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Identification cards — ICC-managed devices —

Part 4: Test methods for logical characteristics

Cartes d'identification — Dispositifs contrôlés par carte à circuit intégré (ICC) —
Partie 4: Titre manque

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by ISO/IEC JTC 1, *Information technology*, SC 17, *Cards and personal identification*.

A list of all the parts in the ISO 18328 series can be found on the ISO website.

Introduction

The ISO/IEC 18328 series of standards establishes a normative basis for an ICC with at least one additional device, such as an ICC-managed device.

This document prescribes requirements for testing the conformance of an ICC with at least one ICC-managed device with requirements of ISO/IEC 18328-3, respectively.

Identification cards — ICC-managed devices —

Part 4: Test methods for logical characteristics

1 Scope

This document specifies the test methods used for conformity testing, to determine whether an ICC with at least one ICC-managed device is considered to conform with the specifications of ISO/IEC 18328-3, e.g. device management and device handling.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 7816-4, *Identification cards — Integrated circuit cards — Part 4: Organization, security and commands for interchange*

ISO/IEC 18328-1, *Identification cards — ICC-managed devices — Part 1: General framework*

ISO/IEC 18328-2, *Identification cards — ICC-managed devices — Part 2: Physical characteristics and test methods for cards with devices*

ISO/IEC 18328-3, *Identification cards — ICC-managed devices — Part 3: Organization, security and commands for interchange*

3 Terms and definitions

For the purpose of this document, the terms and definition given in ISO/IEC 7816-4, ISO/IEC 18328-1, ISO/IEC 18328-2 and ISO/IEC 18328-3 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

4 Abbreviated terms

For the purposes of this document, the abbreviated terms given in ISO/IEC 7816-4, ISO/IEC 18328-1, ISO/IEC 18328-2, ISO/IEC 18328-3 and the following apply.

DUT device under test

5 Test design

5.1 General

This clause describes the concept of the test methods for ICC-managed devices.

Clause 6 provides test methods for an ICC with a general ICC-managed device. These test methods are independent from any specific device.

An elementary test method is a test case. All test cases are categorized into several test units.

5.2 Device under test (DUT)

A device under test (DUT) is an ICC with at least one ICC-managed on-card device for this edition of this document. Figure 1 illustrates a DUT with a test apparatus. This edition of this document specifies the test methods only for on-card devices. Test cases of checking general feature management DO, such as Idle 001 to 003 may cover off-card devices.

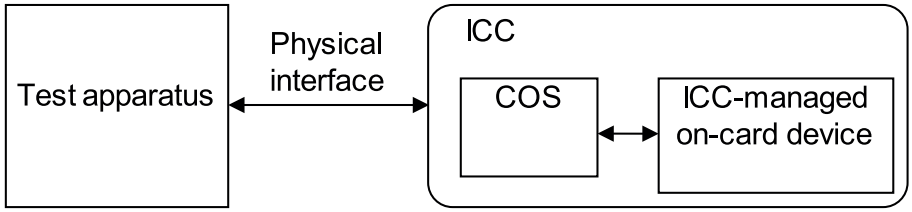

Figure 1 — DUT with test apparatus

5.3 Test unit

A test unit is a group of test cases that are related to the same type of functionality. Each test unit is defined by the following information:

Test Unit-ID	Uniquely identifies the test unit.
Purpose	Specifies the common issue addressed by the test cases contained in this test unit.
References	Optionally identifies references applicable to all test cases within the test unit.

5.4 Test case

A test case covers testing one function of an ICC with an ICC-managed device. Each test case is defined by the following information:

Test Case-ID	Uniquely identifies the test case within a test unit. Test Case-ID is a concatenation of Test unit-ID and a consecutive number.
Purpose	Specifies the requirement addresses in this test case.
Version	Version number of this test case.
References	Identifies specific reference to the requirement addressed by this test case.
Profile	Defines the features for which the test case is applicable. If the DUT does not match with each of the defined features, the test case is skipped and marked “NA“ (not applicable) in the test report. A feature is described with its own number defined in Table 1.
Precondition	Defines the state in which the DUT needs to be before the test case can be executed, including test cases that shall have been successfully passed, if any. If these preconditions are not fulfilled, the test case is skipped and marked as such in the test report.

