EN 301 366 V1.1.2 (1999-05)

European Standard (Telecommunications series)

**Universal Personal Telecommunication (UPT);
UPT phase 2;
Functional specification of the interface of a UPT Integrated
Circuit Card (ICC) and Card Accepting Devices (CADs);
UPT card accepting Dual Tone Multiple Frequency (DTMF)
device;
Conformance test specification**

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Contents

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Network Aspects (NA).

National transposition dates	
Date of adoption of this EN:	16 April 1999
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1 Scope

The present document provides the test specification for the Universal Personal Telecommunication (UPT) card and the Card Accepting Device (CAD) defined in ETS 300 477 [1].

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.

- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1]   ETS 300 477 (1996): "Universal Personal Telecommunication (UPT); UPT phase 2; Functional specification of the interface of a UPT Integrated Circuit Card (ICC) and Card Accepting Devices (CAD); UPT card accepting Dual Tone Multiple Frequency (DTMF) device".

[2]   ISO/IEC 7816-1: "Identification cards; Integrated circuit(s) with contacts; Part 1: Physical characteristics".

[3]   ISO/IEC 7816-2: "Identification car; Integrated circuit(s) cards with contacts; Part 2: Dimensions and location of the contacts".

[4]   ISO/IEC 7816-3: "Identification car; Integrated circuit(s) cards with contacts; Part 3: Electronic signals and transmission protocols".

[5]   ISO/IEC 7816-4: "Identification car; Integrated circuit(s) cards with contacts; Part 4: Interindustry commands for interchange".

[6]   ISO/IEC 7811-1: "Identification car; Recording technique; Part 1: Embossing".

[7]   ISO/IEC 7811-3: "Identification car; Recording technique; Part 3: Location of embossed characters on ID-1 cards".

[8]   Void.

[9]   ISO/IEC 8859-1: "Information technology; 8-bit single-byte coded graphic character sets; Part 1: Latin alphabet No. 1 ".

[10]   ISO 639 (1988): "Codes for the representation of names of languages".

[11]   EN 726-6: "Requirements for IC cards and terminals for telecommunication use; Part 6: Telecommunication features".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following definitions in addition with the terms defined in
ETS 300 477 [1] apply:

Implementation Conformance Statement (ICS): statement made by the supplier of an implementation or system
claimed to conform to a given specification, stating which capabilities have been implemented. The ICS can take several
forms: protocol ICS, profile ICS, profile specific ICS, information object ICS, etc.

ICS proforma: document, in the form of a questionnaire, which when completed for an implementation or system
becomes an ICS.

3.2 Symbols

For the purposes of the present document, the symbols defined in ETS 300 477 [1] apply.

3.3 Abbreviations

For the purposes of the present document, the following abbreviations in addition to the terms defined in
ETS 300 477 [1] apply:

CRn	Conformance Requirement "n"
ICS	Implementation Conformance Statement
IUT	Implementation Under Test

4 UPT Integrated Circuit Card part

4.1 Test environment

This subclause specifies several requirements which shall be met, and a number of rules which shall be adhered to
before testing can proceed.

4.1.1 Test equipment

This subclause recommends a minimum specification for each of the items of test equipment referenced in the tests.

4.1.1.1 CAD simulator

This item of equipment shall allow T = 0 protocol communications to take place on both ID-1 and plug-in UPT cards. It
shall be able to generate and send any command APDU and receive any of the possible responses. These commands
may be generated manually, one at a time, or automatically from a predefined batch procedure containing one or more
commands.

The voltage level for Vcc (contact C1) of the UPT card shall be adjustable between 0 V and 6,0 V to an accuracy of
0,1 V. The voltage level for I/O (contact C7) when sending data to the PIM shall be adjustable between 0 V and 6,0 V to
an accuracy of 0,1 V.

The CAD simulator shall be able to source current in the range -2 mA to +12 mA.

The CAD simulator shall be able to support clock stop modes.

The CAD simulator shall be able to accept an external clock signal to drive RST (contact C3) of the UPT card.

It shall be possible to access all the UPT card contacts either directly or through test points.

4.1.1.2   Signal generation device

This item of equipment shall be able to generate square-wave signals for the UPT card, any of which can be a signal-shot or continuous signal, in the range 1 MHz to 5 MHz. The voltage levels for both high and low states shall be adjustable between 0 V and 5,50 V to an accuracy of 0,1 V. The duty cycle of the clock signal shall be adjustable between 40 % and 60 % to an accuracy of 1 %. It will also provide control over the following parameters:

-    rise and fall time to an accuracy of 10 μS;

-    overshoot/undershoot voltage to ± 0,3 V to an accuracy of 0,1 V.

4.1.1.3   Precision force-inducing contacting device

This item of equipment shall be able to apply a prescribed and maintained level of force onto one or more contacts of a UPT card. The range shall be between 0 N and 0,5 N and accurate to 0,01 N.

4.1.1.4   Temperature controllable environment

This item of equipment shall be able to control the temperature of a chamber large enough to enclose a UPT card and card reader. The range of temperature control required is between -25°C and +85°C to an accuracy of 0,5°C.

4.1.1.5   Temperature measuring device

This item of equipment shall be able to measure the temperature of the UPT card to within 0,5°C. The range of this device shall allow measurement of temperatures between -25°C and +85°C.

4.1.1.6   Voltage Measuring Device

This item of equipment shall be able to measure static and transient voltages on any one of the contacts of the UPT card. The measurable voltage range shall be between -10 V to +10 V (to an accuracy of 50 mV) with a timebase accuracy of 100 ns.

4.1.1.7   Precision measuring device

This item of equipment shall be able to measure both linear and radius of curvature dimensions to an accuracy of 0,01 mm.

4.1.1.8   Current measuring device

This item of equipment shall be able to measure current levels for any one of the contacts of the UPT card. The measurable current range shall be between -2 mA to +12 mA to an accuracy of 1 μA.

4.1.2   IUT default conditions

Unless otherwise stated, the following is default:

-    the voltage level for Vcc (contact C1) is set to 5,0 V;

-    the voltage levels for CLK (contact C3) are set to 0,7 V and 5,0 V for low and high respectively;

-    the clock frequency CLK (contact C3) is set to 5 MHz with duty cycle 50 %;

-    the CAD simulator generated voltage levels for I/O (contact C7) are set to 0,7 V and 5,0 V for low and high respectively.

4.1.3   Default data formatting

All numeric data enclosed in single quotes (e.g. '8C') in this subclause are hexadecimal data.

Where "X" is used in place of a hexadecimal digit, X ranges from '0' to 'F'. For example, the data '6X' ranges from '60' to '6F' inclusive.

Where data is expressed as a group of bytes, it shall be in the following format: 'XX XX XX... XX', indicating first byte, second byte, third byte etc. in that order.

4.1.4   Test procedure

The following statements are applicable to the test procedure subclause for all test purposes contained within this subclause:

- Unless otherwise stated, all steps with the test procedure are to be carried out in order.

- Where steps indicate that a CAD simulator shall select a particular DF or EF using an unspecified number SELECT commands, the CAD simulator is to send the correct sequence of SELECT commands in order to select the required file ID from the current file ID (this may be achieved most easily by selecting from the MF down each time).

    The procedure to select DF_{UPT} is defined below:

    a) The CAD simulator sends a SELECT command to the UPT card to select EF_{DIR};

    b) the CAD simulator sends a GET RESPONSE command to the UPT card;

    c) the CAD simulator gains the access conditions to read EF_{DIR} (if necessary);

    d) the CAD simulator sends a READ BINARY command to the UPT card;

    e) the CAD simulator sends as many SELECT commands as are required to select the DF_{UPT} by file ID as given in EF_{DIR};

    f) the CAD simulator sends a GET RESPONSE command to the UPT card.

    The procedure to select DF_{TEL} is defined below:

    a) The CAD simulator sends a SELECT command to the UPT card to select EF_{DIR};

    b) the CAD simulator sends a GET RESPONSE command to the UPT card;

    c) the CAD simulator gains the access conditions to read EF_{DIR} (if necessary);

    d) the CAD simulator sends a READ BINARY command to the UPT card;

    e) the CAD simulator sends as many SELECT commands as are required to select the DF_{TEL} by file ID as given in EF_{DIR};

    f) the CAD simulator sends a GET RESPONSE command to the UPT card.

    The procedure to select the relevant EF_{CHV1} for the UPT card is defined below:

    a) the CAD simulator select DF_{UPT}, as defined above;

    b) the CAD simulator sends a SELECT command to the UPT card to select EF_{CHV1};

    c) if the status condition returned by the UPT card is SW1 = '94', SW2 = '04', "file not found", then the CAD simulator sends a SELECT command to select the parent directory using file ID;

    d) repeat steps b) and c) until EF_{CHV1} is found.

- Unless otherwise stated, the length Le, Lc for all READ RECORD and UPDATE RECORD commands sent by the CAD simulator is to be that of the length of the EF currently selected. In the case where an EF is not currently selected, the length sent is to be 1 unless otherwise stated.

- Unless otherwise stated, the offset for all READ BINARY, UPDATE BINARY and SEEK commands sent by the CAD simulator is to be '00 00'.

- Unless otherwise stated, the length Le for all GET RESPONSE commands sent by the CAD simulator is to be such that all available data is read.

- Unless otherwise stated, the CHV and UNBLOCK CHV presented for VERIFY CHV, CHANGE CHV, and UNBLOCK CHV commands sent by the CAD simulator is to be correct.

- Unless otherwise stated, the CHV1 on the UPT card is activated and enabled and sufficient VERIFY CHV1 and UNBLOCK CHV1 attempts remain.

4.1.5   Test requirement

Where steps within a test procedure involve a CAD simulator sending one or more commands to the UPT card, these commands are required to be correctly executed, with the UPT card responding with status conditions of '90 00' or '9F XX', unless otherwise stated in the test requirements subclause for the test.

4.2   Test group hierarchy

This subclause contains the test group hierarchy diagrams which provide a structure for the test purposes and also a correlation between the base specification and the present document.

The information contained in each node for each of the diagrams is as follows:

mnemonic for test group
reference to subclause in test specification

As the test group hierarchy for the UPT is large, it has been broken into subclauses to aid presentation.

4.2.1   Test groups under PIM
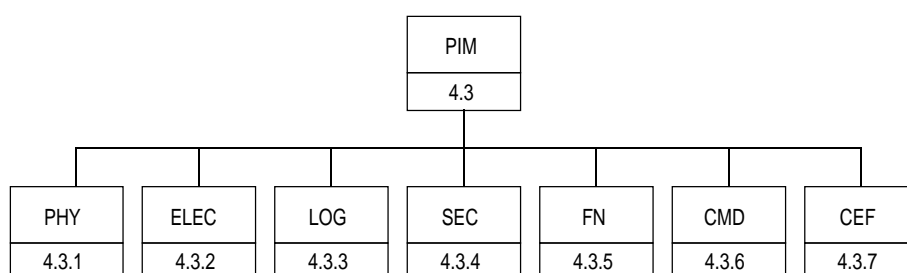
Figure 1: Top level test group hierarchy

The mnemonics chosen for this test group are as follows:

- PHY: Physical characteristics - ETS 300 477 [1], clause 4;

- ELEC: Electronic signals and transmission protocols - ETS 300 477 [1], clause 5;

- LOG: Logical Model - ETS 300 477 [1], clause 6;

- SEC: Security services and facilities - ETS 300 477 [1], clause 7;

- FN: Description of the functions - ETS 300 477 [1], clause 8;

- CMD: Description of the commands - ETS 300 477 [1], clause 9;

- CEF: Contents of the elementary files - ETS 300 477 [1], clause 10.

The test groups "PHY", "ELEC", "LOG", "SEC", "CMD" and "CEF", shown in figure 1, are broken down further, as shown in the following figures.

4.2.2   Test groups under PHY
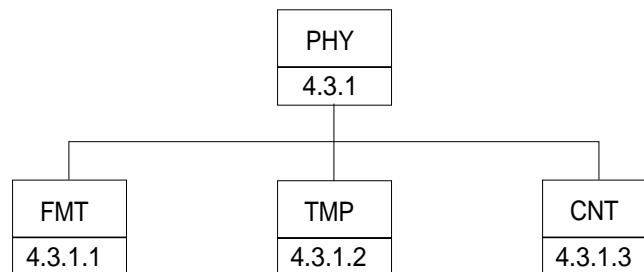
Figure 2: Breakdown of "PHY" test group

The mnemonics chosen for this test group are as follows:

- FMT: Format and layout - ETS 300 477 [1], subclause 4.1;

- TMP: Temperature range for card operation - ETS 300 477 [1], subclause 4.2;

- CNT: Contacts - ETS 300 477 [1], subclause 4.3.

4.2.3   Test groups under ELEC
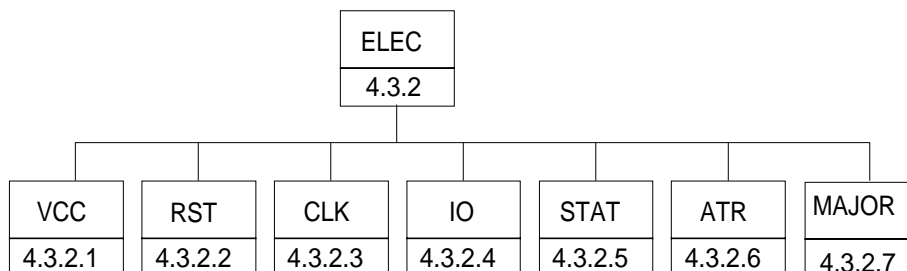
Figure 3: Breakdown of "ELEC" test group

The mnemonics chosen for this test group are as follows:

- VCC: Supply voltage Vcc (contact C1) - ETS 300 477 [1], subclause 5.1;

- RST: Reset RST (contact C2) - ETS 300 477 [1], subclause 5.2;

- CLK: Clock CLK (contact C3) - ETS 300 477 [1], subclause 5.3;

- IO: I/O (contact C7) - ETS 300 477 [1], subclause 5.5;

- STAT: States - ETS 300 477 [1], subclause 5.6;

- ATR: Answer To Reset (ATR) - ETS 300 477 [1], subclause 5.8;

- MAJOR: Major capabilitiesStates - ETS 300 477 [1], clause 5, subclauses 5.7, 5.9.

4.2.4   Test groups under LOG
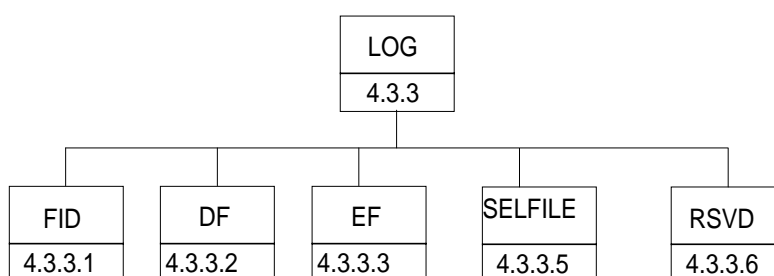
Figure 4: Breakdown of "LOG" test group

The mnemonics chosen for this test group are as follows:

- FID: File identifier - ETS 300 477 [1], subclause 6.2;

- DF: Dedicated Files - ETS 300 477 [1], subclause 6.4;

- EF: Elementary Files - ETS 300 477 [1], subclause 6.5;

- SELFILE: Methods for selecting a file - ETS 300 477 [1], subclause 6.6;

- RSVD: Reservation of file IDs - ETS 300 477 [1], subclause 6.7.

4.2.5   Test groups under SEC
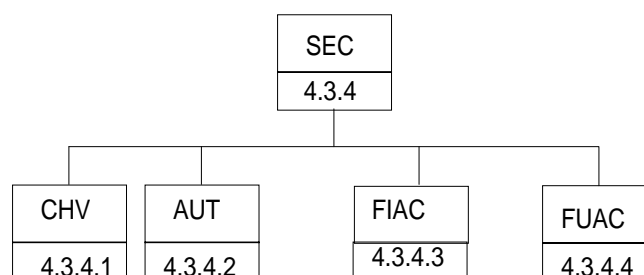
Figure 5: Breakdown of "SEC" test group

The mnemonics chosen for this test group are as follows:

-   CHV: Card Holder Verification - ETS 300 477 [1], subclause 7.2.1;

-   AUT: Strong Authentication - ETS 300 477 [1], subclause 7.2.2;

-   FIAC: File access condition - ETS 300 477 [1], subclause 7.3;

-   FUAC: Function access condition - ETS 300 477 [1], subclause 7.4.

4.2.6   Test groups under CMD

```
                    ┌──────────┐
                    │   CMD    │
                    ├──────────┤
                    │   4.3.6  │
                    └──────────┘
          ┌──────────┬───┴────┬──────────┐
    ┌──────────┐┌──────────┐┌──────────┐┌──────────┐
    │   MAP    ││   DEF    ││   COD    ││    SC    │
    ├──────────┤├──────────┤├──────────┤├──────────┤
    │  4.3.6.1 ││  4.3.6.2 ││  4.3.6.3 ││  4.3.6.4 │
    └──────────┘└──────────┘└──────────┘└──────────┘
```
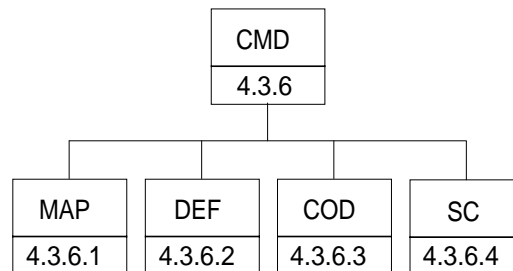
Figure 6: Breakdown of "CMD" test group

The mnemonics chosen for this test group are as follows:

-   MAP: Mapping principles - ETS 300 477 [1], subclause 9.1;

-   DEF: Definitions and coding - ETS 300 477 [1], subclause 9.2;

-   COD: Coding of the commands - ETS 300 477 [1], subclause 9.3;

-   SC: Status conditions returned by the UPT card - ETS 300 477 [1], subclause 9.6;

-   SW: Coding of the status words- ETS 300 477 [1], subclause 9.6.1-5;

-   CSR: Commands versus possible status responses - ETS 300 477 [1], subclause 9.6.6.

4.2.7   Test groups under CEF

```
                    ┌──────────┐
                    │   CEF    │
                    ├──────────┤
                    │   4.3.7  │
                    └──────────┘
          ┌──────────┬───┴────┬──────────┐
    ┌──────────┐┌──────────┐┌──────────┐┌──────────┐
    │  EFCHV   ││    MF    ││   UPT    ││   TEL    │
    ├──────────┤├──────────┤├──────────┤├──────────┤
    │  4.3.7.1 ││  4.3.7.2 ││  4.3.7.3 ││  4.3.7.4 │
    └──────────┘└──────────┘└──────────┘└──────────┘
```
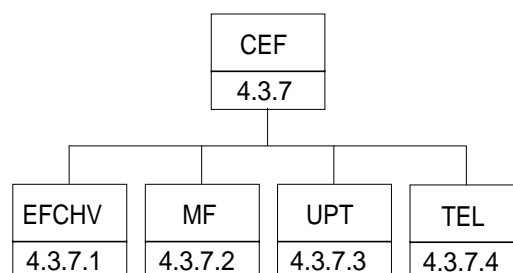
Figure 7: Breakdown of "CEF" test group

The mnemonics chosen for this test group are as follows:

-   EFCHV: Contents of the CHV file - ETS 300 477 [1], subclause 10.1;

-   MF: Contents of the EFs at the MF level - ETS 300 477 [1], subclause 10.2;

-   UPT: Contents of EFs at the UPT application level- ETS 300 477 [1], subclause 10.3;

-   TEL: Contents of EFs at the TELECOM application level - ETS 300 477 [1], subclause 10.4.

4.3 Test procedure

This subclause details each of the tests in each of the test groups within the Test Group Hierarchy. This test suite allows testing of the Implementation Under Test (IUT) against the base specification with respect to:

- physical characteristics;

- electronic signals and transmission protocols;

- logical model;

- security services and facilities;

- functions;

- commands;

- contents of the elementary files.

4.3.1 Physical characteristics

The tests in this subclause ensure that the IUT conforms to the specification for both format and layout and contacts.

4.3.1.1 Format and layout

4.3.1.1.1 ID-1 card

4.3.1.1.1.1 Definition and applicability

The format and layout characteristics shall be adhered to, in order to ensure proper operation in the UPT environment.

This test applies to ID-1 UPT cards.

4.3.1.1.1.2 Conformance requirement

1) Format and layout of the ID-1 card shall be in accordance with ISO/IEC 7816-1 [2] and ISO/IEC 7816-2 [3], unless otherwise specified.

2) The identification number, as defined in EF_{ID}, shall be present on the exterior of the ID-1 card.

3) The card shall have a polarization mark which indicates how the user should insert the card into the PE.

4) The card shall be embossed (optional).

5) The embossing shall be in accordance with ISO/IEC 7811-1 [6] and ISO/IEC 7811-3 [7] (conditional).

6) The contacts shall be located on either the front (embossed face).

Reference: ETS 300 477 [1], clause 4, subclauses 4.1 and 4.1.1.

Test Group Reference (TGR): TGR_PIM_PHY_FMT_ID1.

Test Procedure Reference (TPR): TPR_PIM_PHY_FMT_ID1.

4.3.1.1.1.3 Test purpose

To verify that the UPT card conforms to the above requirements.

NOTE 1: The testing of Conformance Requirement One (CR1) is outside the scope of the present document. Please refer to the test specification for ISO/IEC 7816-1 [2] and ISO/IEC 7816-2 [3].

NOTE 2: The testing of CR5 is outside the scope of the present document. Please refer to the test specification for ISO/IEC 7811-1 [6] and ISO/IEC 7811-3 [7].

4.3.1.1.1.4 Method of test

Initial conditions

None.

Test procedure

a) the card is examined for the following:

   - identification number;

   - polarization mark;

   - contact location;

b) connect the UPT card to the CAD simulator;

c) the CAD simulator resets the UPT card;

d) the CAD simulator sends a SELECT command to the UPT card to select EF_{ID};

e) the CAD simulator sends a READ BINARY command to the UPT card with a length of 10 and an offset of 0 to read the identification number.

4.3.1.1.1.5 Test requirement

1) After step a), the card shall have been observed to exhibit the following:

   - identification number located on the exterior of the card;

   - polarization mark indicating how the user should insert the card into the PE;

   - contact location on the front of the card.

2) After step e), the identification number read from EF_{ID} shall be identical with that on the exterior of the card.

4.3.1.1.2 Plug-in card

4.3.1.1.2.1 Definition and applicability

The format and layout characteristics shall be adhered to, in order to ensure proper operation in the UPT environment.

This test applies to plug-in UPT cards.

4.3.1.1.2.2 Conformance requirement

1) Format and layout of the plug-in card shall be in accordance with ISO/IEC 7816-1 [2] and ISO/IEC 7816-2 [3], unless otherwise specified.

2) The information on the exterior of the plug-in card shall include at least the individual account identifier and the check digit.

3) The plug-in card shall have a width of 25 mm, a height of 15 mm, a thickness the same as an ID-1 card and a feature for orientation.

Reference: ETS 300 477 [1], clause 4, subclauses 4.1 and 4.1.2.

Test Group Reference (TGR): TGR_PIM_PHY_FMT_PIC.

Test Procedure Reference (TPR): TPR_PIM_PHY_FMT_PIC.

4.3.1.1.2.3   Test purpose

To verify that the PIM conforms to the above requirements.

NOTE: The testing of CR1 is outside the scope of the present document. Please refer to the test specification for ISO/IEC 7816-1 [2] and ISO/IEC 7816-2 [3].

4.3.1.1.2.4   Method of test

Initial conditions

None.

Test procedure

a) the card is examined for the following:

- individual account identifier and check digit;

- width;

- height;

- thickness;

- feature for orientation;

b) connect the PIM to the CAD simulator;

c) the CAD simulator resets the PIM;

d) the CAD simulator sends a SELECT command to the PIM to select EF_{ID};

e) the CAD simulator sends a READ BINARY command to the PIM with a length of 10 and an offset of 0 to read the identification number.

4.3.1.1.2.5   Test requirement

1) After step a), the card shall have been observed to exhibit the following:

- at least the individual account identifier and check digit located on the exterior of the card;

- correct width, height and thickness over the full surface area;

- feature for orientation.

2) After step e), the account identifier and check digit read from EF_{ID} shall be identical with that on the exterior of the card.

4.3.1.2   Temperature range for card operation

4.3.1.2.1   Definition and applicability

The temperature range for full operational use shall be adhered to, in order to ensure proper operation in the UPT environment.

This test applies to both plug-in and ID-1 UPT cards.

4.3.1.2.2   Conformance requirement

1) The temperature range for full operational use shall be between -25°C and +70°C with occasional peaks of up to +85°C, where "occasional" means not more than 4 hours each time and not over 100 times during the life time of the card.

Reference: ETS 300 477 [1], subclause 4.2.

Test Group Reference (TGR): TGR_PIM_PHY_TMP.

Test Procedure Reference (TPR): TPR_PIM_PHY_TMP.

4.3.1.2.3   Test purpose

To verify that the PIM conforms to the above requirements.

4.3.1.2.4   Method of test

Initial conditions:

1) The PIM is placed in a temperature-controllable environment and connected to a CAD simulator.

2) A temperature measuring device is connected to the surface of the PIM.

3) The PIM shall have passed the Format and Layout tests in subclause 4.3.1.1.

Test procedure:

a) the temperature of the PIM is set to +25°C;

b) the CAD simulator resets the PIM;

c) the CAD simulator performs the PIM initialization procedure, as defined in ETS 300 477 [1], subclause 11.2.1;

d) the temperature of the PIM is reduced to -25°C;

e) steps b) and c) are repeated;

f) the temperature of the PIM is increased to +70°C;

g) steps b) and c) are repeated;

h) the temperature of the PIM is increased to +85°C;

i) steps b) and c) are repeated for a period of 4 hours;

j) the temperature of the PIM is reduced to +25°C;

k) steps h), i) and j) are repeated a further 99 times;

l) carry out the tests in subclause 4.3.1.1 again.

4.3.1.2.5   Test requirement

1) The PIM shall operate successfully during steps c), e), g), i) and k).

2) After step l), the PIM shall have satisfied the Test requirements within subclause 4.3.1.1.

4.3.1.3   Contacts

4.3.1.3.1   Definition and applicability

The shape, robustness and provision of contacts shall be adhered to, in order to maintain good electrical contact with the CAD, ensuring proper operation in the UPT environment.

4.3.1.3.2   Conformance requirement

1) Contact C4 shall be provided (optional).

2) Contact C6 shall not be bonded in the PIM.

3) Contact C8 shall be provided (optional).

4) The contact force shall not be greater than 0,5 N per contact.

Reference: ETS 300 477 [1], subclause 4.3.1 and 4.3.3.

Test Group Reference (TGR): TGR_PIM_PHY_CNT.

Test Procedure Reference (TPR): TPR_PIM_PHY_CNT.

4.3.1.3.3   Test purpose

To verify that the PIM conforms to the above requirements.

NOTE: As the contacts specified in CR1 and CR3 are optional, the tests specified here shall only be performed on those contacts when the contacts are present.

4.3.1.3.4   Method of test

Initial conditions:

1) The PIM shall have passed the contacts tests in subclause 4.3.1.1.

Test procedure

a) the bonding of contact C6 is examined;

b) a precision force-inducing contacting device is used to apply a maximum pressure of 0,5 N per contact to the PIM;

c) the PIM is connected to a CAD simulator;

d) the CAD simulator resets the PIM.

4.3.1.3.5   Test requirement

1) After step a), it shall have been observed that contact C6 is bonded only to supply Vpp.

2) After step e), the PIM shall have been reset successfully.

4.3.2   Electronic signals and transmission protocols

The tests in this subclause ensure that the IUT conforms to the electrical specification for each of the contacts and also the protocol.

