the relevant initial conditions

Security parameters: Minimum security requirements defined for the applet installation process.

Test Area: Set of Test Cases applicable to a specific part (class method, framework behaviour,…) of the 03.19 specification.

Test Case: Elementary test that checks for compliance with one or more Conformance Requirement References.

Test Output file: TBD.

Test procedure: the sequence of actions/commands to perform all the test cases defined in a test area.

Test Script file: File containing the APDU commands that will execute and verify the test results.

Test Toolkit Applet: Applet designed to test a specific functionality of the SIM API 03.19 specification.

3.2 Abbreviations

For the purpose of the present document, the following abbreviations apply, in addition to those listed in GSM 01.04 [2]:

AC	Application Code
AID	Application Identifier
APDU	Application Protocol Data Unit
API	Application Programming Interface
CAD	Card Acceptance Device

FFS	For Further Study
IFD	Interface Device
JCRE	Java Card™ Run Time Environment
JVM	Java Virtual Machine
SIM	Subscriber Identity Module
SE	Sending Entity

4 Test Environment

This clause specifies requirements that shall be met and the testing rules that shall be followed during the test procedure.

4.1 Applicability

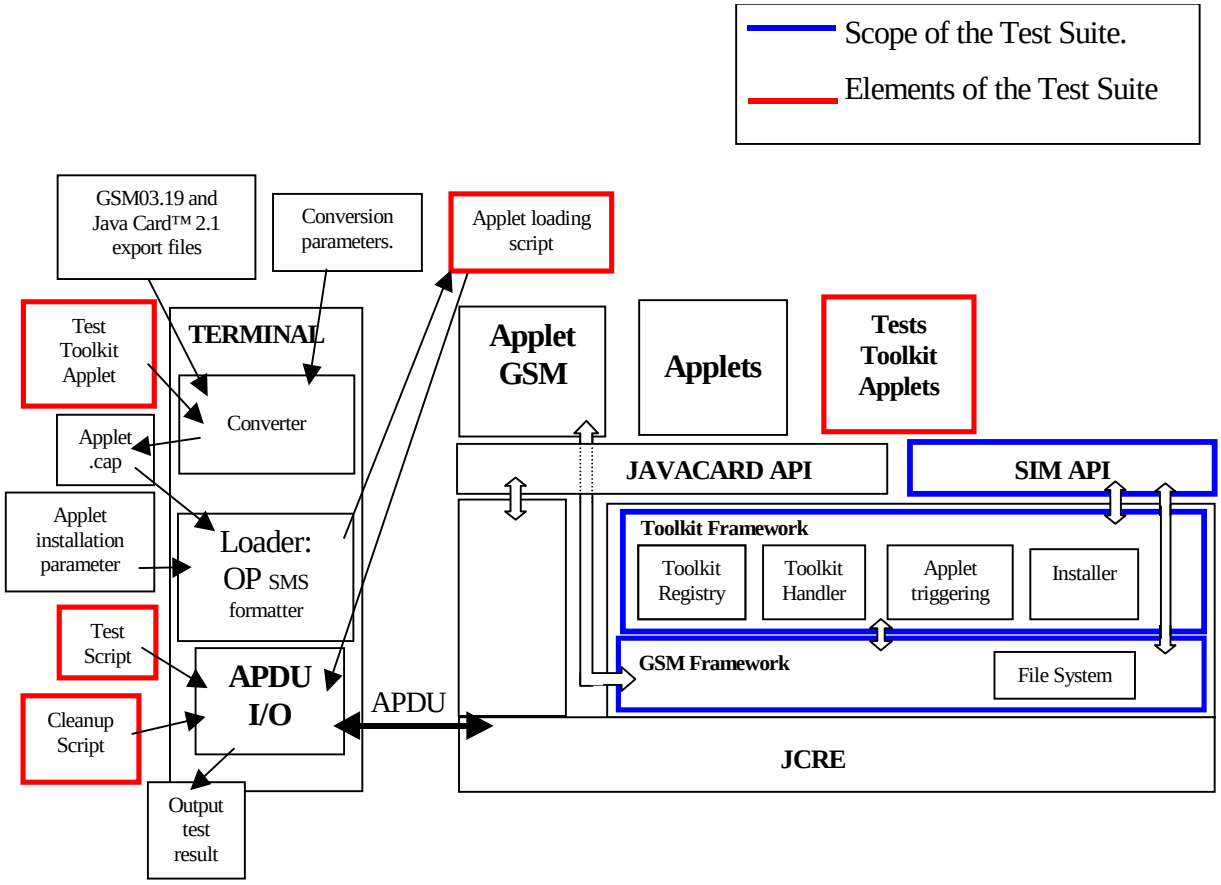
The tests defined in this specification shall be performed taking into account the services supported by the card as specified in the EF_{SST} file.

This specification contains tests that test interoperability at the API level. This specification does not currently contain tests for interoperability at the SIM API framework and at the byte code level. These are for further study.

The test defined in this specification are applicable to cards implementing TS 03.19 [7] version 7.4.0 unless otherwise stated.

4.2 Test environment description

The general architecture for the test environment is:



Note: This diagram shows the test architecture required to test interoperability at both API and bytcode level. The latter is currently not included in the current specification. The diagram is for information.

4.3 Tests format

4.3.1 Test Area Reference

Each test area is referenced as follows:

API Testing:: 'API_[package name]_[classname]_[methodname]' where

package name:

sim.access package: '1'

sim.toolkit package: '2'

class name:

yyy: 3 letters for each class.

See Annex A for full classes acronyms list.

method name:

zzzz[input parameters]:

See Annex A for full methods name acronyms list.

FWK: framework testing

[TBD]

LDR: loader testing

[TBD]

4.3.1.1 Conformance requirements

The conformance requirements are expressed in the following way:

- Method prototype as listed in GSM 03.19 [7]specification.
- Normal execution:
  - Contains normal execution and correct parameters limit values, each referenced as a Conformance Requirement Reference Normal (CRRN)
- Parameters error:
  - Contains parameter errors and incorrect parameter limit values, each referenced as a Conformance Requirement Reference Parameter Error (CRRP)
- Context error:
  - Contains errors due to the context the method is used in, each referenced as a Conformance Requirement Reference Context Error (CRRC)

4.3.1.2 Test Area files

The files included in the Test Area use the following naming convention:

- Test Script: [Test Area Reference]_[Test script number].scr
- Test Applet: [Test Area Reference]_[Test applet number].java
- Load Script: [Test Area Reference]_[Load Script number].ldr

- Cleanup Script: [Test Area Reference]_[Cleanup Script number].clr

The test script, applet, installation parameters, load script, cleanup script and conversion parameters numbers start from '1'.

The test script, load script and cleanup script shall share a common syntax and format (see Annex B).

Scripts file shall be run in the following order:

[Test Area Reference]_1.ldr

[Test Area Reference]_1.scr

[Test Area Reference]_1.clr

[Test Area Reference]_2.ldr

[Test Area Reference]_2.scr

[Test Area Reference]_2.clr

….

[Test Area Reference]_n.ldr

[Test Area Reference]_n.scr

[Test Area Reference]_n.clr

In case that one of the files is not needed, it shall be skipped during the tests execution.

4.3.1.3 Test Procedure

Each test procedure contains a table to indicate the expected responses form the API and/or the APDU level as follows:

Test Case			
Id	**Description**	**API Expectation**	**APDU Expectation**
	Test Case detailed description	*API expected behavior.*	*Expected response at APDU level.*

4.3.1.4 Test Coverage

The table at the end of each test procedure indicates the correspondence between the Conformance Requirements Reference (CRR) and the different test cases.

4.4 Initial Conditions

The Initial Conditions are a set of general prerequisites for the SIM prior to the execution of testing. For each test procedure described in this document, the following rules apply to the Initial Conditions:

- unless otherwise stated, the file system and the files' content shall fulfil the requirements described in the "Default Prepersonalisation" paragraph;

- unless otherwise stated, before installing the applet(s) relevant to the current test procedure, all packages specific to other test procedures shall not be present.

When both statements apply, a test procedure is said to be in the "Default Initial Conditions" state.

4.5 Package name

Java packages integrating this Test Suite shall follow this naming convention:

sim.test.access.[Test Area Reference]: Java Card packages containing Test Area References for the GSM 03.19 sim.access package.

sim.test.framework.[Test Area Reference]: Java Card packages containing Test Area References for the GSM 03.19 framework.

sim.test.util: for the Test util package defined in this Test Suite.

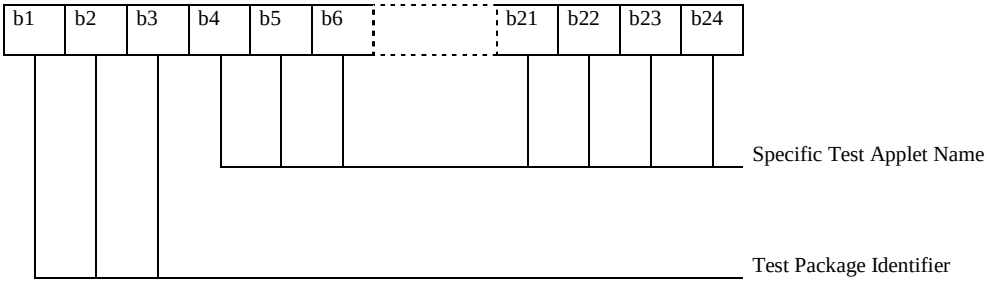
sim.test.toolkit.[Test Area Reference]: Java Card packages containing Test Area References for the GSM 03.19[7] sim.toolkit package.

Example: The package *../sim.test.access.[Test Area Reference]* creates the following directory structure *../sim/test/access/[Test Area Reference]/API_1_..._[1..n].**, where '*API_1_..._[1..n].**' are the different test applets Java source files used in *[Test Area Reference]*.

4.6 AID Coding

The AID coding for the API Test Packages, Applet classes and Applet shall be as specified in TS 101 220 [14]. In addition, the following TAR values are defined for use within the present document:

TAR Coding (3 bytes/ 24 bits):



Test package Identifier(bits b1-b3):

000 reserved (as TAR= '00.00.00' is reserved for Card Manager)

001 API

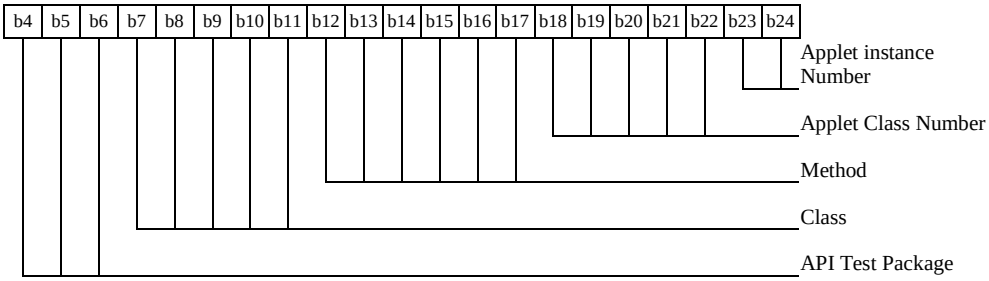
010 Framework

011 Loader

111 sim.test.util

other values are RFU

Specific applet test name (bits b4-b24):



for API test package(3 bits)

001 sim.access

010 sim.toolkit

other are RFU

Class (5 bits): need to be assigned specification order see Annex A for the full list

Method (6 bits): need to be assigned specification order see Annex A for the full list

Applet Class number (5 bits): linked to Test Area, it shall start with 1 for classes and shall be 0 for package.

Applet Instance number (2 bits) defined in the test procedure it shall start with 01 for applet instance and shall be 0 for package and class.

Application Provider specific data (1 byte):

'00' for Package

'01' for Applet class

'02' for Applet Instance

For example, the AID of Package sim.test.util is 'A0 00 00 00 09 00 02 FF FF FF FF 89 E0 00 00 00'

4.7 Test Equipment

These subclauses recommend a minimum specification for each of the items of test equipment referenced in the tests.

4.7.1 APDU tool

This test tool shall meet the following requirements:

- be able to send command to the card TPDU;
- be able to check none, only a part, or all of the data returned;
- be able to check none, only part, or all of the status returned;
- be able to accept all valid status codes returned;
- be able to support Reader commands;
- be able to generate a log file for each test execution.
- if more data is returned than defined in the test specification, the tool shall continue;
- if less data is returned than defined in the test specification, the tool shall aborts and return an error;
- if there is an error in data or status returned, the tool shall abort and return an error.

The log file produced by the test tool shall include the following information:

- all commands issued;
- all data returned;
- all status returned;
- all errors codes;
- expected data and status in case of error;
- comments from the scripts;
- a log message to report success or failure of the test.

4.7.2 Util package

Annex D includes java source code for the sim.test.util package as well as loading , testing and cleaning script examples.

4.7.3 Applet installation parameters

4.7.3.1 Security parameters

Loading scripts shall use the following security parameters as stated in GSM 03.48 [8] for applet installation:

Parameter	Value in hexadecimal
SPI	0A 00
KIC	00
KID	11
TAR	00 00 00
CNTR	00 00 00 00 01
PCNTR	00
Key	01 23 45 67 89 AB CD EF

4.7.3.2 Loading components

Cap files in loading scripts shall not include the descriptor component as described in Java Card 2.1 VM Architecture Specification [13].

4.8 Testing methodology

4.8.1 Test interfaces and facilities

The SIM-ME interface provides the main transport interface for the purpose of performing conformance tests.

The SIM API interface provides the main test interface for the purpose of performing conformance tests.

5 Test plan

The test plan is divided according to the SIM API specification, that way the tests will follow the class hierarchy for the sim.toolkit and sim.access package; for the SIM Toolkit framework this test plan describes the different points that will be tested with the present test specification.

6 API Test Plan

6.1 Package sim.access:

6.1.1 Interface SIMView

Note: The Test applet shall be run on a class that implements this interface.

6.1.1.1 Constants

Test Area Reference: API_1_SVW_CONST

6.1.1.1.1 Conformance Requirements

This section does not describe the conformance requirements for a method, but rather for the constants of the interface.

Normal execution

CRRN1: The constants shall have the same name and value that is defined in GSM 03.19 [].

6.1.1.1.2 Test Suite Files

Additional requirements for the GSM personalisation: None

Test Script: API_1_SVW_CONST_1.scr

Test Applet: API_1_SVW_CONST_1.java

Load Script: API_1_SVW_CONST_1.ldr

Cleanup Script: API_1_SVW_CONST_1.clr

6.1.1.1.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
01	Check constant FID_MF = '3F00'		
02	Check constant FID_DF_TELECOM = '7F10'		
03	Check constant FID_DF_GSM = '7F20'		
04	Check constant FID_DF_DCS_1800 = '7F21'		
05	Check constant FID_DF_IS_41 = '7F22'		
06	Check constant FID_DF_FP_CTS = '7F23'		
07	Check constant FID_DF_GRAPHICS = '5F50'		
08	Check constant FID_DF_IRIDIUM = '5F30'		
09	Check constant FID_DF_GLOBALSTAR = '5F31'		
10	Check constant FID_DF_ICO = '5F32'		
11	Check constant FID_DF_ACES = '5F33'		
12	Check constant FID_DF_PCS_1900 = '5F40'		
13	Check constant FID_DF_CTS = '5F60'		
14	Check constant FID_DF_SOLSA = '5F70'		
15	Check constant FID_EF_ICCID = '2FE2'		
16	Check constant FID_EF_ELP = '2F05'		
17	Check constant FID_EF_ADN = '6F3A'		
18	Check constant FID_EF_FDN = '6F3B'		
19	Check constant FID_EF_SMS = '6F3C'		
20	Check constant FID_EF_CCP = '6F3D'		
21	Check constant FID_EF_MSISDN = '6F40'		
22	Check constant FID_EF_SMSP = '6F42'		
23	Check constant FID_EF_SMSS = '6F43'		
24	Check constant FID_EF_LND = '6F44'		
25	Check constant FID_EF_SDN = '6F49'		
26	Check constant FID_EF_EXT1 = '6F4A'		
27	Check constant FID_EF_EXT2 = '6F4B'		
28	Check constant FID_EF_EXT3 = '6F4C'		
29	Check constant FID_EF_BDN = '6F4D'		
30	Check constant FID_EF_EXT4 = '6F4E'		
31	Check constant FID_EF_SMSR = '6F47'		
32	Check constant FID_EF_IMG = '4F20'		
33	Check constant FID_EF_LP = '6F05'		
34	Check constant FID_EF_IMSI = '6F07'		
35	Check constant FID_EF_KC = '6F20'		
36	Check constant FID_EF_PLMNSEL = '6F30'		
37	Check constant FID_EF_HPLMN = '6F31'		
38	Check constant FID_EF_ACMMAX = '6F37'		
39	Check constant FID_EF_SST = '6F38'		
40	Check constant FID_EF_ACM = '6F39'		
41	Check constant FID_EF_GID1 = '6F3E'		
42	Check constant FID_EF_GID2 = '6F3F'		

Id	Description	API Expectation	APDU Expectation
43	Check constant FID_EF_SPN = '6F46'		
44	Check constant FID_EF_PUCT = '6F41'		
45	Check constant FID_EF_CBMI = '6F45'		
46	Check constant FID_EF_BCCH = '6F74'		
47	Check constant FID_EF_ACC = '6F78'		
48	Check constant FID_EF_FPLMN = '6F7B'		
49	Check constant FID_EF_LOCI = '6F7E'		
50	Check constant FID_EF_AD = '6FAD'		
51	Check constant FID_EF_PHASE = '6FAE'		
52	Check constant FID_EF_VGCS = '6FB1'		
53	Check constant FID_EF_VGCSS = '6FB2'		
54	Check constant FID_EF_VBS = '6FB3'		
55	Check constant FID_EF_VBSS = '6FB4'		
56	Check constant FID_EF_EMLPP = '6FB5'		
57	Check constant FID_EF_AAEM = '6FB6'		
58	Check constant FID_EF_CBMID = '6F48'		
59	Check constant FID_EF_ECC = '6FB7'		
60	Check constant FID_EF_CBMIR = '6F50'		
61	Check constant FID_EF_DCK = '6F2C'		
62	Check constant FID_EF_CNL = '6F32'		
63	Check constant FID_EF_NIA = '6F51'		
64	Check constant FID_EF_KCGPRS = '6F52'		
65	Check constant FID_EF_LOCIGPRS = '6F53'		
66	Check constant FID_EF_SUME = '6F54'		
67	Check constant FID_EF_SAI = '4F30'		
68	Check constant FID_EF_SLL = '4F31'		
69	Check constant REC_ACC_MODE_NEXT = '02'		
70	Check constant REC_ACC_MODE_PREVIOUS = '03'		
71	Check constant REC_ACC_MODE_ABSOLUTE_CURRENT = '04'		
72	Check constant SEEK_FROM_BEGINNING_FORWARD = '00'		
73	Check constant SEEK_FROM_END_BACKWARD = '01'		
74	Check constant SEEK_FROM_NEXT_FORWARD = '02'		
75	Check constant SEEK_FROM_PREVIOUS_BACKWARD = '03'		

6.1.1.1.4 Test Coverage

CRR Number	Test Case Number
CRRN1	1-75

6.1.1.2 Method select

Test Area Reference: API_1_SVW_ SLCTS_BSS

6.1.1.2.1 Conformance Requirements

The method with the following header shall be compliant to its definition in the API.

```
public short select(short fid,
                    byte[] fci,
                    short fciOffset,
                    short fciLength)
             throws java.lang.NullPointerException,
                    java.lang.ArrayIndexOutOfBoundsException,
                    SIMViewException
```

Normal execution

CRRN1: If the desired file is selected, the length of the FCI (File Control Information) which has been written to the array fci is returned.

CRRN2: If the length fciLength is greater than or equal to the length of the FCI structure, the whole FCI structure is copied into the array fci and the length of the FCI which has been written to the array fci is returned.

CRRN3: If the length fciLength is less than the length of the FCI structure, the first part of the FCI structure is copied into the array fci and the length of the FCI which has been written to the array fci is returned.

CRRN4: After selecting a DF/MF no EF is selected.

CRRN5: After selecting a linear fixed EF no record is selected.

CRRN6: After selecting a cyclic EF the first record which is the last updated record is selected.

CRRN7: The current files (file context) of any other applets shall not be changed. See GSM 03.19 [] - §5.2. This will be tested during the testing of the framework.

CRRN8: The information returned by fci shall be formatted as described in GSM 11.11 [], §9.2.1.

CRRN9: The file with a File-ID that matches fid shall be found according to the following selection rules:

1) An immediate child EF or DF of the current MF/DF can be selected,
2) A sibling DF of the current DF can be selected,
3) The current MF/DF it self can be selected,
4) The parent MF/DF of the current DF can be selected,
5) The MF can always be selected.

Parameter errors

CRRP1: If the array fci is null, an instance of NullPointerException shall be thrown.

CRRP2: If fciOffset is less than 0, an instance of ArrayIndexOutOfBoundsException shall be thrown.

CRRP3: If fciLength is less than 0, an instance of ArrayIndexOutOfBoundsException shall be thrown.

CRRP4: If fciOffset plus fciLength is greater than the length of the array fci.length, or fciOffset equals fci.length, an instance of ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: If the file with a File-ID which matches fid could not be found according to the selection rules listed in CRRN9, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.FILE_NOT_FOUND.

CRRC2: If the method call causes a memory problem (e.g. memory access error), an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.MEMORY_PROBLEM.

CRRC3: If the method call causes an error to occur that is not expected and thus not handled, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INTERNAL_ERROR.

6.1.1.2.2 Test Suite Files

Additional requirements for the GSM personalisation: None

Test Script: API_1_SVW_SLCTS_BSS_1.scr

Test Applet: API_1_SVW_SLCTS_BSS_1.java

Load Script: API_1_SVW_SLCTS_BSS_1.ldr

Cleanup Script: API_1_SVW_SLCTS_BSS_1.clr

6.1.1.2.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
0	**SIM Initialisation**	Responses ignored.	

1	**Select EFICCID in MF (Transparent EF)**
	`fid = SIMView.FID_EF_ICCID`
	`byte[] fci = new byte[34]`
	`fciOffset = 0`
	`fciLength = 20`
	`select()`
		No exception shall be thrown.
		Shall return a value not greater than 20.
		
		<Description of fci:
		XX XX
		XX XX
		2F E2
		04
		>	

2	**Select EF_{ICCID} in MF (Transparent EF)**
	`fid = SIMView.FID_EF_ICCID`
	`fciOffset = 0`
	`fciLength = 13`
	`select()`
		No exception shall be thrown.
		Shall return 13.
		fci shall contain the first 13 bytes of the FCI structure.	

3	**Select DF_{GSM} in MF**
	`fid = SIMView.FID_DF_GSM`
	`fciOffset = 0`
	`fciLength = 7`
	`select()`
		No exception shall be thrown.
		Shall return 7.
		fci shall contain the entire FCI structure.
		<Description of fci:
		XX XX
		XX XX
		7F 20
		02
		>	

4	**Select EF_{ACM} in DF_{GSM} (CyclicEF)**
	`fid = SIMView.FID_EF_ACM`
	`fciOffset = 0`
	`fciLength = 20`
	`select()`
		No exception shall be thrown.
		Shall return a value between 15 and 20. (Cyclic EF)
		fci shall contain the first 15 or more bytes of the FCI structure.
		fci[14] shall have the value 3 (length of record).	

5	**Select MF**
	`fid = SIMView.FID_MF`
	`fciOffset = 0`
	`fciLength = 34`
	`select()`
		No exception shall be thrown.
		Shall return a value between 22 and 34.
		fci shall contain the entire FCI structure.	

6	**Select $DF_{TELECOM}$ in MF**
	`fid = SIMView.FID_DF_TELECOM`
	`fci[0] = fci[1] = '05'`
	`fciOffset = 2`
	`fciLength = 20`
	`select()`
		No exception shall be thrown.
		Shall return 20.
		fci shall contain the first 20 bytes of the FCI structure starting at index 2. The first two bytes shall (still) have the value '05'.	

7	**Select EF_{FDN} in $DF_{TELECOM}$ (Linear FixedEF)**
	`fid = SIMView.FID_EF_FDN`
	`fciOffset = 0`
	`fciLength = 15`
	`select()`
		No exception shall be thrown.
		Shall return 15.
		fci shall contain the first 15 bytes of the FCI structure.
		fci[14] shall have the value 28 (length of record).	

8	**fci is null**
	`fid = SIMView.FID_EF_FDN`
	`byte[] nullBuffer = null`
	`fciOffset = 0`
	`fciLength = 15`
	`select()`
		Shall throw java.lang.NullPointerException.	

9	**fciOffset < 0**
	`fid = SIMView.FID_EF_FDN`
	`fciOffset = -1`
	`fciLength = 15`
	`select()`
		Shall throw java.lang.ArrayIndexOutOfBoundsException.	

10	**fciLength < 0**
	`fid = SIMView.FID_EF_FDN`
	`fciOffset = 0`
	`fciLength = -1`
	`select()`
		Shall throw java.lang.ArrayIndexOutOfBoundsException.	

11	**fciOffset + fciLength > fci.length**	Shall throw	

Id	Description	API Expectation	APDU Expectation
	fid = SIMView.FID_EF_FDN fciOffset = 20 fciLength = 15 select()	java.lang.ArrayIndexOutOfBoundsException.	
12	**fciOffset >= fci.length** fid = SIMView.FID_EF_FDN fciOffset = 34 fciLength = 1 select()	Shall throw java.lang.ArrayIndexOutOfBoundsException	
13	**Selection possibilities** 1 - fid = SIMView.FID_MF fciOffset = 0 fciLength = 15 select() 2 – fid = SIMView.FID_DF_TELECOM select() 3 - fid = SIMView.FID_DF_GRAPHICS select() 4 - fid = SIMView.FID_DF_TELECOM select() 5 - fid = SIMView.FID_DF_GRAPHICS select() 6 - fid = SIMView.FID_MF select() 7 - fid = SIMView.FID_DF_GSM select() 8 - fid = SIMView.FID_DF_TELECOM select() 9 - fid = SIMView.FID_DF_TELECOM select() –	1 – No exception shall be thrown. 2 – No exception shall be thrown. 3 – No exception shall be thrown. 4 – No exception shall be thrown. 5 – No exception shall be thrown. 6 – No exception shall be thrown. 7 – No exception shall be thrown. 8 – No exception shall be thrown. 9 – No exception shall be thrown.	
14	**EF not selected after MF/DF selection** 1 - fid = SIMView.FID_MF select() fid = SIMView.FID_EF_ICCID select() 2 - fid = SIMView.FID_MF select() readBinary()	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code NO_EF_SELECTED.	
15	**No selection of non-reachable file** 1 - fid = SIMView.FID_MF select() 2 - fid = SIMView.FID_EF_ACM select()	1 – No exception shall be thrown. 2 – Shall throw sim.access.SIMViewException with reason code FILE_NOT_FOUND.	
16	**No record is selected after selecting linear fixed EF** 1 - fid = SIMView.FID_MF select() 2 - fid = SIMView.FID_DF_TELECOM select() 3 - fid = SIMView.FID_EF_ADN select() 4 – recNumber = 0 mode = REC_ACC_MODE_ABSOLUTE_CURRENT readRecord()	1 – No exception shall be thrown. 2 – No exception shall be thrown. 3 – No exception shall be thrown. 4 – Shall throw sim.access.SIMViewException with reason code RECORD_NUMBER_NOT_AVAILABLE.	
17	**Record pointer in selected cyclic EF** 1 – fid = SIMView.FID_MF select() 2 - fid = SIMView.FID_DF_GSM select() 3 - fid = SIMView.FID_EF_ACM select() 4 – byte[] data1 = { 1,2,3 } mode = REC_ACC_MODE_PREVIOUS updateRecord(data1) 5 - fid = SIMView.FID_EF_ACM select() readRecord(data2) compare data1 to data2	1 - No exception shall be thrown. 2 - No exception shall be thrown. 3 - No exception shall be thrown. 4 - No exception shall be thrown. 5 - The contents of data1 and data2 shall be identical.	

6.1.1.2.4 Test Coverage

CRR Number	Test Case Number
N1	1-7
N2	3, 5
N3	1, 2, 4, 6, 7
N4	14
N5	16
N6	17
N8	1, 3
N9	1-7, 13
P1	8
P2	9
P3	10
P4	11, 12
C1	15
C2, C3	Not Tested

6.1.1.3 Method select

Test Area Reference: API_1_SVW_SLCTS

6.1.1.3.1 Conformance Requirements

The method with the following header shall be compliant to its definition in the API.

```
public void select(short fid)
           throws SIMViewException
```

Normal execution

CRRN1: If the desired file is selected, no exception is thrown.

CRRN2: After selecting a DF/MF no EF is selected.

CRRN3: After selecting a linear fixed EF no record is selected.

CRRN4: After selecting a cyclic EF the first record which is the last updated record is selected.

CRRN5: The current files (file context) of any other applets shall not be changed [03.19 - §5.2]. This will be tested during the testing of the framework.

CRRN6: The file with a File-ID that matches fid shall be found according to the following selection rules:

1) An immediate child EF or DF of the current MF/DF can be selected,
2) A sibling DF of the current DF can be selected,
3) The current MF/DF it self can be selected,
4) The parent MF/DF of the current DF can be selected,
5) The MF can always be selected.

Parameter errors

This method has no errors that occur due to parameters.

Context errors

CRRC1: If the file with a File-ID which matches fid could not be found according to the selection rules listed in CCRN6, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.FILE_NOT_FOUND.

CRRC2: If the method call causes a memory problem (e.g. memory access error), an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.MEMORY_PROBLEM.

CRRC3: If the method call causes an error to occur that is not expected and thus not handled, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INTERNAL_ERROR.

6.1.1.3.2 Test Suite Files

Additional requirements for the GSM personalisation: None

Test Script: API_1_SVW_SLCTS_1.scr

Test Applet: API_1_SVW_SLCTS_1.java

Load Script: API_1_SVW_SLCTS_1.ldr

Cleanup Script: API_1_SVW_SLCTS_1.clr

6.1.1.3.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
0	**SIM Initialisation**	Responses ignored.	

1	**Select EF_{ICCID} in MF (Transparent EF)**
	`fid = SIMView.FID_EF_ICCID`
	`select()`
		No exception shall be thrown.	

2	**EF not selected after MF/DF selection**
	`1 - fid = SIMView.FID_MF`
	`select()`
	`fid = SIMView.FID_EF_ICCID`
	`select()`
	`2 - fid = SIMView.FID_MF`
	`select()`
	`readBinary()`
		1 - No exception shall be thrown.
		2 - Shall throw sim.access.SIMViewException with reason code NO_EF_SELECTED.	

3	**No record is selected after selecting linear fixed EF**
	`1 - fid = SIMView.FID_MF`
	`select()`
	`2 - fid = SIMView.FID_DF_TELECOM`
	`select()`
	`3 - fid = SIMView.FID_EF_ADN`
	`select()`
	`4 – recNumber = 0`
	`mode = REC_ACC_MODE_ABSOLUTE_CURRENT`
	`readRecord()`
		1 – No exception shall be thrown.
		2 – No exception shall be thrown.
		3 – No exception shall be thrown.
		4 – Shall throw sim.access.SIMViewException with reason code RECORD_NUMBER_NOT_AVAILABLE.	

4	**Record pointer in selected cyclic EF**
	`1 – fid = SIMView.FID_MF`
	`select()`
	`2 - fid = SIMView.FID_DF_GSM`
	`select()`
	`3 - fid = SIMView.FID_EF_ACM`
	`select()`
	`4 – byte[] data1 = { 1,2,3 }`
	`updateRecord(data1)`
	`5 - fid = SIMView.FID_EF_ACM`
	`select()`
	`readRecord(data2)`
	`compare data1 to data2`
		1 - No exception shall be thrown.
		2 - No exception shall be thrown.
		3 - No exception shall be thrown.
		4 - No exception shall be thrown.
		5 - The contents of data1 and data2 shall be identical.	

5	**No Change to File Context** This will be tested during the testing of the framework.		

6	**Selection possibilities**
	`1 - fid = SIMView.FID_MF`
	`select()`
	`2 – fid = SIMView.FID_DF_TELECOM`
	`select()`
	`3 - fid = SIMView.FID_DF_GRAPHICS`
	`select()`
	`4 - fid = SIMView.FID_DF_TELECOM`
	`select()`
	`5 - fid = SIMView.FID_DF_GRAPHICS`
	`select()`
	`6 - fid = SIMView.FID_MF`
	`select()`
	`7 - fid = SIMView.FID_DF_GSM`
	`select()`
	`8 - fid = SIMView.FID_DF_TELECOM`
	`select()`
	`9 - fid = SIMView.FID_DF_TELECOM`
	`select()`
		1 – No exception shall be thrown.
		2 – No exception shall be thrown.
		3 – No exception shall be thrown.
		4 – No exception shall be thrown.
		5 – No exception shall be thrown.
		6 – No exception shall be thrown.
		7 – No exception shall be thrown.
		8 – No exception shall be thrown.
		9 – No exception shall be thrown.	

7	**No selection of unreachable file**
	`1 - fid = SIMView.FID_MF`
	`select()`
	`2 - fid = SIMView.FID_EF_ACM`
	`select()`
		1 – No exception shall be thrown.
		2 – Shall throw sim.access.SIMViewException with reason code FILE_NOT_FOUND.	

6.1.1.3.4 Test Coverage

CRR Number	Test Case Number
CRRN1	1
CRRN2	2
CRRN3	3
CRRN4	4

CRR Number	Test Case Number
CRRN6	6
CRRC1	7
CRRC2, CRRC3	Not Tested

6.1.1.4 Method status

Test Area Reference: API_1_SVW_STAT_BSS

6.1.1.4.1 Conformance Requirements

The method with the following header shall be compliant to its definition in the API.

```
public short status(byte[] fci,
                    short fciOffset,
                    short fciLength)
             throws java.lang.NullPointerException,
                    java.lang.ArrayIndexOutOfBoundsException,
                    SIMViewException
```

Normal execution

CRRN1: The FCI (File Control Information) of the current DF (or MF) is returned in the same format as for a SELECT command in case of selecting an MF/DF (described in GSM 03.19 [], §9.2.1).

CRRN2: If the length fciLength is greater than or equal to the length of the FCI structure, the whole FCI structure is copied into the array fci and the length of the FCI which has been written to the array fci is returned.

CRRN3: If the length fciLength is less than the length of the FCI structure, the first part of the FCI structure is copied into the array fci and the length of the FCI which has been written to the array fci is returned.

Parameter errors

CRRP1: If the array fci is null, an instance of NullPointerException shall be thrown.

CRRP2: If fciOffset is less than 0, an instance of ArrayIndexOutOfBoundsException shall be thrown.

CRRP3: If fciLength is less than 0, an instance of ArrayIndexOutOfBoundsException shall be thrown.

CRRP4: If fciOffset plus fciLength is greater than the length of the array fci.length, or fciOffset equals fci.length, an instance of ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: If the method call causes a memory problem (e.g. memory access error), an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.MEMORY_PROBLEM.

CRRC2: If the method call causes an error to occur that is not expected and thus not handled, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INTERNAL_ERROR.

6.1.1.4.2 Test Suite Files

Additional requirements for the GSM personalisation:

Test Script: API_1_SVW_STAT_BSS_1.scr

Test Applet: API_1_SVW_STAT_BSS_1.java

Load Script: API_1_SVW_STAT_BSS_1.ldr

Cleanup Script: API_1_SVW_STAT_BSS_1.clr

6.1.1.4.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
0	**SIM Initialisation**	Responses ignored.	
1	**Status of MF** byte[] fci = new byte[34] fciOffset = 0 fciLength = 7 status()	No exception shall be thrown. Shall return 7. fci shall contain the entire FCI structure. *<Description of fci:* *XX XX* *XX XX* *3F 00* *01* *>*	
2	**Status after select EF_{ICCID} in MF** 1 – fid = SIMView.FID_DF_GSM fciOffset = 0 fciLength = 34 len = select() 2 – byte[] fci2 = new byte[34] len2 = status() 3 – Compare len and len2 4 - Compare the len bytes of fci and fci2	1 - No exception shall be thrown. Shall return a value between 22 and 34. 2 - No exception shall be thrown. Shall return 22 or more. 3 - len and len2 shall be identical 4 - fci and fci2 shall be identical	
3	**Status of $DF_{Telecom}$** 1 – fid = SIMView.FID_DF_TELECOM select() 2 – fciOffset = 0 fciLength = 100 status()	1 - No exception shall be thrown. Shall return a value between 22 and 34. 2 - No exception shall be thrown. Shall return a value between 22 and34. fci shall contain the entire FCI structure (check that returned value is equal to 13 plus the "length of following data" - fci[12]).FID of the returned fci (fci[4:5]) is FID_DF_TELECOM.	
4	**Status $DF_{TELECOM}$** fciOffset = 0 fciLength = 7 status()	No exception shall be thrown. Shall return 7. fci shall contain the first 7 bytes of the FCI structure starting at index 0. FID of the returned fci (fci[4:5]) is FID_DF_TELECOM.	
5	**fci is null** byte[] nullBuffer = null fciOffset = 0 fciLength = 34 status()	Shall throw java.lang.NullPointerException.	
6	**fciOffset < 0** fciOffset = -1 fciLength = 34 status()	Shall throw java.lang.ArrayIndexOutOfBoundsException.	
7	**fciLength < 0** fciOffset = 0 fciLength = -1 status()	Shall throw java.lang.ArrayIndexOutOfBoundsException.	
8	**fciOffset + fciLength > fci.length** fciOffset = 20 fciLength = 15 status()	Shall throw java.lang.ArrayIndexOutOfBoundsException.	
9	**fciOffset >= fci.length** fciOffset = 34 fciLength = 1 status()	Shall throw java.lang.ArrayIndexOutOfBoundsException.	

6.1.1.4.4 Test Coverage

CRR Number	Test Case Number
CRRN1	1-4
CRRN2	2, 3

CRR Number	Test Case Number
CRRN3	1, 4
CRRP1	5
CRRP2	6
CRRP3	7
CRRP4	8, 9
CRRC1, CRRC2	Not Tested

6.1.1.5 Method readBinary

Test Area Reference: API_1_SVW_REDBS_BSS

6.1.1.5.1 Conformance Requirements

The method with the following header shall be compliant to its definition in the API.

```
public short readBinary(short fileOffset,
                        byte[] resp,
                        short respOffset,
                        short respLength)
                 throws java.lang.NullPointerException,
                        java.lang.ArrayIndexOutOfBoundsException,
                        SIMViewException
```

Normal execution

CRRN1: If data can be accessed at the specified offset, the value respOffset plus respLength are returned and the data bytes of the currently selected transparent file are returned in resp.

Parameter errors

CRRP1: If fileOffset is less than 0, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.OUT_OF_FILE_BOUNDARIES.

CRRP2: If fileOffset plus respLength exceeds the length of the file, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.OUT_OF_FILE_BOUNDARIES.

CRRP3: If the array resp is null, an instance of NullPointerException shall be thrown.

CRRP4: If respOffset is less than 0, an instance of ArrayIndexOutOfBoundsException shall be thrown.

CRRP5: If respLength is less than 0, an instance of ArrayIndexOutOfBoundsException shall be thrown.

CRRP6: If respOffset plus respLength is greater than the length of the array resp.length, an instance of ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: If the calling applet has currently no EF selected, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.NO_EF_SELECTED.

CRRC2: If the currently selected EF is not transparent, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.FILE_INCONSISTENT.

CRRC3: If the calling applet does not fulfil the access condition, READ, to perform this function, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.AC_NOT_FULFILLED.

CRRC4: If the currently selected EF is invalidated and the file status of the EF does not allow for the reading of an invalidated file, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INVALIDATION_STATUS_CONTRADICTION.

CRRC5: If the method call causes a memory problem (e.g. memory access error), an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.MEMORY_PROBLEM.

CRRC6: If the method call causes an error to occur that is not expected and thus not handled, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INTERNAL_ERROR.

6.1.1.5.2 Test Suite Files

Additional requirements for the GSM personalisation: none.

Test Script: API_1_SVW_REDBS_BSS_1.scr

Test Applet: API_1_SVW_REDBS_BSS_1.java

Load Script: API_1_SVW_REDBS_BSS_1.ldr

Cleanup Script: API_1_SVW_REDBS_BSS_1.clr

6.1.1.5.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
0	**SIM Initialisation**	Responses ignored	
1	**Read from EFICCID in MF (Transparent EF)** 1 – fid = SIMView.FID_EF_ICCID select() 2 – fileOffset = 0 byte[] resp = new byte[20] resp[0:19] = '55' respOffset = 10 respLength = 10 readBinary()	1 - No exception shall be thrown. 2 - No exception shall be thrown. Shall return 20. resp shall contain the entire contents of EFICCID starting at index 10. <Description of resp: 55 55 55 55 55 55 55 55 55 55 0F FF FF FF FF FF FF FF FF FF >	
2	**Read from EFICCID in MF** resp[0:19] = '55' fileOffset = 5 respOffset = 10 respLength = 5 readBinary()	No exception shall be thrown. Shall return 15. resp shall contain the last 5 bytes of EFICCID starting at index 10. <Description of resp: 55 55 55 55 55 55 55 55 55 55 FF FF FF FF FF 55 55 55 55 55 >	
3	**Offset into File out of bounds** fileOffset = -1 respOffset = 0 respLength = 10 readBinary()	Shall throw sim.access.SIMViewException with reason code OUT_OF_FILE_BOUNDARIES.	
4	**fileOffset + respLength > EF length** fileOffset = 9 respOffset = 0 respLength = 2 readBinary()	Shall throw sim.access.SIMViewException with reason code OUT_OF_FILE_BOUNDARIES.	
5	**resp is null** byte[] nullBuffer = null fileOffset = 0 respOffset = 0 respLength = 10 readBinary()	Shall throw java.lang.NullPointerException.	
6	**respOffset < 0** fileOffset = 0 respOffset = -1 respLength = 10 readBinary()	Shall throw java.lang. ArrayIndexOutOfBoundsException.	
7	**respLength < 0** fileOffset = 0 respOffset = 0 respLength = -1 readBinary()	Shall throw java.lang. ArrayIndexOutOfBoundsException.	
8	**respOffset + respLength > resp.length** fileOffset = 0 respOffset = 10 respLength = 11 readBinary()	Shall throw java.lang. ArrayIndexOutOfBoundsException.	

Id	Description	API Expectation	APDU Expectation
9	**EF is not Transparent** 1 - fid = DFTELECOM select() 2 - fid = EFADN select() 3 - fileOffset = 0 respOffset = 0 respLength = 1 readBinary()	1 - No exception shall be thrown. 2 - No exception shall be thrown. 3 - Shall throw sim.access.SIMViewException with reason code FILE_INCONSISTENT.	
10	**Access condition not fulfilled** 1 - fid = DFSIMTTEST select() 2 - fid = EFTNR select() 3 - fileOffset = 0 respOffset = 0 respLength = 1 readBinary()	Shall throw sim.access.SIMViewException with reason code AC_NOT_FULFILLED.	
11	**EF is invalidated** 1 - fid = EFTNU invalidate() 2 - readBinary() 3 - rehabilitate()	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code INVALIDATION_STATUS_CONTRADICTION. 3 - No exception shall be thrown.	
12	**No EF selected** 1- fid = SIMView.FID_MF select() 2 readBinary()	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code NO_EF_SELECTED.	

6.1.1.5.4 Test Coverage

CRR Number	Test Case Number
CRRN1	1-2
CRRP1	3
CRRP2	4
CRRP3	5
CRRP4	6
CRRP5	7
CRRP6	8,
CRRC1	12
CRRC2	9
CRRC3	10
CRRC4	11
CRRC5, CRRC6	Not Tested

6.1.1.6 Method updateBinary

Test Area Reference: API_1_SVW_UPDBS_BSS

6.1.1.6.1 Conformance Requirements

The method with the following header shall be compliant to its definition in the API.

```
public void updateBinary(short fileOffset,
                         byte[] data,
                         short dataOffset,
                         short dataLength)
                  throws java.lang.NullPointerException,
                         java.lang.ArrayIndexOutOfBoundsException,
                         SIMViewException
```

Normal execution

CRRN1: The currently selected transparent file is updated starting at fileOffset, with the string of dataLength bytes in the array data starting at dataOffset.

Parameter errors

CRRP1: If fileOffset is less than 0, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.OUT_OF_FILE_BOUNDARIES.

CRRP2: If fileOffset plus dataLength exceeds the length of the file, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.OUT_OF_FILE_BOUNDARIES.

CRRP3: If the array data is null, an instance of NullPointerException shall be thrown.

CRRP4: If dataOffset is less than 0, an instance of ArrayIndexOutOfBoundsException shall be thrown.

CRRP5: If dataLength is less than 0, an instance of ArrayIndexOutOfBoundsException shall be thrown.

CRRP6: If dataOffset plus dataLength greater than the length of the array data.length an instance of ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: If the calling applet has currently no EF selected, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.NO_EF_SELECTED.

CRRC2: If the currently selected EF is not transparent, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.FILE_INCONSISTENT.

CRRC3: If the calling applet does not fulfil the access condition, UPDATE, to perform this function, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.AC_NOT_FULFILLED.

CRRC4: If the currently selected EF is invalidated and the file status of the EF does not allow for updating of an invalidated file, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INVALIDATION_STATUS_CONTRADICTION.

CRRC5: If the method call causes a memory problem (e.g. memory access error), an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.MEMORY_PROBLEM.

CRRC6: If the method call causes an error to occur that is not expected and thus not handled, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INTERNAL_ERROR.

6.1.1.6.2 Test Suite Files

Additional requirements for the GSM personalisation: None

Test Script: API_1_SVW_UPDBS_BSS_1.scr

Test Applet: API_1_SVW_UPDBS_BSS_1.java

Load Script: API_1_SVW_UPDBS_BSS_1.ldr

Cleanup Script: API_1_SVW_UPDBS_BSS_1.clr

6.1.1.6.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
0	**SIM Initialisation**	Responses ignored.	
1	**No EF selected** fileOffset = 0 byte[] data = new byte[20] data[0] = '55' dataOffset = 0 dataLength = 10 updateBinary()	Shall throw sim.access.SIMViewException with reason code NO_EF_SELECTED.	
2	**Update Transparent EF** 1 - fid = DFSIMTEST select() 2 - fid = EFTARU select() 3 - fileOffset = 3 data[0] = '55' dataOffset = 0 dataLength = 1 updateBinary() 4 - fileOffset = 3 respOffset = 0 respLength = 1 readBinary()	1 – No exception shall be thrown. 2 – No exception shall be thrown. 3 – No exception shall be thrown. 4 – No exception shall be thrown. Data in resp[0] shall be '55'.	
3	**1 - fileOffset = 254** data[0] = '55' data[1] = 'AA' data[2] = '66' dataOffset = 0 dataLength = 3 updateBinary() 2 - fileOffset = 254 respOffset = 0 respLength = 3 readBinary()	1 - No exception shall be thrown. 2 - No exception shall be thrown. Data in resp shall be resp[0] = '55' resp[1] = 'AA' resp[2] = '66'	
4	**Offset into File out of bounds** fileOffset = -1 dataOffset = 0 dataLength = 10 updateBinary()	Shall throw sim.access.SIMViewException with reason code OUT_OF_FILE_BOUNDARIES.	
5	**fileOffset + dataLength > EF length** fileOffset = 259 dataOffset = 0 dataLength = 2 updateBinary()	Shall throw sim.access.SIMViewException with reason code OUT_OF_FILE_BOUNDARIES.	
6	**data is null** byte[] nullBuffer = null fileOffset = 0 dataOffset = 0 dataLength = 10 updateBinary()	Shall throw java.lang.NullPointerException.	
7	**dataOffset < 0** fileOffset = 0 dataOffset = -1 dataLength = 10 updateBinary()	Shall throw java.lang. ArrayIndexOutOfBoundsException.	
8	**dataLength < 0** fileOffset = 0 dataOffset = 0 dataLength = -1 updateBinary()	Shall throw java.lang. ArrayIndexOutOfBoundsException.	
9	**dataOffset + dataLength > data.length** fileOffset = 0 dataOffset = 10 dataLength = 11 updateBinary()	Shall throw java.lang. ArrayIndexOutOfBoundsException.	

Id	Description	API Expectation	APDU Expectation
10	**EF is not Transparent** 1 - fid = DFTELECOM select() 2 - fid = EFADN select() 3 - fileOffset = 0 data[0] = '55' dataOffset = 0 dataLength = 1 updateBinary()	1 - No exception shall be thrown. 2 - No exception shall be thrown. 3 - Shall throw sim.access.SIMViewException with reason code FILE_INCONSISTENT.	
11	**Access condition not fulfilled** 1 - fid = DFSIMTEST select() fid = EFTNU select() 2 - fileOffset = 0 data[0] = '55' dataOffset = 0 dataLength = 1 updateBinary()	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code AC_NOT_FULFILLED.	
12	**EF is invalidated** 1 - fid = EFTNR invalidate() 2 - fileOffset = 0 data[0] = '55' dataOffset = 0 dataLength = 1 updateBinary() 3 - rehabilitate()	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code INVALIDATION_STATUS_CONTRADICTION. 3 - No exception shall be thrown.	

6.1.1.6.4 Test Coverage

CRR Number	Test Case Number
CRRN1	2, 3
CRRP1	4
CRRP2	5
CRRP3	6
CRRP4	7
CRRP5	8
CRRP6	9
CRRC1	1
CRRC2	10
CRRC3	11
CRRC4	12
CRRC5, CRRC6	Not Tested

6.1.1.7 Method readRecord

Test Area Reference: API_1_SVW_REDRSBS_BSS

6.1.1.7.1 Conformance Requirements

The method with the following header shall be compliant to its definition in the API.

```
public short readRecord(short recNumber,
                        byte mode,
                        short recOffset,
                        byte[] resp,
                        short respOffset,
                        short respLength)
                 throws java.lang.NullPointerException,
                        java.lang.ArrayIndexOutOfBoundsException,
                        SIMViewException
```

Normal execution

CRRN1: The data bytes from the record, specified by mode and recNumber of the currently selected linear fixed or cyclic EF, is read at recOffset. A total of respLength bytes of this data is copied to the array resp at respOffset.

CRRN2: If the access mode is REC_ACC_MODE_ABSOLUTE_CURRENT:

- if recNumber is not 0, the record addressed by recNumber will be read;
- if recNumber is 0 the current selected record will be read; and
- the current record pointer shall not change.

CRRN3: If the access mode is REC_ACC_MODE_NEXT:

- the next record relative to the current selected record will be selected and read;
- if no current record is selected, the first record will be selected and read;
- if the current record pointer is set to the last record for a cyclic EF the record pointer is set to the first record and the record is read;
- the current record pointer of any other applet shall not be changed.

CRRN4: If the access mode is REC_ACC_MODE_PREVIOUS:

- the previous record relative to the current selected record will be selected and read;
- if no current record is selected, the last record will be selected and read;
- if the current record pointer is set to the first record, for a linear fixed EF the method responses with an error exception and for a cyclic EF the record pointer is set to the last record and the record is read;
- the current record pointer of any other applet shall not be changed.

Parameter errors

CRRP1: If the currently selected EF is linear fixed and the access mode is REC_ACC_MODE_ABSOLUTE_CURRENT and recNumber is less than 0 or greater than records available, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.RECORD_NUMBER_NOT_AVAILABLE.

CRRP2: If the currently selected EF is linear fixed and the access mode is REC_ACC_MODE_ABSOLUTE_CURRENT, recNumber is 0 and there is no current record selected, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.RECORD_NUMBER_NOT_AVAILABLE.

CRRP3: If the currently selected EF is linear fixed and the access mode is REC_ACC_MODE_NEXT and the current record pointer is set to the last record, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.RECORD_NUMBER_NOT_AVAILABLE.

CRRP4: If the currently selected EF is linear fixed and the access mode is REC_ACC_MODE_PREVIOUS and the current record pointer is set to the first record, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.RECORD_NUMBER_NOT_AVAILABLE.

CRRP5: If the specified offset into the selected record recOffset is less than 0, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.OUT_OF_RECORD_BOUNDARIES.

CRRP6: If recOffset plus respLength is greater than the record length, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.OUT_OF_RECORD_BOUNDARIES.

CRRP7: If the access mode is not between 2 and 4 inclusive (2 = REC_ACC_MODE_NEXT, etc.), an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INVALID_MODE.

CRRP8: If the array resp is null, an instance of NullPointerException shall be thrown.

CRRP9: If respOffset is less than 0, an instance of ArrayIndexOutOfBoundsException shall be thrown.

CRRP10: If respLength is less than 0, an instance of ArrayIndexOutOfBoundsException shall be thrown.

CRRP11: If respOffset plus respLength is greater than the length of the array resp.length, or respOffset equals resp.length, an instance of ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: If the calling applet has currently no EF selected, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.NO_EF_SELECTED.

CRRC2: If the currently selected EF is neither linear fixed nor cyclic, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.FILE_INCONSISTENT.

CRRC3: If the calling applet does not fulfil the access condition, READ, to perform this function, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.AC_NOT_FULFILLED.

CRRC4: If the currently selected EF is invalidated and the file status of the EF does not allow for reading an invalidated file, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INVALIDATION_STATUS_CONTRADICTION.

CRRC5: If the method call causes a memory problem (e.g. memory access error), an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.MEMORY_PROBLEM.

CRRC6: If the method call causes an error to occur that is not expected and thus not handled, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INTERNAL_ERROR.

6.1.1.7.2 Test Suite Files

Additional requirements for the GSM personalisation: None

Test Script: API_1_SVW_REDRSBS_BSS_1.scr

Test Applet: API_1_SVW_REDRSBS_BSS_1.java

Load Script: API_1_SVW_REDRSBS_BSS_1.ldr

Cleanup Script: API_1_SVW_REDRSBS_BSS_1.clr

6.1.1.7.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
0	**SIM Initialisation**	Responses ignored.	

1	**No EF selected**
	`recNumber = 1`
	`mode = REC_ACC_MODE_ABSOLUTE_CURRENT`
	`recOffset = 0`
	`byte[] resp = new byte[20]`
	`respOffset = 0`
	`respLength = 10`
	`readRecord()`
		Shall throw sim.access.SIMViewException with reason code NO_EF_SELECTED.	

Id	Description	API Expectation	APDU Expectation
2	**Read Absolute and Current from Linear Fixed EF** 1 - fid = DFSIMTEST select() 2 - fid = EFLARU select() // Record pointer not set. 3 - recNumber = 0 mode = REC_ACC_MODE_NEXT recOffset = 0 respOffset = 0 respLength = 4 readRecord() 4 – recNumber = 2 mode = REC_ACC_MODE_ABSOLUTE_CURRENT readRecord() 5 - recNumber = 1 readRecord() 6 - recNumber = 0 resp[0] = resp[1] = resp[2] = resp[3] = '00' readRecord()	1 - No exception shall be thrown. 2 - No exception shall be thrown. 3 - No exception shall be thrown. resp shall be: resp[0] = '55' resp[1] = '55' resp[2] = '55' resp[3] = '55' 4 - No exception shall be thrown. resp shall be: resp[0] = 'AA' resp[1] = 'AA' resp[2] = 'AA' resp[3] = 'AA' 5 - No exception shall be thrown. resp shall be: resp[0] = '55' resp[1] = '55' resp[2] = '55' resp[3] = '55' 6 - No exception shall be thrown. resp shall be: resp[0] = '55' resp[1] = '55' resp[2] = '55' resp[3] = '55'	
3	**Read Next from Linear Fixed EF** recNumber = 0 mode = REC_ACC_MODE_NEXT recOffset = 0 respOffset = 0 respLength = 4 readRecord()	No exception shall be thrown. resp shall be: resp[0] = 'AA' resp[1] = 'AA' resp[2] = 'AA' resp[3] = 'AA'	
4	**Read Next from Linear Fixed EF** recNumber = 0 mode = REC_ACC_MODE_NEXT recOffset = 0 respOffset = 0 respLength = 4 readRecord()	Shall throw sim.access.SIMViewException with reason code RECORD_NUMBER_NOT_AVAILABLE.	
5	**Read Previous from Linear Fixed EF** recNumber = 0 mode = REC_ACC_MODE_PREVIOUS recOffset = 0 respOffset = 0 respLength = 4 readRecord()	No exception shall be thrown. resp shall be: resp[0] = '55' resp[1] = '55' resp[2] = '55' resp[3] = '55'	
6	**Read Previous from Linear Fixed EF** recNumber = 0 mode = REC_ACC_MODE_PREVIOUS recOffset = 0 respOffset = 0 respLength = 4 readRecord()	Shall throw sim.access.SIMViewException with reason code RECORD_NUMBER_NOT_AVAILABLE.	

Id	Description	API Expectation	APDU Expectation
7	**Read Absolute and Current from Cyclic EF** 1 - fid = EFCARU select() 2 - recNumber = 2 mode = REC_ACC_MODE_ABSOLUTE_CURRENT recOffset = 0 respOffset = 0 respLength = 3 readRecord() 3 – recNumber = 1 readRecord() 4 – recNumber = 0 resp[0] = resp[1] = resp[2] = '00 readRecord()	1 - No exception shall be thrown. 2 - No exception shall be thrown. resp shall be: resp[0] = ' AA' resp[1] = ' AA' resp[2] = ' AA' 3 - No exception shall be thrown. resp shall be: resp[0] = '55' resp[1] = '55' resp[2] = '55' 4 - No exception shall be thrown. resp shall be: resp[0] = '55' resp[1] = '55' resp[2] = '55'	
8	**Read Next from Cyclic EF** recNumber = 0 mode = REC_ACC_MODE_NEXT recOffset = 0 respOffset = 0 respLength = 3 readRecord()	No exception shall be thrown. resp shall be: resp[0] = 'AA' resp[1] = 'AA' resp[2] = 'AA'	
9	**Read Next from Cyclic EF** recNumber = 0 mode = REC_ACC_MODE_NEXT recOffset = 0 respOffset = 0 respLength = 3 readRecord()	No exception shall be thrown. resp shall be: resp[0] = '55' resp[1] = '55' resp[2] = '55'	
10	**Read Previous from Cyclic EF** recNumber = 0 mode = REC_ACC_MODE_PREVIOUS recOffset = 0 respOffset = 0 respLength = 3 readRecord()	No exception shall be thrown. resp shall be: resp[0] = 'AA' resp[1] = 'AA' resp[2] = 'AA'	
11	**Read Previous from Cyclic EF** recNumber = 0 mode = REC_ACC_MODE_PREVIOUS recOffset = 0 respOffset = 0 respLength = 3 readRecord()	No exception shall be thrown. resp shall be: resp[0] = '55' resp[1] = '55' resp[2] = '55'	
12	**Read Absolute from Linear Fixed EF beyond** Records 1 - fid = EFLARU select() 2 – recNumber = -1 mode = REC_ACC_MODE_ABSOLUTE_CURRENT recOffset = 0 respOffset = 0 respLength = 4 readRecord() 3 – recNumber = 3 readRecord()	1 – No exceptionshall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code RECORD_NUMBER_NOT_AVAILABLE. 3 - Shall throw sim.access.SIMViewException with reason code RECORD_NUMBER_NOT_AVAILABLE.	

13	**No current record in linear fixed EF, read**
	current
	1 - fid = EFLARU
	select() // No curr rec
	2 – recNumber = 0 // curr rec
	mode = REC_ACC_MODE_ABSOLUTE_CURRENT
	recOffset = 0
	respOffset = 0
	respLength = 4
	readRecord()
		1 - No exception shall be thrown.
		2 - Shall throw sim.access.SIMViewException with reason code RECORD_NUMBER_NOT_AVAILABLE.	

Id	Description	API Expectation	APDU Expectation

14	**recOffset < 0**
	1 - fid = EFLARU
	select()
	2 - recNumber = 1 // rec 1
	mode = REC_ACC_MODE_ABSOLUTE_CURRENT
	recOffset = -1
	respOffset = 0
	respLength = 4
	readRecord()
		1 - No exception shall be thrown.
		2 - Shall throw sim.access.SIMViewException with reason code OUT_OF_RECORD_BOUNDARIES.	