Test scenario	Defines the test steps that shall be taken. Each step covers a simple, exactly defined operation with a measureable result that can be included in the test report. The steps shall be performed in the order listed. Each test step is defined by the following: — Test Step-ID is a consecutive number, uniquely identifying each test step and the execution order in the test case. — Description defines the operation that has to be executed for this step. — Configuration Data optionally specifies input data required to perform this test step.
Expected result	Defines pass criteria for each test step in the test scenario. The analysis of the observed result in comparison with this expected result leads to a "Pass" or a "Fail".

Table 1 lists features described in the column of profile for test cases.

Table 1 — List of features

Number of the feature	Feature
01	Supplemental logical channel supporting
02	ICC with MF
03	ICC without MF having one application DF
04	ICC having one application DF
05	ICC having two application DFs
06	ICC-managed on-card and/or off-card device
07	ICC-managed on-card device
08	ICC-managed on-card device with DVCP
09	ICC-managed on-card input device
10	ICC-managed on-card input device with DVCP
11	Shareable ICC-managed on-card input device with DVCP
12	Not shareable ICC-managed on-card input device with DVCP
13	ICC-managed on-card input device with supporting time frame
14	ICC-managed on-card output device
15	ICC-managed on-card output device with DVCP
16	Shareable ICC-managed on-card output device with DVCP
17	Not shareable ICC-managed on-card output device with DVCP
18	Device identifier list DO'83' under general feature management DO'7F74' in EF.ATR/INFO under MF
19	Device identifier list DO'83' under general feature management DO'7F74' in EF.ATR/INFO under the application DF
20	Device identifier list DO'83' under general feature management DO'7F74' under the FCI of the application DF
21	Device identifier list DO'83' under general feature management DO'7F74' in EF.ATR/INFO or under the FCI of the application DF
22	ADM GENERAL DEVICE RESET command
23	ADM LOGICAL DEVICE RESET command
24	ADM OPEN DEVICE command
25	ADM DEACTIVATE DEVICE command
26	ADM REACTIVATE DEVICE command
27	ADM EXCLUSIVE DEVICE USAGE command

Table 1 *(continued)*

Number of the feature	Feature
28	ADM GENERAL DEVICE USAGE command
29	ADM GET FROM DEVICE command
30	ADM GET FROM DEVICE command with absent response data field
31	ADM PUT TO DEVICE command
32	ADM PUT TO DEVICE command with absent command data field
33	ADM GET DEVICE INFORMATION command
34	ADM ERASE DEVICE CONTENT command
35	A structure (e.g. transparent EF, record or data object) receiving input data from ICC-managed on-card input device
36	A proper command (e.g. READ BINARY, READ RECORD or GET DATA) for retrieving input data from a structure

NOTE Feature 06 is provided for test unit Idle 001 to 003 and these test units can cover on-card devices.

5.5 Test report

Detailed test results shall be recorded for reference in a test report. The test report contains the test result of each:

— test unit;

— test case;

— test step.

If the profile of a test case is not applicable, this is noted. If the profile of a test case is applicable and the preconditions are fulfilled, the test result for a test step, a test case and a test unit can be:

— Pass for matching the expected results with actually obtained results from the DUT.

— Fail for not matching one of the expected results with actually obtained results from the DUT.

6 Test methods

6.1 General test requirements

6.1.1 Preconditions for testing

The tests in this clause require a fully personalized ICC with at least one on-card ICC-managed device.

6.1.2 Test setup

For setting up these tests, any test apparatus for communicating with an ICC that meets the requirements of ISO/IEC 7816-1, ISO/IEC 7816-2, ISO/IEC 7816-3, and/or ISO/IEC 14443 (all parts) can be used.