4.3.2.1   Supply voltage Vcc (contact C1)

4.3.2.1.1   Voltage limits

4.3.2.1.1.1   Definition and applicability

In addition to the electronic signals and transmission protocols defined in ISO/IEC 7816-3 [4], the PIM shall operate within the following supply voltage conditions to ensure proper operation in the UPT environment.

This test applies to all PIM implementations with 5 V interface.

4.3.2.1.1.2   Conformance requirement

1) The PIM shall operate when the supply voltage on contact C1 (Vcc) is in the range 4,5 V and 5,5 V.

Reference: ETS 300 477 [1], subclause 5.1.

Test Group Reference (TGR): TGR_PIM_ELEC_VCC.

Test Procedure Reference (TPR): TPR_PIM_ELEC_VCC_V.

4.3.2.1.1.3   Test purpose

To verify that the PIM conforms to the above requirements.

4.3.2.1.1.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

2) The CHV value is 4 zeroes.

Test procedure:

a) the voltage source for contact C1 (Vcc) is set to 4,5 V;

b) the CAD simulator resets the PIM;

c) the CAD simulator sends an UPDATE CHV command to the PIM with new CHV value of 8 zeroes;

d) the CAD simulator sends an UPDATE CHV command to the PIM to return the CHV to its original value;

e) the voltage source for contact C1 (Vcc) is set to 5,5 V;

f) the CAD simulator resets the PIM;

g) the CAD simulator sends an UPDATE CHV command to the PIM with new CHV value of 8 zeroes;

h) the CAD simulator sends an UPDATE CHV command to the PIM to return the CHV to its original value.

4.3.2.1.1.5   Test requirement

1) After step b), the PIM shall send the correct ATR sequence.

2) After step f), the PIM shall send the correct ATR sequence.

4.3.2.1.2   Current limits

4.3.2.1.2.1   Definition and applicability

In addition to the electronic signals and transmission protocols defined in ISO/IEC 7816-3 [4], the current consumption shall not exceed the specified limit under normal operating conditions to ensure proper operation in the UPT environment.

This test applies to all PIM implementations with 5 V interface.

4.3.2.1.2.2   Conformance requirement

1) The current consumption of the PIM shall not exceed 10 mA at any frequency accepted by the PIM.

Reference: ETS 300 477 [1], subclause 5.1.

Test Group Reference (TGR): TGR_PIM_ELEC_VCC.

Test Procedure Reference (TPR): TPR_PIM_ELEC_VCC_I.

4.3.2.1.2.3   Test purpose

To verify that the PIM conforms to the above requirements.

4.3.2.1.2.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

2) A current measuring device is connected to the PIM.

3) The CHV value is 4 zeroes.

Test procedure:

a) the frequency of the clock source is set to 1 MHz;

b) the CAD simulator resets the PIM;

c) the CAD simulator performs the PIM initialization procedure during which time the current consumption is measured;

d) the CAD simulator sends an UPDATE CHV command to the PIM with new CHV value of 8 zeroes;

e) the CAD simulator sends an UPDATE CHV command to the PIM to return the CHV to its original value;

f) the frequency of the clock source is set to 3 MHz;

g) the CAD simulator resets the PIM;

h) the CAD simulator performs the PIM initialization procedure during which time the current consumption is measured;

i) the CAD simulator sends an UPDATE CHV command to the PIM with new CHV value of 8 zeroes;

j) the CAD simulator sends an UPDATE CHV command to the PIM to return the CHV to its original value;

k) the frequency of the clock source is set to 5 MHz;

l) the CAD simulator resets the PIM;

m) the CAD simulator performs the PIM initialization procedure during which time the current consumption is measured;

n) the CAD simulator sends an UPDATE CHV command to the PIM with new CHV value of 8 zeroes;

o) the CAD simulator sends an UPDATE CHV command to the PIM to return the CHV to its original value.

4.3.2.1.2.5   Test requirement

1) During steps b), c), d, e), g), h), i), j), l), m), n) and o), the current consumption of the PIM shall not have exceeded 10 mA, excluding spikes up to a maximum charge of 40 nAs with no more than 400 nS duration and an amplitude of at most 200 mA.

4.3.2.1.3   Idle current limits

4.3.2.1.3.1   Definition and applicability

In addition to the electronic signals and transmission protocols defined in ISO/IEC 7816-3 [4], the current consumption shall not exceed the specified limit under idle conditions to ensure proper operation in the UPT environment.

This test applies to all PIM implementations with 5 V interface.

4.3.2.1.3.2   Conformance requirement

1) The idle current consumption of the PIM shall not exceed 200 µA at 1 MHz and +25°C.

Reference: ETS 300 477 [1], subclause 5.1.

Test Group Reference (TGR): TGR_PIM_ELEC_VCC.

Test Procedure Reference (TPR): TPR_PIM_ELEC_VCC_IDLE.

4.3.2.1.3.3   Test purpose

To verify that the PIM conforms to the above requirements.

4.3.2.1.3.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

2) The frequency of the clock source is set to 1 MHz.

3) The temperature of the PIM is +25°C.

Test procedure:

a) the CAD simulator resets the PIM;

b) the idle current consumption is measured over a period of 10 seconds.

4.3.2.1.3.5   Test requirement

1) During step b), the current consumption of the PIM shall not exceed 200 µA.

4.3.2.2   Reset RST (contact C2)

4.3.2.2.1   Static operation

4.3.2.2.1.1   Definition and applicability

In addition to the electronic signals and transmission protocols defined in ISO/IEC 7816-3 [4], the PIM shall operate within the following limits regarding the reset RST signal to ensure proper operation in the UPT environment.

This test applies to all PIM implementations with 5 V interface.

4.3.2.2.1.2   Conformance requirement

1) The PIM shall operate within the following limits for RST:

   - V_{OH} between Vcc - 0,7 V and Vcc for I_{OHmax} of +20 µA;

   - V_{OL} between 0 V and 0,6 V for I_{OLmax} of -200 µA;

   - t_R and t_F not exceeding 400 µS, with C_{out} and C_{in} equal to 30 pF.

Reference: ETS 300 477 [1], subclause 5.2.

Test Group Reference (TGR): TGR_PIM_ELEC_RST.

Test Procedure Reference (TPR): TPR_PIM_ELEC_RST_ST.

4.3.2.2.1.3   Test purpose

To verify that the PIM conforms to the above requirements.

4.3.2.2.1.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

2) A current measuring device is connected to RST (contact C2) of the PIM.

3) The capacitance, C_{out} and C_{in}, of RST (contact C2) is measured to be 30 pF.

Test procedure:

a) the following parameters are set for RST:

    - V_{OH} of the RST signal is set to Vcc - 0,7 V,

    - V_{OL} of the RST signal is set to 0 V,

    - t_R and t_F are set to 400 µS;

b) the CAD simulator resets the PIM;

c) the following parameters are set for RST:

    - V_{OH} of the RST signal is set to Vcc,

    - V_{OL} of the RST signal is set to 0,6 V,

    - t_R and t_F are set to 400 µS;

d) the CAD simulator resets the PIM.

4.3.2.2.1.5   Test requirement

1) After steps b) and d), the following shall be true:

    - I_{OHmax} is measured to be less than or equal to +20 µA;

    - I_{OLmax} is measured to be less than or equal to -200 µA.

4.3.2.2.2   Dynamic operation

4.3.2.2.2.1   Definition and applicability

In addition to the electronic signals and transmission protocols defined in ISO/IEC 7816-3 [4], the PIM shall operate within the following limits regarding the reset RST signal to ensure proper operation in the UPT environment.

This test applies to all PIM implementations with 5 V interface.

4.3.2.2.2.2   Conformance requirement

1) The voltage on RST shall remain between -0,3 V and Vcc + 0,3 V during dynamic operation.

Reference: ETS 300 477 [1], subclause 5.2.

Test Group Reference (TGR): TGR_PIM_ELEC_RST.

Test Procedure Reference (TPR): TPR_PIM_ELEC_RST_DY.

4.3.2.2.2.3   Test purpose

To verify that the PIM conforms to the above requirements.

4.3.2.2.2.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

2) The following parameters are set for signal RST:

   - V_{OH} of the RST signal is set to Vcc;

   - V_{OL} of the RST signal is set to 0,0 V;

   - t_R and t_F are set to 400 μS;

   - set the overshoot voltage to be Vcc +0,3 V;

   - set the undershoot voltage to be -0,3 V.

Test procedure:

a) The CAD simulator resets the PIM.

4.3.2.2.2.5   Test requirement

1) After step a), the PIM shall send the correct ATR.

4.3.2.3   Clock CLK (contact C3)

4.3.2.3.1   Frequency and duty cycle

4.3.2.3.1.1   Definition and applicability

In addition to the electronic signals and transmission protocols defined in ISO/IEC 7816-3 [4], the PIM shall operate within the following limits regarding the reset RST signal to ensure proper operation in the UPT environment.

This test applies to all PIM implementations with 5 V interface.

4.3.2.3.1.2   Conformance requirement

1) The PIM shall support clock frequencies between 1 MHz and 5 MHz.

2) The PIM shall **not** support an internal clock.

3) The PIM shall support a duty cycle between 40 % and 60 % of the period during stable operation.

Reference: ETS 300 477 [1], subclause 5.4.

Test Group Reference (TGR): TGR_PIM_ELEC_CLK.

Test Procedure Reference (TPR): TPR_PIM_ELEC_CLK_FREQ.

4.3.2.3.1.3   Test purpose

To verify that the PIM conforms to the above requirements.

4.3.2.3.1.4 Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

Test procedure:

a) the frequency of the clock source is set to 1 MHz;

b) the duty cycle of the clock source is set to 40 % high;

c) the CAD simulator resets the PIM;

d) the duty cycle of the clock source is set to 60 % high;

e) the CAD simulator resets the PIM;

f) the frequency of the clock source is set to 5 MHz;

g) the duty cycle of the clock source is set to 40 % high;

h) the CAD simulator resets the PIM;

i) the duty cycle of the clock source is set to 60 % high;

j) the CAD simulator resets the PIM.

4.3.2.3.1.5 Test requirement

1) After steps c), e), h) and j), the PIM shall send the correct ATR sequence.

2) The PIM shall not support an internal clock.

4.3.2.3.2 Voltage and current

4.3.2.3.2.1 Definition and applicability

In addition to the electronic signals and transmission protocols defined in ISO/IEC 7816-3 [4], the PIM shall operate within the following limits regarding the clock CLK signal to ensure proper operation in the UPT environment.

This test applies to all PIM implementations with 5 V interface.

4.3.2.3.2.2 Conformance requirement

1) The PIM shall operate within the following limits for CLK:

- V_{OH} between Vcc - 0,7 V and Vcc for I_{OHmax} of +20 μA;

- V_{OL} between 0 V and 0,5 V for I_{OLmax} of -200 μA;

- t_R and t_F not exceeding 9 % of the clock period (0,5 μS max.), with C_{out} and C_{in} equal to 30 pF.

Reference: ETS 300 477 [1], subclause 5.4.

Test Group Reference (TGR): TGR_PIM_ELEC_CLK.

Test Procedure Reference (TPR): TPR_PIM_ELEC_CLK_VI.

4.3.2.3.2.3 Test purpose

To verify that the PIM conforms to the above requirements.

4.3.2.3.2.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

2) A current measuring device is connected to CLK (contact C3) of the PIM.

3) The capacitance, C_{out} and C_{in}, of CLK (contact C3) is measured to be 30 pF.

Test procedure:

a) the clock signal is set to 1 MHz;

b) the following parameters are set for CLK:

- V_{OH} at Vcc - 0,7 V;

- V_{OL} at 0 V;

c) the CAD simulator resets the PIM;

d) the following parameters are set for CLK:

- V_{OH} at Vcc - 0,7 V;

- V_{OL} at 0,5 V;

e) the CAD simulator resets the PIM;

f) the following parameters are set for CLK:

- V_{OH} at Vcc;

- V_{OL} at 0 V;

g) the CAD simulator resets the PIM;

h) the following parameters are set for CLK:

- V_{OH} at Vcc;

- V_{OL} at 0,5 V;

i) the CAD simulator resets the PIM;

j) the clock signal is set to 5 MHz;

k) the following parameters are set for CLK:

- V_{OH} at Vcc - 0,7 V;

- V_{OL} at 0 V;

l) the CAD simulator resets the PIM;

m) the following parameters are set for CLK:

- V_{OH} at Vcc - 0,7 V;

- V_{OL} at 0,5 V;

n) the CAD simulator resets the PIM;

o) the following parameters are set for CLK:

- V_{OH} at Vcc;

- V_{OL} at 0 V;

p) the CAD simulator resets the PIM;

q) the following parameters are set for CLK:

- V_{OH} at Vcc;

- V_{OL} at 0,5 V;

r) the CAD simulator resets the PIM.

4.3.2.3.2.5   Test requirement

1) After steps c), e), g), i), l), n), p) and r) the following shall be true:

- I_{OHmax} is measured to be less than or equal to +20 μA;

- I_{OLmax} is measured to be less than or equal to -200 μA;

- t_R and t_F is measured and shall not exceed 9 % of the clock period (0,5 μS max.), with C_{out} and C_{in} equal to 30 pF.

4.3.2.3.3   Dynamic operation

4.3.2.3.3.1   Definition and applicability

In addition to the electronic signals and transmission protocols defined in ISO/IEC 7816-3 [4], the PIM shall operate within the following limits regarding the clock CLK signal to ensure proper operation in the UPT environment.

This test applies to all PIM implementations with 5 V interface.

4.3.2.3.3.2   Conformance requirement

1) The voltage on CLK shall remain between -0,3 V and Vcc + 0,3 V during dynamic operation.

Reference: ETS 300 477 [1], subclause 5.4.

Test Group Reference (TGR): TGR_PIM_ELEC_CLK.

Test Procedure Reference (TPR): TPR_PIM_ELEC_CLK_DY.

4.3.2.3.3.3   Test purpose

To verify that the PIM conforms to the above requirements.

4.3.2.3.3.4   Method of test

Initial conditions

1) The PIM is connected to a CAD simulator.

2) The following parameters are set for signal CLK:

   - V_{OH} of the RST signal is set to Vcc;

   - V_{OL} of the RST signal is set to 0,0 V;

   - t_R and t_F are set to 400 μS;

   - set the overshoot voltage to be Vcc +0,3 V;

   - set the undershoot voltage to be -0,3 V.

Test procedure

a) The CAD simulator resets the PIM.

4.3.2.3.3.5   Test requirement

1) During step a), the PIM shall send the correct ATR sequence.

4.3.2.4   I/O (contact C7)

4.3.2.4.1   Voltage and current

4.3.2.4.1.1   Definition and applicability

In addition to the electronic signals and transmission protocols defined in ISO/IEC 7816-3 [4], the PIM shall operate within the following limits regarding the I/O signal to ensure proper operation in the UPT environment.

This test applies to all PIM implementations with 5 V interface.

4.3.2.4.1.2   Conformance requirement

1) The PIM shall operate within the following limits for I/O:

   - V_{IH} between 0,7 x Vcc and Vcc + 0,3 V for I_{IHmax} of +20 μA;

   - V_{IL} between -0,3 V and 0,8 V for I_{ILmax} of +1 mA;

   - V_{OH} between 3,8 V and Vcc for I_{OHmax} of +20 μA;

   - V_{OL} between 0 V and 0,4 V for I_{OLmax} of -1 mA;

   - t_R and t_F not exceeding 1 μS, with C_{out} and C_{in} equal to 30 pF.

Reference: ETS 300 477 [1], subclause 5.5.

Test Group Reference (TGR): TGR_PIM_ELEC_IO.

Test Procedure Reference (TPR): TPR_PIM_ELEC_IO_VI.

4.3.2.4.1.3   Test purpose

To verify that the PIM conforms to the above requirements.

4.3.2.4.1.4   Method of test

Initial conditions:

   1) The PIM is connected to a CAD simulator.

   2) A current measuring device is connected to I/O (contact C7) of the PIM.

   3) The capacitance, C_{out} and C_{in}, of I/O (contact C7) is measured to be 30 pF.

Test procedure:

   a) V_{OH} and V_{OL} on the CAD simulator are set to the minimum ranges allowed by the PIM (V_{IH} and V_{IL});

   b) the CAD simulator resets the PIM;

   c) the CAD simulator sends a SELECT command to the PIM;

   d) V_{OH} and V_{OL} on the CAD simulator are set to the maximum ranges allowed by the PIM (V_{IH} and V_{IL});

   e) the CAD simulator resets the PIM;

   f) the CAD simulator sends a SELECT command to the PIM.

4.3.2.4.1.5   Test requirement

   1) During steps b), c), e) and f), the PIM conforms to the above requirements.

4.3.2.4.2   Dynamic operation

4.3.2.4.2.1   Definition and applicability

In addition to the electronic signals and transmission protocols defined in ISO/IEC 7816-3 [4], the PIM shall operate within the following limits regarding the I/O signal to ensure proper operation in the UPT environment.

This test applies to all PIM implementations with 5 V interface.

4.3.2.4.2.2   Conformance requirement

   1) The voltage on I/O shall remain between -0,3 V and Vcc + 0,3 V during dynamic operation.

Reference: ETS 300 477 [1], subclause 5.5.

Test Group Reference (TGR): TGR_PIM_ELEC_IO.

Test Procedure Reference (TPR): TPR_PIM_ELEC_IO_DY.

4.3.2.4.2.3   Test purpose

To verify that the PIM conforms to the above requirements.

4.3.2.4.2.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

2) The following parameters are set for signal I/O:

  - V_{OH} of the I/O signal is set to Vcc;

  - V_{OL} of the I/O signal is set to 0,0 V;

  - t_R and t_F are set to 1 µS;

  - set the overshoot voltage to be Vcc +0,3 V;

  - set the undershoot voltage to be -0,3 V.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator sends a SELECT command to the PIM.

4.3.2.4.2.5   Test requirement

1) After step a), the PIM shall send the correct ATR.

4.3.2.5   States

4.3.2.5.1   Definition and applicability

There are two states for the while the power supply is on, operating state when the PIM is executing a command, and idle state at any other time.

This test applies to both plug-in and ID-1 UPT cards.

4.3.2.5.2   Conformance requirement

1) The PIM shall support exactly one of these items:

  - clock stop allowed, no preferred level;

  - clock stop allowed, high level preferred;

  - clock stop allowed, low level preferred;

  - clock stop not allowed;

  - clock stop only allowed on high level;

  - clock stop only allowed on low level.

2) When the PIM is in idle state, all pertinent data shall be retained.

Reference: ETS 300 477 [1], subclauses 5.6 and 10.2.2.

Test Group Reference (TGR): TGR_PIM_ELEC_STAT.

Test Procedure Reference (TPR): TPR_PIM_ELEC_STAT.

4.3.2.5.3   Test purpose

To verify that the PIM conforms to the above requirements.

4.3.2.5.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator sends a SELECT command to the PIM to select EF_{ICC};

c) the CAD simulator sends a READ BINARY command using a length of 1 byte to the PIM;

d) the CAD simulator sends a SELECT command to the PIM to select EF_{ICC};

e) the CAD simulator stops the clock according to the clock stop mode read in step c);

f) the CAD simulator pauses for 10 seconds, then starts the clock;

g) the CAD simulator sends a GET RESPONSE command to the PIM.

4.3.2.5.5   Test requirement

1) After step c), the coding of bits 1, 2 and 3 shall be one of the following only:

Bit 3	Bit 2	Bit 1	Clock stop mode
1	0	0	Clock stop allowed, no preferred level
1	1	0	Clock stop allowed, high level preferred
1	0	1	Clock stop allowed, low level preferred
0	0	0	Clock stop not allowed
0	1	0	Clock stop only allowed on high level
0	0	1	Clock stop only allowed on low level

2) After step g), the response data read shall be that indicating EF_{ICC}.

4.3.2.6   Answer To Reset (ATR)

4.3.2.6.1   ATR content

4.3.2.6.1.1   Definition and applicability

The ATR is information presented by the PIM to the CAD at the beginning of the card session and gives operational requirements.

This test applies to both plug-in and ID-1 UPT cards.

4.3.2.6.1.2   Conformance requirement

1) The ATR consists of at the most 33 characters.

2) Initial character TS is sent by the PIM.

3) Format character T0 is sent by the PIM.

4) Interface character (global) TA1 is sent by the PIM (optional).

5) Interface character (global) TB1 is sent by the PIM (optional).

6) Interface character (global) TC1 is sent by the PIM (optional).

7) Interface character TD1 is sent by the PIM (optional).

8) Interface character (specific) TA2 is sent by the PIM (optional).

9) Interface character (global) TB2 is **never** sent by the PIM.

10) Interface character (specific) TC2 is sent by the PIM (optional).

11) Interface character TDi is sent by the PIM (optional).

12) Interface characters TAi, TBi, TCi (i > 2) are sent by the PIM (optional).

13) Historical characters T1, ... ,TK are sent by the PIM (optional).

14) Check character TCK is sent by the PIM (conditional).

Reference: ETS 300 477 [1], subclauses 5.8.1 and 5.8.2.

Test Group Reference (TGR): TGR_PIM_ELEC_ATR.

Test Procedure Reference (TPR): TPR_PIM_ELEC_ATR_CON.

4.3.2.6.1.3   Test purpose

To verify that the PIM conforms to the above requirements.

4.3.2.6.1.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

Test procedure:

a) The CAD simulator resets the PIM.

4.3.2.6.1.5   Test requirement

1) After step a), the PIM shall send the ATR sequence.

2) The total length of the ATR sequence shall not be more than 33 characters.

3) The following characters shall be present and in the following order:

   - initial character TS;

   - format character T0;

   - interface character (global) TA1, if its presence is indicated by T0;

   - interface character (global) TB1, if its presence is indicated by T0;

   - interface character (global) TC1, if its presence is indicated by T0;

   - interface character TD1, if its presence is indicated by T0;

   - interface character (specific) TA2, if its presence is indicated by TD1;

   - interface character (specific) TC2, if its presence is indicated by TD1;

   - interface character TDi, if its presence is indicated by TD(i-1, i > 1);

   - interface characters TAi, TBi, TCi if their presence is indicated by TD(i-1, i > 2);

   - historical characters T1, ... ,TK, if their presence is indicated by T0;

   - check character TCK, if an additional protocol tyCAD to T = 0 is indicated by TD1.

4) PI1 shall equal 0 if TB1 is sent.

5) TC1 shall be either 0 or 255, if sent.

6) The PIM shall never send interface character (global) TB2.

4.3.2.6.2   PTS procedure

4.3.2.6.2.1   Definition and applicability

The ATR indicates which protocols are available for use during a session. The PTS procedure allows one of the available protocol types to be selected.

This test applies to both plug-in and ID-1 UPT cards.

4.3.2.6.2.2   Conformance requirement

1) The PIM shall respond to a PTS-Request from the CAD with a PTS-Response.

Reference: ETS 300 477 [1], subclauses 5.8.1 and 5.8.2.

Test Group Reference (TGR): TGR_PIM_ELEC_ATR.

Test Procedure Reference (TPR): TPR_PIM_ELEC_ATR_PTS.

4.3.2.6.2.3   Test purpose

To verify that the PIM conforms to the above requirements.

4.3.2.6.2.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

Test Procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator sends a PTS-Request to the PIM, selecting T = 0 protocol.

4.3.2.6.2.5   Test requirement

1) After step a), the PIM shall send the correct ATR sequence.

2) After step b), the PIM shall send a valid PTS-Response.

4.3.2.7   Major Capabilities

4.3.2.7.1   Definition and applicability

The PIM shall adhere to the electronic signals and transmission protocols defined in ETS 300 477 [1] and ISO/IEC 7816-3 [4] to ensure proper operation in the UPT environment.

This test applies to both plug-in and ID-1 UPT cards.

4.3.2.7.2   Conformance requirement

1) Electronic signals and transmission protocols shall be in accordance with ISO/IEC 7816-3 [4] unless otherwise specified.

2) The choice of the transmission protocol(s), to be used to communicate between the CAD and the PIM, shall at least include that specified and denoted by T = 0 in ISO/IEC 7816-3 [4].

3) The baud rate for all communications shall be: (clock frequency) / 372.

4) Error detection and character repetition is mandatory for the PIM for all communications.

Reference: ETS 300 477 [1], clause 5, subclauses 5.7, and 5.9.

Test Group Reference (TGR): TGR_PIM_ELEC_MAJOR.

Test Procedure Reference (TPR): TPR_PIM_ELEC_MAJOR.

4.3.2.7.3   Test purpose

To verify that the PIM conforms to the above requirements.

> NOTE: The testing of CR1, CR2, CR3, CR4 is outside the scope of the present document. Please refer to the test
> specification for ISO/IEC 7816-3 [4].

4.3.2.7.4   Method of test

Initial conditions

N/A.

Test procedure

N/A.

4.3.2.7.5   Test requirement

N/A.

4.3.3   Logical model

The tests in this subclause ensure that the IUT is tested against the specification of the logical structure, for a PIM, the
code associated with it, and the structure of the files used.

4.3.3.1   File identifier

4.3.3.1.1   File-type identification

4.3.3.1.1.1   Definition and applicability

A file identifier is used to address or identify each specific file.

This test applies to both plug-in and ID-1 UPT cards.

4.3.3.1.1.2   Conformance requirement

1) For UPT, the Master File shall be coded as '3F 00'.

2) For UPT, file type '7F' shall be used to identify Dedicated Files.

3) For UPT, file types '00', '01' and '2F' shall be used to identify Elementary Files under the MF.

4) For UPT, file type '6F' shall be used to identify Elementary Files under a Dedicated File.

Reference: ETS 300 477 [1], subclause 6.2.

Test Group Reference (TGR): TGR_PIM_LOG_FID.

Test Procedure Reference (TPR): TPR_PIM_LOG_FID_FTI.

4.3.3.1.1.3 Test purpose

To verify that the PIM conforms to the above requirements.

4.3.3.1.1.4 Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

Test procedure:

a) the CAD simulator resets the PIM;

b) for every possible file ID in the file structure for the UPT application, the CAD simulator sends SELECT commands to the PIM to select the file ID and, if selected successfully, the CAD simulator sends a GET RESPONSE command to the PIM.

4.3.3.1.1.5 Test requirement

After each successful SELECT and GET RESPONSE in step b), byte 7 of the response data shall conform to the following table.

File ID	Type of File
'3F 00'	'01'
'7F XX'	'02'
'00 XX'	'04'
'01 XX'	'04'
'2F XX'	'04'
'6F XX'	'04'

4.3.3.1.2 File ID assignments

4.3.3.1.2.1 Definition and applicability

A file identifier is used to address or identify each specific file. There are a number of rules regarding file ID assignment.

This test applies to both plug-in and ID-1 UPT cards.

4.3.3.1.2.2 Conformance requirement

1) A file ID is assigned at the time of creation of the file concerned.

2) Two files under the same parent shall never have the same ID.

3) A child and its parent shall never have the same ID.

4) A child and its grandparent shall never have the same file ID.

5) A child and its grandparent's child (if it is a DF) shall never have the same file ID.

Reference: ETS 300 477 [1], subclause 6.2.

Test Group Reference (TGR): TGR_PIM_LOG_FID.

Test Procedure Reference (TPR): TPR_PIM_LOG_FID_FIA.

4.3.3.1.2.3   Test purpose

To verify that all files within the PIM structure conform to the above requirements.

NOTE 1:   CR1 cannot be tested as the SELECT function requires the file ID in order to select files.

NOTE 2:   CR2, CR3, CR4 and CR5 cannot be tested due to the operation of the SELECT function which can only ever select a single file for a given file ID.

4.3.3.1.2.4   Method of test

Initial conditions

N/A.

Test procedure

N/A.

4.3.3.1.2.5   Test requirement

N/A.