15	**recOffset + respLength > Record Length** 1 - fid = EFLARU select() 2 - recNumber = 1 mode = REC_ACC_MODE_ABSOLUTE_CURRENT recOffset = 2 respOffset = 0 respLength = 4 readRecord()	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code OUT_OF_RECORD_BOUNDARIES.	
16	**Reading with invalid mode** 1 – fid = EFLARU select() 2 – recNumber = 0 mode = 1 recOffset = 0 respOffset = 0 respLength = 4 readRecord() 3 – mode = 5 readRecord()	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code INVALID_MODE. 3 - Shall throw sim.access.SIMViewException with reason code INVALID_MODE.	
17	**resp is null** byte[] nullBuffer = null mode = REC_ACC_MODE_ABSOLUTE_CURRENT respOffset = 0 respLength = 10 readRecord()	Shall throw java.lang.NullPointerException.	
18	**respOffset < 0** respOffset = -1 respLength = 10 readRecord ()	Shall throw java.lang. ArrayIndexOutOfBoundsException.	
19	**respLength < 0** respOffset = 0 respLength = -1 readRecord ()	Shall throw java.lang. ArrayIndexOutOfBoundsException.	
20	**respOffset + respLength > resp.length** respOffset = 10 respLength = 11 readRecord ()	Shall throw java.lang. ArrayIndexOutOfBoundsException.	
21	**EF is neither Cyclic nor Linear Fixed** 1 - fid = DFSIMTEST select() 2 - fid = EFTNU select() 3 – respOffset = 0 respLength = 4 readRecord()	1 - No exception shall be thrown. 2 - No exception shall be thrown. 3 - Shall throw sim.access.SIMViewException with reason code FILE_INCONSISTENT.	
22	**Access condition not fulfilled** 1 - fid = EFCNR select() 2 – readRecord()	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code AC_NOT_FULFILLED.	
23	**EF is invalidated** 1 - fid = EFCNU invalidate() 2 – readRecord() 3 – rehabilitate()	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code INVALIDATION_STATUS_CONTRADICTION. 3 - No exception shall be thrown.	

6.1.1.7.4 Test Coverage

CRR Number	Test Case Number
CRRN1	2-5, 7-11
CRRN2	2, 7
CRRN3	3, 8, 9
CRRN4	5, 10, 11
CRRP1	12
CRRP2	13
CRRP3	4
CRRP4	6
CRRP5	14
CRRP6	15
CRRP7	16
CRRP8	17
CRRP9	18
CRRP10	19
CRRP11	20
CRRC1	1
CRRC2	21
CRRC3	22
CRRC4	23
CRRC5, CRRC6	Not Tested

6.1.1.8 Method updateRecord

Test Area Reference: API_1_SVW_UPDRSBS_BSS

6.1.1.8.1 Conformance Requirements

The method with the following header shall be compliant to its definition in the API.

```
public void updateRecord(short recNumber,
                         byte mode,
                         short recOffset,
                         byte[] data,
                         short dataOffset,
                         short dataLength)
                  throws java.lang.NullPointerException,
                         java.lang.ArrayIndexOutOfBoundsException,
                         SIMViewException
```

Normal execution

CRRN1: dataLength bytes of the record specified by mode and recNumber of the current selected linear fixed or cyclic EF are updated at recOffset, by using the string of bytes in the array data starting at dataOffset.

CRRN2: If the access mode is REC_ACC_MODE_ABSOLUTE_CURRENT and the file is a linear fixed EF:

- the record addressed by recNumber will be updated;
- if recNumber is 0 the current selected record will be updated; and
- the current record pointer shall not change.

CRRN3: If the access mode is REC_ACC_MODE_NEXT and the file is a linear fixed EF:

- the next record relative to the current selected record will be selected and updated;
- if no current record is selected, the first record will be selected and updated;
- the current record pointer of any other applet shall not be changed.

CRRN4: If the access mode is REC_ACC_MODE_PREVIOUS:

- the previous record relative to the current selected record will be selected and updated;
- if no current record is selected, the last record will be selected and updated;

- if a cyclic EF is updated, the oldest record will be updated independent of the current record pointer and this record becomes record number 1 and the current record;
- the current record pointer of any other applet shall not be changed in case of a linear fixed EF.

Parameter errors

CRRP1: If the currently selected EF is linear fixed and the access mode is REC_ACC_MODE_ABSOLUTE_CURRENT and recNumber is less than 0 or greater than records available, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.RECORD_NUMBER_NOT_AVAILABLE.

CRRP2: If the currently selected EF is linear fixed and the access mode is REC_ACC_MODE_ABSOLUTE_CURRENT, recNumber is 0 and there is no current record selected, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.RECORD_NUMBER_NOT_AVAILABLE.

CRRP3: If the currently selected EF is linear fixed and the access mode is REC_ACC_MODE_NEXT and the current record pointer is set to the last record, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.RECORD_NUMBER_NOT_AVAILABLE.

CRRP4: If the currently selected EF is linear fixed and the access mode is REC_ACC_MODE_PREVIOUS and the current record pointer is set to the first record; an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.RECORD_NUMBER_NOT_AVAILABLE.

CRRP5: If the specified offset into the selected record recOffset is less than 0, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.OUT_OF_RECORD_BOUNDARIES.

CRRP6: If recOffset plus dataLength is greater than the record lengh, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.OUT_OF_RECORD_BOUNDARIES.

CRRP7: If the access mode is not between 2 and 4 inclusive (2 = REC_ACC_MODE_NEXT, etc.), an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INVALID_MODE.

CRRP8: If the currently selected EF is cyclic and the mode of record access mode is not REC_ACC_MODE_PREVIOUS, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INVALID_MODE.

CRRP9: If the array data is null, an instance of NullPointerException shall be thrown.

CRRP10: If dataOffset is less than 0, an instance of ArrayIndexOutOfBoundsException shall be thrown.

CRRP11: If dataLength is less than 0, an instance of ArrayIndexOutOfBoundsException shall be thrown.

CRRP12: If dataOffset plus dataLength, is greater than the length of the array data.length, or dataOffset equals data.length, an instance of ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: If the calling applet has currently no EF selected, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.NO_EF_SELECTED.

CRRC2: If the currently selected EF is neither linear fixed nor cyclic, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.FILE_INCONSISTENT.

CRRC3: If the calling applet does not fulfil the access condition, UPDATE, to perform this function, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.AC_NOT_FULFILLED.

CRRC4: If the currently selected EF is invalidated and the file status of the EF does not allow for updating an invalidated file, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INVALIDATION_STATUS_CONTRADICTION.

CRRC5: If the method call causes a memory problem (e.g. memory access error), an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.MEMORY_PROBLEM.

CRRC6: If the method call causes an error to occur that is not expected and thus not handled, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INTERNAL_ERROR.

6.1.1.8.2 Test Suite Files

Additional requirements for the GSM personalisation: This test is based on the assumption that the contents of the EFs in $DF_{SIMTEST}$ are identical to those defined in the default pre-personalisation and the current record pointers have not been altered.

Test Script: API_1_SVW_UPDRSBS_BSS_1.scr

Test Applet: API_1_SVW_UPDRSBS_BSS_1.java

Load Script: API_1_SVW_UPDRSBS_BSS_1.ldr

Cleanup Script: API_1_SVW_UPDRSBS_BSS_1.clr

6.1.1.8.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
0	**SIM Initialisation**	Responses ignored.	
1	**No EF selected** recNumber = 1 mode = REC_ACC_MODE_ABSOLUTE_CURRENT recOffset = 0 byte[] data = new byte[20] dataOffset = 0 dataLength = 10 updateRecord()	Shall throw sim.access.SIMViewException with reason code NO_EF_SELECTED.	
2	**Update Absolute and Current from Linear Fixed EF** 1 - fid = DFSIMTEST select() 2 - fid = EFLARU select() // Record pointer not set. 3 - recNumber = 0 mode = REC_ACC_MODE_NEXT recOffset = 0 data[0:3] = '00' dataOffset = 0 dataLength = 4 updateRecord() respOffset = 0 respLength = 4 readRecord() 4 - recNumber = 2 mode = REC_ACC_MODE_ABSOLUTE_CURRENT data[0:3] = '11' updateRecord() readRecord() 5 - recNumber = 0 data[0:3] = '22' updateRecord() readRecord()	1 - No exception shall be thrown. 2 - No exception shall be thrown. 3 - No exception shall be thrown. resp shall be: resp[0] = '00' resp[1] = '00' resp[2] = '00' resp[3] = '00' 4 - No exception shall be thrown. resp shall be: resp[0] = '11' resp[1] = '11' resp[2] = '11' resp[3] = '11' 5 - No exception shall be thrown. resp shall be: resp[0] = '22' resp[1] = '22' resp[2] = '22' resp[3] = '22'	
3	**Update Next from Linear Fixed EF** recNumber = 0 mode = REC_ACC_MODE_NEXT recOffset = 0 data[0:3] = '33' dataOffset = respOffset = 0 dataLength = respLength = 4 updateRecord() readRecord()	No exception shall be thrown. resp shall be: resp[0] = '33' resp[1] = '33' resp[2] = '33' resp[3] = '33'	
4	**Update Next from Linear Fixed EF** recNumber = 0 mode = REC_ACC_MODE_NEXT recOffset = 0 data[0:3] = '33' dataOffset = 0 dataLength = 4 updateRecord()	Shall throw sim.access.SIMViewException with reason code RECORD_NUMBER_NOT_AVAILABLE.	
5	**Update Previous from Linear Fixed EF**	No exception shall be thrown.	

Id	Description	API Expectation	APDU Expectation
	recNumber = 0 mode = REC_ACC_MODE_PREVIOUS recOffset = 0 data[0:3] = '44 dataOffset = respOffset = 0 dataLength = respLength = 4 updateRecord() readRecord()	resp shall be: resp[0] = '44' resp[1] = '44' resp[2] = '44' resp[3] = '44'	
6	**Update Previous from Linear Fixed EF** recNumber = 0 mode = REC_ACC_MODE_PREVIOUS recOffset = 0 data[0:3] = '44' dataOffset = respOffset = 0 dataLength = respLength = 4 updateRecord()	Shall throw sim.access.SIMViewException with reason code RECORD_NUMBER_NOT_AVAILABLE.	
7	**Update Previous from Cyclic EF** 1 - fid = DFSIMTEST select() 2 - fid = EFCARU select() 3 – recNumber = 2 mode = REC_ACC_MODE_ABSOLUTE_CURRENT recOffset = 0 readRecord() 4 – recNumber = 2 mode = REC_ACC_MODE_PREVIOUS data[0:2] = resp[0:2] ^ 'FF' dataOffset = 0 dataLength = 3 updateRecord() 5 – recNumber = 0 mode = REC_ACC_MODE_ABSOLUTE_CURRENT respOffset = 0 respLength = 3 readRecord()	1 - No exception shall be thrown. 2 - No exception shall be thrown. 3 - No exception shall be thrown. 4 - No exception shall be thrown. 5 - No exception shall be thrown. resp shall be: resp[0] = data[0] resp[1] = data[1] resp[2] = data[2]	
8	**Update Absolute from Linear Fixed EF beyond Records** 1 – fid = EFLARU select() 2 -recNumber = -1 mode = REC_ACC_MODE_ABSOLUTE_CURRENT recOffset = 0 dataOffset = 0 dataLength = 4 updateRecord() 2 - recNumber = 3 updateRecord()	1 – No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code RECORD_NUMBER_NOT_AVAILABLE. 3 - Shall throw sim.access.SIMViewException with reason code RECORD_NUMBER_NOT_AVAILABLE.	

9	**No current record in linear fixed EF, update current**
	1 - fid = EFLARU
	select() // No curr rec
	2 - recNumber = 0 // curr rec
	mode = REC_ACC_MODE_ABSOLUTE_CURRENT
	recOffset = 0
	dataOffset = 0
	dataLength = 4
	updateRecord()
		1 - No exception shall be thrown.
		2 - Shall throw sim.access.SIMViewException with reason code RECORD_NUMBER_NOT_AVAILABLE.	

10	**recOffset < 0**
	1 - fid = EFLARU
	select()
	2 - recNumber = 1 // rec 1
	mode = REC_ACC_MODE_ABSOLUTE_CURRENT
	recOffset = -1
	dataOffset = 0
	dataLength = 4
	updateRecord()
		1 - No exception shall be thrown.
		2 - Shall throw sim.access.SIMViewException with reason code OUT_OF_RECORD_BOUNDARIES.	

11	**recOffset + dataLength > Record Length** 1 - fid = EFLARU select() 2 - recNumber = 1 mode = REC_ACC_MODE_ABSOLUTE_CURRENT recOffset = 2 dataOffset = 0 dataLength = 4	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code OUT_OF_RECORD_BOUNDARIES.	

Id	Description	API Expectation	APDU Expectation
	updateRecord()		
12	**Updating with invalid mode** 1 - fid = EFLARU select() 2 - recNumber = 0 mode = 1 recOffset = 0 dataOffset = 0 dataLength = 4 updateRecord() 3 - mode = 5 updateRecord()	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code INVALID_MODE. 3 - Shall throw sim.access.SIMViewException with reason code INVALID_MODE.	
13	**Updating Cyclic EF with invalid mode** 1 - fid = DFSIMTEST select() 2 - fid = EFCARU select() 3 - recNumber = 0 mode = REC_ACC_MODE_NEXT recOffset = 0 data[0:2] = '00' dataOffset = 0 dataLength = 3 updateRecord() 4 - recNumber = 0 mode = REC_ACC_MODE_ABSOLUTE_CURRENT updateRecord() 5 - recNumber = 2 mode = REC_ACC_MODE_ABSOLUTE_CURRENT updateRecord()	1 - No exception shall be thrown. 2 - No exception shall be thrown. 3 - Shall throw sim.access.SIMViewException with reason code INVALID_MODE. 4 - Shall throw sim.access.SIMViewException with reason code INVALID_MODE. 5 - Shall throw sim.access.SIMViewException with reason code INVALID_MODE.	
14	**data is null** byte[] nullBuffer = null dataOffset = 0 dataLength = 10 updateRecord()	Shall throw java.lang.NullPointerException.	
15	**dataOffset < 0** dataOffset = -1 dataLength = 10 updateRecord()	Shall throw java.lang. ArrayIndexOutOfBoundsException.	
16	**dataLength < 0** dataOffset = 0 dataLength = -1 updateRecord()	Shall throw java.lang. ArrayIndexOutOfBoundsException.	
17	**dataOffset + dataLength > data.length** dataOffset = 10 dataLength = 11 updateRecord()	Shall throw java.lang. ArrayIndexOutOfBoundsException.	
18	**EF is neither Cyclic nor Linear Fixed** 1 - fid = DFSIMTEST select() 2 - fid = EFTNR select() 3 - dataOffset = 0 dataLength = 4 updateRecord()	1 - No exception shall be thrown. 2 - No exception shall be thrown. 3 - Shall throw sim.access.SIMViewException with reason code FILE_INCONSISTENT.	
19	**Access condition not fulfilled** 1 - fid = EFCNU select() 2 - updateRecord() 3 - fid = EFLNU select() 4 - recNumber = 1 mode = REC_ACC_MODE_ABSOLUTE_CURRENT recOffset = 0 dataOffset = 0 dataLength = 4 updateRecord()	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code AC_NOT_FULFILLED. 3 - No exception shall be thrown. 4 - Shall throw sim.access.SIMViewException with reason code AC_NOT_FULFILLED.	
20	**EF is invalidated** 1 - fid = EFCNR invalidate() 2 – updateRecord() 3 - rehabilitate()	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code INVALIDATION_STATUS_CONTRADICTION. 3 - No exception shall be thrown.	

6.1.1.8.4 Test Coverage

CRR Number	Test Case Number
CRRN1	2, 3, 5, 7
CRRN2	2,
CRRN3	3, 4
CRRN4	5, 6, 7
CRRP1	8
CRRP2	9
CRRP3	4
CRRP4	6
CRRP5	10
CRRP6	11
CRRP7	12
CRRP8	13
CRRP9	14
CRRP10	15
CRRP11	16
CRRP12	17
CRRC1	1
CRRC2	18
CRRC3	19
CRRC4	20
CRRC5, CRRC6	Not Tested

6.1.1.9 Method seek

Test Area Reference: API_1_SVW_SEEKB_BSS

6.1.1.9.1 Conformance Requirements

The method with the following header shall be compliant to its definition in the API.

```
public short seek(byte mode,
                  byte[] patt,
                  short pattOffset,
                  short pattLength)
           throws java.lang.NullPointerException,
                  java.lang.ArrayIndexOutOfBoundsException,
                  SIMViewException
```

Normal execution

CRRN1: If the pattern in patt with the length pattLength at offset pattOffset is found in the record being specified by mode, the current record pointer is set to that record and the record number is returned. The record pointer of any other applet is not changed. This will be tested during the testing of the framework.

CRRN2: If mode is SEEK_FROM_BEGINNING_FORWARD, the search starts with the first record forward towards the end of the file.

CRRN3: If mode is SEEK_FROM_END_BACKWARD, the search starts with the last record backward towards the beginning of the file.

CRRN4: If mode is SEEK_FROM_NEXT_FORWARD, the search starts from the next record after the current record pointer forward towards the end of file. If no current record pointer is selected, the search starts with the first record.

CRRN5: If mode is SEEK_FROM_PREVIOUS_BACKWARD, the search starts from the previous record before the current record pointer backward towards the beginning of the file. If no current record pointer is selected the search starts with the last record.

CRRN6: If pattern in patt is not found, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.PATTERN_NOT_FOUND.

CRRN7: If mode is SEEK_FROM_NEXT_FORWARD and the record pointer is at the last record, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.PATTERN_NOT_FOUND.

CRRN8: If mode is SEEK_FROM_PREVIOUS_BACKWARD and the record pointer is at the first record, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.PATTERN_NOT_FOUND.

Parameter errors

CRRP1: If mode is not between 0 and 3 inclusive (0 = SEEK_FROM_BEGINNING_FORWARD, etc.), an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INVALID_MODE.

CRRP2: If the pattern array patt is null, an instance of NullPointerException shall be thrown.

CRRP3: If pattOffset is less than 0, an instance of ArrayIndexOutOfBoundsException shall be thrown.

CRRP4: If pattLength is less than 0, an instance of ArrayIndexOutOfBoundsException shall be thrown.

CRRP5: If pattLength is greater than the size of the record of the currently selected EF, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.OUT_OF_RECORD_BOUNDARIES.

CRRP6: If pattOffset plus pattLength is greater than the length of the pattern array patt.length, an instance of ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: If the calling applet has currently no EF selected, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.NO_EF_SELECTED.

CRRC2: If the currently selected EF is not linear fixed, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.FILE_INCONSISTENT.

CRRC3: If the calling applet does not fulfil the access condition, READ, to perform this function, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.AC_NOT_FULFILLED.

CRRC4: If the currently selected EF is invalidated and the file status of the EF does not allow for reading an invalidated file, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INVALIDATION_STATUS_CONTRADICTION.

CRRC5: If the method call causes a memory problem (e.g. memory access error), an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.MEMORY_PROBLEM.

CRRC6: If the method call causes an error to occur that is not expected and thus not handled, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INTERNAL_ERROR.

6.1.1.9.2 Test Suite Files

Additional requirements for the GSM personalisation: None

Test Script: API_1_SVW_SEEKB_BSS_1.scr

Test Applet: API_1_SVW_SEEKB_BSS_1.java

Load Script: API_1_SVW_SEEKB_BSS_1.ldr

Cleanup Script: API_1_SVW_SEEKB_BSS_1.ldr

6.1.1.9.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
0	**SIM Initialisation**	Responses ignored.	

1	**No EF selected**
	`Byte[] patt = new byte[20]`
	`pattOffset = 0`
	`pattLength = 10`
	`mode = SEEK_FROM_BEGINNING_FORWARD`
	`seek()`
		Shall throw sim.access.SIMViewException with reason code NO_EF_SELECTED.	

2	**Pattern not Found**	1 - No exception shall be thrown.	

Id	Description	API Expectation	APDU Expectation
	1 - fid = DFSIMTEST select() 2 - fid = EFLARU select() 3 - patt[0] = 'DA' pattOffset = 0 pattLength = 1 mode = SEEK_FROM_BEGINNING_FORWARD seek()	2 - No exception shall be thrown. 3 - Shall throw sim.access.SIMViewException with reason code PATTERN_NOT_FOUND.	
3	**Seek without affecting another record pointer** This will be tested during the testing of the framework.		
4	**Seek from Beginning Forward** patt[0:2] = '55' pattOffset = 0 pattLength = 3 mode = SEEK_FROM_BEGINNING_FORWARD seek()	No exception shall be thrown. Shall return 1	
5	**Seek from End Backward** patt[0:2] = '55' pattOffset = 0 pattLength = 3 mode = SEEK_FROM_END_BACKWARD seek()	No exception shall be thrown. Shall return 1	
6	**Seek from Next Forward** patt[0:2] = 'AA' pattOffset = 0 pattLength = 3 mode = SEEK_FROM_NEXT_FORWARD seek()	No exception shall be thrown. Shall return 2	
7	**Last Record, Seek from Next Forward** mode = SEEK_FROM_NEXT_FORWARD seek()	Shall throw sim.access.SIMViewException with reason code PATTERN_NOT_FOUND.	
8	**Seek from Previous Backward** patt[0:2] = '55' pattOffset = 0 pattLength = 3 mode = SEEK_FROM_PREVIOUS_BACKWARD seek()	No exception shall be thrown. Shall return 1	
9	**First Record, Seek from Previous Backward** SEEK_FROM_PREVIOUS_BACKWARD seek()	Shall throw sim.access.SIMViewException with reason code PATTERN_NOT_FOUND.	
10	**Pattern not Found (out of reach)** patt[0:2] = '55' pattOffset = 0 pattLength = 3 mode = SEEK_FROM_NEXT_FORWARD seek()	Shall throw sim.access.SIMViewException with reason code PATTERN_NOT_FOUND.	
11	**Invalid mode** 1 - mode = 4 seek() 2 - mode = -1 seek()	1 - Shall throw sim.access.SIMViewException with reason code INVALID_MODE 2 - Shall throw sim.access.SIMViewException with reason code INVALID_MODE	
12	**patt is null** byte[] nullBuffer = null mode = SEEK_FROM_BEGINNING_FORWARD seek ()	Shall throw java.lang.NullPointerException.	
13	**pattOffset < 0** patt[0:2] = '55' pattOffset = -1 pattLength = 3 mode = SEEK_FROM_BEGINNING_FORWARD seek()	Shall throw java.lang. ArrayIndexOutOfBoundsException	
14	**pattLength < 0** patt[0:2] = '55' pattOffset = 0 pattLength = -1 mode = SEEK_FROM_BEGINNING_FORWARD seek()	Shall throw java.lang. ArrayIndexOutOfBoundsException	
15	**pattLength > size of record**	Shall throw	

Id	Description	API Expectation	APDU Expectation
	patt[0:3] = '55' pattOffset = 0 pattLength = 4 mode = SEEK_FROM_BEGINNING_FORWARD seek()	sim.access.SIMViewException with reason code OUT_OF_RECORD_BOUNDARIES	
16	**pattOffset + pattLength > patt.length** patt[0:2] = '55' pattOffset = 1 pattLength = 3 mode = SEEK_FROM_BEGINNING_FORWARD seek()	Shall throw java.lang.ArrayIndexOutOfBoundsException	
17	**EF is not Linear Fixed** 1 - fid = EFTNU select() 2 - pattOffset = 0 pattLength = 3 mode = SEEK_FROM_BEGINNING_FORWARD seek() 3 - fid = EFCNU select() seek()	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code FILE_INCONSISTENT 3 - Shall throw sim.access.SIMViewException with reason code FILE_INCONSISTENT	
18	**Access condition not fulfilled** 1 - fid = EFLNR select() 2 - patt[0] = '55' pattOffset = 0 pattLength = 1 mode = SEEK_FROM_BEGINNING_FORWARD seek()	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code AC_NOT_FULFILLED.	
19	**EF is invalidated** 1 - fid = EFLARU select() 2 - invalidate() 3 - patt[0] = '55 pattOffset = 0 pattLength = 1 mode = SEEK_FROM_BEGINNING_FORWARD seek() 4 - rehabilitate()	1 - No exception shall be thrown. 2 - No exception shall be thrown. 3 - Shall throw sim.access.SIMViewException with reason code INVALIDATION_STATUS_CONTRADICTION. 4 - No exception shall be thrown.	

6.1.1.9.4 Test Coverage

CRR Number	Test Case Number
CRRN1	2, 4 - 7, 8
CRRN2	4
CRRN3	5
CRRN4	6
CRRN5	8
CRRN6	2, 7, 9, 10
CRRN7	7
CRRN8	9
CRRP1	11
CRRP2	12
CRRP3	13
CRRP4	14
CRRP5	15
CRRP6	16
CRRC1	1
CRRC2	17
CRRC3	18
CRRC4	19
CRRC5, CRRC6	Not Tested

6.1.1.10 Method increase

Test Area Reference: API_1_SVW_INCR_BS_BS

6.1.1.10.1 Conformance Requirements

The method with the following header shall be compliant to its definition in the API.

```
public short increase(byte[] incr,
                      short incrOffset,
                      byte[] resp,
                      short respOffset)
               throws java.lang.NullPointerException,
                      java.lang.ArrayIndexOutOfBoundsException,
                      SIMViewException
```

Normal execution

CRRN1: The value in the array incr is added to the value of the last increased / updated record in the currently selected cyclic EF. The result is stored in the oldest record and returned in the array resp. The updated record becomes record number 1 and is selected as current record. The number of bytes of valid data in resp is returned.

Parameter errors

CRRP1: If the array incr is null, an instance of NullPointerException shall be thrown.

CRRP2: If incrOffset is less than 0, an instance of ArrayIndexOutOfBoundsException shall be thrown.

CRRP3: If incrOffset plus the value 3, is greater than the length of the array incr.length, an instance of ArrayIndexOutOfBoundsException shall be thrown.

CRRP4: If the result of the addition is greater than the maximum value of the record (represented by all bytes set to 'FF'), an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.MAX_VALUE_REACHED.

CRRP5: If the array resp is null, an instance of NullPointerException shall be thrown.

CRRP6: If respOffset is less than 0, an instance of ArrayIndexOutOfBoundsException shall be thrown.

CRRP7: If the remaining length of the array resp at the offset respOffset is less than the length of the record, an instance of ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: If the calling applet has currently no EF selected, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.NO_EF_SELECTED.

CRRC2: If the currently selected EF is not cyclic, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.FILE_INCONSISTENT.

CRRC3: If increase is not allowed as indicated by the FCI byte 8 (GSM 11.11: FCI structure of an EF returned by the SELECT command), an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.FILE_INCONSISTENT.

CRRC4: If the calling applet does not fulfil the access condition, INCREASE, to perform this function, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.AC_NOT_FULFILLED.

CRRC5: If the currently selected EF is invalidated, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INVALIDATION_STATUS_CONTRADICTION.

CRRC6: If the method call causes a memory problem (e.g. memory access error), an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.MEMORY_PROBLEM.

CRRC7: If the method call causes an error to occur that is not expected and thus not handled, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INTERNAL_ERROR.

6.1.1.10.2 Test Suite Files

Additional requirements for the GSM personalisation: None

Test Script: API_1_SVW_INCR_BS_BS_1.scr

Test Applet: API_1_SVW_INCR_BS_BS_1.java

Load Script: API_1_SVW_INCR_BS_BS_1.ldr

Cleanup Script: API_1_SVW_INCR_BS_BS_1.clr

6.1.1.10.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
0	**SIM Initialisation**	Responses ignored.	
1	**No EF selected** byte[] incr = new byte[4] byte[] resp = new byte[4] incrOffset = 0 respOffset = 0 increase()	Shall throw sim.access.SIMViewException with reason code NO_EF_SELECTED.	

2	**Increase Cyclic EF**
	1 - fid = DFSIMTEST
	select()
	2 - fid = EFCARU
	select()
	3 - //Set both records to 00 00 00
	mode = REC_ACC_MODE_PREVIOUS
	data[0:3] = 0
	dataOffset = 0
	dataLength = 3
	updateRecord()
	updateRecord()
	4 - incrOffset = 0
	incr[2] = 1
	respOffset = 0
	increase()
		1 - No exception shall be thrown.
		2 - No exception shall be thrown.
		3 - No exception shall be thrown.
		4 - No exception shall be thrown.
		resp[] shall contain {0,0,1,0}.	

3	**1 - incrOffset = 1** incr[2] = 0, incr[3] = 2 respOffset = 1 increase() 2 - resp[3] = 0 recNumber = 0 mode = REC_ACC_MODE_ABSOLUTE_CURRENT recOffset = 0 respOffset = 0 respLength = 0 readRecord()	1 - No exception shall be thrown. resp[] shall contain {0,0,0,3}. 2 - No exception shall be thrown. resp[] shall contain {0,0,3,0}.	
4	**incr is null** byte[] nullBuffer = null incrOffset = 0 respOffset = 0 increase()	Shall throw java.lang.NullPointerException.	
5	**incrOffset < 0** incrOffset = -1 respOffset = 0 increase()	Shall throw java.lang. ArrayIndexOutOfBoundsException.	
6	**incrOffset + 3 > incr.length** incrOffset = 2 respOffset = 0 increase()	Shall throw java.lang. ArrayIndexOutOfBoundsException.	
7	**Reach Maximum Value** incr[0] = incr[1] = incr[2] = 'FF' incrOffset = 0 respOffset = 0 increase()	Shall throw sim.access.SIMViewException with reason code MAX_VALUE_REACHED.	
8	**resp is null** incr[0] = incr[1] = 0x00' incr[2] = '02' incrOffset = 0 byte[] respNull = null respOffset = 0 increase()	Shall throw java.lang.NullPointerException.	
9	**respOffset < 0** incrOffset = 0 respOffset = -1 increase()	Shall throw java.lang. ArrayIndexOutOfBoundsException.	
10	**respOffset + recordLength > resp.length** incrOffset = 0 respOffset = 2 increase()	Shall throw java.lang. ArrayIndexOutOfBoundsException.	

Id	Description	API Expectation	APDU Expectation
11	**EF is not Cyclic** 1 - fid = EFTARU select() 2 – incrOffset = 0 respOffset = 0 increase() 3 - fid = EFLARU select() 4 – incrOffset = 0 respOffset = 0 increase()	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code FILE_INCONSISTENT. 3 - No exception shall be thrown. 4 - Shall throw sim.access.SIMViewException with reason code FILE_INCONSISTENT.	
12	**Access condition not fulfilled** 1 - fid = EFCNIC select() 2 – incrOffset = 0 respOffset = 0 increase()	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code AC_NOT_FULFILLED.	
13	**EF is invalidated** 1 - fid = EFCARU select() 2 – invalidate() 3 – incrOffset = 0 respOffset = 0 increase() 4 – rehabilitate()	1 - No exception shall be thrown. 2 - No exception shall be thrown. 3 - Shall throw sim.access.SIMViewException with reason code INVALIDATION_STATUS_CONTRADICTION. 4 - No exception shall be thrown.	

6.1.1.10.4 Test Coverage

CRR Number	Test Case Number
CRRN1	2, 3
CRRP1	4
CRRP2	5
CRRP3	6
CRRP4	7
CRRP5	8
CRRP6	9
CRRP7	10
CRRC1	1
CRRC2	11
CRRC3	Cannot be tested in an Implementation independent way
CRRC4	12
CRRC5	13
CRRC6, CRRC7	Not Tested

6.1.1.11 Method invalidate

Test Area Reference: API_1_SVW_INVL

6.1.1.11.1 Conformance Requirements

The method with the following header shall be compliant to its definition in the API.

```
public void invalidate()
                throws SIMViewException
```

Normal execution

CRRN1: The currently selected EF of the calling applet shall be invalidated, i.e. the flag in the EF file status shall be changed accordingly.

Parameter errors

This method has no parameters.

Context errors

CRRC1: If the calling applet has currently no EF selected, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.NO_EF_SELECTED.

CRRC2: If the calling applet does not fulfil the access condition, INVALIDATE, to perform this function, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.AC_NOT_FULFILLED.

CRRC3: If the currently selected EF is already invalidated, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INVALIDATION_STATUS_CONTRADICTION.

CRRC4: If the method call causes a memory problem (e.g. memory access error), an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.MEMORY_PROBLEM.

CRRC5: If the method call causes an error to occur that is not expected and thus not handled, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INTERNAL_ERROR.

6.1.1.11.2 Test Suite Files

Additional requirements for the GSM personalisation: None

Test Script: API_1_SVW_INVL_1.scr

Test Applet: API_1_SVW_INVL_1.java

Load Script: API_1_SVW_INVL_1.ldr

Cleanup Script: API_1_SVW_INVL_1.clr

6.1.1.11.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
0	**SIM Initialisation**	Responses ignored.	
1	**No EF is selected** `1 – invalidate()`	1 - Shall throw sim.access.SIMViewException with reason code NO_EF_SELECTED.	

2	**Invalidate EF**
	`1 – fid = DFSIMTEST`
	`select()`
	`2 – fid = EFTNR`
	`select()`
	`3 – invalidate()`
	`4 – rehabilitate()`
		1 - No exception shall be thrown.
		2 - No exception shall be thrown.
		3 - No exception shall be thrown.
		4 - No exception shall be thrown.	

3	**Access condition not fulfilled**
	`1 – fid = EFCNIV`
	`select()`
	`2 – invalidate()`
		1 - No exception shall be thrown.
		2 - Shall throw sim.access.SIMViewException with reason code AC_NOT_FULFILLED.	

4	**EF is already invalidated**
	`1 – fid = EFTNR`
	`select()`
	`2 – invalidate()`
	`3 – invalidate()`
		1 - No exception shall be thrown.
		2 - No exception shall be thrown.
		3 - Shall throw sim.access.SIMViewException with reason code INVALIDATION_STATUS_CONTRADICTION.	

6.1.1.11.4 Test Coverage

CRR number	Test Case Number
CRRN1	2
CRRC1	1
CRRC2	3
CRRC3	4
CRRC4, CRRC5	Not Tested

6.1.1.12 Method rehabilitate

Test Area Reference: API_1_SVW_REHA

6.1.1.12.1 Conformance Requirements

The method with the following header shall be compliant to its definition in the API.

```
public void rehabilitate()
                  throws SIMViewException
```

Normal execution

CRRN1: The currently selected EF of the calling applet shall be rehabilitated, i.e. the flag in the EF file status shall be changed accordingly.

Parameter errors

This method has no parameters.

Context errors

CRRC1: If the calling applet has currently no EF selected, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.NO_EF_SELECTED.

CRRC2: If the calling applet does not fulfil the access condition, REHABILITATE, to perform this function, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.AC_NOT_FULFILLED.

CRRC3: If the currently selected EF is not invalidated, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INVALIDATION_STATUS_CONTRADICTION.

(Explanation for removal) CRRC4: If the method call causes a memory problem (e.g. memory access error), an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.MEMORY_PROBLEM.

CRRC5: If the method call causes an error to occur that is not expected and thus not handled, an instance of SIMViewException shall be thrown. The reason code shall be SIMViewException.INTERNAL_ERROR.

6.1.1.12.2 Test Suite Files

Additional requirements for the GSM personalisation: None

Test Script: API_1_SVW_REHA_1.scr

Test Applet: API_1_SVW_REHA_1.java

Load Script: API_1_SVW_REHA_1.ldr

Cleanup Script: API_1_SVW_REHA_1.clr

6.1.1.12.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
0	**SIM Initialisation**	Responses ignored.	
1	**No EF is selected** `1 – rehabilitate()`	1 - Shall throw sim.access.SIMViewException with reason code NO_EF_SELECTED.	

2	**Rehabilitate invalidated File**
	`1 – fid = DFSIMTEST`
	`select()`
	`2 - fid = EFCNR`
	`select()`
	`3 – invalidate()`
	`4 – rehabilitate()`
		1 - No exception shall be thrown.
		2 - No exception shall be thrown.
		3 - No exception shall be thrown.
		4 - No exception shall be thrown.
		5 - No exception shall be thrown.
		Shall return 1.	

Id	Description	API Expectation	APDU Expectation
	5 - byte[] incr = new byte[1] = 1 incrOffset = 0 byte[] resp = new byte[1] = 1 respOffset = 0 increase()		
3	**Access condition not fulfilled** 1 – fid = EFCNRH select() 2 – rehabilitate()	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code AC_NOT_FULFILLED..	
4	**Rehabilitate validated File** 1 - fid = EFCNR select() 2 – rehabilitate()	1 - No exception shall be thrown. 2 - Shall throw sim.access.SIMViewException with reason code INVALIDATION_STATUS_CONTRADICTION.	

6.1.1.12.4 Test Coverage

CRR number	Test Case Number
CRRN1	2
CRRC1	1
CRRC2	3
CRRC3	4
CRRC5, CRRC6	Not Tested

6.1.2 Class SIMSystem

6.1.2.1 Method getTheSIMView

Test Area Reference: API_1_SSY_GETS

6.1.2.1.1 Conformance Requirement:

The method with following header shall compliant to its definition in the API.

```
public static SIMView getTheSIMView()
```

Normal execution

CRRN1: returns a reference to class which implements the SIMView interface

Parameters error

No requirements

Context errors

No requirements

6.1.2.1.2 Test suite files

No additional requirements for the GSM personalisation:

Test Script: API_1_SSY_GETS_1.scr

Test Applet: API_1_SSY_GETS_1.java

Installation parameter: API_1_SSY_GETS.install (Same as default applet)

Load Script: API_1_SSY_GETS.ldr

6.1.2.1.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
1	**reference not equal null after execute**	The returned reference shall be not null after execute	
2	**reference to the GSM interface**	Returned a reference to the GSM interface	

6.1.2.1.4 Test Coverage

CRR number	Test case number
N1	1,2

6.1.3 Class SIMViewException

6.1.3.1 Method throwIt

Test Area Reference: API_1_SVE_THITS

6.1.3.1.1 Conformance Requirement:

The method with following header shall compliant to its definition in the API.

```
public static void throwIt(short reason)
        throws  SIMViewException
```

Normal execution

CRRN1: Throws the JCRE instance of SIMViewException with the specified reason

CRRN2: extends Java card.framework.CardRuntimeException

Parameters error

No requirements

Context errors

No requirements

6.1.3.1.2 Test suite files

No additional requirements for the GSM personalisation

Test Script: API_1_SVE_THITS_1.scr

Test Applet: API_1_SVE_THITS_1 .java

Installation parameter: API_1_SVE_THITS.install (Same as default applet)

Load Script: API_1_SVE_THITS.ldr

6.1.3.1.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
1	**Throws the JCRE instance of SIMViewException with the specified reason**	Reason (specified)	
2	**SIMViewException extends javacard.framework.CardRuntimeException**	Reason (specified)	

6.1.3.1.4 Test Coverage

CRR number	Test case number
N1	1
N2	2

6.1.3.2 Constructor

Test Area Reference: API_1_SVE_COORS

6.1.3.2.1 Conformance Requirement:

The method with following header shall compliant to its definition in the API.

```
public SIMViewException(short reason)
        throws  SIMViewException
```

Normal execution

CRRN1: Construct a SIMViewException with the specified reason

Parameters error

No requirements

Context errors

No requirements

6.1.3.2.2 Test suite files

No additional requirements for the GSM personalisation

Test Script: API_1_SVE_COORS_1.scr

Test Applet: API_1_SVE_COORS_1.java

Installation parameter: API_1_SVE_COORS.install (Same as default applet)

Load Script: API_1_SVE_COORS.ldr

6.1.3.2.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
1	**SIMViewException with the specified reason** (The reason shall set with setReason and compare the Exception with getReason)	Reason (specified)	

6.1.3.2.4 Test Coverage

CRR number	Test case number
N1	1

6.1.3.3 Reason Codes

Test Area Reference: API_1_SVE_CONS

6.1.3.3.1 Conformance Requirement:

There is no API, only constants. This constants shall compliant to its definition in the API.

Normal execution

CRRN1: The Constants of the class SIMViewException shall all have the same name and value defined in the GSM03.19

CRRN2: Constructs SIMViewException a Exception with the specified reason

Parameters error

None

Context errors

None

6.1.3.3.2 Test suite files

Additional requirements for the GSM personalisation: None

Test Script: API_1_SVE_CONS_1.scr

Test Applet: API_1_SVE_CONS_1.java

Installation parameter: API_1_SVE_CONS.install

Same as default applet

Load Script: API_1_SVE_CONS.ldr

6.1.3.3.3 Test Procedure

Id	Description
01	Check constant NO_EF_SELECTED = 1;
02	Check constant FILE_INCONSISTENT = 2
03	Check constant AC_NOT_FULFILLED = 3
04	Check constant FILE_NOT_FOUND = 4
05	Check constant INTERNAL_ERROR = 5
06	Check constant INVALIDATION_STATUS_CONTRADICTION = 6
07	Check constant OUT_OF_FILE_BOUNDARIES = 7
08	Check constant OUT_OF_RECORD_BOUNDARIES = 8
09	Check constant RECORD_NUMBER_NOT_AVAILABLE = 9
10	Check constant INVALID_MODE = 10
11	Check constant PATTERN_NOT_FOUND = 11
12	Check constant MAX_VALUE_REACHED = 12
13	Check constant MEMORY_PROBLEM = 13

6.1.3.3.4 Test Coverage

CRR number	Test case number
N1	1-13
N2	1-13

6.2 Package sim.toolkit

6.2.1 Interface ToolkitConstants

6.2.1.1 Constants

Test Area Reference: API_2_TKC_CONS

6.2.1.1.1 Conformance Requirement:

There is no API, only constants. This constants shall be compare to its definition in the API.

Normal execution

CRRN1: The Toolkit Constants shall all have the same name and value defined in the GSM03.19 normalization.

Parameters error

None

Context errors

None

6.2.1.1.2 Test suite files

No additional requirements for the GSM personalisation.

Test Script: API_2_TKC_CONS_1.scr

Test case trigger: 1- first applet check the first 80 constants

2- second applet checked the 66 others.

Test Applet: API_2_TKC_CONS_1.java

Load Script: API_2_TKC_CONS_1.ldr

Cleaning script: API_2_TKC_CONS_1.clr

6.2.1.1.3 Test Procedure

First applet triggered:

Test Case	
Id	**Test purpose**
01	Check constant EVENT_PROFILE_DOWNLOAD=1
02	Check constant EVENT_FORMATTED_SMS_PP_ENV=2
03	Check constant EVENT_FORMATTED_SMS_PP_UPD=3
04	Check constant EVENT_UNFORMATTED_SMS_PP_ENV=4
05	Check constant EVENT_UNFORMATTED_SMS_PP_UPD=5
06	Check constant EVENT_UNFORMATTED_SMS_CB=6
07	Check constant EVENT_MENU_SELECTION=7
08	Check constant EVENT_MENU_SELECTION_HELP_REQUEST=8
09	Check constant EVENT_CALL_CONTROL_BY_SIM=9
10	Check constant EVENT_MO_SHORT_MESSAGE_CONTROL_BY_SIM=10

11	Check constant EVENT_TIMER_EXPIRATION=11
12	Check constant EVENT_EVENT_DOWNLOAD_MT_CALL12
13	Check constant EVENT_EVENT_DOWNLOAD_CALL_CONNECTED=13
14	Check constant EVENT_EVENT_DOWNLOAD_CALL_DISCONNECTED=14
15	Check constant EVENT_EVENT_DOWNLOAD_LOCATION_STATUS=15
16	Check constant EVENT_EVENT_DOWNLOAD_USER_ACTIVITY=16
17	Check constant EVENT_EVENT_DOWNLOAD_IDLE_SCREEN_AVAILABLE=17
18	Check constant EVENT_EVENT_DOWNLOAD_CARD_READER_STATUS=18
19	Check constant EVENT_STATUS_COMMAND=127
20	Check constant EVENT_UNRECOGNIZED_ENVELOPE=-1
21	Check constant BTAG_PROACTIVE_SIM_COMMAND='D0'
22	Check constant BTAG_SMS_PP_DOWNWLOAD='D1'
23	Check constant BTAG_CELL_BROADCAST_DOWNLOAD='D2'
24	Check constant BTAG_MENU_SELECTION='D3'
25	Check constant BTAG_CALL_CONTROL='D4'
26	Check constant BTAG_MO_SHORT_MESSAGE_CONTROL='D5'
27	Check constant BTAG_EVENT_DOWNLOAD='D6'
28	Check constant BTAG_TIMER_EXPIRATION='D7'
29	Check constant TAG_COMMAND_DETAILS='01'
30	Check constant TAG_DEVICE_IDENTITIES='02'
31	Check constant TAG_RESULT='03'
32	Check constant TAG_DURATION='04'
33	Check constant TAG_ALPHA_IDENTIFIER='05'
34	Check constant TAG_ADDRESS='06'
35	Check constant TAG_CAPABILITY_CONFIGURATION_PARAMETERS='07'
36	Check constant TAG_CALLED_PARTY_SUBADDRESS='08'
37	Check constant TAG_SS_STRING='09'
38	Check constant TAG_USSD_STRING='0A'
39	Check constant TAG_SMS_TPDU='0B'
40	Check constant TAG_CELL_BROADCAST_PAGE='0C'
41	Check constant TAG_TEXT_STRING='0D'
42	Check constant TAG_TONE='0E'
43	Check constant TAG_ITEM='0F'
44	Check constant TAG_ITEM_IDENTIFIER='10'
45	Check constant TAG_RESPONSE_LENGTH='11'
46	Check constant TAG_FILE_LIST='12'
47	Check constant TAG_LOCATION_INFORMATION='13'
48	Check constant TAG_IMEI='14'
49	Check constant TAG_HELP_REQUEST='15'
50	Check constant TAG_NETWORK_MEASUREMENT_RESULTS='16'
51	Check constant TAG_DEFAULT_TEXT='17'
52	Check constant TAG_ITEMS_NEXT_ACTION_INDICATOR='18'
53	Check constant TAG_EVENT_LIST='19'
54	Check constant TAG_CAUSE='1A'
55	Check constant TAG_LOCATION_STATUS='1B'
56	Check constant TAG_TRANSACTION_IDENTIFIER='1C'
57	Check constant TAG_BCCH_CHANNEL_LIST='1D'
58	Check constant TAG_ICON_IDENTIFIER='1E'
59	Check constant TAG_ITEM_ICON_IDENTIFIER_LIST='1F'
60	Check constant TAG_CARD_READER_STATUS='20'
61	Check constant TAG_CARD_ATR='21'
62	Check constant TAG_C_APDU='22'
63	Check constant TAG_R_APDU='23'
64	Check constant TAG_TIMER_IDENTIFIER='24'
65	Check constant TAG_TIMER_VALUE='25'
66	Check constant TAG_DATE_TIME_AND_TIME_ZONE='26'
67	Check constant TAG_CALL_CONTROL_REQUESTED_ACTION='27'
68	Check constant TAG_AT_COMMAND='28'
69	Check constant TAG_AT_RESPONSE='29'
70	Check constant TAG_BC_REPEAT_INDICATOR='2A'
71	Check constant TAG_IMMEDIATE_RESPONSE='2B'
72	Check constant TAG_DTMF_STRING='2C'
73	Check constant TAG_SET_CR='80'
74	Check constant TAG_SET_NO_CR='7F'
75	Check constant TLV_LENGTH_CODED_2BYTES='81'

76	Check constant TLV_NOT_FOUND='00'
77	Check constant TLV_FOUND_CR_SET='01'
78	Check constant TLV_FOUND_CR_NOT_SET='02'
79	Check constant PRO_CMD_REFRESH='01'
80	Check constant PRO_CMD_MORE_TIME='02'

Second applet triggered:

Test Case	
Id	**Test purpose**
01	Check constant PRO_CMD_SET_UP_CALL='10'
02	Check constant PRO_CMD_SEND_SS='11'
03	Check constant PRO_CMD_SEND_USSD='12'
04	Check constant PRO_CMD_SEND_SHORT_MESSAGE='13'
05	Check constant PRO_CMD_SEND_DTMF='14'
06	Check constant PRO_CMD_PLAY_TONE='20'
07	Check constant PRO_CMD_DISPLAY_TEXT='21'
08	Check constant PRO_CMD_GET_INKEY='22'
09	Check constant PRO_CMD_GET_INPUT='23'
10	Check constant PRO_CMD_SELECT_ITEM='24'
11	Check constant PRO_CMD_PROVIDE_LOCAL_INFORMATION='26'
12	Check constant PRO_CMD_TIMER_MANAGEMENT='27'
13	Check constant PRO_CMD_SET_UP_IDLE_MODE_TEXT='28'
14	Check constant PRO_CMD_PERFORM_CARD_APDU='30'
15	Check constant PRO_CMD_POWER_ON_CARD='31'
16	Check constant PRO_CMD_POWER_OFF_CARD='32'
17	Check constant PRO_CMD_GET_READER_STATUS='33'
18	Check constant PRO_CMD_RUN_AT_COMMAND='34'
19	Check constant DEV_ID_KEYPAD='01'
20	Check constant DEV_ID_DISPLAY='02'
21	Check constant DEV_ID_EARPIECE='03'
22	Check constant DEV_ID_ADDITIONAL_CARD_READER_0='10'
23	Check constant DEV_ID_ADDITIONAL_CARD_READER_1='11'
24	Check constant DEV_ID_ADDITIONAL_CARD_READER_2='12'
25	Check constant DEV_ID_ADDITIONAL_CARD_READER_3='13'
26	Check constant DEV_ID_ADDITIONAL_CARD_READER_4='14'
27	Check constant DEV_ID_ADDITIONAL_CARD_READER_5='15'
28	Check constant DEV_ID_ADDITIONAL_CARD_READER_6='16'
29	Check constant DEV_ID_ADDITIONAL_CARD_READER_7='17'
30	Check constant DEV_ID_SIM='81'
31	Check constant DEV_ID_ME='82'
32	Check constant DEV_ID_NETWORK='83'
33	Check constant DCS_DEFAULT_ALPHABET='00'
34	Check constant DCS_8_BIT_DATA='04'
35	Check constant DCS_UCS2='08'
36	Check constant SW1_RP_ERROR='9E'
37	Check constant SW1_RP_ACK='9F'
38	Check constant POLL_NO_DURATION=0
39	Check constant POLL_SYSTEM_DURATION=(-1)
40	Check constant RES_CMD_PERF='00'
41	Check constant RES_CMD_PERF_PARTIAL_COMPR='01'
42	Check constant RES_CMD_PERF_MISSING_INFO='02'
43	Check constant RES_CMD_PERF_REFRESH_ADD_EF_READ='03'
44	Check constant RES_CMD_PERF_REQ_ICON_NOT_DISP='04'
45	Check constant RES_CMD_PERF_MODIF_CC_SIM='05'
46	Check constant RES_CMD_PERF_SESSION_TERM_USER='10'
47	Check constant RES_CMD_PERF_BACKWARD_MOVE_REQ='11'
48	Check constant RES_CMD_PERF_NO_RESP_FROM_USER='12'
49	Check constant RES_CMD_PERF_HELP_INFO_REQ='13'
50	Check constant RES_CMD_PERF_USSD_TRANSAC_TERM='14'
51	Check constant RES_TEMP_PB_ME_UNABLE_PROC='20'
52	Check constant RES_TEMP_PB_SESSION_TERM_USER='21'
53	Check constant RES_TEMP_PB_USER_REJECT_CALL_REQ='22'
54	Check constant RES_TEMP_PB_USER_CLEAR_CALL='23'

55	Check constant RES_TEMP_PB_IN_CONTR_TIMER_STATE='24'
56	Check constant RES_TEMP_PB_INTERACT_CC_BY_SIM='25'
57	Check constant RES_ERROR_CMD_BEYOND_ME_CAPAB='30'
58	Check constant RES_ERROR_CMD_TYP_NOT_UNDERSTOOD='31'
59	Check constant RES_ERROR_CMD_DATA_NOT_UNDERSTOOD='32'
60	Check constant RES_ERROR_CMD_NUMBER_NOT_KNOWN='33'
61	Check constant RES_ERROR_SS_RETURN_ERROR='34'
62	Check constant RES_ERROR_SMS_RP_ERROR='35'
63	Check constant RES_ERROR_REQ_VALUES_MISS='36'
64	Check constant RES_ERROR_USSD_RETURN_ERROR='37'
65	Check constant RES_ERROR_MULTIPLE_CARD_ERROR='38'
66	Check constant RES_ERROR_INTERACT_CC_SMSMO_BY_SIM='39'

We expect for each case the comparison is true

6.2.1.1.4 Test Coverage

CRR number	Test case number
1	each case of the two applets

6.2.2 Interface ToolkitInterface

6.2.2.1 Method processToolkit

Test Area Reference: API_1_PRTKB

6.2.2.1.1 Conformance Requirement:

The method with following prototype shall compliant to its definition in the API.

```
public void processToolkit(byte event)
        throws  ToolkitException
```

Normal execution

CRRN1: This interface must be implemented by a Toolkit applet (which extends the javacard.framework.Applet class) so that it can be triggered by the Toolkit Handler according to the registration information.

CRRN2: The Toolkit applet will have to implement the processToolkit shared method so that the following events can be notified:

Event	Description
EVENT_PROFILE_DOWNLOAD	Terminal Profile command reception
EVENT_FORMATTED_SMS_PP_ENV	03.48 formatted envelope SMS-PP Data Download reception
EVENT_FORMATTED_SMS_PP_UPD	03.48 formatted Update Record EF SMS
EVENT_UNFORMATTED_SMS_PP_ENV	Unformatted Envelope SMS-PP Data Download reception
EVENT_UNFORMATTED_SMS_PP_UPD	Unformatted Update Record EF SMS
EVENT_UNFORMATTED_SMS_CB	Unformatted Cell Broadcast Data Download command reception
EVENT_MENU_SELECTION	Envelope Menu Selection command reception
EVENT_MENU_SELECTION_HELP_REQUEST	Envelope Menu Selection Help Request command reception
EVENT_CALL_CONTROL_BY_SIM	Envelope Call Control by SIM command reception
EVENT_MO_SHORT_MESSAGE_CONTROL_BY_SIM	Envelope MO Short Message Control by SIM command reception
EVENT_TIMER_EXPIRATION	Envelope Timer Expiration
EVENT_EVENT_DOWNLOAD_MT_CALL	Envelope Event Download - MT call
EVENT_EVENT_DOWNLOAD_CALL_CONNECTED	Envelope Event Download - Call connected
EVENT_EVENT_DOWNLOAD_CALL_DISCONNECTED	Event Download - Call disconnected
EVENT_EVENT_DOWNLOAD_LOCATION_STATUS	Envelope Event Download - Location status
EVENT_EVENT_DOWNLOAD_USER_ACTIVITY	Envelope Event Download - User activity
EVENT_EVENT_DOWNLOAD_IDLE_SCREEN_AVAILABLE	Envelope Event Download - Idle screen available
EVENT_EVENT_DOWNLOAD_CARD_READER_STATUS	Envelope Event Download - Card Reader Status
EVENT_STATUS_COMMAND	Status APDU command event
EVENT_UNRECOGNIZED_ENVELOPE	Unrecognized Envelope command reception

Parameters error

No requirements

Context errors

No requirements

6.2.2.1.2 Test suite files

The method is tested in the Framework

6.2.2.1.3 Test Coverage

CRR number	Test case number
CRRN1	Tested in Framework
CRRN2	Tested in Framework

6.2.3 Class EditHandler

It is not possible to test the methods provided by this class as it is declared 'abstract'; it will be done in the class inheriting it: EnvelopeResponseHandler, ProactiveHandler.

6.2.4 Class EnvelopeHandler

6.2.4.1 sim.tookit.EnvelopeHandler.getEnvelopeTag_1

Test Area Reference: API_2_ENH_GENT

6.2.4.1.1 Conformance Requirement:

The method with following header shall be compliant to its definition in the API.

```
public byte getEnvelopeTag()
```

Normal execution

CRRN1: The method shall return the Envelope BER-TLV tag.

CRRN2: The Envelope BER TAG is available for all triggered toolkit applets from the invocation to the termination of their processToolkit method if the EnvelopeHandler is available.

Parameters error

Context errors

6.2.4.1.2 Test suite files

Test Script: API_2_ENH_GENT_1.scr

Test Applet: API_2_ENH_GENT_1.java

Load Script: API_2_ENH_GENT_1.ldr

Clean-up Script: API_2_ENH_GENT_1.clr

6.2.4.1.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
1	getEnvelopeTag called just after triggering of the application.	Returns 0xD1	
2	getEnvelopeTag called after a proactive command.	Returns 0xD1	
3	getEnvelopeTag called after a second proactive command.	Returns 0xD1	

6.2.4.1.4 Test Coverage

CRR number	Test case number
N1	1, 2, 3
N2	1, 2, 3

6.2.4.2 sim.tookit.EnvelopeHandler.getItemIdentifier_1

Test Area Reference: API_2_ENH_GIID

6.2.4.2.1 Conformance Requirement:

The method with following header shall be compliant to its definition in the API.

```
public byte getItemIdentifier()
                    throws ToolkitException
```

Normal execution

CRRN1:The method shall return the item identifier byte value.

CRRN2:The item identifier byte value returned shall be from the first Item Identifier TLV element.

CRRN3: If the element is available it becomes the TLV selected.

CRRN4: The item identifier is available for all triggered toolkit applets from the invocation to the termination of their processToolkit method if the EnvelopeHandler is available.

Parameters error

Context errors

CRRC1: The method shall throw ToolkitException (UNAVAILABLE_ELEMENT) if the item identifier TLV is not present.

CRRC2: The method shall throw ToolkitException (OUT_OF_TLV_BOUNDARIES) if the item identifier byte is missing in the Item Identifier Simple TLV.

6.2.4.2.2 Test suite files

Test Script: API_2_ENH_GIID_1.scr

Test Applet: API_2_ENH_GIID_1.java

Load Script: API_2_ENH_GIID_1.ldr

Clean-up Script: API_2_ENH_GIID_1.clr

6.2.4.2.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
1	Send envelope SMS-PP Formatted with item identifier TLV and identifier value of 03	Returns 03	
2	Send envelope SMS-PP Formatted with two item identifier TLV with first value FF and second 44	Returns FF	
3	Send envelope SMS-PP Formatted with two item identifier TLV with first value 81 and second 44, call twice the method getItemIdentifier	Returns 81 Returns 81	
4	Send envelope SMS-PP Formatted with item identifier TLV and value of 66. FindTLV with TAG 02. getItemIdentifier and then getValueByte with offset 0	getItemIdentifier=getValueByte	
5	Send envelope SMS-PP Formatted without item identifier TLV and getItemIdentifier	ToolkitException (UNAVAILABLE_ELEMENT)	
6	Send Envelope SMS-PP Formatted with item identifier TLV (66), send proactive command. Then getItemIdentifier	Returns 66	
7	Send Envelope SMS-PP Formatted with item identifier TLV but without item number	ToolkitException (OUT_OF_TLV_BOUNDARIES)	

6.2.4.2.4 Test Coverage

CRR number	Test case number
N1	1, 2, 3
N2	2, 3
N3	4
N4	6
C1	5
C2	7

6.2.4.3 sim.tookit.EnvelopeHandler.getSecuredDataLength_1

Test Area Reference: API_2_ENH_GSDL

6.2.4.3.1 Conformance Requirement:

The method with following header shall be compliant to its definition in the API.

```
public short getSecuredDataLength()
                          throws ToolkitException
```

Normal execution

CRRN1: The method shall return the length of the secured data contained in a SMS TPDU TLV.

CRRN2: The length is from the first SMS TPDU TLV.

CRRN3: The length should not include padding bytes.

CRRN4: The method can be used if the event is EVENT_FORMATTED_SMS_PP_ENV and if the SMS TP-UD is formatted according to GSM03.48.

CRRN5: The method can be used if the event is EVENT_FORMATTED_SMS_PP_UPD and if the SMS TP-UD is formatted according to GSM03.48.

CRRN6: If the method is successful, the selected TLV should be the SMS TPDU TLV.

Parameters error

Context errors

CRRC1: The method shall thrown ToolkitException (UNAVAILABLE_ELEMENT) in case of unavailable SMS TPDU TLV element.

CRRC2: The method shall thrown ToolkitException (UNAVAILABLE_ELEMENT) in case of missing Secured Data.