6.2 List of test cases

Table 2 lists test cases specified in Clause 6. “Input” in the device column of Table 2 means ICC-managed input device and operation of this device is required for test cases of test unit input, e.g. key inputting, sensor touching or button pushing. “Output” in the device column of Table 2 means ICC-managed output device and visually or auditory verification of this device is required for test cases of test unit output,

e.g. lighting, displaying image or sound. "-" in the device column of Table 2 means that operation of ICC-managed input device and/or visually or auditory verification of ICC-managed output device is not required.

Table 2 — List of test cases

Test Unit	No.	Device	Outline
Idle	001	-	Getting general feature management DO from EF.ATR/INFO with MF
	002	-	Getting general feature management DO from EF.ATR/INFO without MF
	003	-	Getting general feature management DO from FCI of application DF
	004	-	Opening on-card device
Ready	001	-	Getting DVCP
	002	-	Switching usage attribute GENERAL and EXCLUSIVE DEVICE USAGE
	003	-	Switching activity status READY and DEACTIVATED
	004	-	Logical resetting from READY
	005	-	Logical resetting from DEACTIVATED
	006	-	General resetting from READY
	007	-	General resetting from DEACTIVATED
Input	001	Input	Inputting data into ICC
	002	Input	Inputting data into response data field
Output	001	Output	Outputting data from ICC
	002	Output	Outputting data from command data field
Erase	001	Output	Turning back the condition of an output device into same as just after OPEN DEVICE function applied
Deactivated	001	-	Unable to input at DEACTIVATED
	002	-	Unable to output at DEACTIVATED
Exclusive	001	-	Unable to input by other application at EXCLUSIVE DEVICE USAGE
	002	-	Unable to output by other application at EXCLUSIVE DEVICE USAGE
General	001	Input	Enable to input by different applications at GENERAL DEVICE USAGE
	002	Output	Enable to output by different applications at GENERAL DEVICE USAGE
Timeout	001	-	Detecting timeout
Shareability	001	Input	Enable to input by using different logical channels on shareable device
	002	Output	Enable to output by using different logical channels on shareable device
	003	Input	Unable to input by using other logical channel on not shareable input device
	004	Output	Unable to output by using other logical channel on not shareable output device

6.3 Test unit Idle

6.3.1 Test unit

Test Unit-ID	Idle
Purpose	Identifying ICC-managed on-card and/or off-card device at IDLE/WAIT state and possible function of ADDITIONAL DEVICE MANAGEMENT (ADM) command
References	ISO/IEC 7816-4, ISO/IEC 18328-3

6.3.2 Test case Idle 001

Test Case-ID	Idle 001
Purpose	Identifying ICC-managed on-card and/or off-card device at IDLE/WAIT state
Version	1.0
References	ISO/IEC 18328-3:2016, Tables 1 and 2
Profile	02 ICC with MF 06 ICC-managed on-card and/or off-card device 18 Device identifier list DO‘83‘ under general feature management DO‘7F74‘ in EF.ATR/INFO under MF
Precondition	1. ICC with its communication protocol is activated. 2. ICC-managed device is powered. 3. MF is selected.
Test scenario	1. Selecting EF.ATR/INFO by file identifier ‘2F01‘ 2. Reading entire content of EF.ATR/INFO
Expected result	1. The DUT returns SW1-SW2 as ‘9000‘. 2. The DUT returns entire content of EF.ATR/INFO with SW1-SW2 as ‘9000‘. The content includes DO‘7F74‘. DO‘7F74‘ shall include on-card services DO‘81‘ and its format of value field is according to ISO/IEC 18328-3:2016, Table 2. DO‘7F74‘ includes device identifier list DO‘83‘ and its format of value field is according to Table 1 in ISO/IEC 18328-3.

6.3.3 Test case Idle 002

Test Case-ID	Idle 002
Purpose	Identifying ICC-managed on-card and/or off-card device at IDLE/WAIT state
Version	1.0
References	ISO/IEC 18328-3:2016, Tables 1 and 2
Profile	03 ICC without MF having one application DF 06 ICC-managed on-card and/or off-card device 19 Device identifier list DO‘83‘ under general feature management DO‘7F74‘ in EF.ATR/INFO under the application DF
Precondition	1. ICC with its communication protocol is activated. 2. ICC-managed device is powered.