4.3.3.2   Dedicated files

4.3.3.2.1   Definition and applicability

Dedicated files provide a functional grouping of both Elementary and Dedicated Files. In this way a structured hierarchy of files can be established on the PIM.

This test applies to both plug-in and ID-1 UPT cards.

4.3.3.2.2   Conformance requirement

The identifier for and the path to DF_{UPT} and $DF_{TELECOM}$ (optional) shall be given in the Elementary File EF_{DIR}.

Reference: ETS 300 477 [1], subclause 6.4.

Test Group Reference (TGR): TGR_PIM_LOG_DF.

Test Procedure Reference (TPR): TPR_PIM_LOG_DF.

4.3.3.2.3   Test purpose

To verify that the Dedicated Files within the PIM file structure conform to the above requirements.

4.3.3.2.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator sends a SELECT command to the PIM to select EF_{DIR};

c) the CAD simulator gains the correct ADM access conditions to read EF_{DIR} (if necessary);

d) the CAD simulator sends a READ BINARY command to the PIM;

e) the CAD simulator sends as many SELECT commands as are required to select the DF_{UPT} by file ID as given in EF_{DIR};

f) the CAD simulator sends a SELECT command to select the masterfile;

g) the CAD simulator sends as many SELECT commands as are required to select the $DF_{TELECOM}$ by file ID as given in EF_{DIR}.

4.3.3.2.5 Test requirement

After step e) and g) the status condition returned by the PIM shall be SW1 = '9F', SW2 = 'XX' - length 'XX' of the response data.

4.3.3.3 Elementary files

4.3.3.3.1 Definition and applicability

Elementary Files structure the way in which information is held on the PIM and provide security on how this information is accessed.

This test applies to both plug-in and ID-1 UPT cards.

4.3.3.3.2 Conformance requirement

1) The total data length of the body of an EF with transparent structure shall be indicated in the header of the EF.

2) The record length of an EF with linear fixed structure shall be indicated in the header of the EF.

3) The record length multiplied by the number of records of an EF with linear fixed structure shall be indicated in the header of the EF.

4) For an EF with cyclic structure, when all the records have been used for storage, then the next storage of data shall overwrite the oldest information.

5) The record length of an EF with cyclic structure shall be indicated in the header of the EF.

6) The record length multiplied by the number of records of an EF with cyclic structure shall be indicated in the header of the EF.

7) The PIM shall be able to access records within a linear fixed EF using all of the methods given in subclause 6.5.2 of ETS 300 477 [1].

8) The PIM shall be able to access records within a cyclic EF using all of the methods given in subclause 6.5.3 of ETS 300 477 [1].

Reference: ETS 300 477 [1], subclauses 6.5.1, 6.5.2 and 6.5.3.

Test Group Reference (TGR): TGR_PIM_LOG_EF.

Test Procedure Reference (TPR): TPR_PIM_LOG_EF.

4.3.3.3.3 Test purpose

To verify that the EFs within the PIM file structure conform to the above requirements.

NOTE 1: CR4, CR5, CR6 and CR8 cannot be tested if there is no EF_{LND} within the PIM structure.

NOTE 2: CR2, CR3 and CR7 cannot be tested if there are no linear fixed EFs within the PIM structure.

NOTE 3: CR7, CR8 are tested in subclauses 4.3.5.4 and 4.3.5.5.

4.3.3.3.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

Test procedure:

a) the CAD simulator resets the PIM;

b) for all EFs in the file structure on the PIM, the CAD simulator sends SELECT commands to the PIM to select each EF in sequence;

c) for all EFs successfully selected, the CAD simulator sends a GET RESPONSE command to the PIM;

d) for all transparent EFs, the CAD simulator sends a READ BINARY command to the PIM. The length used shall be that of bytes 3 and 4 of the response data in step c);

e) for all transparent EFs, the CAD simulator sends a READ BINARY command with offset '00 01' to the PIM. The length used shall be that of bytes 3 and 4 of the response data in step c);

f) for all linear fixed EFs, the CAD simulator sends a READ RECORD using FIRST mode to the PIM. The length used shall be that of byte 15 of the response data in step c);

g) for all linear fixed EFs, the CAD simulator sends a READ RECORD using ABSOLUTE mode to the PIM. The record length used shall be that of byte 15 of the response data in step c) and the record number shall be that of bytes 3 and 4 of the response data in step c) divided by the record length;

h) for all linear fixed EFs, the CAD simulator sends a READ RECORD using ABSOLUTE mode to the PIM. The record length used shall be that of byte 15 of the response data in step c) and the record number shall be that of bytes 3 and 4 of the response data in step c) divided by the record length, plus 1;

i) for all cyclic EFs, the CAD simulator sends a UPDATE RECORD to the PIM. The record length used shall be that of byte 15 of the response data in step c) and the record number shall be that of bytes 3 and 4 of the response data in step c) divided by the record length, plus 1. The content of the first record shall be '0...01', the second '0...02' and so on;

j) for all cyclic EFs, the CAD simulator sends a READ RECORD using RECORD NUMBER to the PIM. The record length used shall be that of byte 15 of the response data in step c) and the record number shall be that of bytes 3 and 4 of the response data in step c) divided by the record length.

4.3.3.3.5   Test requirement

1) After steps e) and h) the status condition returned by the PIM shall be SW1 = '94', SW2 = '02' - out of range (invalid address).

2) After step j) the content of the records returned by the PIM shall be: '0...0m' for the first record, '0...0(m-1)' for the second record, ... and '0...02' for the nth record, in which 'm' is the record length given in byte 15 of the response data in step c) and 'n' is the record given in bytes 3 and 4 of the response data in step c) divided by 'm'.

4.3.3.4   Methods for selecting a file

4.3.3.4.1   Definition and applicability

The CAD accesses information on the PIM navigating around the file structure by selecting DFs and EFs as required. There are a number of rules regarding which file elements may be selected from a given DF or EF.

This test applies to both plug-in and ID-1 UPT cards.

4.3.3.4.2 Conformance requirement

1) selection of a DF or MF shall set the current Directory on the PIM;

2) after a selection of a DF or MF there shall be no current EF;

3) after a selection of an EF, the current EF shall be set to this EF;

4) after a selection of an EF the current Directory shall remain the DF or MF which is the parent of this EF;

5) the current EF shall always be the child of the current Directory;

6) it shall be possible to select any of the "file selections" in the following table for each of the "last selected file" entries. Pay attention that EF_{NAME}, EF_{LANG}, EF_{ID}, EF_{ICC}, EF_{PST}, EF_{MTV}, EF_{ADN}, EF_{LND} and EF_{EXT1} are optional.

current file	valid selections
MF	DF_{UPT}, $DF_{TELECOM}$, EF_{DIR}, EF_{NAME}, EF_{LANG}, EF_{ID}, EF_{ICC}, EF_{CHV1}
DF_{UPT}	MF, $DF_{TELECOM}$, EF_{PUI}, EF_{SEQ}, EF_{PST}, EF_{CT}, EF_{TV}, EF_{MTV}
$DF_{TELECOM}$	MF, DF_{UPT}, EF_{ADN}, EF_{LND}, EF_{EXT1}
EF_{DIR}	MF, DF_{UPT}, $DF_{TELECOM}$, EF_{NAME}, EF_{LANG}, EF_{ID}, EF_{ICC}, EF_{CHV1}
EF_{NAME}	MF, DF_{UPT}, $DF_{TELECOM}$, EF_{DIR}, EF_{LANG}, EF_{ID}, EF_{ICC}, EF_{CHV1}
EF_{LANG}	MF, DF_{UPT}, $DF_{TELECOM}$, EF_{DIR}, EF_{NAME}, EF_{ID}, EF_{ICC}, EF_{CHV1}
EF_{ID}	MF, DF_{UPT}, $DF_{TELECOM}$, EF_{DIR}, EF_{NAME}, EF_{LANG}, EF_{ICC}, EF_{CHV1}
EF_{ICC}	MF, DF_{UPT}, $DF_{TELECOM}$, EF_{DIR}, EF_{NAME}, EF_{LANG}, EF_{ID}, EF_{CHV1}
EF_{CHV1}	MF, DF_{UPT}, $DF_{TELECOM}$, EF_{DIR}, EF_{NAME}, EF_{LANG}, EF_{ID}, EF_{ICC}
EF_{PUI}	MF, DF_{UPT}, $DF_{TELECOM}$, EF_{SEQ}, EF_{PST}, EF_{CT}, EF_{TV}, EF_{MTV}
EF_{SEQ}	MF, DF_{UPT}, $DF_{TELECOM}$, EF_{PUI}, EF_{PST}, EF_{CT}, EF_{TV}, EF_{MTV}
EF_{PST}	MF, DF_{UPT}, $DF_{TELECOM}$, EF_{PUI}, EF_{SEQ}, EF_{CT}, EF_{TV}, EF_{MTV}
EF_{CT}	MF, DF_{UPT}, $DF_{TELECOM}$, EF_{PUI}, EF_{SEQ}, EF_{PST}, EF_{TV}, EF_{MTV}
EF_{TV}	MF, DF_{UPT}, $DF_{TELECOM}$, EF_{PUI}, EF_{SEQ}, EF_{PST}, EF_{CT}, EF_{MTV}
EF_{MTV}	MF, DF_{UPT}, $DF_{TELECOM}$, EF_{PUI}, EF_{SEQ}, EF_{PST}, EF_{CT}, EF_{TV}
EF_{ADN}	MF, DF_{UPT}, $DF_{TELECOM}$, EF_{LND}, EF_{EXT1}
EF_{LND}	MF, DF_{UPT}, $DF_{TELECOM}$, EF_{ADN}, EF_{EXT1}
EF_{EXT1}	MF, DF_{UPT}, $DF_{TELECOM}$, EF_{ADN}, EF_{LND}

Reference: ETS 300 477 [1], subclause 6.6.

Test Group Reference (TGR): TGR_PIM_LOG_SELFILE.

Test Procedure Reference (TPR): TPR_PIM_LOG_SELFILE.

4.3.3.4.3   Test purpose

To verify that the PIM conforms to the above requirements with regard to file selection.

    NOTE: CR4 and CR5 cannot be tested as there is no possibility in these cases to check the current Directory.

4.3.3.4.4   Method of test

Initial conditions:

    1) The PIM is connected to a CAD simulator.

Test procedure:

    a) the CAD simulator resets the PIM;

    b) the CAD simulator selects DF_{UPT} as defined in subclause 4.4;

    c) he CAD simulator sends a GET RESPONSE command to the PIM;

    d) the CAD simulator sends a READ BINARY command using a length of 1 byte to the PIM;

    e) the CAD simulator selects $DF_{TELECOM}$ as defined in subclause 4.4;

    f) the CAD simulator sends a GET RESPONSE command to the PIM;

    g) the CAD simulator sends a READ BINARY command using a length of 1 byte to the PIM;

    h) step i) is carried out for each line in the table, subclause 4.3.3.4.3;

    i) step j) is carried out for each one of the "valid selections" in that line of the table;

    j) steps k) and l) on the one hand and step m) on the other hand are carried out in turn;

    k) the CAD simulator sends SELECT commands to the PIM to select the "last selected file";

    l) the CAD simulator sends a GET RESPONSE command to the PIM;

    m) he CAD simulator sends a SELECT command to the PIM to select the "valid selection".

4.3.3.4.5   Test requirement

    1) After steps d) and g) the status condition returned by the PIM shall be SW1 = '94', SW2 = '00' - no EF selected.

    2) After step c) bytes 5 and 6 of the response data shall indicate that DF_{UPT} is the currently selected directory.

    3) After step f) bytes 5 and 6 of the response data shall indicate that DF_{UPT} is the currently selected directory.

    4) After steps l) the response data shall indicate that the currently selected EF is the one that was tried to select last in step k).

4.3.3.5   Reservation of file IDs

4.3.3.5.1   Definition and applicability

In order to accommodate planned and possible future requirements, certain file IDs are considered reserved, and may not be used in the PIM file structure.

This test applies to both plug-in and ID-1 UPT cards.

4.3.3.5.2   Conformance requirement

1) The following Dedicated File IDs are reserved for use by UPT:

    - '7F 1X';

    - '7F 4X'.

2) The following Elementary File IDs are reserved for use by UPT:

    - '2F XX';

    - '6F XX'.

3) The coding 'FF FF' shall not be used.

Reference: ETS 300 477 [1], subclause 6.7.

Test Group Reference (TGR): TGR_PIM_LOG_RSVD.

Test Procedure Reference (TPR): TPR_PIM_LOG_RSVD.

4.3.3.5.3   Test purpose

To verify that the PIM conforms to the above requirements.

4.3.3.5.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

Test procedure:

a) the CAD simulator resets the PIM;

b) for all possible EFs on the PIM, the CAD simulator sends SELECT commands to the PIM to select each EF in sequence;

c) at every DF level (including MF) within the file structure on the PIM, the CAD simulator sends a SELECT command to the PIM to select the file 'FF FF'.

4.3.3.5.5   Test requirement

1) For all successful selections in step b), the ID of the selected file shall be one of those in clause 10 of ETS 300 477 [1] or shall not be one of those listed as reserved.

2) The status conditions returned by the PIM after step c) shall be SW1 = '94', SW2 = '04' - file ID not found.

4.3.4   Security services and facilities

The tests in this subclause ensure that the IUT conforms with the security aspects which are related to the PIM.

4.3.4.1   Card Holder Verification

4.3.4.1.1   Definition and applicability

It shall be mandatory for all cards complying with ETS 300 477 [1] to support all functions described therein.

This test applies to both plug-in and ID-1 UPT cards.

4.3.4.1.2   Conformance requirement

1) The LPIN can be changed by using the CHANGE CHV command.

2) In case of 3 consecutive false CHV1 the access rights are lossed and the UPT application cannot be accessed.

3) In case of 3 consecutive false CHV1it is not possible to perform a success card holder verification until the CHV1 has been unblocked.

Reference: ETS 300 477 [1], subclause 7.2.1.

Test Group Reference (TGR): TGR_PIM_SEC_CHV.

Test Procedure Reference (TPR): TPR_PIM_ SEC_CHV.

4.3.4.1.3   Test purpose

To verify that the UPT card conforms to the above requirements.

NOTE: CR1 is tested in subclause 4.3.5.8.

4.3.4.1.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

2) CHV1 on the PIM is set to '0000'.

3) Three VERIFY CHV1 attempts and ten UNBLOCK CHV1 attempts remain.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator selects DF_{UPT} as defined in subclause 4.4;

c) the CAD simulator sends a VERIFY CHV command with **incorrect** CHV1 '1111' to the PIM;

d) the CAD simulator sends VERIFY CHV command with **incorrect** CHV1 '1111' to the PIM;

e) the CAD simulator sends VERIFY CHV command with **incorrect** CHV1 '1111' to the PIM;

f) the CAD simulator sends a SELECT command to the PIM to select EF_{CT};

g) the CAD simulator sends a READ BINARY;

h) the CAD simulator sends a SELECT command to the PIM to select EF_{PUI};

i) the CAD simulator sends a READ BINARY;

j) the CAD simulator sends a SELECT command to the PIM to select EF_{SEQ};

k) the CAD simulator sends a READ BINARY;

l) the CAD simulator sends a INTERNAL AUTHENTICATION command to the PIM containing the sequence number;

m) the CAD simulator sends a VERIFY CHV command with correct CHV1 '0000' to the PIM;

n) the CAD simulator sends a SELECT command to the PIM to select EF_{CHV1};

o) the CAD simulator sends an UNBLOCK CHV command to the PIM;

p) the CAD simulator sends a VERIFY CHV command with correct CHV1 '0000' to the PIM.

4.3.4.1.5   Test requirement

1) After step e) the status condition returned by the PIM shall be SW1 = '98', SW2 = '40' - unsuccessful CHV verification, verify CHV mechanism no longer possible.

2) After steps g), i) k) and l) the status condition returned by the PIM shall be SW1 = '98', SW2 = '04' - access condition not fulfilled.

3) After step m) the status condition returned by the PIM shall be SW1 = '98', SW2 = '40' - CHV blocked.

4.3.4.2   Strong authentication

4.3.4.2.1   Definition and applicability

The PIM authenticate itself by the network.

4.3.4.2.2   Conformance requirement

1) The PIM shall work as described in ETS 300 477 [1], subclause 7.2.2.

Reference: ETS 300 477 [1], subclause 7.2.2.

Test Group Reference (TGR): TGR_PIM_SEC_AUT.

Test Procedure Reference (TPR): TPR_ PIM_SEC_AUT.

4.3.4.2.3   Test purpose

To verify that the CAD conform to the above requirements.

    NOTE: CR1 is tested in subclauses 4.3.5.10 and 4.3.4.1.

4.3.4.2.4   Method of test

Initial condition

N/A.

Test procedure

N/A.

4.3.4.2.5   Test requirement

N/A.

4.3.4.3   File access conditions

4.3.4.3.1   ALWAYS, CHV1 and NEVER

4.3.4.3.1.1   Definition and applicability

Every file has its own specific access condition for each command which shall be fulfilled before the command can take place.

This test applies to both plug-in and ID-1 PIM cards.

4.3.4.3.1.2   Conformance requirement

1) For access condition ALWAYS, the command can be performed without any restriction.

2) For access condition CHV1, the command shall only be possible if one of the following three conditions is fulfilled:

   - a correct CHV1 value has already been presented to the PIM during the current session;

   - UNBLOCK CHV1 has been successfully performed during the current session.

3) For access condition NEVER, the command shall not be possible over the PIM interface.

NOTE: Allocation of ADM levels and the respective requirements for their fulfilment are the responsibility of the appropriate administrative authority.

Reference: ETS 300 477 [1], subclause 7.3.

Test Group Reference (TGR): TGR_PIM_SEC_FIAC.

Test Procedure Reference (TPR): TPR_PIM_SEC_FIAC.

4.3.4.3.1.3   Test purpose

To verify that the PIM conforms to the above requirements.

4.3.4.3.1.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

2) Three VERIFY CHV1 attempts remain.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator sends SELECT commands to the PIM to select EF_{DIR};

c) the CAD simulator sends a READ BINARY command to the PIM to read the first 1 byte in EF_{DIR};

d) the CAD simulator sends an UPDATE BINARY command to the PIM to update the byte in EF_{DIR} with the byte read in step c);

e) the CAD simulator sends SELECT commands to the PIM to select DF_{UPT};

f) the CAD simulator sends a SELECT command to the PIM to select EF_{CT};

g) the CAD simulator sends a READ BINARY command to the PIM to read the first byte in EF_{CT};

h) the CAD simulator gains CHV1 security access;

i) the CAD simulator sends a READ BINARY command to the PIM to read the first byte in EF_{CT};

j) the CAD simulator sends an UPDATE BINARY command to the PIM to update the byte in EF_{CT} with the byte read in step i).

4.3.4.3.1.5   Test requirement

1) If the access condition or READ EF_{DIR} is CHV1, then the status condition returned by the PIM after step c) shall be SW1 = '98', SW2 = '04' - access condition not fulfilled.

2) After steps d), g) and j) the status condition returned by the PIM shall be SW1 = '98', SW2 = '04' - access condition not fulfilled.

4.3.4.4 Function access condition

4.3.4.4.1 Definition and applicability

This test applies to both plug-in and ID-1 PIM cards.

4.3.4.4.2 Conformance requirement

1) It shall not be possible, that the INTERNAL AUTHENTICATION command can performed without a previous successful card holder verification.

Reference: ETS 300 477 [1], subclause 7.4.

Test Group Reference (TGR): TGR_PIM_SEC_FUAC.

Test Procedure Reference (TPR): TPR_PIM_SEC_FUAC.

4.3.4.4.3 Test purpose

To verify that the PIM conforms to the above requirements.

NOTE: CR1 is tested in subclauses 4.3.5.10 and 4.3.4.1.

4.3.4.4.4 Method of test

Initial conditions

N/A.

Test procedure

N/A.

4.3.4.4.5 Test requirement

N/A.

4.3.5 Description of the functions

The tests in this subclause ensure that the IUT conforms to the functional specification for all the commands and their respective responses.

4.3.5.1 SELECT function

4.3.5.1.1 Definition and applicability

It shall be mandatory for all cards complying with ETS 300 477 [1] to support all functions described therein.

This test applies to both plug-in and ID-1 UPT cards.

4.3.5.1.2 Conformance requirement

1) The SELECT function shall select a file according to the methods described in clause 6 of ETS 300 477 [1].

2) The function shall accept as an input, a file ID.

3) If the selected file is the MF or a DF, then the function shall output the file ID, total memory space available and CHV1 status. For further details, see subclause 9.3.1.

4) If the selected file is an EF, then the function shall output the file ID, access conditions, structure of EF and the length of the records in the case of linear fixed or cyclic structure. For further details, see subclause 9.3.1.

5) If the selected file is EF$_{CHV}$, the function shall output all the information described for the EF, plus the number of remaining CHV attempts. For further details, see subclause 9.3.1.

6) After a successful selection, the record pointer in a linear fixed file shall be undefined.

Reference: ETS 300 477 [1], subclauses 8.1 and 9.3.1.

Test Group Reference (TGR): TGR_PIM_FN.

Test Procedure Reference (TPR): TPR_PIM_FN_SEL.

4.3.5.1.3   Test purpose

To verify that the SELECT function conforms to the above requirements for the different file types available.

NOTE: CR1 is tested in subclause 4.3.3.4.

4.3.5.1.4   Method of test

Initial conditions:

1) The UPT is connected to a CAD simulator.

2) Three VERIFY CHV1 attempts and ten UNBLOCK CHV1 attempts remain.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator selects DF$_{UPT}$ as defined in subclause 4.4;

c) the CAD simulator selects DF$_{TELECOM}$ as defined in subclause 4.4;

d) the CAD simulator selects the Masterfile;

e) the CAD simulator sends a GET RESPONSE command to the PIM;

f) the CAD simulator sends a VERIFY CHV command with **incorrect** CHV1 to the PIM;

g) the CAD simulator selects DF$_{UPT}$ as defined in subclause 4.4;

h) the CAD simulator selects DF$_{TELECOM}$ as defined in subclause 4.4;

i) the CAD simulator selects the Masterfile;

j) the CAD simulator sends a GET RESPONSE command to the PIM;

k) the CAD simulator selects EF$_{CHV1}$ using the file ID as defined in subclause 4.4;

l) the CAD simulator sends a GET RESPONSE command to the PIM;

m) steps n) and o) are carried out for EF$_{DIR}$, EF$_{NAME}$, EF$_{LANG}$, EF$_{ID}$, EF$_{ICC}$, EF$_{PUI}$, EF$_{SEQ}$, EF$_{PST}$, EF$_{CT}$, EF$_{TV}$ and EF$_{MTV}$;

n) the CAD selects the appropriate EF using file ID considering the methods of selecting a file in subclause 6.6 of ETS 300 477 [1];

o) the CAD simulator sends a GET RESPONSE command to the PIM;

p) steps q), r) and s) are carried out for EF$_{ADN}$ and EF$_{EXT1}$;

q) the CAD selects the appropriate EF using file ID considering the methods of selecting a file in subclause 6.6 of ETS 300 477 [1];

r) the CAD simulator sends a GET RESPONSE command to the PIM;

s) the CAD simulator sends a READ RECORD command using PREVIOUS mode to the PIM;

t) the CAD selects EF$_{LND}$ using file ID considering the methods of selecting a file in subclause 6.6 of
    ETS 300 477 [1];

u) the CAD simulator sends a GET RESPONSE command to the PIM.

4.3.5.1.5   Test requirement

1) After steps b) and g) bytes 5 and 6 of the response data shall indicate that DF$_{UPT}$ is the currently selected file.

2) After steps c) and h) bytes 5 and 6 of the response data shall indicate that DF$_{TELECOM}$ is the currently selected
    file.

3) After steps e) and j) bytes 5 and 6 of the response data shall indicate that MF is the currently selected file.

4) After steps b), c) and e) the following shall be true of the response data:

    -   bits 1 through 4 of byte 19 shall indicate three VERIFY CHV1 attempts remaining;

    -   bits 1 through 4 of byte 20 shall indicate ten UNBLOCK CHV1 attempts remaining.

5) After step g), h) and j) the following shall be true of the response data:

    -   bits 1 through 4 of byte 19 shall indicate two VERIFY CHV1 attempts remaining.

6) After step l) the following shall be true of the response data:

    -   bytes 9 through 11 shall state the access conditions in subclause 10.1 of ETS 300 477 [1];

    -   byte 14 shall be '00' indicating transparent structure;

    -   byte 15 shall indicate two VERIFY CHV1 attempts remaining.

7) After steps o) the following shall be true of the response data:

    -   bytes 5 and 6 shall indicate that the currently selected EF is the one that was tried to select in step n);

    -   bytes 9 through 11 shall state the access conditions in subclauses 10.2 and 10.3 of ETS 300 477 [1];

    -   byte 14 shall be '00' indicating transparent structure;

    -   byte 3 and 4 shall indicate the file size.

8) After steps r) the following shall be true of the response data:

    -   bytes 5 and 6 shall indicate that the currently selected EF is the one that was tried to select in step q);

    -   bytes 9 through 11 shall state the access conditions in subclause 10.4 of ETS 300 477 [1];

    -   byte 14 shall be '01' indicating linear fixed structure;

    -   byte 15 shall indicate the length of the records.

9) After steps s) the response data shall be the same as that of the last record indicating that the current pointer was
    undefined.

10) After step u) the following shall be true of the response data:

    -   bytes 5 and 6 shall indicate that EF$_{LND}$ is the currently selected file;

    -   bytes 9 through 11 shall state the access conditions in subclause 10.4.2 of ETS 300 477 [1];

    -   byte 14 shall be '03' indicating cyclic structure;

    -   byte 15 shall indicate the length of the records.

4.3.5.2   READ BINARY function

4.3.5.2.1   Definition and applicability

It shall be mandatory for all cards complying with ETS 300 477 [1] to support all functions described therein.

This test applies to both plug-in and ID-1 UPT cards.

4.3.5.2.2   Conformance requirement

1) The READ BINARY function shall read a string of bytes from the current transparent EF.

2) The function shall accept as an input, the relative address (offset) and the length (in bytes) of the string.

3) The function shall output the string of bytes.

4) The function shall only be performed if the READ access condition for the current EF is satisfied.

Reference: ETS 300 477 [1], subclauses 8.2 and 9.3.2.

Test Group Reference (TGR): TGR_PIM_FN.

Test Procedure Reference (TPR): TPR_PIM_FN_RDBIN.

4.3.5.2.3   Test purpose

To verify that the READ BINARY function conforms to the above requirements.

4.3.5.2.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

2) EF_{PUI} contains the data string: '05 12 34 5F '.

3) CHV1 is enabled.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator sends SELECT commands to the PIM to select EF_{PUI} under DF_{UPT};

c) the CAD simulator sends a READ BINARY command using a length of 2 bytes to the PIM;

d) the CAD simulator sends a VERIFY CHV command to the PIM;

e) the CAD simulator sends a READ BINARY command using a length of 2 bytes to the PIM;

f) the CAD simulator sends a READ BINARY command using a length of 1 byte to the PIM;

g) the CAD simulator sends a READ BINARY command using an offset of '00 01' and length 1 byte to the PIM;

h) the CAD simulator sends a READ BINARY command using an offset of '00 01' and length 7 byte to the PIM;

i) the CAD simulator sends a READ BINARY command using an offset of '00 06' and length 1 byte to the PIM.

4.3.5.2.5   Test requirement

1) After step c) the status condition returned by the PIM shall be SW1 = '98', SW2 = '04' - access condition not fulfilled.

2) After step e) the data string returned shall be '05 31'.

3) After step f) the data string returned shall be '05'.

4) After step g) the data string returned shall be '31'.

5) After step h) the status condition returned by the PIM shall be SW1 = '67', SW2 = 'XX' - incorrect parameter P3.