6.2.4.3.2 Test suite files

Specific triggering:

- SMS CB
- FORMATTED SMS PP UPD
- UNFORMATED SMS PP ENV

Test Script: API_2_ENH_GSDL_1.scr

Test Applet: API_2_ENH_GSDL_1.java

Load Script: API_2_ENH_GSDL_1.ldr

Clean-up Script: API_2_ENH_GSLD_1.clr

6.2.4.3.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	Test with various length of TP-OA 1. Send a SMS PP with TP-OA =2 2. Send a SMS PP with TP-OA =6 3. Send a SMS PP with TP-OA =12	Returns 0x2A (for each sub case)	
2	Test with various length of RC/CC/DS 1. Send a SMS PP with RC/CC/DS = 0	Returns 0x10 (for each sub case)	
3	Test with PCNTR = 0	Returns 0x10	
4	Test with PCNTR = 7	Returns 0x05	
5	Test with SecuredDataLength = 00	Returns 0x00	
6	Test with UserDataLength = 0x33	Returns 0x33	
7	Test with UserDataLength = 0x 6C	Returns 0x 6C	
8	Test with UserDataLength = 0x 6D	Returns 0x 6D	
9	Test with UserDataLength = maximum length: 0x79	Returns 0x 79	
10	Verify it is the first TPDU TLV: Send a SMS PP with 2 TPDU TLV and inside two different secured data lengths: 5 and 10	Returns 0x05	

11	Same test as 1 but with FORMATTED_SMS_PP_UPD	Returns 0x2A	
12	Same test as 2 but with FORMATTED_SMS_PP_UPD	Returns 0x10	
13	Same test as 3 but with FORMATTED_SMS_PP_UPD	Returns 0x10	
14	Same test as 4 but with FORMATTED_SMS_PP_UPD	Returns 0x05	
15	Same test as 5 but with FORMATTED_SMS_PP_UPD	Returns 0x00	
16	Same test as 6 but with FORMATTED_SMS_PP_UPD	Returns 0x33	
17	Same test as 7 but with FORMATTED_SMS_PP_UPD	Returns 0x 6C	
18	Same test as 8 but with FORMATTED_SMS_PP_UPD	Returns 0x 6D	
19	Same test as 9 but with FORMATTED_SMS_PP_UPD	Returns 0x 79	
20	Same test as 10 but with FORMATTED_SMS_PP_UPD	Returns 0x05	
21	Verify after call of the method the current TLV is the TPDU TLV: findTLV device identities, getSecuredDataLength and then getValueByte to verify that the current TLV is the TPDU TLV	getValueByte returns 0x40	
22	Send an envelope SMS CB, getSecuredDataLength	ToolkitException UNAVAILABLE_ELEMENT	
23	Send an envelope SMS PP unformatted	ToolkitException UNAVAILABLE_ELEMENT	

6.2.4.3.4 Test Coverage

This method has only been tested with SMS PP without security and the tests shall be improved during 03.48 tests.

CRR number	Test case number
N1	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
N2	10
N3	3, 4
N4	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 25
N5	11, 12, 13, 14, 15, 16, 17, 18, 19, 20
N6	21
C1	22
C2	23

6.2.4.4 sim.tookit.EnvelopeHandler.getSecuredDataOffset_1

Test Area Reference: API_2_ENH_GSDO

6.2.4.4.1 Conformance Requirement:

The method with following header shall be compliant to its definition in the API.

```
public short getSecuredDataOffset()
                          throws ToolkitException
```

Normal execution

CRRN1: The method shall return the offset of the secured data first byte contained in a SMS TPDU TLV.

CRRN2: The offset is from the first SMS TPDU TLV.

CRRN3: The method can be used if the event is EVENT_FORMATTED_SMS_PP_ENV and if the SMS TP-UD is formatted according to GSM03.48.

CRRN4: The method can be used if the event is EVENT_FORMATTED_SMS_PP_UPD and if the SMS TP-UD is formatted according to GSM03.48.

CRRN5: If the method is successful, the selected TLV should be the SMS TPDU TLV.

Parameters error

Context errors

CRRC1: The method shall thrown ToolkitException (UNAVAILABLE_ELEMENT) in case of unavailable SMS TPDU TLV element.

CRRC2: The method shall thrown ToolkitException (UNAVAILABLE_ELEMENT) in case of missing Secured Data.

6.2.4.4.2 Test suite files

Specific triggering:

```
SMS CB
FORMATTED SMS PP UPD
UNFORMATED SMS PP ENV
```

Test Script: API_2_ENH_GSDO_1.scr

Test Applet: API_2_ENH_GSDO_1.java

Load Script: API_2_ENH_GSDO_1.ldr

Clean-up Script: API_2_ENH_GSDO_1.clr

6.2.4.4.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
1	Test with TP-OA length of 2	Returns 0x21	
2	Test with TP-OA length of 6	Returns 0x23	
3	Test with TP-OA length of 12	Returns 0x26	
4	Test with RC/CC/DS length of 0	Returns 0x21	
5	Send a SMS PP with 2 TPDU TLV and inside two different secured data offsets	Returns 0x24 (the first offset)	
6	Same test as 1 but with FORMATTED_SMS_PP_UPD	Returns 0x21	
7	Same test as 2 but with FORMATTED_SMS_PP_UPD	Returns 0x23	
8	Same test as 3 but with FORMATTED_SMS_PP_UPD	Returns 0x26	
9	Same test as 4 but with FORMATTED_SMS_PP_UPD	Returns 0x21	
10			
11	Same test as 5 but with FORMATTED_SMS_PP_UPD	Returns 0x24 (the first offset)	
12	Verify after call of the method the current TLV is the TPDU TLV: findTLV device identities, getSecuredDataOffset and then getValueByte to verify that the current TLV is the TPDU TLV	Returns 0x40	
13	Send an envelope SMS CB, getSecuredDataOffset	ToolkitException UNAVAILABLE_ELEMENT	
14			
15	Send an envelope SMS PP unformatted	ToolkitException UNAVAILABLE_ELEMENT	
16	Send an envelope SMS-PP formatted with no secured data , getSecuredDataOffset	Returns 0x21	

6.2.4.4.4 Test Coverage

This method has only been tested with SMS PP without security and the tests shall be improved during 03.48 tests.

CRR number	Test case number
N1	1, 2, 3, 4, 5, 14
N2	5
N3	1, 2, 3, 4, 5, 15
N4	6, 7, 8, 9, 10
N5	11
C1	12
C2	13

6.2.4.5 sim.tookit.EnvelopeHandler.getTheHandler_1

6.2.4.5.1 Conformance Requirements

The method with following header shall be compliant to its definition in the API.

```
public static EnvelopeHandler getTheHandler()
                                    throws ToolkitException
```

Normal execution

CRRN1: The method shall return the single system instance of the EnvelopeHandler class.

CRRN2: The EnvelopeHandler is a Temporary JCRE Entry Point Object (see Javacard 2.1 Runtime Environment (JCRE) Specification [12])

Parameters error

Context errors

CRRC1: The method shall thrown ToolkitException (HANDLER_NOT_AVAILABLE) if the handler is busy.

6.2.4.5.2 Test suite files

Test Script: API_2_ENH_GTHD_1.scr

Test Applet: API_2_ENH_GTHD_1.java

Load Script: API_2_ENH_GTHD_1.ldr

Clean-up Script: API_2_ENH_GTHD_1.clr

6.2.4.5.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
1	getTheHandler twice	The returned objects shall be the same	
2	Verify that getTheHandler returns an EnvelopeHandler GetTheHandler	The reference returned shall be an EnvelopeHandler (checkcast)	
3	Verify the returned value is not null GetTheHandler	The reference returned shall not be null.	

6.2.4.5.4 Test Coverage

CRR number	Test case number
N1	1, 2, 3
N2	To be checked in Framework tests and insert here cross reference
C1	To be checked in Framework tests and insert here cross reference

6.2.4.6 sim.tookit.EnvelopeHandler.getTPUDLOffset_1

Test Area Reference: API_2_ENH_GTPO

6.2.4.6.1 Conformance Requirement:

The method with following header shall be compliant to its definition in the API.

```
public short getTPUDLOffset()
                    throws ToolkitException
```

Normal execution

CRRN1: The method shall return the TPUDL offset in a SMS TPDU TLV.

CRRN2: The offset is from the first SMS TPDU TLV.

CRRN3: The method can be used if the event is EVENT_FORMATTED_SMS_PP_ENV.

CRRN4: The method can be used if the event is EVENT_FORMATTED_SMS_PP_UPD.

CRRN5: The method can be used if the event is EVENT_UNFORMATTED_SMS_PP_ENV.

CRRN6: The method can be used if the event is EVENT_UNFORMATTED_SMS_PP_UPD.

CRRN7: If the method is successful, the selected TLV should be the SMS TPDU TLV.

Parameters error

Context errors

CRRC1: The method shall thrown ToolkitException (UNAVAILABLE_ELEMENT) in case of unavailable SMS TPDU TLV element.

CRRC2: The method shall thrown ToolkitException (UNAVAILABLE_ELEMENT) if the TPUDL field does not exist.

6.2.4.6.2 Test suite files

Specific triggering:

```
FORMATTED SMS PP UPD
UNFORMATTED SMS PP UPD
UNFORMATTED SMS PP ENV
SMS CB
```

Test Script: API_2_ENH_GTPO_1.scr

Test Applet: API_2_ENH_GTPO_1.java

Load Script: API_2_ENH_GTPO_1.ldr

Clean-up Script: API_2_ENH_GTPO_1.clr

6.2.4.6.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	Test with TP-OA length of 2	Returns 0x0D	
2	Test with TP-OA length of 6	Returns 0x0F	
3	Test with TP-OA length of 12	Returns 0x12	
4	Send a SMS PP with 2 TPDU TLV and inside two different UDL offsets	Returns 0x10 (the first offset)	
5	Same test as 1 but with FORMATTED_SMS_PP_UPD	Returns 0x0D	
6	Same test as 2 but with FORMATTED_SMS_PP_UPD	Returns 0x0F	
7	Same test as 3 but with FORMATTED_SMS_PP_UPD	Returns 0x12	
8	Same test as 4 but with FORMATTED_SMS_PP_UPD	Returns 0x10 (the first offset)	
9	Same test as 1 but with UNFORMATTED_SMS_PP_UPD	Returns 0x0D	
10	Same test as 2 but with UNFORMATTED_SMS_PP_UPD	Returns 0x0F	
11	Same test as 3 but with UNFORMATTED_SMS_PP_UPD	Returns 0x12	
12	Same test as 4 but with UNFORMATTED_SMS_PP_UPD	Returns 0x12 (the first offset)	
13	Same test as 1 but with UNFORMATTED_SMS_PP_ENV	Returns 0x0D	
14	Same test as 2 but with UNFORMATTED_SMS_PP_ENV	Returns 0x0F	
15	Same test as 3 but with UNFORMATTED_SMS_PP_ENV	Returns 0x12	
16	Same test as 4 but with UNFORMATTED_SMS_PP_ENV	Returns 0x10 (the first offset)	
17	Verify after call of the method the current TLV is the TPDU TLV: findTLV device identities, getTPUDLOffset and then getValueByte to verify that the current TLV is the TPDU TLV	Returns 0x40	
18	Send an envelope SMS CB, getTPUDLOffset	ToolkitException UNAVAILABLE_ELEMENT	

6.2.4.6.4 Test Coverage

CRR number	Test case number
N1	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17
N2	4
N3	1, 2, 3, 4, 17
N4	5, 6, 7, 8
N5	13, 14, 15, 16
N6	9, 10, 11, 12
N7	17
C1	18
C2	Don't no how to test

6.2.4.7 sim.tookit.EnvelopeHandler.getLength_1

Test Area Reference: API_2_ENH_GLEN

6.2.4.7.1 Conformance Requirement

The method with following header shall be compliant to its definition in the API.

```
public short getLength()
```

```
                    throws ToolkitException
```

Normal execution

CRRN1: returns the length in bytes of the TLV list.

Parameter Error

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException.HANDLER_NOT_AVAILABLE.

6.2.4.7.2 Test Suite files

Specific triggering: None

Test Script: API_2_ENH_GLEN_1.scr

Test Applet: API_2_ENH_GLEN_1.java

Load Script: API_2_ENH_GLEN_1.ldr

Clean-up Script: API_2_ENH_GLEN_1.clr

6.2.4.7.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
1	Send an envelope SMS PP with BER length of 0x31	Result of getLength() is 0x0031	
2	Send an envelope SMS PP with BER length of 0x7F	Result of getLength() is 0x007Fh	
3	Send an envelope SMS PP with BER length of 81 80	Result of getLength() is 0x0080h	
4	Send an envelope SMS PP with BER length of 81 FC	Result of getLength() is 0x00FCh	

6.2.4.7.4 Test Coverage

CRR number	Test case number
N1	1, 2, 3, 4
C1	Does not apply for EnvelopeHandler

6.2.4.8 sim.tookit.EnvelopeHandler.copy_1

Test Area Reference: API_2_ENH_COPY_BSS

6.2.4.8.1 Conformance Requirement

The method with following header shall be compliant to its definition in the API.

```
public short copy(byte[] dstBuffer,
short dstOffset,
short dstLength)
               throws java.lang.NullPointerException,
                      java.lang.ArrayIndexOutOfBoundsException,
                      ToolkitException
```

Normal execution

CRRN1: copies the simple TLV list contained in the handler to the destination byte array.

CRRN2: returns dstOffset + dstLength.

Parameter errors

CRRP1: if dstBuffer is null a NullPointerException is thrown.

CRRP2: if dstOffset or dstLength or both would cause access outside array bounds, or if dstLength is negative, an ArrayIndexOutOfBoundsException is thrown.

CRRP3: if dstLength is grater than the length of the simple TLV List, an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException. OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.4.8.2 Test Suite files

Specific triggering: None

Test Script: API_2_ENH_COPY_BSS_1.scr

Test Applet: API_2_ENH_COPY_BSS_1.java

Load Script: API_2_ENH_COPY_BSS_1.ldr

Clean-up Script: API_2_ENH_ COPY _ BSS _1.clr

6.2.4.8.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
1	**NULL as parameter to dstBuffer**	NullPointerException is thrown	
2	**dstOffset ≥ dstBuffer.length** dstBuffer.length = 5 dstOffset = 5 dstLength = 1	ArrayIndexOutOfBoundsException is thrown	
3	**dstOffset < 0** dstBuffer.length = 5 dstOffset = -1 dstLength = 1	ArrayIndexOutOfBoundsException is thrown	
4	**dstLength > dstBuffer.length** dstBuffer.length = 5 dstOffset = 0 dstLength = 6	ArrayIndexOutOfBoundsException is thrown	
5	**DstOffset + dstLength > dstBuffer.length** DstBuffer.length = 5 DstOffset = 3 DstLength = 3	ArrayIndexOutOfBoundsException is thrown	
6	**dstLength < 0** dstBuffer.length = 5 dstOffset = 0 dstLength = -1	ArrayIndexOutOfBoundsException is thrown	
7	**DstLength > length of the simple TLV list** DstBuffer.length = 48 DstOffset = 0 DstLength = 48	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
8	**Successful call, dstBuffer is the whole buffer** DstBuffer.length = 47 DstOffset = 0 DstLength = 47	Result of copy() is 0X0047	
9	**Compare the buffer**	Result of arrayCompare() is 0	
10	**Successful call, dstBuffer is part of a buffer** DstBuffer.length = 50 dstOffset = 3 dstLength = 47	Result of copy() is 0X0032	
11	**Compare the whole buffer**	Result of arrayCompare() is 0	
12	**Successful call, dstBuffer is part of a buffer** dstBuffer.length = 15 dstOffset = 3	Result of copy() is 0X0009	

	dstLength = 6		
13	**Compare the whole buffer**	Result of arrayCompare() is 0	
14	**Successful call, dstBuffer is part of a buffer** dstBuffer.length = 260 dstOffset = 257 dstLength = 3	Result of copy() is 0X0104	
15	**Compare the whole buffer**	Result of arrayCompare() is 0	
16	**Successful call, copy with length =0** dstBuffer.length = 260 dstOffset = 260 dstLength = 0	Result of copy() is 0x104	

6.2.4.8.4 Test Coverage

CRR number	Test case number
N1	9, 11, 13, 15
N2	8, 10, 12, 14, 16
P1	1
P2	2, 3, 4, 5, 6
P3	7
C1	Does not apply for EnvelopeHandler

6.2.4.9 sim.tookit.EnvelopeHandler.findTLV_1

Test Area Reference: API_2_ENH_FINDBB

6.2.4.9.1 Conformance Requirement

The method with following header shall be compliant to its definition in the API.

```
public byte findTLV(byte tag, byte occurrence)
                throws ToolkitException
```

Normal execution

Looks for the indicated occurrence of a TLV element from the beginning of the TLV list (handler buffer):

CRRN1: the method is successful if the required occurrence exists then the corresponding TLV becomes current.

CRRN2: if the method is successful then it returns TLV_FOUND_CR_SET when Comprehension Required flag is set.

CRRN3: if the method is successful then it returns TLV_FOUND_CR_NOT_SET when Comprehension Required flag is not set.

CRRN4: if the required occurrence of the TLV element does not exist, the current TLV is no longer defined and TLV_NOT_FOUND is returned.

CRRN5: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if an input parameter is not valid (e.g. occurrence = 0) an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException BAD_INPUT_PARAMETER.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.4.9.2 Test Suite files

Specific triggering: None

Test Script: API_2_ENH_ENH_FINDBB_1.scr

Test Applet: API_2_ENH_ENH_FINDBB_1.java

Load Script: API_2_ENH_ENH_FINDBB_1.ldr

Clean-up Script: API_2_ENH_FINDBB_1.clr

6.2.4.9.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
	Trig the applet with SMS PP including one more tag 02 and one TAG 04		
1	**Invalid input parameter** `Occurrence = 0`	ToolkitException.BAD_INPUT_PARAMETER is thrown	

2	**Search 1st TLV**
	`Tag = 02h`
	`Occurrence = 1`
		Result is TLV_FOUND_CR_SET	

3	**Call the getValueLength() method**	Result is 0x02	

4	**Search 2nd TLV**
	`Tag = 06h`
	`Occurrence = 1`
		Result is TLV_FOUND_CR_SET	

5	**Call the getValueLength() method**	Result is 0x05h	
6	**Select a TLV (tag 02h)**		

	Search a wrong tag
	`Tag = 03h`
	`Occurrence = 1`
		Result is TLV_NOT_FOUND	

7	**Call the getValueLength() method**	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	

8	**Search a tag with wrong occurrence**
	`Tag = 02h`
	`Occurrence = 3`
		Result is TLV_NOT_FOUND	

9	**Call the getValueLength() method**	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	

10	**Search the TLV**
	`Tag = 02h`
	`Occurrence = 2`
		Result is TLV_FOUND_CR_NOT_SET	

11	**Search the TLV**
	`Tag = 04h`
	`Occurrence = 1`
		Result is TLV_FOUND_CR_NOT_SET	

12	**Search tag 81h**
	`Tag = 86h`
	`Occurrence = 1`
		Result is TLV_FOUND_CR_SET	

13	**Search tag 84h**
	`Tag = 84h`
	`Occurrence = 1`
		Result is TLV_FOUND_CR_NOT_SET	

6.2.4.9.4 Test Coverage

CRR number	Test case number
N1	3, 5
N2	2, 4
N3	10, 11
N4	6, 7,8, 9
N5	12, 13
P1	1
C1	Does not apply for EnvelopeHandler

6.2.4.10 sim.tookit.EnvelopeHandler.getValueLength_1

Test Area Reference: API_2_ENH_GVLE

6.2.4.10.1 Conformance Requirement

The method with following header shall be compliant to its definition in the API.

```
public short getValueLength()
                        throws ToolkitException
```

Normal execution

CRRN1: gets and returns the binary length of the value field for the last TLV element which has been found in the handler.

Parameter errors

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

CRRC2: in case of unavailable TLV element an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException UNAVAILABLE_ELEMENT.

6.2.4.10.2 Test Suite files

Specific triggering: None

Test Script: API_2_ENH_GVLE_1.scr

Test Applet: API_2_ENH_GVLE_1.java

Load Script: API_2_ENH_GVLE_1.ldr

Clean-up Script: API_2_ENH_GVLE_1.clr

6.2.4.10.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
	Fill the SMS PP with TLV: Tag 33, Length C8		
1	**getValueLength()**	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
2	**Search TLV 02h**		
	`getValueLength()`	Result is 0X0002	
3	**Search TLV 0Bh**		
	`getValueLength()`	Result is 0X0024	
4	**Search TLV 33h**		
	`getValueLength()`	Result is 0X00C8	

6.2.4.10.4 Test Coverage

CRR number	Test case number
N1	2, 3, 4
C1	Does not apply for EnvelopeHandler
C2	1

6.2.4.11 sim.tookit.EnvelopeHandler.getValueByte_1

Test Area Reference: API_2_ENH_GVBYS

6.2.4.11.1 Conformance Requirement

The method with following header shall be compliant to its definition in the API.

```
public byte getValueByte(short valueOffset)
                    throws ToolkitException
```

Normal execution

CRRN1: Gets a byte from the last TLV element which has been found in the handler and returns its value (1 byte).

Parameter errors

CRRP1: if valueOffset is out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

CRRC2: in case of unavailable TLV element an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException UNAVAILABLE_ELEMENT.

6.2.4.11.2 Test Suite files

Specific triggering: None

Test Script: API_2_ENH_GVBY.scr

Test Applet: API_2_ENH_GVBY_1.java

Load Script: API_2_ENH_GVBY.ldr

6.2.4.11.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
	Fill the SMS PP with TLV: Tag 33, Length C8 Value 01 02 …		
1	getValueByte(0)	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
2	**Search TLV 02h**		
	`getValueByte(2)`	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
3	**Search TLV 02h**		
	`getValueByte(1)`	Result is 0x81	
4	**Search TLV 02h (Device Identities TLV)**		
	`getValueByte(0)`	Result is 83h (Source)	
5	**Search TLV 33h**		
	`getValueByte(7E)`	Result is 0x7F	
6	**Search TLV 33h**		
	`getValueByte(80)`	Result is 0x81	
7	`getValueByte(7F)`	Result is 0x80	
8	**Search TLV B3h**		
	`getValueByte(C7)`	Result is 0xC8	

6.2.4.11.4 Test Coverage

CRR number	Test case number
N1	3, 4, 5, 6, 7, 8
P1	2
C1	Does not apply for EnvelopeHandler
C2	1

6.2.4.12 sim.tookit.EnvelopeHandler.copyValue_1

Test Area Reference: API_2_ENH_CPYVS_BSS

6.2.4.12.1 Conformance Requirement

The method with following header shall be compliant with its definition in the API.

```
public short copyValue(short valueOffset,
                       byte[] dstBuffer,
                       short dstOffset,
                       short dstLength)
                throws java.lang.NullPointerException,
                       java.lang.ArrayIndexOutOfBoundsException,
                       ToolkitException
```

Normal execution

CRRN1: copies a part of the last TLV element which has been found, into a destination. buffer.

CRRN2: returns dstOffset + dstLength.

Parameter errors

CRRP1: if dstBuffer is null NullPointerException is thrown.

CRRP2: if dstOffset or dstLength or both would cause access outside array bounds, or if dstLength is negative ArrayIndexOutOfBoundsException is thrown.

CRRP3: if valueOffset, dstLength or both are out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

CRRC2: in case of unavailable TLV element an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException UNAVAILABLE_ELEMENT.

6.2.4.12.3 Test Suite files

Specific triggering: None

Test Script: API_2_ENH_CPYVS_BSS_1.scr

Test Applet: API_2_ENH_CPYVS_BSS_1.java

Load Script: API_2_ENH_CPYVS_BSS_1.ldr

Clean-up Script: API_2_ENH_CPYVS_BSS_1.clr

6.2.4.12.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Search TLV 02h**		
	copyValue() with a null dstBuffer	NullPointerException is thrown	
2	**Search TLV 0Bh**		
	dstOffset ≥ dstBuffer.length dstBuffer.length = 5 dstOffset = 5 dstLength = 1	ArrayIndexOutOfBoundsException is thrown	
3	**dstOffset < 0** dstBuffer.length = 5 dstOffset = -1 dstLength = 1	ArrayIndexOutOfBoundsException is thrown	
4	**dstLength >dstBuffer.length** dstBuffer.length = 5 dstOffset = 0 dstLength = 6	ArrayIndexOutOfBoundsException is thrown	
5	**dstOffset + dstLength >dstBuffer.length** dstBuffer.length = 5 dstOffset = 3 dstLength = 3	ArrayIndexOutOfBoundsException is thrown	
6	**dstLength < 0** dstBuffer.length = 5 dstOffset = 0 dstLength = -1	ArrayIndexOutOfBoundsException is thrown	
7	**Search TLV 06h**		
	valueOffset ≥ TLV Length valueOffset = 6 dstBuffer.length = 15 dstOffset = 0 dstLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
8	**valueOffset < 0** valueOffset = -1 dstBuffer.length = 15 dstOffset = 0 dstLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
9	**dstLength > TLV length** valueOffset = 0 dstBuffer.length = 15 dstOffset = 0 dstLength = 7	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
10	**valueOffset + dstLength > TLV length** valueOffset = 2 dstBuffer.length = 15 dstOffset = 0 dstLength = 5	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
11	**Search TLV 01h**		
	copyValue()	ToolkitException.UNAVAILABLE_ELEMENT is thrown on the copyValue() method	
12	**Search TLV 06h**		
	Successful call valueOffset = 0 dstBuffer.length = 6 dstOffset = 0 dstLength = 6	Result of copyValue() is 0x0006	
13	**Compare buffer** buffer = 81 11 22 33 44 F5	Result is 00h	
14	**initialise dstBuffer** dstBuffer = 55 55 … 55		
	Successful call valueOffset = 1 dstBuffer.length = 20 dstOffset = 3 dstLength = 4	Result of copyValue() is 0x0007	
15	**Compare buffer** buffer = 55 55 55 11 22 33 44 55 55 55 55 55 55 55 55 55 55 55 55 55	Result is 00h	
16	**Successful call, copy with length =0**	Result of copyValue() is 20	

	dstBuffer.length = 20 dstOffset = 20 dstLength = 0		

6.2.4.12.4 Test Coverage

CRR number	Test case number
N1	13, 15
N2	12, 14, 16
P1	1
P2	2, 3, 4, 5, 6
P3	7, 8, 9, 10
C1	Does not apply for EnvelopeHandler
C2	11

6.2.4.13 sim.tookit.EnvelopeHandler.compareValue_1

Test Area Reference: API_2_ENH_CPRVS_BSS

6.2.4.13.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte compareValue(short valueOffset,
                         byte[] compareBuffer,
                         short compareOffset,
                         short compareLength)
                  throws java.lang.NullPointerException,
                         java.lang.ArrayIndexOutOfBoundsException,
                         ToolkitException
```

Normal execution

Compares the last found TLV element with a buffer:

CRRN1: returns 0 if identical.

CRRN2: returns -1 if the first miscomparing byte in simple TLV List is less than that in compareBuffer.

CRRN3: returns 1 if the first miscomparing byte in simple TLV List is greater than that in compareBuffer.

Parameter errors

CRRP1: if compareBuffer is null NullPointerException shall be thrown.

CRRP2: if compareOffset or compareLength or both would cause access outside array bounds, or if compareLength is negative ArrayIndexOutOfBoundsException shall be thrown.

CRRP3: if valueOffset, dstLength or both are out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

CRRC2: in case of unavailable TLV element an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException UNAVAILABLE_ELEMENT.

6.2.4.13.3 Test Suite files

Specific triggering: None

Test Script: API_2_ENH_CPRVS_BSS_1.scr

Test Applet: API_2_ENH_CPRVS_BSS_1.java

Load Script: API_2_ENH_CPRVS_BSS_1.ldr

Clean-up Script: API_2_ENH_CPRVS_BSS_1.clr

6.2.4.13.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Search TLV 02h**		
	`compareValue() with a null compareBuffer`	NullPointerException is thrown	
2	**Search TLV 0Bh**		

	compareOffset ≥ compareBuffer.length
	`compareBuffer.length = 5`
	`compareOffset = 5`
	`compareLength = 1`
		ArrayIndexOutOfBoundsException is thrown	

3	**compareOffset < 0**
	`compareBuffer.length = 5`
	`compareOffset = -1`
	`compareLength = 1`
		ArrayIndexOutOfBoundsException is thrown	

4	**compareLength >compareBuffer.length**
	`compareBuffer.length = 5`
	`compareOffset = 0`
	`compareLength = 6`
		ArrayIndexOutOfBoundsException is thrown	

5	**compareOffset + compareLength >compareBuffer.length**
	`compareBuffer.length = 5`
	`compareOffset = 3`
	`compareLength = 3`
		ArrayIndexOutOfBoundsException is thrown	

6	**compareLength < 0**
	`compareBuffer.length = 5`
	`compareOffset = 0`
	`compareLength = -1`
		ArrayIndexOutOfBoundsException is thrown	

7	**Search TLV 06h**		

	valueOffset ≥ TLV Length
	`valueOffset = 6`
	`compareBuffer.length = 15`
	`compareOffset = 0`
	`compareLength = 1`
		ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

8	**valueOffset < 0**
	`valueOffset = -1`
	`compareBuffer.length = 15`
	`compareOffset = 0`
	`compareLength = 1`
		ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

9	**compareLength > TLV length**
	`valueOffset = 0`
	`compareBuffer.length = 15`
	`compareOffset = 0`
	`compareLength = 7`
		ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

10	**valueOffset + compareLength > TLV length**
	`valueOffset = 2`
	`compareBuffer.length = 15`
	`compareOffset = 0`
	`compareLength = 5`
		ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

11	**Search TLV 01h**	Result is TLV_NOT_FOUND	
	`compareValue()`	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
12	**Search TLV 06h**		

	Initialise compareBuffer
	`compareBuffer =`
	`81 11 22 33 44 F5`		

	Compare buffers
	`valueOffset = 0`
	`compareOffset = 0`
	`compareLength = 6`
		Result is 00h	

13	**Initialise compareBuffer**
	`compareBuffer =`
	`7F 11 22 33 44 F5`		

	Compare buffers with same parameters	Result is -1	

14	**Initialise compareBuffer**
	`compareBuffer =`
	`83 11 22 33 44 F5`		

	Compare buffers with same parameters	Result is -1	

15	**Initialise compareBuffer**
	`compareBuffer =`
	`55 55 55 81 11 22 33 44 F5`
	`55 55 55 55 55`		

	Compare buffers
	`valueOffset = 1`
	`compareOffset = 4`
	`compareLength = 5`
		Result is 00h	

16	**Initialise compareBuffer**
	`compareBuffer =`
	`55 55 55 81 10 22 33 44 F5`
	`55 55 55 55 55`		

	Compare buffers with same parameters	Result is +1	

17	**Initialise compareBuffer**
	`compareBuffer =`
	`55 55 55 81 12 22 33 44 F5`
	`55 55 55 55 55`		

	Compare buffers with same parameters	Result is -1	

18	**Successful call, compareValue with length** `=0`
	`CompareBuffer.length = 15`
	`CompareOffset = 15`
	`CompareLength = 0`
		Result of compareValue() is 0	

6.2.4.13.4 Test Coverage

CRR number	Test case number
N1	12, 15
N2	13, 16, 18
N3	14, 17
P1	1
P2	2, 3, 4, 5, 6
P3	7, 8, 9, 10
C1	Does not apply for EnvelopeHandler
C2	11

6.2.4.14 sim.tookit.EnvelopeHandler.findAndCopyValue_1

Test Area Reference: API_2_ENH_FACYB_BS

6.2.4.14.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short findAndCopyValue(byte tag,
                              byte[] dstBuffer,
                            short dstOffset)
throws  java.lang.NullPointerException,
java.lang.ArrayIndexOutOfBoundsException,
                              ToolkitException
```

Normal execution

CRRN1: looks for the first occurrence of a TLV element from the beginning of a TLV list and copy its value into a destination buffer.

CRRN2: if no TLV element is found, the UNAVAILABLE_ELEMENT exception is thrown and the current TLV is no longer defined.

CRRN3: if the method is successful then the corresponding TLV becomes current and dstOffset + length of the copied value is returned.

CRRN4: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if dstBuffer is null NullPointerException shall be thrown.

CRRP2: if dstOffset would cause access outside array bounds ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.4.14.3 Test Suite files

Specific triggering: None

Test Script: API_2_ENH_FACYB_BS_1.scr

Test Applet: API_2_ENH_FACYB_BS_1.java

Load Script: API_2_ENH_FACYB_BS_1.ldr

Clean-up Script: API_2_ENH_FACYB_BS_1.clr

6.2.4.14.3 Test procedure

Id	Description	API Expectation	APDU Expectation
	Fill the SMS PP with TLV: Tag 02 Value 22 44 Tag 33, Length C4 Value 01 02 …		
1	**FindAndCopyValue() with a null dstBuffer**	NullPointerException is thrown	
2	**dstOffset ≥ dstBuffer.length** tag = 06h dstBuffer.length = 06 dstOffset = 06	ArrayIndexOutOfBoundsException is thrown	
3	**dstOffset < 0** dstBuffer.length = 06 dstOffset = -1	ArrayIndexOutOfBoundsException is thrown	
4	**length > dstBuffer.length** dstBuffer.length = 05 dstOffset = 0	ArrayIndexOutOfBoundsException is thrown	
5	**DstOffset + length >dstBuffer.length** DstBuffer.length = 06 DstOffset = 1	ArrayIndexOutOfBoundsException is thrown	
6	**Select a TLV (tag 02h)**		
	findAndCopyValue() tag = 03h	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
	Call the getValueLength() method	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	
7	**Successful call** Tag = 06h DstBuffer.length = 06 DstOffset = 0	Result of findAndCopyValue () is 0006	
8	**Compare buffer** buffer = 81 11 22 33 44 F5	Result is 00h	
9	**initialise dstBuffer** dstBuffer = 55 55 … 55		
	Successful call dstBuffer.length = 12 dstOffset = 2	Result of findAndCopyValue () is 0008	
10	**Compare buffer** buffer = 55 55 81 11 22 33 44 F5 55 55 55 55	Result is 00h	
11	**Successful call** tag = 02h dstBuffer.length = 2	Result of findAndCopyValue () is 0002	

	dstOffset = 0		
12	**Compare buffer** buffer = 83 81	Result is 00h	
13	**Successful call (with tag 82h)** tag = 82h dstBuffer.length = 02 dstOffset = 0	Result of findAndCopyValue () is 0002	
14	**Compare buffer** buffer = 83 81	Result is 00h	
15	**Successful call (with tag B3h)** tag = B3h dstBuffer.length = C4 dstOffset = 0	Result of findAndCopyValue () is 00C4	
16	**Compare buffer** buffer = 01 02 … C4	Result is 00h	

6.2.4.14.4 Test Coverage

CRR number	Test case number
N1	8, 10, 12
N2	6
N3	7, 9, 11
N4	13, 14, 15, 16
P1	1
P2	2, 3, 4, 5
C1	Does not apply for EnvelopeHandler

6.2.4.15 sim.tookit.EnvelopeHandler.findAndCopyValue_2

Test Area Reference: API_2_ENH_FACYBS_BSS

6.2.4.15.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short findAndCopyValue(byte tag,
                              byte occurence,
                              short valueOffset,
                              byte[] dstBuffer,
                              short dstOffset,
                              short dstLength)
                        throws java.lang.NullPointerException,
java.lang.ArrayIndexOutOfBoundsException,
                              ToolkitException
```

Normal execution

CRRN1: looks for the indicated occurrence of a TLV element from the beginning of a TLV list and copy its value into a destination buffer.

CRRN2: if no TLV element is found, the UNAVAILABLE_ELEMENT exception is thrown and the current TLV is no longer defined.

CRRN3: if the method is successful then the corresponding TLV becomes current and dstOffset + dstLength is returned.

CRRN4: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if dstBuffer is null NullPointerException shall be thrown.

CRRP2: if dstOffset or dstLength or both would cause access outside array bounds, or if dstLength is negative ArrayIndexOutOfBoundsException shall be thrown.

CRRP3: if valueOffset, dstLength or both are out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.4.15.3 Test Suite files

Test Script: API_2_ENH_FACYBS_BSS_1.scr

Test Applet: API_2_ENH_FACYBS_BSS_1.java

Load Script: API_2_ENH_FACYBS_BSS_1.ldr

Clean-up Script: API_2_ENH_FACYBS_BSS_1.clr

6.2.4.15.3 Test procedure

Id	Description	API Expectation	APDU Expectation
	Fill the SMS PP with TLV: Tag 02 Value 22 44 Tag 33, Length C4 Value 01 02 …		
1	**findAndCopyValue() with a null dstBuffer**	NullPointerException is thrown	

2	**dstOffset ≥ dstBuffer.length**
	`tag = 06h, occurrence = 1`
	`valueOffset = 0`
	`dstBuffer.length = 5`
	`dstOffset = 5`
	`dstLength = 1`
		ArrayIndexOutOfBoundsException is thrown	

3	**dstOffset < 0**
	`dstBuffer.length = 5`
	`dstOffset = -1`
	`dstLength = 1`
		ArrayIndexOutOfBoundsException is thrown	

4	**dstLength >dstBuffer.length**
	`dstBuffer.length = 5`
	`dstOffset = 0`
	`dstLength = 6`
		ArrayIndexOutOfBoundsException is thrown	

5	**dstOffset + dstLength >dstBuffer.length**
	`dstBuffer.length = 5`
	`dstOffset = 3`
	`dstLength = 3`
		ArrayIndexOutOfBoundsException is thrown	

6	**dstLength < 0**
	`dstBuffer.length = 5`
	`dstOffset = 0`
	`dstLength = -1`
		ArrayIndexOutOfBoundsException is thrown	

7	**valueOffset ≥ Value Length**
	`tag = 06h, occurrence = 1`
	`valueOffset = 6`
	`dstBuffer.length = 15`
	`dstOffset = 0`
	`dstLength = 1`
		ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

8	**valueOffset < 0**
	`valueOffset = -1`
	`dstBuffer.length = 15`
	`dstOffset = 0`
	`dstLength = 1`
		ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

9	**dstLength > Value length**
	`valueOffset = 0`
	`dstBuffer.length = 15`
	`dstOffset = 0`
	`dstLength = 7`
		ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

10	**valueOffset + dstLength > Text String** `length`
	`valueOffset = 2`
	`dstBuffer.length = 15`
	`dstOffset = 0`
	`dstLength = 5`
		ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

11	**Select a TLV (tag 02h)**		
	findAndCopyValue()	ToolkitException.UNAVAILABLE	

	tag = 06h occurrence = 2	_ELEMENT is thrown	
	Call the getValueLength() method	ToolkitException.UNAVAILABLE _ELEMENT is thrown.	
12	**Successful call** tag = 06h, occurrence = 1 valueOffset = 0 dstBuffer.length = 06 dstOffset = 0 dstLength = 06	Result of findAndCopyValue() is 6	
13	**Compare buffer** buffer = 81 11 22 33 44 F5	Result is 00h	
14	**initialise dstBuffer** dstBuffer = 55 55 … 55		
	Successful call tag = 06h, occurrence = 1 valueOffset = 2 dstBuffer.length = 12 dstOffset = 3 dstLength = 04	Result of findAndCopyValue () is 0007	
15	**Compare buffer** buffer = 55 55 55 22 33 44 F5 55 55 55 55 55	Result is 00h	
16	**Successful call** tag = 02h, occurrence = 1 valueOffset = 0 dstBuffer.length = 12 dstOffset = 0 dstLength = 2	Result of findAndCopyValue() is 0002	
17	**Compare buffer** buffer = 83 81 55 … 55	Result is 00h	
18	**Successful call** tag = 02h, occurrence = 2 valueOffset = 0 dstBuffer.length = 12 dstOffset = 0 dstLength = 2	Result of findAndCopyValue() is 0002	
19	**Compare buffer** buffer = 22 44 55 … 55	Result is 00h	
20	**Successful call (with tag 82h)** tag = 82h occurrence = 1 valueOffset = 0 dstBuffer.length = 12 dstOffset = 0 dstLength = 02	Result of findAndCopyValue () is 0002	
21	**Compare buffer** buffer = 83 81 55 … 55	Result is 00h	
22	**Successful call (with tag 82h)** tag = 82h occurrence = 2 valueOffset = 0 dstBuffer.length = 12 dstOffset = 0 dstLength = 02	Result of findAndCopyValue () is 0002	
23	**Compare buffer** Buffer = 22 44 55 … 55	Result is 00h	
24	**Successful call, findAndCopyValue with length =0** DstBuffer.length = 12 dstOffset = 12 dstLength = 0	Result of findAndCopyValue () is 12	

6.2.4.15.4 Test Coverage

CRR number	Test case number
N1	13, 15, 17, 19
N2	11
N3	12, 14, 16, 18, 24
N4	20, 21, 22, 23
P1	1
P2	2, 3, 4, 5, 6
P3	7, 8, 9, 10
C1	Does not apply for EnvelopeHandler

6.2.4.16 sim.tookit.EnvelopeHandler.findAndCompareValue_1

Test Area Reference: API_2_ENH_FACRB_BS

6.2.4.16.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte findAndCompareValue(byte tag,
                                byte[] compareBuffer,
                                short compareOffset)
throws  java.lang.NullPointerException,
java.lang.ArrayIndexOutOfBoundsException,
                         ToolkitException
```

Normal execution

Looks for the first occurrence of a TLV element from beginning of a TLV list and compare its value with a buffer:

CRRN1: if no TLV element is found, the UNAVAILABLE_ELEMENT exception is thrown and the current TLV is no longer defined.

CRRN2: if the method is successful then the corresponding TLV becomes current.

CRRN3: if identical returns 0.

CRRN4: if the first miscomparing byte in simple TLV is less than that in compareBuffer returns -1.

CRRN5: if the first miscomparing byte in simple TLV is greater than that in compareBuffer returns 1.

CRRN6: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if compareBuffer is null NullPointerException shall be thrown.

CRRP2: if compareOffset would cause access outside array bounds ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.4.16.3 Test Suite files

Test Script: API_2_ENH_FACRB_BS_1.scr

Test Applet: API_2_ENH_FACRB_BS_1.java

Load Script: API_2_ENH_FACRB_BS_1.ldr

Clean-up Script: API_2_ENH_FACRB_BS_1.clr

6.2.4.16.3 Test procedure

Id	Description	API Expectation	APDU Expectation
	Fill the SMS PP with TLV: Tag 02 Value 22 44 Tag 33, Length C4 Value 01 02 …		
1	**findAndCompareValue() with a null dstBuffer**	NullPointerException is thrown	
2	**compareOffset ≥ compareBuffer.length** tag = 06h compareBuffer.length = 12 compareOffset = 12	ArrayIndexOutOfBoundsException is thrown	
3	**compareOffset < 0** compareBuffer.length = 12 compareOffset = -1	ArrayIndexOutOfBoundsException is thrown	
4	**length > compareBuffer.length** compareBuffer.length = 05 compareOffset = 0	ArrayIndexOutOfBoundsException is thrown	
5	**compareOffset + length > compareBuffer.length** compareBuffer.length = 12 compareOffset = 7	ArrayIndexOutOfBoundsException is thrown	
6	**Select a TLV (tag 02h)**		
	findAndCompareValue() tag = 03h	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
	Call the getValueLength() method	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	
7	**Initialise compareBuffer** compareBuffer = 81 11 22 33 44 F5		
	Compare buffers tag = 06h compareOffset = 0	Result is 00h	
8	**Verify current TLV** getValueLength()	Result is 06	
9	**Initialise compareBuffer** compareBuffer = 81 11 22 33 44 F4		
	Compare buffers with same parameters	Result is +1	
10	**Initialise compareBuffer** compareBuffer = 81 11 22 33 44 F6		
	Compare buffers with same parameters	Result is -1	
11	**Initialise compareBuffer** compareBuffer = 55 55 81 11 22 33 44 F5 55 55 55 55		
	Compare buffers compareOffset = 2	Result is 00h	
12	**Initialise compareBuffer** compareBuffer = 55 55 83 81 55 55 55 55 55 55 55 55		
	Compare buffers compareOffset = 2	Result is 00h	
13	**Initialise compareBuffer** compareBuffer = 55 55 83 80 55 55 55 55 55 55 55 55		
	Compare buffers compareOffset = 2	Result is +1	
14	**Initialise compareBuffer** compareBuffer = 55 55 83 82 55 55 55 55 55 55 55 55		
	Compare buffers compareOffset = 2	Result is -1	
15	**Initialise compareBuffer** compareBuffer = 83 81 55 55 55 55 55 55 55 55 55 55		
	Successful call (with tag 02h) tag = 02h compareBuffer.length = 12 compareOffset = 0	Result is 00h	
16	**Initialise compareBuffer** CompareBuffer = 01 02 … C4		
	Successful call (with tag B3h) Tag = B3h	Result is 00h	

	CompareBuffer.length = C4 CompareOffset = 0		

6.2.4.16.4 Test Coverage

CRR number	Test case number
N1	6
N2	8
N3	7, 11, 12
N4	9, 13
N5	10, 14
N6	15, 16
P1	1
P2	2, 3, 4, 5
C1	Does not apply for EnvelopeHandler

6.2.4.17 sim.tookit.EnvelopeHandler.findAndCompareValue_2

Test Area Reference: API_2_ENH_FACRBBS_BSS

6.2.4.17.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte findAndCompareValue(byte tag,
                                byte occurence,
                                short valueOffset,
                                byte[] compareBuffer,
                                short compareOffset,
                                short compareLength)
                         throws java.lang.NullPointerException,
java.lang.ArrayIndexOutOfBoundsException,
                                ToolkitException
```

Normal execution

Looks for the indicated occurrence of a TLV element from the beginning of a TLV list and compare its value with a buffer:

CRRN1: if no TLV element is found, the UNAVAILABLE_ELEMENT exception is thrown and the current TLV is no longer defined.

CRRN2: if the method is successful then the corresponding TLV becomes current.

CRRN3: if identical 0 is returned.

CRRN4: if the first miscomparing byte in simple TLV is less than that in compareBuffer -1 is returned.

CRRN5: if the first miscomparing byte in simple TLV is greater than that in compareBuffer 1 is returned

CRRN6: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if compareBuffer is null NullPointerException shall be thrown.

CRRP2: if compareOffset or compareLength or both would cause access outside array bounds, or if compareLength is negative ArrayIndexOutOfBoundsException shall be thrown.

CRRP3: if valueOffset, compareLength or both are out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

CRRP4: if an input parameter is not valid (e.g. occurence = 0) an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException BAD_INPUT_PARAMETER.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.4.17.3 Test Suite files

Test Script: API_2_ENH_FACRBBS_BSS_1.scr

Test Applet: API_2_ENH_FACRBBS_BSS_1.java

Load Script: API_2_ENH_FACRBBS_BSS_1.ldr

Clean-up Script: API_2_ENH_FACRBBS_BSS_1.clr

6.2.4.17.3 Test procedure

Id	Description	API Expectation	APDU Expectation
	Fill the SMS PP with TLV: Tag 02 Value 22 44 Tag 33, Length C4 Value 01 02 …		
1	**findAndCompareValue() with a null compareBuffer**	NullPointerException is thrown	
2	**compareOffset ≥ compareBuffer.length** tag = 06h, occurrence = 1 valueOffset = 0 compareBuffer.length = 6 compareOffset = 6 compareLength = 1	ArrayIndexOutOfBoundsException is thrown	
3	**compareOffset < 0** compareBuffer.length = 6 compareOffset = -1 compareLength = 1	ArrayIndexOutOfBoundsException is thrown	
4	**compareLength >compareBuffer.length** compareBuffer.length = 5 compareOffset = 0 compareLength = 6	ArrayIndexOutOfBoundsException is thrown	
5	**compareOffset + compareLength >compareBuffer.length** compareBuffer.length = 5 compareOffset = 3 compareLength = 3	ArrayIndexOutOfBoundsException is thrown	
6	**compareLength < 0** compareBuffer.length = 5 compareOffset = 0 compareLength = -1	ArrayIndexOutOfBoundsException is thrown	
7	**valueOffset ≥ Value Length** tag = 06h, occurrence = 1 valueOffset = 6 compareBuffer.length = 15 compareOffset = 0 compareLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
8	**valueOffset < 0** valueOffset = -1 compareBuffer.length = 15 compareOffset = 0 compareLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
9	**compareLength > Value length** valueOffset = 0 compareBuffer.length = 15 compareOffset = 0 compareLength = 7	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
10	**valueOffset + compareLength > Value length** valueOffset = 2 compareBuffer.length = 15 compareOffset = 0 compareLength = 5	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
11	**Invalid parameter** occurrence = 0	ToolkitException.BAD_INPUT_PARAMETER is thrown	
12	**Select a TLV (tag 02h)**		
	findAndCompareValue() tag = 06h	ToolkitException.UNAVAILABLE_ELEMENT is thrown	

	occurrence = 2		
	Call the getValueLength() method	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	
13	**Initialise compareBuffer** compareBuffer = 81 11 22 33 44 F5		
	findAndCompareValue() tag = 06h, occurrence = 1 valueOffset = 0 compareOffset = 0 compareLength = 6	Result is 00h	
14	**Verify current TLV** getValueLength()	Result is 0006	
15	**Initialise compareBuffer** compareBuffer = 81 11 22 33 44 F4		
	Compare buffers with same parameters	Result is +1	
16	**Initialise compareBuffer** compareBuffer = 81 11 22 33 44 F6		
	Compare buffers with same parameters	Result is -1	
17	**Initialise compareBuffer** compareBuffer = 55 55 55 22 33 44 F5 55 55 55 55		
	Compare buffers valueOffset = 2 compareOffset = 3 compareLength = 4	Result is 00h	
18	**Initialise compareBuffer** compareBuffer = 55 55 55 22 33 45 F5 55 55 55 55		
	Compare buffers with same parameters	Result is -1	
19	**Initialise compareBuffer** compareBuffer = 55 55 55 22 33 43 F5 55 55 55 55		
	Compare buffers with same parameters	Result is +1	
20	**Initialise compareBuffer** compareBuffer = 83 81 55 55 55 55 55 55 55 55 55 55		
	findAndCompareValue() tag = 02h, occurrence = 1 valueOffset = 0 compareOffset = 0 compareLength = 2	Result is 00h	
21	**Initialise compareBuffer** compareBuffer = 22 44 55 55 55 55 55 55 55 55 55 55		
	findAndCompareValue() tag = 02h, occurrence = 2 valueOffset = 0 compareOffset = 0 compareLength = 2	Result is 00h	
22	**Initialise compareBuffer** compareBuffer = 22 45 55 55 55 55 55 55 55 55 55 55		
	findAndCompareValue() tag = 02h, occurrence = 2 valueOffset = 0 compareOffset = 0 compareLength = 2	Result is -1	
23	**Initialise compareBuffer** compareBuffer = 83 81 55 55 55 55 55 55 55 55 55 55		
	Successful call (with tag 02h) tag = 02h, occurrence = 1 valueOffset = 0 compareBuffer.length = 12 compareOffset = 0 compareLength = 2	Result is 00h	
24	**Initialise compareBuffer** compareBuffer = 01 02 … C4		
	Successful call (with tag B3h) tag = B3h, occurrence = 1 valueOffset = 0 compareBuffer.length = 00C4 compareOffset = 0	Result is 00h	

	compareLength = 00C4		
25	**Successful call, findAndCompareValue with length =0** DstBuffer.length = C4 DstOffset = C4 DstLength = 0	Result of findAndCompareValue() is 00h	

6.2.4.17.4 Test Coverage

CRR number	Test case number
N1	12
N2	14
N3	13, 17, 20, 21, 25
N4	19, 15
N5	16, 18, 22
N6	23, 24
P1	1
P2	2, 3, 4, 5, 6
P3	7, 8, 9, 10
P4	11
C1	Does not apply for EnvelopeHandler

6.2.5 Class EnvelopeResponseHandler

6.2.5.1 sim.tookit.EnvelopeResponseHandler.getTheHandler_1

Test Area Reference: API_2_ERH_GTHD

6.2.5.1.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
public static EnvelopeResponseHandler getTheHandler()
                                        throws ToolkitException
```

Normal execution

CRRN1: The method shall return the single system instance of the EnvelopeResponseHandler class.

CRRN2: The EnvelopeResponseHandler is a Temporary JCRE Entry Point Object (see Javacard 2.1 Runtime Environment (JCRE) Specification [12])

Parameter errors

Context errors

CRRC1: The method shall thrown ToolkitException (HANDLER_NOT_AVAILABLE) if the handler is busy.

CRRC2: After the first invocation of the ProactiveHandler.send method the EnvelopeResponseHandler is no more available

6.2.5.1.2 Test suite files

Test Script: API_2_ERH_GTHD_1.scr

Test Applet: API_2_ERH_GTHD_1.java

Load Script: API_2_ERH_GTHD_1.ldr

Clean-up Script: API_2_ERH_GTHD_1.clr

6.2.5.1.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**getTheHandler twice**	The returned objects shall be the same	
2	**Verify that getTheHandler returns an EnvelopeHandler** `getTheHandler`	The reference returned shall be an EnvelopeResponseHandler (checkcast)	
3	**Verify the returned value is not null** `getTheHandler`	The reference returned shall not be null.	
4	**getTheHandler, then send a proactive command, and then, appendTLV**	ToolkitException HANDLER_NOT_AVAILABLE is thrown	

6.2.5.1.4 Test Coverage

CRR number	Test case number
N1	1, 2, 3
N2	To be checked in Framework tests and insert here cross reference
C1	To be checked in Framework tests and insert here cross reference
C2	4

6.2.5.2 sim.tookit.EnvelopeResponseHandler.post_1

Test Area Reference:API_2_ERH_POSTB

6.2.5.2.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public void post(byte statusType)
          throws ToolkitException
```

Normal execution

CRRN1: When the method is called, the toolkit applet can continue it's processing (e.g. prepare a proactive command).

CRRN2: The byte statusType is SW1 of the status.

CRRN3: If the send method is called after a post method, the posted data are the first sent to the ME.

CRRN4: The SIM Toolkit Framework shall take the optional Application Data posted by the triggered toolkit applet if present, secure and send the response packet the SIM Toolkit Framework will return the response APDU defined by the toolkit applet.

Parameter error

Context errors

CRRC1: The method shall thrown ToolkitException (HANDLER_NOT_AVAILABLE) if the handler is busy.

6.2.5.2.2 Test suite files

Test Script: API_2_ERH_POSTB_1.scr

All SMS PP sent to the applet are not securedwith SPI = 0800

Test Applet: API_2_ERH_POSTB_1.java

Load Script: API_2_ERH_POSTB_1.ldr

Clean-up Script: API_2_ERH_POSTB_1.clr

6.2.5.2.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**getTheHandler and then post** (the handler is empty)		9000
2	**Fill the handler (appendTLV to have** bytes in it)and then post data with status 9F		9FFD data are retrieved with GET RESPONSE command
3	**Verify that after a post the handler is no more available** appendTLV, post and then appendTLV	ToolkitException HANDLER_NOT_AVAILABLE is thrown on the second appendTLV	
4	**construct the response (appendTLV with 0x10 data) and post it with status 9E and then send a display text**		9E12 and posted data retrieved by a GET RESPONSE with status 9113 and display text retrieved by a FETCH
5	**Verify that it is possible to send a proactive command after a post** getTheHandler and post , then send a display text		91 13 and display text is retrieved by a FETCH
6	**Verify it is not possible to post after a proactive command** getTheHandler, appendTLV, send a display text, post.	ToolkitException HANDLER_NOT_AVAILABLE is thrown	
7	**Verify that the handler is no more available after a post** getTheHandler, appendTLV, post with status 9E, post with status 9F	ToolkitException HANDLER_NOT_AVAILABLE is thrown	9E12 and posted data retrieved by a GET RESPONSE

6.2.5.2.4 Test Coverage

CRR number	Test case number
N1	3, 4, 7
N2	1, 2, 4, 7
N3	4, 5
N4	To be checked in Framework tests and insert here cross reference
C1	6

6.2.5.3 sim.tookit.EnvelopeResponseHandler.postAsBERTLV_1

Test Area Reference:API_2_ERH_POSTBB

6.2.5.3.1 Conformance Requirement

The method with following header shall be compliant to its definition in the API.

```
public void postAsBERTLV(byte statusType,
                         byte tag)
                  throws ToolkitException
```

Normal execution

CRRN1: When the method is called, the toolkit applet can continue it's processing (e.g. prepare a proactive command) the SIM Toolkit Framework will return the response APDU defined by the toolkit applet.

CRRN2: The byte statusType is SW1 of the status

CRRN3: If the send method is called after a postAsBERTLV method, the posted data are the first sent to the ME.

CRRN4: The byte tag is the BER Tag at the beginning of the simple TLV list.

Parameter errors

Context errors

CRRC1: The method shall thrown ToolkitException (HANDLER_NOT_AVAILABLE) if the handler is busy.

6.2.5.3.2 Test suite files

Specific triggering: Call control

Test Script: API_2_ERH_POSTBB_1.scr

Test Applet: API_2_ERH_POSTBB_1.java

Load Script: API_2_ERH_POSTBB_1.ldr

Clean-up Script: API_2_ERH_POSTBB_1.clr

6.2.5.3.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**getTheHandler and then postAsBERTLV** (the handler is empty)		9F02 data are retrieved with GET RESPONSE command, the tag shall be 33 and the length is 00
2	**Fill the handler and then postAsBERTLV the data with status 9F, and tag 33**		9FFF data are retrieved with GET RESPONSE command, the tag shall be 33
3	**appendTLV, postAsBERTLV and then appendTLV**	ToolkitException HANDLER_NOT_AVAILABLE is thrown on the second appendTLV	
4	**construct the response (appendTLV with 0x10 data) and postAsBERTLV it with status 9E, tag 75 and then send a display text**		9E14 and posted data retrieved by a GET RESPONSE the tag shall be 75 with status 9113 and display text retrieved by a FETCH
5	**getTheHandler and postAsBERTLV, then send a display text**		9E02 and posted data retrieved by a GET RESPONSE the tag 33 (and the length 00) with status 9113 and display text is retrieved by a FETCH
6	**Verify it is not possible to postAsBERTLV after a proactive command** getTheHandler, appendTLV, send a display text, postAsBERTLV.	ToolkitException HANDLER_NOT_AVAILABLE is thrown on the postAsBERTLV	
7	**Verify that the handler is no more available after a postAsBERTLV** getTheHandler, appendTLV(with data length = 0x10, postAsBERTLV with status 9E, tag 56, postAsBERTLV with status 9F, tag 28	ToolkitException HANDLER_NOT_AVAILABLE is thrown on the second postAsBERTLV	9E14 and posted data retrieved by a GET RESPONSE the tag shall be 56 with status 9000

6.2.5.3.4 Test Coverage

CRR number	Test case number
N1	3, 4, 7
N2	1, 2, 4, 7
N3	4, 5
N4	2, 4, 7
C1	6

6.2.5.4 Method getLength

Test Area Reference: API_2_ERH_GLEN

6.2.5.4.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short getLength()
                    throws ToolkitException
```

Normal execution

CRRN1: returns the length in bytes of the TLV list.

Parameter errors

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException.HANDLER_NOT_AVAILABLE.

6.2.5.4.3 Test Suite files

Test Script: API_2_ERH_GLEN_1.scr

Test Applet: API_2_ERH_GLEN_1.java

Load Script: API_2_ERH_GLEN_1.ldr

Clean-up Script: API_2_ERH_GLEN_1.clr

6.2.5.4.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Clear the handler** `getLength()`	Result of getLength() is 0	
2	**appendTLV with length of 7** `getLength()`	Result of getLength() is 9	
3	**Clear the handler and appendTLV with Length of 253** `getLength()`	Result of getLength() is 256	
4	**Build a 7Fh Envelope response handler** `getLength()`	Result of getLength() is 81h	
5	**Build a 80h Envelope response handler** `getLength()`	Result of getLength() is 83h	

6.2.5.4.4 Test Coverage

CRR number	Test case number
N1	1, 2, 3, 4,5
C1	Does not apply for Envelope response handler

6.2.5.5 Method copy

Test Area Reference: API_2_ERH_COPY_BSS

6.2.5.5.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short copy(byte[] dstBuffer,
short dstOffset,
```

```
short dstLength)
                throws java.lang.NullPointerException,
                       java.lang.ArrayIndexOutOfBoundsException,
                       ToolkitException
```

Normal execution

CRRN1: copies the simple TLV list contained in the handler to the destination byte array.

CRRN2: returns dstOffset + dstLength.

Parameter errors

CRRP1: if dstBuffer is null a NullPointerException is thrown.

CRRP2: if dstOffset or dstLength or both would cause access outside array bounds, or if dstLength is negative, an ArrayIndexOutOfBoundsException is thrown.

CRRP3: if dstLength is greater than the length of the simple TLV List, an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException. OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.5.5.3 Test Suite files

Test Script: API_2_ERH_COPY_BSS_1.scr

Test Applet: API_2_ERH_COPY_BSS_1.java

Load Script: API_2_ERH_COPY_BSS_1.ldr

Clean-up Script: API_2_ERH_COPY_BSS_1.clr

6.2.5.5.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**NULL as parameter to dstBuffer**	NullPointerException is thrown	
2	**appendTLV with value length of 7**		
	dstOffset ≥ dstBuffer.length dstBuffer.length = 5 dstOffset = 5 dstLength = 1	ArrayIndexOutOfBoundsException is thrown	
3	**dstOffset < 0** dstBuffer.length = 5 dstOffset = -1 dstLength = 1	ArrayIndexOutOfBoundsException is thrown	
4	**dstLength > dstBuffer.length** dstBuffer.length = 5 dstOffset = 0 dstLength = 6	ArrayIndexOutOfBoundsException is thrown	
5	**dstOffset + dstLength > dstBuffer.length** dstBuffer.length = 5 dstOffset = 3 dstLength = 3	ArrayIndexOutOfBoundsException is thrown	
6	**dstLength < 0** dstBuffer.length = 5 dstOffset = 0 dstLength = -1	ArrayIndexOutOfBoundsException is thrown	
7	**dstLength > length of the simple TLV list** dstBuffer.length = 10 dstOffset = 0 dstLength = 10	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
8	**Successful call, dstBuffer is the whole buffer** dstBuffer.length = 9 dstOffset = 0 dstLength = 9	Result of copy() is 9	
9	**Compare the buffer**	Result of arrayCompare() is 0	
10	**Successful call, dstBuffer is part of a buffer** dstBuffer.length = 15 dstOffset = 3 dstLength = 9	Result of copy() is 12	
11	**Compare the whole buffer**	Result of arrayCompare() is 0	
12	**Successful call, dstBuffer is part of a buffer** dstBuffer.length = 15 dstOffset = 3 dstLength = 6	Result of copy() is 9	
13	**Compare the whole buffer**	Result of arrayCompare() is 0	
14	**Successful call, copy with length =0** dstBuffer.length = 15 dstOffset = 15 dstLength = 0	Result of copy() is 15	

6.2.5.5.4 Test Coverage

CRR number	Test case number
N1	9, 11, 13
N2	8, 10, 12, 14
P1	1
P2	2, 3, 4, 5, 6
P3	7
C1	Does not apply for Envelope response handler

6.2.5.6 Method findTLV

Test Area Reference: API_2_ERH_FINDBB

6.2.5.6.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte findTLV(byte tag, byte occurrence)
               throws ToolkitException
```

Normal execution

Looks for the indicated occurrence of a TLV element from the beginning of the TLV list (handler buffer):

CRRN1: the method is successful if the required occurrence exists then the corresponding TLV becomes current.

CRRN2: if the method is successful then it returns TLV_FOUND_CR_SET when Comprehension Required flag is set.

CRRN3: if the method is successful then it returns TLV_FOUND_CR_NOT_SET when Comprehension Required flag is not set.

CRRN4: if the required occurrence of the TLV element does not exist, the current TLV is no longer defined and TLV_NOT_FOUND is returned.

CRRN5: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if an input parameter is not valid (e.g. occurrence = 0) an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException BAD_INPUT_PARAMETER.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.5.6.3 Test Suite files

Test Script: API_2_ERH_FINDBB_1.scr

Test Applet: API_2_ERH_FINDBB_1.java

Load Script: API_2_ERH_FINDBB_1.ldr

Clean-up Script: API_2_ERH_FINDBB_1.clr

6.2.5.6.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**append the handler with TLVs:** 81 03 11 22 33 82 02 99 77		
	Invalid input parameter Occurrence = 0	ToolkitException.BAD_INPUT_PARAMETER is thrown	
2			
	Search 1st TLV Tag = 01h Occurrence = 1	Result is TLV_FOUND_CR_SET	
3	**Call the getValueLength() method**	Result is 03h	
4	**Search 2nd TLV** Tag = 02h Occurrence = 1	Result is TLV_FOUND_CR_SET	
5	**Call the getValueLength() method**	Result is 02h	
6	**Select a TLV (tag 02h)**		
	Search a wrong tag Tag = 03h Occurrence = 1	Result is TLV_NOT_FOUND	

7	**Call the getValueLength() method**	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	
8	**Search a tag with wrong occurrence** Tag = 01h Occurrence = 2	Result is TLV_NOT_FOUND	
9	**Call the getValueLength() method**	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	
10	**Append a TLV with tag=02h**		
	Search the TLV Tag = 02h Occurrence = 2	Result is TLV_FOUND_CR_NOT_SET	
11	**Append a TLV with tag=04h**		
	Search the TLV Tag = 04h Occurrence = 1	Result is TLV_FOUND_CR_NOT_SET	
12	**Search tag 81h** Tag = 81h Occurrence = 1	Result is TLV_FOUND_CR_SET	
13	**Search tag 84h** Tag = 84h Occurrence = 1	Result is TLV_FOUND_CR_NOT_SET	

6.2.5.6.4 Test Coverage

CRR number	Test case number
N1	3, 5
N2	2, 4
N3	10, 11
N4	6, 7,8, 9
N5	12, 13
P1	1
C1	Does not apply for Envelope response handler

6.2.5.7 Method getValueLength

Test Area Reference: API_2_ERH_GVLE

6.2.5.7.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short getValueLength()
                    throws ToolkitException
```

Normal execution

CRRN1: gets and returns the binary length of the value field for the last TLV element which has been found in the handler.

Parameter errors

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

CRRC2: in case of unavailable TLV element an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException UNAVAILABLE_ELEMENT.

6.2.5.7.3 Test Suite files

Test Script: API_2_ERH_GVLE_1.scr

Test Applet: API_2_ERH_GVLE_1.java

Load Script: API_2_ERH_GVLE_1.ldr

Clean-up Script: API_2_ERH_GVLE_1.clr

6.2.5.7.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**appendTLV 02 02 02 02 findTLV with TAG 03**		
	getValueLength()	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
2	**appendTLV with TAG 0D and length 00**		
	Search TLV 0Dh		
	`getValueLength()`	Result is 00h	
3	**Clear the handler and append TLV with TAG 0D and length 02**		
	Search TLV 0Dh		
	`getValueLength()`	Result is 02h	
4	**Clear the handler and append TLV with TAG 0D and length 0x7F**		
	Search TLV 0Dh		
	getValueLength()	Result is 7Fh	
5	**Clear the handler and append TLV with TAG 0D and length 0x80**		
	Search TLV 0Dh		
	`getValueLength()`	Result is 80h	
6	**Clear the handler and append TLV with TAG 0D and length 0xF1**		
	Search TLV 0Dh		
	`getValueLength()`	Result is F1h	

6.2.5.7.4 Test Coverage

CRR number	Test case number
N1	2, 3, 4, 5, 6
C1	Does not apply for EnvelopeResponseHandler
C2	1

6.2.5.8 Method getValueByte

Test Area Reference: API_2_ERH_GVBYS

6.2.5.8.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte getValueByte(short valueOffset)
                  throws ToolkitException
```

Normal execution

CRRN1: Gets a byte from the last TLV element which has been found in the handler and returns its value (1 byte).

Parameter errors

CRRP1: if valueOffset is out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

CRRC2: in case of unavailable TLV element an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException UNAVAILABLE_ELEMENT.

6.2.5.8.3 Test Suite files

Test Script: API_2_ERH_GVBYS_1.scr

Test Applet: API_2_ERH_GVBYS_1.java

Load Script: API_2_ERH_GVBYS_1.ldr

Clean-up Script: API_2_ERH_GVBYS_1.clr

6.2.5.8.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**appendTLV 82 02 81 82, appendTLV 81 03 11 22 FE findTLV with TAG 03**		
	`getValueByte(0)`	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
2	**Search TLV 01h**		
	`getValueByte(3)`	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
3	**Search TLV 01h**		
	`getValueByte(2)`	Result is FEh	
4	**Search TLV 02h**		
	`getValueByte(0)`	Result is 81h	
5	**appendTLV with TAG 0D, Length 0x7E, Value: 00, 01, ..., 7D**		
	`getValueByte(7D)`	Result is 7Dh	
6	**clear the handler, appendTLV with TAG 0D, Length 0x80, Value: 00, 01, ..., 7F**		
	`getValueByte(7E)`	Result is 7Eh	
7	`getValueByte(7F)`	Result is 7Fh	
8	**clear the handler, appendTLV with TAG 0D, Length 0xF1, Value: 00, 01, ..., F0**		
	`getValueByte(F0)`	Result is F0h	

6.2.5.8.4 Test Coverage

CRR number	Test case number
N1	3, 4, 5, 6, 7, 8
P1	2
C1	Does not apply for EnvelopeResponseHandler
C2	1

6.2.5.9 Method copyValue

Test Area Reference: API_2_ERH_CPYVS_BSS

6.2.5.9.1 Conformance requirement

The method with following header shall be compliant with its definition in the API.

```
public short copyValue(short valueOffset,
                           byte[] dstBuffer,
                           short dstOffset,
                           short dstLength)
                    throws java.lang.NullPointerException,
                           java.lang.ArrayIndexOutOfBoundsException,
                           ToolkitException
```

Normal execution

CRRN1: copies a part of the last TLV element which has been found, into a destination. buffer.

CRRN2: returns dstOffset + dstLength.

Parameter errors

CRRP1: if dstBuffer is null NullPointerException is thrown.

CRRP2: if dstOffset or dstLength or both would cause access outside array bounds, or if dstLength is negative ArrayIndexOutOfBoundsException is thrown.

CRRP3: if valueOffset, dstLength or both are out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

CRRC2: in case of unavailable TLV element an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException UNAVAILABLE_ELEMENT.

6.2.5.9.3 Test Suite files

Test Script: API_2_ERH_CPYVS_BSS_1.scr

Test Applet: API_2_ERH_CPYVS_BSS_1.java

Load Script: PI_2_ERH_CPYVS_BSS_1.ldr

Clean-up Script: PI_2_ERH_CPYVS_BSS_1.clr

6.2.5.9.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Initialise the handler** **Select a TLV**		
	copyValue() with a null dstBuffer	NullPointerException is thrown	
2	**appendTLV with TAG: 0D and length 16** **Select Text String TLV**		
	dstOffset ≥ dstBuffer.length dstBuffer.length = 5 dstOffset = 5 dstLength = 1	ArrayIndexOutOfBoundsException is thrown	
3	**dstOffset < 0** dstBuffer.length = 5 dstOffset = -1 dstLength = 1	ArrayIndexOutOfBoundsException is thrown	
4	**dstLength >dstBuffer.length** dstBuffer.length = 5 dstOffset = 0 dstLength = 6	ArrayIndexOutOfBoundsException is thrown	
5	**dstOffset + dstLength >dstBuffer.length** dstBuffer.length = 5 dstOffset = 3 dstLength = 3	ArrayIndexOutOfBoundsException is thrown	
6	**dstLength < 0** dstBuffer.length = 5 dstOffset = 0 dstLength = -1	ArrayIndexOutOfBoundsException is thrown	
7	**clear the handler, appendTLV with TAG: 0D and length 6** **Select Text String TLV**		
	valueOffset ≥ Text String Length valueOffset = 6 dstBuffer.length = 15 dstOffset = 0 dstLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
8	**valueOffset < 0** valueOffset = -1 dstBuffer.length = 15 dstOffset = 0 dstLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
9	**dstLength > Text String length** valueOffset = 0 dstBuffer.length = 15 dstOffset = 0 dstLength = 7	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
10	**valueOffset + dstLength > Text String length** valueOffset = 2 dstBuffer.length = 15 dstOffset = 0 dstLength = 5	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
11	**Initialise the handler**		
	copyValue()	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
12	**clear the handler, appendTLV with TAG: 0D and value: 04 00 01 … 0F** **Select Text String TLV**		
	Successful call valueOffset = 0 dstBuffer.length = 17 dstOffset = 0 dstLength = 17	Result of copyValue() is 17	
13	**Compare buffer** buffer = 04 00 01 … 0F	Result is 00h	
14	**initialise dstBuffer** dstBuffer = 55 55 … 55		
	Successful call valueOffset = 2 dstBuffer.length = 20 dstOffset = 3 dstLength = 12	Result of copyValue() is 15	

15	**Compare buffer** buffer = 55 55 55 01 02 03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55	Result is 00h	
16	**Successful call, copyValue with length =0** dstBuffer.length = 20 dstOffset = 20 dstLength = 0	Result of copyValue() is 20	

6.2.5.9.4 Test Coverage

CRR number	Test case number
N1	13, 15
N2	12, 14, 16
P1	1
P2	2, 3, 4, 5, 6
P3	7, 8, 9, 10
C1	Does not apply for EnvelopeResponseHandler
C2	11

6.2.5.10 Method compareValue

Test Area Reference: API_2_ERH_CPRVS_BSS

6.2.5.10.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte compareValue(short valueOffset,
                         byte[] compareBuffer,
                         short compareOffset,
                         short compareLength)
                  throws java.lang.NullPointerException,
                         java.lang.ArrayIndexOutOfBoundsException,
                         ToolkitException
```

Normal execution

Compares the last found TLV element with a buffer:

CRRN1: returns 0 if identical.

CRRN2: returns -1 if the first miscomparing byte in simple TLV List is less than that in compareBuffer.

CRRN3: returns 1 if the first miscomparing byte in simple TLV List is greater than that in compareBuffer.

Parameter errors

CRRP1: if compareBuffer is null NullPointerException shall be thrown.

CRRP2: if compareOffset or compareLength or both would cause access outside array bounds, or if compareLength is negative ArrayIndexOutOfBoundsException shall be thrown.

CRRP3: if valueOffset, dstLength or both are out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

CRRC2: in case of unavailable TLV element an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException UNAVAILABLE_ELEMENT.

6.2.5.10.3 Test Suite files

Test Script: API_2_ERH_CPRVS_BSS_1.scr

Test Applet: API_2_ERH_CPRVS_BSS_1.java

Load Script: API_2_ERH_CPRVS_BSS_1.ldr

Clean-up Script: API_2_ERH_CPRVS_BSS_1.clr

6.2.5.10.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Initialise the handler** **Select a TLV**		
	compareValue() with a null compareBuffer	NullPointerException is thrown	
2	**appendTLV with TAG: 0D and length 16** **Select Text String TLV**		

	compareOffset ≥ compareBuffer.length
	`compareBuffer.length = 5`
	`compareOffset = 5`
	`compareLength = 1`
		ArrayIndexOutOfBoundsException is thrown	

3	**compareOffset < 0**
	`compareBuffer.length = 5`
	`compareOffset = -1`
	`compareLength = 1`
		ArrayIndexOutOfBoundsException is thrown	

4	**compareLength >compareBuffer.length**
	`compareBuffer.length = 5`
	`compareOffset = 0`
	`compareLength = 6`
		ArrayIndexOutOfBoundsException is thrown	

5	**compareOffset + compareLength >compareBuffer.length**
	`compareBuffer.length = 5`
	`compareOffset = 3`
	`compareLength = 3`
		ArrayIndexOutOfBoundsException is thrown	

6	**compareLength < 0**
	`compareBuffer.length = 5`
	`compareOffset = 0`
	`compareLength = -1`
		ArrayIndexOutOfBoundsException is thrown	

7	**appendTLV with TAG: 0D and length 6** **Select Text String TLV**		

	valueOffset ≥ Text String Length
	`valueOffset = 6`
	`compareBuffer.length = 15`
	`compareOffset = 0`
	`compareLength = 1`
		ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

8	**valueOffset < 0**
	`valueOffset = -1`
	`compareBuffer.length = 15`
	`compareOffset = 0`
	`compareLength = 1`
		ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

9	**compareLength > Text String length**
	`valueOffset = 0`
	`compareBuffer.length = 15`
	`compareOffset = 0`
	`compareLength = 7`
		ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

10	**valueOffset + compareLength > Text String length**
	`valueOffset = 2`
	`compareBuffer.length = 15`
	`compareOffset = 0`
	`compareLength = 5`
		ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

11	**Initialise the handler**		
	`compareValue()`	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
12	**appendTLV with TAG: 0D and value: 04 00 01 … 0F**		

	Select Text String TLV		
	Initialise compareBuffer compareBuffer = 04 00 01 … 0F		
	Compare buffers valueOffset = 0 compareOffset = 0 compareLength = 17	Result is 00h	
13	**Initialise compareBuffer** compareBuffer = 04 00 01 02 03 04 05 06 07 08 05 0A 0B 0C 0D 0E 10		
	Compare buffers with same parameters	Result is -1	
14	**Initialise compareBuffer** compareBuffer = 03 00 01 … 0F		
	Compare buffers with same parameters	Result is +1	
15	**Initialise compareBuffer** compareBuffer = 55 55 55 01 02 03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55		
	Compare buffers valueOffset = 2 compareOffset = 3 compareLength = 12	Result is 00h	
16	**Initialise compareBuffer** compareBuffer = 55 55 55 02 01 03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55		
	Compare buffers with same parameters	Result is -1	
17	**Initialise compareBuffer** compareBuffer = 55 55 55 01 02 03 04 05 06 07 08 09 0A 0A 0D 55 55 55 55 55		
	Compare buffers with same parameters	Result is +1	
18	**Successful call, compareValue with length =0** compareBuffer.length = 15 compareOffset = 15 compareLength = 0	Result of compareValue() is 0	

6.2.5.10.4 Test Coverage

CRR number	Test case number
N1	12, 15, 18
N2	13, 16
N3	14, 17
P1	1
P2	2, 3, 4, 5, 6
P3	7, 8, 9, 10
C1	Does not apply for EnvelopeResponseHandler
C2	11

6.2.5.11 Method findAndCopyValue(byte tag, byte[] dstBuffer, short valueOffset)

Test Area Reference: API_2_ERH_FACYB_BS

6.2.5.11.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short findAndCopyValue(byte tag,
                                byte[] dstBuffer,
                               short dstOffset)
throws  java.lang.NullPointerException,
java.lang.ArrayIndexOutOfBoundsException,
                               ToolkitException
```

Normal execution

CRRN1: looks for the first occurrence of a TLV element from the beginning of a TLV list and copy its value into a destination buffer.

CRRN2: if no TLV element is found, the UNAVAILABLE_ELEMENT exception is thrown and the current TLV is no longer defined.

CRRN3: if the method is successful then the corresponding TLV becomes current and dstOffset + length of the copied value is returned.

CRRN4: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if dstBuffer is null NullPointerException shall be thrown.

CRRP2: if dstOffset would cause access outside array bounds ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.5.11.3 Test Suite files

Test Script: API_2_ERH_FACYB_BS_1.scr

Test Applet: API_2_ERH_FACYB_BS_1.java

Load Script: API_2_ERH_FACYB_BS_1.ldr

Clean-up Script: API_2_ERH_FACYB_BS_1.clr

6.2.5.11.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Initialise the handler**		
	findAndCopyValue() with a null dstBuffer	NullPointerException is thrown	
2	**appendTLV with TAG: 0D and length 16** **Select Text String TLV**		

	dstOffset ≥ dstBuffer.length
	`tag = 0Dh`
	`dstBuffer.length = 20`
	`dstOffset = 20`
		ArrayIndexOutOfBoundsException is thrown	

3	**dstOffset < 0**
	`dstBuffer.length = 20`
	`dstOffset = -1`
		ArrayIndexOutOfBoundsException is thrown	

4	**dstOffset + length >dstBuffer.length**
	`dstBuffer.length = 20`
	`dstOffset = 5`
		ArrayIndexOutOfBoundsException is thrown	

5	**length > dstBuffer.length**
	`dstBuffer.length = 15`
	`dstOffset = 0`
		ArrayIndexOutOfBoundsException is thrown	

6	**clear the handler, appendTLV with TAG 02 and Length 02**		
	Select a TLV (tag 02h)		
	`findAndCopyValue()` `tag = 03h`	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
	Call the getValueLength() method	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	
7	**appendTLV with TAG: 0D and value: 04 00 01 … 0F**		

	Successful call
	`Tag = 0Dh`
	`dstBuffer.length = 17`
	`dstOffset = 0`
		Result of findAndCopyValue() is 17	

8	**Compare buffer** `buffer = 04 00 01 … 0F`	Result is 00h	
9	**initialise dstBuffer** `dstBuffer = 55 55 … 55`		

	Successful call
	`dstBuffer.length = 20`
	`dstOffset = 2`
		Result of findAndCopyValue() is 19	

10	**Compare buffer**
	`buffer =`
	`55 55 04 00 01`
	`02 03 04 05 06`
	`07 08 09 0A 0B`
	`0C 0D 0E 0F 55`
		Result is 00h	

11	**clear the handler, appendTLV with TAG: 0D and value: 04 00 01 … 0F**		
	append a 2nd Text String TLV		

	Successful call
	`tag = 0Dh`
	`dstBuffer.length = 17`
	`dstOffset = 0`
		Result of findAndCopyValue() is 17	

12	**Compare buffer** `buffer = 04 00 01 … 0F`	Result is 00h	
13	**clear the handler, appendTLV with TAG: 0D and value: 04 00 01 … 0F**		

	Successful call (with tag 8Dh)
	`tag = 8Dh`
	`dstBuffer.length = 17`
	`dstOffset = 0`
		Result of findAndCopyValue() is 17	

14	**Compare buffer** `buffer = 04 00 01 … 0F`	Result is 00h	
15	**Append tag 0Fh** `buffer = 00 01 … 0F`		

	Successful call (with tag 8Fh)
	`tag = 8Fh`
	`dstBuffer.length = 16`
	`dstOffset = 0`
		Result of findAndCopyValue() is 16	

16	**Compare buffer** `buffer = 00 01 … 0F`	Result is 00h	

6.2.5.11.4 Test Coverage

CRR number	Test case number
N1	8, 10, 12
N2	6
N3	7, 9, 11
N4	13, 14, 15, 16
P1	1
P2	2, 3, 4, 5
C1	Does not apply for EnvelopeResponseHandler

6.2.5.12 Method findAndCopyValue(byte tag, byte occurrence, short valueOffset, byte[] dstBuffer, short dstOffset, short dstLength)

Test Area Reference: API_2_ERH_FACYBBS_BSS

6.2.5.12.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short findAndCopyValue(byte tag,
                              byte occurrence,
                            short valueOffset,
                            byte[] dstBuffer,
                            short dstOffset,
                            short dstLength)
                     throws java.lang.NullPointerException,
                         java.lang.ArrayIndexOutOfBoundsException,
                            ToolkitException
```

Normal execution

CRRN1: looks for the indicated occurrence of a TLV element from the beginning of a TLV list and copy its value into a destination buffer.

CRRN2: if no TLV element is found, the UNAVAILABLE_ELEMENT exception is thrown and the current TLV is no longer defined.

CRRN3: if the method is successful then the corresponding TLV becomes current and dstOffset + dstLength is returned.

CRRN4: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if dstBuffer is null NullPointerException shall be thrown.

CRRP2: if dstOffset or dstLength or both would cause access outside array bounds, or if dstLength is negative ArrayIndexOutOfBoundsException shall be thrown.

CRRP3: if valueOffset, dstLength or both are out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.5.12.3 Test Suite files

Test Script: API_2_ERH_FACYBBS_BSS_1.scr

Test Applet: API_2_ERH_FACYBBS_BSS_1.java

Load Script: API_2_ERH_FACYBBS_BSS_1.ldr

Clean-up Script: API_2_ERH_FACYBBS_BSS_1.clr

6.2.5.12.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Initialise the handler**		
	findAndCopyValue() with a null dstBuffer	NullPointerException is thrown	
2	**appendTLV with TAG: 0D and length 16**		
	dstOffset ≥ dstBuffer.length `tag = 0Dh, occurrence = 1`	ArrayIndexOutOfBoundsExceptio n is thrown	

	valueOffset = 0 dstBuffer.length = 5 dstOffset = 5 dstLength = 1		
3	**dstOffset < 0** dstBuffer.length = 5 dstOffset = -1 dstLength = 1	ArrayIndexOutOfBoundsException is thrown	
4	**dstLength >dstBuffer.length** dstBuffer.length = 5 dstOffset = 0 dstLength = 6	ArrayIndexOutOfBoundsException is thrown	
5	**dstOffset + dstLength >dstBuffer.length** dstBuffer.length = 5 dstOffset = 3 dstLength = 3	ArrayIndexOutOfBoundsException is thrown	
6	**dstLength < 0** dstBuffer.length = 5 dstOffset = 0 dstLength = -1	ArrayIndexOutOfBoundsException is thrown	
7	**appendTLV with TAG: 0D and length 6**		
	valueOffset ≥ Text String Length tag = 0Dh, occurrence = 1 valueOffset = 6 dstBuffer.length = 15 dstOffset = 0 dstLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
8	**valueOffset < 0** valueOffset = -1 dstBuffer.length = 15 dstOffset = 0 dstLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
9	**dstLength > Text String length** valueOffset = 0 dstBuffer.length = 15 dstOffset = 0 dstLength = 7	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
10	**valueOffset + dstLength > Text String length** valueOffset = 2 dstBuffer.length = 15 dstOffset = 0 dstLength = 5	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
11	**clear the handler, appendTLV with TAG 02 and Length 02**		
	Select a TLV (tag 02h)		
	findAndCopyValue() tag = 0Dh occurrence = 2	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
	Call the getValueLength() method	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	
12	**clear the handler and appendTLV with TAG: 0D and value: 04 00 01 … 0F**		
	Successful call tag = 0Dh, occurrence = 1 valueOffset = 0 dstBuffer.length = 17 dstOffset = 0 dstLength = 17	Result of findAndCopyValue() is 17	
13	**Compare buffer** buffer = 04 00 01 … 0F	Result is 00h	
14	**initialise dstBuffer** dstBuffer = 55 55 … 55		
	Successful call tag = 0Dh, occurrence = 1 valueOffset = 2 dstBuffer.length = 20 dstOffset = 3 dstLength = 12	Result of findAndCopyValue() is 15	
15	**Compare buffer** buffer = 55 55 55 01 02 03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55	Result is 00h	

16	**Append a Text String TLV** tag = 0D buffer = 00 11 22 33 44 55 (no specific DCS byte)		
	Successful call tag = 0Dh, occurrence = 1 valueOffset = 0 dstBuffer.length = 20 dstOffset = 0 dstLength = 17	Result of findAndCopyValue() is 17	
17	**Compare buffer** buffer = 04 00 01 … 0F	Result is 00h	
18	**Successful call** tag = 0Dh, occurrence = 2 valueOffset = 0 dstBuffer.length = 6 dstOffset = 0 dstLength = 6	Result of findAndCopyValue() is 6	
19	**Compare buffer** buffer = 00 11 22 33 44 55	Result is 00h	
20	**clear the handler and appendTLV with TAG: 0D and value: 04 00 01 … 0F**		
	Successful call (with tag 8Dh) tag = 8Dh occurrence = 1 valueOffset = 0 dstBuffer.length = 17 dstOffset = 0 dstLength = 17	Result of findAndCopyValue () is 17	
21	**Compare buffer** buffer = 04 00 01 … 0F	Result is 00h	
22	**Append tag 0Fh** buffer = 00 01 … 0F		
	Successful call (with tag 8Fh) tag = 8Fh occurrence = 1 valueOffset = 0 dstBuffer.length = 16 dstOffset = 0 dstLength = 16	Result of findAndCopyValue () is 16	
23	**Compare buffer** buffer = 00 01 … 0F	Result is 00h	
24	**Successful call, findAndCopyValue with length =0** dstBuffer.length = 16 dstOffset = 16 dstLength = 0	Result of findAndCopyValue () is 16	

6.2.5.12.4 Test Coverage

CRR number	Test case number
N1	13, 15, 17, 19
N2	11
N3	12, 14, 16, 18, 24
N4	20, 21, 22, 23
P1	1
P2	2, 3, 4, 5, 6
P3	7, 8, 9, 10
C1	Does not apply for EnvelopeResponseHandler

6.2.5.13 Method findAndCompareValue(byte tag, byte[] compareBuffer, short compareOffset)

Test Area Reference: API_2_ERH_FACRB_BS

6.2.5.13.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte findAndCompareValue(byte tag,
                                byte[] compareBuffer,
                                short compareOffset)
            throws  java.lang.NullPointerException,
                    java.lang.ArrayIndexOutOfBoundsException,
                        ToolkitException
```

Normal execution

Looks for the first occurrence of a TLV element from beginning of a TLV list and compare its value with a buffer:

CRRN1: if no TLV element is found, the UNAVAILABLE_ELEMENT exception is thrown and the current TLV is no longer defined.

CRRN2: if the method is successful then the corresponding TLV becomes current.

CRRN3: if identical returns 0.

CRRN4: if the first miscomparing byte in simple TLV is less than that in compareBuffer returns -1.

CRRN5: if the first miscomparing byte in simple TLV is greater than that in compareBuffer returns 1.

CRRN6: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if compareBuffer is null NullPointerException shall be thrown.

CRRP2: if compareOffset would cause access outside array bounds ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.5.13.3 Test Suite files

Test Script: API_2_ERH_FACRB_BS_1.scr

Test Applet: API_2_ERH_FACRB_BS_1.java

Load Script: API_2_ERH_FACRB_BS_1.ldr

Clean-up Script: API_2_ERH_FACRB_BS_1.clr

6.2.5.13.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Initialise the handler**		
	findAndCompareValue() with a null dstBuffer	NullPointerException is thrown	
2	**appendTLV with TAG: 0D and length 16**		

	compareOffset ≥ compareBuffer.length
	`tag = 0Dh`
	`compareBuffer.length = 20`
	`compareOffset = 20`
		ArrayIndexOutOfBoundsException is thrown	

3	**compareOffset < 0**
	`compareBuffer.length = 20`
	`compareOffset = -1`
		ArrayIndexOutOfBoundsException is thrown	

4	**compareOffset + length > compareBuffer.length** `compareBuffer.length = 20`	ArrayIndexOutOfBoundsException is thrown	

	compareOffset = 5		
5	**length > compareBuffer.length** compareBuffer.length = 15 compareOffset = 0	ArrayIndexOutOfBoundsException is thrown	
6	**clear the handler, appendTLV with TAG 02 and Length 02**		
	Select a TLV (tag 02h)		
	findAndCompareValue() tag = 03h	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
7	**Verify current TLV** getValueLength()	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	
8	**clear the handler and appendTLV with TAG: 0D and value: 04 00 01 … 0F**		
	Initialise compareBuffer compareBuffer = 04 00 01 … 0F		
	Compare buffers tag = 0Dh compareOffset = 0	Result is 00h	
9	**Verify current TLV** getValueLength()	Result is 17	
10	**Initialise compareBuffer** compareBuffer = 04 00 01 … 10		
	Compare buffers with same parameters	Result is -1	
11	**Initialise compareBuffer** compareBuffer = 03 00 01 … 0F		
	Compare buffers with same parameters	Result is +1	
12	**Initialise compareBuffer** compareBuffer = 55 55 04 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 55		
	Compare buffers compareOffset = 2	Result is 00h	
13	**append a Text String TLV** tag = 0Dh buffer = 00 11 22 33 44 55		
	Initialise compareBuffer compareBuffer = 55 55 04 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 55		
	Compare buffers compareOffset = 2	Result is 00h	
14	**Initialise compareBuffer** compareBuffer = 55 55 04 01 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 55		
	Compare buffers compareOffset = 2	Result is -1	
15	**Initialise compareBuffer** compareBuffer = 55 55 04 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0D 10 55		
	Compare buffers compareOffset = 2	Result is +1	
16	**clear the handler and appendTLV with TAG: 0D and value: 04 00 01 … 0F**		
	Initialise compareBuffer compareBuffer = 04 00 01 … 0F		
	Successful call (with tag 8Dh) tag = 8Dh compareBuffer.length = 17 compareOffset = 0	Result is 00h	

17	**Append tag 0Fh** `buffer = 00 01 … 0F`		
	Initialise compareBuffer `compareBuffer = 00 01 … 0F`		

	Successful call (with tag 8Fh)
	`tag = 8Fh`
	`compareBuffer.length = 16`
	`compareOffset = 0`
		Result is 00h	

6.2.5.13.4 Test Coverage

CRR number	Test case number
N1	6,7
N2	7,9
N3	8, 13, 12
N4	10, 14
N5	11, 15
N6	17, 16
P1	1
P2	2, 3, 4, 5
C1	Does not apply for Envelope response handler

6.2.5.14 Method findAndCompareValue(byte tag, byte occurrence, short valueOffset, byte[] compareBuffer, short compareOffset, short compareLength)

Test Area Reference: API_2_ERH_FACRBBS_BSS

6.2.5.14.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte findAndCompareValue(byte tag,
                                byte occurrence,
                                short valueOffset,
                                byte[] compareBuffer,
                                short compareOffset,
                                short compareLength)
                         throws java.lang.NullPointerException,
                                java.lang.ArrayIndexOutOfBoundsException,
                               ToolkitException
```

Normal execution

Looks for the indicated occurrence of a TLV element from the beginning of a TLV list and compare its value with a buffer:

CRRN1: if no TLV element is found, the UNAVAILABLE_ELEMENT exception is thrown and the current TLV is no longer defined.

CRRN2: if the method is successful then the corresponding TLV becomes current.

CRRN3: if identical 0 is returned.

CRRN4: if the first miscomparing byte in simple TLV is less than that in compareBuffer -1 is returned.

CRRN5: if the first miscomparing byte in simple TLV is greater than that in compareBuffer 1 is returned

CRRN6: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if compareBuffer is null NullPointerException shall be thrown.

CRRP2: if compareOffset or compareLength or both would cause access outside array bounds, or if compareLength is negative ArrayIndexOutOfBoundsException shall be thrown.

CRRP3: if valueOffset, compareLength or both are out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

CRRP4: if an input parameter is not valid (e.g. occurrence = 0) an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException BAD_INPUT_PARAMETER.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.5.14.3 Test Suite files

Test Script: API_2_ERH_FACRBBS_BSS_1.scr

Test Applet: API_2_ERH_FACRBBS_BSS_1.java

Load Script: API_2_ERH_FACRBBS_BSS_1.ldr

Clean-up Script: API_2_ERH_FACRBBS_BSS_1.clr

6.2.5.14.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Initialise the handler**		
	findAndCompareValue() with a null compareBuffer	NullPointerException is thrown	
2	**clear the handler and appendTLV with TAG: 0D and value: 04 00 01 … 0F**		
	compareOffset ≥ compareBuffer.length tag = 0Dh, occurrence = 1 valueOffset = 0 compareBuffer.length = 5 compareOffset = 5 compareLength = 1	ArrayIndexOutOfBoundsException is thrown	
3	**compareOffset < 0** compareBuffer.length = 5 compareOffset = -1 compareLength = 1	ArrayIndexOutOfBoundsException is thrown	
4	**compareLength >compareBuffer.length** compareBuffer.length = 5 compareOffset = 0 compareLength = 6	ArrayIndexOutOfBoundsException is thrown	
5	**compareOffset + compareLength >compareBuffer.length** compareBuffer.length = 5 compareOffset = 3 compareLength = 3	ArrayIndexOutOfBoundsException is thrown	
6	**compareLength < 0** compareBuffer.length = 5 compareOffset = 0 compareLength = -1	ArrayIndexOutOfBoundsException is thrown	
7	**clear the handler and appendTLV with TAG and length of 6**		
	valueOffset ≥ Text String Length tag = 0Dh, occurrence = 1 valueOffset = 6 compareBuffer.length = 15 compareOffset = 0 compareLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
8	**valueOffset < 0** valueOffset = -1 compareBuffer.length = 15 compareOffset = 0 compareLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

9	**compareLength > Text String length** valueOffset = 0 compareBuffer.length = 15 compareOffset = 0 compareLength = 7	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
10	**valueOffset + compareLength > Text String length** valueOffset = 2 compareBuffer.length = 15 compareOffset = 0 compareLength = 5	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
11	**Invalid parameter** occurrence = 0	ToolkitException.BAD_INPUT_PARAMETER is thrown	
12	**appendTLV with TAG 02 and length 02**		
	Select a TLV (tag 02h)		
	findAndCompareValue() tag = 0Dh occurrence = 2	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
13	**Verify current TLV** getValueLength()	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	
14	**clear the handler and appendTLV with TAG: 0D and value: 04 00 01 … 0F**		
	Initialise compareBuffer compareBuffer = 04 00 01 … 0F		
	findAndCompareValue() tag = 0Dh, occurrence = 1 valueOffset = 0 compareOffset = 0 compareLength = 17	Result is 00h	
15	**Verify current TLV** getValueLength()	Result is 17	
16	**Initialise compareBuffer** compareBuffer = 04 00 01 … 10		
	Compare buffers with same parameters	Result is -1	
17	**Initialise compareBuffer** compareBuffer = 03 00 01 … 0F		
	Compare buffers with same parameters	Result is +1	
18	**Initialise compareBuffer** compareBuffer = 55 55 55 01 02 03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55		
	Compare buffers valueOffset = 2 compareOffset = 3 compareLength = 12	Result is 00h	
19	**Initialise compareBuffer** compareBuffer = 55 55 55 02 01 03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55		
	Compare buffers with same parameters	Result is -1	
20	**Initialise compareBuffer** compareBuffer = 55 55 55 01 02 03 04 05 06 07 08 09 0A 0A 0D 55 55 55 55 55		
	Compare buffers with same parameters	Result is +1	
21	**append a Text String TLV** tag = 0Dh buffer = 00 11 22 33 44 55		
	Initialise compareBuffer compareBuffer = 04 00 01 … 0F		
	findAndCompareValue() tag = 0Dh, occurrence = 1 valueOffset = 0	Result is 00h	

	compareOffset = 0 compareLength = 17		
22	**Initialise compareBuffer** compareBuffer = 00 11 22 33 44 55		
	findAndCompareValue() tag = 0Dh, occurrence = 2 valueOffset = 0 compareOffset = 0 compareLength = 6	Result is 00h	
23	**Initialise compareBuffer** compareBuffer = 00 11 22 33 44 66		
	findAndCompareValue() tag = 0Dh, occurrence = 2 valueOffset = 0 compareOffset = 0 compareLength = 6	Result is -1	
24	**clear the handler and appendTLV with TAG: 0D and value: 04 00 01 … 0F**		
	Initialise compareBuffer compareBuffer = 04 00 01 … 0F		
	Successful call (with tag 8Dh) tag = 8Dh, occurrence = 1 valueOffset = 0 compareBuffer.length = 17 compareOffset = 0 compareLength = 17	Result is 00h	
25	**Append tag 0Fh** buffer = 00 01 … 0F		
	Initialise compareBuffer compareBuffer = 00 01 … 0F		
	Successful call (with tag 8Fh) tag = 8Fh, occurrence = 1 valueOffset = 0 compareBuffer.length = 16 compareOffset = 0 compareLength = 16	Result is 00h	
26	**Successful call, findAndCompareValue with length =0** CompareBuffer.length = 16 compareOffset = 16 compareLength = 0	Result of findAndCompareValue () is 00	

6.2.5.14.4 Test Coverage

CRR number	Test case number
N1	12,13
N2	15,13
N3	14, 18, 22, 21, 26
N4	16, 19, 23
N5	17, 19
N6	25, 24
P1	1
P2	2, 3, 4, 5, 6
P3	7, 8, 9, 10
P4	11
C1	Does not apply for EnvelopeResponseHandler

6.2.5.15 Method appendArray

Test Area Reference: API_2_ERH_APDA_BSS

6.2.5.15.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
void appendArray(byte[] buffer, short offset, short length)
        throws  java.lang.NullPointerException,
                java.lang.ArrayIndexOutOfBoundsException,
                ToolkitException
```

Normal execution

CRRN1: appends a buffer into the EditHandler buffer

CRRN2: a successful append does not modify the TLV selected

6.2.5.15.2.2 Parameters error

CRRP1: if buffer is null, a java.lang.NullPointerException is thrown

CRRP2: if offset or length or both would cause access outside the array bounds, or if length is negative, a java.lang.ArrayIndexOutOfBoundsException is thrown.

Context errors

CRRC1: if the EditHandler buffer is too small to append the requested data, a ToolkitException is thrown with reason code HANDLER_OVERFLOW

CRRC2: if the EditHandler buffer is busy, a ToolkitException is thrown with reason code HANDLER_NOT_AVAILABLE

6.2.5.15.2 Test suite files

Test Script: API_2_ERH_APDA_BSS_1.scr

Test Applet: API_2_ERH_APDA_BSS_1.java

Load Script: API_2_ERH_APDA_BSS_1.ldr

Clean-up Script: API_2_ERH_APDA_BSS_1.clr

6.2.5.15.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Null buffer**	NullPointerException is thrown	
2	**offset ≥ buffer.length** buffer.length = 5 offset = 5 length = 1	ArrayIndexOutOfBoundsException is thrown	
3	**offset < 0** buffer.length = 5 offset = -1 length = 1	ArrayIndexOutOfBoundsException is thrown	
4	**length > buffer.length** buffer.length = 5 offset = 0 length = 6	ArrayIndexOutOfBoundsException is thrown	
5	**offset + length > buffer.length** buffer.length = 5 offset = 3 length = 3	ArrayIndexOutOfBoundsException is thrown	
6	**length < 0** buffer.length = 5 offset = 0 length = -1	ArrayIndexOutOfBoundsException is thrown	
7	**Handler overflow** buffer.length = 256 offset = 0 length = 256	ToolkitException.HANDLER_OVERFLOW is thrown	

8	**append the handler with TLVs:** 81 03 11 22 33 82 02 99 77		
	findTLV 0x81		
	Successful call buffer = FF FE … F8 offset = 0 length = 8		
	Verify Current TLV: Call getValueLength()	Result is 03h	
9	**Clear the handler**		
	Successful call buffer = FF FE … F8 offset = 0 length = 8		
	Call copy() method		
	Compare handler compareBuffer = FF FE … F8	Result is 00h	
10	**Successful call** buffer = 00 01 … 07 offset = 2 length = 6		
	Call copy() method		
	Compare handler compareBuffer = FF FE … F8 02 03 … 07	Result is 00h	
11	**Successful call** buffer = 11 22 … 88 offset = 2 length = 4		
	Call copy() method		
	Compare handler compareBuffer = FF FE … F8 02 03 … 07 33 44 55 66	Result is 00h	

6.2.5.15.4 Test Coverage

CRR number	Test case number
N1	9, 10, 11
N2	8
N3	
P1	1
P2	2, 3, 4, 5, 6
C1	7
C2	Does not apply for EnvelopeResponseHandler

6.2.5.16 Method appendTLV(byte tag, byte value)

Test Area Reference: API_2_ERH_APTLBB

6.2.5.16.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
void appendTLV  (byte tag, byte value)
        throws ToolkitException
```

Normal execution

CRRN1: Appends a TLV element to the current TLV list (1-byte element).

CRRN2: A successful append does not modify the TLV selected.

Parameters error

None

Context errors

CRRC1: if the EditHandler buffer is too small to append the requested data, a ToolkitException is thrown with reason code HANDLER_OVERFLOW

CRRC2: if the EditHandler buffer is busy, a ToolkitException is thrown with reason code HANDLER_NOT_AVAILABLE

6.2.5.16.2 Test suite files

Test Script: API_2_ERH_APTLBB_1.scr

Test Applet: API_2_ERH_APTLBB_1.java

Load Script: API_2_ERH_APTLBB_1.ldr

Clean-up Script: API_2_ERH_APTLBB_1.clr

6.2.5.16.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Call appendArray()** `length = 251`		
	Handler Overflow: Call the appendTLV() method	ToolkitException.HANDLER_OVERFLOW is thrown	

2	**append the handler with TLVs:**
	`81 03 11 22 33`
	`82 02 99 77`		

	Select Command Details TLV		
	Call the appendTLV() method		
	Verify Current TLV: Call getValueLength()	Result is 03h	
3	**Clear the handler**		

	Successful call
	`tag = 84h`
	`value = 00h`		

	Call copy() method		
	Compare handler `compareBuffer = 84 01 00`	Result is 00h	

4	**Successful call**
	`tag = 01h`
	`value = FEh`		

	Call copy() method		
	Compare handler `compareBuffer = 84 01 00 01 01 FE`	Result is 00h	

6.2.5.16.4 Test Coverage

CRR number	Test case number
N1	3, 4
N2	2
C1	1
C2	Does not apply for EnvelopeResponseHandler

6.2.5.17 Method appendTLV(byte tag, byte value1, byte value2)

Test Area Reference: API_2_ERH_APTLBBB

6.2.5.17.1 Conformance requirements:

The method with following header shall be compliant to its definition in the API.

```
void appendTLV  (byte tag, byte value1,byte value2)
```

```
throws ToolkitException
```

Normal execution

CRRN1: Appends a TLV element to the current TLV list (2-byte element).

CRRN2: A successful append does not modify the TLV selected.

Parameters error

None

Context errors

CRRC1: if the EditHandler buffer is too small to append the requested data, a ToolkitException is thrown with reason code HANDLER_OVERFLOW

CRRC2: if the EditHandler buffer is busy, a ToolkitException is thrown with reason code HANDLER_NOT_AVAILABLE

6.2.5.17.2 Test suite files

Test Script: API_2_ERH_APTLBBB_1.scr

Test Applet: API_2_ERH_APTL BBB_1.java

Load Script: API_2_ERH_APTL BBB_1.ldr

Clean-up Script: API_2_ERH_APTLBBB_1.clr

6.2.5.17.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Call the appendTLV with length of 253**		
	Handler Overflow: Call the appendTLV() method	ToolkitException.HANDLER_OVERFLOW is thrown	
2	**clear the handler, append the handler with TLVs:** 81 03 11 22 33 82 02 99 77		
	Select Command Details TLV		
	Call the appendTLV() method		
	Verify Current TLV: Call getValueLength()	Result is 03h	
3	**Clear the handler**		
	Successful call tag = 84h value1 = 00h value2 = 01h		
	Call copy() method		
	Compare handler compareBuffer = 84 02 00 01	Result is 00h	
4	**Successful call** tag = 01h value1 = FEh value2 = FDh		
	Call copy() method		
	Compare handler compareBuffer = 84 02 00 01 01 02 FE FD	Result is 00h	

6.2.5.17.4 Test Coverage

CRR number	Test case number
N1	3, 4
N2	2
C1	1
C2	Does not apply for EnvelopeResponseHandler

6.2.5.18 Method appendTLV(byte tag, byte[ ] value, short valueoffset, short valuelength)

Test Area Reference: API_2_ERH_APTLB_BSS

6.2.5.18.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
void appendTLV  (byte tag,
                 byte[] value,
                 short valueoffset,
                 short valuelength)
    throws  java.lang.NullPointerException,
            java.lang.ArrayIndexOutOfBoundsException,
            ToolkitException
```

Normal execution

CRRN1: Appends a TLV element to the current TLV list (byte-array element).

CRRN2: A successful append does not modify the TLV selected.

Parameters error

CRRP1: if value is null, a java.lang.NullPointerException is thrown

CRRP2: if valueoffset or valuelength or both would cause access outside the array bounds, or if length is negative, a java.lang.ArrayIndexOutOfBoundsException is thrown.

Context errors

CRRC1: if the EditHandler buffer is too small to append the requested data, a ToolkitException is thrown with reason code HANDLER_OVERFLOW

CRRC2: if the EditHandler buffer is busy, a ToolkitException is thrown with reason code HANDLER_NOT_AVAILABLE

CRRC3: if valuelength is greater than 255, a ToolkitException is thrown with reason code BAD_INPUT_PARAMETER

6.2.5.18.2 Test suite files

Test Script: API_2_ERH_APTLB_BSS_1.scr

Test Applet: API_2_ERH_APTLB_BSS_1.java

Load Script: API_2_ERH_APTLB_BSS_1.ldr

Clean-up Script: API_2_ERH_APTLB_BSS_1.clr

6.2.5.18.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Null value**	NullPointerException is thrown	
2	**valueOffset ≥ value.length** value.length = 5 valueOffset = 5 valueLength = 1	ArrayIndexOutOfBoundsException is thrown	
3	**valueOffset < 0** value.length = 5 valueOffset = -1 valueLength = 1	ArrayIndexOutOfBoundsException is thrown	
4	**valueLength > value.length** value.length = 5 valueOffset = 0 valueLength = 6	ArrayIndexOutOfBoundsException is thrown	
5	**valueOffset + valueLength > value.length** value.length = 5 valueOffset = 3 valueLength = 3	ArrayIndexOutOfBoundsException is thrown	
6	**valueLength < 0** value.length = 5 valueOffset = 0 valueLength = -1	ArrayIndexOutOfBoundsException is thrown	
7	**Handler overflow** value.length = 254 valueOffset = 0 valueLength = 254	ToolkitException.HANDLER_OVERFLOW is thrown	
8	**Bad parameter** value.length = 256 valueOffset = 0 valueLength = 256	ToolkitException.BAD_INPUT_PARAMETER is thrown	
9	**clear the handler, append the handler with TLVs:** 81 03 11 22 33 82 02 99 77		
	Select Command Details TLV		
	Successful call tag = 04 value = FF FE … F8 valueOffset = 0 valueLength = 8		
	Verify Current TLV: Call getValueLength()	Result is 03h	
10	**Clear the handler**		
	Successful call tag = 04 value = FF FE … F8 valueOffset = 0 valueLength = 8		
	Call copy() method		
	Compare handler compareBuffer = 04 08 FF FE … F8	Result is 00	
11	**Successful call** tag = 85h value = 00 01 … 07 valueOffset = 2 valueLength = 6		
	Call copy() method		
	Compare handler compareBuffer = 04 08 FF FE … F8 85 06 02 03 … 07	Result is 00	
12	**Successful call** tag = 01 value = 11 22 … 88 valueOffset = 2 valueLength = 4		
	Call copy() method		
	Compare handler compareBuffer = 04 08 FF FE … F8 85 06 02 03 … 07 01 04 33 44 55 66	Result is 00	
13	**Clear the handler**		
	Successful call tag = 04		

	value = 00 01 … 7F valueOffset = 0 valueLength = 80h		
	Call copy() method		
	Compare handler compareBuffer = 04 81 80 00 01…7F	Result is 00	

6.2.5.18.4 Test Coverage

CRR number	Test case number
N1	10, 11, 12, 13
N2	9
P1	1
P2	2, 3, 4, 5, 6
C1	7
C2	Does not apply for EnvelopeResponseHandler
C3	8

6.2.5.19 Method appendTLV(byte tag, byte value1, byte[ ] value2, short value2offset, short value2length)

Test Area Reference: API_2_ERH_APTLBB_BSS

6.2.5.19.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
void appendTLV  (byte tag,
                 byte value1
                 byte[] value2,
                 short value2offset,
                 short value2length)
            throws  java.lang.NullPointerException,
                    java.lang.ArrayIndexOutOfBoundsException,
                    ToolkitException
```

Normal execution

CRRN1: Appends a TLV element to the current TLV list (1 byte and a byte-array element).

CRRN2: A successful append does not modify the TLV selected.

Parameters error

CRRP1: if value2 is null, a java.lang.NullPointerException is thrown

CRRP2: if value2offset or value2length or both would cause access outside the array bounds, or if length is negative, a java.lang.ArrayIndexOutOfBoundsException is thrown.

Context errors

CRRC1: if the EditHandler buffer is too small to append the requested data, a ToolkitException is thrown with reason code HANDLER_OVERFLOW

CRRC2: if the EditHandler buffer is busy, a ToolkitException is thrown with reason code HANDLER_NOT_AVAILABLE

CRRC3: if valuelength is greater than 255, a ToolkitException is thrown with reason code BAD_INPUT_PARAMETER

6.2.5.19.2 Test suite files

Test Script: API_2_ERH_APTLVBB_BSS_1.scr

Test Applet: API_2_ERH_APTLVBB_BSS_1.java

Load Script: API_2_ERH_APTLVBB_BSS_1.ldr

Clean-up Script: API_2_ERH_APTLVBB_BSS_1.clr

6.2.5.19.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Null value2**	NullPointerException is thrown	
2	**value2Offset ≥ value2.length** value2.length = 5 value2Offset = 5 value2Length = 1	ArrayIndexOutOfBoundsException is thrown	
3	**value2Offset < 0** value2.length = 5 value2Offset = -1 value2Length = 1	ArrayIndexOutOfBoundsException is thrown	
4	**value2Length > value2.length** value2.length = 5 value2Offset = 0 value2Length = 6	ArrayIndexOutOfBoundsException is thrown	
5	**value2Offset + value2Length > value2.length** value2.length = 5 value2Offset = 3 value2Length = 3	ArrayIndexOutOfBoundsException is thrown	
6	**value2Length < 0** value2.length = 5 value2Offset = 0 value2Length = -1	ArrayIndexOutOfBoundsException is thrown	
7	**Handler overflow** value2.length = 254 value2Offset = 0 value2Length = 254	ToolkitException.HANDLER_OVERFLOW is thrown	
8	**Bad parameter** value2.length = 256 value2Offset = 0 value2Length = 256	ToolkitException.BAD_INPUT_PARAMETER is thrown	
9	**clear the handler, append the handler with TLVs:** 81 03 11 22 33 82 02 99 77		
	Select Command Details TLV		
	Successful call tag = 04 value1 = 05 value2 = FF FE … F8 value2Offset = 0 value2Length = 8		
	Verify Current TLV: Call getValueLength()	Result is 03h	
10	**Clear the handler**		
	Successful call tag = 04 value1 = 05 value2 = FF FE … F8 value2Offset = 0 value2Length = 8		
	Call copy() method		
	Compare handler CompareBuffer = 04 09 05 FF FE … F8	Result is 00	
11	**Successful call** tag = 85h value1 = 55h value2 = 00 01 … 07 value2Offset = 2 value2Length = 6		
	Call copy() method		
	Compare handler	Result is 00	

	compareBuffer = 04 09 05 FF FE … F8 85 07 55 02 03 … 07		
12	**Successful call** tag = 01 value1 = 44h value2 = 11 22 … 88 value2Offset = 2 value2Length = 4		
	Call copy() method		
	Compare handler CompareBuffer = 04 09 05 FF FE … F8 85 07 55 02 03 … 07 01 05 44 33 44 55 66	Result is 00	
13	**Clear the handler**		
	Successful call tag = 04 value1 = 00 value2 = 01 … 7F value2Offset = 0 value2Length = 7Fh		
	Call copy() method		
	Compare handler compareBuffer = 04 81 80 00 01…7F	Result is 00	

6.2.5.19.4 Test Coverage

CRR number	Test case number
N1	10, 11, 12, 13
N2	9
P1	1
P2	2, 3, 4, 5, 6
C1	7
C2	Does not apply for EnvelopeResponseHandler
C3	8

6.2.5.20 Method clear

Test Area Reference: API_2_ERH_CLER

6.2.5.20.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
void clear()
       throws ToolkitException
```

Normal execution

CRRN1: Clears the TLV list of an EditHandler and resets the current TLV selected.

Parameters error

No requirements

Context errors

CRRC1: if the EditHandler buffer is busy, a ToolkitException is thrown with reason code HANDLER_NOT_AVAILABLE

6.2.5.20.2 Test suite files

Test Script: API_2_ERH_CLER_1.scr

Test Applet: API_2_ERH_CLER_1.java

Load Script: API_2_ERH_CLER_1.ldr

Clean-up Script: API_2_ERH_CLER_1.clr

6.2.5.20.3 Test procedure

Id	Description	API Expectation	APDU Expectation

1	**append the handler with TLVs:**
	`81 03 11 22 33`
	`82 02 99 77`
	`Select Command Details TLV`
	`Call the getLength() method`
		Result of getLength() is not null	

	Clear the handler `Call the getLength() method`	Result of getLength() is 0	
2	**Call the getValueLength() method**	ToolkitException.UNAVAILABLE_ELEMENT is thrown	

6.2.5.20.4 Test Coverage

CRR number	Test case number
N1	1, 2
C1	Does not apply for EnvelopeResponseHandler

6.2.6 Class MEProfile

6.2.6.1 Method check (byte index)

Test Area Reference: API_2_MEP_CHECB

6.2.6.1.1 Conformance requirement:

The method with following header shall compliant to its definition in the API.

```
public static boolean check(byte index)
        throws  ToolkitException
```

Normal execution

CRRN1: The method checks a facility in the handset profile: returns true if supported and false if not.

Parameters error

CRRP1: The method shall throw ME_PROFILE_NOT_AVAILABLE ToolkitException if Terminal Profile data are not available

Context errors

None

6.2.6.1.2 Test suite files

No Additional requirements for the GSM personalisation:

Test Script: API_2_MEP_CHECB_1.scr

Test Applet: API_2_MEP_CHECB_1.java

Installation parameter: Terminal Profile = 0x (FF 7F FF FF FF FF FF FF FF FF FF FF FF FF FF FF) (facility index 15 not supported)

Load Script: API_2_MEP_CHECB_1.ldr (the applet is loaded without INI after the reset (RST)

Cleaning Script: API_2_MEP_CHECB_1.clr

6.2.6.1.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**No Terminal Profile is registered** Triggered by formated SMS Index = 1	ME_PROFILE_NOT_AVAILABLE ToolkitException is thrown	
2	**Terminal Profile, Facility is supported** index = 0	true is returned by the method	
3	**Terminal Profile, Facility is not supported** Index = 15	false is returned by the method	

6.2.6.1.4 Test Coverage

CRR number	Test case number
N1	2,3
P1	1

6.2.6.2 Method check (byte [ ] mask, short offset, short length)

Test Area Reference: API_2_MEP_CHEC_BSS

6.2.6.2.1 Conformance requirement:

The method with following header shall compliant to its definition in the API.

```
public static boolean check(byte[] mask,
                            short offset,
                            short length)
              throws  java.lang.NullPointerException,
                      java.lang.ArrayIndexOutOfBoundsException,
                      ToolkitException
```

Normal execution

CRRN1: The method checks all the facilities corresponding to bits set to 1 in the mask buffer: returns true if they are all supported and false if not.

CRRN2: The method returns true if the length to check is 0.

Parameters error

CRRP1: The method shall throw java.lang.NullPointerException if mask is null.

CRRP2: The method shall throw java.lang.ArrayIndexOutOfBoundsException if offset or length or both would cause access outside array bounds.

CRRP3: The method shall throw ME_PROFILE_NOT_AVAILABLE ToolkitException if Terminal Profile data are not available.

Context errors

None

6.2.6.2.2 Test suite files

No Additional requirements for the GSM personalisation:

Test Script: API_2_MEP_CHEC_BSS_1.scr

Test Applet: API_2_MEP_CHEC_BSS_1.java

Installation parameter: Terminal Profile = 0x(FF 7F FF FF FF FF FF FF FF FF FF FF FF FF FF FF) (facility index 15 not supported)

Load Script: API_2_MEP_CHEC_BSS_1.ldr (the applet is loaded without INI after the reset (RST))

Cleaning Script: API_2_MEP_CHEC_BSS_1.clr

6.2.6.2.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**No Terminal Profile is registered** Triggered by formated SMS Mask = 0xFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF7F Offset = 0 Length = 16	ME_PROFILE_NOT_AVAILABLE ToolkitException is thrown	
2	**NULL as parameter to check** mask= NULL	NullPointerException is thrown	
3	**Offset > mask.length** mask = 0xFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF7F Offset = 17	ArrayIndexOutOfBoundsException is thrown	
4	**Offset < 0** mask = 0xFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF7F Offset = -1	ArrayIndexOutOfBoundsException is thrown	
5	**Length > mask.length** mask = 0xFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF7F Offset = 0 Length = 18	ArrayIndexOutOfBoundsException is thrown	
6	**Offset + length > mask.length** Mask = 0xFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF7F Offset = 9 Length = 9	ArrayIndexOutOfBoundsException is thrown	
7	**length = 0** mask = 0xFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF7F Offset = 0 Length = 0	true is returned	
8	**Check all the Terminal Profile** mask = 0xFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF7F Offset = 0 Length = 16	false is returned by the method because facility 15 is not supported	
9	**Check a part of the Terminal Profile** mask = 0xFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF7F Offset = 15 Length = 2	true is returned by the method: the 16 first facilities except facility 15 have been successfully checked	
10	**Check a part of the Terminal Profile** mask = 0x0080 Offset = 0 Length = 2	false is returned by the method only facility 15 is checked and not supported.	

6.2.6.2.4 Test Coverage

CRR number	Test case number
N1	8,9,10
N2	7
P1	2
P2	3,4,5,6
P3	1

6.2.7 Class ProactiveHandler

6.2.7.1 Method getTheHandler

Test Area Reference: API_2_PAH_GTHD

6.2.7.1.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public static ProactiveHandler getTheHandler()
                      throws ToolkitException
```

Normal execution

CRRN1: The method shall return the single system instance of the ProactiveHandler class.

CRRN2: The EnvelopeHandler is a Temporary JCRE Entry Point Object

Parameter errors

Context errors

CRRC1: The method shall throw ToolkitException.HANDLER_NOT_AVAILABLE if the handler is busy.

6.2.7.1.3 Test Suite files

Test Script: API_2_PAH_GTHD_1.scr

Test Applet: API_2_PAH_GTHD_1.java

Load Script: API_2_PAH_GTHD_1.ldr

Clean-up Script: API_2_PAH_GTHD_1.clr

6.2.7.1.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**getTheHandler() twice**	The returned objects shall be the same	
2	**getTheHandler()**	The reference shall be a ProactiveHandler	
3	**getTheHandler()**	The reference shall not be null	

6.2.7.1.4 Test Coverage

CRR number	Test case number
N1	1, 2, 3
N2	To be checked in Framework tests and insert here cross reference
C1	To be checked in Framework tests and insert here cross reference

6.2.7.2 Method init

Test Area Reference: API_2_PAH_INITBBB

6.2.7.2.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public void init(byte type,
                 byte qualifier,
                 byte dstDevice)
```

Normal execution

CRRN1: The init() method initialises the next Proactive command in the ProactiveHandler, with Command details and Device Identities TLV. The source device is always the SIM Card (81h). The Comprehension Required flags are set.

CRRN2: The Command number may take any value between 01h and FEh.

CRRN3: The init() method clears the ProactiveHandler before initialising it.

CRRN4: No TLV is selected after a call to the method.