6) After step i) the status condition returned by the PIM shall be SW1 = '6B', SW2 = 'XX' - incorrect parameter P1 or P2.

4.3.5.3   UPDATE BINARY function

4.3.5.3.1   Definition and applicability

It shall be mandatory for all cards complying with ETS 300 477 [1] to support all functions described therein.

This test applies to both plug-in and ID-1 UPT cards.

4.3.5.3.2   Conformance requirement

1) The UPDATE BINARY function shall update the current transparent EF with a string of bytes.

2) The function shall accept as an input, the relative address (offset), the length (in bytes) of the string, and the string of bytes.

3) The function shall only be performed if the UPDATE access condition for the current EF is satisfied.

Reference: ETS 300 477 [1], subclauses 8.3 and 9.3.3.

Test Group Reference (TGR): TGR_PIM_FN.

Test Procedure Reference (TPR): TPR_PIM_FN_UPBIN.

4.3.5.3.3   Test purpose

To verify that the UPDATE BINARY function conforms to the above requirements.

4.3.5.3.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

2) EF_{SEQ} contains the data string: '00 00 00 00 00 00 00 01'.

3) CHV1 is enabled.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator sends SELECT commands to the PIM to select EF_{SEQ} under DF_{UPT};

c) the CAD simulator sends an UPDATE BINARY command using a length of 2 bytes, and data string '01 01' to the PIM;

d) the CAD simulator sends a READ BINARY command to the PIM using a length of 2 bytes and an offset of '00 00';

e) the CAD simulator sends a VERIFY CHV command to the PIM;

f) the CAD simulator sends an UPDATE BINARY command using a length of 2 bytes, and data string '0101' to the PIM;

g) the CAD simulator sends a READ BINARY command using a length of 2 bytes to the PIM;

h) the CAD simulator sends an UPDATE BINARY command using a length of 1 byte, and data string '00' to the PIM;

i) the CAD simulator sends a READ BINARY command using a length of 2 bytes to the PIM;

j) the CAD simulator sends an UPDATE BINARY command using an offset of '00 01', a length 1 byte, and data string '00' to the PIM;

k) the CAD simulator sends a READ BINARY command using a length of 2 bytes to the PIM.

4.3.5.3.5 Test requirement

1) After step c) the status condition returned by the PIM shall be SW1 = '98', SW2 = '04' - access condition not fulfilled.

2) After step d) the status condition returned by the PIM shall be SW1 = '98', SW2 = '04' - access condition not fulfilled.

3) After step g) the data string returned shall be '01 01".

4) After step i) the data string returned shall be '00 01'.

5) After step k) the data string returned shall be '00 00'.

4.3.5.4 READ RECORD function

4.3.5.4.1 Definition and applicability

It shall be mandatory for all cards complying with ETS 300 477 [1] to support all functions described therein.

This test applies to both plug-in and ID-1 UPT cards.

4.3.5.4.2 Conformance requirement

1) The READ RECORD function shall read one complete record in the current linear fixed or cyclic EF.

2) The function shall accept as an input, the mode, record number if absolute mode, and the length of the record.

3) The function shall output the record specified by the mode.

4) The function shall only be performed if the READ access condition for the current EF is satisfied.

5) If the mode is CURRENT, the current record is read, the record pointer is not affected.

6) If the mode is ABSOLUTE, the record given by the record number is read, the record pointer is not affected.

7) If the mode is NEXT, the record pointer is incremented before the function is performed and the pointed record is read.

8) If the mode is NEXT, and the record pointer has not been previously been set within the selected EF, the **first** record shall be read and the record pointer set to this record.

9) If the mode is NEXT, and the record pointer addresses the last record in a linear fixed EF, the record pointer shall not change and no data shall be read.

10) If the mode is NEXT, and the record pointer addresses the last record in a cyclic EF, the **first** record shall be read and the record pointer set to this record.

11) If the mode is PREVIOUS, the record pointer is decremented before the function is performed and the pointed record is read.

12) If the mode is PREVIOUS, and the record pointer has not been previously been set within the selected EF, the **last** record shall be read and the record pointer set to this record.

13) If the mode is PREVIOUS, and the record pointer addresses the first record in a linear fixed EF, the record pointer shall not change and no data shall be read.

14) If the mode is PREVIOUS, and the record pointer addresses the first record in a cyclic EF, the **last** record shall be read and the record pointer set to this record.

15) The record pointer shall not be changed if the function is unsuccessful.

Reference: ETS 300 477 [1], subclauses 8.4 and 9.3.4

Test Group Reference (TGR): TGR_PIM_FN.

Test Procedure Reference (TPR): TPR_PIM_FN_RDREC.

4.3.5.4.3   Test purpose

To verify that the READ RECORD function conforms to the above requirements for the different modes available.

4.3.5.4.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

2) DF_{TEL}, EF_{ADN} and EF_{LND} exist under the PIM structure.

3) The first two records in EF_{ADN} contain the following data:

   - record 1: '7F 0A 11 04 92 94 43 77 FF FF';

   - record 2: '7F 0A 11 04 93 69 85 00 FF FF'.

   The data for all other records (if any) is 'FF'.

4) The first two records in EF_{LND} contain the following data:

   - record 1: '7F 08 11 93 95 40 00 FF FF';

   - record 2: '7F 0B 11 00 01 33 98 51 2F FF FF'.

5) CHV1 is enabled.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator sends SELECT commands to the PIM to select EF_{ADN} under DF_{TEL};

c) the CAD simulator sends a READ RECORD command using ABSOLUTE mode with record 1 to the PIM;

d) the CAD simulator sends a VERIFY CHV command to the PIM;

e) the CAD simulator sends a READ RECORD command using ABSOLUTE mode with record 1 to the PIM;

f) the CAD simulator sends a READ RECORD command using NEXT mode to the PIM;

g) the CAD simulator sends a READ RECORD command using PREVIOUS mode to the PIM;

h) the CAD simulator sends a READ RECORD command using CURRENT mode to the PIM;

i) the CAD simulator sends a READ RECORD command using ABSOLUTE mode with record 2 to the PIM;

j) the CAD simulator sends a READ RECORD command using NEXT mode to the PIM;

k) the CAD simulator sends a READ RECORD command using NEXT mode to the PIM;

l) the CAD simulator sends a READ RECORD command using PREVIOUS mode to the PIM;

m) the CAD simulator sends SELECT commands to the PIM to select EF_{LND} under DF_{TEL};

n) the CAD simulator sends a VERIFY CHV command to the PIM;

o) the CAD simulator sends a READ RECORD command using ABSOLUTE mode with record 2 to the PIM;

p) the CAD simulator sends a READ RECORD command using NEXT mode to the PIM;

q) the CAD simulator sends a READ RECORD command using NEXT mode to the PIM;

r) the CAD simulator sends a READ RECORD command using NEXT mode to the PIM;

s) the CAD simulator sends a READ RECORD command using ABSOLUTE mode with record 1 to the PIM;

t) the CAD simulator sends a READ RECORD command using PREVIOUS mode to the PIM.

4.3.5.4.5   Test requirement

1) After step c) the status condition returned by the PIM shall be SW1 = '98', SW2 = '04' - access condition not fulfilled.

2) After step e) f) h) l) the record data returned shall be that of the first record in EF_{ADN}.

3) After steps i) and j) the record data returned shall be that of the second record in EF_{ADN}.

4) After steps g), k) the status condition returned by the PIM shall be SW1 = '94', SW2 = '02' - out of range (invalid address).

5) After step p) r) s) the record data returned shall be that of the first record in EF_{LND}.

6) After step o) q) t) the record data returned shall be that of the second record in EF_{LND}.

4.3.5.5   UPDATE RECORD function

4.3.5.5.1   Definition and applicability

It shall be mandatory for all cards complying with ETS 300 477 [1] to support all functions described therein.

This test applies to both plug-in and ID-1 UPT cards.

4.3.5.5.2   Conformance requirement

1) The UPDATE RECORD function shall update one complete record in the current linear fixed or cyclic EF.

2) The function shall accept as an input, the mode, record number if absolute mode, the length of the record, and the data used for updating the record.

3) The function shall only be performed if the UPDATE access condition for the current EF is satisfied.

4) For cyclic files, only PREVIOUS mode is allowed.

5) If the mode is CURRENT, the current record is updated, the record pointer is not affected.

6) If the mode is ABSOLUTE, the record given by the record number is updated, the record pointer is not affected.

7) If the mode is NEXT, the record pointer is incremented before the function is performed and the pointed record is updated.

8) If the mode is NEXT, and the record pointer has not been previously been set within the selected EF, the **first** record shall be updated and the record pointer set to this record.

9) If the mode is NEXT, and the record pointer addresses the last record, the record pointer shall not change and no record shall be updated.

10) If the mode is PREVIOUS, the record pointer is decremented before the function is performed and the pointed record is updated.

11) If the mode is PREVIOUS, and the record pointer has not been previously been set within the selected EF, the **last** record shall be updated and the record pointer set to this record.

12) If the mode is PREVIOUS, and the record pointer addresses the first record, the record pointer shall not change and no record shall be updated.

13) If the mode is PREVIOUS and the EF is a cyclic file, the oldest record is updated, the record pointer set to this record, and this record shall become the first record.

14) If the mode is FIRST, the **first** record shall be updated and the record pointer set to this record.

15) If the mode is LAST, the **last** record shall be updated and the record pointer set to this record.

16) The record pointer shall not be changed if the function is unsuccessful.

Reference: ETS 300 477 [1], subclauses 8.5 and 9.3.5.

Test Group Reference (TGR): TGR_PIM_FN.

Test Procedure Reference (TPR): TPR_PIM_FN_UPREC.

4.3.5.5.3   Test purpose

To verify that the UPDATE RECORD function conforms to the above requirements for the different modes available.

4.3.5.5.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

2) Each record in EF$_{ADN}$ contains '00' for all bytes of data.

3) Each record in EF$_{LND}$ contains 'FF' for all bytes of data.

4) CHV1 is enabled.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator sends SELECT commands to the PIM to select EF$_{ADN}$ under DF$_{TEL}$;

c) the CAD simulator sends a UPDATE RECORD command using ABSOLUTE mode with record 1 to the PIM. The data used is 'E2' for all bytes;

d) the CAD simulator sends a VERIFY CHV command to the PIM;

e) the CAD simulator sends a UPDATE RECORD command using ABSOLUTE mode with record 1 to the PIM. The data used is 'E2' for all bytes;

f) the CAD simulator sends a READ RECORD command using NEXT mode to the PIM;

g) the CAD simulator sends a UPDATE RECORD command using NEXT mode with to the PIM. The data used is 'E3' for all bytes;

h) the CAD simulator sends a READ RECORD command using ABSOLUTE mode with record 2 to the PIM;

i) the CAD simulator sends an UPDATE RECORD command using PREVIOUS mode to the PIM. The data used is 'E4' for all bytes;

j) the CAD simulator sends a READ RECORD command using ABSOLUTE with record 1 mode to the PIM;

k) the CAD simulator sends a UPDATE RECORD command using CURRENT mode to the PIM. The data used is 'E5' for all bytes;

l) the CAD simulator sends a READ RECORD command using ABSOLUTE mode with record 1 to the PIM;

m) the CAD simulator sends an UPDATE RECORD command using NEXT mode to the PIM. The data used is 'E6' for all bytes;

n) the CAD simulator sends a READ RECORD command using ABSOLUTE mode with record 2 to the PIM;

o) the CAD simulator sends an UPDATE RECORD command using NEXT mode to the PIM. The data used is 'E7' for all bytes;

p) the CAD simulator sends an UPDATE RECORD command using PREVIOUS mode to the PIM. The data used is 'E8' for all bytes;

q) the CAD simulator sends an UPDATE RECORD command using PREVIOUS mode to the PIM. The data used is 'E9' for all bytes;

r) b) the CAD simulator sends SELECT commands to the PIM to select EF_{LND} under DF_{TEL};

s) the CAD simulator sends an UPDATE RECORD command using NEXT mode to the PIM. The data used is 'EA' for all bytes;

t) the CAD simulator sends an UPDATE RECORD command using CURRENT mode to the PIM. The data used is 'EA' for all bytes;

u) the CAD simulator sends an UPDATE RECORD command using ABSOLUTE mode with record 1 to the PIM. The data used is 'EA' for all bytes;

v) the CAD simulator sends an UPDATE RECORD command using PREVIOUS mode to the PIM. The data used is 'EB' for all bytes;

w) the CAD simulator sends a READ RECORD command using ABSOLUTE mode with record 1 to the PIM.

4.3.5.5.5   Test requirement

1) After step c) the status condition returned by the PIM shall be SW1 = '98', SW2 = '04' - access condition not fulfilled.

2) After step f) the record data returned shall be 'E2' for all bytes.

3) After step h) the record data returned shall be 'E3' for all bytes.

4) After step j) the record data returned shall be 'E4' for all bytes.

5) After step l) the record data returned shall be 'E5' for all bytes.

6) After step n) the record data returned shall be 'E6' for all bytes.

7) After steps o) and q) the status condition returned by the PIM shall be SW1 = '94', SW2 = '02' - out of range (invalid address).

8) After step s), t) and u) the status condition returned by the PIM shall be SW1 = '94', SW2 = '02' - out of range (invalid address).

9) After step w) the record data returned shall be 'EB' for all bytes.

4.3.5.6   SEEK function

4.3.5.6.1   Definition and applicability

It shall be mandatory for all cards complying with ETS 300 477 [1] to support all functions described therein.

This test applies to both plug-in and ID-1 UPT cards.

4.3.5.6.2   Conformance requirement

1) The SEEK function shall search through the current linear fixed EF to find a record containing the given pattern.

2) The function shall accept as an input, the type and mode, pattern, length of pattern and offset.

3) The SEEK function shall support both type 1 and type 2.

4) For a type 2 SEEK, the function shall output the record number.

5) The SEEK function shall support the following modes:

   - from the beginning forwards;

   - from the end backwards;

   - from the next location forwards;

   - from the previous location backwards.

6) The function shall only be performed if the READ access condition for the current EF is satisfied.

7) If the parameter P3 indicates a pattern-length greater than the record length, the PIM shall send the status information "incorrect parameter P3".

8) If the record length is shorter than pattern length and offset, then the response from the PIM shall be "offset out of range".

9) The PIM shall be able to accept any pattern length from 1 to 16 bytes inclusive.

10) For a SEEK function of next location forwards, if the record pointer has not been previously set within the selected linear fixed EF, the search begins with the **first** record.

11) For a SEEK function of previous location backwards, if the record pointer has not been previously set within the selected linear fixed EF, the search begins with the **last** record.

12) After a successful SEEK function, the record pointer shall be set to the record in which the pattern was found.

13) The record pointer shall not be changed by an unsuccessful SEEK function.

14) If the record pointer is set to the last record, a SEEK from the next location forward is not allowed.

15) If the record pointer is set to the first record, a SEEK from the previous location backward is not allowed.

Reference: ETS 300 477 [1], subclauses 8.6 and 9.3.6.

Test Group Reference (TGR): TGR_PIM_FN.

Test Procedure Reference (TPR): TPR_PIM_FN_SEEK.

4.3.5.6.3   Test purpose

To verify that the SEEK function conforms to the above requirements for the different modes available.

4.3.5.6.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

2) Each record in EF$_{EXT1}$ contains '00' for all bytes of data.

3) The first two records in EF$_{ADN}$ contain the following data:

   - record 1: '7F 0A 11 04 92 94 43 77 FF FF';

   - record 2: '7F FF FF FF FF FF 0A 11 04 93 69 85 77 FF FF'.

4) CHV1 is enabled.

Test procedure:

a) THE CAD simulator resets the PIM;

b) the CAD simulator sends SELECT commands to the PIM to select EF$_{EXT1}$ under DF$_{TEL}$;

c) the CAD simulator sends a type 1 SEEK command using the "from the beginning forwards" mode, a pattern-length of 1, and pattern '00' to the PIM;

d) the CAD simulator sends a VERIFY CHV command to the PIM;

e) the CAD simulator sends a type 1 SEEK command using the "from the beginning forwards" mode, a pattern length of 1, and pattern '00' to the PIM;

f) the CAD simulator sends SELECT commands to the PIM to select EF$_{ADN}$ under DF$_{TEL}$;

g) the CAD simulator sends a type 2 SEEK command using the "from the beginning forwards" mode, a pattern length of 1, and pattern '7F' to the PIM;

h) the CAD simulator sends a GET RESPONSE command to the PIM;

i) the CAD simulator sends a type 2 SEEK command using the "from the beginning forwards" mode, an offset of '09', a pattern-length of 3, and pattern '77 FF FF' to the PIM;

j) the CAD simulator sends a GET RESPONSE command to the PIM;

k) the CAD simulator sends a type 2 SEEK command using the "from the end backwards" mode, an offset of '09', a pattern-length of 3, and pattern '77 FF FF' to the PIM;

l) the CAD simulator sends a GET RESPONSE command to the PIM;

m) the CAD simulator sends a type 2 SEEK command using the "from the previous location backwards" mode, a pattern-length of 16, and the following pattern to the PIM:

   - '7F FF FF FF FF FF 0A 11 04 93 69 85 77 FF FF ';

n) the CAD simulator sends a GET RESPONSE command to the PIM;

o) the CAD simulator sends a type 2 SEEK command using the "from the next location forwards" mode, an offset of '09', a pattern-length of 3, and pattern '77 FF FF' to the PIM;

p) the CAD simulator sends a GET RESPONSE command to the PIM;

q) the CAD simulator sends a SELECT command to the PIM to select EF$_{ADN}$ again;

r) the CAD simulator sends a type 2 SEEK command using the "from the next location forwards" mode, an offset of '09', a pattern-length of 3, and pattern '77 FF FF' to the PIM;

s) the CAD simulator sends a GET RESPONSE command to the PIM to retrieve the single byte of response data;

t) the CAD simulator sends a SELECT command to the PIM to select EF$_{ADN}$ again;

u) the CAD simulator sends a type 2 SEEK command using the "from the previous location backwards" mode, an offset of '09', a pattern-length of 3, and pattern '77 FF FF' to the PIM;

v) the CAD simulator sends a GET RESPONSE command to the PIM;

w) the CAD simulator sends a type 2 SEEK command using the "from the beginning forwards" mode, a pattern-length of 5, and pattern 'FF 00 FF 00 FF' to the PIM;

x) the CAD simulator sends a READ RECORD command using CURRENT mode to the PIM;

y) the CAD simulator sends SELECT commands to the PIM to select EF_{EXT1} under DF_{TEL};

z) the CAD simulator sends a type 2 SEEK command using the "from the beginning forwards" mode, a pattern length of 14, and 'FF' for all 14 bytes to the PIM;

aa) the CAD simulator sends a type 2 SEEK command using the "from the beginning forwards" mode, an offset of '02', a pattern-length of 12, and 'FF' for all pattern bytes to the PIM.

4.3.5.6.5   Test requirement

1) After step c) the status condition returned by the DAM shall be SW1 = '98', SW2 = '04' - access condition not fulfilled.

2) After steps e), j), n) and s) the response data shall indicate that the first record has been found.

3) After steps h), l), p) and v) the response data shall indicate that the second record has been found.

4) After step w) the status condition returned by the PIM shall be SW1 = '94', SW2 = '04' - pattern not found.

5) After step x) the record data returned shall be that of the second record in EF_{ADN}.

6) After step z) the status condition returned by the PIM shall be SW1 = '67', SW2 = '00' - incorrect parameter P3.

7) After step aa) the status condition returned by the PIM shall be SW1 = '94', SW2 = '02' - out of range.

4.3.5.7   VERIFY CHV function

4.3.5.7.1   Definition and applicability

It shall be mandatory for all cards complying with ETS 300 477 [1] to support all functions described therein.

This test applies to both plug-in and ID-1 UPT cards.

4.3.5.7.2   Conformance requirement

1) This function shall verify the CHV presented for the current directory by comparing it with the one stored in the relevant EF_{CHV1}.

2) The function shall accept as input, an indication of CHV1 and the CHV.

3) The verification process shall be subject to the following conditions being fulfilled:

   -   CHV1 is not blocked.

4) If the access condition for a function to be performed on a file is CHV1, then a successful verification of the relevant CHV shall be required prior to the use of the function on this file.

5) If the CHV presented is correct, the number of remaining CHV attempts for the CHV1 shall be reset to its initial value 3.

6) If the CHV presented is false, the number of remaining CHV attempts for the CHV1 shall be decremented.

7) After 3 consecutive false CHV attempts, not necessarily in the same card session, the CHV1 shall be blocked and the access condition never fulfilled until the UNBLOCK CHV function has been successfully performed on the CHV1.

Reference: ETS 300 477 [1], subclauses 8.7 and 9.3.7.

Test Group Reference (TGR): TGR_PIM_FN.

Test Procedure Reference (TPR): TPR_PIM_FN_VERCHV.

4.3.5.7.3   Test purpose

To verify that the VERIFY CHV function conforms to the above requirements.

4.3.5.7.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

2) CHV1 on the PIM is enabled and three VERIFY CHV1 attempts and ten UNBLOCK CHV1 attempts remain.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator sends SELECT commands to the PIM to select EF_{PUI} under DF_{UPT};

c) the CAD simulator sends a READ BINARY command using a length of 2 bytes to the PIM;

d) the CAD simulator sends a VERIFY CHV command to the PIM. If the status condition returned by the PIM is SW1 = '98', SW2 = '02' then the following steps do not apply;

e) the CAD simulator sends a READ BINARY command using a length of 2 bytes to the PIM;

f) the CAD simulator sends a VERIFY CHV command with **incorrect** CHV1 to the PIM;

g) the CAD simulator sends a SELECT and a GET RESPONSE command to the PIM to select EFCHV1;

h) the CAD simulator sends a VERIFY CHV command to the PIM;

i) the CAD simulator sends a SELECT and a GET RESPONSE command to the PIM to select EFCHV1;

j) the CAD simulator sends a VERIFY CHV command with **incorrect** CHV1 to the PIM;

k) the CAD simulator sends a VERIFY CHV command with **incorrect** CHV1 to the PIM;

l) the CAD simulator resets the PIM;

m) the CAD simulator sends a VERIFY CHV command with **incorrect** CHV1 to the PIM;

n) the CAD simulator resets the PIM;

o) the CAD simulator sends a VERIFY CHV command to the PIM;

p) the CAD simulator sends an UNBLOCK CHV command to the PIM.

4.3.5.7.5   Test requirement

1) After steps c), f), j) and k), the status condition returned by the PIM shall be SW1 = '98', SW2 = '04' - access condition not fulfilled.

2) After step g) the following shall be true of the response data:

   - byte 15 shall indicate two VERIFY CHV1 attempts remaining.

3) After step i) the following shall be true of the response data:

    - byte 15 shall indicate three VERIFY CHV1 attempts remaining.

4) After steps o) and m), the status condition returned by the PIM shall be SW1 = '98', SW2 = '40' - CHV blocked.

4.3.5.8   CHANGE CHV function

4.3.5.8.1   Definition and applicability

It shall be mandatory for all cards complying with ETS 300 477 [1] to support all functions described therein.

This test applies to both plug-in and ID-1 UPT cards.

4.3.5.8.2   Conformance requirement

1) This function shall assign a new value to the relevant CHV1, subject to the following conditions being fulfilled:

    - CHV is not blocked.

2) The function shall accept as input, an indication of CHV1 and the old and new CHV.

3) If the old CHV presented is correct, the number of remaining CHV attempts for that CHV1 shall be reset to its initial value 3 and the new value for the CHV shall become valid.

4) If the old CHV presented is false, the number of remaining CHV attempts for that CHV1 shall be decremented and the value of the CHV shall remain unchanged.

5) After 3 consecutive false CHV presentations, not necessarily in the same card session, the respective CHV1 shall be blocked and the access condition never fulfilled until the UNBLOCK CHV function has been successfully performed on the respective CHV.

Reference: ETS 300 477 [1], subclauses 8.8, 9.3.8.

Test Group Reference (TGR): TGR_PIM_FN.

Test Procedure Reference (TPR): TPR_PIM_FN_CHCHV.

4.3.5.8.3   Test purpose

To verify that the CHANGE CHV function conforms to the above requirements.

4.3.5.8.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

2) CHV1 on the PIM is set to '0000'.

3) Three VERIFY CHV1 attempts and ten UNBLOCK CHV1 attempts remain.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator sends a CHANGE CHV command with an **incorrect** old CHV1 of '11 11' and new CHV1 of '3333' to the PIM;

c) the CAD simulator sends a SELECT and a GET RESPONSE command to the PIM to select EFCHV1;

d) the CAD simulator sends a CHANGE CHV command with an old CHV1 of '00 00' and new CHV1 of '33 33' to the PIM;

e) the CAD simulator sends a SELECT and a GET RESPONSE command to the PIM to select EFCHV1;

f) the CAD simulator sends a CHANGE CHV command with an **incorrect** old CHV1 of '00 00' and new CHV1 of '55 55' to the PIM;

g) the CAD simulator sends a CHANGE CHV command with an **incorrect** old CHV1 of '00 00' and new CHV1 of '55 55' to the PIM;

h) the CAD simulator resets the PIM;

i) the CAD simulator sends a CHANGE CHV command with an **incorrect** old CHV1 of '00 00' and new CHV1 of '55 55' to the PIM;

j) the CAD simulator resets the PIM;

k) the CAD simulator sends a CHANGE CHV command with an old CHV1 of '33 33' and new CHV1 of '55 55' to the PIM;

l) the CAD simulator sends an UNBLOCK CHV command with CHV1 of '55 55' to the PIM;

m) the CAD simulator resets the PIM;

n) the CAD simulator sends a CHANGE CHV command with an old CHV1 '55 55' and new CHV1 of '77 77' to the PIM.

4.3.5.8.5   Test requirement

1) After step b), f), and g), the status condition returned by the PIM shall be SW1 = '98', SW2 = '04' - access condition not fulfilled.

2) After step c) the following shall be true of the response data:

    -   byte 15 shall indicate two VERIFY CHV1 attempts remaining.

3) After step e) the following shall be true of the response data:

    -   byte 15 shall indicate three VERIFY CHV1 attempts remaining.

4) After steps i) and k) the status condition returned by the PIM shall be SW1 = '98', SW2 = '40' - CHV blocked.

4.3.5.9   UNBLOCK CHV function

4.3.5.9.1   Definition and applicability

It shall be mandatory for all cards complying with ETS 300 477 [1] to support all functions described therein.

This test applies to both plug-in and ID-1 UPT cards.

4.3.5.9.2   Conformance requirement

1) This function shall unblock a CHV which has been blocked by 3 consecutive wrong CHV presentations.

2) The function shall accept as input, an indication of CHV1, the UNBLOCK CHV and the new CHV.

3) This function shall be performed regardless of whether or not the relevant CHV is blocked.

4) If the UNBLOCK CHV presented is correct, the new CHV value, presented together with the UNBLOCK CHV is stored in the relevant EFCHV1, the number of remaining UNBLOCK CHV attempts for that UNBLOCK CHV is reset to its initial value 10 and the number of remaining CHV attempts for that CHV1 is reset to its initial value 3.

5) After a successful unblocking attempt, the relevant access condition level satisfied.

6) If the presented UNBLOCK CHV is false, the number of remaining UNBLOCK CHV attempts for that UNBLOCK CHV shall be decremented.

7) After 10 consecutive false UNBLOCK CHV presentations, not necessarily in the same card session, the respective UNBLOCK CHV shall be blocked.

8) A false UNBLOCK CHV shall have no effect on the status of the respective CHV itself.

Reference: ETS 300 477 [1], subclauses 8.9 and 9.3.9.

Test Group Reference (TGR): TGR_PIM_FN.

Test Procedure Reference (TPR): TPR_PIM_FN_UNCHV.