CRRN5: The handler is not sent to the mobile by the init() method.

Parameter errors

Context errors

6.2.7.2.3 Test Suite files

Test Script: API_2_PAH_INITBBB_1.scr

Test Applet: API_2_PAH_INITBBB_1.java

Load Script: API_2_PAH_INITBBB_1.ldr

Clean-up Script: API_2_PAH_INITBBB_1.clr

6.2.7.2.3 Test procedure

Id	Description	API Expectation	APDU Expectation

1	**Call the init() method**
	`type = 01h`
	`qualifier = 02h`
	`dstDevice = 03h`		

		Verify each simple TLV of the handler by using ViewHandler methods	
2	**Verify the command number value**	01h-FEh	

3	**Call the init() method**
	`type = FFh`
	`qualifier = FEh`
	`destination = FDh`		

		Verify each simple TLV of the handler by using ViewHandler methods	
4	**Select the 1st TLV in the handler** **Call the init() method with any value**		
	Call the getValueLength() method	UNAVAILABLE_ELEMENT ToolkitException is thrown by getValueLength()	

6.2.7.2.4 Test Coverage

CRR number	Test case number
N1	1, 3
N2	2
N3	3
N4	4
N5	1, 3

6.2.7.3 Method initDisplayText

Test Area Reference: API_2_PAH_INDTBB_BSS

6.2.7.3.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public void initDisplayText(byte qualifier,
                            byte dcs,
                            byte[] buffer,
                            short offset,
                            short length)
                     throws java.lang.NullPointerException,
                            java.lang.ArrayIndexOutOfBoundsException,
                            ToolkitException
```

Normal execution

CRRN1: The method shall build a DISPLAY TEXT proactive command in the ProactiveHandler, using qualifier, dcs and buffer parameters. Comprehension required flags are set.

CRRN2: A call to this method clears the handler then initialises it.

CRRN3: No TLV is selected after a call to the method.

CRRN4: The DISPLAY TEXT command is not sent by the method.

CRRN5: The Command Number may take any value between 01h and FEh.

Parameter errors

CRRP1: The method shall throw NullPointerException if buffer is null.

CRRP2: If offset or length or both would cause access outside array bounds, an ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: A ToolkitException.HANDLER_OVERFLOW shall be thrown if the ProactiveHandler is too small to put the requested data.

6.2.7.3.3 Test Suite files

Test Script: API_2_PAH_INDTBB_BSS_1.scr

Test Applet: API_2_PAH_INDTBB_BSS_1.java

Load Script: API_2_PAH_INDTBB_BSS_1.ldr

Clean-up Script: API_2_PAH_INDTBB_BSS_1.clr

6.2.7.3.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**NULL as parameter to buffer** buffer = NULL	NullPointerException is thrown	
2	**offset > buffer.length** buffer = "Text" offset = 5 length = 0	ArrayIndexOutOfBoundsException is thrown	
3	**offset < 0** buffer = "Text" offset = -1	ArrayIndexOutOfBoundsException is thrown	
4	**length > buffer.length** buffer = "Text" offset = 0 length = 5	ArrayIndexOutOfBoundsException is thrown	
5	**offset + length > buffer.length** buffer = "Text" offset = 3 length = 2	ArrayIndexOutOfBoundsException is thrown	
6	**length < 0** buffer = "Text" offset = 3 length = -1	ArrayIndexOutOfBoundsException is thrown	
7	**Successful call, buffer is the whole buffer** qualifier = 0 dcs = 4 buffer = "TextA" offset = 0 length = 5	No exception is thrown	
	Verify the command number value	01h-FEh	
8	**Send the command**		DISPLAY TEXT Proactive command qualifier = 00h dcs = 4 Text = "TextA"
9	**Succesfull call, buffer is part of a buffer with the end part** **Send the command** qualifier = 0 dcs = 4 buffer = "12TextB" offset = 2 length = 5		DISPLAY TEXT Proactive command qualifier = 00h dcs = 4 Text = "TextB"
10	**Succesfull call, buffer is part of a buffer with the first part** **Send the command** qualifier = 0 dcs = 4 buffer = "TextC12" offset = 0 length = 5		DISPLAY TEXT Proactive command qualifier = 00h dcs = 4 Text = "TextC"
11	**Succesfull call, buffer is part of a buffer** **Send the command** qualifier = 0 dcs = 4 buffer = "12TextD34" offset = 2 length = 5		DISPLAY TEXT Proactive command qualifier = 00h dcs = 4 Text = "TextD"
12	**Succesfull call, qualifier = 81h** **Send the command** qualifier = 81h dcs = 4 buffer = "TextE" offset = 0 length = 5		DISPLAY TEXT Proactive command qualifier = 81h dcs = 4 Text = "TextE"
13	**Succesfull call, DCS=0 (7 bits)** **Send the command** qualifier = 0 dcs = 0 buffer = "TextF" offset = 0		DISPLAY TEXT Proactive command qualifier = 00h dcs = 0 Text = "TextF"

	length = 5		
14	**Succesfull call, DCS=8 (UCS2)** **Send the command** qualifier = 0 dcs = 8 buffer = "TextG" offset = 0 length = 5		DISPLAY TEXT Proactive command qualifier = 00h dcs = 8 Text = "TextG"
15	**Call the init() method with any value** **Then build and send a DISPLAY TEXT command** qualifier = 0 dcs = 4 buffer = "TextHTextH" offset = 0 length = 10		DISPLAY TEXT Proactive command qualifier = 00h dcs = 4 Text = "TextHTextH"
16	**Successful call, text length is null** **Send the command** qualifier = 0 dcs = 4 buffer = "" (not null buffer) offset = 0 length = 0		DISPLAY TEXT Proactive command qualifier = 00h Text String TLV = 8D 00
17	**Select a TLV in the ProactiveHandler** **Call the initDisplayText() method** **Call the getValueLength() method**	UNAVAILABLE_ELEMENT ToolkitException is thrown by getValueLength()	
18	**Successful call, buffer length = 7Eh** qualifier = 0 dcs = 4 buffer = "UUU…" offset = 0 length = 7Eh		DISPLAY TEXT Proactive command Text String TLV = 8D 7F 04 55 55…
19	**Successful call, buffer length = 7Fh** qualifier = 0 dcs = 4 buffer = "UUU…" offset = 0 length = 7Fh		DISPLAY TEXT Proactive command Text String TLV = 8D 81 80 04 55 55…
20	**Successful call, buffer length = 240** Qualifier = 0 dcs = 4 buffer = "UUU…" offset = 0 length = 240		DISPLAY TEXT Proactive command Text String TLV = 8D 81 F1 04 55 55…
21	**Call the initDisplayText() method with a too long buffer** qualifier = 0 dcs = 4 buffer = "XXXX…" offset = 0 length = 241	HANDLER_OVERFLOW ToolkitException is thrown	
22	**Call the initDisplayText() without sending the command**		No proactive command shall be sent expected status is '9000'

6.2.7.3.4 Test Coverage

CRR number	Test case number
N1	8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20
N2	15
N3	17
N4	22
N5	7
P1	1
P2	2, 3, 4, 5, 6
C1	21

6.2.7.4 Method initGetInkey

Test Area Reference: API_2_PAH_INGKBB_BSS

6.2.7.4.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public void initGetInkey(byte qualifier,
                         byte dcs,
                         byte[] buffer,
                         short offset,
                         short length)
                  throws java.lang.NullPointerException,
                         java.lang.ArrayIndexOutOfBoundsException,
                         ToolkitException
```

Normal execution

CRRN1: The method shall build a GET INKEY proactive command in the ProactiveHandler, using qualifier, dcs and buffer parameters. Comprehension Required flags are set.

CRRN2: A call to this method clears the handler then initialises it.

CRRN3: No TLV is selected after a call to the method.

CRRN4: The GET INKEY command is not sent by the method.

CRRN5: The Command Number may take any value between 01h and FEh.

Parameter errors

CRRP1: The method shall throw NullPointerException if buffer is null.

CRRP1: If offset or length or both would cause access outside array bounds, a ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: A ToolkitException.HANDLER_OVERFLOW shall be thrown if the ProactiveHandler is to small to put the requested data.

6.2.7.4.3 Test Suite files

Test Script: API_2_PAH_INGKBB_BSS_1.scr

Test Applet: API_2_PAH_INGKBB_BSS_1.java

Load Script: API_2_PAH_INGKBB_BSS_1.ldr

Clean-up Script: API_2_PAH_INGKBB_BSS_1.clr

6.2.7.4.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**NULL as parameter to buffer** buffer = NULL	NullPointerException is thrown	
2	**offset ≥ buffer.length** buffer = "Text" offset = 4	ArrayIndexOutOfBoundsException is thrown	
3	**offset < 0** buffer = "Text" offset = -1	ArrayIndexOutOfBoundsException is thrown	
4	**length > buffer.length** buffer = "Text" offset = 0 length = 5	ArrayIndexOutOfBoundsException is thrown	
5	**offset + length > buffer.length** buffer = "Text" offset = 3 length = 2	ArrayIndexOutOfBoundsException is thrown	
6	**length < 0** buffer = "Text" offset = 3 length = -1	ArrayIndexOutOfBoundsException is thrown	
7	**Successful call, buffer is the whole buffer** qualifier = 0 dcs = 4 buffer = "TextA" offset = 0 length = 5	No exception is thrown	
	Verify the command number value	01h-FEh	
8	**Send the command**		GET INKEY Proactive command qualifier = 00h dcs = 4 Text = "TextA"
9	**Succesfull call, buffer is part of a buffer Send the command** qualifier = 0 dcs = 4 buffer = "12TextB" offset = 2 length = 5		GET INKEY Proactive command qualifier = 00h dcs = 4 Text = "TextB"
10	**Succesfull call, buffer is part of a buffer Send the command** qualifier = 0 dcs = 4 buffer = "TextC12" offset = 0 length = 5		GET INKEY Proactive command qualifier = 00h dcs = 4 Text = "TextC"
11	**Succesfull call, buffer is part of a buffer Send the command** qualifier = 0 dcs = 4 buffer = "12TextD34" offset = 2 length = 5		GET INKEY Proactive command qualifier = 00h dcs = 4 Text = "TextD"
12	**Succesfull call, qualifier = 81h** qualifier = 81h dcs = 4 buffer = "TextE" offset = 0 length = 5		GET INKEY Proactive command qualifier = 81h dcs = 4 Text = "TextE"
13	**Succesfull call, DCS=0 (7 bits)** qualifier = 0 dcs = 0 buffer = "TextF" offset = 0 length = 5		GET INKEY Proactive command qualifier = 00h dcs = 0 Text = "TextF"
14	**Succesfull call, DCS=8 (UCS2)** qualifier = 0 dcs = 8		GET INKEY Proactive command

	buffer = "TextG" offset = 0 length = 5		qualifier = 00h dcs = 8 Text = "TextG"
15	**Call the init() method with any value Then build and send a GET INKEY command** qualifier = 0 dcs = 4 buffer = "TextHTextH" offset = 0 length = 10		GET INKEY Proactive command qualifier = 00h dcs = 4 Text = "TextHTextH"
16	**Successful call, text length is null Send the command** qualifier = 0 dcs = 4 buffer = "" offset = 0 length = 0		GET INKEY Proactive command qualifier = 00h Text String TLV = 8D 00
17	**Select a TLV in the ProactiveHandler Call the initGetInkey() method Call the getValueLength() method**	UNAVAILABLE_ELEMENT ToolkitException is thrown by getValueLength()	
18	**Successful call, buffer length = 7Eh** qualifier = 0 dcs = 4 buffer = "UUU…" offset = 0 length = 7Eh		GET INKEY Proactive command Text String TLV = 8D 7F 04 55 55…
19	**Successful call, buffer length = 7Fh** qualifier = 0 dcs = 4 buffer = "UUU…" offset = 0 length = 7Fh		GET INKEY Proactive command Text String TLV = 8D 81 80 04 55 55…
20	**Successful call, buffer length = 240** Qualifier = 0 dcs = 4 buffer = "UUU…" offset = 0 length = 240		GET INKEY Proactive command Text String TLV = 8D 81 F1 04 55 55…
21	**Call the initGetInkey() method with a too long buffer** qualifier = 0 dcs = 4 buffer = "XXXX…" offset = 0 length = 241	HANDLER_OVERFLOW ToolkitException is thrown	
22	**Call the initGetInkey() without sending the command**		No proactive command shall be sent expected status is '9000'

6.2.7.4.4 Test Coverage

CRR number	Test case number
N1	8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20
N2	15
N3	17
N4	22
N5	7
P1	1
P2	2, 3, 4, 5, 6
C1	21

6.2.7.5 Method initGetInput

Test Area Reference: API_2_PAH_INGPBB_BSSSS

6.2.7.5.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public void initGetInput(byte qualifier,
                         byte dcs,
                         byte[] buffer,
                         short offset,
                         short length,
                         short minRespLength,
                         short maxRespLength)
                  throws java.lang.NullPointerException,
                         java.lang.ArrayIndexOutOfBoundsException,
                         ToolkitException
```

Normal execution

CRRN1: The method shall build a GET INPUT proactive command in the ProactiveHandler, using qualifier, dcs, buffer, minRespLength and maxRespLength parameters. Comprehension Required flags are set.

CRRN2: A call to this method clears the handler then initialises it.

CRRN3: No TLV is selected after a call to the method.

CRRN4: The GET INPUT command is not sent by the method.

CRRN5: The Command Number may take any value between 01h and FEh.

Parameter errors

CRRP1: The method shall throw NullPointerException if buffer is null.

CRRP2: If offset or length or both would cause access outside array bounds, a ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: A ToolkitException.HANDLER_OVERFLOW shall be thrown if the ProactiveHandler is to small to put the requested data.

6.2.7.5.3 Test Suite files

Test Script: API_2_PAH_INGPBB_BSSSS_1.scr

Test Applet: API_2_PAH_INGPBB_BSSSS_1.java

Load Script: API_2_PAH_INGPBB_BSSSS_1.ldr

Clean-up Script: API_2_PAH_INGPBB_BSSSS_1.clr

6.2.7.5.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**NULL as parameter to buffer** buffer = NULL	NullPointerException is thrown	
2	**offset ≥ buffer.length** buffer = "Text" offset = 4	ArrayIndexOutOfBoundsException is thrown	
3	**offset < 0** buffer = "Text" offset = -1	ArrayIndexOutOfBoundsException is thrown	
4	**length > buffer.length** buffer = "Text" offset = 0 length = 5	ArrayIndexOutOfBoundsException is thrown	
5	**offset + length > buffer.length** buffer = "Text" offset = 3 length = 2	ArrayIndexOutOfBoundsException is thrown	
6	**length < 0** buffer = "Text" offset = 3 length = -1	ArrayIndexOutOfBoundsException is thrown	
7	**Successful call, buffer is the whole buffer** qualifier = 0 dcs = 4 buffer = "TextA" offset = 0 length = 5 minRespLength = 00h maxRespLength = FFh	No exception is thrown	
	Verify the command number value	01h-FEh	
8	**Send the command**		GET INPUT Proactive command qualifier = 00h dcs = 4 Text = "TextA" Min Length = 00h Max Length = FFh
9	**Succesfull call, buffer is part of a buffer** **Send the command** qualifier = 0 dcs = 4 buffer = "12TextB" offset = 2 length = 5 minRespLength = 10h maxRespLength = FFh		GET INPUT Proactive command qualifier = 00h dcs = 4 Text = "TextB" Min Length = 10h Max Length = FFh
10	**Succesfull call, buffer is part of a buffer** **Send the command** qualifier = 0 dcs = 4 buffer = "TextC12" offset = 0 length = 5 minRespLength = FFh maxRespLength = FFh		GET INPUT Proactive command qualifier = 00h dcs = 4 Text = "TextC" Min Length = FFh Max Length = FFh
11	**Succesfull call, buffer is part of a buffer** **Send the command** qualifier = 0 dcs = 4 buffer = "12TextD34" offset = 2 length = 5 minRespLength = 00h maxRespLength = 00h		GET INPUT Proactive command qualifier = 00h dcs = 4 Text = "TextD" Min Length = 00h Max Length = 00h
12	**Succesfull call, qualifier = 81h** qualifier = 81h dcs = 4 buffer = "TextE" offset = 0 length = 5 minRespLength = 00h		GET INPUT Proactive command qualifier = 81h dcs = 4 Text = "TextE"

	maxRespLength = 10h		Min Length = 00h Max Length = 10h
13	**Succesfull call, DCS=0 (7 bits)** qualifier = 0 dcs = 0 buffer = "TextF" offset = 0 length = 5 minRespLength = 10h maxRespLength = 10h		GET INPUT Proactive command qualifier = 00h dcs = 0 Text = "TextF" Min Length = 10h Max Length = 10h
14	**Succesfull call, DCS=8 (UCS2)** qualifier = 0 dcs = 8 buffer = "TextG" offset = 0 length = 5 minRespLength = 00h maxRespLength = FFh		GET INPUT Proactive command qualifier = 00h dcs = 8 Text = "TextG" Min Length = 00h Max Length = FFh
15	**Call the init() method with any value Then build and send a GET INPUT command** qualifier = 0 dcs = 4 buffer = "TextHTextH" offset = 0 length = 10 minRespLength = 00h maxRespLength = 10h		GET INPUT Proactive command qualifier = 00h dcs = 4 Text = "TextHTextH" Min Length = 00h Max Length = 10h
16	**Successful call, text length is null Send the command** qualifier = 0 dcs = 4 buffer = "" offset = 0 length = 0 minRespLength = 00h maxRespLength = 10h		GET INPUT Proactive command qualifier = 00h Text String TLV = 8D 00 Min Length = 00h Max Length = 10h
17	**Select a TLV in the ProactiveHandler Call the initGetInput() method Call the getValueLength() method**	UNAVAILABLE_ELEMENT ToolkitException is thrown by getValueLength()	
18	**Successful call, buffer length = 7Eh** qualifier = 0 dcs = 4 buffer = "UUU…" offset = 0 length = 7Eh minRespLength = 00h maxRespLength = 10h		GET INPUT Proactive command Text String TLV = 8D 7F 04 55 55… Min Length = 00h Max Length = 10h
19	**Successful call, buffer length = 7Fh** qualifier = 0 dcs = 4 buffer = "UUU…" offset = 0 length = 7Fh minRespLength = 00h maxRespLength = 10h		GET INPUT Proactive command Text String TLV = 8D 81 80 04 55 55… Min Length = 00h Max Length = 10h
20	**Successful call, buffer length = 236** Qualifier = 0 dcs = 4 buffer = "UUU…" offset = 0 length = 236 minRespLength = 00h maxRespLength = 10h		GET INPUT Proactive command Text String TLV = 8D 81 ED 04 55 55…
21	**Call the initGetInput() method with a too long buffer** qualifier = 0 dcs = 4 buffer = "XXXX…"	HANDLER_OVERFLOW ToolkitException is thrown	

	offset = 0 length = 237 minRespLength = 00h maxRespLength = 10h		
22	**Call the initGetInput() without sending the command**		No proactive command shall be sent expected status is '9000'

6.2.7.5.4 Test Coverage

CRR number	Test case number
N1	8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20
N2	15
N3	17
N4	22
N5	7
P1	1
P2	2, 3, 4, 5, 6
C1	21

6.2.7.6 Method send

Test Area Reference: API_2_PAH_SEND

6.2.7.6.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte send()
```

Normal execution

CRRN1: The send() method send the current proactive command to the mobile.

CRRN2: The returned byte is equal to general result of the command (first byte of Result TLV in Terminal Response).

CRRN3: The handler remains unchanged after a call to send() method until the use of initXX() or appendTLV().

CRRN4: There is no invocation of select() or deselect() method.

CRRN5: A pending toolkit applet transaction at the method invocation is aborted.

Parameter errors

Context errors

CRRC1: A ToolkitException.UNAVAILABLE_ELEMENT shall be thrown is the Result Simple TLV is missing in Terminal Response.

CRRC2: A ToolkitException.OUT_OF_TLV_BOUNDARIES shall be thrown if the general result byte is missing in the Result Simple TLV in Terminal Response.

6.2.7.6.3 Test Suite files

Test Script: API_2_PAH_SEND_1.scr

Test Applet: API_2_PAH_SEND_1.java

Load Script: API_2_PAH_SEND_1.ldr

Clean-up Script: API_2_PAH_SEND_1.clr

6.2.7.6.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Build and send a DISPLAY TEXT command** qualifier = 00h dcs = 04h buffer = 'Text'		DISPLAY TEXT Proactive command
2	**Terminal Response with General Result = 00** Result TLV = 03 01 00 (command performed successfully)	Result of send() is 00h	
3	**Build and send a DISPLAY TEXT command** qualifier = 00h dcs = 04h buffer = 'Text'		DISPLAY TEXT Proactive command
4	**Terminal Response with General Result = 01, without Additional information on result** Result TLV = 03 01 01 (command performed with partial comprehension)	Result of send() is 01h	
5	**Build and send a DISPLAY TEXT command** qualifier = 00h dcs = 04h buffer = 'Text'		DISPLAY TEXT Proactive command
6	**Terminal Response with General Result = 01, with Additional information on result** Result TLV = 03 02 01 55 (command performed with partial comprehension)	Result of send() is 01h	
7	**Build and send a DISPLAY TEXT command** qualifier = 00h dcs = 04h buffer = 'Text'		DISPLAY TEXT Proactive command
8	**Terminal Response with General Result = 02** Result TLV = 03 04 02 65 43 21 (Missing information)	Result of send() is 02h	
9	**Build and send a 7Fh byte command (DISPLAY TEXT)** qualifier = 00h dcs = 04h buffer = "UUUUU…" length = 73h		DISPLAY TEXT Proactive command BER-TLV = D0 7F Text String TLV = 8D 74 04 55 55 55…
10	**Build and send a 80h byte command (DISPLAY TEXT)** qualifier = 00h dcs = 04h buffer = "UUUUU…" length = 74h		DISPLAY TEXT Proactive command BER-TLV = D0 81 80 Text String TLV = 8D 75 04 55 55 55…
11	**Build and send a maximum length command (length of the handler should be 253)** DISPLAY TEXT: Qualifier = 0 dcs = 4 buffer = "UUU…" offset = 0 length = 240		DISPLAY TEXT Proactive command BER-TLV = D0 81 FD Text String TLV = 8D 81 F1 04 55 55…
12	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
		Verify ProactiveHandler was not modified	
13	**Build and send a DISPLAY TEXT command Verify there is no invocation of select() or deselect() method.**		DISPLAY TEXT Proactive command
14	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response with 2 Result TLV 1st Result TLV = 03 02 02 12 2nd Result TLV = 03 03 03 34 56	Result of send() is 02h	
15	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive

			command
	Terminal Response without Result Simple TLV	ToolkitException.UNAVAILABLE_ELEMENT is thrown by send()	
16	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response without general result byte in the Simple TLV `Result TLV = 03 00`	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown by send()	

6.2.7.6.4 Test Coverage

CRR number	Test case number
N1	1, 3, 5, 7, 9, 10, 11, 12, 13, 14
N2	2, 4, 6, 8, 14
N3	12
N4	13
N5	To be checked in Framework tests and insert here cross reference
C1	15
C2	16

6.2.7.7 Method getLength

Test Area Reference API_2_PAH_GLEN

6.2.7.7.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short getLength()
                  throws ToolkitException
```

Normal execution

CRRN1: returns the length in bytes of the TLV list.

Parameter errors

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException.HANDLER_NOT_AVAILABLE.

6.2.7.7.3 Test Suite files

Test Script: API_2_PAH_GLEN_1.scr

Test Applet: API_2_PAH_GLEN_1.java

Load Script: API_2_PAH_GLEN_1.ldr

Clean-up Script: API_2_PAH_GLEN_1.clr

6.2.7.7.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Clear the handler** `getLength()`	Result of getLength() is 0	
2	**Call the init() method** `getLength()`	Result of getLength() is 9	
3	**Call the initDisplayText() method, with buffer length = 240** `getLength()`	Result of getLength() is 253	
4	**Build a 7Fh Proactive Handler** `getLength()`	Result of getLength() is 7Fh	
5	**Build a 80h Proactive Handler** `getLength()`	Result of getLength() is 80h	

6.2.7.7.4 Test Coverage

CRR number	Test case number
N1	1, 2, 3, 4,5
C1	Does not apply for Proactive Handler

6.2.7.8 Method copy

Test Area Reference API_2_PAH_COPY_BSS

6.2.7.8.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short copy(byte[] dstBuffer,
                short dstOffset,
                short dstLength)
                throws java.lang.NullPointerException,
                        java.lang.ArrayIndexOutOfBoundsException,
                        ToolkitException
```

Normal execution

CRRN1: copies the simple TLV list contained in the handler to the destination byte array.

CRRN2: returns dstOffset + dstLength.

Parameter errors

CRRP1: if dstBuffer is null a NullPointerException is thrown.

CRRP2: if dstOffset or dstLength or both would cause access outside array bounds, or if dstLength is negative, an ArrayIndexOutOfBoundsException is thrown.

CRRP3: if dstLength is grater than the length of the simple TLV List, an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException. OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.7.8.3 Test Suite files

Test Script: API_2_PAH_COPY_BSS_1.scr

Test Applet: API_2_PAH_ COPY_BSS_1.java

Load Script: API_2_PAH_ COPY_BSS_1.ldr

Clean-up Script: API_2_PAH_ COPY_BSS_1.clr

6.2.7.8.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**NULL as parameter to dstBuffer**	NullPointerException is thrown	
2	**Call the init() method**		
	dstOffset > dstBuffer.length dstBuffer.length = 5 dstOffset = 5 dstLength = 0	ArrayIndexOutOfBoundsException is thrown	
3	**dstOffset < 0** dstBuffer.length = 5 dstOffset = -1 dstLength = 1	ArrayIndexOutOfBoundsException is thrown	
4	**dstLength > dstBuffer.length** dstBuffer.length = 5 dstOffset = 0 dstLength = 6	ArrayIndexOutOfBoundsException is thrown	
5	**dstOffset + dstLength > dstBuffer.length** dstBuffer.length = 5 dstOffset = 3 dstLength = 3	ArrayIndexOutOfBoundsException is thrown	
6	**dstLength < 0** dstBuffer.length = 5 dstOffset = 0 dstLength = -1	ArrayIndexOutOfBoundsException is thrown	
7	**dstLength > length of the simple TLV list** dstBuffer.length = 10 dstOffset = 0 dstLength = 10	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
8	**Successful call, dstBuffer is the whole buffer** dstBuffer.length = 9 dstOffset = 0 dstLength = 9	Result of copy() is 9	
9	**Compare the buffer**	Result of arrayCompare() is 0	
10	**Successful call, dstBuffer is part of a buffer** dstBuffer.length = 15 dstOffset = 3 dstLength = 9	Result of copy() is 12	
11	**Compare the whole buffer**	Result of arrayCompare() is 0	
12	**Successful call, dstBuffer is part of a buffer** dstBuffer.length = 15 dstOffset = 3 dstLength = 6	Result of copy() is 9	
13	**Compare the whole buffer**	Result of arrayCompare() is 0	

6.2.7.8.4 Test Coverage

CRR number	Test case number
N1	9, 11, 13
N2	8, 10, 12
P1	1
P2	2, 3, 4, 5, 6
P3	7
C1	Does not apply for ProactiveHandler

6.2.7.9 Method findTLV

Test Area Reference API_2_PAH_FINDBB

6.2.7.9.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte findTLV(byte tag, byte occurrence)
               throws ToolkitException
```

Normal execution

Looks for the indicated occurrence of a TLV element from the beginning of the TLV list (handler buffer):

CRRN1: the method is successful if the required occurrence exists then the corresponding TLV becomes current.

CRRN2: if the method is successful then it returns TLV_FOUND_CR_SET when Comprehension Required flag is set.

CRRN3: if the method is successful then it returns TLV_FOUND_CR_NOT_SET when Comprehension Required flag is not set.

CRRN4: if the required occurrence of the TLV element does not exist, the current TLV is no longer defined and TLV_NOT_FOUND is returned.

CRRN5: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if an input parameter is not valid (e.g. occurrence = 0) an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException BAD_INPUT_PARAMETER.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.7.9.3 Test Suite files

Test Script: API_2_PAH_FINDBB_1.scr

Test Applet: API_2_PAH_FINDBB_1.java

Load Script: API_2_PAH_FINDBB_1.ldr

Clean-up Script: API_2_PAH_FINDBB_1.clr

6.2.7.9.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Initialise the handler**		
	Invalid input parameter `Occurrence = 0`	ToolkitException.BAD_INPUT_PARAMETER is thrown	
2	**Call the init() method**		

	Search 1st TLV
	`Tag = 01h`
	`Occurrence = 1`
		Result is TLV_FOUND_CR_SET	

3	**Call the getValueLength() method**	Result is 03h	

4	**Search 2nd TLV**
	`Tag = 02h`
	`Occurrence = 1`
		Result is TLV_FOUND_CR_SET	

5	**Call the getValueLength() method**	Result is 02h	
6	**Select a TLV (tag 02h)**		

	Search a wrong tag
	`Tag = 03h`
	`Occurrence = 1`
		Result is TLV_NOT_FOUND	

7	**Call the getValueLength() method**	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	

8	**Search a tag with wrong occurrence**
	`Tag = 01h`
	`Occurrence = 2`
		Result is TLV_NOT_FOUND	

9	**Call the getValueLength() method**	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	
10	**Append a TLV with tag=02h**		

	Search the TLV
	`Tag = 02h`
	`Occurrence = 2`
		Result is TLV_FOUND_CR_NOT_SET	

11	**Append a TLV with tag=04h**		

	Search the TLV
	`Tag = 04h`
	`Occurrence = 1`
		Result is TLV_FOUND_CR_NOT_SET	

12	**Search tag 81h**
	`Tag = 81h`
	`Occurrence = 1`
		Result is TLV_FOUND_CR_SET	

13	**Search tag 84h**
	`Tag = 84h`
	`Occurrence = 1`
		Result is TLV_FOUND_CR_NOT_SET	

6.2.7.9.4 Test Coverage

CRR number	Test case number
N1	3, 5
N2	2, 4
N3	10, 11
N4	6, 7,8, 9
N5	12, 13
P1	1
C1	Does not apply for Proactive Handler

6.2.7.10 Method getValueLength

Test Area Reference API_2_PAH_GVLEN

6.2.7.10.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short getValueLength()
                    throws ToolkitException
```

Normal execution

CRRN1: gets and returns the binary length of the value field for the last TLV element which has been found in the handler.

Parameter errors

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

CRRC2: in case of unavailable TLV element an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException UNAVAILABLE_ELEMENT.

6.2.7.10.3 Test Suite files

Test Script: API_2_PAH_GVLEN_1.scr

Test Applet: API_2_PAH_GVLEN_1.java

Load Script: API_2_PAH_GVLEN_1.ldr

Clean-up Script: API_2_PAH_GVLEN_1.clr

6.2.7.10.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Call the init() method**		
	`getValueLength()`	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
2	**Call the initDisplayText() method** `length = 0`		
	Search TLV 0Dh (Text String TLV)		
	`getValueLength()`	Result is 00h	
3	**Call the initDisplayText() method** `length = 1 (+ dcs byte)`		
	Search TLV 0Dh (Text String TLV)		
	`getValueLength()`	Result is 02h	
4	**Call the initDisplayText() method length = 7Eh (+ dcs byte)**		
	Search TLV 0Dh (Text String TLV)		
	`getValueLength()`	Result is 7Fh	
5	**Call the initDisplayText() method** `length = 7Fh (+ dcs byte)`		
	Search TLV 0Dh (Text String TLV)		
	`getValueLength()`	Result is 80h	
6	**Call the initDisplayText() method** `length = F0h (maximum text length)`		
	Search TLV 0Dh (Text String TLV)		
	`getValueLength()`	Result is F1h	

6.2.7.10.4 Test Coverage

CRR number	Test case number
N1	2, 3, 4, 5, 6
C1	Does not apply for Proactive Handler
C2	1

6.2.7.11 Method getValueByte

Test Area Reference API_2_PAH_GVBYTS

6.2.7.11.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte getValueByte(short valueOffset)
                  throws ToolkitException
```

Normal execution

CRRN1: Gets a byte from the last TLV element which has been found in the handler and returns its value (1 byte).

Parameter errors

CRRP1: if valueOffset is out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

CRRC2: in case of unavailable TLV element an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException UNAVAILABLE_ELEMENT.

6.2.7.11.3 Test Suite files

Test Script: API_2_PAH_GVBYTS_1.scr

Test Applet: API_2_PAH_GVBYTS_1.java

Load Script: API_2_PAH_GVBYTS_1.ldr

Clean-up Script: API_2_PAH_GVBYTS_1.clr

6.2.7.11.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Call the init() method** type = FFh qualifier = FEh destination = FDh		
	getValueByte(0)	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
2	**Search TLV 01h (Command Details TLV)**		
	getValueByte(3)	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
3	**Search TLV 01h (Command Details TLV)**		
	getValueByte(2)	Result is FEh (qualifier)	
4	**Search TLV 02h (Device Identities TLV)**		
	getValueByte(0)	Result is 81h (Source)	
5	**initDisplayText()** buffer = 00 01 … 7D length = 7Eh Search TLV 0Dh (Text String TLV)		
	getValueByte(7E)	Result is 7Dh	
6	**initDisplayText()** buffer = 00 01 … 7D 7E length = 7Fh Search TLV 0Dh (Text String TLV)		
	getValueByte(7E)	Result is 7Dh	
7	**getValueByte(7F)**	Result is 7Eh	
8	**initDisplayText()** buffer = 00 01 … EF length = F0h Search TLV 0Dh (Text String TLV)		
	getValueByte(F0)	Result is EFh	

6.2.7.11.4 Test Coverage

CRR number	Test case number
N1	3, 4, 5, 6, 7, 8
P1	2
C1	Does not apply for Proactive Handler
C2	1

6.2.7.12 Method copyValue

Test Area Reference API_2_PAH_CPYVS_BSS

6.2.7.12.1 Conformance requirement

The method with following header shall be compliant with its definition in the API.

```
public short copyValue(short valueOffset,
                       byte[] dstBuffer,
                       short dstOffset,
                       short dstLength)
                throws java.lang.NullPointerException,
                       java.lang.ArrayIndexOutOfBoundsException,
                       ToolkitException
```

Normal execution

CRRN1: copies a part of the last TLV element which has been found, into a destination. buffer.

CRRN2: returns dstOffset + dstLength.

Parameter errors

CRRP1: if dstBuffer is null NullPointerException is thrown.

CRRP2: if dstOffset or dstLength or both would cause access outside array bounds, or if dstLength is negative ArrayIndexOutOfBoundsException is thrown.

CRRP3: if valueOffset, dstLength or both are out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

CRRC2: in case of unavailable TLV element an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException UNAVAILABLE_ELEMENT.

6.2.7.12.3 Test Suite files

Test Script: API_2_PAH_CPYVS_BSS_1.scr

Test Applet: API_2_PAH_CPYVS_BSS_1.java

Load Script: API_2_PAH_CPYVS_BSS_1.ldr

Clean-up Script: API_2_PAH_CPYVS_BSS_1.clr

6.2.7.12.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Initialise the handler** **Select a TLV**		
	`copyValue() with a null dstBuffer`	NullPointerException is thrown	
2	**initDisplayText() with length = 15** `Select Text String TLV`		

	dstOffset ≥ dstBuffer.length
	`dstBuffer.length = 5`
	`dstOffset = 5`
	`dstLength = 1`
		ArrayIndexOutOfBoundsException is thrown	

3	**dstOffset < 0**
	`dstBuffer.length = 5`
	`dstOffset = -1`
	`dstLength = 1`
		ArrayIndexOutOfBoundsException is thrown	

4	**dstLength >dstBuffer.length**
	`dstBuffer.length = 5`
	`dstOffset = 0`
	`dstLength = 6`
		ArrayIndexOutOfBoundsException is thrown	

5	**dstOffset + dstLength >dstBuffer.length**
	`dstBuffer.length = 5`
	`dstOffset = 3`
	`dstLength = 3`
		ArrayIndexOutOfBoundsException is thrown	

6	**dstLength < 0**
	`dstBuffer.length = 5`
	`dstOffset = 0`
	`dstLength = -1`
		ArrayIndexOutOfBoundsException is thrown	

7	**initDisplayText() with length = 5** `Select Text String TLV`		

	valueOffset ≥ Text String Length
	`valueOffset = 6`
	`dstBuffer.length = 15`
	`dstOffset = 0`
	`dstLength = 1`
		ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

8	**[Select Text String TLV]**	ToolkitException.OUT_OF_TLV_	

	valueOffset < 0valueOffset = -1 dstBuffer.length = 15 dstOffset = 0 dstLength = 1	BOUNDARIES is thrown	
9	**[Select Text String TLV]** dstLength > Text String length valueOffset = 0 dstBuffer.length = 15 dstOffset = 0 dstLength = 7	ToolkitException.OUT_OF_TLV_ BOUNDARIES is thrown	
10	**[Select Text String TLV]** valueOffset + dstLength > Text String length valueOffset = 2 dstBuffer.length = 15 dstOffset = 0 dstLength = 5	ToolkitException.OUT_OF_TLV_ BOUNDARIES is thrown	
11	**Initialise the handler**		
	copyValue()	ToolkitException.UNAVAILABLE _ELEMENT is thrown	
12	**initDisplayText()** dcs = 4 buffer = 00 01 … 0F Select Text String TLV		
	Successful call valueOffset = 0 dstBuffer.length = 17 dstOffset = 0 dstLength = 17	Result of copyValue() is 17	
13	**Compare buffer** buffer = 04 00 01 … 0F	Result is 00h	
14	**initialise dstBuffer** dstBuffer = 55 55 … 55		
	Successful call valueOffset = 2 dstBuffer.length = 20 dstOffset = 3 dstLength = 12	Result of copyValue() is 15	
15	**Compare buffer** buffer = 55 55 55 01 02 03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55	Result is 00h	

6.2.7.12.4 Test Coverage

CRR number	Test case number
N1	13, 15
N2	12, 14
P1	1
P2	2, 3, 4, 5, 6
P3	7, 8, 9, 10
C1	Does not apply for Proactive Handler
C2	11

6.2.7.13 Method compareValue

Test Area Reference API_2_PAH_CPRVS_BSS

6.2.7.13.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte compareValue(short valueOffset,
```

```
                byte[] compareBuffer,
                short compareOffset,
                short compareLength)
        throws java.lang.NullPointerException,
                java.lang.ArrayIndexOutOfBoundsException,
                ToolkitException
```

Normal execution

Compares the last found TLV element with a buffer:

CRRN1: returns 0 if identical.

CRRN2: returns -1 if the first miscomparing byte in simple TLV List is less than that in compareBuffer.

CRRN3: returns 1 if the first miscomparing byte in simple TLV List is greater than that in compareBuffer.

Parameter errors

CRRP1: if compareBuffer is null NullPointerException shall be thrown.

CRRP2: if compareOffset or compareLength or both would cause access outside array bounds, or if compareLength is negative ArrayIndexOutOfBoundsException shall be thrown.

CRRP3: if valueOffset, dstLength or both are out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

CRRC2: in case of unavailable TLV element an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException UNAVAILABLE_ELEMENT.

6.2.7.13.3 Test Suite files

Test Script: API_2_PAH_CPRVS_BSS_1.scr

Test Applet: API_2_PAH_CPRVS_BSS_1.java

Load Script: API_2_PAH_CPRVS_BSS_1.ldr

Clean-up Script: API_2_PAH_CPRVS_BSS_1.clr

6.2.7.13.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Initialise the handler** **Select a TLV**		
	compareValue() with a null compareBuffer	NullPointerException is thrown	
2	**initDisplayText() with length = 15** Select Text String TLV		
	compareOffset ≥ compareBuffer.length compareBuffer.length = 5 compareOffset = 5 compareLength = 1	ArrayIndexOutOfBoundsExceptio n is thrown	
3	**compareOffset < 0** compareBuffer.length = 5 compareOffset = -1 compareLength = 1	ArrayIndexOutOfBoundsExceptio n is thrown	
4	**compareLength >compareBuffer.length** compareBuffer.length = 5 compareOffset = 0 compareLength = 6	ArrayIndexOutOfBoundsExceptio n is thrown	
5	**compareOffset + compareLength**	ArrayIndexOutOfBoundsExceptio	

	>compareBuffer.length compareBuffer.length = 5 compareOffset = 3 compareLength = 3	n is thrown	
6	**compareLength < 0** compareBuffer.length = 5 compareOffset = 0 compareLength = -1	ArrayIndexOutOfBoundsException is thrown	
7	**initDisplayText() with length = 5** **Select Text String TLV**		
	valueOffset ≥ Text String Length valueOffset = 6 compareBuffer.length = 15 compareOffset = 0 compareLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
8	**[Select Text String TLV]** valueOffset < 0 valueOffset = -1 compareBuffer.length = 15 compareOffset = 0 compareLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
9	**[Select Text String TLV]** compareLength > Text String length valueOffset = 0 compareBuffer.length = 15 compareOffset = 0 compareLength = 7	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
10	**[Select Text String TLV]** valueOffset + compareLength > Text String length valueOffset = 2 compareBuffer.length = 15 compareOffset = 0 compareLength = 5	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
11	**Initialise the handler**		
	compareValue()	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
12	**initDisplayText()** dcs = 4 buffer = 00 01 … 0F Select Text String TLV		
	Initialise compareBuffer compareBuffer = 04 00 01 … 0F		
	Compare buffers valueOffset = 0 compareOffset = 0 compareLength = 17	Result is 00h	
13	**Initialise compareBuffer** compareBuffer = 04 00 01 02 03 04 05 06 07 08 05 0A 0B 0C 0D 0E 10		
	Compare buffers with same parameters	Result is -1	
14	**Initialise compareBuffer** compareBuffer = 03 00 01 … 0F		
	Compare buffers with same parameters	Result is +1	
15	**Initialise compareBuffer** compareBuffer = 55 55 55 01 02 03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55		
	Compare buffers valueOffset = 2 compareOffset = 3 compareLength = 12	Result is 00h	

16	**Initialise compareBuffer** compareBuffer = 55 55 55 02 01 03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55		
	Compare buffers with same parameters	Result is -1	
17	**Initialise compareBuffer** compareBuffer = 55 55 55 01 02 03 04 05 06 07 08 09 0A 0A 0D 55 55 55 55 55		
	Compare buffers with same parameters	Result is +1	
18	**Initialise compareBuffer** compareBuffer = 55 55 55 99 03 03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55		
	Compare buffers with same parameters	Result is +1	

6.2.7.13.4 Test Coverage

CRR number	Test case number
N1	12, 15
N2	13, 16
N3	14, 17, 18
P1	1
P2	2, 3, 4, 5, 6
P3	7, 8, 9, 10
C1	Does not apply for Proactive Handler
C2	11

6.2.7.14 Method findAndCopyValue(byte tag, byte[] dstBuffer, short valueOffset)

Test Area Reference API_2_PAH_FACYB_BS

6.2.7.14.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short findAndCopyValue(byte tag,
                              byte[] dstBuffer,
                             short dstOffset)
               throws  java.lang.NullPointerException,
                       java.lang.ArrayIndexOutOfBoundsException,
                       ToolkitException
```

Normal execution

CRRN1: looks for the first occurrence of a TLV element from the beginning of a TLV list and copy its value into a destination buffer.

CRRN2: if no TLV element is found, the UNAVAILABLE_ELEMENT exception is thrown and the current TLV is no longer defined.

CRRN3: if the method is successful then the corresponding TLV becomes current and dstOffset + length of the copied value is returned.

CRRN4: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if dstBuffer is null NullPointerException shall be thrown.

CRRP2: if dstOffset would cause access outside array bounds ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.7.14.3 Test Suite files

Test Script: API_2_PAH_FACYB_BS_1.scr

Test Applet: API_2_PAH_FACYB_BS_1.java

Load Script: API_2_PAH_FACYB_BS_1.ldr

Clean-up Script: API_2_PAH_FACYB_BS_1.clr

6.2.7.14.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Initialise the handler**		
	FindAndCopyValue() with a null dstBuffer	NullPointerException is thrown	
2	**InitDisplayText() with length = 15**		
	dstOffset ≥ dstBuffer.length tag = 0Dh dstBuffer.length = 20 dstOffset = 20	ArrayIndexOutOfBoundsException is thrown	
3	**dstOffset < 0** dstBuffer.length = 20 dstOffset = -1	ArrayIndexOutOfBoundsException is thrown	
4	**length > dstBuffer.length** dstBuffer.length = 15 dstOffset = 0	ArrayIndexOutOfBoundsException is thrown	
5	**DstOffset + length >dstBuffer.length** DstBuffer.length = 20 DstOffset = 5	ArrayIndexOutOfBoundsException is thrown	
6	**initDisplayText()**		
	Select a TLV (tag 02h)		
	findAndCopyValue() tag = 03h	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
	Call the getValueLength() method	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	
7	**initDisplayText()** dcs = 4 buffer = 00 01 … 0F		
	Successful call Tag = 0Dh DstBuffer.length = 17 DstOffset = 0	Result of findAndcopyValue() is 17	
8	**Compare buffer** buffer = 04 00 01 … 0F	Result is 00h	
9	**initialise dstBuffer** dstBuffer = 55 55 … 55		
	Successful call dstBuffer.length = 20 dstOffset = 2	Result of findAndcopyValue() is 19	
10	**Compare buffer** buffer = 55 55 04 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 55	Result is 00h	

11	**initDisplayText()** dcs = 4 buffer = 00 01 … 0F		
	append a 2nd Text String TLV		
	Successful call tag = 0Dh dstBuffer.length = 17 dstOffset = 0	Result of findAndcopyValue() is 17	
12	**Compare buffer** buffer = 04 00 01 … 0F	Result is 00h	
13	**initDisplayText()** dcs = 4 buffer = 00 01 … 0F		
	Successful call (with tag 8Dh) tag = 8Dh dstBuffer.length = 17 dstOffset = 0	Result of findAndcopyValue() is 17	
14	**Compare buffer** buffer = 04 00 01 … 0F	Result is 00h	
15	**Append tag 0Fh** buffer = 00 01 … 0F		
	Successful call (with tag 8Fh) tag = 8Fh dstBuffer.length = 16 dstOffset = 0	Result of findAndcopyValue() is 16	
16	**Compare buffer** buffer = 00 01 … 0F	Result is 00h	

6.2.7.14.4 Test Coverage

CRR number	Test case number
N1	8, 10, 12
N2	6
N3	7, 9, 11
N4	13, 14, 15, 16
P1	1
P2	2, 3, 4, 5
C1	Does not apply for Proactive Handler

6.2.7.15 Method findAndCopyValue(byte tag, byte occurence, short valueOffset, byte[] dstBuffer, short dstOffset, short dstLength)

Test Area Reference API_2_PAH_FACYBS_BSS

6.2.7.15.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short findAndCopyValue(byte tag,
                              byte occurence,
                             short valueOffset,
                             byte[] dstBuffer,
                             short dstOffset,
                             short dstLength)
                      throws java.lang.NullPointerException,
java.lang.ArrayIndexOutOfBoundsException,
                             ToolkitException
```

Normal execution

CRRN1: looks for the indicated occurrence of a TLV element from the beginning of a TLV list and copy its value into a destination buffer.

CRRN2: if no TLV element is found, the UNAVAILABLE_ELEMENT exception is thrown and the current TLV is no longer defined.

CRRN3: if the method is successful then the corresponding TLV becomes current and dstOffset + dstLength is returned.

CRRN4: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if dstBuffer is null NullPointerException shall be thrown.

CRRP2: if dstOffset or dstLength or both would cause access outside array bounds, or if dstLength is negative ArrayIndexOutOfBoundsException shall be thrown.

CRRP3: if valueOffset, dstLength or both are out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.7.15.3 Test Suite files

Test Script: API_2_PAH_FACYBS_BSS_1.scr

Test Applet: API_2_PAH_FACYBS_BSS_1.java

Load Script: API_2_PAH_FACYBS_BSS_1.ldr

Clean-up Script: API_2_PAH_FACYBS_BSS_1.clr

6.2.7.15.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Initialise the handler**		
	findAndCopyValue() with a null dstBuffer	NullPointerException is thrown	
2	**initDisplayText() with length = 15**		
	dstOffset ≥ dstBuffer.length tag = 0Dh, occurrence = 1 valueOffset = 0 dstBuffer.length = 5 dstOffset = 5 dstLength = 1	ArrayIndexOutOfBoundsException is thrown	
3	**dstOffset < 0** dstBuffer.length = 5 dstOffset = -1 dstLength = 1	ArrayIndexOutOfBoundsException is thrown	
4	**dstLength >dstBuffer.length** dstBuffer.length = 5 dstOffset = 0 dstLength = 6	ArrayIndexOutOfBoundsException is thrown	
5	**dstOffset + dstLength >dstBuffer.length** dstBuffer.length = 5 dstOffset = 3 dstLength = 3	ArrayIndexOutOfBoundsException is thrown	
6	**dstLength < 0** dstBuffer.length = 5 dstOffset = 0 dstLength = -1	ArrayIndexOutOfBoundsException is thrown	
7	**initDisplayText() with length = 5**		
	valueOffset ≥ Text String Length tag = 0Dh, occurrence = 1 valueOffset = 6 dstBuffer.length = 15	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

	dstOffset = 0 dstLength = 1		
8	**valueOffset < 0** valueOffset = -1 dstBuffer.length = 15 dstOffset = 0 dstLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
9	**dstLength > Text String length** valueOffset = 0 dstBuffer.length = 15 dstOffset = 0 dstLength = 7	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
10	**valueOffset + dstLength > Text String length** valueOffset = 2 dstBuffer.length = 15 dstOffset = 0 dstLength = 5	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
11	**InitDisplayText()**		
	Select a TLV (tag 02h)		
	findAndCopyValue() tag = 0Dh occurrence = 2	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
	Call the getValueLength() method	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	
12	**initDisplayText()** dcs = 4 buffer = 00 01 … 0F		
	Successful call tag = 0Dh, occurrence = 1 valueOffset = 0 dstBuffer.length = 17 dstOffset = 0 dstLength = 17	Result of findAndCopyValue() is 17	
13	**Compare buffer** buffer = 04 00 01 … 0F	Result is 00h	
14	**initialise dstBuffer** dstBuffer = 55 55 … 55		
	Successful call tag = 0Dh, occurrence = 1 valueOffset = 2 dstBuffer.length = 20 dstOffset = 3 dstLength = 12	Result of findAndcopyValue() is 15	
15	**Compare buffer** buffer = 55 55 55 01 02 03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55	Result is 00h	
16	**Append a Text String TLV** tag = 0D buffer = 00 11 22 33 44 55 (no specific DCS byte)		
	Successful call tag = 0Dh, occurrence = 1 valueOffset = 0 dstBuffer.length = 17 dstOffset = 0 dstLength = 17	Result of findAndCopyValue() is 17	
17	**Compare buffer** buffer = 04 00 01 … 0F	Result is 00h	
18	**Successful call** tag = 0Dh, occurrence = 2 valueOffset = 0 dstBuffer.length = 6 dstOffset = 0 dstLength = 6	Result of findAndCopyValue() is 6	
19	**Compare buffer** buffer = 00 11 22 33 44 55	Result is 00h	
20	**initDisplayText()**		

	dcs = 4 buffer = 00 01 … 0F		
	Successful call (with tag 8Dh) tag = 8Dh occurrence = 1 valueOffset = 0 dstBuffer.length = 17 dstOffset = 0 dstLength = 17	Result of findAndcopyValue() is 17	
21	**Compare buffer** buffer = 04 00 01 … 0F	Result is 00h	
22	**Append tag 0Fh** buffer = 00 01 … 0F		
	Successful call (with tag 8Fh) tag = 8Fh occurrence = 1 valueOffset = 0 dstBuffer.length = 16 dstOffset = 0 dstLength = 16	Result of findAndcopyValue() is 16	
23	**Compare buffer** buffer = 00 01 … 0F	Result is 00h	

6.2.7.15.4 Test Coverage

CRR number	Test case number
N1	13, 15, 17, 19
N2	11
N3	12, 14, 16, 18
N4	20, 21, 22, 23
P1	1
P2	2, 3, 4, 5, 6
P3	7, 8, 9, 10
C1	Does not apply for ProactiveHandler

6.2.7.16 Method findAndCompareValue(byte tag, byte[] compareBuffer, short compareOffset)

Test Area Reference API_2_PAH_FACRB_BS

6.2.7.16.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte findAndCompareValue(byte tag,
                                byte[] compareBuffer,
                                short compareOffset)
                    throws  java.lang.NullPointerException,
                            java.lang.ArrayIndexOutOfBoundsException,
                            ToolkitException
```

Normal execution

Looks for the first occurrence of a TLV element from beginning of a TLV list and compare its value with a buffer:

CRRN1: if no TLV element is found, the UNAVAILABLE_ELEMENT exception is thrown and the current TLV is no longer defined.

CRRN2: if the method is successful then the corresponding TLV becomes current.

CRRN3: if identical returns 0.

CRRN4: if the first miscomparing byte in simple TLV is less than that in compareBuffer returns -1.

CRRN5: if the first miscomparing byte in simple TLV is greater than that in compareBuffer returns 1.

CRRN6: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if compareBuffer is null NullPointerException shall be thrown.

CRRP2: if compareOffset would cause access outside array bounds ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.7.16.3 Test Suite files

Test Script: API_2_PAH_FACRB_BS_1.scr

Test Applet: API_2_PAH_FACRB_BS_1.java

Load Script: API_2_PAH_FACRB_BS_1.ldr

Clean-up Script: API_2_PAH_FACRB_BS_1.clr

6.2.7.16.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Initialise the handler**		
	findAndCompareValue() with a null dstBuffer	NullPointerException is thrown	
2	**initDisplayText() with length = 15**		
	compareOffset ≥ compareBuffer.length tag = 0Dh compareBuffer.length = 20 compareOffset = 20	ArrayIndexOutOfBoundsException is thrown	
3	**compareOffset < 0** compareBuffer.length = 20 compareOffset = -1	ArrayIndexOutOfBoundsException is thrown	
4	**length > compareBuffer.length** compareBuffer.length = 15 compareOffset = 0	ArrayIndexOutOfBoundsException is thrown	
5	**compareOffset + length >** compareBuffer.length compareBuffer.length = 20 compareOffset = 5	ArrayIndexOutOfBoundsException is thrown	
6	**InitDisplayText()**		
	Select a TLV (tag 02h)		
	findAndCompareValue() tag = 03h	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
	Call the getValueLength() method	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	
7	**initDisplayText()** dcs = 4 buffer = 00 01 … 0F		
	Initialise compareBuffer compareBuffer = 04 00 01 … 0F		
	Compare buffers tag = 0Dh compareOffset = 0	Result is 00h	
8	**Verify current TLV** getValueLength()	Result is 17	
9	**Initialise compareBuffer** compareBuffer = 04 00 01 … 10		

	Compare buffers with same parameters	Result is -1	
10	**Initialise compareBuffer** compareBuffer = 03 00 01 … 0F		
	Compare buffers with same parameters	Result is +1	
11	**Initialise compareBuffer** compareBuffer = 55 55 04 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 55		
	Compare buffers compareOffset = 2	Result is 00h	
12	**append a Text String TLV** tag = 0Dh buffer = 00 11 22 33 44 55		
	Initialise compareBuffer compareBuffer = 55 55 04 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 55		
	Compare buffers compareOffset = 2	Result is 00h	
13	**Initialise compareBuffer** compareBuffer = 55 55 04 01 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 55		
	Compare buffers compareOffset = 2	Result is -1	
14	**Initialise compareBuffer** compareBuffer = 55 55 04 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0D 10 55		
	Compare buffers compareOffset = 2	Result is +1	
15	**initDisplayText()** dcs = 4 buffer = 00 01 … 0F		
	Initialise compareBuffer CompareBuffer = 04 00 01 … 0F		
	Successful call (with tag 8Dh) tag = 8Dh compareBuffer.length = 17 compareOffset = 0	Result is 00h	
16	**Append tag 0Fh** buffer = 00 01 … 0F		
	Initialise compareBuffer compareBuffer = 00 01 … 0F		
	Successful call (with tag 8Fh) tag = 8Fh compareBuffer.length = 16 compareOffset = 0	Result is 00h	
17	**Initialise compareBuffer** compareBuffer = 00 99 01 03 … 0F		
	Successful call (with tag 8Fh) tag = 8Fh compareBuffer.length = 16 compareOffset = 0	Result is +1	

6.2.7.16.4 Test Coverage

CRR number	Test case number
N1	6
N2	8
N3	7, 11, 12
N4	9, 13
N5	10, 14
N6	15, 16
P1	1
P2	2, 3, 4, 5
C1	Does not apply for Proactive Handler

6.2.7.17 Method findAndCompareValue(byte tag, byte occurence, short valueOffset, byte[] compareBuffer, short compareOffset, short compareLength)

Test Area Reference API_2_PAH_FACRBBS_BSS

6.2.7.17.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte findAndCompareValue(byte tag,
                                byte occurence,
                                short valueOffset,
                                byte[] compareBuffer,
                                short compareOffset,
                                short compareLength)
                          throws   java.lang.NullPointerException,
                                   java.lang.ArrayIndexOutOfBoundsException,
                                   ToolkitException
```

Normal execution

Looks for the indicated occurrence of a TLV element from the beginning of a TLV list and compare its value with a buffer:

CRRN1: if no TLV element is found, the UNAVAILABLE_ELEMENT exception is thrown and the current TLV is no longer defined.

CRRN2: if the method is successful then the corresponding TLV becomes current.

CRRN3: if identical 0 is returned.

CRRN4: if the first miscomparing byte in simple TLV is less than that in compareBuffer -1 is returned.

CRRN5: if the first miscomparing byte in simple TLV is greater than that in compareBuffer 1 is returned

CRRN6: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if compareBuffer is null NullPointerException shall be thrown.

CRRP2: if compareOffset or compareLength or both would cause access outside array bounds, or if compareLength is negative ArrayIndexOutOfBoundsException shall be thrown.