4.3.5.9.3   Test purpose

To verify that the UNBLOCK CHV function conforms to the above requirements.

4.3.5.9.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

2) CHV1 on the PIM is not blocked.

3) Three VERIFY CHV1 attempts and ten UNBLOCK CHV1 attempts remain.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator sends SELECT commands to the PIM to select EF_{PUI} under DF_{UPT};

c) the CAD simulator sends a VERIFY CHV command with **incorrect** CHV to the PIM;

d) the CAD simulator sends a VERIFY CHV command with **incorrect** CHV to the PIM;

e) the CAD simulator sends a VERIFY CHV command with **incorrect** CHV to the PIM;

f) the CAD simulator sends a SELECT and a GET RESPONSE command to the PIM to select EFCHV1;

g) the CAD simulator sends an UNBLOCK CHV command with **incorrect** UNBLOCK CHV1 and CHV1 to the PIM;

h) the CAD simulator sends a SELECT and a GET RESPONSE command to the PIM to select EFCHV1;

i) the CAD simulator sends an UNBLOCK CHV command to the PIM;

j) the CAD simulator sends a SELECT and a GET RESPONSE command to the PIM to select EFCHV1;

k) the CAD simulator sends SELECT commands to the PIM to select EF_{PUI} under DF_{UPT};

l) the CAD simulator sends a READ BINARY command using a length of 2 bytes to the PIM.

4.3.5.9.5   Test requirement

1) After step c),d), e) the status condition returned by the PIM shall be SW1 = '98', SW2 = '04' - access condition not fulfilled.

2) After step f) the following shall be true of the response data:

   - byte 12 shall indicate that CHV1 is blocked.

3) After step h) the following shall be true of the response data:

   - byte 19 shall indicate nine UNBLOCK CHV1 attempts remaining.

4) After step j) the following shall be true of the response data:

   - byte 15 shall indicate three VERIFY CHV1 attempts remaining;

   - byte 19 shall indicate ten UNBLOCK CHV1 attempts remaining.

4.3.5.10   INTERNAL AUTHENTICATION function

4.3.5.10.1   Definition and applicability

It shall be mandatory for all cards complying with ETS 300 477 [1] to support all functions described therein.

This test applies to both plug-in and ID-1 UPT cards.

4.3.5.10.2   Conformance requirement

1) When the CAD sends a INTERNAL AUTHENTICATION command to the PIM, the PIM shall run the specified algorithm and reply with AC.

2) The function shall accept as input a challenge (n).

3) The function shall not be executable unless a successful CHV1 verification procedure has been performed.

Reference: ETS 300 477 [1], subclauses 8.10, 9.3.10, 7.2.2 and 11.4.1.

Test Group Reference (TGR): TGR_PIM_FN.

Test Procedure Reference (TPR): TPR_PIM_FN_ITA.

4.3.5.10.3   Test purpose

To verify that the INTERNAL AUTHENTICATION function conforms to the above requirements.

4.3.5.10.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator selects DF_{UPT} as defined in subclause 4.4;

c) the CAD simulator gains CHV1 security access;

d) the CAD simulator sends a SELECT command to the PIM to select EF_{CT};

e) the CAD simulator sends a READ BINARY;

f) the CAD simulator sends a SELECT command to the PIM to select EF_{PUI};

g) the CAD simulator sends a READ BINARY;

h) the CAD simulator sends a SELECT command to the PIM to select EF_{SEQ};

i) the CAD simulator sends a READ BINARY;

j) the CAD simulator sends a INTERNAL AUTHENTICATION command to the PIM containing the sequence number;

k) the CAD simulator sends a GET RESPONSE command to the PIM;

l) the CAD simulator resets the PIM;

m) the CAD simulator selects DF_{UPT} as defined in subclause 4.4;

n) the CAD simulator sends a SELECT command to the PIM to select EF_{CT};

o) the CAD simulator sends a READ BINARY;

p) the CAD simulator sends a SELECT command to the PIM to select EF_{PUI};

q) the CAD simulator sends a READ BINARY;

r) the CAD simulator sends a SELECT command to the PIM to select EF_{SEQ};

s) the CAD simulator sends a READ BINARY;

t) the CAD simulator sends a INTERNAL AUTHENTICATION command to the PIM containing the sequence number;

u) the CAD simulator sends a GET RESPONSE command to the PIM.

4.3.5.10.5   Test requirement

1) After step k) the PIM shall have sent a AC.

2) After step u) the status condition returned by the PIM shall be SW1 = '98', SW2 = '04' - access condition not fulfilled, authentication failed.

4.3.6   Description of the commands

The tests in this subclause ensure that the IUT conforms to the specification for the mapping of functions onto Application Protocol Data Units (APDUs) which are used by the transmission protocol.

4.3.6.1   Mapping principles

4.3.6.1.1   Definition and applicability

The transmission protocol requires that the command and response Application Protocol Data Units (APDUs) are mapped using certain principles, in order to ensure correct operation in the UPT environment.

NOTE: The testing of the commands do only follow the normal path, and some specific error conditions. To ensure proper execution of the commands under all circumstances especially under more specific error conditions, the PIM should be tested for this too. For the time being no relevant test document for this purpose exists.

This test applies to both plug-in and ID-1 PIM cards.

4.3.6.1.2   Conformance requirement

1) The command APDU shall be in accordance with ISO/IEC 7816-4 [5], subclause 5.3.1.

2) The response APDU shall be in accordance with ISO/IEC 7816-4 [5], subclause 5.3.3.

Reference: ETS 300 477 [1], subclause 9.1.

Test Group Reference (TGR): TGR_PIM_CMD_MAP.

Test Procedure Reference (TPR): TPR_PIM_CMD_MAP.

4.3.6.1.3   Test purpose

To verify that the PIM conforms to the above requirements.

4.3.6.1.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator selects DF_{UPT} as defined in subclause 4.4;

c) the CAD simulator sends a VERIFY CHV command to the PIM:

- [bytes sent: CLA = 'A0', INS = '20', P1 = '00', P2 = '01', Lc = '08', data = valid CHV1 code];

- [bytes received: SW1, SW2];

d) the CAD simulator sends a SELECT command to the PIM to select EF_{CT}:

- [bytes sent: CLA = 'A0', INS = 'A4', P1 = '00', P2 = '00', Lc = '02', data = '6F F6'];

- [bytes received: SW1, $SW2_1$];

e) the CAD simulator sends a GET RESPONSE command to the PIM, requesting all of the available response data, as indicated by $SW2_1$:

- [bytes sent: CLA = 'A0', INS = 'C0', P1 = '00', P2 = '00', Le = $SW2_1$];

- [bytes received: data, SW1, SW2];

f) the CAD simulator sends a READ BINARY command to the PIM to read the one byte:

- [bytes sent: CLA = 'A0', INS = 'B0', P1 = '00', P2 = '00', P3 = '01'];

- [bytes received: data, SW1, SW2];

g) the CAD simulator sends an UPDATE BINARY command to the PIM to update EF_{CT} with '00':

- [bytes sent: CLA = 'A0', INS = 'D6', P1 = '00', P2 = '00', Lc = '01', data = '00'];

- [bytes received: SW1, SW2];

h) the CAD simulator sends the following command APDU:

- [bytes sent: CLA = 'A0', INS = '00', P1 = '00', P2 = '00', P3 = '00'];

- [bytes received: SW1, SW2].

4.3.6.1.5   Test requirement

1) After step d), the PIM shall have sent SW1 = '9F' and SW2 = 'lgth'.

2) After step e), the PIM shall have sent 'lgth' bytes followed by SW1 = '90' and SW2 = '00'.

3) After step f), the PIM shall have sent one byte followed by SW1 = '90' and SW2 = '00'.

4) After step g), the PIM shall have sent SW1 = '98' and SW2 = '04'.

5) After step h), the PIM shall have sent SW1 = '6D' and SW2 = 'XX'.

4.3.6.2   Definitions and coding

4.3.6.2.1   Definition and applicability

Certain definitions and coding are used in the response parameters/data of the commands.

This test applies to both plug-in and ID-1 PIM cards.

4.3.6.2.2   Conformance requirement

1) In a UPT specific card, all bytes which are RFU shall be set to '00'.

2) In a UPT specific card, all bits which are RFU shall be set to 0.

Reference: ETS 300 477 [1], subclause 9.2.

Test Group Reference (TGR): TGR_PIM_CMD_DEF.

Test Procedure Reference (TPR): TPR_PIM_CMD_DEF.

4.3.6.2.3   Test purpose

To verify that the response parameters/data conform to the above requirements for all file IDs on the PIM.

4.3.6.2.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

Test procedure:

a) The CAD simulator resets the PIM;

b) For every possible file ID in the file structure, the CAD simulator sends SELECT commands to select the file ID. When a file is selected successfully, the CAD simulator sends a GET RESPONSE command to the PIM.

4.3.6.2.5   Test requirement

1) After step b) for the MF and all DFs found, the following shall be true of the response data:

   - byte 1, 2, 9, 10, 11, 18, 21 and 33 shall be '00';

   - bits 1 to 7 of byte 8 shall be 0;

   - bits 2 to 8 of byte 12 shall be 0;

   - bits 2 and 5 to 7 of byte 14 shall be 0.

2) After step b) for all EFs found (except for EF_{CHV}), the following shall be true of the response data:

   - bytes 1, 2, 8, 10 and 11 shall be '00';

   - bits 2 to 8 of byte 12 shall be 0;

   - if present, byte 15 shall be '00' if the EF is transparent;

   - if present, bytes 16 and following shall be '00'.

3) After step b) for EF$_{CHV}$ files, the following shall be true of the response data:

- bytes 1, 2, 8, 10 and 11 shall be '00';

- bits 4 to 8 of byte 12 shall be 0;

- bytes 21 and following shall be '00'.

4.3.6.3   Coding of the commands

The test procedures defined in subclause 4.3.5 of the present document, intrinsically test most the coding of the associated commands.

Therefore, test purposes exist in this subclause only to cover areas of testing not already covered by subclause 4.3.5.

4.3.6.3.1   SELECT command

4.3.6.3.1.1   Definition and applicability

It shall be mandatory for all cards complying with ETS 300 477 [1] to support all functions described therein.

This test applies to both plug-in and ID-1 PIM cards.

4.3.6.3.1.2   Conformance requirement

The SELECT command shall provide the response data described in ETS 300 477 [1], subclause 9.3.1.

Reference: ETS 300 477 [1], subclause 9.3.1.

Test Group Reference (TGR): TGR_PIM_ CMD_COD.

Test Procedure Reference (TPR): TPR_PIM_CMD_COD _SEL.

4.3.6.3.1.3   Test purpose

To verify that the coding of the SELECT command conforms to the above requirements.

4.3.6.3.1.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator sends a SELECT command to the PIM to select MF:

- [bytes sent: CLA = 'A0', INS = 'A4', P1 = '00', P2 = '00', Lc = '02', data = '3F 00'];

- [bytes received: SW1, SW2$_1$];

c) the CAD simulator sends a GET RESPONSE command to the PIM:

- [bytes sent: CLA = 'A0', INS = 'C0', P1 = '00', P2 = '00', Le = SW2$_1$];

- [bytes received: data, SW1, SW2];

d) the CAD simulator selects DF$_{UPT}$ as defined in subclause 4.4;

e) the CAD simulator sends SELECT commands to the PIM to select DF_{SR1}:

   - [example bytes sent: CLA = 'A0', INS = 'A4', P1 = '00', P2 = '00', P3 = '02', data = '7F 70'];

   - [bytes received: SW1, $SW2_2$];

f) the CAD simulator sends a GET RESPONSE command to the PIM:

   - [bytes sent: CLA = 'A0', INS = 'C0', P1 = '00', P2 = '00', Le = $SW2_2$];

   - [bytes received: data, SW1, SW2];

g) the CAD simulator sends a SELECT command to the PIM to select EF_{SEQ}:

   - [bytes sent: CLA = 'A0', INS = 'A4', P1 = '00', P2 = '00', Lc = '02', data = '6F 50'];

   - [bytes received: SW1, $SW2_3$];

h) the CAD simulator sends a GET RESPONSE command to the PIM:

   - [bytes sent: CLA = 'A0', INS = 'C0', P1 = '00', P2 = '00', Le = $SW2_3$];

   - [bytes received: data, SW1, SW2];

i) if EF_{ADN} is present, the CAD simulator sends a SELECT command to the PIM to select EF_{ADN}:

   - [bytes sent: CLA = 'A0', INS = 'A4', P1 = '00', P2 = '00', Lc = '02', data = '6F 3A'];

   - [bytes received: SW1, $SW2_4$];

j) if EF_{ADN} is present, the CAD simulator sends a GET RESPONSE command to the PIM:

   - [bytes sent: CLA = 'A0', INS = 'C0', P1 = '00', P2 = '00', Le = $SW2_4$];

   - [bytes received: data, SW1, SW2];

k) the CAD simulator selects the relevant EF_{CHV1} as defined in subclause 4.4;

l) the CAD simulator sends a SELECT command to the PIM to re-select EF_{CHV1}:

   - [bytes sent: CLA = 'A0', INS = 'A4', P1 = '00', P2 = '00', Lc = '02', data = '00 00'];

   - [bytes received: SW1, $SW2_5$];

m) the CAD simulator sends a GET RESPONSE command to the PIM:

   - [bytes sent: CLA = 'A0', INS = 'C0', P1 = '00', P2 = '00', Le = $SW2_5$];

   - [bytes received: data, SW1, SW2].

4.3.6.3.1.5   Test requirement

1) After step c) the following shall be true of the response data:

   - bytes 3 and 4 shall contain information about the total memory amount under the MF that is not allocated by any of the DFs or EFs under the MF;

   - bytes 5 and 6 shall contain the file ID for the MF, '3F 00';

   - byte 7 shall contain '01' for MF;

   - byte 8 shall give the access conditions for the MF;

   - byte 12 shall contain the binary code 0000000X, where X gives the invalidation status, which shall be 1 otherwise the card has become mute;

   - byte 13 shall give the number of bytes that follow in the response information;

- byte 14 shall give the current directory characteristics as specified in ETS 300 477 [1];

- byte 15 shall indicate the correct number of DFs which are a direct child of the MF;

- byte 16 shall indicate the correct number of EFs which are a direct child of the MF;

- bytes 19 - 22 shall give information about the CHVs under the MF. For details see ETS 300 477 [1].

2) After step f) the following shall be true of the response data:

- bytes 3 and 4 shall contain information about the total memory amount under DF_{UPT} that is not allocated by any of the DFs or EFs under DF_{UPT};

- bytes 5 and 6 shall contain the file ID for DF_{UPT};

- byte 7 shall contain '02' for DF;

- byte 8 shall give the access conditions for DF_{UPT};

- byte 12 shall contain the binary code 0000000X, where X gives the invalidation status, which shall be 1 otherwise the card has become mute;

- byte 13 shall give the number of bytes that follow in the response information;

- byte 15 shall indicate the correct number of DFs which are a direct child of DF_{UPT};

- byte 16 shall indicate the correct number of EFs which are a direct child of DF_{UPT};

- bytes 19 - 22 shall give information about the CHVs under DF_{UPT}. For details see ETS 300 477 [1].

3) After step h) the following shall be true of the response data:

- bytes 3 and 4 shall contain information about the file size for EF_{SEQ}. The size shall be 8;

- bytes 5 and 6 shall contain the file ID for EF_{SEQ} '6F 50';

- byte 7 shall contain '04' for EF;

- byte 9 shall give the access conditions for EF_{SEQ}. Byte 9 shall have the value '11';

- byte 12: bit 1 shall be 1;

- byte 13 shall give the number of bytes that follow in the response information;

- byte 14 gives the structure of the EF and in this case it shall contain '00' indicating transparent structure;

- byte 15, if present, shall be '00'.

4) If the command GET RESPONSE in step j) is sent, the following shall be true of the response data after step j):

- bytes 3 and 4 shall contain information about the file size for EF_{ADN};

- bytes 5 and 6 shall contain the file ID for EF_{ADN}, '6F 3A';

- byte 7 shall contain '04' for EF;

- byte 9 shall give the access conditions for EF_{ADN}. Byte 9 shall have the value '11';

- byte 12: bit 1 shall be 1;

- byte 13 shall give the number of bytes that follow in the response information;

- byte 14 gives the structure of the EF and in this case it shall be '01' indicating linear fixed structure;

- byte 15 shall be 'X+14'.

5) After step m) the following shall be true of the response data:

- bytes 3 and 4 shall be '00 17';

- bytes 5 and 6 shall contain the file ID for EF_{CHV1}, '00 00';

- byte 7 shall contain '04' for EF;

- byte 9 shall give the access conditions for EF_{CHV1}. Byte 9 shall have the value 'FF';

- byte 12: bit 1 shall be 1, bit 2 shall be 1 and bit 3 shall be 0;

- byte 13 shall give the number of bytes that follow and shall be coded '07';

- byte 14 gives the structure of the EF and in this case it shall be '00' indicating transparent structure;

- byte 15 shall indicate the number of remaining CHV attempts and shall be in the range '00' to '03';

- byte 16 shall be '01' indicating CHV verification;

- byte 17 bits 1, 2 and 3 shall be 0;

- bytes 18 and 20 shall be 'FF';

- byte 19 shall indicate the number of remaining UNBLOCK CHV attempts and shall be in the range '00' to '0A'.

4.3.6.3.2   READ BINARY command

The test procedure defined in subclause 4.3.5.3 intrinsically tests the coding of this command and so is not replicated here.

COMMAND	CLASS	INS	P1	P2	Le
READ BINARY	'A0'	'B0'	offset high	offset low	lgth of data

4.3.6.3.3   UPDATE BINARY command

The test procedure defined in subclause 4.3.5.4 intrinsically tests the coding of this command and so is not replicated here.

COMMAND	CLASS	INS	P1	P2	Le
UPDATE BINARY	'A0'	'D6'	offset high	offset low	lgth of data following

4.3.6.3.4   READ RECORD command

The test procedure defined in subclause 4.3.5.5 intrinsically tests the coding of this command and so is not replicated here.

COMMAND	CLASS	INS	P1	P2	Le
READ RECORD	'A0'	'B2'	rec no	Mode	lgth of data

4.3.6.3.5   UPDATE RECORD command

The test procedure defined in subclause 4.3.5.6 intrinsically tests the coding of this command and so is not replicated here.

COMMAND	CLASS	INS	P1	P2	Le
UPDATE RECORD	'A0'	'DC'	rec no	Mode	lgth of data following

4.3.6.3.6 SEEK command

The test procedure defined in subclause 4.3.5.7 intrinsically tests the coding of this command and so is not replicated here.

COMMAND	CLASS	INS	P1	P2	Le
SEEK	'A0'	'A2'	'00'	Type/Mode	lgth of data following

4.3.6.3.7 VERIFY CHV command

The test procedure defined in subclause 4.3.5.9 intrinsically tests the coding of this command and so is not replicated here.

COMMAND	CLASS	INS	P1	P2	Le
VERIFY CHV	'A0'	'20'	'00'	'01'	'08'

4.3.6.3.8 CHANGE CHV command

The test procedure defined in subclause 4.3.5.10 intrinsically tests the coding of this command and so is not replicated here.

COMMAND	CLASS	INS	P1	P2	Le
CHANGE CHV	'A0'	'24'	'00'	'01'	'10'

4.3.6.3.9 UNBLOCK CHV command

The test procedure defined in subclause 4.3.5.13 intrinsically tests the coding of this command and so is not replicated here.

COMMAND	CLASS	INS	P1	P2	Le
UNBLOCK CHV	'A0'	'2C'	'00'	'01'	'10'

4.3.6.3.10 INTERNAL AUTHENTICATION command

The test procedure defined in subclause 4.3.5.19 intrinsically tests the coding of this command and so is not replicated here.

COMMAND	CLASS	INS	P1	P2	Le
INTERNAL AUTHENTICATION	'A0'	'88'	'00'	'00'	lgth of following data

4.3.6.3.11 GET RESPONSE command

4.3.6.3.11.1 Definition and applicability

It shall be mandatory for all cards complying with ETS 300 477 [1] to support all functions described therein.

This test applies to both plug-in and ID-1 PIM cards.

4.3.6.3.11.2 Conformance requirement

1) The GET RESPONSE command shall provide response data after the execution of commands SELECT, SEEK (type 2), INTERNAL AUTHENTICATION and GET RESPONSE.

2) It is required that the GET RESPONSE command is executed immediately after the command it is related to (no other command shall come between the command/response pair and the command GET RESPONSE). If this sequence is not respected, the PIM shall send the Status Information "technical problem with no diagnostic given" as a reaction to the GET RESPONSE.

Reference: ETS 300 477 [1], subclause 9.3.11.

Test Group Reference (TGR): TGR_PIM_CMD_COD.

Test Procedure Reference (TPR): TPR_PIM_CMD_COD _GET.

4.3.6.3.11.3   Test purpose

To verify that the coding of the GET RESPONSE command conforms to the above requirements.

NOTE: CR1, except for the command GET RESPONSE, is tested in subclauses 4.3.5.1, 4.3.5.6 and 4.3.5.10.

4.3.6.3.11.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator sends a SELECT command to the PIM to select MF:

- [bytes sent: CLA = 'A0', INS = 'A4', P1 = '00', P2 = '00', Lc = '02', data = '3F 00'];

- [bytes received: SW1, $SW2_1$];

c) the CAD simulator sends a GET RESPONSE command to the PIM:

- [bytes sent: CLA = 'A0', INS = 'C0', P1 = '00', P2 = '00', Le = $SW2_1$-1];

- [bytes received: data, SW1, SW2];

d) the CAD simulator sends a GET RESPONSE command to the PIM:

- [bytes sent: CLA = 'A0', INS = 'C0', P1 = '00', P2 = '00', Le = 1];

- [bytes received: data, SW1, SW2];

e) the CAD simulator sends a VERIFY CHV command to the PIM:

- [bytes sent: CLA = 'A0', INS = '20', P1 = '00', P2 = '01', Lc = '08', data = valid CHV1 code];

- [bytes received: SW1, SW2];

f) the CAD simulator sends a GET RESPONSE command to the PIM:

- [bytes sent: CLA = 'A0', INS = 'C0', P1 = '00', P2 = '00', Le = '1'];

- [bytes received: P3 bytes of data, SW1, SW2].

4.3.6.3.11.5   Test requirement

1) After step d) the status condition returned by the PIM shall be SW1 = '6F', SW2 = 'XX' - technical problem with no diagnostic given.

4.3.6.4   Status conditions returned by the PIM

4.3.6.4.1   Coding of the status words

4.3.6.4.1.1   Definition and applicability

The status words SW1 and SW2 provide the method with which the PIM can respond to the PE after executing a command.

This test applies to both plug-in and ID-1 PIM cards.

4.3.6.4.1.2   Conformance requirement

1) The PIM shall respond with the correct SW1 and SW2 status words for commands which produce security management errors.

2) The PIM shall respond with the correct SW1 and SW2 status words for commands which produce memory management errors.

3) The PIM shall respond with the correct SW1 and SW2 status words for commands which produce referencing management errors.

4) The PIM shall respond with the correct SW1 and SW2 status words for commands which produce application independent errors.

5) The PIM shall respond with the correct SW1 and SW2 status words for commands which are correctly executed or supporting chaining mechanism.

Reference: ETS 300 477 [1], subclause 9.6.

Test Group Reference (TGR): TGR_PIM_CMD_SC_SW.

Test Procedure Reference (TPR): TPR_PIM_CMD_SC_SW.

4.3.6.4.1.3   Test purpose

To verify that the PIM conforms to the above requirements when issuing SW1 and SW2 status words.

    NOTE: CR2 cannot be tested as there is no mechanism to force the PIM to produce memory errors.

4.3.6.4.1.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

2) CHV 1 on the PIM is enabled.

3) Three VERIFY CHV1 attempts and ten UNBLOCK CHV1 attempts remain.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator sends a VERIFY CHV command to the PIM;

c) the CAD simulator sends SELECT commands to the PIM to select DF_{UPT};

d) the CAD simulator sends a GET RESPONSE command to the PIM;

e) the CAD simulator sends a READ BINARY command using a length of 1 byte to the PIM;

f) the CAD simulator sends a SELECT command to the PIM to select EF_{ADN};

ETSI

g) the CAD simulator sends an UPDATE RECORD command using LAST mode to the PIM. The data used is 'E1' for all bytes;

h) the CAD simulator sends an UPDATE RECORD command using NEXT mode to the PIM. The data used is 'E2' for all bytes;

i) the CAD simulator sends a READ BINARY command using a length of 1 byte to the PIM;

j) the CAD simulator sends a VERIFY CHV command with **incorrect** CHV1 to the PIM;

k) the CAD simulator sends VERIFY CHV command with **incorrect** CHV1 to the PIM;

l) the CAD simulator sends VERIFY CHV command with **incorrect** CHV1 to the PIM;

m) the CAD simulator sends an UPDATE RECORD command using FIRST mode to the PIM. Parameter Lc is set to 1 and the data used is 'E3';

n) the CAD simulator sends an UPDATE RECORD command using mode '44' to the PIM. The data used is 'E4' for all bytes;

o) the CAD simulator sends the following APDU to the PIM:

   [bytes sent: CLA = 'A0', INS = '18', P1 = '00', P2 = '00', P3 = '00'];

p) the CAD simulator sends the following APDU to the PIM:

   [bytes sent: CLA = 'F2', INS = 'F2', P1 = '00', P2 = '00', P3 = '00'];

q) the CAD simulator sends a GET RESPONSE command to the PIM.

4.3.6.4.1.5   Test requirement

1) After step c) the status condition returned by the PIM shall be SW1 = '9F', SW2 = 'XX' - length 'XX' of the response data.

2) After step d) the status condition returned by the PIM shall be SW1 = '90', SW2 = '00' - normal ending of command.

3) After step e) the status condition returned by the PIM shall be SW1 = '94', SW2 = '00' - no EF selected.

4) After step h) the status condition returned by the PIM shall be SW1 = '94', SW2 = '02' - out of range (invalid address).

5) After step i) the status condition returned by the PIM shall be SW1 = '94', SW2 = '08' - file type inconsistent with the command.

6) After steps j) and m) the status condition returned by the PIM shall be SW1 = '98', SW2 = '04' - unsuccessful CHV verification, at least one attempt left.

7) After step l) the status condition returned by the PIM shall be SW1 = '98', SW2 = '40' - unsuccessful CHV verification, no attempt left.

8) After step m) the status condition returned by the PIM shall be SW1 = '67', SW2 = 'XX' - wrong length.

9) After step n) the status condition returned by the PIM shall be SW1 = '6B', SW2 = 'XX' - incorrect parameter P1 or P2.

10) After step o) the status condition returned by the PIM shall be SW1 = '6D', SW2 = 'XX' - unknown instruction code given in the command.

11) After step p) the status condition returned by the PIM shall be SW1 = '6E', SW2 = 'XX' - wrong instruction class given in the command.

12) After step q) the status condition returned by the PIM shall be SW1 = '6F', SW2 = 'XX' - technical problem with no diagnostic given.

4.3.6.4.2   Commands versus possible status responses

4.3.6.4.2.1   Definition and applicability

Limiting the status conditions for each command to a defined set allows the PE to efficiently manage the handling of the status condition.

This test applies to both plug-in and ID-1 PIM cards.

4.3.6.4.2.2   Conformance requirement

1) Table 42 in ETS 300 477 [1], subclause 9.6.6 shows for each command the possible status conditions returned (marked by an asterisk *). The PIM shall not generate status conditions other than those allowed for each command.

Reference: ETS 300 477 [1], subclause 9.6.6.

Test Group Reference (TGR): TGR_PIM_CMD_SC_CSR.

Test Procedure Reference (TPR): TPR_PIM_CMD_SC_CSR.

4.3.6.4.2.3   Test purpose

To verify for each command that the PIM will only generate the allowed status conditions.

NOTE: CR1 cannot be tested as it is not possible to force the PIM to generate all of the allowed status conditions for each command and there is no way of forcing the PIM to generate disallowed status conditions for each command.

4.3.6.4.2.4   Method of test

Initial conditions:

N/A.

Test procedure:

N/A.

4.3.6.4.2.5   Test requirement

N/A.

4.3.7   Contents of the EFs

The subclause provides tests to ensure that the IUT contains all of the EFs needed for a UPT session.

4.3.7.1   Content of the EF$_{CHV1}$

4.3.7.1.1   Definition and applicability

The following Elementary File is required on the UPT card at the parent level of the UPT application in order for a UPT session to be carried out. For this EF, the correct access conditions, data items and coding need to be in place:

-    EF$_{CHV1}$ - Card holder verification information for CHV1.

This test applies to both plug-in and ID-1 UPT cards.

4.3.7.1.2   Conformance requirement

1) The ASCII coding of the data items shall be in accordance with ISO 8859-1 [9].

2) EFs, records or data items having an unassigned value shall have their bytes and bits set to 'FF' and 1, respectively.

3) After the administrative phase, all data items shall have a defined value or have their bits set to 1.

4) All implemented EFs have a file size greater than zero shall contain all mandatory items.

5) Optional data items shall be filled with 'F', or if located at the end of the EF need not exist.

6) EF_{CHV1} shall contain the following data items for bytes 1 to 23:

   - EF_{CHV} activation byte;

   - way to present CHV/UNBLOCK CHV;

   - coded 'FF';

   - CHV;

   - preset number of permissible consecutive false CHV attempts initialized to '03";

   - remaining CHV attempts counter;

   - UNBLOCK CHV;

   - remaining UNBLOCK CHV attempts counter;

   - coded 'FF'.

7) The CHV1 shall consist of 4 to 8 ASCII coded decimal digits ('0' to '9') right padded with 'FF'.

8) The UNBLOCK CHV1 shall consist of 8 ASCII coded decimal digits ('0' to '9').

Reference: ETS 300 477 [1], subclause 10.1.

Test Group Reference (TGR): TGR_PIM_CEF_EFCHV.

Test Procedure Reference (TPR): TPR_PIM_CEF_EFCHV.

4.3.7.1.3   Test purpose

To verify that the PIM conforms to the above requirements.

   NOTE: These requirements are already tested in the following subclauses: 4.3.5.7 (VERIFY CHV), 4.3.5.8 (CHANGE CHV), 4.3.5.9 (UNBLOCK CHV) and 4.3.5.1 (SELECT).

4.3.7.1.4   Method of test

Initial conditions:

N/A.

Test procedure:

N/A.

4.3.7.1.5   Test requirement

N/A.

4.3.7.2   Contents of the EFs at the MF level

4.3.7.2.1   Definition and applicability

The following Elementary Files are required on the UPT card at the MF level in order for a UPT session to be carried out. For each of these EFs, the correct access conditions, data items and coding need to be in place:

- EF$_{ID}$ (optional) - unique identification number of the PIM;

- EF$_{ICC}$ (optional) - chip related information;

- EF$_{DIR}$ - application identifier for UPT and its relevant path;

- EF$_{LANG}$ (optional) - codes for one or more languages;

- EF$_{NAME}$ (optional) -card holder name.

This test applies to both plug-in and ID-1 UPT cards.

4.3.7.2.2   Conformance requirement

1) The ASCII coding of the data items shall be in accordance with ISO 8859-1 [9].

2) EFs, records or data items having an unassigned value shall have their bytes and bits set to 'FF' and 1, respectively.

3) After the administrative phase, all data items shall have a defined value or have their bits set to 1.

4) All implemented EFs have a file size greater than zero shall contain all mandatory items.

5) Optional data items shall be filled with 'F', or if located at the end of the EF need not exist.

6) EF$_{ID}$ (optional) shall contain the following data items:

   - identification number;

   - date of activation;

   - card expiry date;

   - card sequence number;

   - country code.

7) EF$_{ICC}$ (optional) shall contain the following data items for bytes 1 to 15:

   - clock stop mode;

   - IC card serial number;

   - IC card manufacturing references;

   - card personalizer ID;

   - embedder/IC assembler ID.

8) EF$_{ICC}$ (optional) shall contain the following data items for bytes 16 to 19 (optional):

   - IC identifier;

   - card profile;

   - type of selection.

9) Byte 19 of EF$_{ICC}$ (optional) shall be coded such that "Selection by file ID" is supported.

10) EF$_{DIR}$ shall contain the following data items for bytes 1 to X:

- application identifier tag (shall be coded '4F');

- application identifier length;

- application identifier.

11) EF$_{DIR}$ shall contain the following data items for bytes X + 1 to Y:

- application label tag (shall be coded '50');

- application label length;

- application label (verbal description).

12) EF$_{DIR}$ shall contain the following data items for bytes Y + 1 to end:

- path tag (shall be coded '51');

- path length;

- path.

13) All "Path" data items within EF$_{DIR}$ shall be coded using the MF as the starting file ID and the file ID of the application as the ending file ID.

14) EF$_{LANG}$ (optional) shall contain the following data items for bytes 1 to 2:

- first language preference.

15) EF$_{LANG}$ (optional) shall contain the following data items for bytes 3 to 8 (optional):

- second language preference;

- third language preference;

- fourth language preference.

16) EF$_{NAME}$ (optional) shall contain the following data items for bytes 1 to X (optional):

- card holder name.

17) The coding of the "card holder name" data item in EF$_{NAME}$ shall be left justified and padded with 'FF' (optional).

Reference: ETS 300 477 [1], subclause 10.2.

Test Group Reference (TGR): TGR_PIM_CEF_MF.

Test Procedure Reference (TPR): TPR_PIM_CEF_MF.

4.3.7.2.3   Test purpose

To verify that the PIM conforms to the above requirements.

4.3.7.2.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

Test procedure:

    a)   the CAD simulator resets the PIM;

    b)   the CAD simulator gains the access condition necessary to read EF_{ID} (if necessary);

    c)   the CAD simulator sends a SELECT command to the PIM to select EF_{ID};

    d)   the CAD simulator sends a GET RESPONSE command to the PIM;

    e)   the CAD simulator sends a READ BINARY command to the PIM to read all available data bytes;

    f)   the CAD simulator sends a SELECT command to the PIM to select EF_{ICC};

    g)   the CAD simulator sends a GET RESPONSE command to the PIM;

    h)   the CAD simulator sends a READ BINARY command to the PIM to read all available data bytes;

    i)   the CAD simulator sends a SELECT command to the PIM to select EF_{DIR};

    j)   the CAD simulator sends a GET RESPONSE command to the PIM;

    k)   the CAD simulator sends a READ BINARY command to the PIM to read all available data bytes;

    l)   the CAD simulator sends a SELECT command to the PIM to select EF_{LANG};

    m)   the CAD simulator sends a GET RESPONSE command to the PIM;

    n)   the CAD simulator sends a READ BINARY command to the PIM to read all available data bytes;

    o)   the CAD simulator sends a SELECT command to the PIM to select EF_{NAME};

    p)   the CAD simulator sends a GET RESPONSE command to the PIM;

    q)   the CAD simulator sends a READ BINARY command to the PIM to read all available data bytes.

4.3.7.2.5   Test requirement

After steps e), h), k), n), and q) the data read shall conform to the requirements above.

4.3.7.3   Contents of the EFs at the UPT application level

4.3.7.3.1   Definition and applicability

The following Elementary Files are required on the UPT card at the UPT application level in order for a UPT session to be carried out. For each of these EFs, the correct access conditions, data items and coding need to be in place.

-   EF_{CT} - CT value;

-   EF_{PUI} - PUI;

-   EF_{SEQ} - sequence number n;

-   EF_{PST} (optional) - allocated and activated / disactivated services;

-   EF_{TV} - time-out value;

-   EF_{MTV} (optional) - maximum time-out value.

This test applies to both plug-in and ID-1 UPT cards.

4.3.7.3.2 Conformance requirement

1) The ASCII coding of the data items shall be in accordance with ISO 8859-1 [9].

2) EFs, records or data items having an unassigned value shall have their bytes and bits set to 'FF' and 1, respectively.

3) After the administrative phase, all data items shall have a defined value or have their bits set to 1.

4) All implemented EFs file a have size greater than zero shall contain all mandatory items.

5) Optional data items shall be filled with 'F', or if located at the end of the EF need not exist.

6) EF_{CT} shall contain the following data item for byte 1:

   - CT.

7) EF_{PUI} shall contain the following data items for bytes 1 to 9:

   - Length of PUI;

   - PUI.

8) EF_{SEQ} shall contain the following data items for bytes 1 to 8:

   - Individual sequence number.

9) EF_{PST} (optional) shall contain the following data items for bytes 1 to 4:

   - services number 1 to number 14.

10) EF_{TV} shall contain the following data items for bytes 1 to 2:

   - Number of minutes.

11) EF_{MTV} (optional) shall contain the following data items for bytes 1 to 2:

   - Number of minutes.

Reference: ETS 300 477 [1], subclause 10.3.

Test Group Reference (TGR): TGR_PIM_CEF_UPT.

Test Procedure Reference (TPR): TPR_PIM_CEF_UPT.

4.3.7.3.3 Test purpose

To verify that the PIM conforms to the above requirements.

4.3.7.3.4 Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator selects DF_{UPT} as defined in subclause 4.4;

c) the CAD simulator sends a SELECT command to the PIM to select EF_{CT};

d) the CAD simulator sends a GET RESPONSE command to the PIM;

e) the CAD simulator sends READ BINARY commands to the PIM to read all available data bytes;

f) the CAD simulator sends a SELECT command to the PIM to select EF_{PUI};

g) the CAD simulator sends a GET RESPONSE command to the PIM;

h) the CAD simulator sends a READ BINARY command to the PIM to read all available data bytes;

i) the CAD simulator sends a SELECT command to the PIM to select EF_{SEQ};

j) the CAD simulator sends a GET RESPONSE command to the PIM;

k) the CAD simulator sends a READ BINARY command to the PIM to read all available data bytes;

l) the CAD simulator sends a SELECT command to the PIM to select EF_{PST};

m) the CAD simulator sends a GET RESPONSE command to the PIM;

n) the CAD simulator sends a READ BINARY command to the PIM to read all available data bytes;

o) the CAD simulator sends a SELECT command to the PIM to select EF_{TV};

p) the CAD simulator sends a GET RESPONSE command to the PIM;

q) the CAD simulator sends a READ BINARY command to the PIM to read all available data bytes;

r) the CAD simulator sends a SELECT command to the PIM to select EF_{MTV};

s) the CAD simulator sends a GET RESPONSE command to the PIM;

t) the CAD simulator sends a READ BINARY command to the PIM to read all available data bytes.

4.3.7.3.5　Test requirement

After steps e), h), k), n), q) and t) the data read shall conform to the requirements above.

4.3.7.4　Contents of the EFs at the telecom level

4.3.7.4.1　Definition and applicability

The following Elementary Files are required on the UPT card at the (optional) telecom level in order for a UPT session to be carried out. For each of these EFs, the correct access conditions, data items and coding need to be in place:

- EF_{ADN} (optional) - Abbreviated dialling numbers;

- EF_{LND} (optional) - Last number dialled, if it was dialled by the DTMF device;

- EF_{EXT1} (optional) - Extension data of an ADN.

This test applies to both plug-in and ID-1 UPT cards.

4.3.7.4.2　Conformance requirement

1) The ASCII coding of the data items shall be in accordance with ISO 8859-1 [9].

2) EFs, records or data items having an unassigned value shall have their bytes and bits set to 'FF' and 1, respectively.

3) After the administrative phase, all data items shall have a defined value or have their bits set to 1.

4) All implemented EFs have a file size greater than zero shall contain all mandatory items.

5) Optional data items shall be filled with 'F', or if located at the end of the EF need not exist.

6) EF_{ADN} (optional) shall contain the following data items for each record (X+14 bytes) for bytes1 to X (optional):

- Alpha identifier.

7) EF$_{ADN}$ (optional) shall contain the following data items for each record (X+14 bytes) for bytes X to X+14:

   - Length of BCD number;

   - Type of number and Numbering Plan Identifier;

   - Dialling number;

   - Extension 1 record identifier.

8) EF$_{LND}$ (optional) shall contain the following data items for each record (X+14 bytes) for bytes 1 to X (optional):

   - Alpha identifier.

9) EF$_{LND}$ (optional) shall contain the following data items for each record (X+14 bytes) for bytes X to X+14:

   - Length of BCD number;

   - Type of number and Numbering Plan Identifier;

   - Dialling number;

   - Extension 1 record identifier.

10) EF$_{EXT1}$ shall contain the following data items for each record (13 bytes):

   - Record type;

   - Extension data;

   - Identifier.

Reference: ETS 300 477 [1], subclause 10.4.

Test Group Reference (TGR): TGR_PIM_CEF_TEL.

Test Procedure Reference (TPR): TPR_PIM_CEF_TEL.

4.3.7.4.3   Test purpose

To verify that the PIM conforms to the above requirements.

4.3.7.4.4   Method of test

Initial conditions:

1) The PIM is connected to a CAD simulator.

Test procedure:

a) the CAD simulator resets the PIM;

b) the CAD simulator selects DF$_{TELECOM}$ as defined in subclause 4.4;

c) the CAD simulator gains the access condition necessary to read EF$_{ADN}$, EF$_{LND}$ and EF$_{EXT1}$;

d) the CAD simulator sends a SELECT command to the PIM to select EF$_{ADN}$;

e) the CAD simulator sends a GET RESPONSE command to the PIM;

f) the CAD simulator sends READ RECORD commands to the PIM to read all data in all the records. The record length is X+14 bytes;

g) the CAD simulator sends a SELECT command to the PIM to select EF$_{LND}$;

h) the CAD simulator sends a GET RESPONSE command to the PIM;

i)   the CAD simulator sends a READ RECORD commands to the PIM to read all data in all the records. The record length is X+14 bytes;

j)   the CAD simulator sends a SELECT command to the PIM to select EF$_{EXT1}$;

k)   the CAD simulator sends a GET RESPONSE command to the PIM;

l)   the CAD simulator sends a READ RECORD commands to the PIM to read all data in all the records. The record length is 13 bytes.

4.3.7.4.5   Test requirement

After steps f), i) and l) the data read shall conform to the requirements above.

5   UPT Card Accepting Device part

5.1   Test environment

This subclause specifies several requirements and which shall be met, and a number of rules which shall be adhered to before testing can proceed.

5.1.1   Test equipment

This subclause provides a minimum specification for each of the items of test equipment referenced in the tests.

5.1.1A   PIM simulator

This item of equipment shall allow T = 0 protocol communications to take place with any CAD. It shall be able to generate any response APDU and receive any of the possible commands. These responses may be generated manually, one at a time, or automatically from a predefined batch procedure containing one or more commands.

It shall be possible to access all of the CAD contacts either directly or through test points.

5.1.2   IUT default conditions

Unless otherwise stated, the following is default:

Not applicable.

5.1.3   Default data formatting

All numeric data enclosed in single quotes (') in this subclause is hexadecimal data.

Where "X" is used in place of a hexadecimal digit, X ranges from "0" to "F". For example, the data '6X' ranges from '60' to '6F' inclusive.

Where data is expressed as a group of bytes, it shall be in the following format: 'XX XX XX... XX', indicating first byte, second byte, third byte etc. in that order.

In some subclauses containing tests with CHV values and time out values, numeric data are used for enter them in the CAD by the keyboard or to calculate some seconds to wait for a new action. These data are enclosed in double quotes (").

5.1.4   Test procedure

The following statements are applicable to the Test Procedure clause for all test purposes contained within this subclause:

- unless otherwise stated, all steps with the test procedure are to be carried out in order;

- where steps indicate that a CAD shall select a particular DF or EF using an unspecified number SELECT commands, the CAD is to send the correct sequence of SELECT commands in order to select the required file ID from the current file ID;

- unless otherwise stated, the length (P3) for all READ RECORD and UPDATE RECORD commands sent by the CAD is to be that of the length of the EF currently selected. In the case where an EF is not currently selected, the length sent is to be 1 unless otherwise stated;

- unless otherwise stated, the offset for all READ BINARY, UPDATE BINARY and SEEK commands sent by the CAD is to be '00 00';

- unless otherwise stated, the length (P3) for GET RESPONSE command sent by the CAD is to be such that all available data is read.

5.1.5   Test Requirement

Where steps within a test procedure involve a CAD sending one or more commands to the PIM simulator, these commands are required to be correct unless otherwise stated in the Test Requirements clause for the test.

5.2   Test group hierarchy

This subclause contains the test group hierarchy diagrams which provide a structure for the test purposes and also a correlation between the base specification and the present document.

The information contained in each node for each of the diagrams is as follows.

mnemonic for test group
reference to subclause in test specification

As the test group hierarchy for the UPT is large, it has been broken into subclauses to aid presentation.

5.2.1   Test groups under CAD
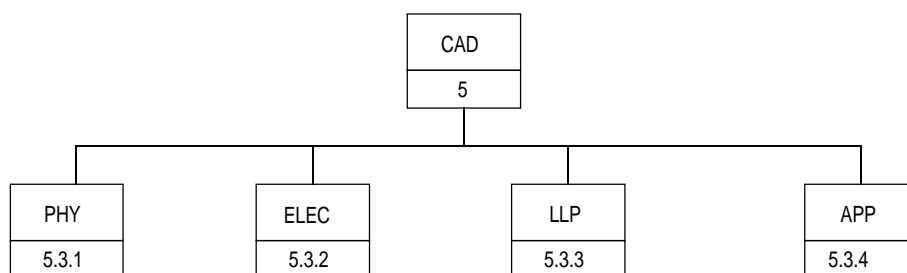
Figure 8: Top level test group hierarchy

The mnemonics chosen for this test group are as follows:

- PHY: Physical characteristics - ETS 300 477 [1], clause 4;

- ELEC: Electronic signals - ETS 300 477 [1], clause 5;

- LLP: Low Level Protocol - ETS 300 477 [1], clauses 4, 5 and 6;

- APP: Application Protocol - ETS 300 477 [1], clause 11.

The test groups, "ELEC", shown in figure 1, are broken down further, as shown in the following figures.

5.2.2   Test groups under ELEC

```
                    ┌──────────┐
                    │   ELEC   │
                    ├──────────┤
                    │   5.3.2  │
                    └──────────┘
            ┌───────────┼───────────┐
     ┌──────────┐  ┌──────────┐  ┌──────────┐
     │   PTP    │  │   CNCT   │  │   SGN    │
     ├──────────┤  ├──────────┤  ├──────────┤
     │  5.3.2.1 │  │  5.3.2.2 │  │  5.3.2.3 │
     └──────────┘  └──────────┘  └──────────┘
```
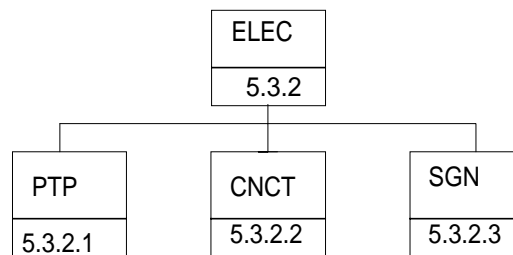
Figure 9: Breakdown of "ELEC" test group

The mnemonics chosen for this test group are as follows:

- PTP: Power Transition Phase - ETS 300 477 [1], subclause 4.3.2;

- CNCT: Contact : Supply voltage Vcc (contact C1) - ETS 300 477 [1], subclause 5.1;

    Reset RST (contact C2) - ETS 300 477 [1], subclause 5.2;

    Clock CLK (contact C3) - ETS 300 477 [1], subclause 5.3;

    I/O (contact C7) - ETS 300 477 [1], subclause 5.5;

- SGN: Electronic signal - ETS 300 477 [1], subclause 5.