CRRP3: if valueOffset, compareLength or both are out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

CRRP4: if an input parameter is not valid (e.g. occurence = 0) an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException BAD_INPUT_PARAMETER.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.7.17.3 Test Suite files

Test Script: API_2_PAH_FACRBBS_BSS_1.scr

Test Applet: API_2_PAH_FACRBBS_BSS_1.java

Load Script: API_2_PAH_FACRBBS_BSS_1.ldr

Clean-up Script: API_2_PAH_FACRBBS_BSS_1.clr

6.2.7.17.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Initialise the handler**		
	findAndCompareValue() with a null compareBuffer	NullPointerException is thrown	
2	**initDisplayText() with length = 15**		
	compareOffset ≥ compareBuffer.length tag = 0Dh, occurrence = 1 valueOffset = 0 compareBuffer.length = 5 compareOffset = 5 compareLength = 1	ArrayIndexOutOfBoundsException is thrown	
3	**compareOffset < 0** compareBuffer.length = 5 compareOffset = -1 compareLength = 1	ArrayIndexOutOfBoundsException is thrown	
4	**compareLength >compareBuffer.length** compareBuffer.length = 5 compareOffset = 0 compareLength = 6	ArrayIndexOutOfBoundsException is thrown	
5	**compareOffset + compareLength** >compareBuffer.length compareBuffer.length = 5 compareOffset = 3 compareLength = 3	ArrayIndexOutOfBoundsException is thrown	
6	**compareLength < 0** compareBuffer.length = 5 compareOffset = 0 compareLength = -1	ArrayIndexOutOfBoundsException is thrown	
7	**initDisplayText() with length = 5**		
	valueOffset ≥ Text String Length tag = 0Dh, occurrence = 1 valueOffset = 6 compareBuffer.length = 15 compareOffset = 0 compareLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
8	**valueOffset < 0** valueOffset = -1 compareBuffer.length = 15 compareOffset = 0 compareLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
9	**compareLength > Text String length** valueOffset = 0 compareBuffer.length = 15 compareOffset = 0 compareLength = 7	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
10	**valueOffset + compareLength > Text String length** valueOffset = 2 compareBuffer.length = 15 compareOffset = 0 compareLength = 5	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

11	**Invalid parameter** occurrence = 0	ToolkitException.BAD_INPUT_PARAMETER is thrown	
12	**InitDisplayText()**		
	Select a TLV (tag 02h)		
	findAndCompareValue() tag = 0Dh occurrence = 2	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
	Call the getValueLength() method	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	
13	**initDisplayText()** dcs = 4 buffer = 00 01 … 0F		
	Initialise compareBuffer compareBuffer = 04 00 01 … 0F		
	findAndCompareValue() tag = 0Dh, occurrence = 1 valueOffset = 0 compareOffset = 0 compareLength = 17	Result is 00h	
14	**Verify current TLV** getValueLength()	Result is 17	
15	**Initialise compareBuffer** compareBuffer = 04 00 01 … 10		
	Compare buffers with same parameters	Result is -1	
16	**Initialise compareBuffer** compareBuffer = 03 00 01 … 0F		
	Compare buffers with same parameters	Result is +1	
17	**Initialise compareBuffer** compareBuffer = 55 55 55 01 02 03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55		
	Compare buffers valueOffset = 2 compareOffset = 3 compareLength = 12	Result is 00h	
18	**Initialise compareBuffer** compareBuffer = 55 55 55 02 01 03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55		
	Compare buffers with same parameters	Result is -1	
19	**Initialise compareBuffer** compareBuffer = 55 55 55 01 02 03 04 05 06 07 08 09 0A 0A 0D 55 55 55 55 55		
	Compare buffers with same parameters	Result is +1	
20	**append a Text String TLV** tag = 0Dh buffer = 00 11 22 33 44 55		
	Initialise compareBuffer compareBuffer = 04 00 01 … 0F		
	findAndCompareValue() tag = 0Dh, occurrence = 1 valueOffset = 0 compareOffset = 0 compareLength = 17	Result is 00h	

21	**Initialise compareBuffer** compareBuffer = 00 11 22 33 44 55		
	findAndCompareValue() tag = 0Dh, occurrence = 2 valueOffset = 0 compareOffset = 0 compareLength = 6	Result is 00h	
22	**Initialise compareBuffer** compareBuffer = 00 11 22 33 44 66		
	findAndCompareValue() tag = 0Dh, occurrence = 2 valueOffset = 0 compareOffset = 0 compareLength = 6	Result is –1	
23	**initDisplayText()** dcs = 4 buffer = 00 01 … 0F		
	Initialise compareBuffer CompareBuffer = 04 00 01 … 0F		
	Successful call (with tag 8Dh) tag = 8Dh, occurrence = 1 valueOffset = 0 compareBuffer.length = 17 compareOffset = 0 compareLength = 17	Result is 00h	
24	**Append tag 0Fh** buffer = 00 01 … 0F		
	Initialise compareBuffer compareBuffer = 00 01 … 0F		
	Successful call (with tag 8Fh) tag = 8Fh, occurrence = 1 valueOffset = 0 compareBuffer.length = 16 compareOffset = 0 compareLength = 16	Result is 00h	

6.2.7.17.4 Test Coverage

CRR number	Test case number
N1	12
N2	14
N3	13, 17, 20, 21
N4	15, 18, 22
N5	16, 19
N6	23, 24
P1	1
P2	2, 3, 4, 5, 6
P3	7, 8, 9, 10
P4	11
C1	Does not apply for Proactive Handler

6.2.7.18 Method appendArray

Test Area Reference: API_2_PAH_APDA

6.2.7.18.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
void appendArray(byte[] buffer, short offset, short length)
            throws  java.lang.NullPointerException,
```

```
java.lang.ArrayIndexOutOfBoundsException,
ToolkitException
```

Normal execution

CRRN1: appends a buffer into the Edithandler buffer

CRRN2: a successful append does not modify the TLV selected

Parameters error

CRRP1: if buffer is null, a java.lang.NullPointerException is thrown

CRRP2: if offset or length or both would cause access outside the array bounds, or if length is negative, a java.lang.ArrayIndexOutOfBoundsException is thrown.

Context errors

CRRC1: if the EditHandler buffer is too small to append the requested data, a ToolkitException is thrown with reason code HANDLER_OVERFLOW

CRRC2: if the EditHandler buffer is busy, a ToolkitException is thrown with reason code HANDLER_NOT_AVAILABLE

6.2.7.18.2 Test suite files

Test Script: API_2_PAH_APDA_1.scr

Test Applet: API_2_PAH_APDA_1.java

Load Script: API_2_PAH_APDA_1.ldr

Clean-up Script: API_2_PAH_APDA_1.clr

6.2.7.18.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Null buffer**	NullPointerException is thrown	
2	**offset > buffer.length** buffer.length = 5 offset = 6 length = 0	ArrayIndexOutOfBoundsException is thrown	
3	**offset < 0** buffer.length = 5 offset = -1 length = 1	ArrayIndexOutOfBoundsException is thrown	
4	**length > buffer.length** buffer.length = 5 offset = 0 length = 6	ArrayIndexOutOfBoundsException is thrown	
5	**offset + length > buffer.length** buffer.length = 5 offset = 3 length = 3	ArrayIndexOutOfBoundsException is thrown	
6	**length < 0** buffer.length = 5 offset = 0 length = -1	ArrayIndexOutOfBoundsException is thrown	
7	**Handler overflow** buffer.length = 256 offset = 0 length = 256	ToolkitException.HANDLER_OVERFLOW is thrown	
8	**Initialise handler**		
	Select Command Details TLV		
	Successful call buffer = FF FE … F8 offset = 0 length = 8		
	Verify Current TLV: Call getValueLength()	Result is 03h	

9	**Clear the handler**		

	Successful call
	`buffer = FF FE … F8`
	`offset = 0`
	`length = 8`		

	Call copy() method		
	Compare the arrays `compareBuffer = FF FE … F8`	Result of javacard.framework.Util.arrayCompare() is 00h	

10	**Successful call**
	`buffer = 00 01 … 07`
	`offset = 2`
	`length = 6`		

	Call copy() method		
	Compare the arrays `compareBuffer = FF FE … F8 02 03 … 07`	Result of javacard.framework.Util.arrayCompare() is 00h	

11	**Successful call**
	`buffer = 11 22 … 88`
	`offset = 2`
	`length = 4`		

	Call copy() method		
	Compare the arrays `compareBuffer = FF FE … F8 02 03 … 07 33 44 55 66`	Result of javacard.framework.Util.arrayCompare() is 00h	

6.2.7.18.4 Test Coverage

CRR number	Test case number
N1	9, 10, 11
N2	8
P1	1
P2	2, 3, 4, 5, 6
C1	7
C2	Does not apply for ProactiveHandler

6.2.7.19 Method appendTLV(byte tag, byte value)

Test Area Reference: API_2_PAH_APTLBB

6.2.7.19.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
void appendTLV  (byte tag, byte value)
                throws ToolkitException
```

Normal execution

CRRN1: Appends a TLV element to the current TLV list (1-byte element).

CRRN2: A successful append does not modify the TLV selected.

Parameters error

None

Context errors

CRRC1: if the EditHandler buffer is too small to append the requested data, a ToolkitException is thrown with reason code HANDLER_OVERFLOW

CRRC2: if the EditHandler buffer is busy, a ToolkitException is thrown with reason code HANDLER_NOT_AVAILABLE

6.2.7.19.2 Test suite files

Test Script: API_2_PAH_APTLBB_1.scr

Test Applet: API_2_PAH_APTLBB_1.java

Load Script: API_2_PAH_APTLBB_1.ldr

Clean-up Script: API_2_PAH_APTLBB_1.clr

6.2.7.19.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Call appendArray()** `length = 251`		
	Handler Overflow: Call the appendTLV() method	ToolkitException.HANDLER_OVERFLOW is thrown	
2	**Initialise handler**		
	Select Command Details TLV		
	Call the appendTLV() method		
	Verify Current TLV: Call getValueLength()	Result is 03h	
3	**Clear the handler**		

	Successful call
	`tag = 84h`
	`value = 00h`		

	Call copy() method		
	Compare the arrays `compareBuffer = 84 01 00`	Result of javacard.framework.Util.arrayCompare() is 00h	

4	**Successful call**
	`tag = 01h`
	`value = FEh`		

	Call copy() method		
	Compare the arrays `compareBuffer = 84 01 00 01 01 FE`	Result of javacard.framework.Util.arrayCompare() is 00h	

6.2.7.19.4 Test Coverage

CRR number	Test case number
N1	3, 4
N2	2
C1	1
C2	Does not apply for Proactive Handler

6.2.7.20 Method appendTLV(byte tag, byte value1, byte value2)

Test Area Reference: API_2_PAH_APTLBBB

6.2.7.20.1 Conformance requirements:

The method with following header shall be compliant to its definition in the API.

```
void appendTLV  (byte tag, byte value)
        throws ToolkitException
```

Normal execution

CRRN1: Appends a TLV element to the current TLV list (2-byte element).

CRRN2: A successful append does not modify the TLV selected.

Parameters error

None

Context errors

CRRC1: if the EditHandler buffer is too small to append the requested data, a ToolkitException is thrown with reason code HANDLER_OVERFLOW

CRRC2: if the EditHandler buffer is busy, a ToolkitException is thrown with reason code HANDLER_NOT_AVAILABLE

6.2.7.20.2 Test suite files

Test Script: API_2_PAH_APTLBBB_1.scr

Test Applet: API_2_PAH_APTLBBB_1.java

Load Script: API_2_PAH_APTLBBB_1.ldr

Clean-up Script: API_2_PAH_APTLBBB_1.clr

6.2.7.20.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Call the initDisplayText()** `length = 250`		
	Handler Overflow: Call the appendTLV() method	ToolkitException.HANDLER_OVERFLOW is thrown	
2	**Initialise handler**		
	Select Command Details TLV		
	Call the appendTLV() method		
	Verify Current TLV: Call getValueLength()	Result is 03h	
3	**Clear the handler**		

	Successful call
	`tag = 84h`
	`value1 = 00h`
	`value2 = 01h`		

	Call copy() method		
	Compare the arrays `compareBuffer = 84 02 00 01`	Result of javacard.framework.Util.arrayCompare() is 00h	

4	**Successful call**
	`tag = 01h`
	`value1 = FEh`
	`value2 = FDh`		

	Call copy() method		
	Compare the arrays `compareBuffer = 84 02 00 01 01 02 FE FD`	Result of javacard.framework.Util.arrayCompare() is 00h	

6.2.7.20.4 Test Coverage

CRR number	Test case number
N1	3, 4
N2	2
C1	1
C2	Does not apply for Proactive Handler

6.2.7.21 Method appendTLV(byte tag, byte[ ] value, short valueoffset, short valuelength)

Test Area Reference: API_2_PAH_APTLBBSS

6.2.7.21.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
void appendTLV  (byte tag,
         byte[] value,
         short valueoffset,
         short valuelength)
        throws  java.lang.NullPointerException,
                java.lang.ArrayIndexOutOfBoundsException,
                ToolkitException
```

Normal execution

CRRN1: Appends a TLV element to the current TLV list (byte-array element).

CRRN2: A successful append does not modify the TLV selected.

Parameters error

CRRP1: if value is null, a java.lang.NullPointerException is thrown

CRRP2: if valueoffset or valuelength or both would cause access outside the array bounds, or if length is negative, a java.lang.ArrayIndexOutOfBoundsException is thrown.

Context errors

CRRC1: if the EditHandler buffer is too small to append the requested data, a ToolkitException is thrown with reason code HANDLER_OVERFLOW

CRRC2: if the EditHandler buffer is busy, a ToolkitException is thrown with reason code HANDLER_NOT_AVAILABLE

CRRC3: if valuelength is greater than 255, a ToolkitException is thrown with reason code BAD_INPUT_PARAMETER

6.2.7.21.2 Test suite files

Test Script: API_2_PAH_APTLBBSS_1.scr

Test Applet: API_2_PAH_APTLBBSS_1.java

Load Script: API_2_PAH_APTLBBSS_1.ldr

Clean-up Script: API_2_PAH_APTLBBSS_1.clr

6.2.7.21.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Null value**	NullPointerException is thrown	

2	**valueOffset ≥ value.length**
	`value.length = 5`
	`valueOffset = 5`
	`valueLength = 1`
		ArrayIndexOutOfBoundsException is thrown	

3	**valueOffset < 0**
	`value.length = 5`
	`valueOffset = -1`
	`valueLength = 1`
		ArrayIndexOutOfBoundsException is thrown	

4	**valueLength > value.length**
	`value.length = 5`
	`valueOffset = 0`
	`valueLength = 6`
		ArrayIndexOutOfBoundsException is thrown	

5	**valueOffset + valueLength > value.length**
	`value.length = 5`
	`valueOffset = 3`
	`valueLength = 3`
		ArrayIndexOutOfBoundsException is thrown	

6	**valueLength < 0**
	`value.length = 5`
	`valueOffset = 0`
	`valueLength = -1`
		ArrayIndexOutOfBoundsException is thrown	

7	**Handler overflow**
	`value.length = 254`
	`valueOffset = 0`
	`valueLength = 254`
		ToolkitException.HANDLER_OVERFLOW is thrown	

8	**Bad parameter**
	`value.length = 256`
	`valueOffset = 0`
	`valueLength = 256`
		ToolkitException.BAD_INPUT_PARAMETER is thrown	

9	**Initialise handler**		
	Select Command Details TLV		

	Successful call
	`tag = 04`
	`value = FF FE … F8`
	`valueOffset = 0`
	`valueLength = 8`		

	Verify Current TLV: Call `getValueLength()`	Result is 03h	
10	**Clear the handler**		

	Successful call
	`tag = 04`
	`value = FF FE … F8`
	`valueOffset = 0`
	`valueLength = 8`		

	Call copy() method		
	Compare the arrays `compareBuffer = 04 08 FF FE … F8`	Result of javacard.framework.Util.arrayCompare() is 00h	

11	**Successful call**
	`tag = 85h`
	`value = 00 01 … 07`
	`valueOffset = 2`
	`valueLength = 6`		

	Call copy() method		
	Compare the arrays `compareBuffer = 04 08 FF FE … F8 85 06 02 03 … 07`	Result of javacard.framework.Util.arrayCompare() is 00h	

12	**Successful call**
	`tag = 01`
	`value = 11 22 … 88`
	`valueOffset = 2`
	`valueLength = 4`		

	Call copy() method		
	Compare the arrays `compareBuffer = 04 08 FF FE … F8 85 06 02 03 … 07 01 04 33 44 55 66`	Result of javacard.framework.Util.arrayCompare() is 00h	
13	**Clear the handler**		

	Successful call
	`tag = 04`
	`value = 00 01 … 7F`		

	valueOffset = 0 valueLength = 80h		
	Call copy() method		
	Compare the arrays compareBuffer = 04 81 80 00 01…7F	Result of javacard.framework.Util.arrayCompare() is 00h	

6.2.7.21.4 Test Coverage

CRR number	Test case number
N1	10, 11, 12, 13
N2	9
P1	1
P2	2, 3, 4, 5, 6
C1	7
C2	Does not apply for Proactive Handler
C3	8

6.2.7.22 Method appendTLV(byte tag, byte value1, byte[ ] value2, short value2offset, short value2length)

Test Area Reference: API_2_PAH_APTLBB_BSS

6.2.7.22.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
void appendTLV  (byte tag,
         byte value1
         byte[] value2,
         short value2offset,
         short value2length)
        throws  java.lang.NullPointerException,
                java.lang.ArrayIndexOutOfBoundsException,
                ToolkitException
```

Normal execution

CRRN1: Appends a TLV element to the current TLV list (1 byte and a byte-array element).

CRRN2: A successful append does not modify the TLV selected.

Parameters error

CRRP1: if value2 is null, a java.lang.NullPointerException is thrown

CRRP2: if value2offset or value2length or both would cause access outside the array bounds, or if length is negative, a java.lang.ArrayIndexOutOfBoundsException is thrown.

Context errors

CRRC1: if the EditHandler buffer is too small to append the requested data, a ToolkitException is thrown with reason code HANDLER_OVERFLOW

CRRC2: if the EditHandler buffer is busy, a ToolkitException is thrown with reason code HANDLER_NOT_AVAILABLE

CRRC3: if valuelength is greater than 255, a ToolkitException is thrown with reason code BAD_INPUT_PARAMETER

6.2.7.22.2 Test suite files

Test Script: API_2_PAH_APTLBB_BSS_1.scr

Test Applet: API_2_PAH_APTLBB_BSS_1.java

Load Script: API_2_PAH_APTLBB_BSS_1.ldr

Clean-up Script: API_2_PAH_APTLBB_BSS_1.clr

6.2.7.22.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Null value2**	NullPointerException is thrown	
2	**value2Offset ≥ value2.length** value2.length = 5 value2Offset = 5 value2Length = 1	ArrayIndexOutOfBoundsException is thrown	
3	**value2Offset < 0** value2.length = 5 value2Offset = -1 value2Length = 1	ArrayIndexOutOfBoundsException is thrown	
4	**value2Length > value2.length** value2.length = 5 value2Offset = 0 value2Length = 6	ArrayIndexOutOfBoundsException is thrown	
5	**value2Offset + value2Length > value2.length** value2.length = 5 value2Offset = 3 value2Length = 3	ArrayIndexOutOfBoundsException is thrown	
6	**value2Length < 0** value2.length = 5 value2Offset = 0 value2Length = -1	ArrayIndexOutOfBoundsException is thrown	
7	**Handler overflow** value2.length = 254 value2Offset = 0 value2Length = 254	ToolkitException.HANDLER_OVERFLOW is thrown	
8	**Bad parameter** value2.length = 256 value2Offset = 0 value2Length = 256	ToolkitException.BAD_INPUT_PARAMETER is thrown	
9	**Initialise handler**		
	Select Command Details TLV		
	Successful call tag = 04 value1 = 05 value2 = FF FE … F8 value2Offset = 0 value2Length = 8		
	Verify Current TLV: Call getValueLength()	Result is 03h	
10	**Clear the handler**		
	Successful call tag = 04 value1 = 05 value2 = FF FE … F8 value2Offset = 0 value2Length = 8		
	Call copy() method		
	Compare the arrays CompareBuffer = 04 09 05 FF FE … F8	Result of javacard.framework.Util.arrayCompare() is 00h	
11	**Successful call** tag = 85h value1 = 55h value2 = 00 01 … 07 value2Offset = 2 value2Length = 6		
	Call copy() method		
	Compare the arrays compareBuffer = 04 09 05 FF FE … F8	Result of javacard.framework.Util.arrayCo	

	85 07 55 02 03 … 07	mpare() is 00h	
12	**Successful call** tag = 01 value1 = 44h value2 = 11 22 … 88 value2Offset = 2 value2Length = 4		
	Call copy() method		
	Compare the arrays CompareBuffer = 04 09 05 FF FE … F8 85 07 55 02 03 … 07 01 05 44 33 44 55 66	Result of javacard.framework.Util.arrayCompare() is 00h	
13	**Clear the handler**		
	Successful call tag = 04 value1 = 00 value2 = 01 … 7F value2Offset = 0 value2Length = 7Fh		
	Call copy() method		
	Compare the arrays compareBuffer = 04 81 80 00 01…7F	Result of javacard.framework.Util.arrayCompare() is 00h	

6.2.7.22.4 Test Coverage

CRR number	Test case number
N1	10, 11, 12, 13
N2	9
P1	1
P2	2, 3, 4, 5, 6
C1	7
C2	Does not apply for Proactive Handler
C3	8

6.2.7.23 Method clear

Test Area Reference: API_2_PAH_CLR

6.2.7.23.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
void clear()
       throws ToolkitException
```

Normal execution

CRRN1: Clears the TLV list of an EditHandler and resets the current TLV selected.

Parameters error

No requirements

Context errors

CRRC1: if the EditHandler buffer is busy, a ToolkitException is thrown with reason code HANDLER_NOT_AVAILABLE

6.2.7.23.2 Test suite files

Test Script: API_2_PAH_CLR_1.scr

Test Applet: API_2_PAH_CLR_1.java

Load Script: API_2_PAH_CLR_1.ldr

Clean-up Script: API_2_PAH_CLR_1.clr

6.2.7.23.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Initialise the handler** Select Command Details TLV Call the getLength() method	Result of getLength() is not null	
	Clear the handler Call the getLength() method	Result of getLength() is 0	
2	**Call the getValueLength() method**	ToolkitException.UNAVAILABLE_ELEMENT is thrown	

6.2.7.23.4 Test Coverage

CRR number	Test case number
N1	1, 2
C1	Does not apply for Proactive Handler

6.2.8 Class ProactiveResponseHandler

6.2.8.1 Method copyAdditionalInformation

Test Area Reference: API_2_PRH_CPAI_BSS

6.2.8.1.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short copyAdditionalInformation(byte[] dstBuffer,
                                       short dstOffset,
                                       short dstLength)
                            throws  java.lang.NullPointerException,
                                    java.lang.ArrayIndexOutOfBoundsException,
                                    ToolkitException
```

Normal execution

CRRN1: The copyAdditionalInformation() method shall copy a part of the additional information field from Result TLV element in dstBuffer, using dstOffset and dstLength.

CRRN2: dstBuffer shall only be modified from dstOffset to (dstOffset + dstLength – 1) (included).

CRRN3: The method returns (dstOffset + dstLength).

CRRN4: If a Result TLV element is available, it becomes the TLV selected after a call to the method.

CRRN5: The method shall copy from the first Result TLV.

Parameter errors

CRRP1: A NullPointerException shall be thrown if dstBuffer is null.

CRRP2: An ArrayIndexOutOfBoundsException shall be thrown if dstOffset or dstLength or both would cause access outside array bounds.

Context errors

CRRC1: A ToolkitException.UNAVAILABLE_ELEMENT shall be thrown in case of unavailable Result TLV element.

CRRC2: A ToolkitException.OUT_OF_TLV_BOUNDARIES shall be thrown if dstLength is greater than the value field of the available TLV.

6.2.8.1.3 Test Suite files

6.2.8.1.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Build and send a DISPLAY TEXT command** qualifier = 0 dcs = 4 buffer = "Text"		DISPLAY TEXT Proactive command
	Terminal Response with 11 additional bytes Result TLV = 03 0C 01 01 23 45 67 89 AB CD EF 01 23 45		
	NULL as parameter to dstBuffer dstBuffer = NULL	NullPointerException is thrown	
2	**dstOffset ≥ dstBuffer.length** dstBuffer.length = 10 dstOffset = 10 dstLength = 1	ArrayIndexOutOfBoundsException is thrown	
3	**dstOffset < 0** dstBuffer.length = 10 dstOffset = -1 dstLength = 1	ArrayIndexOutOfBoundsException is thrown	
4	**dstLength > dstBuffer.length** dstBuffer.length = 10 dstOffset = 0 dstLength = 11	ArrayIndexOutOfBoundsException is thrown	
5	**dstOffset + dstLength > dstBuffer.length** dstBuffer.length = 10 dstOffset = 6 dstLength = 5	ArrayIndexOutOfBoundsException is thrown	
6	**dstLength < 0** dstBuffer.length = 10 dstOffset = 6 dstLength = -1	ArrayIndexOutOfBoundsException is thrown	
7	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response with 5 additional bytes Result TLV = 03 06 01 01 23 45 67 89		
	Successfull call, dstBuffer is the whole buffer dstBuffer.length = 5 dstOffset = 0 dstLength = 5	result of copyAdditionalInformation() is 05h.	
8	**Compare dstBuffer using arrayCompare()** src = {01, 23, 45, 67, 89} srcOffset = 00 dest = dstBuffer destOffset = 0 length = 5	result of arrayCompare() is 00h.	
9	**Call the getValueLength() method**	Result is 06h.	
10	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response with 6 additional bytes Result TLV = 03 07 01 AB CD EF FE DC BA		
	Successfull call, dstBuffer is part of a buffer dstBuffer.length = 7 dstOffset = 2 dstLength = 5	result of copyAdditionalInformation() is 07h.	

11	**Compare dstBuffer using arrayCompare()** src = {AB, CD, EF, FE, DC} srcOffset = 00 dest = dstBuffer destOffset = 2 length = 5	result of arrayCompare() is 00h.	
12	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response with 7 additional bytes Result TLV = 03 08 01 FE DC BA 98 76 54 32		
	Successfull call, dstBuffer is part of a buffer dstBuffer.length = 7 dstOffset = 0 dstLength = 5	result of copyAdditionalInformation() is 05h.	
13	**Compare dstBuffer using arrayCompare()** src = {FE, DC, BA, 98, 76} srcOffset = 00 dest = dstBuffer destOffset = 0 length = 5	result of arrayCompare() is 00h.	
14	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response with 8 additional bytes Result TLV = 03 09 01 00 11 22 33 44 55 66 77		
	Successfull call, dstBuffer is the whole buffer dstBuffer.length = 9 dstOffset = 2 dstLength = 5	result of copyAdditionalInformation() is 07h.	
15	**Compare dstBuffer using arrayCompare()** src = {00, 11, 22, 33, 44} srcOffset = 00 dest = dstBuffer destOffset = 2 length = 5	result of arrayCompare() is 00h.	
16	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response with F2h additional bytes Result TLV = 03 81 F3 01 00 01 02 03…		
	Successfull call to the method dstBuffer.length = F2h dstOffset = 0 dstLength = F2h	result of copyAdditionalInformation() is F2h.	
17	**Compare dstBuffer using arrayCompare()** src = {00, 01, 02, 03, 04…} srcOffset = 00 dest = dstBuffer destOffset = 0 length = F2h	result of arrayCompare() is 00h.	
18	**Call the getValueLength() method**	Result is F3h.	
19	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response with 5 additional bytes Result TLV = 03 06 01 00 11 22 33 44		
	dstLength > data available dstBuffer.length = 6 dstOffset = 0 dstLength = 6	OUT_OF_TLV_BOUNDARIES ToolkitException is thrown	
20	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response with 5 additional bytes Result TLV = 03 06 01 00 11 22 33 44		

	Initialise dstBuffer dstBuffer = {00h, 01h, 02h, 03h…}		
	Call the copyAdditionalInformation() method dstBuffer.length = 20 dstOffset = 5 dstLength = 5		
	Compare dstBuffer using arrayCompare() src = { 00h, 01h, 02h, 03h, 04h, 00h, 11h, 22h, 33h, 44h, 0Ah, 0Bh, 0Ch, 0Dh, 0Eh, 0Fh, 10h, 11h, 12h, 13h} srcOffset = 0 dest = dstBuffer destOffset = 0 length = 20	result of arrayCompare() is 00h	
21	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response with 2 Result TLV elements 1st Result TLV = 03 06 01 01 23 45 67 89 2nd Result TLV = 03 01 00		
	Successfull call to copyAdditionalInformation() dstBuffer.length = 5 dstOffset = 0 dstLength = 5	result of copyAdditionalInformation() is 05h.	
22	**Compare dstBuffer using arrayCompare()** src = {01, 23, 45, 67, 89} srcOffset = 00 dest = dstBuffer destOffset = 0 length = 5	result of arrayCompare() is 00h.	
23	**Call the getValueLength() method**	Result is 06h.	
24	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response without Result Simple TLV	ToolkitException.UNAVAILABLE_ELEMENT is thrown by send()	
	copyAdditionalInformation()	ToolkitException.UNAVAILABLE_ELEMENT is thrown	

6.2.8.1.4 Test Coverage

CRR number	Test case number
N1	8, 11, 13, 15, 17, 20, 22
N2	20
N3	7, 10, 12, 14, 16, 21
N4	9, 18, 23
N5	21, 22, 23
P1	1
P2	2, 3, 4, 5, 6
C1	24
C2	19

6.2.8.2 Method copyTextString

Test Area Reference: API_2_PRH_CPTS_BS

6.2.8.2.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short copyTextString(byte[] dstBuffer,
                            short dstOffset)
```

```
                    throws java.lang.NullPointerException,
                           java.lang.ArrayIndexOutOfBoundsException,
                           ToolkitException
```

Normal execution

CRRN1: The copyTextString() method copies the text string value from the first Text String TLV element, using dstBuffer and dstOffset.

CRRN2: If a Text String TLV element is available, it becomes the TLV selected.

CRRN3: The method returns (dstOffset + length of copied value).

Parameter errors

CRRP1: A NullPointerException shall be thrown if dstBuffer is null.

CRRP2: A ArrayIndexOutOfBoundsException shall be thrown if dstOffset or dstOffset + (length of the TextString to be copied, without the Data Coding Scheme included), as specified for the returned value, would cause access outside array bounds.

Context errors

CRRC1: A ToolkitException.UNAVAILABLE_ELEMENT shall be thrown in case of unavailable Text String TLV element.

6.2.8.2.3 Test Suite files

Test Script: API_2_PRH_CPTS_BS_1.scr

Test Applet: API_2_PRH_CPTS_BS_1.java

Load Script: API_2_PRH_CPTS_BS_1.ldr

Clean-up Script: API_2_PRH_CPTS_BS_1.clr

6.2.8.2.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Build and send a GET INPUT command** qualifier = 00h dcs = 04h buffer = 'Text' minRespLength = 00h maxRespLength = FFh		GET INPUT Proactive command
	Terminal Response Text String TLV = 0D 02 04 41		
	ProactiveResponseHandler.getTheHandler() ; call the copyTextString() method with a null dstBuffer dstBuffer = null dstOffset = 0	NullPointerException is thrown	
2	**Build and send a GET INPUT command**		GET INPUT Proactive command Proactive
	Terminal Response Text String TLV = 0D 04 04 "ABC"		
	dstOffset + text length > dstBuffer.length dstBuffer.length = 04h dstOffset = 02h	ArrayIndexOutOfBoundsException is thrown	
3	**dstOffset < 0** dstBuffer.length = 04h dstOffset = -1	ArrayIndexOutOfBoundsException is thrown	

4	**Build and send a DISPLAY TEXT command** qualifier = 00h dcs = 04h buffer = 'Text'		GET INPUT Proactive command Proactive
	Terminal Response without Text String TLV		
	ProactiveResponseHandler.getTheHandler() ; call the copyTextString() method	UNAVAILABLE_ELEMENT ToolkitException is thrown	
5	**Build and send a GET INPUT command**		GET INPUT Proactive command Proactive
	Terminal Response with a null Text String TLV Text String TLV = 0D 00		
	Initialise dstBuffer dstBuffer = {00h, 01h, 02h, 03h}		
	Call the copyTextString() method dstBuffer.length = 04h dstOffset = 02h	Result of copyTextString() is 02h	
6	**Compare dstBuffer using arrayCompare()** src = {00h, 01h, 02h, 03h} srcOffset = 00h dest = dstBuffer destOffset = 00h length = 04h	Result of arrayCompare() is 00h	
7	**Build and send a GET INPUT command**		GET INPUT Proactive command Proactive
	Terminal Response with text length = 01h Text String TLV = 0D 02 04 41		
	Initialise dstBuffer dstBuffer = {00h, 01h, 02h, 03h}		
	Call the copyTextString() method dstBuffer.length = 04h dstOffset = 00h	Result of copyTextString() is 01h	
8	**Compare dstBuffer using arrayCompare()** src = {41h, 01h, 02h, 03h} srcOffset = 00h dest = dstBuffer destOffset = 00h length = 04h	Result of arrayCompare() is 00h	
9	**Build and send a GET INPUT command**		GET INPUT Proactive command Proactive
	Terminal Response with text length = 02h Text String TLV = 0D 03 04 42 43		
	Initialise dstBuffer dstBuffer = {00h, 01h, 02h, 03h}		
	Call the copyTextString() method dstBuffer.length = 04h dstOffset = 02h	Result of copyTextString() is 04h	
10	**Compare dstBuffer using arrayCompare()** src = {00h, 01h, 42h, 43h} srcOffset = 00h dest = dstBuffer destOffset = 00h length = 04h	Result of arrayCompare() is 00h	
11	**Call the getValueLength() method**	Result is 03h	
12	**Build and send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response with text length = 7Eh Text String TLV = 0D 7F 04 01 02 … 7E		

	Initialise dstBuffer dstBuffer = {00h, 00h … 00h}		
	Call the copyTextString() method dstBuffer.length = 7Eh dstOffset = 00h	Result of copyTextString() is 7Eh	
13	**Compare dstBuffer using arrayCompare()** src = {01h, …, 7Eh} srcOffset = 00h dest = dstBuffer destOffset = 00h length = 7Eh	Result of arrayCompare() is 00h	
14	**Call the getValueLength() method**	Result is 7Fh	
15	**Build and send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response with text length = 7Fh Text String TLV = 0D 81 80 04 01 02 …7F		
	Initialise dstBuffer dstBuffer = {00h, 01h … FFh}		
	Call the copyTextString() method dstBuffer.length = FFh dstOffset = 10h	Result of copyTextString() is 8Fh	
16	**Compare dstBuffer using arrayCompare()** src = {00h, 01h,… 0Fh, 01h, …7Fh, 8Fh, … FFh} srcOffset = 00h dest = dstBuffer destOffset = 00h length = FFh	Result of arrayCompare() is 00h	
17	**Build and send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response with text length = EFh Text String TLV = 0D 81 F0 04 01 02 … EF		
	Initialise dstBuffer dstBuffer = {00h, 00h … 00h}		
	Call the copyTextString() method dstBuffer.length = FFh dstOffset = 00h	Result of copyTextString() is EFh	
18	**Compare dstBuffer using arrayCompare()** src = {01h, …EFh, 00h … 00h } srcOffset = 00h dest = dstBuffer destOffset = 00h length = FFh	Result of arrayCompare() is 00h	
19	**Build and send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response with two Text String TLV 1st Text String TLV = 0D 03 04 42 43 2nd Text String TLV = 0D 02 04 44		
	Initialise dstBuffer dstBuffer = {00h, 01h, 02h, 03h}		
	Call the copyTextString() method dstBuffer.length = 04h dstOffset = 02h	Result of copyTextString() is 04h	
20	**Compare dstBuffer using arrayCompare()** src = {00h, 01h, 42h, 43h} srcOffset = 00h dest = dstBuffer destOffset = 00h length = 04h	Result of arrayCompare() is 00h	
21	**Call the getValueLength() method**	Result is 03h	

6.2.8.2.4 Test Coverage

CRR number	Test case number
N1	6, 8, 10, 13, 16, 18, 20
N2	11, 14, 21
N3	5, 7, 9, 12, 15, 17, 19
P1	1
P2	2, 3
C1	4

6.2.8.3 Method getAdditionalInformationLength

Test Area Reference: API_2_PRH_GTIL

6.2.8.3.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short getAdditionalInformationLength()
                    throws ToolkitException
```

Normal execution

CRRN1: This method returns the length of the additional information field from the first Result TLV in the ProactiveResponseHandler.

CRRN2: After a successful execution of the method, the Result TLV becomes the selected TLV of the ProactiveResponseHandler.

Parameter errors

Context errors

CRRC1: A ToolkitException.UNAVAILABLE_ELEMENT shall be thrown in case of unavailable Result TLV element.

6.2.8.3.3 Test Suite files

Test Script: API_2_PRH_GTIL_1.scr

Test Applet: API_2_PRH_GTIL_1.java

Load Script: API_2_PRH_GTIL_1.ldr

Clean-up Script: API_2_PRH_GTIL_1.clr

6.2.8.3.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Build and send a DISPLAY TEXT command** qualifier = 00h dcs = 04h buffer = 'Text'		DISPLAY TEXT Proactive command
	Terminal Response without additional information		
	ProactiveResponseHandler.getTheHandler() **; call the getAdditionalInformationLength() method**	Result is 00h	
2	**Call the getValueLength() method**	Result is 01h	
3	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT ProactiveProactive command
	Terminal Response with 1 additional byte Result TLV = 03 02 02 55		
	ProactiveResponseHandler.getTheHandler() ; call the getAdditionalInformationLength() method	Result is 01h	
4	**Call the getValueLength() method**	Result is 02h	
5	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT ProactiveProactive command
	Terminal Response with 7Eh additional bytes Result TLV = 03 7F 02 55 55 55 …		
	ProactiveResponseHandler.getTheHandler() ; call the getAdditionalInformationLength() method	Result is 7Eh	
6	**Call the getValueLength() method**	Result is 7Fh	
7	Build and send a DISPLAY TEXT command		DISPLAY TEXT Proactive commandProactive
	Terminal Response with 7Fh additional bytes Result TLV = 03 81 80 02 55 55 55 …		
	ProactiveResponseHandler.getTheHandler() ; call the getAdditionalInformationLength() method	Result is 7Fh	
8	**Call the getValueLength() method**	Result is 80h	
9	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive commandProactive
	Terminal Response with 80h additional bytes **Result TLV = 03 81 81 02 55 55 55 …**		
	ProactiveResponseHandler.getTheHandler() ; call the getAdditionalInformationLength() method	Result is 80h	
10	**Call the getValueLength() method**	Result is 81h	
11	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive commandProactive
	Terminal Response with F2h additional bytes Result TLV = 03 81 F3 02 55 55 55 …		
	ProactiveResponseHandler.getTheHandler() ; call the getAdditionalInformationLength() method	Result is F2h	
12	**Call the getValueLength() method**	Result is F3h	
13	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive commandProactive

	Terminal Response with 2 Result TLV 1st Result TLV = 03 03 02 01 23 2nd Result TLV = 03 01 00		
	ProactiveResponseHandler.getTheHandler() ; call the getAdditionalInformationLength() method	Result is 02h	
14	**Call the getValueLength() method**	Result is 03h	
15	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command Proactive
	Terminal Response without Result Simple TLV	ToolkitException.UNAVAILABLE_ELEMENT is thrown by send()	
	Get ProactiveResponseHandler		
	Call the getAdditionalInformationLength() method	ToolkitException.UNAVAILABLE_ELEMENT is thrown by getAdditionalInformationLength ()	

6.2.8.3.4 Test Coverage

CRR number	Test case number
N1	1, 3, 5, 7, 9, 11, 13
N2	2, 4, 6, 8, 10, 12, 14
C1	15

6.2.8.4 Method getGeneralResult

Test Area Reference: API_2_PRH_GTGR

6.2.8.4.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte getGeneralResult()
                    throws ToolkitException
```

Normal execution

CRRN1: This method returns the general result of a proactive command.

CRRN2: After a successful execution of the method, the Result TLV becomes the selected TLV of the ProactiveResponseHandler.

Parameter errors

Context errors

CRRC1: A ToolkitException.UNAVAILABLE_ELEMENT shall be thrown in case of unavailable Result TLV element.

CRRC2: A ToolkitException.OUT_OF_TLV_BOUNDARIES shall be thrown if the general result byte is missing in the Result Simple TLV.

6.2.8.4.3 Test Suite files

Test Script: API_2_PRH_GTGR_1.scr

Test Applet: API_2_PRH_GTGR_1.java

Load Script: API_2_PRH_GTGR_1.ldr

Clean-up Script: API_2_PRH_GTGR_1.clr

6.2.8.4.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Build and send a DISPLAY TEXT command** qualifier = 00h dcs = 04h buffer = 'Text'		DISPLAY TEXT Proactive command
	Terminal Response with General Result = 00 (command performed successfully)		
	ProactiveResponseHandler.getTheHandler() Call the getGeneralResult() method	Result of getGeneralResult() is 00h	
2	**Call the getValueLength() method**	Result is 01h	
3	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response with General Result = 01, without Additional information on result (command performed with partial comprehension)		
	ProactiveResponseHandler.getTheHandler() Call the getGeneralResult() method	Result of getGeneralResult() is 01h	
4	**Call the getValueLength() method**	Result is 01h	
5	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response with General Result = 01, with Additional information on result Result TLV = 03 02 01 55 (command performed with partial comprehension)		
	ProactiveResponseHandler.getTheHandler() Call the getGeneralResult() method	Result of getGeneralResult() is 01h	
6	**Call the getValueLength() method**	Result is 02h	
7	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response with General Result = 02 Result TLV = 03 04 02 65 43 21 (Missing information)		
	ProactiveResponseHandler.getTheHandler() Call the getGeneralResult() method	Result of getGeneralResult() is 02h	
8	**Call the getValueLength() method**	Result is 04h	
9	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response with 7Fh additional bytes Result TLV = 03 81 80 02 55 55 55 …		
	ProactiveResponseHandler.getTheHandler() ; call the getGeneralResult() method	Result is 02h	
10	**Call the getValueLength() method**	Result is 80h	
11	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response with 2 Result TLV 1st Result TLV = 03 02 02 12 2nd Result TLV = 03 03 03 34 56		
	ProactiveResponseHandler.getTheHandler() ; call the getGeneralResult() method	Result is 02h	

12	**Call the getValueLength() method**	Result is 02h	
13	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response without Result Simple TLV	ToolkitException.UNAVAILABLE_ELEMENT is thrown by send()	
	ProactiveResponseHandler.getTheHandler() ; call the getGeneralResult() method	UNAVAILABLE_ELEMENT ToolkitException is thrown	
14	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response without General Result Byte in Result Simple TLV	ToolkitException.UNAVAILABLE_ELEMENT is thrown by send()	
	ProactiveResponseHandler.getTheHandler() ; `call the getGeneralResult() method` `Result TLV = 03 00`	OUT_OF_TLV_BOUNDARIES ToolkitException is thrown	

6.2.8.4.4 Test Coverage

CRR number	Test case number
N1	1, 3, 5, 7, 9, 11
N2	2, 4, 6, 8, 10, 12
C1	13
C2	14

6.2.8.5 Method getItemIdentifier

Test Area Reference: API_2_PRH_GTII

6.2.8.5.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte getItemIdentifier()
                    throws ToolkitException
```

Normal execution

CRRN1: The method returns the item identifier byte value from the first Item Identifier TLV element.

CRRN2: If an Item Identifier TLV element is available, it becomes the TLV selected.

Parameter errors

Context errors

CRRC1: A ToolkitException.UNAVAILABLE_ELEMENT shall be thrown in case of unavailable Item Identifier TLV element.

CRRC2: A ToolkitException.OUT_OF_TLV_BOUNDARIES shall be thrown if the item identifier byte is missing in the Item Identifier Simple TLV.

6.2.8.5.3 Test Suite files

Test Script: API_2_PRH_GTII_1.scr

Test Applet: API_2_PRH_GTII_1.java

Load Script: API_2_PRH_GTII_1.ldr

Clean-up Script: API_2_PRH_GTII_1.clr

6.2.8.5.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response (no Item Identifier TLV available)		
	Call to getItemIdentifier() with unavailable Item Identifier TLV	UNAVAILABLE_ELEMENT ToolkitException is thrown	
2	**Build and send a SELECT ITEM command with 2 items (ID=01, 02)**		SELECT ITEM Proactive command
	Terminal Response with Item 1 selected `Item Identifier TLV = 10 01 01`		
	Call the getItemIdentifier() method	Result is 01h	
3	**Call the getValueByte() method** `valueOffset = 00h`	Result is 01h	
4	**Build and send a SELECT ITEM command with 3 items (ID=03, 05, 07)**		SELECT ITEM Proactive command
	Terminal Response with Item 5 selected `Item Identifier TLV = 10 01 05`		
	Call the getItemIdentifier() method	Result is 05h	
5	**Call the getValueByte() method** `valueOffset = 00h`	Result is 05h	
6	**Build and send a SELECT ITEM command with 3 items (ID=FDh, FEh, FFh)**		SELECT ITEM Proactive command
	Terminal Response with Item FFh selected `Item Identifier TLV = 10 01 FF`		
	Call the getItemIdentifier() method	Result is FFh	
7	**Call the getValueByte() method** `valueOffset = 00h`	Result is FFh	
8	**Build and send a SELECT ITEM command with 3 items (ID=FDh, FEh, FFh)**		SELECT ITEM Proactive command

	Terminal Response with 2 Item Identifier `TLV`
	`1st Item Identifier TLV = 10 01 FFh`
	`2nd Item Identifier TLV = 10 01 FEh`		

	Call the getItemIdentifier() method	Result is FFh	
9	**Call the getValueByte() method** `valueOffset = 00h`	Result is FFh	
10	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response without item identifier in the Item Identifier Simple TLV `Item Identifier TLV = 10 00`		
	Call to getItemIdentifier()	OUT_OF_TLV_BOUNDARIES ToolkitException is thrown	

6.2.8.5.4 Test Coverage

CRR number	Test case number
N1	2, 4, 6, 8
N2	3, 5, 7, 9
C1	1
C2	10

6.2.8.6 Method getTextStringCodingScheme

Test Area Reference: API_2_PRH_GTCS

6.2.8.6.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte getTextStringCodingScheme()
                              throws ToolkitException
```

Normal execution

CRRN1: This method returns the data coding scheme from the first Text String TLV element.

CRRN2: If a Text String TLV element is available, it becomes the TLV selected.

Parameter errors

Context errors

CRRC1: A ToolkitException.UNAVAILABLE_ELEMENT shall be thrown in case of unavailable Text String TLV element.

CRRC2: A ToolkitException.OUT_OF_TLV_BOUNDARIES shall be thrown if the Text String TLV is present with a length of 0.

6.2.8.6.3 Test Suite files

Test Script: API_2_PRH_GTCS_1.scr

Test Applet: API_2_PRH_GTCS_1.java

Load Script: API_2_PRH_GTCS_1.ldr

Clean-up Script: API_2_PRH_GTCS_1.clr

6.2.8.6.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response (no Text String TLV element available)		
	Call to getTextStringCodingScheme() with unavailable Text String TLV	UNAVAILABLE_ELEMENT ToolkitException is thrown	
2	**Build and send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response with a null Text String TLV `Text String TLV = 0D 00`		
	Call the getTextStringCodingScheme() method	OUT_OF_TLV_BOUNDARIES ToolkitException is thrown	

3	**Build and send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response with text length = 01h, DCS = 04h Text String TLV = 0D 02 04 "A"		
	Call the getTextStringCodingScheme() method	Result is 04h	
4	**Call the getValueLength() method**	Result is 02h	
5	**Build and send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response with text length = 02h, DCS = 00h Text String TLV = 0D 03 00 "BB"		
	Call the getTextStringCodingScheme() method	Result is 00h	
6	**Call the getValueLength() method**	Result is 03h	
7	**Build and send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response with text length = 7Eh, DCS = 08h Text String TLV = 0D 7F 08 01 02 … 7E		
	Call the getTextStringCodingScheme() method	Result is 08h	
8	**Call the getValueLength() method**	Result is 7Fh	
9	**Build and send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response with text length = 7Fh, DCS = 04h Text String TLV = 0D 81 80 04 01 02 … 7F		
	Call the getTextStringCodingScheme() method	Result is 04h	
10	**Call the getValueLength() method**	Result is 80h	
11	**Build and send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response with text length = EFh, DCS = 08h Text String TLV = 0D 81 F0 08 01 02 … EE EF		
	Call the getTextStringCodingScheme() method	Result is 08h	
12	**Call the getValueLength() method**	Result is F0h	
13	**Build and send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response with 2 Text String TLV 1st Text String TLV = 0D 02 04 41 2nd Text String TLV = 0D 03 08 42 43		

	Call the getTextStringCodingScheme() method	Result is 04h	
14	**Call the getValueLength() method**	Result is 02h	

6.2.8.6.4 Test Coverage

CRR number	Test case number
N1	3, 5, 7, 9, 11, 13
N2	4, 6, 8, 10, 12, 14
C1	1
C2	2

6.2.8.7 Method GetTextStringLength

Test Area Reference: API_2_PRH_GTTL

6.2.8.7.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short getTextStringLength()
                        throws ToolkitException
```

Normal execution

CRRN1: The getTextStringLength() method returns the text string length value from the first Text String TLV element.

CRRN2: If a Text String TLV element is available, it becomes the TLV selected.

Parameter errors

Context errors

CRRC1: A ToolkitException.UNAVAILABLE_ELEMENT shall be thrown in case of unavailable Text String TLV element.

6.2.8.7.3 Test Suite files

Test Script: API_2_PRH_GTTL_1.scr

Test Applet: API_2_PRH_GTTL_1.java

Load Script: API_2_PRH_GTTL_1.ldr

Clean-up Script: API_2_PRH_GTTL_1.clr

6.2.8.7.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Build and send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response (no Text String TLV element available)		
	Call to getTextStringLength() with unavailable Text String TLV	UNAVAILABLE_ELEMENT ToolkitException is thrown	
2	**Build and send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response with a null Text String TLV Text String TLV = 0D 00		
	Call the getTextStringLength() method	Result is 00h	
3	**Call the getValueLength() method**	Result is 00h	
4	**Build and send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response with text length = 01h, DCS = 04h Text String TLV = 0D 02 04 "A"		
	Call the getTextStringLength() method	Result is 01h	
5	**Call the getValueLength() method**	Result is 02h	
6	**Build and send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response with text length = 02h, DCS = 00h Text String TLV = 0D 03 00 "BB"		
	Call the getTextStringLength() method	Result is 02h	
7	**Call the getValueLength() method**	Result is 03h	
8	**Build and send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response with text length = 7Eh, DCS = 08h Text String TLV = 0D 7F 08 01 02 … 7E		
	Call the getTextStringLength() method	Result is 7Eh	
9	**Call the getValueLength() method**	Result is 7Fh	
10	**Build and send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response with text length = 7Fh, DCS = 04h Text String TLV = 0D 81 80 04 01 02 … 7F		
	Call the getTextStringLength() method	Result is 7Fh	
11	**Call the getValueLength() method**	Result is 80h	
12	**Build and send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response with text length = EFh, DCS = 04h Text String TLV = 0D 81 F0 04 01 02 … EE		

	EF		
	Call the getTextStringLength() method	Result is EFh	
13	**Call the getValueLength() method**	Result is F0h	
14	**Build and send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response with 2 Text String TLV 1st Text String TLV = 0D 02 04 41 2nd Text String TLV = 0D 03 08 42 43		
	Call the getTextStringLength() method	Result is 01h	
15	**Call the getValueLength() method**	Result is 02h	

6.2.8.7.4 Test Coverage

CRR number	Test case number
1	2, 4, 6, 8, 10, 12, 14
2	3, 5, 7, 9, 11, 13, 15
3	1

6.2.8.8 Method getTheHandler

Test Area Reference: API_2_PRH_GTHD

6.2.8.8.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public static ProactiveResponseHandler getTheHandler()
                        throws ToolkitException
```

Normal execution

CRRN1: The method shall return the single system instance of the ProactiveHandler class.

CRRN2: The EnvelopeHandler is a Temporary JCRE Entry Point Object

Parameter errors

Context errors

CRRC1: The method shall throw ToolkitException.HANDLER_NOT_AVAILABLE if the handler is busy.

6.2.8.8.3 Test Suite files

Test Script: API_2_PRH_GTHD_1.scr

Test Applet: API_2_PRH_GTHD_1.java

Load Script: API_2_PRH_GTHD_1.ldr

Clean-up Script: API_2_PRH_GTHD_1.clr

6.2.8.8.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Build and send a Proactive Command**		Proactive Command
	Terminal Response		
	getTheHandler() twice	The returned objects shall be the same	
2	**getTheHandler()**	The reference shall be a ProactiveResponseHandler	
3	**getTheHandler()**	The reference shall not be null	

6.2.8.8.4 Test Coverage

CRR number	Test case number
N1	1, 2, 3
N2	To be checked in Framework tests and insert here cross reference
C1	To be checked in Framework tests and insert here cross reference

6.2.8.9 Method getLength

Test Area Reference API_2_PRH_GLEN

6.2.8.9.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short getLength()
                  throws ToolkitException
```

Normal execution

CRRN1: returns the length in bytes of the TLV list.

Parameter errors

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException.HANDLER_NOT_AVAILABLE.

6.2.8.9.3 Test Suite files

Test Script: API_2_PRH_GLEN_1.scr

Test Applet: API_2_PRH_GLEN_1.java

Load Script: API_2_PRH_GLEN_1.ldr

Clean-up Script: API_2_PRH_GLEN_1.clr

6.2.8.9.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Build and send a Display Text command**		DISPLAY TEXT Proactive command
	Terminal Response without additional information in General Result TLV		
	ProactiveResponseHandler.getTheHandler() `getLength()`	Result of getLength() is 12	
2	**Build and send a Display Text command**		DISPLAY TEXT Proactive command
	Terminal Response with F2h additional information in General Result TLV		
	ProactiveResponseHandler.getTheHandler() getLength()	Result of getLength() is FFh	

6.2.8.9.4 Test Coverage

CRR number	Test case number
N1	1, 2
C1	Does not apply for Proactive Response Handler

6.2.8.10 Method copy

Test Area Reference API_2_PRH_COPY_BSS

6.2.8.10.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short copy(byte[] dstBuffer,
                short dstOffset,
                short dstLength)
                throws  java.lang.NullPointerException,
                        java.lang.ArrayIndexOutOfBoundsException,
                        ToolkitException
```

Normal execution

CRRN1: copies the simple TLV list contained in the handler to the destination byte array.

CRRN2: returns dstOffset + dstLength.

Parameter errors

CRRP1: if dstBuffer is null a NullPointerException is thrown.

CRRP2: if dstOffset or dstLength or both would cause access outside array bounds, or if dstLength is negative, an ArrayIndexOutOfBoundsException is thrown.

CRRP3: if dstLength is grater than the length of the simple TLV List, an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException. OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.8.10.3 Test Suite files

Test Script: API_2_PRH_COPY_BSS_1.scr

Test Applet: API_2_PRH_COPY_BSS_1.java

Load Script: API_2_PRH_COPY_BSS_1.ldr

Clean-up Script: API_2_PRH_COPY_BSS_1.clr

6.2.8.10.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response without Additional Information in General Result TLV: `01 03 01 21 00 02 02 82 81 03 01 00`		
	ProactiveResponseHandler.getTheHandler() copy() with NULL as parameter to dstBuffer	NullPointerException is thrown	

2	**dstOffset ≥ dstBuffer.length**
	`dstBuffer.length = 5`
	`dstOffset = 5`
	`dstLength = 1`
		ArrayIndexOutOfBoundsException is thrown	

3	**dstOffset < 0**
	`dstBuffer.length = 5`
	`dstOffset = -1`
	`dstLength = 1`
		ArrayIndexOutOfBoundsException is thrown	

4	**dstLength > dstBuffer.length**
	`dstBuffer.length = 5`
	`dstOffset = 0`
	`dstLength = 6`
		ArrayIndexOutOfBoundsException is thrown	

5	**dstOffset + dstLength > dstBuffer.length**
	`dstBuffer.length = 5`
	`dstOffset = 3`
	`dstLength = 3`
		ArrayIndexOutOfBoundsException is thrown	

6	**dstLength < 0**
	`dstBuffer.length = 5`
	`dstOffset = 0`
	`dstLength = -1`
		ArrayIndexOutOfBoundsException is thrown	

7	**dstLength > length of the simple TLV list**
	`dstBuffer.length = 13`
	`dstOffset = 0`
	`dstLength = 13`
		ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

8	**Successful call, dstBuffer is the whole buffer**
	`dstBuffer.length = 12`
	`dstOffset = 0`
	`dstLength = 12`
		Result of copy() is 12	

9	**Compare the buffer with buffer:** `01 03 01 21 00 02 02 82 81 03 01 00`	Result of arrayCompare() is 0	

10	**Successful call, dstBuffer is part of a buffer**
	`dstBuffer.length = 20`
	`dstOffset = 3`
	`dstLength = 12`
		Result of copy() is 15	

11	**Compare the whole buffer**	Result of arrayCompare() is 0	

12	**Successful call, dstBuffer is part of a buffer**
	`dstBuffer.length = 20`
	`dstOffset = 3`
	`dstLength = 9`
		Result of copy() is 12	

13	**Compare the whole buffer**	Result of arrayCompare() is 0	

6.2.8.10.4 Test Coverage

CRR number	Test case number
N1	9, 11, 13
N2	8, 10, 12
P1	1
P2	2, 3, 4, 5, 6
P3	7
C1	Does not apply for Proactive Response Handler

6.2.8.11 Method findTLV

Test Area Reference API_2_PRH_FINDBB

6.2.8.11.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte findTLV(byte tag, byte occurrence)
               throws ToolkitException
```

Normal execution

Looks for the indicated occurrence of a TLV element from the beginning of the TLV list (handler buffer):

CRRN1: the method is successful if the required occurrence exists then the corresponding TLV becomes current.

CRRN2: if the method is successful then it returns TLV_FOUND_CR_SET when Comprehension Required flag is set.

CRRN3: if the method is successful then it returns TLV_FOUND_CR_NOT_SET when Comprehension Required flag is not set.

CRRN4: if the required occurrence of the TLV element does not exist, the current TLV is no longer defined and TLV_NOT_FOUND is returned.

CRRN5: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if an input parameter is not valid (e.g. occurrence = 0) an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException BAD_INPUT_PARAMETER.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.8.11.3 Test Suite files

Test Script: API_2_PRH_FINDBB_1.scr

Test Applet: API_2_PRH_FINDBB_1.java

Load Script: API_2_PRH_FINDBB_1.ldr

Clean-up Script: API_2_PRH_FINDBB_1.clr

6.2.8.11.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Send a DISPLAY TEXT command**		DISPLAY TEXT Proactive command
	Terminal Response with 2 General Result TLV 01 03 01 21 00 82 02 82 81 03 01 00 03 02 01 12		
	findTLV() with Invalid input parameter occurrence = 0	ToolkitException.BAD_INPUT_PARAMETER is thrown	
2	**Search 1st TLV** tag = 01h occurrence = 1	Result is TLV_FOUND_CR_NOT_SET	
3	**Call the getValueLength() method**	Result is 03h	
4	**Search 2nd TLV**	Result is TLV_FOUND_CR_SET	

	tag = 02h occurrence = 1		
5	**Call the getValueLength() method**	Result is 02h	
6	**Select a TLV (tag 02h)**		
	Search a wrong tag tag = 04h occurrence = 1	Result is TLV_NOT_FOUND	
7	**Call the getValueLength() method**	ToolkitException.UNAVAILABLE_ELEMENT shall be thrown	
8	**Search a tag with wrong occurrence** tag = 01h occurrence = 2	Result is TLV_NOT_FOUND	
9	**Call the getValueLength() method**	ToolkitException.UNAVAILABLE_ELEMENT shall be thrown.	
10	**Search 3rd TLV** tag = 03h occurrence = 1	Result is TLV_FOUND_CR_NOT_SET	
11	**Call the getValueLength() method**	Result is 01h	
12	**Search 3rd TLV** tag = 03h occurrence = 2	Result is TLV_FOUND_CR_NOT_SET	
13	**Call the getValueLength() method**	Result is 02h	
14	**Search tag 81h** tag = 81h occurrence = 1	Result is TLV_FOUND_CR_NOT_SET	
15	**Search tag 82h** tag = 82h occurrence = 1	Result is TLV_FOUND_CR_SET	

6.2.8.11.4 Test Coverage

CRR number	Test case number
N1	3, 5, 11, 13
N2	2, 4
N3	10, 12
N4	6, 7,8, 9
N5	14,15
P1	1
C1	Does not apply for Proactive Response Handler

6.2.8.12 Method getValueLength

Test Area Reference API_2_PRH_GVLEN

6.2.8.12.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short getValueLength()
                        throws ToolkitException
```

Normal execution

CRRN1: gets and returns the binary length of the value field for the last TLV element which has been found in the handler.

Parameter errors

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

CRRC2: in case of unavailable TLV element an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException UNAVAILABLE_ELEMENT.

6.2.8.12.3 Test Suite files

Test Script: API_2_PRH_GVLEN_1.scr

Test Applet: API_2_PRH_GVLEN_1.java

Load Script: API_2_PRH_GVLEN_1.ldr

Clean-up Script: API_2_PRH_GVLEN_1.clr

6.2.8.12.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response `Text String TLV = 0D 00`		
	ProactiveResponseHandler.getTheHandler() `getValueLength()`	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
2	**Search TLV 0Dh**		
	`getValueLength()`	Result is 00h	
3	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response `Text String TLV = 0D 02 04 41`		
	Search TLV 0Dh (Text String TLV)		
	`getValueLength()`	Result is 02h	
4	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 7Eh `Text String TLV = 0D 7F 04 01 02 … 7E`		
	Search TLV 0Dh (Text String TLV)		
	`getValueLength()`	Result is 7Fh	
5	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 7Fh `Text String TLV = 0D 81 80 04 01 02 … 7E 7F`		
	Search TLV 0Dh (Text String TLV)		
	`getValueLength()`	Result is 80h	
6	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = EFh `Text String TLV = 0D 81 F0 04 01 02 … EF`		
	Search TLV 0Dh (Text String TLV)		
	`getValueLength()`	Result is F0h	

6.2.8.12.4 Test Coverage

CRR number	Test case number
N1	2, 3, 4, 5, 6
C1	Does not apply for Proactive Response Handler
C2	1

6.2.8.13 Method getValueByte

Test Area Reference API_2_PRH_GVBYTS

6.2.8.13.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte getValueByte(short valueOffset)
                  throws ToolkitException
```

Normal execution

CRRN1: Gets a byte from the last TLV element which has been found in the handler and returns its value (1 byte).

Parameter errors

CRRP1: if valueOffset is out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

CRRC2: in case of unavailable TLV element an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException UNAVAILABLE_ELEMENT.