5.2.3   Test groups under APP

```
                              ┌──────────┐
                              │   APP    │
                              ├──────────┤
                              │   5.3.4  │
                              └──────────┘
   ┌───────┬───────┬───────┬──────┼───────┬───────┬───────┐
┌──────┐┌──────┐┌──────┐┌──────┐┌──────┐┌──────┐┌──────┐
│  GP  ││ PIM  ││ CHV  ││ SEC  ││ GTP  ││ GIP  ││ ERR  │
├──────┤├──────┤├──────┤├──────┤├──────┤├──────┤├──────┤
│5.3.4.1││5.3.4.2││5.3.4.3││5.3.4.4││5.3.4.5││5.3.4.6││5.3.4.7│
└──────┘└──────┘└──────┘└──────┘└──────┘└──────┘└──────┘
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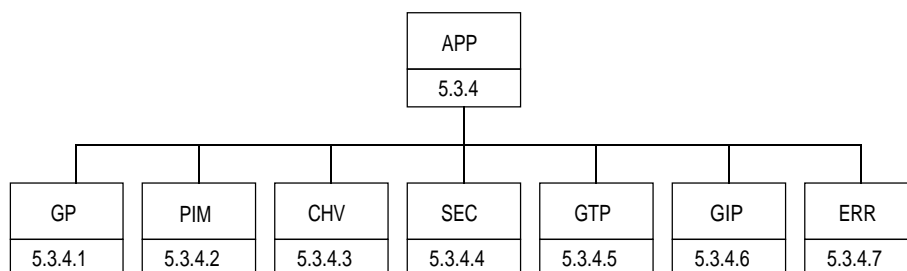
Figure 10: Breakdown of "APP" test group

The mnemonics chosen for this test group are as follows:

- GP: General Procedures - ETS 300 477 [1], subclause 11.1;

- PIM: PIM management procedures - ETS 300 477 [1], subclause 11.2;

- CHV: CHV related procedures - ETS 300 477 [1], subclause 11.3;

- SEC: Security related procedures - ETS 300 477 [1], subclause 11.4;

- GTP: General Telecom Procedures - ETS 300 477 [1], subclause 11.5;

- GIF: General Information Procedures - ETS 300 477 [1], subclause 11.6;

- ERR: Error behaviour - ETS 300 477 [1].

5.3   Test procedure

This subclause details each of the tests in each of the test groups within the Test Group Hierarchy. This test suite allows testing of the IUT against the base specification with respect to:

a) mechanical characteristics;

b) electrical characteristics;

c) low level protocols;

d) application protocols.

A PIM simulator will be required.

Due to the likely difficulty of accessing the terminals of the PIM/CAD interface for the purposes of measurements, the CAD manufacturer may provide a test interface in order to carry out the tests.

To perform the logical tests, PIMs programmed with specific data may be used. The PIM data is not defined within the initial conditions of the tests unless it differs from the default values defined below.

5.3.1   Physical characteristics

5.3.1.1   Accept ID-1 size cards

5.3.1.1.1   Definition and applicability

The acceptance by the CAD of the ID-1 card which format and layout is in accordance with ISO/IEC 7816-1 [2] and ISO/IEC 7816-2 [3].

5.3.1.1.2   Conformance requirement

1) The CAD shall accept ID-1 card.

Reference: ETS 300 477 [1], subclause 4.3.3.

Test Group Reference (TGR): TGR_CAD_PHY.

Test Procedure Reference (TPR): TPR_CAD_PHY_ID1.

5.3.1.1.3   Test purpose

To verify that the insertion of an ID-1 card is possible without any excessive pressure and without damaging the card.

5.3.1.1.4   Method of test

Initial conditions

1) The CAD manufacturers shall provide a separate card reader (mechanical components) to make the measurement possible.

Test procedure

a) Insert the ID-1 card.

5.3.1.1.5   Test requirement

1) After step a), the CAD shall accept the card without using excessive force and without damaging the card.

5.3.1.2   Accept Plug-in size cards

5.3.1.2.1   Definition and applicability

The acceptance by the CAD of the plug-in size card which format and layout is in accordance with the standard requirement.

5.3.1.2.2   Conformance requirement

1) The CAD shall accept Plug-in card.

Reference: ETS 300 477 [1], subclause 4.3.3.

Test Group Reference (TGR): TGR_CAD_PHY.

Test Procedure Reference (TPR): TPR_CAD_PHY_PLUG.

5.3.1.2.3   Test purpose

To verify that the insertion of a Plug-in card is possible without any excessive pressure and without damaging the card.

5.3.1.2.4   Method of test

Initial conditions

1) The CAD manufacturers shall provide a separate card reader (mechanical components) to make the measurement possible.

Test procedure

a) Insert the Plug-in card.

5.3.1.2.5   Test requirement

1) After step a), the CAD shall accept the card without using excessive force and without damaging the card.

5.3.1.3   Accept embossed ID-1 size cards

5.3.1.3.1   Definition and applicability

The acceptance by the CAD of the embossed ID-1 card which format and layout is in accordance with
ISO/IEC 7811-1 [6] and ISO/IEC 7811-3 [7] and which the contact are located on the embossed face of the card.

5.3.1.3.2   Conformance requirement

1) The CAD shall accept embossed ID-1 card.

Reference: ETS 300 477 [1], subclause 4.3.3.

Test Group Reference (TGR): TGR_CAD_PHY.

Test Procedure Reference (TPR): TPR_CAD_PHY_ID1E.

5.3.1.3.3   Test purpose

To verify that the insertion of an embossed ID-1 card is possible without any excessive pressure and without damaging the card.

5.3.1.3.4 Method of test

Initial conditions

1) The CAD manufacturers shall provide a separate card reader (mechanical components) to make the measurement possible.

Test procedure

a) Insert the embossed ID-1 card.

5.3.1.3.5 Test requirement

1) After step a), the CAD shall accept the card without using excessive force and without damaging the card.

5.3.1.4 Provision of contacts

5.3.1.4.1 Definition and applicability

The shape, robustness and provision of contacts shall be adhered to, in order to maintain good electrical contact with the PIM, ensuring proper operation in the UPT environment.

5.3.1.4.2 Conformance requirement

1) Contact C4 shall be provided (optional).

2) Contact C6 shall be provided (optional).

3) Contact C8 shall be provided (optional).

Reference: ETS 300 477 [1], subclause 4.3.1.

Test Group Reference (TGR): TGR_CAD_PHY.

Test Procedure Reference (TPR): TPR_CAD_PHY_CNT.

5.3.1.4.3 Test purpose

To verify that the CAD conforms to the above requirements.

NOTE: As the contacts specified in CR1, CR2 and CR3 are optional, the tests specified here shall only be performed on those contacts when the contacts are present.

5.3.1.4.4 Method of test

Initial conditions:

None.

Test procedure

a) The CAD is connected to a PIM simulator;

b) the CAD resets the PIM.

5.3.1.4.5 Test requirement

1) After step b), the PIM shall have been reset successfully.

5.3.1.5   Contacts

5.3.1.5.1   Definition and applicability

The shape, robustness and provision of contacts is in accordance with ISO/IEC 7816-2 [3].

5.3.1.5.2   Conformance requirement

1) The provision of contacts is in accordance with ISO/IEC 7816-2 [3].

Reference: ETS 300 477 [1], subclause 4.3.

Test Group Reference (TGR): TGR_CAD_PHY.

Test Procedure Reference (TPR): TPR_CAD_PHY_PCNT.

5.3.1.5.3   Test purpose

To verify that the CAD conforms to the above requirements.

5.3.1.5.4   Method of test

Initial conditions:

None.

Test procedure

a) the CAD is connected to a PIM simulator.

5.3.1.5.5   Test requirement

1) All acceptable cards shall be insertable and each of the contacts of the card shall be connected to the corresponding one of the CAD.

5.3.1.6   Contact pressure

5.3.1.6.1   Definition and applicability

The contacts of the card reader shall exert a force to maintain a good electrical contact, but the force shall not be excessive and damage the PIM.

5.3.1.6.2   Conformance requirement

1) A contact force may not be greater than 0,5 N per contact.

Reference: ETS 300 477 [1], subclause 4.3.3.

Test Group Reference (TGR): TGR_CAD_PHY.

Test Procedure Reference (TPR): TPR_CAD_PHY_PRES.

5.3.1.6.3   Test purpose

To verify that the contact pressure of each contacting element is not greater than 0,5 N when each of the following types of card is used:

i) Unembossed;

ii) Embossed on the contact side;

NOTE: Only type i) applies to the plug-in PIM.

5.3.1.6.4   Method of test

Initial conditions

1) The CAD manufacturers shall provide a separate card reader (mechanical components) to make the measurement possible.

Test procedure

a) The pressure of each contacting element is measured.

5.3.1.6.5   Test requirement

1) After step a), the contact pressure of each contacting element shall be not greater than 0,5 N.

5.3.1.7   Shape of contacts for IC card PIM card reader

5.3.1.7.1   Definition and applicability

The shape of the contacts is important to maintain a good electrical contact, but not damage the PIM.

5.3.1.7.2   Conformance requirement

1) The radius of curvature of the contacting elements shall be greater than or equal to 0,8 mm in the contact area of both axes.

Reference: ETS 300 477 [1], subclause 4.3.3.

Test Group Reference (TGR): TGR_ CAD_PHY.

Test Procedure Reference (TPR): TPR_ CAD_PHY_SHAPE.

5.3.1.7.3   Test purpose

To verify that the radius of curvature of the contacting elements is greater than or equal to 0,8 mm in the contact area on both axes.

5.3.1.7.4   Method of test

Initial conditions

1) The CAD manufacturers shall provide a separate card reader (mechanical components) to make the measurement possible.

Test procedure

a) The radius of curvature of the contacting elements is measured on both axes.

5.3.1.7.5   Test requirement

1) After step a), the radius of curvature of the contacting elements shall be greater than or equal to 0,8 mm in the contact area on both axes.

5.3.2   Electrical tests

This subclause lists the electrical tests to be performed to test the electrical characteristics of the PIM/CAD interface. They include:

   i)   tests during activation and deactivation phases; and

   ii) tests to be performed on each contact in both static and dynamic states: e.g. voltages, currents and signal characteristics.

The measurement conventions are specified in ISO/IEC 7816-3 [4] subclause 4.2.1.

5.3.2.1   Test of the power transition phases

5.3.2.1.1   Phase during PIM power on

5.3.2.1.1.1   Definition and applicability

When the CAD is switched on, the contacts shall be activated in a defined sequence in order to prevent any damage to the PIM.

The timing of this sequence is not defined, a measurement resolution better than or equivalent to 100 ns is assumed.

5.3.2.1.1.2   Conformance requirement

   1)   When the CAD is powered on, the contacts of the PIM/CAD interface shall be activated in the following order:

   -   RST in state L;

   -   Vcc powered;

   -   I/O (PP) in reception mode;

   -   clock signal provided with a suitable and stable clock.

   2)   When Vpp is connected to Vcc, as allowed by ETS 300 477 [(subclauses 4.3.2 and 5.3), then Vpp is activated together with Vcc, at the time of Vcc (step 2 in the sequence above).

Reference: ETS 300 477 [1], subclause 4.3.2.

Test Group Reference (TGR): TGR_ CAD_ELEC_PTP.

Test Procedure Reference (TPR): TPR_ CAD_ELEC_PTP_PIM.

5.3.2.1.1.3   Test purpose

To verify that the contacts of the PIM/CAD interface are activated in the correct order, as described in the conformance requirement.

5.3.2.1.1.4   Method of test

Initial condition

   1)   The CAD is connected to a PIM simulator.

Test procedure

   a)   The CAD is powered on;

   b)   the verification of each activation procedure starts with the first contact leaving the inactive state. The PIM/CAD interface is monitored until it is fully activated.

5.3.2.1.1.5   Test requirement

1) The contacts of the PIM/CAD interface shall be activated in the correct order, as described in the conformance requirement.

5.3.2.1.2   Phase during CAD power off with clock stop forbidden

5.3.2.1.2.1   Definition and applicability

When the CAD is "normal" powered down, the contacts shall be deactivated in a defined sequence in order to prevent any damage to the PIM.

The timing of this sequence is not defined, a measurement resolution better than or equivalent to 100 ns is assumed.

NOTE: If during CAD operation the PIM is physically removed it is impractical to ensure correct sequencing of deactivation and the possible damage to the PIM cannot be safeguarded by a test. Furthermore, in this situation the integrity of PIM data is not guaranteed.

5.3.2.1.2.2   Conformance requirement

1) When the PP is powered down, the contacts of the PIM/CAD interface shall be deactivated in the following order:

   - RST at low state;

   - clock stopped at low state;

   - Vpp inactive;

   - I/O at state A;

   - Vcc inactive.

Reference: ETS 300 477 [1], subclause 4.3.2.

Test Group Reference (TGR): TGR_ CAD_ELEC_PTP.

Test Procedure Reference (TPR): TPR_ CAD_ELEC_PTP_CAD.

5.3.2.1.2.3   Test purpose

To verify that the contacts of the PIM/CAD interface become deactivated in the correct order, as given in the conformance requirement.

5.3.2.1.3.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator.

2) The file characteristics of the directories (byte 14 of STATUS information) shall indicate clock stop allowed.

Test procedure

a) The CAD is powered off;

b) the CAD/PIM interface is monitored until it is fully deactivated.

5.3.2.1.2.5   Test requirement

1) The contacts of the PIM/CAD interface shall be deactivated in the correct order, as given in the conformance requirement.

5.3.2.1.3   Phase during PP power off with clock stop allowed

5.3.2.1.3.1   Definition and applicability

When the CAD is powered off the contacts shall be deactivated in a defined sequence in order to prevent any damage to the PIM.

The timing of this sequence is not defined, a measurement resolution better than or equivalent to 100 ns is assumed.

> NOTE: If during CAD operation the PIM is physically removed it is impractical to ensure correct sequencing of deactivation and the possible damage to the PIM cannot be safeguarded by a test. Furthermore, in this situation the integrity of the PIM data is not guaranteed.

5.3.2.1.3.2   Conformance requirement

1) Depending on the state of the clock at the time of deactivation, the contacts of the PIM/CAD shall be deactivated in one of two ways.

2) If the clock is running, the contacts of the PIM/CAD interface shall be deactivated in the following order:

   - RST at low level;

   - Clock stopped at low level;

     I/O at status A;

   - Vcc inactive.

3) If the clock is stopped and is not restarted, the CAD is allowed to deactivate all the contacts in any order, provided that all signals reach low level before Vcc leaves high level.

Reference: ETS 300 477 [1], subclause 4.3.2.

Test Group Reference (TGR): TGR_ CAD_ELEC_PTP.

Test Procedure Reference (TPR): TPR_ CAD_ELEC_PTP_PP.

5.3.2.1.3.3   Test purpose

To verify that, depending on the state of the clock (running or stopped), the contacts of the PIM/CAD interface become deactivated in the correct order, as given in the conformance requirement.

5.3.2.1.3.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator.

2) The file characteristics of the directories (byte 14 of STATUS information) shall indicate that clock stop is allowed.

Test procedure

a) The CAD is powered off;

b) the PIM/CAD interface is monitored until it is fully deactivated.

5.3.2.1.3.5   Test requirement

1) During step b), the contacts of the PIM/CAD interface shall be deactivated in the correct order, as given in the conformance requirements.

5.3.2.2   Electrical tests on each CAD contact

The electrical values, as given in the following tables, shall apply to all contacts, other than that under test. [Testing at extreme conditions to be defined].

Table 1: Nominal conditions on 5V PIM/CAD interface

Contacts	Low level	High level	Max capacitive load from test equipment
C1 (Vcc)	V = 5V ± 10 % I = 10 mA		
C2 (RST)	0 V ≤ V ≤ 0,6 V I = -200µA	Vcc - 0,7 V ≤ V ≤ Vcc I = +20µA	30 pF
C3 (CLK)	0 V ≤ V ≤ 0,6 V I = -200µA	0,7 V x Vcc ≤ V ≤ Vcc I = +20µA	30 pF
C5 (GND)	0 V	0 V	
C6 (Vpp)		5 V ± 10 %	
I	0 V ≤ V ≤ 0,8 V I = +1mA	0,7 x Vcc ≤ V ≤ Vcc I = ± 20µA	30 pF
C7 (I/O) O	0 V ≤ V ≤ 0,4 V I = -1mA	3,8 V ≤ V ≤ Vcc	I = +20µA

NOTE 1: The reference point of all measurements is the contact C5 (Ground).

NOTE 2: Currents flowing into the PIM are considered positive.

5.3.2.2.1   Electrical tests on VCC (contact C1)

C1 = Card power supply (Vcc).

5.3.2.2.1.1   Test 1

5.3.2.2.1.1.1   Definition and applicability

When the CAD is activated, the supply voltage on the PIM/CAD interface shall remain in the specified range in order to ensure correct operation and to prevent any damage to the PIM.

5.3.2.2.1.1.2   Conformance requirement

1) The voltage on contact C1 of the PIM/CAD interface shall be 5V ± 10 % for Icc up to 10 mA.

Reference: ETS 300 477 [1], subclause 5.1.

Test Group Reference (TGR): TGR_ CAD_ELEC_CNCT.

Test Procedure Reference (TPR): TPR_ CAD_ELEC_CNCT_VCC_T1.

5.3.2.2.1.1.3   Test purpose

To verify that the CAD keeps the voltage on contact C1 of the PIM/CAD interface within the ranges specified in the conformance requirements.

5.3.2.2.1.1.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator.

2) The PIM activation sequence is completed, and a deactivation sequence has not started.

3) The remaining contacts of the PIM/CAD interface are in nominal test conditions (See table 1).

Test Procedure

a) The voltage of contact C1 (Vcc) of the PIM/CAD interface is measured.

5.3.2.2.1.1.5   Test requirement

1) After step a), the voltage on contact C1 of the PIM/CAD interface shall be within the ranges specified in the conformance requirements.

5.3.2.2.1.2   Test 2

5.3.2.2.1.2.1   Definition and applicability

When the CAD is activated, the supply voltage on the PIM/CAD interface shall be able to counteract spikes in the current consumption of the PIM up to the limits given in the conformance requirement, ensuring that the supply voltage stays in the specified range.

5.3.2.2.1.2.2   Conformance requirement

1) The voltage on contact C1 of the PIM/CAD interface shall be 5V ± 10 % for spikes in the current consumption with a maximum charge of 40 nAs with no more than 400 ns duration and an amplitude of at most 200 mA.

Reference: ETS 300 477 [1], subclause 5.1.

Test Group Reference (TGR): TGR_ CAD_ELEC_CNCT.

Test Procedure Reference (TPR): TPR_ CAD_ELEC_CNCT_VCC_T2.

5.3.2.2.1.2.3   Test purpose

To verify that the CAD keeps the voltage on contact C1 of the PIM/CAD interface within the specified range for the conditions given in the conformance requirement.

5.3.2.2.1.2.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator.

2) The PIM activation sequence is completed and a deactivation sequence has not begun.

3) The remaining contacts of the PIM/CAD interface are held in nominal test condition (See table 1).

Test procedure

a) The voltage on contact C1 of the PIM/CAD interface is monitored and the following current spikes are applied:

1) continuous spikes:

- current amplitude 20 mA;

- current offset 0 mA;

- duration 100 ns;

- pause 100 ns.

2) continuous spikes:

- current 20 mA;

- current offset 0 mA;

- duration 400 ns;

- pause 400 ns.

3) continuous spikes:

- current amplitude 15 mA;

- current offset 5 mA;

- (i.e. maximum amplitude = 5 mA + 15 mA = 20 mA;

- duration 150 ns;

- pause 300 ns.

4) random spikes:

- current amplitude 200 mA;

- current offset 5 mA;

- duration 200 ns;

- pause between 0,1 ms and 500 ms, randomly varied.

5) random spikes:

- current amplitude 100 mA;

- current offset 0 mA;

- duration 400 ns;

- pause between 0,1 ms and 500 ms, randomly varied.

6) random spikes:

- current amplitude 195 mA;

- current offset 5mA;

- (i.e. maximum amplitude = 5 mA + 195 mA = 200 mA;

- duration 200 ns;

- pause between 0,1 ms and 500 ms, randomly varied.

NOTE: The specified spike durations are measured at 50 % of the spike amplitude.

5.3.2.2.1.2.5   Test requirement

1) During step a), the voltage on contact C1 of the PIM/CAD interface shall be within the ranges specified in the conformance requirements.

5.3.2.2.2   Electrical tests on RST (contact C2)

C2 = Reset (RST).

5.3.2.2.2.1 Definition and applicability

When the CAD is activated, the voltage on contact C2 of the PIM/CAD interface shall remain in the specified range in order to ensure correct operation and to prevent any damage to the PIM.

5.3.2.2.2.2 Conformance requirement

1) The voltage on contact C2 (RST) of the PIM/CAD interface shall be between -0,3 V and +0,6 V for a current of -200 µA in low state and between 3,8 V and Vcc + 0,3 V for a current of +20 µA in high state.

2) t_R and t_F not exceeding 400 µS, with C_{out} and C_{in} equal to 30 pF.

Reference: ETS 300 477 [1], subclause 5.2.

Test Group Reference (TGR): TGR_ CAD_ELEC_CNCT.

Test Procedure Reference (TPR): TPR_ CAD_ELEC_CNCT_RST.

5.3.2.2.2.3 Test purpose

To verify that the CAD keeps the voltage on contact C2 (RST) of the PIM/CAD interface within the specified range, as given in the conformance requirement.

5.3.2.2.2.4 Method of test

Initial condition

1) The CAD is connected to a PIM simulator.

2) The PIM activation sequence is completed and a deactivation sequence has not started.

3) The remaining contacts of the PIM/CAD interface are held in nominal test conditions (See table 1).

4) the capacitance, C_{out} and C_{in}, of RST (contact C2) is measured to be 30 pF.

Test procedure

a) The voltage on contact C2 (RST) of the PIM/CAD interface is measured.

5.3.2.2.2.5 Test requirement

1) After step a), the voltage on contact C2 (RST) of the PIM/CAD interface shall be within the range specified in the conformance requirement.

5.3.2.2.3 Electrical tests on CLK (contact C3)

C3 = Clock (CLK).

5.3.2.2.3.1 Definition and applicability

When the CAD is activated, the voltage, the rise/fall time of the signal, the clock cycle ratio and the frequency on contact C3 of the PIM/CAD interface shall remain in the specified range in order to ensure correct operation and to prevent any damage to the PIM.

5.3.2.2.3.2 Conformance requirement

1) The voltage on contact C3 (CLK) of the PIM/CAD interface shall be between -0,3 V and +0,5 V for a current of -200 µA in low state and between 3,15 V and Vcc +0,3 V for a current of +20 µA in high state.

Reference: ETS 300 477 [1], subclause 5.4.

Test Group Reference (TGR): TGR_ CAD_ELEC_CNCT.

Test Procedure Reference (TPR): TPR_ CAD_ELEC_CNCT_CLK.

5.3.2.2.3.3   Test purpose

To verify that the CAD keeps the voltage, the rise and fall time, the cycle ratio and the frequency on contact C3 (CLK) of the PIM/CAD interface within the ranges specified in the conformance requirements.

5.3.2.2.3.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator.

2) The activation sequence of the PIM is completed and a deactivation sequence has not started.

3) The remaining contacts of the PIM/CAD interface are held in nominal test conditions (See table 1).

Test procedure

a) The voltage, the rise/fall time, the clock cycle ratio and the frequency on contact C3 (CLK) of the PIM/CAD interface are measured.

5.3.2.2.3.5   Test requirement

1) After step a), the voltage, the rise and fall time, the cycle ratio and the frequency on contact C3 (CLK) of the PIM/CAD interface shall be within the ranges specified in the conformance requirements.

5.3.2.2.4   Electrical tests on I/O (contact C7)

C7 = Input - output (I/O).

5.3.2.2.4.1   Definition and applicability

When the CAD is activated, the CAD shall keep the voltage, the current and the rise/fall time of the signal on contact C7 of the PIM/CAD interface within the specified range in order to ensure correct operation and to prevent any damage to the PIM.

5.3.2.2.4.2   Conformance requirement

1) CAD receiving state A (low state):

   - With an imposed voltage of 0 V the current flowing out of the CAD shall not exceed 1 mA.

2) CAD transmitting state A (low state):

   - The voltage shall be between -0,3 V and 0,4 V when a current of 1 mA flowing into the CAD is applied.

3) CAD transmitting or receiving state Z (high state):

   - The voltage shall be between -3,8 V and Vcc +0,3 V when a current of 20 μA flowing out of the CAD is applied.

4) The rise time and the fall time of the I/O signal shall not exceed 1 μs.

Reference: ETS 300 477 [1], subclause 5.5.

Test Group Reference (TGR): TGR_ CAD_ELEC_CNCT.

Test Procedure Reference (TPR): TPR_ CAD_ELEC_CNCT_IO.

5.3.2.2.4.3   Test purpose

To verify that the CAD keeps the voltage, the current and the rise and fall times of the signal on contact C7 (I/O) of the PIM/CAD interface within the ranges specified in the conformance requirements.

5.3.2.2.4.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator.

2) The PIM activation sequence is completed and a deactivation sequence has not started.

3) The remaining contacts of the PIM/CAD interface are held in nominal test conditions. (See table above)

Test procedure

a) The voltage, the current and the rise/fall time on contact C7 (I/O) of the PIM/CAD interface are measured.

5.3.2.2.4.5   Test requirement

1) After step a), the voltage, the current and the rise and fall times of the signal on contact C7 (I/O) of the PIM/CAD interface shall be within the ranges specified in the conformance requirements.

5.3.2.3   Electronic signal and transmission protocol

5.3.2.3.1   Definition and applicability

The CAD shall adhere to the electronic signals and transmission protocols defined in ETS 300 477 [1] and ISO/IEC 7816-3 [4] to ensure proper operation in the UPT environment.

5.3.2.3.2   Conformance requirement

1) Electronic signals and transmission protocols shall be in accordance with ISO/IEC 7816-3 [4] unless otherwise specified.

2) The choice of the transmission protocol(s), to be used to communicate between the CAD and the PIM, shall at least include that specified and denoted by T = 0 in ISO/IEC 7816-3 [4].

3) The baud rate for all communications shall be: (clock frequency) / 372.

Reference: ETS 300 477 [1], clause 5, subclauses 5.7, and 5.9.

Test Group Reference (TGR): TGR_CAD_ELEC_SGN.

Test Procedure Reference (TPR): TPR_CAD_ELEC_SGN.

5.3.2.3.3   Test purpose

To verify that the CAD conforms to the above requirements.

   NOTE: The testing of CR1, CR2, CR3, CR4 is outside the scope of the present document. Please refer to the test specification for ISO/IEC 7816-3 [4].

5.3.2.3.4   Method of test

Initial conditions

N/A.

Test procedure

N/A.

5.3.2.3.5   Test requirement

N/A.

5.3.3   Low level protocol tests

5.3.3.1   Character transmission

5.3.3.1.1   Error handling during the transmission from the CAD to the PIM simulator

5.3.3.1.1.1   Definition and applicability

Error checking is done for each character transmitted by making use of the parity bit. If the PIM detects a parity error, an error signal is sent to the CAD, and the CAD retransmits that character.

5.3.3.1.1.2   Conformance requirement

1) Subsequent to Answer to Reset and the protocol type selection, the error detection and character repetition procedure specified in ISO/IEC 7816-3 [4] is mandatory for transmission on the basis of T = 0: on receipt of an error signal, the CAD shall repeat the previously transmitted character.

Reference: ETS 300 477 [1], subclause 5.9.

Test Group Reference (TGR): TGR_ CAD_LLP.

Test Procedure Reference (TPR): TPR_ CAD_LLP_TOPIM.

5.3.3.1.1.3   Test purpose

To verify the error handling during the transmission from the CAD to the PIM.

5.3.3.1.1.4   Method of test

Initial conditions

1) The CAD is connected to the PIM simulator, and powered on.

Test procedure

a) The PIM simulator shall transmit an error signal in response to a received character in accordance with ISO/IEC 7816-3 [4], subclause 6.1.3.

5.3.3.1.1.5   Test requirement

1) After step a), the CAD shall repeat the character in accordance with ISO/IEC 7816-3 [4], subclause 6.1.3.

5.3.3.1.2   Error handling during transmission from the PIM simulator to the CAD

5.3.3.1.2.1   Definition and applicability

Error checking is done for each character transmitted by making use of the parity bit. If the CAD detects a parity error, an error signal is sent to the PIM, and the PIM retransmits that character.

5.3.3.1.2.2   Conformance requirement

1) Subsequent to Answer to Reset and the protocol type selection, the error detection and character repetition procedure specified in ISO/IEC 7816-3 [4] is mandatory for transmission on the basis of T = 0: on receipt of a response with a parity error, the CAD shall send an error signal and expect the previously transmitted character to be repeated.

Reference: ETS 300 477 [1], subclause 5.9.

Test Group Reference (TGR): TGR_ CAD_LLP.

Test Procedure Reference (TPR): TPR_ CAD_LLP_TOCAD.

5.3.3.1.2.3 Test purpose

To verify the error handling during the transmission from the PIM to the CAD.

5.3.3.1.2.4 Method of test

Initial conditions

1) The CAD is connected to the PIM simulator, and powered on.

Test procedure

a) The PIM simulator shall send a response with a parity error and check that the CAD performs error handling in accordance with ISO/IEC 7816-3 [4] subclause 6.1.3.

5.3.3.1.2.5 Test requirement

1) After step a), the CAD shall send an error signal in accordance with ISO/IEC 7816-3 [4], subclause 6.1.3, and expect a repetition of the character. The CAD shall correctly evaluate the character when repeated by the PIM simulator.

5.3.3.2 Answer to reset (RST)

5.3.3.2.1 Acceptance of PIMs with internal RST

5.3.3.2.1.1 Definition and applicability

Internal RST is one possible implementation of reset, and CADs shall be able to accept PIMs with internal reset.

5.3.3.2.1.2 Conformance requirement

1) The CAD shall accept a PIM with internal reset by recognizing the ATR within the specified time range.

Reference: ETS 300 477 [1] subclause 5.8 and ISO/IEC 7816-3 [4] (1990) subclause 5.2.

Test Group Reference (TGR): TGR_ CAD_LLP.

Test Procedure Reference (TPR): TPR_ CAD_LLP_ATR _RST1.

5.3.3.2.1.3 Test purpose

To verify that the CAD accepts a PIM with internal reset.

5.3.3.2.1.4 Method of test

Initial conditions

1) The CAD is connected to the PIM (or PIM simulator) and powered on.

2) The PIM shall be synchronized with the successive detection of Vcc and the clock signal in order to begin the reset routine.

Test procedure

a) The PIM (or the PIM simulator) verifies that RST is at low status and starts its answer between (400/fi) s and (40 000/fi) s after the clock signal has been detected.

NOTE: fi is the initial frequency supplied by the CAD.

5.3.3.2.1.5   Test requirement

1) The CAD accepts the PIM with internal reset.

5.3.3.2.2   Acceptance of PIMs with active low RST

5.3.3.2.2.1   Definition and applicability

Active low RST is one possible implementation of reset, and CADs shall be able to accept PIMs with active low reset.

5.3.3.2.2.2   Conformance requirement

1) The CAD shall accept a PIM with active low reset by putting the RST contact to state H. The signal timing shall be in accordance with the specification.

Reference: ETS 300 477 [1] subclause 5.8 and ISO/IEC 7816-3 [4] (1990) subclause 5.2.

Test Group Reference (TGR): TGR_ CAD_LLP.

Test Procedure Reference (TPR): TPR_ CAD_LLP_ATR _RST2.

5.3.3.2.2.3   Test purpose

To verify that the CAD accepts a PIM with active low reset.

5.3.3.2.2.4   Method of test

Initial conditions

1) The CAD is connected to the PIM (or PIM simulator) and powered on.

2) The PIM (or the PIM simulator) shall be synchronized with the successive detection of Vcc and the clock signal in order to begin the reset routine.

Test procedure

a) The PIM simulator sends no internal reset and checks that the RST contact is put to state H after a minimum of (40,000/fi)s. The PIM simulator sends an answer to reset and verifies that the RST contact stays at this level for at least a further (40 000/fi)s.

5.3.3.2.2.5   Test requirement

1) The CAD shall accept the PIM with active low reset.

5.3.3.2.3   Characters of the answer to reset

5.3.3.2.3.1   Definition and applicability

When the PIM is reset, it sends up to 33 characters to the CAD, containing information which shall be interpreted by the CAD to ascertain the transmission protocol to be used.

5.3.3.2.3.2   Conformance requirement

1) The CAD shall adopt the data encoding convention and initial etu time defined in the initial character TS of the ATR.

2) The CAD shall be able to receive historical characters and a check byte.

Reference: ETS 300 477 [1], subclause 5.8 and 5.8.1.

Test Group Reference (TGR): TGR_ CAD_LLP.

Test Procedure Reference (TPR): TPR_ CAD_LLP_ATR_CHA.