6.2.8.13.3 Test Suite files

Test Script: API_2_PRH_GVBYTS_1.scr

Test Applet: API_2_PRH_GVBYTS_1.java

Load Script: API_2_PRH_GVBYTS_1.ldr

Clean-up Script: API_2_PRH_GVBYTS_1.clr

6.2.8.13.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 7Eh Text String TLV = 0D 7F 04 01 02 … 7E		
	ProactiveResponseHandler.getTheHandler()		
	getValueByte(0)	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
2	**Search TLV 01h (Command Details TLV)**		
	getValueByte(3)	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
3	**Search TLV 01h (Command Details TLV)**		
	getValueByte(2)	Result is 00h (qualifier)	
4	**Search TLV 02h (Device Identities TLV)**		
	getValueByte(0)	Result is 82h (Source)	
5	**Search TLV 0Dh (Text String TLV)**		
	getValueByte(7E)	Result is 7Eh	
6	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = EFh Text String TLV = 0D 81 F0 04 01 02 … 7E 7F … EF		
	Search TLV 0Dh (Text String TLV)		
	getValueByte(7E)	Result is 7Eh	
7	getValueByte(7F)	Result is 7Fh	
8	getValueByte(EF)	Result is EFh	

6.2.8.13.4 Test Coverage

CRR number	Test case number
N1	3, 4, 5, 6, 7, 8
P1	2
C1	Does not apply for Proactive Response Handler
C2	1

6.2.8.14 Method copyValue

Test Area Reference API_2_PRH_CPYVS_BSS

6.2.8.14.1 Conformance requirement

The method with following header shall be compliant with its definition in the API.

```
public short copyValue(short valueOffset,
                       byte[] dstBuffer,
                       short dstOffset,
                       short dstLength)
                throws java.lang.NullPointerException,
                       java.lang.ArrayIndexOutOfBoundsException,
                       ToolkitException
```

Normal execution

CRRN1: copies a part of the last TLV element which has been found, into a destination. buffer.

CRRN2: returns dstOffset + dstLength.

Parameter errors

CRRP1: if dstBuffer is null NullPointerException is thrown.

CRRP2: if dstOffset or dstLength or both would cause access outside array bounds, or if dstLength is negative ArrayIndexOutOfBoundsException is thrown.

CRRP3: if valueOffset, dstLength or both are out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

CRRC2: in case of unavailable TLV element an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException UNAVAILABLE_ELEMENT.

6.2.8.14.3 Test Suite files

Test Script: API_2_PRH_CPYVS_BSS_1.scr

Test Applet: API_2_PRH_CPYVS_BSS_1.java

Load Script: API_2_PRH_CPYVS_BSS_1.ldr

Clean-up Script: API_2_PRH_CPYVS_BSS_1.clr

6.2.8.14.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 5 `Text String TLV = 0D 06 04 01 02 … 05`		
	ProactiveResponseHandler.getTheHandler() `Select Text String TLV`		
	`copyValue() with a null dstBuffer`	NullPointerException is thrown	

2	**dstOffset ≥ dstBuffer.length**
	`dstBuffer.length = 5`
	`dstOffset = 5`
	`dstLength = 1`
		ArrayIndexOutOfBoundsException is thrown	

3	**dstOffset < 0**
	`dstBuffer.length = 5`
	`dstOffset = -1`
	`dstLength = 1`
		ArrayIndexOutOfBoundsException is thrown	

4	**dstLength >dstBuffer.length**
	`dstBuffer.length = 5`
	`dstOffset = 0`
	`dstLength = 6`
		ArrayIndexOutOfBoundsException is thrown	

5	**dstOffset + dstLength >dstBuffer.length**
	`dstBuffer.length = 5`
	`dstOffset = 3`
	`dstLength = 3`
		ArrayIndexOutOfBoundsException is thrown	

6	**dstLength < 0**
	`dstBuffer.length = 5`
	`dstOffset = 0`
	`dstLength = -1`
		ArrayIndexOutOfBoundsException is thrown	

7	**valueOffset ≥ Text String Length**
	`valueOffset = 6`
	`dstBuffer.length = 15`
	`dstOffset = 0`
	`dstLength = 1`
		ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

8	**valueOffset < 0**	ToolkitException.OUT_OF_TLV_	

	valueOffset = -1 dstBuffer.length = 15 dstOffset = 0 dstLength = 1	BOUNDARIES is thrown	
9	**dstLength > Text String length** valueOffset = 0 dstBuffer.length = 15 dstOffset = 0 dstLength = 7	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
10	**valueOffset + dstLength > Text String** length valueOffset = 2 dstBuffer.length = 15 dstOffset = 0 dstLength = 5	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
11	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 16 Text String TLV = 0D 11 04 00 01 … 0F		
	ProactiveResponseHandler.getTheHandler		
	copyValue()	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
12	**Select Text String TLV**		
	Successful call valueOffset = 0 dstBuffer.length = 17 dstOffset = 0 dstLength = 17	Result of copyValue() is 17	
13	**Compare buffer** buffer = 04 00 01 … 0F	Result is 00h	
14	**initialise dstBuffer** dstBuffer = 55 55 … 55		
	Successful call valueOffset = 2 dstBuffer.length = 20 dstOffset = 3 dstLength = 12	Result of copyValue() is 15	
15	**Compare buffer** buffer = 55 55 55 01 02 03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55	Result is 00h	

6.2.8.14.4 Test Coverage

CRR number	Test case number
N1	13, 15
N2	12, 14
P1	1
P2	2, 3, 4, 5, 6
P3	7, 8, 9, 10
C1	Does not apply for Proactive Response Handler
C2	11

6.2.8.15 Method compareValue

Test Area Reference API_2_PRH_CPRVS_BSS

6.2.8.15.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte compareValue(short valueOffset,
```

```
                byte[] compareBuffer,
                short compareOffset,
                short compareLength)
        throws java.lang.NullPointerException,
                java.lang.ArrayIndexOutOfBoundsException,
                ToolkitException
```

Normal execution

Compares the last found TLV element with a buffer:

CRRN1: returns 0 if identical.

CRRN2: returns -1 if the first miscomparing byte in simple TLV List is less than that in compareBuffer.

CRRN3: returns 1 if the first miscomparing byte in simple TLV List is greater than that in compareBuffer.

Parameter errors

CRRP1: if compareBuffer is null NullPointerException shall be thrown.

CRRP2: if compareOffset or compareLength or both would cause access outside array bounds, or if compareLength is negative ArrayIndexOutOfBoundsException shall be thrown.

CRRP3: if valueOffset, dstLength or both are out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

CRRC2: in case of unavailable TLV element an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException UNAVAILABLE_ELEMENT.

6.2.8.15.3 Test Suite files

Test Script: API_2_PRH_CPRVS_BSS_1.scr

Test Applet: API_2_PRH_CPRVS_BSS_1.java

Load Script: API_2_PRH_CPRVS_BSS_1.ldr

Clean-up Script: API_2_PRH_CPRVS_BSS_1.clr

6.2.8.15.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 5 `Text String TLV = 0D 06 04 01 02 … 05`		
	ProactiveResponseHandler.getTheHandler() `Select Text String TLV`		
	compareValue() with a null compareBuffer	NullPointerException is thrown	

2	**compareOffset ≥ compareBuffer.length**
	`compareBuffer.length = 5`
	`compareOffset = 5`
	`compareLength = 1`
		ArrayIndexOutOfBoundsException is thrown	

3	**compareOffset < 0**
	`compareBuffer.length = 5`
	`compareOffset = -1`
	`compareLength = 1`
		ArrayIndexOutOfBoundsException is thrown	

4	**compareLength >compareBuffer.length**
	`compareBuffer.length = 5`
	`compareOffset = 0`
		ArrayIndexOutOfBoundsException is thrown	

	compareLength = 6		
5	**compareOffset + compareLength >compareBuffer.length** compareBuffer.length = 5 compareOffset = 3 compareLength = 3	ArrayIndexOutOfBoundsException is thrown	
6	**compareLength < 0** compareBuffer.length = 5 compareOffset = 0 compareLength = -1	ArrayIndexOutOfBoundsException is thrown	
7	**valueOffset ≥ Text String Length** valueOffset = 6 compareBuffer.length = 15 compareOffset = 0 compareLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
8	**valueOffset < 0** valueOffset = -1 compareBuffer.length = 15 compareOffset = 0 compareLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
9	**compareLength > Text String length** valueOffset = 0 compareBuffer.length = 15 compareOffset = 0 compareLength = 7	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
10	**valueOffset + compareLength > Text String length** valueOffset = 2 compareBuffer.length = 15 compareOffset = 0 compareLength = 5	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
11	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 16 Text String TLV = 0D 11 04 00 01 … 0F		
	ProactiveResponseHandler.getTheHandler()		
	compareValue()	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
12	**Select Text String TLV**		
	Initialise compareBuffer compareBuffer = 04 00 01 … 0F		
	Compare buffers valueOffset = 0 compareOffset = 0 compareLength = 17	Result is 00h	
13	**Initialise compareBuffer** compareBuffer = 04 00 01 … 10		
	Compare buffers with same parameters	Result is -1	
14	**Initialise compareBuffer** compareBuffer = 03 00 01 … 0F		
	Compare buffers with same parameters	Result is +1	
15	**Initialise compareBuffer** compareBuffer = 55 55 55 01 02 03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55		
	Compare buffers valueOffset = 2 compareOffset = 3 compareLength = 12	Result is 00h	
16	**Initialise compareBuffer** compareBuffer = 55 55 55 02 01		

	03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55		
	Compare buffers with same parameters	Result is -1	
17	**Initialise compareBuffer** compareBuffer = 55 55 55 01 02 03 04 05 06 07 08 09 0A 0A 0D 55 55 55 55 55		
	Compare buffers with same parameters	Result is +1	

6.2.8.15.4 Test Coverage

CRR number	Test case number
N1	12, 15
N2	13, 16
N3	14, 17
P1	1
P2	2, 3, 4, 5, 6
P3	7, 8, 9, 10
C1	Does not apply for Proactive Response Handler
C2	11

6.2.8.16 Method findAndCopyValue(byte tag, byte[] dstBuffer, short valueOffset)

Test Area Reference API_2_PRH_FACYB_BS

6.2.8.16.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short findAndCopyValue(byte tag,
                              byte[] dstBuffer,
                            short dstOffset)
                    throws  java.lang.NullPointerException,
                            java.lang.ArrayIndexOutOfBoundsException,
                            ToolkitException
```

Normal execution

CRRN1: looks for the first occurrence of a TLV element from the beginning of a TLV list and copy its value into a destination buffer.

CRRN2: if no TLV element is found, the UNAVAILABLE_ELEMENT exception is thrown and the current TLV is no longer defined.

CRRN3: if the method is successful then the corresponding TLV becomes current and dstOffset + length of the copied value is returned.

CRRN4: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if dstBuffer is null NullPointerException shall be thrown.

CRRP2: if dstOffset would cause access outside array bounds ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.8.16.3 Test Suite files

Test Script: API_2_PRH_FACYB_BS_1.scr

Test Applet: API_2_PRH_FACYB_BS_1.java

Load Script: API_2_PRH_FACYB_BS_1.ldr

Clean-up Script: API_2_PRH_FACYB_BS_1.clr

6.2.8.16.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 15 Text String TLV = 0D 10 04 01 02 … 0F		
	ProactiveResponseHandler.getTheHandler()		
	findAndCopyValue() with a null dstBuffer	NullPointerException is thrown	
2	**dstOffset ≥ dstBuffer.length** tag = 0Dh dstBuffer.length = 20 dstOffset = 20	ArrayIndexOutOfBoundsException is thrown	
3	**dstOffset < 0** dstBuffer.length = 20 dstOffset = -1	ArrayIndexOutOfBoundsException is thrown	
4	**length > dstBuffer.length** dstBuffer.length = 15 dstOffset = 0	ArrayIndexOutOfBoundsException is thrown	
5	**dstOffset + length >dstBuffer.length** dstBuffer.length = 20 dstOffset = 5	ArrayIndexOutOfBoundsException is thrown	
6	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 16 Text String TLV = 0D 11 04 00 01 … 0F		
	ProactiveResponseHandler.getTheHandler()		
	Select a TLV (tag 02h)		
	findAndCopyValue() tag = 04h	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
	Call the getValueLength() method	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	
7	**Successful call** tag = 0Dh dstBuffer.length = 17 dstOffset = 0	Result of findAndcopyValue() is 17	
8	**Compare buffer** buffer = 04 00 01 … 0F	Result is 00h	
9	**initialise dstBuffer** dstBuffer = 55 55 … 55		
	Successful call dstBuffer.length = 20 dstOffset = 2	Result of findAndcopyValue() is 19	
10	**Compare buffer** buffer = 55 55 04 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 55	Result is 00h	
11	**Send a GET INPUT command**		GET INPUT Proactive

			command
	Terminal Response, with 2 Text String TLV 0D 11 04 00 01 … 0F 0D 02 04 41		
	ProactiveResponseHandler.getTheHandler()		
	Successful call tag = 0Dh dstBuffer.length = 17 dstOffset = 0	Result of findAndcopyValue() is 17	
12	**Compare buffer** buffer = 04 00 01 … 0F	Result is 00h	
13	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 16 Text String TLV = 0D 11 04 00 01 … 0F		
	ProactiveResponseHandler.getTheHandler()		
	Successful call (with tag 8Dh) tag = 8Dh dstBuffer.length = 17 dstOffset = 0	Result of findAndcopyValue() is 17	
14	**Compare buffer** buffer = 04 00 01 … 0F	Result is 00h	

6.2.8.16.4 Test Coverage

CRR number	Test case number
N1	8, 10, 12
N2	6
N3	7, 9, 11
N4	13, 14
P1	1
P2	2, 3, 4, 5
C1	Does not apply for Proactive Response Handler

6.2.8.17 Method findAndCopyValue(byte tag, byte occurence, short valueOffset, byte[] dstBuffer, short dstOffset, short dstLength)

Test Area Reference API_2_PRH_FACYBBS_BSS

6.2.8.17.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public short findAndCopyValue(byte tag,
                              byte occurence,
                             short valueOffset,
                             byte[] dstBuffer,
                             short dstOffset,
                             short dstLength)
                      throws  java.lang.NullPointerException,
                              java.lang.ArrayIndexOutOfBoundsException,
                              ToolkitException
```

Normal execution

CRRN1: looks for the indicated occurrence of a TLV element from the beginning of a TLV list and copy its value into a destination buffer.

CRRN2: if no TLV element is found, the UNAVAILABLE_ELEMENT exception is thrown and the current TLV is no longer defined.

CRRN3: if the method is successful then the corresponding TLV becomes current and dstOffset + dstLength is returned.

CRRN4: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if dstBuffer is null NullPointerException shall be thrown.

CRRP2: if dstOffset or dstLength or both would cause access outside array bounds, or if dstLength is negative ArrayIndexOutOfBoundsException shall be thrown.

CRRP3: if valueOffset, dstLength or both are out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.8.17.3 Test Suite files

Test Script: API_2_PRH_FACYBBS_BSS_1.scr

Test Applet: API_2_PRH_FACYBBS_BSS_1.java

Load Script: API_2_PRH_FACYBBS_BSS_1.ldr

Clean-up Script: API_2_PRH_FACYBBS_BSS_1.clr

6.2.8.17.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 15 Text String TLV = 0D 10 04 01 02 … 0F		
	ProactiveResponseHandler.getTheHandler()		
	findAndCopyValue() with a null dstBuffer	NullPointerException is thrown	
2	**dstOffset ≥ dstBuffer.length** tag = 0Dh, occurrence = 1 valueOffset = 0 dstBuffer.length = 5 dstOffset = 5 dstLength = 1	ArrayIndexOutOfBoundsException is thrown	
3	**dstOffset < 0** dstBuffer.length = 5 dstOffset = -1 dstLength = 1	ArrayIndexOutOfBoundsException is thrown	
4	**dstLength > dstBuffer.length** dstBuffer.length = 5 dstOffset = 0 dstLength = 6	ArrayIndexOutOfBoundsException is thrown	
5	**dstOffset + dstLength > dstBuffer.length** dstBuffer.length = 5 dstOffset = 3 dstLength = 3	ArrayIndexOutOfBoundsException is thrown	
6	**dstLength < 0** dstBuffer.length = 5 dstOffset = 0 dstLength = -1	ArrayIndexOutOfBoundsException is thrown	
7	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 5 Text String TLV = 0D 06 04 01 02 … 05		
	ProactiveResponseHandler.getTheHandler()		

	valueOffset ≥ Text String Length tag = 0Dh, occurrence = 1 valueOffset = 6 dstBuffer.length = 15 dstOffset = 0 dstLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
8	**valueOffset < 0** valueOffset = -1 dstBuffer.length = 15 dstOffset = 0 dstLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
9	**dstLength > Text String length** valueOffset = 0 dstBuffer.length = 15 dstOffset = 0 dstLength = 7	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
10	**valueOffset + dstLength > Text String length** valueOffset = 2 dstBuffer.length = 15 dstOffset = 0 dstLength = 5	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
11	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 16 Text String TLV = 0D 11 04 00 01 … 0F		
	ProactiveResponseHandler.getTheHandler()		
	Select a TLV (tag 02h)		
	findAndCopyValue() tag = 0Dh occurrence = 2	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
	Call the getValueLength() method	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	
12	**Successful call** tag = 0Dh, occurrence = 1 valueOffset = 0 dstBuffer.length = 17 dstOffset = 0 dstLength = 17	Result of findAndCopyValue() is 17	
13	**Compare buffer** buffer = 04 00 01 … 0F	Result is 00h	
14	**initialise dstBuffer** dstBuffer = 55 55 … 55		
	Successful call tag = 0Dh, occurrence = 1 valueOffset = 2 dstBuffer.length = 20 dstOffset = 3 dstLength = 12	Result of findAndcopyValue() is 15	
15	**Compare buffer** buffer = 55 55 55 01 02 03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55	Result is 00h	
16	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, with 2 Text String TLV 0D 11 04 00 01 02 … 0F 0D 06 00 11 22 33 44 55 (no specific DCS byte)		
	ProactiveResponseHandler.getTheHandler()		
	Successful call tag = 0Dh, occurrence = 1 valueOffset = 0 dstBuffer.length = 17 dstOffset = 0 dstLength = 17	Result of findAndCopyValue() is 17	
17	**Compare buffer** buffer = 04 00 01 … 0F	Result is 00h	
18	**Successful call**	Result of findAndCopyValue() is	

	tag = 0Dh, occurrence = 2 valueOffset = 0 dstBuffer.length = 6 dstOffset = 0 dstLength = 6	6	
19	**Compare buffer** buffer = 00 11 22 33 44 55	Result is 00h	
20	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 16 Text String TLV = 0D 11 04 00 01 … 0F		
	ProactiveResponseHandler.getTheHandler()		
	Successful call (with tag 8Dh) tag = 8Dh, occurrence = 1 valueOffset = 0 dstBuffer.length = 17 dstOffset = 0 dstLength = 17	Result of findAndcopyValue() is 17	
21	**Compare buffer** buffer = 04 00 01 … 0F	Result is 00h	

6.2.8.17.4 Test Coverage

CRR number	Test case number
N1	13, 15, 17, 19
N2	11
N3	12, 14, 16, 18
N4	20, 21
P1	1
P2	2, 3, 4, 5, 6
P3	7, 8, 9, 10
C1	Does not apply for Proactive Response Handler

6.2.8.18 Method findAndCompareValue(byte tag, byte[] compareBuffer, short compareOffset)

Test Area Reference API_2_PRH_FACRB_BS

6.2.8.18.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte findAndCompareValue(byte tag,
                                byte[] compareBuffer,
                                short compareOffset)
                         throws  java.lang.NullPointerException,
                                 java.lang.ArrayIndexOutOfBoundsException,
                                 ToolkitException
```

Normal execution

Looks for the first occurrence of a TLV element from beginning of a TLV list and compare its value with a buffer:

CRRN1: if no TLV element is found, the UNAVAILABLE_ELEMENT exception is thrown and the current TLV is no longer defined.

CRRN2: if the method is successful then the corresponding TLV becomes current.

CRRN3: if identical returns 0.

CRRN4: if the first miscomparing byte in simple TLV is less than that in compareBuffer returns -1.

CRRN5: if the first miscomparing byte in simple TLV is greater than that in compareBuffer returns 1.

CRRN6: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if compareBuffer is null NullPointerException shall be thrown.

CRRP2: if compareOffset would cause access outside array bounds ArrayIndexOutOfBoundsException shall be thrown.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.8.18.3 Test Suite files

Test Script: API_2_PRH_FACRB_BS_1.scr

Test Applet: API_2_PRH_FACRB_BS_1.java

Load Script: API_2_PRH_FACRB_BS_1.ldr

Clean-up Script: API_2_PRH_FACRB_BS_1.clr

6.2.8.18.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 15 `Text String TLV = 0D 10 04 01 02 … 0F`		
	ProactiveResponseHandler.getTheHandler()		
	findAndCompareValue() with a null dstBuffer	NullPointerException is thrown	

2	**compareOffset ≥ compareBuffer.length**
	`tag = 0Dh`
	`compareBuffer.length = 20`
	`compareOffset = 20`
		ArrayIndexOutOfBoundsException is thrown	

3	**compareOffset < 0**
	`compareBuffer.length = 20`
	`compareOffset = -1`
		ArrayIndexOutOfBoundsException is thrown	

4	**length > compareBuffer.length**
	`compareBuffer.length = 15`
	`compareOffset = 0`
		ArrayIndexOutOfBoundsException is thrown	

5	**compareOffset + length >**
	`compareBuffer.length`
	`compareBuffer.length = 20`
	`compareOffset = 5`
		ArrayIndexOutOfBoundsException is thrown	

6	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 16 `Text String TLV = 0D 11 04 00 01 … 0F`		
	ProactiveResponseHandler.getTheHandler()		
	Select a TLV (tag 02h)		
	findAndCompareValue() `tag = 04h`	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
	Call the getValueLength() method	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	

7	**Initialise compareBuffer**
	`compareBuffer =`
	`04 00 01 … 0F`		

	Compare buffers
	`tag = 0Dh`
	`compareOffset = 0`
		Result is 00h	

8	**Verify current TLV** `getValueLength()`	Result is 17	

9	**Initialise compareBuffer**
	`compareBuffer =`
	`04 00 01 … 10`		

	Compare buffers with same parameters	Result is -1	

10	**Initialise compareBuffer**
	`compareBuffer =`
	`03 00 01 … 0F`		

	Compare buffers with same parameters	Result is +1	

11	**Initialise compareBuffer**
	`compareBuffer =`
	`55 55 04 00 01`
	`02 03 04 05 06`
	`07 08 09 0A 0B`
	`0C 0D 0E 0F 55`		

	Compare buffers `compareOffset = 2`	Result is 00h	
12	**Send a GET INPUT command**		GET INPUT Proactive command

	Terminal Response, with 2 Text String TLV
	`0D 11 04 00 01 … 0F`
	`0D 06 00 11 22 33 44 55`		

	ProactiveResponseHandler.getTheHandler()		

	Initialise compareBuffer
	`compareBuffer =`
	`55 55 04 00 01`
	`02 03 04 05 06`
	`07 08 09 0A 0B`
	`0C 0D 0E 0F 55`		

	Compare buffers `compareOffset = 2`	Result is 00h	

13	**Initialise compareBuffer**
	`compareBuffer =`
	`55 55 04 01 01`
	`02 03 04 05 06`
	`07 08 09 0A 0B`
	`0C 0D 0E 0F 55`		

	Compare buffers `compareOffset = 2`	Result is -1	

14	**Initialise compareBuffer**
	`compareBuffer =`
	`55 55 04 00 01`
	`02 03 04 05 06`
	`07 08 09 0A 0B`
	`0C 0D 0D 10 55`		

	Compare buffers `compareOffset = 2`	Result is +1	
15	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 16 `Text String TLV = 0D 11 04 00 01 … 0F`		
	ProactiveResponseHandler.getTheHandler()		

	Initialise compareBuffer
	`CompareBuffer =`
	`04 00 01 … 0F`		

	Compare buffers (with tag 8Dh)
	`tag = 8Dh`
	`compareOffset = 0`
		Result is 00h	

6.2.8.18.4 Test Coverage

CRR number	Test case number
N1	6
N2	8
N3	7, 11, 12
N4	9, 13
N5	10, 14
N6	15
P1	1
P2	2, 3, 4, 5
C1	Does not apply for Proactive Response Handler

6.2.8.19 Method findAndCompareValue(byte tag, byte occurence, short valueOffset, byte[] compareBuffer, short compareOffset, short compareLength)

Test Area Reference API_2_PRH_FACRBBS_BSS

6.2.8.19.1 Conformance requirement

The method with following header shall be compliant to its definition in the API.

```
public byte findAndCompareValue(byte tag,
                                byte occurence,
                                short valueOffset,
                                byte[] compareBuffer,
                                short compareOffset,
                                short compareLength)
                          throws java.lang.NullPointerException,
                                 java.lang.ArrayIndexOutOfBoundsException,
                                 ToolkitException
```

Normal execution

Looks for the indicated occurrence of a TLV element from the beginning of a TLV list and compare its value with a buffer:

CRRN1: if no TLV element is found, the UNAVAILABLE_ELEMENT exception is thrown and the current TLV is no longer defined.

CRRN2: if the method is successful then the corresponding TLV becomes current.

CRRN3: if identical 0 is returned.

CRRN4: if the first miscomparing byte in simple TLV is less than that in compareBuffer -1 is returned.

CRRN5: if the first miscomparing byte in simple TLV is greater than that in compareBuffer 1 is returned

CRRN6: The search method is comprehension required flag independent.

Parameter errors

CRRP1: if compareBuffer is null NullPointerException shall be thrown.

CRRP2: if compareOffset or compareLength or both would cause access outside array bounds, or if compareLength is negative ArrayIndexOutOfBoundsException shall be thrown.

CRRP3: if valueOffset, compareLength or both are out of the current TLV an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException OUT_OF_TLV_BOUNDARIES.

CRRP4: if an input parameter is not valid (e.g. occurence = 0) an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException BAD_INPUT_PARAMETER.

Context errors

CRRC1: if the handler is busy an instance of ToolkitException shall be thrown. The reason code shall be ToolkitException HANDLER_NOT_AVAILABLE.

6.2.8.19.3 Test Suite files

Test Script: API_2_PRH_FACRBBS_BSS_1.scr

Test Applet: API_2_PRH_FACRBBS_BSS_1.java

Load Script: API_2_PRH_FACRBBS_BSS_1.ldr

Clean-up Script: API_2_PRH_FACRBBS_BSS_1.clr

6.2.8.19.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 15 Text String TLV = 0D 10 04 01 02 … 0F		
	ProactiveResponseHandler.getTheHandler()		
	findAndCompareValue() with a null compareBuffer	NullPointerException is thrown	
2	**compareOffset ≥ compareBuffer.length** tag = 0Dh, occurrence = 1 valueOffset = 0 compareBuffer.length = 5 compareOffset = 5 compareLength = 1	ArrayIndexOutOfBoundsException is thrown	
3	**compareOffset < 0** compareBuffer.length = 5 compareOffset = -1 compareLength = 1	ArrayIndexOutOfBoundsException is thrown	
4	**compareLength >compareBuffer.length** compareBuffer.length = 5 compareOffset = 0 compareLength = 6	ArrayIndexOutOfBoundsException is thrown	
5	**compareOffset + compareLength** >compareBuffer.length compareBuffer.length = 5 compareOffset = 3 compareLength = 3	ArrayIndexOutOfBoundsException is thrown	
6	**compareLength < 0** compareBuffer.length = 5 compareOffset = 0 compareLength = -1	ArrayIndexOutOfBoundsException is thrown	
7	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 5 Text String TLV = 0D 06 04 01 02 … 05		
	ProactiveResponseHandler.getTheHandler()		
	valueOffset ≥ Text String Length tag = 0Dh, occurrence = 1 valueOffset = 6 compareBuffer.length = 15 compareOffset = 0 compareLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
8	**valueOffset < 0** valueOffset = -1 compareBuffer.length = 15 compareOffset = 0 compareLength = 1	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
9	**compareLength > Text String length** valueOffset = 0 compareBuffer.length = 15 compareOffset = 0 compareLength = 7	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	

10	**valueOffset + compareLength > Text String length** valueOffset = 2 compareBuffer.length = 15 compareOffset = 0 compareLength = 5	ToolkitException.OUT_OF_TLV_BOUNDARIES is thrown	
11	**Invalid parameter** occurrence = 0	ToolkitException.BAD_INPUT_PARAMETER is thrown	
12	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 16 Text String TLV = 0D 11 04 00 01 … 0F		
	ProactiveResponseHandler.getTheHandler()		
	Select a TLV (tag 02h)		
	findAndCompareValue() tag = 0Dh occurrence = 2	ToolkitException.UNAVAILABLE_ELEMENT is thrown	
	Call the getValueLength() method	ToolkitException.UNAVAILABLE_ELEMENT is thrown.	
13	**Initialise compareBuffer** compareBuffer = 04 00 01 … 0F		
	findAndCompareValue() tag = 0Dh, occurrence = 1 valueOffset = 0 compareOffset = 0 compareLength = 17	Result is 00h	
14	**Verify current TLV** getValueLength()	Result is 17	
15	**Initialise compareBuffer** compareBuffer = 04 00 01 … 10		
	Compare buffers with same parameters	Result is -1	
16	**Initialise compareBuffer** compareBuffer = 03 00 01 … 0F		
	Compare buffers with same parameters	Result is +1	
17	**Initialise compareBuffer** compareBuffer = 55 55 55 01 02 03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55		
	Compare buffers valueOffset = 2 compareOffset = 3 compareLength = 12	Result is 00h	
18	**Initialise compareBuffer** compareBuffer = 55 55 55 02 01 03 04 05 06 07 08 09 0A 0B 0C 55 55 55 55 55		
	Compare buffers with same parameters	Result is -1	
19	**Initialise compareBuffer** compareBuffer = 55 55 55 01 02 03 04 05 06 07 08 09 0A 0A 0D 55 55 55 55 55		
	Compare buffers with same parameters	Result is +1	
20	**Send a GET INPUT command**		GET INPUT Proactive command

	Terminal Response, with 2 Text String TLV 0D 11 04 00 01 … 0F 0D 06 00 11 22 33 44 55		
	ProactiveResponseHandler.getTheHandler()		
	Initialise compareBuffer compareBuffer = 04 00 01 … 0F		
	findAndCompareValue() tag = 0Dh, occurrence = 1 valueOffset = 0 compareOffset = 0 compareLength = 17	Result is 00h	
21	**Initialise compareBuffer** compareBuffer = 00 11 22 33 44 55		
	findAndCompareValue() tag = 0Dh, occurrence = 2 valueOffset = 0 compareOffset = 0 compareLength = 6	Result is 00h	
22	**Initialise compareBuffer** compareBuffer = 00 11 22 33 44 66		
	findAndCompareValue() tag = 0Dh, occurrence = 2 valueOffset = 0 compareOffset = 0 compareLength = 6	Result is -1	
23	**Send a GET INPUT command**		GET INPUT Proactive command
	Terminal Response, Text String length = 16 Text String TLV = 0D 11 04 00 01 … 0F		
	ProactiveResponseHandler.getTheHandler()		
	Initialise compareBuffer CompareBuffer = 04 00 01 … 0F		
	Compare buffers (with tag 8Dh) tag = 8Dh, occurrence = 1 valueOffset = 0 compareOffset = 0 compareLength = 17	Result is 00h	

6.2.8.19.4 Test Coverage

CRR number	Test case number
N1	12
N2	14
N3	13, 17, 20, 21
N4	15, 18, 22
N5	16, 19
N6	23
P1	1
P2	2, 3, 4, 5, 6
P3	7, 8, 9, 10
P4	11
C1	Does not apply for Proactive Response Handler

6.2.9 Class ToolkitRegistry

6.2.9.1 Method allocateTimer

Test Area Reference: API_2_TKR_ATIM

6.2.9.1.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
public byte allocateTimer() throws ToolkitException
```

Normal execution

CRRN1: the returned timer identifier shall be between 01 and 08 inclusive.

CRRN2: the returned timer identifier shall be different from a previously allocated but not released one.

CRRN3: The SIM Toolkit Framework shall trigger the applet when receiving an ENVELOPE(TIMER EXPIRATION) command for the allocated timer.

CRRN4: A call to isEventSet() method for EVENT_TIMER_EXPIRATION should return true if the applet has at least one timer allocated.

Parameters error

No requirements

Context errors

CRRC1: Shall throw a ToolkitException with reason NO_TIMER_AVAILABLE if all the timers are allocated.

CRRC2: Shall throw a ToolkitException with reason NO_TIMER_AVAILABLE if the maximum number of timers have been allocated to this applet according to installation parameter.

6.2.9.1.2 Test suite files

Test Script: API_2_TKR_ATIM_1.scr

Test Applet: 1. API_2_TKR_ATIM_1.java

2. API_2_TKR_ATIM_2.java

3. API_2_TKR_ATIM_3.java

Installation parameters:

For this test procedure the non-volatile memory of each instance is 200 (Hexa).

The maximum timer parameter value is as follows for each applet:

- applet 1 (API_2_TKR_ATIM_1): 8 timers
- applet 2 (API_2_TKR_ATIM_2): 4 timers
- applet 3 (API_2_TKR_ATIM_3): 0 timer

Load Script: API_2_TKR_ATIM_1.ldr

The load script installs the 6 instances.

Cleanup Script: API_2_TKR_ATIM_1.clr

6.2.9.1.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Allocates up to 8 timers (applet 1)** `8 * allocateTimer().`	No exception shall be thrown. Timer ID returned shall be between 01 and 08 inclusive. It shall be different after each call.	
2	**Allocate timers more than the maximum (applet 1)** `The applet 1 allocates 1 more timer.`	Shall throw a ToolkitException with reason NO_TIMER_AVAILABLE.	

3	**Check applet is Triggered by ENVELOPE(TIMER_EXPIRATION) command (applet1)**
	`Send ENVELOPE(TIMER EXPIRATION) with all timers id (not in an increase order).`
	
	`Calls releaseTimer(id) each time a timer expires.`
		Shall trigger each time an ENVELOPE(TIMER EXPIRATION) is sent to the SIM, for Timer ID = '01' to '08'.	

4	**Allocate up to 4 timers (applet 2)** `4 * allocateTimer().`	No exception shall be thrown. Each time, the returned timer identifier shall be between '01' and '08' inclusive. It shall be different after each call.	
5	**Allocate timers more than the maximum (applet 3)** `The applet 3 allocates 1 more timer.`	Shall throw a ToolkitException with reason NO_TIMER_AVAILABLE.	

6.2.9.1.4 Test Coverage

CRR number	Test case number
N1	1,4
N2	1,4
N3	3
N4	1
C1	2
C2	5

6.2.9.2 Method changeMenuEntry

Test Area Reference: API_2_TKR_CMETB_BSSBZBS

6.2.9.2.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
public void changeMenuEntry(byte id,
                            byte[] menuEntry,
                            short offset,
                            short length,
                            byte nextAction,
                            boolean helpSupported,
                            byte iconQualifier,
                            short iconIdentifier)
              throws            java.lang.NullPointerException,
                                java.lang.ArrayIndexOutOfBoundsException,
                                ToolkitException
```

Normal execution

CRRN1: The SIM Toolkit Framework shall automatically update the menu stored in the ME by issuing a SET UP MENU proactive command.The later will reflect the changes done for the entry. The SIM Toolkit Framework shall use the data of the EF sume file in order to build the SET UP MENU command.

CRRN2: The default state of the changed menu entry is 'enabled'.

CRRN3: a call to isEventSet() method on EVENT_MENU_SELECTION shall return true before and after the call.

CRRN4: if helpSupported was true then a call to isEventSet() method on EVENT_MENU_SELECTION_HELP_REQUEST event shall return true.

CRRN5: if helpSupported was true then after the completion of the SETUP MENU command, if an ENVELOPE(MENU_SELECTION_HELP_REQUEST) command is received by the SIM for this entry, then the SIM Toolkit framework shall trigger the applet.

CRRN6: if help supported was true, the SIM Toolkit Framework shall issue a SETUP MENU command with command qualifier = '80'

CRRN7: if helpSupported was false and if no entries is supporting help then a call to isEventSet() method on EVENT_MENU_SELECTION_HELP_REQUEST event shall return false .

CRRN8: if helpSupported was false and if no entries is supporting help then after the completion of the SETUP MENU command, if an ENVELOPE(MENU_SELECTION_HELP_REQUEST) command is received by the SIM, then the SIM Toolkit framework shall not trigger the applet.

CRRN9: The SIM Toolkit Framework shall supply in the SET UP MENU command with the icon identifier provided in the icon identifier list within the item icon identifier list Simple TLV if all the applets registered to the EVENT_MENU_SELECTION provide it.

CRRN10: The SIM Toolkit Framework shall set in the SET UP MENU command with the Icon list qualifier transmitted to the ME as 'icon is not self explanatory' if one of the applet registered prefers this qualifier.

CRRN11: If Next Action Indicator was different from '00', the SIM Toolkit Framework shall issue a SETUP MENU proactive command containing an Items Next Action Indicator simple TLV with the comprehension flag set to 0 as defined in GSM 11.14 [4].

Parameters error

CRRP1: Shall throw java.lang.NullPointerException - if menuEntry is null

CRRP2: Shall throw java.lang.ArrayIndexOutOfBoundsException - if offset would cause access outside array bounds

CRRP3: Shall throw java.lang.ArrayIndexOutOfBoundsException - if length would cause access outside array bounds

CRRP4:Shall throw java.lang.ArrayIndexOutOfBoundsException - if both offset and length would cause access outside array bounds

Context errors

CRRC1: Shall throw a ToolkitException with MENU_ENTRY_NOT_FOUND reason if the Menu Identifier isn't associated to the calling applet instance.

CRRC2: Shall throw ALLOWED_LENGTH_EXCEEDED if the menu entry string is bigger than the allocated space.

6.2.9.2.2 Test suite files

Additional requirements for the GSM personalisation:

- content of EF sume shall be:

  - Title Alpha Identifier: "TOOLKIT TEST"

Test Script: API_2_TKR_CMETB_BBSSBZBS_1.scr

Test Applet: API_2_TKR_CMETB_BBSSBZBS_1.java

- entry '01' is "Init1"
- entry '02' is "Init2"

Installation parameter:

Same as default applet but with:

- Maximum text length for a menu entry: 15
- Maximum number of menu entries: 2
- Position / Identifier for each menu entry: '01'/'01','02'/'02'

Load Script: API_2_TKR_CMETB_BBSSBZBS_1.ldr

Cleanup Script: API_2_TKR_CMETB_BBSSBZBS_1.clr

6.2.9.2.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Applet changes the entry's title by menuEntry buffer, with a greater length than the initial length** 1- ChangeMenuEntry()with parameters: Id = '02' MenuEntry = "UseAllBuffer" Offset = 0 Length = menuEntry.length NextAction = 0 HelpSupported = false IconQualifier = 0 IconIdentifier = 0. 2- isEventSet(EVENT_MENU_SELECTION). 3- isEventSet(EVENT_MENU_SELECTION_HELP_REQUEST).	1- No exception shall be thrown. 2- shall return true. 3- shall return false.	The SIM shall issue a SETUP MENU proactive command which contains the new text for entry ID '02'.
2	**Changing the title with part of menuEntry buffer** 1- changeMenuEntry()with parameters: Id = '01' MenuEntry = "UsePartOfBuffer" Offset = 3 Length = 12 NextAction = 0 HelpSupported = false IconQualifier = 0 IconIdentifier = 0. 2- isEventSet(EVENT_MENU_SELECTION). 3- isEventSet(EVENT_MENU_SELECTION_HELP_REQUEST)	1- No exception shall be thrown. 2- Shall return true. 3- Shall return false.	The SIM shall issue a SETUP MENU proactive command which contains the new text for entry ID '01'.
3	**Length = 0** 1- changeMenuEntry() for entry '01' and entry '02', with parameters: Id = '01'/'02' MenuEntry = "LengthEquals0" Offset = 0 Length = 0 NextAction = 0 HelpSupported = false IconQualifier = 0 IconIdentifier = 0. 2- isEventSet(EVENT_MENU_SELECTION). 3- isEventSet(EVENT_MENU_SELECTION_HELP_REQUEST).	1- No exception shall be thrown. 2- Shall return true. 3- shall return false.	The SIM shall issue a SETUP MENU proactive command which contains for entry '01'and entry '02', no text part.
4	**Setting a next action indicator != 0** 1- changeMenuEntry()with parameters: Id = '02' MenuEntry = "NextActionIndic" Offset = 0 Length = menuEntry.length NextAction = '10' (SETUP CALL) HelpSupported = false	1- No exception shall be thrown. 2- Shall return true. 3- Shall return false.	The SIM shall issue a SETUP MENU proactive command which contains an Items Next Action Indicator list.

	IconQualifier = 0 IconIdentifier = 0 2- isEventSet(EVENT_MENU_SELECTION). 3- isEventSet(EVENT_MENU_SELECTION_HELP_REQUEST).		
5	**Checking applet isn't triggered by a MENU_SELECTION_HELP_REQUEST** Send ENVELOPE(MENU_SELECTION_HELP_REQUEST) with Item Identifier = '02'	Applet is not trigged by a MENU_SELECTION_HELP_REQUEST	
6	**help supported=true** 1- changeMenuEntry()with parameters: Id = '02' MenuEntry = "HelpSupported" Offset = 0 Length = menuEntry.length NextAction = 0 HelpSupported = true IconQualifier = 0 IconIdentifier = 0 2- isEventSet(EVENT_MENU_SELECTION). 3- isEventSet(EVENT_MENU_SELECTION_HELP_REQUEST).	1- No exception shall be thrown. 2- Shall return true. 3- Shall return true.	The SIM shall issue a SETUP MENU proactive command which contains a command qualifier '80'.
7	**Checking applet is triggered by a MENU_SELECTION_HELP_REQUEST** Send ENVELOPE(MENU_SELECTION_HELP_REQUEST) with Item Identifier = '02'	Applet is trigged by a MENU_SELECTION_HELP_REQUEST	
8	**Setting icons, help supported = false** 1- changeMenuEntry() for entries '01','02', with parameters: Id = '01'/'02' MenuEntry = "IconQualifier" Offset = 0 Length = menuEntry.length NextAction = 0 HelpSupported = false IconQualifier = '01' IconIdentifier = '02' / '01' 2- isEventSet(EVENT_MENU_SELECTION). 3- isEventSet(EVENT_MENU_SELECTION_HELP_REQUEST).	1- No exception shall be thrown. 2- Shall return true. 3- Shall return false.	The SIM shall issue a SETUP MENU proactive command which contains an Icon Identifier List.
9	**MenuEntry is disabled** 1- disableMenuEntry('01'). 2- changeMenuEntry()with parameters: Id = '01' MenuEntry = "EnableEntry" Offset = 0 Length = menuEntry.length NextAction = 0 HelpSupported = false IconQualifier = 0 IconIdentifier = 0 3- isEventSet(EVENT_MENU_SELECTION). 4-	1- No exception shall be thrown. 2- No exception shall be thrown. 3- Shall return true. 4- Shall return false.	The SIM shall issue a SETUP MENU proactive command which contains the entry.

	isEventSet(EVENT_MENU_SELECTION_HELP_REQUEST).		
10	**MenuEntry is null** changeMenuEntry()with: MenuEntry = NULL	Shall throw java.lang.NullPointerException.	
11	**Offset causes access outside array bounds** Id = '01' MenuEntry = "Violation" Offset = menuEntry.length +1 Length = 0 NextAction = 0 HelpSupported = false IconQualifier = 0 IconIdentifier = 0	Shall throw java.lang.ArrayIndexOutOfBoundsException.	
12	**Big Offset causes access outside array bounds** Id = '01' MenuEntry = "Violation" Offset = 255 Length = 1 NextAction = 0 HelpSupported = false IconQualifier = 0 IconIdentifier = 0	Shall throw java.lang.ArrayIndexOutOfBoundsException.	
13	**Offset < 0 causes access outside array bounds** Id = '01' MenuEntry = "Violation" Offset = -1 Length = 1 NextAction = 0 HelpSupported = false IconQualifier = 0 IconIdentifier = 0	Shall throw java.lang.ArrayIndexOutOfBoundsException.	
14	**Length causes access outside array bounds** Id = '01' MenuEntry = "Violation" Offset = 0 Length = MenuEntry.length + 1 NextAction = 0 HelpSupported = false IconQualifier = 0 IconIdentifier = 0.	Shall throw java.lang.ArrayIndexOutOfBoundsException.	
15	**Length < 0 causes access outside array bounds** Id = '01' MenuEntry = "Violation" Offset = 0 Length = -1 NextAction = 0 HelpSupported = false IconQualifier = 0 IconIdentifier = 0.	Shall throw java.lang.ArrayIndexOutOfBoundsException.	
16	**Both offset and length causes access outside array bounds** Id = '01' MenuEntry = "Violation" Offset ∈ [1, MenuEntry.length] Length = MenuEntry.length NextAction = 1 HelpSupported = false IconQualifier = 0 IconIdentifier = 0	Shall throw java.lang.ArrayIndexOutOfBoundsException. .	

17	**Invalid ID used** Id = '00' MenuEntry = contains text, != null Offset = 0 Length = menuEntry.length < 16 NextAction = 0 HelpSupported = false IconQualifier = 0 IconIdentifier = 0	Shall throw a ToolkitException with MENU_ENTRY_NOT_FOUND reason code.	
18	**ID isn't allocated to a menu entry of this applet instance** Id = '0A' MenuEntry = contains text, != null Offset = 0 Length = menuEntry.length < 16 NextAction = 0 HelpSupported = false IconQualifier = 0 IconIdentifier = 0	Shall throw a ToolkitException with reason code: MENU_ENTRY_NOT_FOUND.	
19	**The text is bigger than the allocated space** Id = '02' MenuEntry = contains text, != null Offset = 0 Length = menuEntry.length > 15 NextAction = 0 HelpSupported = false IconQualifier = 0 IconIdentifier = 0	Shall throw a ToolkitException with reason code: ALLOWED_LENGTH_EXCEEDED.	
20	**With a smaller text length than the initial length** 1. changeMenuEntry()with parameters: Id = '02' MenuEntry = "Init" Offset = 0 Length = menuEntry.length NextAction = 0 HelpSupported = false IconQualifier = 0 IconIdentifier = 0 2. isEventSet(EVENT_MENU_SELECTION) 3. isEventSet(EVENT_MENU_SELECTION_HELP_REQUEST)	1. No exception shall be thrown. 2. Shall return true. 3. Shall return false.	The SIM shall issue a SETUP MENU proactive command which contains the new text for entry ID '02'.

6.2.9.2.4 Test Coverage

CRR number	Test case number
N1	1,2,3,4,6,8,9,20
N2	9
N3	1,2,3,4,6,8,9,20
N4	6
N5	7
N6	6
N7	1,2,3,4,8,9,20
N8	5
N9	8
N10	8
N11	4
P1	10
P2	11,12,13
P3	14,15
P4	16
C1	17,18
C2	19

6.2.9.3 Method clearEvent

Test Area Reference: API_2_TKR_CEVTB

6.2.9.3.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
public void clearEvent(byte event)
             throws ToolkitException
```

Normal execution

CRRN1: A call to isEventSet() method for a cleared event should return false after a call to clearEvent.

CRRN2:The SIM Toolkit Framework shall not trigger the applet on the occurrence of the cleared event anymore.

CRRN3: if event was EVENT_CALL_CONTROL_BY_SIM and after the call, no applet is registered to it, The SIM Toolkit Framework shall allow an applet to register to this event.

CRRN4: if event was EVENT_CALL_CONTROL_BY_SIM and one applet is still registered to these event, The SIM Toolkit Framework shall not allow an applet to register to this event.

CRRN5: if event was EVENT_MO_SHORT_MESSAGE_CONTROL_BY_SIM and after the call, no applet is registered to it, The SIM Toolkit Framework shall allow an applet to register to this event.

CRRN6: if event was EVENT_MO_SHORT_MESSAGE_CONTROL_BY_SIM and one applet is still registered to these event, The SIM Toolkit Framework shall not allow an applet to set this event.

Parameters error

CRRP1: Shall throw a Toolkit Exception with reason EVENT_NOT_ALLOWED if event was EVENT_MENU_SELECTION.

CRRP2: Shall throw a Toolkit Exception with reason EVENT_NOT_ALLOWED if event was EVENT_MENU_SELECTION_HELP_REQUEST.

CRRP3: Shall throw a Toolkit Exception with reason EVENT_NOT_ALLOWED if event was EVENT_TIMER_EXPIRATION.

CRRP4: Shall throw a Toolkit Exception with reason EVENT_NOT_ALLOWED if event was EVENT_STATUS_COMMAND.

Context errors

No requirements

6.2.9.3.2 Test suite files

Test Script: API_2_TKR_CEVTB_1.scr

Test Applet: API_2_TKR_ CEVTB _1.java

As default but applet registers to an event list which contains all defined events in GSM 03.19 [7] excepted those that aren't allowed or supported by setEvent().

Load Script: API_2_TKR_ CEVTB_1.ldr

Cleanup script: API_2_TKR_ CEVTB_1.clr

6.2.9.3.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Clear ALLOWED unregistered events** For events ranging from 1 to 127 excepted those that aren't allowed (EVENT_MENU_SELECTION, EVENT_MENU_SELECTION_HELP_REQUEST, EVENT_TIMER_EXPIRATION, EVENT_STATUS_COMMAND), the applet calls: 1- clearEvent() method 2- isEventSet() method	1- No exception is thrown each time. 2- Shall return false each time.	
2	**Clear registered events** 1- For each ALLOWED and SUPPORTED events, the applet calls setEvent() method. 2- For events ranging from 1 to 127 excepted those that aren't allowed, the applet calls: 2.1- clearEvent() method 2.2- isEventSet() method	1- No exception shall be thrown. 2.1- No exception shall be thrown. 2.2- Shall return false.	
3	**Clearing NOT ALLOWED events** For each event among: EVENT_MENU_SELECTION, EVENT_MENU_SELECTION_HELP_REQUEST, EVENT_TIMER_EXPIRATION, EVENT_STATUS_COMMAND 1- The applet calls clearEvent(event) method.	1- Each time, clearEvent shall throw a Toolkit Exception with reason EVENT_NOT_ALLOWED.	
4	**Checking applet isn't triggered by an ENVELOPE(SMS-PP DOWNLOAD) command** An ENVELOPE(SMS-PP DOWNLOAD) is sent with a TAR referencing applet.	Applet is not trigged by an ENVELOPE(SMS-PP DOWNLOAD) command	

6.2.9.3.4 Test Coverage

CRR number	Test case number
N1	1,2
N2	4
N3	Framework
N4	Framework
N5	Framework
N6	Framework
P1	3
P2	3
P3	3
P4	3

6.2.9.4 Method disableMenuEntry

Test Area Reference: API_2_TKR_DMETB

6.2.9.4.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
public void disableMenuEntry(byte id)
        throws ToolkitException
```

Normal execution

CRRN1: A call to isEventSet() method on EVENT_MENU_SELECTION shall return the same result before and after the call to disableMenuEntry() method.

CRRN2: A call to isEventSet() method on EVENT_MENU_SELECTION_HELP_REQUEST shall return the same result before and after the call to disableMenuEntry() method.

CRRN3: After invocation of this method the SIM Toolkit Framework should dynamically update the menu stored in the ME .

CRRN4: After invocation of this method, if there is no more enabled menu entries then the SIM Toolkit framework shall issue a SETUP MENU proactive command containing Item Data Object for Item 1 TLV with a length of zero and no value part.

Parameters error

No requirements

Context errors

CRRC1: shall throw a ToolkitException with reason = ENTRY_NOT_FOUND if the menu entry doesn't exist for this applet

6.2.9.4.2 Test suite files

Additional requirements for the GSM personalisation:

- content of EF sume shall be:

  - Title Alpha Identifier: "TOOLKIT TEST"

Test Script: API_2_TKR_DMETB_1.scr

Test Applet: API_2_TKR_DMETB_1.java

Installation parameter:

Same as default applet but with:

- Maximum text length for a menu entry: 15
- Maximum number of menu entries: 2
- Position / Identifier for each menu entry: '01'/'01', '02'/'02'

Load Script: API_2_TKR_DMETB_1.ldr

Cleanup script: API_2_TKR_DMETB_1.clr

6.2.9.4.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Check the menu state before disabling a previously enabled entry not registered to EVENT_MENU_SELECTION_HELP_REQUEST** 1- reset and initialise the card 2- isEventSet(EVENT_MENU_SELECTION) 3- isEventSet(EVENT_MENU_SELECTION_HELP_REQUEST)	1- Shall return true 2- Shall return false	1- The SIM shall issue a SET UP MENU proactive command with entry '01' and '02'.
2	**Check the menu state after disabling a previously enabled entry not registered to EVENT_MENU_SELECTION_HELP_REQUEST** 1- disableMenuEntry('01') 2- isEventSet(EVENT_MENU_SELECTION) 3- isEventSet(EVENT_MENU_SELECTION_HELP_REQUEST)	1- No exception shall be thrown. 2- Shall return true. 3- Shall return false.	3- The SIM shall issue a SET UP MENU proactive command with entry '02' only.
3	**Check the menu before disabling a previously enabled entry registered to EVENT_MENU_SELECTION_HELP_REQUEST** 1- change Menu Entry '02' to indicate help supported 2- isEventSet(EVENT_MENU_SELECTION) 3- isEventSet(EVENT_MENU_SELECTION_HELP_REQUEST)	2- Shall return true 3- Shall return true	3- The SIM shall issue a SET UP MENU proactive command with entry '02', indicating help supported.
4	**Check the menu after disabling a previously enabled entry registered to EVENT_MENU_SELECTION_HELP_REQUEST** 1- disableMenuEntry('02') 2- isEventSet(EVENT_MENU_SELECTION) 3- isEventSet(EVENT_MENU_SELECTION_HELP_REQUEST)	1- No exception shall be thrown. 2- Shall return true. 3- Shall return true.	3- The SIM shall issue a SET UP MENU proactive command with 1st Item TLV with a length of 0.
5	**Disabling invalid entries** For ID ranging from '00' to 'FF' except '01' and '02', the applet calls disableMenuEntry(ID) method.	Each time a Toolkit Exception with MENU_ENTRY_NOT_FOUND reason code shall be thrown.	

6.2.9.4.4 Test Coverage

CRR number	Test case number
N1	1,2,3,4
N2	1,2,3,4
N3	2,4
N4	4
C1	5

6.2.9.5 Method enableMenuEntry

Test Area Reference: API_2_TKR_EMETB

6.2.9.5.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
public void enableMenuEntry(byte id)
        throws ToolkitException
```

Normal execution

CRRN1: A call to isEventSet() method on EVENT_MENU_SELECTION shall return the same result before and after the call to enableMenuEntry() method.

CRRN2: A call to isEventSet() method on EVENT_MENU_SELECTION_HELP_REQUEST shall return the same result before and after the call to enableMenuEntry() method.

CRRN3:The SIM Toolkit Framework should automatically issue a SETUP MENU proactive command which does contain an ITEM SIMPLE TLV object for this entry.

Parameters error

No requirements

Context errors

CRRC1: shall throw a ToolkitException with reason = MENU_ENTRY_NOT_FOUND if the menu entry doesn't exist for this applet

6.2.9.5.2 Test suite files

Additional requirements for the GSM personalisation:

- content of EF sume shall be:

  - Title Alpha Identifier: "TOOLKIT TEST"

Test Script: API_2_TKR_EMETB_1.scr

Test Applet: API_2_TKR_EMETB_1.java

Installation parameter:

Same as default applet but with:

- Maximum text length for a menu entry: 15
- Maximum number of menu entries: 2
- Position / Identifier for each menu entry: '01'/'01', '02'/'02'

Load Script: API_2_TKR_EMETB_1.ldr

Cleanup script: API_2_TKR_EMETB_1.clr

6.2.9.5.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Check menu state before enabling a previously disabled entry not registered to EVENT_MENU_SELECTION_HELP_REQUEST** 1- isEventSet(EVENT_MENU_SELECTION) 2- isEventSet(EVENT_MENU_SELECTION_HELP_REQUEST) 3- disableMenuEntry('01')	1- Shall return true 2- Shall return false 3- No exception shall be thrown.	3- The SIM shall issue a SET UP MENU proactive command with entry '02' only.
2	**Check menu state after enabling a previously disabled entry not registered to EVENT_MENU_SELECTION_HELP_REQUEST** 1- enableMenuEntry('01') 2- isEventSet(EVENT_MENU_SELECTION) 3- isEventSet(EVENT_MENU_SELECTION_HELP_REQUEST)	1- No exception shall be thrown. 2- Shall return true. 3- Shall return false.	3- The SIM shall issue a SET UP MENU proactive command with entry '01' and '02'.
3	**Check menu state before enabling a previously enabled entry registered to EVENT_MENU_SELECTION_HELP_REQUEST** 1- change Menu Entry '02' to indicate help supported 2- isEventSet(EVENT_MENU_SELECTION) 3- isEventSet(EVENT_MENU_SELECTION_HELP_REQUEST) 4- disableMenuEntry('02')	2- Shall return true 3- Shall return true 4- No exception shall be thrown	4- The SIM shall issue a SET UP MENU proactive command with entry '01' indicating help supported.
4	**Check menu state after enabling a previously enabled entry registered to EVENT_MENU_SELECTION_HELP_REQUEST** 1- enableMenuEntry('02'). 2- isEventSet(EVENT_MENU_SELECTION) 3- isEventSet(EVENT_MENU_SELECTION_HELP_REQUEST)	1- No exception shall be thrown. 2- Shall return true. 3- Shall return true.	3- The SIM shall issue a SET UP MENU proactive command with entries '01' and '02' indicating help supported.
5	**Enabling invalid entries** For ID ranging from '00' to 'FF' except '01' and '02', the applet calls enableMenuEntry(ID) method.	Each time a Toolkit Exception with MENU_ENTRY_NOT_FOUND reason code shall be thrown.	

6.2.9.5.4 Test Coverage

CRR number	Test case number
N1	1,2,3,4
N2	1,2,3,4
N3	1,2,3,4
C1	5

6.2.9.6 Method getEntry

Test Area Reference: API_2_TKR_GETY

6.2.9.6.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
public static ToolkitRegistry getEntry()
            throws ToolkitException
```

Normal execution

CRRN1: returns a reference to the applet ToolkitRegistry object of the calling applet.

CRRN2: Each successive call to getEntry() method shall return the same object.

Parameters error

No requirements

6.2.9.6.2 Test suite files

Test Script: API_2_TKR_GETY_1.scr

Test Applet: API_2_TKR_GETY_1.java

Load Script: API_2_TKR_GETY_1.ldr

Cleanup script: API_2_TKR_GETY_1.clr

6.2.9.6.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Installalation** `In the constructor, the applet instance calls the getEntry() method.`	Returns a not null ToolkitRegistry instance.	
2	**Check it returns the same entry** `The applet calls the getEntry() method again.`	Returns the same ToolkitRegistry instance as for test case 1.	

6.2.9.6.4 Test Coverage

CRR number	Test case number
N1	1
N2	2

6.2.9.7 Method getPollInterval

Test Area Reference: API_2_TKR_GPOL

6.2.9.7.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
public short getPollInterval()
```

Normal execution

CRRN1: shall return a value between 1 and 15300 if applet is registered to EVENT_STATUS_COMMAND event.

CRRN2: shall return POLL_NO_DURATION value (0) if the toolkit applet is not registered to EVENT_STATUS_COMMAND event.

Parameters error

No requirements.

Context errors

No requirements.

6.2.9.7.2 Test suite files

Test Script: API_2_TKR_GPOL_1.scr

Test Applet: API_2_TKR_ GPOL_1.java

Load Script: API_2_TKR_ GPOL_1.ldr

Cleanup script: API_2_TKR_ GPOL_1.clr

6.2.9.7.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Applet isn't registered to EVENT_STATUS_COMMAND** `getPollInterval().`	Shall return 0.	

2	**Requesting max duration**
	`1- requestPollInterval(15300)`
	`2- Reset and initialize the card`
	`3- getPollInterval()`
		1- No exception shall be thrown.
		3- Shall return a value between 1 and 15300.	

3	**Requesting System Duration**
	`1- requestPollInterval(POLL_SYSTEM_DURATION)`
	`2- Reset and initialize the card`
	`3- getPollInterval().`
		1- No exception shall be thrown.
		3- Shall return a value between 1 and 15300.	

4	**Requesting no Duration**
	`1- requestPollInterval(POLL_NO_DURATION)`
	`2- Reset and initialize the card`
	`3- getPollInterval().`
		1- No exception shall be thrown.
		3- Shall return 0.	

6.2.9.7.4 Test Coverage

CRR number	Test case number
N1	2,3
N2	1,4

6.2.9.8 Method initMenuEntry

Test Area Reference: API_2_TKR_IMET_BSSBZBS

6.2.9.8.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
public byte initMenuEntry(byte[] menuEntry,
                short offset,
                short length,
                byte nextAction,
                boolean helpSupported,
                byte iconQualifier,
                short iconIdentifier)
        throws  java.lang.NullPointerException,
                java.lang.ArrayIndexOutOfBoundsException,
                ToolkitException
```

Normal execution

CRRN1: The SIM Toolkit Framework shall automatically update the menu stored in the ME by issuing a SETUP MENU proactive command.The later will reflect the changes done for the entry. The SIM Toolkit Framework shall use the data of the EF sume file in order to build the SET UP MENU command.

CRRN2: a call to isEventSet() method on EVENT_MENU_SELECTION shall return true after the 1st successful call (without an exception).

CRRN3: if helpSupported was true then a following call to isEventSet() method on EVENT_MENU_SELECTION_HELP_REQUEST event shall return true .

CRRN4: if helpSupported was true then after the completion of the SETUP MENU command, if an ENVELOPE(MENU_SELECTION_HELP_REQUEST) command is received by the SIM for this entry, then the SIM Toolkit framework shall trigger the applet.

CRRN5: if help supported was true, the SIM Toolkit Framework shall issue a SETUP MENU command with command qualifier = '80'

CRRN6: if helpSupported was false and there isn't any menu entry supporting help then a call to isEventSet() method on EVENT_MENU_SELECTION_HELP_REQUEST event shall return false.

CRRN7: The SIM Toolkit Framework shall supply in the SET UP MENU command with the icon identifier provided in the icon identifier list within the item icon identifier list Simple TLV if all the applets registered to the EVENT_MENU_SELECTION provide it.

CRRN8: The SIM Toolkit Framework shall set in the SET UP MENU command with the Icon list qualifier transmitted to the ME as 'icon is not self explanatory' if one of the applet registered prefers this qualifier.

CRRN9: If Next Action Indicator was different from '00', the SIM Toolkit Framework shall issue a SETUP MENU proactive command containing an Items Next Action Indicator simple TLV with the comprehension flag set to 0.

CRRN10: After the completion of the SETUP MENU command, if an ENVELOPE (MENU_SELECTION) command is received by the SIM for this identifier, then the SIM Toolkit framework shall trigger the applet.

Parameters error

CRRP1: Shall throw java.lang.NullPointerException - if menuEntry is null

CRRP2: Shall throw java.lang.ArrayIndexOutOfBoundsException - if offset would cause access outside array bounds

CRRP3: Shall throw java.lang.ArrayIndexOutOfBoundsException - if length would cause access outside array bounds

CRRP4:Shall throw java.lang.ArrayIndexOutOfBoundsException - if both offset and length would cause access outside array bounds

Context errors

CRRC1: Shall throw ALLOWED_LENGTH_EXCEEDED if the menu entry string is bigger than the allocated space

CRRC2: Shall throw REGISTRY_ERROR if the menu entry cannot be initialised (eg no more item data in applet loading parameter)

6.2.9.8.2 Test suite files

Additional requirements for the GSM personalisation:

- content of EF sume shall be:
  - Title Alpha Identifier: "TOOLKIT TEST"
  - Test case trigger: 1- Applet instantiation

    2- Menu selection

    3- Menu selection Help Supported

Test Script: API_2_TKR_IMET_BSSBZBS_1.scr

Test Applet: API_2_TKR_IMET_BSSBZBS_1.java

Installation parameter:

Same as default applet but with:

- Maximum text length for a menu entry: 15
- Maximum number of menu entries: 6
- Position / Identifier for each menu entry: '01'/'01', '02'/'02', '03'/'03', '04'/'04', '05'/'05', and '06'/'06'

Load Script: API_2_TKR_IMET_BSSBZBS_1.ldr

Cleanup script: API_2_TKR_IMET_BSSBZBS_1.clr

6.2.9.8.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**NULL as parameter to menuEntry** MenuEntry = NULL	Shall throw a java.lang.NullPointerException.	
2	**Offset > menuEntry.length** MenuEntry = "ToolkitTest" Offset = 1112 Length = 0	Shall throw java.lang.ArrayIndexOutOfBoundsException.	
3	**Offset < 0** MenuEntry = "ToolkitTest" Offset = -1 Length = 11	Shall throw java.lang.ArrayIndexOutOfBoundsException.	
4	**Offset = 255** MenuEntry = "ToolkitTest" Offset = 255 Length = 11	Shall throw java.lang.ArrayIndexOutOfBoundsException.	
5	**Length = menuEntry.length+1** MenuEntry = "ToolkitTest" Offset = 0 Length = 12	Shall throw java.lang.ArrayIndexOutOfBoundsException.	
6	**Length < 0** MenuEntry = "ToolkitTest" Offset = 0 Length = -1	Shall throw java.lang.ArrayIndexOutOfBoundsException.	
7	**Offset + length > menuEntry.length** MenuEntry = "ToolkitTest" Offset = 11 Length = 1	Shall throw java.lang.ArrayIndexOutOfBoundsException.	
8	**MenuEntry.length > size allocated at loading for each menu entry** MenuEntry = "ToolkitTest impossible" Offset = 0 Length = 16	ALLOWED_LENGTH_EXCEEDED ToolkitException is thrown.	
9	**Successful call, menuEntry is the whole buffer** 1- initMenuEntry() MenuEntry = "TOOLKIT TEST 1" Offset = 0 Length = 14 NextAction = '00' HelpSupported = false IconQualifier = '00' IconIdentifier = 0 2- isEventSet(EVENT_MENU_SELECTION)	1- No exception shall be thrown, Shall return ID '01'. 2- Shall return true.	
10	**Successful call, menuEntry part of a buffer** 1- initMenuEntry() MenuEntry = "1234567TOOLKIT TEST 2" Offset = 7 Length = 14 NextAction = '00' HelpSupported = false IconQualifier = '00' IconIdentifier = 0 2- isEventSet(EVENT_MENU_SELECTION_HELP_REQUEST)	1- No exception shall be thrown,Shall return ID '02'. 2- Shall return false.	

11	**Successful call,** **menuEntry with help supported** 1- initMenuEntry() MenuEntry = "TOOLKIT TEST 3" Offset = 0 Length = 14 NextAction = '00' HelpSupported = true IconQualifier = '00' IconIdentifier = 0 2- isEventSet(EVENT_MENU_SELECTION_HELP_REQUEST)	1- No exception shall be thrown, Shall return ID '03' 2- Shall return true.	
12	**Successful call,** **menuEntry with an Icon** MenuEntry = "TOOLKIT TEST 4" Offset = 0 Length = 14 NextAction = '00' HelpSupported = false IconQualifier = '01' [icon not self explanatory] IconIdentifier = 1	1- No exception shall be thrown. 2- Shall return ID '04'	
13	**Successful call,** **menuEntry with a next action indication** MenuEntry = "TOOLKIT TEST 5" Offset = 0 Length = 14 NextAction = '24' [Select Item] HelpSupported = false IconQualifier = '00' IconIdentifier = 0	1- No exception shall be thrown. 2- Shall return ID '05'	
14	**Successful call,** **length = 0** initMenuEntry() MenuEntry = "ToolkitTest" Offset = 0 Length = 0 NextAction = '00' HelpSupported = false IconQualifier = '00' IconIdentifier = 0	No exception shall be thrown,Shall return ID '06'.	
15	**Initialize more entry than allocated at loading** MenuEntry = "ToolkitTest" Offset = 0 Length = 11	REGISTRY_ERROR ToolkitException is thrown.	
16	**Dynamic update of the menu stored by the** ME Fetch		Card shall Send a SetUpMenu Proactive command: [CommandQualifier]=help supported [AlphaId]="TOOLKIT TEST" [ItemId=1] = "TOOLKIT TEST 1" [ItemId=2] = "TOOLKIT TEST 2" [ItemId=3] = "TOOLKIT TEST 3" [ItemId=4] = "TOOLKIT TEST 4" [ItemId=5] = "TOOLKIT TEST 5" [ItemId=6] = ""

			[ItemsNextAction]=06000000002400
17	**Check Applet is triggered by ENVELOPE(MENU_SELECTION) command** `Menu Entry ID = '01'`	Applet is trigged by an ENVELOPE(MENU_SELECTION) command & Menu Entry ID = '01'	
18	**Check Applet is triggered by ENVELOPE(MENU_SELECTION) command** `Menu Entry ID = '02'`	Applet is trigged by an ENVELOPE(MENU_SELECTION) command & Menu Entry ID = '02'	
19	**Check Applet is triggered by ENVELOPE(MENU_SELECTION) command** `Menu Entry ID = '03'`	Applet is trigged by an ENVELOPE(MENU_SELECTION) command & Menu Entry ID = '03'	
20	**Check Applet is triggered by ENVELOPE(MENU_SELECTION) command** `Menu Entry ID = '04'`	Applet is trigged by an ENVELOPE(MENU_SELECTION) command & Menu Entry ID = '04'	
21	**Check Applet is triggered by ENVELOPE(MENU_SELECTION) command** `Menu Entry ID = '05'`	Applet is trigged by an ENVELOPE(MENU_SELECTION) command & Menu Entry ID = '05'	
22	Check Applet is triggered by ENVELOPE (MENU_SELECTION_HELP_REQUEST) command `Menu Entry ID = '03'`	Applet is trigged by an ENVELOPE(MENU_SELECTION_HELP_REQUEST) command & Menu Entry ID = '03'	
23	**Check Applet is triggered by ENVELOPE(MENU_SELECTION) command** `Menu Entry ID = '06'`	Applet is trigged by an ENVELOPE(MENU_SELECTION) command & Menu Entry ID = '06'	

6.2.9.8.4 Test Coverage

CRR number	Test case number
N1	16
N2	9
N3	11
N4	22
N5	11,16
N6	10
N7	12,16
N8	12,16
N9	13,16
N10	9,10,11,12,13,14,17,18,19,20,21,23
P1	1
P2	2,3,4
P3	5,6
P4	7
C1	8
C2	14

6.2.9.9 Method isEventSet

Test Area Reference: API_2_TKR_IEVSB

6.2.9.9.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
public boolean isEventSet(byte event)
```

Normal execution

CRRN1: shall return true if the event is set in the Toolkit Registry for the applet

CRRN2: shall return false if the event isn't set in the Toolkit Registry for the applet

Parameters error

No requirements.

Context errors

No requirements

6.2.9.9.2 Test suite files

Test Script: API_2_TKR_IEVSB_1.scr

Test Applet: API_2_TKR_ IEVSB _1.java

Installation parameter:

Same as default applet but with:

- Maximum text length for a menu entry: 15
- Maximum number of menu entries: 1
- Position / Identifier for each menu entry: '01'/'01'
- Maximum number of timers: 1

Load Script: API_2_TKR_ IEVSB_1.ldr

Cleanup script: API_2_TKR_ IEVSB_1.clr

6.2.9.9.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Events aren't set** Applet calls isEventSet() for each events ranging from 1 to 127 excepted EVENT_FORMATTED_SMS_PP_ENV and EVENT_MENU_SELECTION.	Shall return false each time.	
2	**For EVENT_FORMATTED_SMS_PP_ENV** isEventSet (EVENT_FORMATTED_SMS_PP_ENV)	Shall return true.	
3	**For EVENT_MENU_SELECTION** isEventSet (EVENT_MENU_SELECTION)	Shall return true	
4	**After clearing EVENT_FORMATTED_SMS_PP_ENV** 1- clearEvent(EVENT_FORMATTED_SMS_PP_ENV) 2- isEventSet(EVENT_FORMATTED_SMS_PP_ENV) .	1- No exception shall be thrown. 2- Shall return false.	
5	**Setting events** 1- For each SUPPORTED and ALLOWED events for setEvent(), applet calls: 1.1- setEvent() method 1.2- isEventSet() method.	1.1- No exception shall be thrown. 1.2- Shall return true each time.	
6	**For EVENT_MENU_SELECTION_HELP_REQUEST** 1- isEventSet (EVENT_MENU_SELECTION_HELP_REQUEST) 2- call changeMenuEntry with help supported 3- isEventSet (EVENT_MENU_SELECTION_HELP_REQUEST)	1- Shall return false. 3- Shall return true	
7	**For EVENT_TIMER_EXPIRATION** 1- isEventSet(EVENT_TIMER_EXPIRATION) 2- call allocateTimer() 3- isEventSet(EVENT_TIMER_EXPIRATION)	1- Shall return false. 3- Shall return true	
8	**For EVENT_STATUS_COMMAND** 1- isEventSet(EVENT_STATUS_COMMAND) 2- call requestPollInterval(POLL_SYSTEM_DURATION) 3- isEventSet(EVENT_STATUS_COMMAND)	1- Shall return false. 3- Shall return true	

6.2.9.9.4 Test Coverage

CRR number	Test case number
N1	2,3,4,5,6,7,8
N2	1,5,6,7,8

6.2.9.10 Method releaseTimer

Test Area Reference: API_2_TKR_RTIMB

6.2.9.10.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
public void releaseTimer(byte timerIdentifier)
            throws ToolkitException
```

Normal execution

CRRN1: if it was the last allocated timer for the applet then a following call to isEventSet() method for EVENT_TIMER_EXPIRATION should return false.

CRRN2: if applet has timers allocated then a call to isEventSet(EVENT_TIMER_EXPIRATION) shall return true.

CRRN3: After invocation of the method the indicated timer shall be released and available for reallocation.

CRRN4: The applet is deregistered of the EVENT_TIMER_EXPIRATION for the indicated Timer Identifier.

Parameters error

CRRP1: shall throw a ToolkitException with INVALID_TIMER_ID reason if the timer identifier isn't between 1 and 8.

Context errors

CRRC1: shall throw a ToolkitException with INVALID_TIMER_ID reason if the timer is valid but isn't allocated to this applet.

6.2.9.10.2 Test suite files

Test Script: API_2_TKR_RTIMB_1.scr

Test Applet: API_2_TKR_RTIMB_1.java

Installation parameter:

As Default, except max timer which is set to 8.

Load Script: API_2_TKR_RTIMB_1.ldr

Cleanup script: API_2_TKR_RTIMB_1.clr

6.2.9.10.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Releasing not allocated timers** For each timer ID ranging from '00' to 'FF', applet calls releaseTimer(ID).	Each time, method shall throw a ToolkitException with reason code INVALID_TIMER_ID.	
2	**Releasing allocated timers** 1- 8 * allocateTimer() . 2- 7 * releaseTimer(id). 3- isEventSet(EVENT_TIMER_EXPIRATION)	1- No exception shall be thrown. 2- Each time, no exception shall be thrown. 3- Shall return true	
3	**Releasing invalid timer ID** 1- releaseTimer('FF') method 2- isEventSet(EVENT_TIMER_EXPIRATION)	1- Shall throw a ToolkitException with INVALID_TIMER_ID reason code. 2- Shall return true.	
4	**Releasing last timer** 1- releaseTimer(last timer allocated) 2- isEventSet(EVENT_TIMER_EXPIRATION)	1- No exception shall be thrown. 2- Shall return false.	
5	**Checking we can allocate timers after they** have been released 8 * allocateTimer().	No exception shall be thrown.	
6	**Releasing all timers.** For 1 to 8, releaseTimer(id).	No exception shall be thrown.	
7	**Checking applet isn't triggered by** ENVELOPE(TIMER_EXPIRATION) command Send ENVELOPE(TIMER_EXPIRATION)	Applet is not trigged by an ENVELOPE(TIMER_EXPIRATION) command	

6.2.9.10.4 Test Coverage

CRR number	Test case number
N1	4
N2	2,3
N3	5,6
N4	7
P1	1,3
C1	Framework

6.2.9.11 Method requestPollInterval

Test Area Reference: API_2_TKR_RPOLS

6.2.9.11.1 Conformance requirement:

The method with following header shall be compliant to its definition in the API.

```
public void requestPollInterval(short duration)
            throws ToolkitException
```

Normal execution

CRRN1: If duration is between 1 and 15300 or equal to POLL_SYSTEM_DURATION, the applet registers to EVENT_STATUS_COMMAND.

CRRN2: If duration is POLL_NO_DURATION, the applet is deregistered from EVENT_STATUS_COMMAND.

Parameters error

CRRP1: the method should throw a ToolkitException with REGISTRY_ERROR reason if duration is > 15300 or is < -1 (POLL_SYSTEM_DURATION).

Context errors

No Requirements.

6.2.9.11.2 Test suite files

Test Script: API_2_TKR_RPOLS_1.scr

Test Applet: API_2_TKR_RPOLS_1.java

Load Script: API_2_TKR_RPOLS_1.ldr

Cleanup script: API_2_TKR_RPOLS_1.clr

6.2.9.11.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Requesting a value between 1 and 15300 s** 1- isEventSet(EVENT_STATUS_COMMMAND) 2- For duration ranging from 1 to 15300, requestPollInterval(duration). 3- isEventSet(EVENT_STATUS_COMMAND).	1- Shall return false. 2- No exception shall be thrown. 3- Shall return true.	
2	1- Check Applet is triggered by a STATUS commandreset and card initialisation 2- Send STATUS command	2- Applet is trigged by a STATUS command	
3	**Requesting POLL SYSTEM DURATION** 1- isEventSet(EVENT_STATUS_COMMMAND). 2- RequestPollInterval(POLL_SYSTEM_DURATION). 3- IsEventSet(EVENT_STATUS_COMMAND).	1- Shall return true. 2- No exception shall be thrown. 3- Shall return true.	
4	**Check Applet is triggered by a STATUS command** 1- reset and card initialisation 2- Send STATUS command	2- Applet is trigged by a STATUS command	
5	**Requesting invalid duration** For duration ranging from 15301 to 15305, -2 requestPollInterval(duration)	Each time, a ToolkitException with REGISTRY_ERROR reason code, shall be thrown.	
6	**Requesting POLL NO DURATION** 1- isEventSet(EVENT_STATUS_COMMMAND) 2- requestPollInterval(POLL_NO_DURATION) 3- isEventSet(EVENT_STATUS_COMMAND)	1- Shall return true. 2- No exception shall be thrown. 3- Shall return false.	

7	**Check Applet isn't triggered by an STATUS command.** 1- reset and card initialisation 2- Send STATUS command	2- Applet is not trigged by a STATUS command	

6.2.9.11.4 Test Coverage

CRR number	Test case number
N1	1,2,3,4
N2	6,7
P1	5

6.2.9.12 Method setEvent

Test Area Reference: API_2_TKR_SEVTB

6.2.9.12.1 Conformance Requirement:

The method with following header shall be compliant to its definition in the API.

```
public void setEvent(byte id)
       throws ToolkitException
```

Normal execution

CRRN1: a following call to isEventSet() method with the same event id shall answer true for the applet.

CRRN2: the SIM Toolkit Framework shall trigger the applet if an occurrence of the set event happens.

CRRN3: this method shall accept all the events defined in GSM 0319 excepted: EVENT_MENU_SELECTION, EVENT_MENU_SELECTION_HELP_REQUEST, EVENT_TIMER_EXPIRATION , EVENT_STATUS_COMMAND

Parameters error

CRRP1: shall throw a ToolkitException with EVENT_NOT_SUPPORTED reason if event is 0 or event ranges from 20 to 127.

CRRP2: shall throw a ToolkitException with EVENT_NOT_ALLOWED reason if event is EVENT_MENU_SELECTION.

CRRP3: shall throw a ToolkitException with EVENT_NOT_ALLOWED reason if event is EVENT_MENU_SELECTION_HELP_REQUEST.

CRRP4: shall throw a ToolkitException with EVENT_NOT_ALLOWED reason if event is EVENT_TIMER_EXPIRATION.

CRRP5: shall throw a ToolkitException with EVENT_NOT_ALLOWED reason if event is EVENT_STATUS_COMMAND.

Context errors

CRRC1: shall throw a ToolkitException with EVENT_ALREADY_REGISTERED if event is EVENT_CALL_CONTROL_BY_SIM but another applet is already registered to it.

CRRC2: shall throw a ToolkitException with EVENT_ALREADY_REGISTERED if event is EVENT_MO_SHORT_MESSAGE_CONTROL_BY_SIM but another applet is already registered to it.

6.2.9.12.2 Test suite files

Test Script: API_2_TKR_SEVTB_1.scr

Test Applet: 1. API_2_TKR_SEVTB_1.java

2. API_2_TKR_SEVTB_2.java

Load Script: API_2_TKR_SEVTB_1.ldr

The load script installs the 2 instances.

Cleanup script: API_2_TKR_SEVTB_1.clr

6.2.9.12.3 Test Procedure

Id	Description	API Expectation	APDU Expectation
1	**Applet 1 is triggered by ENVELOPE(SMS_PP_FORMATTED) command.** Send ENVELOPE(SMS_PP_FORMATTED)	Applet 1 shall be triggered	
2	**Setting ALLOWED and SUPPORTED events** 1- For all events defined in GSM 0319 (from 1 to 19) and allowed: EVENT_PROFILE_DOWNLOAD, EVENT_FORMATTED_SMS_PP_ENV, EVENT_FORMATTED_SMS_PP_UPD, EVENT_UNFORMATTED_SMS_PP_ENV, EVENT_UNFORMATTED_SMS_PP_UPD, EVENT_UNFORMATTED_SMS_CB, EVENT_CALL_CONTROL_BY_SIM, EVENT_MO_SHORT_MESSAGE_CONTROL_BY_SIM, EVENT_EVENT_DOWNLOAD_MT_CALL, EVENT_EVENT_DOWNLOAD_CALL_CONNECTED, EVENT_EVENT_DOWNLOAD_CALL_DISCONNECTED, EVENT_EVENT_DOWNLOAD_LOCATION_STATUS, EVENT_EVENT_DOWNLOAD_USER_ACTIVITY, EVENT_EVENT_DOWNLOAD_IDLE_SCREEN_AVAILABLE, EVENT_EVENT_DOWNLOAD_CARD_READER_STATUS 1.1- clearEvent(event) 1.2- isEventSet(event) 1.3- setEvent(event) 1.4- isEventSet(event) 1.5- clearEvent(event)	1.1- No exception shall be thrown. 1.2- Shall return false. 1.3- No exception shall be thrown. 1.4- Shall return true. 1.5- No exception shall be thrown.	
3	**Event 0** Call setEvent(0)	Shall throw a ToolkitException with EVENT_NOT_SUPPORTED reason code.	
4	**Events from 20 to 127** Call setEvent(event) with event = 20 to 127	Shall throw a ToolkitException with EVENT_NOT_SUPPORTED reason code.	
5	**Setting EVENT_MENU_SELECTION** Call setEvent(EVENT_MENU_SELECTION)	Shall throw a ToolkitException with EVENT_NOT_ALLOWED reason code.	
6	**Setting EVENT_MENU_SELECTION_HELP_REQUEST** Call setEvent(EVENT_MENU_SELECTION_HELP_REQUEST)	Shall throw a ToolkitException with EVENT_NOT_ALLOWED reason code.	
7	**Setting EVENT_TIMER_EXPIRATION**	Shall throw a ToolkitException with	

	Call setEvent(EVENT_TIMER_EXPIRATION)	EVENT_NOT_ALLOWED reason code.	
8	**Setting EVENT_STATUS_COMMAND** Call setEvent(EVENT_STATUS_COMMAND)	Shall throw a ToolkitException with EVENT_NOT_ALLOWED reason code.	
9	**Check applet is triggered by an ENVELOPE(CALL_CONTROL)** setEvent(EVENT_CALL_CONTROL_BY_SIM) Trigger the applet	Applet is trigged by an ENVELOPE(CALL_CONTROL)	
10	**Check applet is triggered by an ENVELOPE(MO_SHORT_MESSAGE_CONTROL)** setEvent(EVENT_MO_SHORT_MESSAGE_CONTROL_BY_SIM) Trigger the Applet	Applet is trigged by an ENVELOPE(MO_SHORT_MESSAGE_CONTROL)	
11	**Applet 2 is triggered by ENVELOPE(SMS_PP_DOWNLOAD) command.** Trigger the applet 2	Applet 2 is trigged by an ENVELOPE(SMS_PP_DOWNLOAD) command	
12	**Applet 2 registers to CALL_CONTROL but it is already assigned** setEvent(EVENT_CALL_CONTROL_BY_SIM)	Shall throw a ToolkitException with EVENT_ALREADY_REGISTERED reason code.	
13	**Applet 2 registers to MO_MESSAGE_CONTROL but it is already assigned** setEvent(EVENT_MO_SHORT_MESSAGE_CONTROL_BY_SIM)	Shall throw a ToolkitException with EVENT_ALREADY_REGISTERED reason code.	

6.2.9.12.4 Test Coverage

CRR number	Test case number
N1	2
N2	1, 9,10,11
N3	2,5,6,7,8
P1	3,4
P2	5
P3	6
P4	7
P5	8
C1	12
C2	13

6.2.9.13 Method setEventList

Test Area Reference: API_2_TKR_SEVL_BSS

6.2.9.13.1 Conformance Requirement:

The method with following header shall be compliant to its definition in the API.

```
public void setEventList(byte[] eventList,
                    short offset,
                    short length)
             throws java.lang.NullPointerException,
                    java.lang.ArrayIndexOutOfBoundsException,
                    ToolkitException
```

Normal execution

CRRN1: for all events set successfully by this method, a call to isEventSet() method should return true.

CRRN2: the SIM Toolkit Framework shall trigger the applet if an occurrence of one of the successfully registered events happens.

CRRN3: this method shall accept all the events defined in GSM 0319 excepted: EVENT_MENU_SELECTION, EVENT_MENU_SELECTION_HELP_REQUEST, EVENT_TIMER_EXPIRATION , EVENT_STATUS_COMMAND.

Parameters error

CRRP1: shall throw a java.lang.NullPointerException if eventList is null.

CRRP2: shall throw a java.lang.ArrayIndexOutOfBoundsException if offset would cause access outside array bounds.

CRRP3: shall throw a java.lang.ArrayIndexOutOfBoundsException if length would cause access outside array bounds.

CRRP4: shall throw a java.lang.ArrayIndexOutOfBoundsException if both offset and length would cause access outside array bounds.

CRRP5: shall throw a ToolkitException with EVENT_NOT_SUPPORTED reason if event is 0 or event ranges from 20 to 127.

CRRP6: shall throw a ToolkitException with EVENT_NOT_ALLOWED reason if eventList contains EVENT_MENU_SELECTION.

CRRP7: shall throw a ToolkitException with EVENT_NOT_ALLOWED reason if eventList contains EVENT_MENU_SELECTION_HELP_REQUEST.

CRRP8: shall throw a ToolkitException with EVENT_NOT_ALLOWED reason if eventList contains EVENT_TIMER_EXPIRATION.

CRRP9: shall throw a ToolkitException with EVENT_NOT_ALLOWED reason if eventList contains EVENT_STATUS_COMMAND.

Context errors

CRRC1: shall throw a ToolkitException with EVENT_ALREADY_REGISTERED if eventList contains EVENT_CALL_CONTROL_BY_SIM but another applet is already registered to it.

CRRC2: shall throw a ToolkitException with EVENT_ALREADY_REGISTERED if eventList contains EVENT_MO_SHORT_MESSAGE_CONTROL_BY_SIM but another applet is already registered to it.

6.2.9.13.2 Test suite files

Test Script: API_2_TKR_SEVL_BSS_1.scr

Test Applet: 1. API_2_TKR_ SEVL_BSS _1.java

2. API_2_TKR_ SEVL_BSS _2.java

Load Script: API_2_TKR_ SEVL_BSS_1.ldr

The load script installs the 2 instances.

Cleanup script: API_2_TKR_ SEVL_BSS_1.clr

6.2.9.13.3 Test Procedure

Id	Description	API Expectation	APDU Expectation

1	**Applet 1 Registering all eventList buffer**
	
	`EventList = all allowed events defined in GSM 0319:`
	`EVENT_PROFILE_DOWNLOAD,`
	`EVENT_FORMATTED_SMS_PP_ENV,`
		1- No exception shall be thrown.
		
		2- No exception shall be thrown.
		
		3- Each time shall return true.	

	EVENT_FORMATTED_SMS_PP_UPD, EVENT_UNFORMATTED_SMS_PP_ENV, EVENT_UNFORMATTED_SMS_PP_UPD, EVENT_UNFORMATTED_SMS_CB, EVENT_CALL_CONTROL_BY_SIM, EVENT_MO_SHORT_MESSAGE_CONTROL_BY_SIM, EVENT_EVENT_DOWNLOAD_MT_CALL, EVENT_EVENT_DOWNLOAD_CALL_CONNECTED, EVENT_EVENT_DOWNLOAD_CALL_DISCONNECTED, EVENT_EVENT_DOWNLOAD_LOCATION_STATUS, EVENT_EVENT_DOWNLOAD_USER_ACTIVITY, EVENT_EVENT_DOWNLOAD_IDLE_SCREEN_AVAILABLE , EVENT_EVENT_DOWNLOAD_CARD_READER_STATUS 1- For each event in EventList clearEvent(event) 2- setEventList(eventList) Offset = 0 Length = eventList.lentgh 3- For all events in eventList isEventSet(event) 4- For each event in EventList clearEvent(event)	4- No exception shall be thrown.	
2	**Registering part of eventList buffer** EventList = all allowed events defined in GSM 0319 (see test case 1). 1- For each event in EventList clearEvent(event) 2- setEventList(eventList, offset, length) Offset > 0 Length = eventList.lentgh – offset 3- For all events in eventList: isEventSet(event) 4- For each event in EventList: clearEvent(event)	1- No exception shall be thrown. 2- No exception shall be thrown. 3- Each time shall return true for events ranging from offset to offset+length else shall return false. 4- No exception shall be thrown.	
3	**Null buffer** EventList = null	Shall throw a java.lang.NullPointerException Exception	
4	**Out of bounds offset** Offset = eventList.length Length = 1	Shall throw a java.lang.ArrayIndexOutOfBounds Exception	
5	**Out of bounds and big offset** Offset = 255 Length = 1	Shall throw a java.lang.ArrayIndexOutOfBounds Exception	
6	**Offset < 0** Offset = -1 Length = 1	Shall throw a java.lang.ArrayIndexOutOfBounds Exception	
7	**Out of bounds length** Offset = 0 Length = eventList.length + 1	Shall throw a java.lang.ArrayIndexOutOfBounds Exception	
8	**Out of bounds and big length**	Shall throw a java.lang.ArrayIndexOutOfBounds	

	Offset = 0 Length = 255	Exception	
9	**Length < 0** Offset = 0 Length = -1	Shall throw a java.lang.ArrayIndexOutOfBounds Exception	
10	**Out of bounds offset + Length** Offset + length > eventList.length + 1	Shall throw a java.lang.ArrayIndexOutOfBounds Exception	
11	**Event 0** Call setEventList(eventList) with eventList indicating event 0	Shall throw a ToolkitException with EVENT_NOT_SUPPORTED reason code.	
12	**Events from 20 to 127** Call setEventList(eventList) with eventList indicating all the events from 20 to 127	Shall throw a ToolkitException with EVENT_NOT_SUPPORTED reason code.	
13	**EVENT_MENU_SELECTION** Call setEventList(eventList) with eventList indicating EVENT_MENU_SELECTION	Shall throw a ToolkitException with reason code EVENT_NOT_ALLOWED.	
14	**EVENT_MENU_SELECTION_HELP_REQUEST** Call setEventList(eventList) with eventList indicating EVENT_MENU_SELECTION_HELP_REQUEST	Shall throw a ToolkitException with reason code EVENT_NOT_ALLOWED.	
15	**EVENT_TIMER_EXPIRATION** Call setEventList(eventList) with eventList indicating EVENT_TIMER_EXPIRATION	Shall throw a ToolkitException with reason code EVENT_NOT_ALLOWED.	
16	**EVENT_STATUS_COMMAND** Call setEventList(eventList) with eventList indicating EVENT_STATUS_COMMAND	Shall throw a ToolkitException with reason code EVENT_NOT_ALLOWED.	
17	**Setting EVENT_CALL_CONTROL_BY_SIM** setEventList(List, 0, 2) with List containing EVENT_CALL_CONTROL_BY_SIM & EVENT_MO_SHORT_MESSAGE_CONTROL_BY_SIM	Shall not throw an exception	
18	**Check applet is triggered by an ENVELOPE(CALL_CONTROL)** Trigger the applet	Applet is trigged by an ENVELOPE(CALL_CONTROL)	
19	**Check applet is triggered by an ENVELOPE(MO_SHORT_MESSAGE_CONTROL)** Trigger the applet	Applet is trigged by an ENVELOPE(MO_SHORT_MESSAGE_CONTROL)	
20	**Applet 2 registers to CALL_CONTROL but it is already assigned** setEventList(MonoEventList,0,1) with MonoEventList containing EVENT_CALL_CONTROL_BY_SIM	Shall throw a ToolkitException with EVENT_ALREADY_REGISTERED reason code.	
21	**Applet 2 registers to MO_SHORT_MESSAGE_CONTROL but it is already assigned setEventList(MonoEventList,0,1) with MonoEventList containing EVENT_MO_SHORT_MESSAGE_CONTROL_BY_SIM**	Shall throw a ToolkitException with EVENT_ALREADY_REGISTERED reason code.	

6.2.9.13.4 Test Coverage

CRR number	Test case number
N1	1,2
N2	17,18,19
N3	1,2,11,12,13,14,15,16
P1	3
P2	4,5,6
P3	7,8,9
P4	10
P5	11,12
P6	13
P7	14
P8	15
P9	16
C1	20
C2	21

6.2.10 Class ViewHandler

It is not possible to test the methods provided by this class as it is declared 'abstract'; it will be done in the class inheriting it: EditHandler, EnvelopeHandler, ProactiveResponseHandler, ProactiveHandler.

6.2.11 Class ToolkitException

6.2.11.1 Exception Constants

Test Area Reference: API_2_TKE_CONS

6.2.11.1.1 Conformance requirement:

There is no API, only constants.

Normal execution

CRRN1: The Constants of the class ToolkitException shall all have the same name and value defined in the GSM03.19 .

Parameters error

No requirements

Context errors

No requirements

6.2.11.1.2 Test suite files

No additional requirements for the GSM personalisation

- Test Script: API_2_TKE_CONS_1.scr
- Test Applet: API_2_TKE_CONS_1.java
- Installation parameter: API_2_TKE_CONS.install (Same as default applet)
- Load Script: API_2_TKE_CONS.ldr

At the end of the script the applet is loaded but not instantiated.

- Conversion parameter: API_2_TKE_CONS.cnv

6.2.11.1.3 Test procedure

Id	Description
01	Check constant HANDLER_OVERFLOW=1
03	Check constant UNAVAILABLE_ELEMENT=3
04	Check constant MENU_ENTRY_NOT_FOUND=4
05	Check constant REGISTRY_ERROR=5
06	Check constant EVENT_NOT_SUPPORTED=6
07	Check constant EVENT_ALREADY_REGISTERED=7
08	Check constant OUT_OF_TLV_BOUDARIES=8
09	Check constant ME_PROFILE_NOT_AVAILABLE=9
10	Check constant ALLOWED_LENGTH_EXCEEDED=10
11	Check constant NO_TIMER_AVAILABLE=11
12	Check constant INVALID_TIMER_ID=12
13	Check constant EVENT_NOT_ALLOWED=13
14	Check constant BAD_INPUT_PARAMETER=14

6.2.11.1.4 Test Coverage

CRR number	Test case number
N1	1-14

6.2.11.2 Constructor ToolkitException

Test Area Reference: API_2_TKE_COORS

6.2.11.2.1 Conformance requirement:

The constructor with following headershall compliant to its definition in the API.

```
public ToolkitException(short reason)
```

Normal execution

CRRN1: Construct a ToolkitException instance with the specified reason.

Parameters error

No requirements

Context errors

No requirements

6.2.11.2.2 Test suite files

No additional requirements for the GSM personalisation:

Test Script: API_2_TKE _COORS_1.scr

Test Applet: API_2_TKE _COORS_1.java

Load Script: API_2_TKE _COORS_1.ldr

Cleaning script: API_2_TKE _COORS_1.clr

6.2.11.2.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**reason = (short) 19**	ToolkitException.getReason() = (short)19	

6.2.11.2.4 Test Coverage

CRR number	Test case number
N1	1

6.2.11.3 Method throwIt

Test Area Reference: API_2_TKE_THITS

6.2.11.3.1 Conformance requirement:

The method with following header shall compliant to its definition in the API.

```
public static void throwIt(short reason)
        throws  ToolkitException
```

Normal execution

CRRN1: Throws the JCRE instance of the ToolkitException class with the specified reason.

CRRN2: extends javacard.framework.CardRuntimeException

Parameters error

No requirements

Context errors

No requirements

6.2.11.3.2 Test suite files

No additional requirements for the GSM personalisation:

Test Script: API_2_TKE_ THITS.scr

Test Applet: API_2_TKE_ THITS.java

Installation parameter: API_2_TKE_ THITS.install (Same as default applet)

Load Script: API_2_TKE_ THITS.ldr

Conversion parameter: API_2_TKE_ THITS.cnv

6.2.11.3.3 Test procedure

Id	Description	API Expectation	APDU Expectation
1	**Throws the JCRE instance of ToolkitException with the specified reason**	Reason (specified)	can't be checked because the status word's value is not specified
2	**ToolkitException extends javacard.framework.CardRuntimeException**	Reason (specified)	

6.2.11.3.4 Test Coverage

CRR number	Test case number
N1	1
N2	2

6.3 SIM Toolkit Framework

Test Cases for the API and Framework have no interactions and are designed to be independant. The API Test Cases in the present specification shall be considered as completed although no framework tests have been agreed at the present time.

System Handlers management

- minimum handler availability / status / content (+ response handling)

Applet Triggering:

- for each event test separately:
  - Registration / de registration, and dynamic registration
  - triggering
  - multiple applet triggering
  - limitations
  - busy state
- Exception hiding to the mobile.
- Events combination.

  Proactive commands sending

  Envelope response sending

  Toolkit applets installation

  Access control

  File system state

Annex A (normative): Class and Methods AID numbering and acronyms

A.1 Sim.access

Class Name	Acronyms	Numbering on 5 bits
SIMView	SVW	00001
SIMSystem	SSY	00010
SIMViewException	SVE	00011

A.1.1 SIMView methods

Method Name	Acronyms	Numbering on 6 bits
static final Constants		000001
short increase(byte[] incr, short incrOffset, byte[] resp, short respOffset)	INCR_BS_BS	000010
void invalidate()	INVL	000011
void readBinary(short fileOffset, byte[] resp, short respOffset, short respLength)	REDBS_BSS	000100
short readRecord(short recNumber, byte mode, short recOffset, byte[] resp, short respOffset, short respLength)	REDRSBS_BSS	000101
void rehabilitate()	REHA	000110
short seek(byte mode, byte[] patt, short pattOffset, short pattLength)	SEEKB_BSS	000111
void select(short fid)	SLCTS	001000
short select(short fid, byte[] fci, short fciOffset, short fciLength)	SLCTS_BSS	001001
short status(byte[] fci, short fciOffset, short fciLength)	STAT_BSS	001010
short updateBinary(short fileOffset, byte[] data, short dataOffset, short dataLength)	UPDBS_BSS	001011
void updateRecord(short recNumber, byte mode, short recOffset, byte[] data, short dataOffset, short dataLength)	UPDRSBS_BSS	001100

A.1.2 SIMSystem methods

Method Name	Acronyms	Numbering on 6 bits
static SIMView getTheSIMView()	GETS	000001

A.1.3 SIMViewException methods

Method Name	Acronyms	Numbering on 6 bits
static void throwIt(short reason)	THITS	000001
SIMViewException(short reason)	COORS	000010
Constants	CONS	000011

A.2 Sim.toolkit

Class Name	Acronyms	Numbering on 5 bits
ToolkitConstants	TKC	00001
ToolkitInterface	TKI	00010
EditHandler	EDH	00011
EnvelopeHandler	ENH	00100
EnvelopeResponseHandler	ERH	00101
MEProfile	MEP	00110
ProactiveHandler	PAH	00111
ProactiveResponseHandler	PRH	01000
ToolkitRegistry	TKR	01001
ViewHandler	VWH	01010
ToolkitException	TKE	01011

A.2.1 ToolkitConstants

Method Name	Acronyms	Numbering on 6 bits
Constants	CONS	000001

A.2.2 ToolkitInterface methods

Method Name	Acronyms	Numbering on 6 bits
void processToolkit (byte event)	PRTKB	000001

A.2.3 EditHandler methods

The numbering of the EditHandler methods it will be done in the classes inherit it: EnvelopeResponseHandler, ProactiveHandler, because the methods provided by this class as it is declared 'abstract'.

A.2.4 EnvelopeHandler methods

Method Name	Acronyms	Numbering on 6 bits
byte getEnvelopeTag()	GENT	000001
byte getItemIdentifier()	GIID	000010
short getSecuredDataLength()	GSDL	000011
short getSecuredDataOffset()	GSDO	000100
EnvelopeHandler getTheHandler()	GTHD	000101
short getTPUDLOffset()	GTPO	000110
Inherited Method Name: ViewHandler		
Byte compareValue(short valueOffset,byte[] compareBuffer, short compareOffset, short compareLength)	CPRVS_BSS	000111
Short copy(byte[] dstBuffer,short dstOffset,short dstLength)	COPY_BSS	001000
Short copyValue(short valueOffset, byte[] dstBuffer,short dstOffset,short dstLength)	CPYVS_BSS	001001
Byte findAndCompareValue(byte tag,byte[] compareBuffer,short compareOffset)	FACRB_BS	001010
Byte findAndCompareValue(byte tag,byte occurence, short valueOffset,byte[] compareBuffer,short compareOffset,short compareLength)	FACRBBS_BSS	001011

Short FindAndCopyValue(byte tag,byte occurence,short valueOffset, byte[] dstBuffer, short dstOffset, short dstLength)	FACYBBS_BSS	001100
Short findAndCopyValue(byte tag,byte[] dstBuffer,short dstOffset)	FACYB_BS	001101
Byte FindTLV(byte tag,byte occurrence)	FINDBB	001110
Short GetLength()	GLEN	001111
Byte GetValueByte(short valueOffset)	GVBYTS	010000
Short GetValueLength()	GVLEN	010001

A.2.5 EnvelopeResponseHandler methods

Method Name	Acronym	Numbering on 6 bits
EnvelopeResponseHandler getTheHandler()	GTHD	000001
Void post(byte statusType)	POSTB	000010
Void postAsBERTLV(byte statusType, byte tag)	POSTBB	000011
Inherited Method Name: EditHandler		
Void appendArray(byte[] buffer, short offset, short length, short dstLength)	APDA	000100
Void appendTLV(byte tag, byte value)	APTLVBB	000101
Void appendTLV(byte tag, byte[] value, short valueOffset, short valueLength)	APTLVB_BSS	000110
Void appendTLV(byte tag, byte value1, byte value2)	APTLVBBB	000111
Void appendTLV(byte tag, byte value1, byte[] value2, short value2Offset, short value2Length)	APTLVBB_BSS	001000
Void clear()	CLR	001001
Inherited Method Name: ViewHandler		
Byte compareValue(short valueOffset,byte[] compareBuffer, short compareOffset, short compareLength)	CPRVS_BSS	001010
Short Copy(byte[] dstBuffer,short dstOffset,short dstLength)	COPY_BSS	001011
Short CopyValue(short valueOffset, byte[] dstBuffer,short dstOffset,short dstLength)	CPYVS_BSS	001100
Byte FindAndCompareValue(byte tag,byte[] compareBuffer,short compareOffset)	FACRB_BS	001101
Byte findAndCompareValue(byte tag,byte occurence, short valueOffset,byte[] compareBuffer,short compareOffset,short compareLength)	FACRBBS_BSS	001110
Short FindAndCopyValue(byte tag,byte occurence,short valueOffset, byte[] dstBuffer, short dstOffset, short dstLength)	FACYBBS_BSS	001111
Short findAndCopyValue(byte tag,byte[] dstBuffer,short dstOffset)	FACYB_BS	010000
Byte FindTLV(byte tag,byte occurrence)	FINDBB	010001
Short GetLength()	GLEN	010010
Byte GetValueByte(short valueOffset)	GVBYTS	010011
Short GetValueLength()	GVLEN	010100

A.2.6 MEProfile methods

Method Name	Acronym	Numbering on 6 bits
Static boolean check(byte index)	CHECB	000001
Static boolean check(byte[] mask, short offset, short length)	CHECBSS	000010

A.2.7 ProactiveHandler methods

Method Name	Acronyms	Numbering on 6 bits
GetTheHandler()	GTHD	000001
Init(byte type, byte qualifier, byte dstDevice)	INITBBB	000010
InitDisplayText(byte qualifier, byte dcs, byte[] buffer, short offset, short length)	INDTBB_BSS	000011
InitGetInkey(byte qualifier, byte dcs, byte[] buffer, short offset, short length)	INGKBB_BSS	000100
InitGetInput(byte qualifier, byte dcs, byte[] buffer, short offset, short length, short minRespLength, short maxRespLength)	INGPBB_BSSSS	000101
Byte send()	SEND	000110
Inherited Method Name: EditHandler		
Void appendArray(byte[] buffer, short offset, short length, short dstLength)	APDA	000111
Void appendTLV(byte tag, byte value)	APTLVBB	001000
Void appendTLV(byte tag, byte[] value, short valueOffset, short valueLength)	APTLVB_BSS	001001
Void appendTLV(byte tag, byte value1, byte value2)	APTLVBBB	001010
Void appendTLV(byte tag, byte value1, byte[] value2, short value2Offset, short value2Length)	APTLVBB_BSS	001011
Void clear()	CLR	001100
Inherited Method Name: ViewHandler		
Byte CompareValue(short valueOffset,byte[] compareBuffer,short compareOffset, short compareLength)	CPRVS_BSS	001101
Short Copy(byte[] dstBuffer,short dstOffset,short dstLength)	COPY_BSS	001110
Short CopyValue(short valueOffset, byte[] dstBuffer,short dstOffset,short dstLength)	CPYVS_BSS	001111
Byte FindAndCompareValue(byte tag,byte[] compareBuffer,short compareOffset)	FACRB_BS	010000
Byte findAndCompareValue(byte tag,byte occurence, short valueOffset,byte[] compareBuffer,short compareOffset,short compareLength)	FACRBBS_BSS	010001
Short FindAndCopyValue(byte tag,byte occurence,short valueOffset, byte[] dstBuffer, short dstOffset, short dstLength)	FACYBBS_BSS	010010
Short findAndCopyValue(byte tag,byte[] dstBuffer,short dstOffset)	FACYB_BS	010011
Byte FindTLV(byte tag,byte occurrence)	FINDBB	010100
Short GetLength()	GLEN	010101
Byte GetValueByte(short valueOffset)	GVBYTS	010110
Short GetValueLength()	GVLEN	010111

A.2.8 ProactiveResponseHandler methods

Method Name	Acronyms	Numbering on 6 bits
Short CopyAdditionalInformation(byte[] dstBuffer, short dstOffset, short dstLength)	CPAI_BSS	000001
Short copyTextString(byte[] dstBuffer, short dstOffset)	CPT_BS	000010
Short getAdditionalInformationLength()	GTIL	000011
Byte getGeneralResult()	GTGR	000100
Byte getItemIdentifier()	GTII	000101
Byte getTextStringCodingScheme()	GTCS	000110
Short getTextStringLength()	GTTL	000111
GetTheHandler()	GTHD	001000
Inherited Method Name: ViewHandler		
Byte CompareValue(short valueOffset,byte[] compareBuffer,short compareOffset, short compareLength)	CPRVS_BSS	001001
Short Copy(byte[] dstBuffer,short dstOffset,short dstLength)	COPY_BSS	001010
Short CopyValue(short valueOffset, byte[] dstBuffer,short dstOffset,short dstLength)	CPYVS_BSS	001011
Byte FindAndCompareValue(byte tag,byte[] compareBuffer,short compareOffset)	FACRB_BS	001100
Byte findAndCompareValue(byte tag,byte occurence, short valueOffset,byte[] compareBuffer,short compareOffset,short compareLength)	FACRBBS_BSS	001101
Short FindAndCopyValue(byte tag,byte occurence,short valueOffset, byte[] dstBuffer, short dstOffset, short dstLength)	FACYBBS_BSS	001110
Short findAndCopyValue(byte tag,byte[] dstBuffer,short dstOffset)	FACYB_BS	001111
Byte FindTLV(byte tag,byte occurrence)	FINDBB	010000
Short GetLength()	GLEN	010001
Byte GetValueByte(short valueOffset)	GVBYTS	010010
Short GetValueLength()	GVLEN	010011

A.2.9 ToolkitRegistry methods

Method Name	Acronyms	Numbering on 6 bits
`AllocateTimer()`	ATIM	000001
`changeMenuEntry(byte id, byte[] menuEntry, short offset, short length, byte nextAction, boolean helpSupported, byte iconQualifier, short iconIdentifier)`	CMETB_BSSBZBS	000010
`clearEvent(byte event)`	CEVTB	000011
`disableMenuEntry(byte id)`	DMETB	000100
`enableMenuEntry(byte id)`	EMETB	000101
`getEntry()`	GETY	000110
`getPollInterval()`	GPOL	000111
`initMenuEntry(byte[] menuEntry, short offset, short length, byte nextAction, boolean helpSupported, byte iconQualifier, short iconIdentifier)`	IMET_BSSBZBS	001000
`isEventSet(byte event)`	IEVSB	001001
`releaseTimer(byte timerIdentifier)`	RTIM	001010
`requestPollInterval(short duration)`	RPOL	001011
`setEvent(byte event)`	SEVTB	001100
`setEventList(byte[] eventList, short offset, short length)`	SEVL_BSS	001101

A.2.10 ViewHandler methods

The numbering of the ViewHandler methods it will be done in the classes inherit it: EditHandler, EnvelopeHandler, ProactiveResponseHandler, ProactiveHandler, because the methods provided by this class as it is declared 'abstract'.

A.2.11 ToolkitException methods

Method Name	Acronyms	Numbering on 6 bits
`Static void throwIt(short reason)`	THITS	000001
`ToolkitException(short reason)`	COORS	000010
`Constants`	CONS	000011

Annex B (normative): Script file syntax and format description

```
CMD : Command to follow
RST : Resets and powers on the card
OFF : Powers off the card
INI : Performs the terminal profile with the following data. Afterwards, it shall perform all the
fetch and terminal response commands until there is no proactive session in progress.
REM : Used for comments
'\n': Empty lines are accepted
' ', '\t' : Can be used as separator
'\' : Continues on next line
XXX : each line beginning with 3 characters indicates other tool command.

[…] data to be checked, need to be present for an outgoing command. Bytes written as XX shall not be
checked by the APDU tool.
(…) status to be checked; when several status are valid they shall be separated by commas. Bytes
written as XX shall not be checked by the APDU tool.


REM this is an example

RST
INI FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
REM Case 1 example
CMD A0 C2 00 00 00 (91 33 , 69 XX)

REM Case 2 example
CMD A0 C2 00 00 B0 \
    [XX XX XX 55 55 XX 55](91 33 , 69 XX)
CMD A0 C2 00 00 B0 [] (91 33 , 69 XX)

CMD A0 C0 00 00 1F \
    [10 A0 00 00 00 09 00 02 FF FF FF FF 89 28 A4 05 \
    02 0D CC CC CC CC CC CC CC CC CC CC CC CC CC ] \
    (90 00)

REM Case 3 example
CMD A0 C2 00 00 33 \
    D1 31 82 02 83 81 06 05 80 11 22 33 44 8B 24 40 \
    08 00 24 23 85 18 41 04 51 10 10 00 00 00 00 13 \
    02 70 00 00 0E 0D 00 00 00 00 28 A4 05 00 00 00 \
    00 00 00 \
    (90 00)

OFF
```

In order to show a common appearance all the scripts shall follow those format rules:

- start always with a 'RST' followed by an 'INI' command.
- The command, data to be checked and status to be checked shall be presented in the following order:

  CMD *COMMAND* [*EXPECTED DATA*] (*EXPECTED STATUS*)

- APDU shall be presented with command (CLA INS P1 P2 P3) in one line and data (if present) in next line grouped 16 bytes per line (see example above).
- The expected data (if present) shall be presented in 16 bytes groups per line (see example above).

Annex C (normative): Default Prepersonalisation

C.1 General Default Prepersonalisation

This table shows the default prepersonalisation, the file system and the files' content, that the test SIM cards shall contain unless otherwise stated.

Name	Identifier	Default Value	Special Features
EF_{ICCID}	2FE2	0F FF FF FF FF FF FF FF FF FF	This value is not compliant with GSM 11.11
EF_{IMSI}	6F07	FF FF FF FF FF FF FF FF FF	This value is not compliant with GSM 11.11
EF_{LP}	6F05	01 FF FF FF	
EF_{Kc}	6F20	FF FF FF FF FF FF FF FF 07	
$EF_{PLMNsel}$	6F30	FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF	
EF_{HPLMN}	6F31	05	
EF_{ACMmax}	6F37	00 00 00	Access condition UPDATE: CHV1
EF_{SST}	6F38	FF 3F C3 03 0C 00 FF 0F 00 33	
EF_{ACM}	6F39	00 00 00	Access condition UPDATE: CHV1
EF_{PUCT}	6F41	FF FF FF 00 00	Access condition UPDATE: CHV1
EF_{BCCH}	6F74	FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF	
EF_{ACC}	6F78	00 00	
EF_{FPLMN}	6F7B	FF FF FF FF FF FF FF FF FF FF FF FF	
EF_{LOCI}	6F7E	FF FF FF FF 00 F0 00 00 00 FF 01	
EF_{AD}	6FAD	00 FF FF	
EF_{Phase}	6FAE	03	
EF_{FDN}	6F3B	Default value in all the records: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF	Records: 5
EF_{SMSP}	6F42	FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF	Records: 1
EF_{LND}	6F44	FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF	Records: 1
EF_{SMSS}	6F43	FF FF	
EF_{SMS}	6F3C	1st record: 00 FF … FF(length 176) 2nd record:00 FF … FF(length 176) 3rd record: 00 FF … FF(length 176)	Records: 3
EF_{ADN}	6F3A	FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF	Records: 1
EF_{CCP}	6F3D	FF FF FF FF FF FF FF FF FF FF FF FF FF FF	
EF_{MSISDN}	6F40	FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF	Records: 1
EF_{SDN}	6F41	FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF	Records: 1
EF_{SUME}	6F54	85 0C 54 4F 4F 4C 4B 49 54 20 54 45 53 54 FF FF FF FF	
EF_{CBMI}	6F45	FF FF	
EF_{IM}	4F20	FF FF FF FF FF FF FF FF FF FF FF	

The default value for the CHV1 shall be "0x31 0x31 0x31 0x31 0xFF 0xFF 0xFF 0xFF" and its state shall be 'disabled' during test applets execution.

C.2 Sim.Access.SimView test default prepersonalisation

C.2.1 $DF_{SIMTEST}$ (SIM Test)

Identifier: '0319'

C.2.2 EF_{TNR} (Transparent Never Read)

Identifier: '6F01'	Structure: transparent	Mandatory
File size: 3 bytes	Update activity: low	

Access Conditions:

READ	NEVER
UPDATE	ALWAYS
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	Default Value	M/O	Length
1 – 3	Test Data	AA AA AA	M	3 bytes

C.2.3 EF_{TNU} (Transparent Never Update)

Identifier: '6F02'	Structure: transparent	Mandatory
File size: 3 bytes	Update activity: low	

Access Conditions:

READ	ALWAYS
UPDATE	NEVER
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	Default Value	M/O	Length
1 - 3	Test Data	55 55 55	M	3 bytes

C.2.4 EF_{TARU} (Transparent Always Read and Update)

Identifier: '6F03'	Structure: transparent	Mandatory
File size: 260 bytes	Update activity: low	

Access Conditions:

READ	ALWAYS
UPDATE	ALWAYS
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	Default Value	M/O	Length
1 - 260	Test Data	FF ... FF	M	260 bytes

C.2.5 EF_{CNR} (Cyclic Never Read)

Identifier: '6F04'	Structure: cyclic	Mandatory
Record length: 3 bytes	Update activity: high	

Access Conditions:

READ	NEVER
UPDATE	ALWAYS
INCREASE	ALWAYS
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	Default Value	M/O	Length
1 - 3	Test Data	00 00 00	M	3 bytes
4 - 6	Test Data	00 00 00	M	3 bytes

C.2.6 EF_{CNU} (Cyclic Never Update)

Identifier: '6F05'	Structure: cyclic	Mandatory
Record length: 3 bytes	Update activity: high	

Access Conditions:

READ	ALWAYS
UPDATE	NEVER
INCREASE	CHV1
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	Default Value	M/O	Length
1 - 3	Test Data	00 00 00	M	3 bytes
4 - 6	Test Data	00 00 00	M	3 bytes

C.2.7 EF_{CNIC} (Cyclic Never Increase)

Identifier: '6F06	Structure: cyclic	Mandatory
Record length: 3 bytes	Update activity: high	

Access Conditions:

READ	ALWAYS
UPDATE	ALWAYS
INCREASE	NEVER
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	Default Value	M/O	Length
1 - 3	Test Data	00 00 00	M	3 bytes
4 - 6	Test Data	00 00 00	M	3 bytes

C.2.8 EF_{CNIV} (Cyclic Never Invalidate)

Identifier: '6F07	Structure: cyclic	Mandatory
Record length: 3 bytes	Update activity: high	

Access Conditions:

READ	ALWAYS
UPDATE	ALWAYS
INCREASE	ALWAYS
INVALIDATE	NEVER
REHABILITATE	ALWAYS

Bytes	Description	Default Value	M/O	Length
1 - 3	Test Data	00 00 00	M	3 bytes
4 - 6	Test Data	00 00 00	M	3 bytes

C.2.9 EF_{CNRH} (Cyclic Never Rehabilitate)

Identifier: '6F08'	Structure: cyclic	Mandatory
Record length: 3 bytes	Update activity: high	

Access Conditions:

READ	ALWAYS
UPDATE	ALWAYS
INCREASE	ALWAYS
INVALIDATE	ALWAYS
REHABILITATE	NEVER

Bytes	Description	Default Value	M/O	Length
1 - 3	Test Data	00 00 00	M	3 bytes
4 - 6	Test Data	00 00 00	M	3 bytes

C.2.10 EF_{CARU} (Cyclic Always Read and Update)

Identifier: '6F09'	Structure: cyclic	Mandatory
Record length: 3 bytes	Update activity: high	

Access Conditions:

READ	ALWAYS
UPDATE	ALWAYS
INCREASE	ALWAYS
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	Default Value	M/O	Length
1 - 3	Test Data	55 55 55	M	3 bytes
4 - 6	Test Data	AA AA AA	M	3 bytes

C.2.11 EF_{LNR} (Linear Fixed Never Read)

Identifier: '6F0A'	Structure: linear fixed	Mandatory
Record length: 4 bytes	Update activity: low	

Access Conditions:

READ	NEVER
UPDATE	ALWAYS
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	Default Value	M/O	Length
1 - 4	Test Data - Record 1	FF FF FF FF	M	4 bytes
5 -8	Test Data - Record 2	FF FF FF FF	M	4 bytes

C.2.12 EF_{LNU} (Linear Fixed Never Update)

Identifier: '6F0B'	Structure: linear fixed	Mandatory
Record length: 4 bytes	Update activity: low	

Access Conditions:

READ	ALWAYS
UPDATE	NEVER
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	Default Value	M/O	Length
1 - 4	Test Data - Record 1	FF FF FF FF	M	4 bytes
5 -8	Test Data - Record 2	FF FF FF FF	M	4 bytes

C.2.13 EF_{LARU} (Linear Fixed Always Read and Update)

Identifier: '6F0C'	Structure: linear fixed	Mandatory
Record length: 4 bytes	Update activity: low	

Access Conditions:

READ	ALWAYS
UPDATE	ALWAYS
INVALIDATE	ADM
REHABILITATE	ADM

Bytes	Description	Default Value	M/O	Length
1 - 4	Test Data - Record 1	55 55 55 55	M	4 bytes
5 -8	Test Data - Record 2	AA AA AA AA	M	4 bytes

Annex D (normative): sim.test.util package and loading , testing and cleaning script examples.

See attached files:

- Annex_D_TestToolkitApplet.zip
- Annex_D_Examples.zip

Annex E (normative): Test Area files.

The zip file containing script, applet, load and cleanup files for all Test Areas is expected to be included in the subsequent version of this document.

Annex F (informative): Change history

The table below indicates all changes that have been made to the present document since drafting work began.

Change history								
Date	**TSG #**	**TSG Doc**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**Old**	**New**
2000-10	-	-				Draft presented at T3#16		0.2.0
2000-12	TP-10	TP-000208				Presented to TSG-T #10 for information	0.2.0	1.0.0
2001-01	-	-				Input to T3 #17 resulting from T3 ad hoc #24	1.0.0	1.1.0
2001-03	-	-				Document presented for approval at T3#18	1.1.0	1.2.0
2001-03	TP-11	TP-010041				Doument presented for approval to TSG-T #11 (identical in technical content to v1.2.0)	1.2.0	2.0.0
2001-03						As approved at TSG-T #11 (identical in technical content to v2.0.0)	2.0.0	7.0.0
2001-05						Correction to date on cover page / headers	7.0.0	7.0.1

History

Document history		
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