5.3.3.2.3.3   Test purpose

1) To verify that the CAD adopts the appropriate data encoding convention and initial elementary time unit (etu) defined in the initial character TS of the Answer to Reset.

2) To verify that the CAD accepts historical characters and the check digit.

5.3.3.2.3.4   Method of test

Initial conditions

1) The CAD is connected to the PIM or PIM simulator.

Test procedure

a) the CAD is powered on;

b) the PIM or PIM simulator sends an Answer to Reset with TS indicating direct convention coding, historical characters and a check digit;

c) the CAD is made to send further commands to the PIM (e.g. by entering the PIN);

d) the CAD is switched off and on. This time the PIM or PIM simulator sends an Answer to Reset with TS indicating inverse convention coding;

e) the CAD is made to send further commands to the PIM (e.g. by entering the PIN).

5.3.3.2.3.5   Test requirement

1) After step b), the CAD shall use this convention for all subsequent transmissions, and adopt the correct etu.

2) After step d), the CAD shall use this convention for all subsequent transmissions, and adopt the correct etu.

5.3.3.2.4   PTS Request procedure

5.3.3.2.4.1   Definition and applicability

The PTS procedure is required to select the standard transmission protocol if the PIM does not use this as a default.

5.3.3.2.4.2   Conformance requirement

1) If the CAD receives an Answer to Reset where TA1 is not equal to '11', it shall initiate the PTS procedure.

Reference: ETS 300 477 [1], subclause 5.8.2.

Test Group Reference (TGR): TGR_ CAD_LLP.

Test Procedure Reference (TPR): TPR_ CAD_LLP_ATR _PTS.

5.3.3.2.4.3   Test purpose

To verify that CAD uses the PTS procedure.

5.3.3.2.4.4   Method of test

Initial conditions

1) The CAD is connected to the PIM or PIM simulator.

Test procedure

   a) the CAD is powered on;

   b) the PIM (or the PIM simulator) gives an Answer to Reset with TA1 not equal to '11'.

5.3.3.2.4.5   Test requirement

   1) After step b), the CAD shall send to the PIM (or the PIM simulator) 'FF xx FF'.

5.3.3.2.5   Reset repetition

5.3.3.2.5.1   Definition and applicability

If transmission errors result in the ATR being unintelligible to the CAD, the CAD performs the reset again. The minimum number of reset attempts is three.

5.3.3.2.5.2   Conformance requirement

   1) Following receipt of a wrong ATR, the CAD shall perform a reset. The CAD shall not reject the PIM until at least three consecutive wrong ATRs are received.

Reference: ETS 300 477 [1], subclause 5.9.

Test Group Reference (TGR): TGR_ CAD_LLP.

Test Procedure Reference (TPR): TPR_ CAD_LLP_ATR _RST-WRG.

5.3.3.2.5.3   Test purpose

To verify that the CAD repeats the reset procedure on receipt of a wrong ATR, and does not reject the PIM unless at least three consecutive wrong ATRs are received.

5.3.3.2.5.4   Method of test

Initial conditions

   1) The CAD is connected to the PIM simulator.

Test procedure

   a) the CAD is powered on;

   b) the PIM simulator sends a non understandable answer to reset to the CAD. (e.g. a wrong TS byte), at each reset initiated by the CAD.

5.3.3.2.5.5   Test requirement

   1) After step b), the CAD shall repeat the reset.

   2) The CAD shall not reject the PIM until at least three consecutive wrong answers to reset are received.

5.3.3.3   Command processing, procedure bytes

5.3.3.3.1   Definition and applicability

The procedure bytes ACK, NULL, and SW1 are sent from the PIM to the CAD. These give the CAD an acknowledgement for the previous instruction, information concerning transfer of data and the card status at the end of the command.

5.3.3.3.2   Conformance requirement

1) On the basis of protocol T = 0, the CAD shall correctly use the different modes of data transmission defined in ISO/IEC 7816-3 [4], subclause 8.2.2.

Reference: ETS 300 477 [1], subclause 5.7 and ISO/IEC 7616-3 [4]: 1990, subclause 8.2.2.

Test Group Reference (TGR): TGR_ CAD_LLP_ATR.

Test Procedure Reference (TPR): TPR_ CAD_LLP_ATR _PBYTES.

5.3.3.3.3   Test purpose

To verify that the CAD uses correctly the different modes of data transmission.

5.3.3.3.4   Method of test

Initial conditions

1) The CAD is connected to the PIM simulator and powered on.

Test procedure

a) the CAD is made to initiate a command which requires the transfer of data to the PIM. The requirement on this command is that the number of data bytes left to send after step b) shall be at least two. Verification of the test is made easier if a command is used where the response from the PIM is indicated by the CAD's MMI (e.g. entry of PIN);

b) the PIM simulator answers the first few bytes with ACK = INS complemented;

c) the PIM simulator answers the next data byte with NULL (NULL = '60');

d) the PIM simulator then sends ACK = INS. This byte is sent before the Work Waiting Time since step c) is exceeded, but the time interval between step b) and the sending of this byte shall be greater than the Work Waiting Time;

e) the PIM simulator answers the transmission of the rest of the data with NULL;

f) the PIM simulator then sends SW1 and SW2, indicating correct execution of the command ('90' and '00' for SW1 and SW2 respectively). These bytes are sent before the Work Waiting Time since step e) is exceeded, but the time interval between step d) and the sending of these bytes shall be greater than the Work Waiting Time.

5.3.3.3.5   Test requirement

The commands shall be executed correctly, i.e.:

1) For step b), the CAD shall send each character of data individually, and then wait for a further ACK byte from the DAM simulator.

2) After step c), the CAD shall not send any data, but wait for a further procedure byte from the PIM simulator.

3) After step d), the CAD shall send all remaining data bytes together.

4) After step e), the CAD shall wait for a further procedure byte from the PIM simulator.

5) After step f), the CAD shall accept that the command has been executed correctly.

Requirements 1, 2, and 3 shall be checked directly by the PIM simulator. That requirements 4 and 5 have been met shall be indicated by the CAD accepting the command.

5.3.4   Application protocol

5.3.4.1   General procedures

This procedures are implicitly tested in later subclauses of the present document.

5.3.4.1.1   Reading an EF

5.3.4.1.1.1   Definition and applicability

This procedure serve for reading a string of bytes of the current EF.

5.3.4.1.1.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.1.1 by considering the given conditions and in the right format described in ETS 300 477 [1], 9.3.2 for READ BINARY and 9.3.4 for READ RECORD.

Reference: ETS 300 477 [1], subclauses 9.3.2, 9.3.4 and 11.1.1.

Test Group Reference (TGR): TGR_CAD_APP_GP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GP_REA.

5.3.4.1.1.3   Test purpose

To verify that the CAD conform to the above requirements.

NOTE: CR1 is tested in 5.3.4.2.1.1, 5.3.4.2.1.2, 5.3.4.2.6, 5.3.4.4.1, 5.3.4.4.2, 5.3.4.5.5, 5.3.4.5.6, 5.3.4.5.7, 5.3.4.5.8 and 5.3.4.5.9.

5.3.4.1.1.4   Method of test

Initial condition

N/A.

Test procedure

N/A.

5.3.4.1.1.5   Test requirement

N/A.

5.3.4.1.2   Updating an EF

5.3.4.1.2.1   Definition and applicability

This procedure serve for updating the current EF with a string of bytes.

5.3.4.1.2.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.1.2 by considering the given conditions and in the right format described in ETS 300 477 [1], 9.3.3 for UPDATE BINARY and 9.3.5 for UPDATE RECORD.

Reference: ETS 300 477 [1], subclauses 9.3.3, 9.3.5 and 11.1.2.

Test Group Reference (TGR): TGR_CAD_APP_GP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GP_UPD.

5.3.4.1.2.3   Test purpose

To verify that the CAD conform to the above requirements.

> NOTE: CR1 is tested in 5.3.4.2.6, 5.3.4.4.1, 5.3.4.6.2.2, 5.3.4.5.2, 5.3.4.5.3, 5.3.4.5.4, 5.3.4.5.5, 5.3.4.5.6,
> 5.3.4.5.9 and 5.3.4.6.2.2.2.

5.3.4.1.2.4   Method of test

Initial condition

N/A.

Test procedure

N/A.

5.3.4.1.2.5   Test requirement

N/A.

5.3.4.1.3   Seek in an EF

5.3.4.1.3.1   Definition and applicability

The procedure serve for searching in a linear fixed EF to find a record starting with the given pattern.

5.3.4.1.3.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.1.3 and
   considering the given conditions and in the right format described in ETS 300 477 [1], subclause 9.3.6.

Reference: ETS 300 477 [1], subclauses 9.3.6 and 11.1.3.

Test Group Reference (TGR): TGR_CAD_APP_GP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GP_SEE.

5.3.4.1.3.3   Test purpose

To verify that the CAD conform to the above requirements.

> NOTE: CR1 is tested in subclauses 5.3.4.4.2, 5.3.4.5.2, 5.3.4.5.4, 5.3.4.5.5, 5.3.4.5.6, 5.3.4.5.7, 5.3.4.5.8 and
> 5.3.4.5.9.

5.3.4.1.3.4   Method of test

Initial condition

N/A.

Test procedure

N/A.

5.3.4.1.3.5   Test requirement

N/A.

5.3.4.1.4   Select an EF or DF

5.3.4.1.4.1   Definition and applicability

This procedure serve for selecting a file in the PIM.

5.3.4.1.4.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.1.4 considering the given conditions and in the right format described in ETS 300 477 [1], subclause 9.3.1 for selecting MF or DF, for selecting an EF except EF_{CHV1} and for selecting EF_{CHV1}.

Reference: ETS 300 477 [1], subclauses 9.3.1 and 11.1.4.

Test Group Reference (TGR): TGR_CAD_APP_GP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GP_SEL.

5.3.4.1.4.3   Test purpose

To verify that the CAD conform to the above requirements.

NOTE: CR1 is tested in subclauses 5.3.4.2, 5.3.4.3, 5.3.4.4, 5.3.4.5, 5.3.4.6 and 5.3.4.5.

5.3.4.1.4.4   Method of test

Initial condition

N/A.

Test procedure

N/A.

5.3.4.1.4.5   Test requirement

N/A.

5.3.4.2   PIM management procedures

5.3.4.2.1   PIM session initialization

5.3.4.2.1.1   PIM initialization procedure

Within the PIM session initialization procedure the following subjects can optionally be adjusted in the PIM simulator.

a) whether EF_{NAME} exists;

b) whether EF_{LANG} exists;

c) if at least one of the languages in EF_{LANG} (if present) are supported by the CAD;

d) if there is a CHV1 at the MF level and it is not disabled.

The following alternatives will be considered.

Alternative 1 (see subclause 5.3.4.2.1.1.1):

   a) EF_{NAME} exists;

   b) EF_{LANG} exists;

   c) at least one of the languages in EF_{LANG} is supported by the CAD;

   d) there is *no* CHV1 at the MF level which is not disabled.

Alternative 2 (see subclause 5.3.4.2.1.1.2):

   a) EF_{NAME} does not exist;

   b) EF_{LANG} exists;

   c) at least one of the languages in EF_{LANG} is supported by the CAD;

   d) there is *no* CHV1 at the MF level which is not disabled.

Alternative 3 (see subclause 5.3.4.2.1.1.3):

   a) EF_{NAME} exists;

   b) EF_{LANG} exists;

   c) at least one of the languages in EF_{LANG} is supported by the CAD;

   d) there is a CHV1 at the MF level which is not disabled.

Alternative 4 (see subclause 5.3.4.2.1.1.4):

   a) EF_{NAME} exists;

   b) EF_{LANG} exists;

   c) no one of the languages in EF_{LANG} is supported by the CAD;

   d) there is *no* CHV1 at the MF level which is not disabled.

Alternative 5 (see subclause 5.3.4.2.1.1.5):

   a) EF_{NAME} exists;

   b) EF_{LANG} does not exist;

   c) not relevant;

   d) there is *no* CHV1 at the MF level which is not disabled.

5.3.4.2.1.1.1   Test 1

5.3.4.2.1.1.1.1   Definition and applicability

The PIM session initialization is necessary to prepare a UPT session. The tester has to know the languages which are supported by the CAD.

5.3.4.2.1.1.1.2   Conformance requirement

   1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.2.1 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.2.1.

Test Group Reference (TGR): TGR_CAD_APP_PIM.

Test Procedure Reference (TPR): TPR_ CAD_APP_PIM_INI_PIP_TST1.

5.3.4.2.1.1.1.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.2.1.1.1.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) EF_{NAME} exists in the file structure of the PIM simulator.

3) The Card Holder Name stored in EF_{NAME} is "John Wayne" (Length = 10 Bytes).

4) EF_{LANG} exists in the file structure of the PIM simulator.

5) The 1st language preference stored in EF_{LANG} is "English".

6) The 2nd language preference stored in EF_{LANG} is "French".

7) The 3rd language preference stored in EF_{LANG} is "German".

8) If the CAD don't support one of the languages "English", "French" or "German", the 4th language preference is one of the languages which are supported by the CAD; if the CAD supports one of the languages "English", "French" or "German", the 4th language preference is "Spanish".

9) There is *no* CHV1 at the MF level.

Test procedure

a) the PIM simulator sends a ATR;

b) if the CAD sends a PTS request the PIM simulator sends a PTS response;

c) the PIM simulator sends the status bytes corresponding to the received command "select MF";

d) the PIM simulator sends the data and the status bytes corresponding to the received command "get response" which indicates the CHV1 status "not activated";

e) if the CAD has sent the command "select EF_{NAME}", the PIM simulator sends the corresponding status bytes which contains a file size of 10 bytes;

f) if the CAD has sent the command "read", the PIM simulator sends the corresponding data ("John Wayne") and status bytes;

g) the PIM simulator sends the status bytes corresponding to the received command "select EF_{LANG}";

h) the PIM simulator sends the data (content of EF_{LANG}) and the status bytes corresponding to the received command "read".

5.3.4.2.1.1.1.5   Test requirement

1) After step a) the CAD may send a PTS request.

2) After step b) the CAD shall send the command SELECT to select the MF.

3) After step c) the CAD shall send the command GET RESPONSE.

4) If the CAD is able to perform a name request procedure, the CAD shall send the command SELECT to select EF_{NAME} after step d).

5) If the CAD has sent the command "select EF_{NAME}" one step ago, the CAD shall send after step e) the command READ BINARY with P1 = '00', P2 = '00', Le = '0A'.

6) After step f) the CAD shall send the command SELECT to select EF$_{LANG}$.

7) After step g) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = '08'.

5.3.4.2.1.1.2   Test 2

5.3.4.2.1.1.2.1   Definition and applicability

The PIM session initialization is necessary to prepare a UPT session. The tester has to know the languages which are supported by the CAD.

5.3.4.2.1.1.2.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.2.1 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.2.1.

Test Group Reference (TGR): TGR_CAD_APP_PIM.

Test Procedure Reference (TPR): TPR_ CAD_APP_PIM_INI_PIP_TST2.

5.3.4.2.1.1.2.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.2.1.1.2.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) EF$_{NAME}$ does not exists in the file structure of the PIM simulator.

3) EF$_{LANG}$ exists in the file structure of the PIM simulator.

4) The 1st language preference stored in EF$_{LANG}$ is "English".

5) The 2nd language preference stored in EF$_{LANG}$ is "French".

6) The 3rd language preference stored in EF$_{LANG}$ is "German".

7) If the CAD don't support one of the languages "English", "French" or "German", the 4th language preference is one of the languages which are supported by the CAD; if the CAD supports one of the languages "English", "French" or "German", the 4th language preference is "Spanish".

8) There is *no* CHV1 at the MF level.

Test procedure

a) The PIM simulator sends a ATR;

b) if the CAD sends a PTS request the PIM simulator sends a PTS response;

c) the PIM simulator sends the status bytes corresponding to the received command "select MF" which contains the CHV1 status "not activated";

d) the PIM simulator sends the data and the status bytes corresponding to the received command "get response";

e) if the CAD has sent the command "select EF$_{NAME}$", the PIM simulator sends the corresponding status bytes '9 404' (file-ID not found);

f) the PIM simulator sends the status bytes corresponding to the received command "select EF$_{LANG}$";

g) the PIM simulator sends the data (content of EF_{LANG}) and the status bytes corresponding to the received command "read".

5.3.4.2.1.1.2.5   Test requirement

1) After step a) the CAD may send a PTS request.

2) After step b) the CAD shall send the command SELECT to select the MF.

3) After step c) the CAD shall send the command GET RESPONSE.

4) If the CAD is able to perform a name request procedure, the CAD shall send the command SELECT to select EF_{NAME} after step d).

5) After step e) the CAD shall send the command SELECT to select EF_{LANG}.

6) After step f) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00' and Le = '08'.

5.3.4.2.1.1.3   Test 3

5.3.4.2.1.1.3.1   Definition and applicability

The PIM session initialization is necessary to prepare a UPT session. The tester has to know the languages which are supported by the CAD.

5.3.4.2.1.1.3.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.2.1 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.2.1.

Test Group Reference (TGR): TGR_CAD_APP_PIM.

Test Procedure Reference (TPR): TPR_ CAD_APP_PIM_INI_PIP_TST3.

5.3.4.2.1.1.3.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.2.1.1.3.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) EF_{NAME} exists in the file structure of the PIM simulator.

3) The Card Holder Name stored in EF_{NAME} is "John Wayne" (Length = 10 Bytes).

4) EF_{LANG} exists in the file structure of the PIM simulator.

5) The 1st language preference stored in EF_{LANG} is "English".

6) The 2nd language preference stored in EF_{LANG} is "French".

7) The 3rd language preference stored in EF_{LANG} is "German".

8) If the CAD don't support one of the languages "English", "French" or "German", the 4th language preference is one of the languages which are supported by the CAD; if the CAD supports one of the languages "English", "French" or "German", the 4th language preference is "Spanish".

9) There is a CHV1 at the MF level which is not disabled in the PIM simulator.

Test procedure

   a) the PIM simulator sends a ATR;

   b) if the CAD sends a PTS request the PIM simulator sends a PTS response;

   c) the PIM simulator sends the status bytes corresponding to the received command "select MF" which contains the CHV1 status "activated";

   d) the PIM simulator sends the data and the status bytes corresponding to the received command "get response";

   e) if the CAD has sent the command "select EF$_{NAME}$", the PIM simulator sends the corresponding status bytes which indicates a file size of 10 bytes;

   f) if the CAD has sent the command "read", the PIM simulator sends the corresponding data ("John Wayne") and status bytes;

   g) the PIM simulator sends the status bytes corresponding to the received command "select EF$_{LANG}$";

   h) the PIM simulator sends the data (content of EF$_{LANG}$) and the status bytes corresponding to the received command "read";

   i) the PIM simulator sends the status bytes corresponding to the received command "select EF$_{CHV1}$";

   j) the PIM simulator sends the data and the status bytes corresponding to the received command "get response" which indicates that the CHV1 is enabled.

5.3.4.2.1.1.3.5   Test requirement

   1) After step a) the CAD may send a PTS request.

   2) After step b) the CAD shall send the command SELECT to select the MF.

   3) After step c) the CAD shall send the command GET RESPONSE.

   4) If the CAD is able to perform a name request procedure, the CAD shall send the command SELECT to select EF$_{NAME}$ after step d).

   5) If the CAD has sent the command "select EF$_{NAME}$" one step ago, the CAD shall send after step e) the command READ BINARY with P1 = '00', P2 = '00', Le = '0A'.

   6) After step f) the CAD shall send the command SELECT to select EF$_{LANG}$.

   7) After step g) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00' and Le = '08'.

   8) After step h) the CAD shall send the command SELECT to select EF$_{CHV1}$.

   9) After step i) the CAD shall send the command GET RESPONSE.

5.3.4.2.1.1.4   Test 4

5.3.4.2.1.1.4.1   Definition and applicability

The PIM session initialization is necessary to prepare a UPT session. The tester has to know the languages which are supported by the CAD.

5.3.4.2.1.1.4.2   Conformance requirement

   1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.2.1 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.2.1.

Test Group Reference (TGR): TGR_CAD_APP_PIM.

Test Procedure Reference (TPR): TPR_ CAD_APP_PIM_INI_PIP_TST4.

5.3.4.2.1.1.4.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.2.1.1.4.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) EF_{NAME} exists in the file structure of the PIM simulator.

3) The Card Holder Name stored in EF_{NAME} is "John Wayne" (Length = 10 Bytes).

4) EF_{LANG} exists in the file structure of the PIM simulator.

5) The 1st language preference stored in EF_{LANG} is a language that is not supported by the CAD.

6) There are no 2nd, 3rd and 4th languages preference stored in EF_{LANG}.

7) There is *no* CHV1 at the MF level.

Test procedure

a) the PIM simulator sends a ATR;

b) if the CAD sends a PTS request the PIM simulator sends a PTS response;

c) the PIM simulator sends the status bytes corresponding to the received command "select MF";

d) the PIM simulator sends the data and the status bytes corresponding to the received command "get response" which indicates the CHV1 status "not activated";

e) if the CAD has sent the command "select EF_{NAME}", the PIM simulator sends the corresponding status bytes which contains a file size of 10 bytes;

f) if the CAD has sent the command "read", the PIM simulator sends the corresponding data ("John Wayne") and status bytes;

g) the PIM simulator sends the status bytes corresponding to the received command "select EF_{LANG}";

h) the PIM simulator sends the data (content of EF_{LANG}) and the status bytes corresponding to the received command "read".

5.3.4.2.1.1.4.5   Test requirement

1) After step a) the CAD may send a PTS request.

2) After step b) the CAD shall send the command SELECT to select the MF.

3) After step c) the CAD shall send the command GET RESPONSE.

4) If the CAD is able to perform a name request procedure, the CAD shall send the command SELECT to select EF_{NAME} after step d).

5) If the CAD has sent the command "select EF_{NAME}" one step ago, the CAD shall send after step e) the command READ BINARY with P1 = '00', P2 = '00', Le = '0A'.

6) After step f) the CAD shall send the command SELECT to select EF_{LANG}.

7) After step g) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = '08'.

5.3.4.2.1.1.5   Test 5

5.3.4.2.1.1.5.1   Definition and applicability

The PIM session initialization is necessary to prepare a UPT session.

5.3.4.2.1.1.5.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.2.1 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.2.1.

Test Group Reference (TGR): TGR_CAD_APP_PIM.

Test Procedure Reference (TPR): TPR_ CAD_APP_PIM_INI_PIP_TST5.

5.3.4.2.1.1.5.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.2.1.1.5.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) EF_{NAME} exists in the file structure of the PIM simulator.

3) The Card Holder Name stored in EF_{NAME} is "John Wayne" (Length = 10 Bytes).

4) EF_{LANG} does *not* exist in the file structure of the PIM simulator.

5) There is *no* CHV1 at the MF level.

Test procedure

a) The PIM simulator sends a ATR.

b) If the CAD sends a PTS request the PIM simulator sends a PTS response.

c) The PIM simulator sends the status bytes corresponding to the received command "select MF".

d) The PIM simulator sends the data and the status bytes corresponding to the received command "get response" which indicates the CHV1 status "not activated".

e) If the CAD has sent the command "select EF_{NAME}", the PIM simulator sends the corresponding status bytes which contains a file size of 10 bytes.

f) If the CAD has sent the command "read", the PIM simulator sends the corresponding data ("John Wayne") and status bytes.

g) The PIM simulator sends the status bytes '9404' (file-ID not found) corresponding to the received command "select EF_{LANG}".

5.3.4.2.1.1.5.5   Test requirement

1) After step a) the CAD may send a PTS request.

2) After step b) the CAD shall send the command SELECT to select the MF.

3) After step c) the CAD shall send the command GET RESPONSE.

4) If the CAD is able to perform a name request procedure, the CAD shall send the command SELECT to select EF_{NAME} after step d).

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5) If the CAD has sent the command "select EF$_{NAME}$" one step ago, the CAD shall send after step e) the command READ BINARY with P1 = '00', P2 = '00', Le = '0A'.

6) After step f) the CAD shall send the command SELECT to select EF$_{LANG}$.

5.3.4.2.1.2   CHV1 procedures

The successful ending of the PIM initialization procedure gives three possibilities to proceed:

Case 1:   There is no CHV1 at the MF level or the CHV1 at the MF level is disabled.

            (This case can occur after a successful completion of Alternatives 1, 2, 4, and 5 of subclause 5.3.4.2.1.1).

Case 2:   There is a CHV1 at the MF level where the disablishing is allowed, but it is not disabled.

            (This case can occur after a successful completion of Alternative 3 of subclause 5.3.4.2.1.1).

Case 3:   There is a CHV1 at MF level which does not allow the disable/enable function.

            (This case can occur after a successful completion of Alternative 3 of subclause 5.3.4.2.1.1).

5.3.4.2.1.2.1   Test 1

5.3.4.2.1.2.1.1   Definition and applicability

The competition of the CHV1 procedure after a successful PIM session initialization ensure the feasibility of a UPT session of the PIM in the UPT application.

5.3.4.2.1.2.1.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclauses 11.2.1, 11.2.4, 11.2.5 and 11.3.1 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclauses 11.2.1, 11.2.4, 11.2.5 and 11.3.1.

Test Group Reference (TGR): TGR_CAD_APP_PIM.

Test Procedure Reference (TPR): TPR_ CAD_APP_PIM_INI_CHV1_TST1.

5.3.4.2.1.2.1.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.2.1.2.1.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) There is no CHV1 at the MF level in the PIM simulator.

3) Within the EF$_{DIR}$ there are three file IDs in the path to the UPT application.

4) The content of EF$_{TV}$ is "10".

5) The used CHV in the PIM simulator structure is the sequence "1234".

Test procedure

a) A PIM initialization procedure according to Alternative 1, 2, 4 or 5 of subclause 5.3.4.2.1.1 is performed (the response of "select MF" indicates the CHV1 status "not activated");

b) the PIM simulator sends the status bytes corresponding to the received command "select MF";

c) the PIM simulator sends the status bytes corresponding to the received command "select EF_{DIR}";

d) the PIM simulator sends the data and the status bytes corresponding to the received command "get response" (length of EF_{DIR}'s content);

e) the CHV "1234" is entered by the tester by a MMI interaction;

f) if the command "verify chv" sent by the CAD is correct with the CHV "1 234", the PIM simulator sends the status bytes '90 00';

g) the PIM simulator sends the data (content of EF_{DIR}: three file IDs in the path to the UPT application) and the status bytes corresponding to the received command "read";

h) the PIM simulator sends the status bytes corresponding to the received commands to select DF_{UPT};

i) the PIM simulator sends the status bytes corresponding to the received command "select EF_{TV}";

j) the PIM simulator sends the data ("10") and the status bytes corresponding to the received command "read".

5.3.4.2.1.2.1.5   Test requirement

1) After step a) the CAD shall send the command SELECT to select MF.

2) After step b) the CAD shall send the command SELECT to select EF_{DIR}.

3) After step c) the CAD shall send the command GET RESPONSE.

4) After step e) the CAD shall send the command VERIFY CHV with P1 = '00', P2 = '01', Lc = '08' and the data = '31 32 33 34 FF FF FF FF'.

5) After step f) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = length of EF_{DIR}'s content.

6) After step g) the CAD shall send three SELECT commands to select DF_{UPT}.

7) After step h) the CAD shall send the command SELECT to select EF_{TV}.

8) After step i) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = '02'.

5.3.4.2.1.2.2   Test 2

5.3.4.2.1.2.2.1   Definition and applicability

The competition of the CHV1 procedure after a successful PIM session initialization ensure the feasibility of a UPT session of the PIM in the UPT application.

5.3.4.2.1.2.2.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclauses 11.2.1, 11.2.4, 11.2.5 and 11.3.1 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclauses 11.2.1, 11.2.4, 11.2.5 and 11.3.1.

Test Group Reference (TGR): TGR_CAD_APP_PIM.

Test Procedure Reference (TPR): TPR_ CAD_APP_PIM_INI_CHV1_TST2.

5.3.4.2.1.2.2.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.2.1.2.2.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) There is a CHV1 at the MF level where the disablishing is allowed, but it is not disabled.

3) Within the EF$_{DIR}$ there is one file ID in the path to the UPT application.

4) The content of EF$_{TV}$ is "10".

5) The used CHV in the PIM simulator structure on the MF level is the sequence "1234".

6) The used CHV in the PIM simulator structure on the DF$_{UPT}$ level is the sequence "8765".

Test procedure

a) A PIM initialization procedure according to Alternative 3 of subclause 5.3.4.2.1.1 is performed which the response of "select EF$_{CHV1}$" indicates that the disabling of CHV1 is allowed, but it is not disabled;

b) the CHV "1234" is entered by the tester by a MMI interaction;

c) if the command "verify chv" sent by the CAD is correct with the CHV "1234", the PIM simulator sends the status bytes "90 00";

d) the PIM simulator sends the status bytes corresponding to the received command "select MF";

e) the PIM simulator sends the status bytes corresponding to the received command "select EF$_{DIR}$";

f) the PIM simulator sends the data and the status bytes corresponding to the received command "get response" (length of EF$_{DIR}$'s content);

g) the CHV "8765" is entered by the tester by a MMI interaction;

h) if the command "verify chv" sent by the CAD is correct with the CHV "8765", the PIM simulator sends the status bytes "90 00";

i) the PIM simulator sends the data (content of EF$_{DIR}$: one file IDin the path to the UPT application) and the status bytes corresponding to the received command "read";

j) the PIM simulator sends the status bytes corresponding to the received commands to select DF$_{UPT}$;

k) the PIM simulator sends the status bytes corresponding to the received command "select EF$_{TV}$";

l) the PIM simulator sends the data ("10") and the status bytes corresponding to the received command "read".

5.3.4.2.1.2.2.5   Test requirement

1) After step b) the CAD shall send the command VERIFY CHV with P1 = '00', P2 = '01', Lc = '08' and the data = '31 32 33 34 FF FF FF FF'.

2) After step c) the CAD shall send the command SELECT to select MF.

3) After step d) the CAD shall send the command SELECT to select EF$_{DIR}$.

4) After step e) the CAD shall send the command GET RESPONSE.

5) After step g) the CAD shall send the command VERIFY CHV with P1 = '00', P2 = '01', Lc = '08' and the data = '38 37 36 35 FF FF FF FF'.

6) After step h) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = length of EF$_{DIR}$'s content.

7) After step i) the CAD shall send the command SELECT to select DF$_{UPT}$.

8) After step j) the CAD shall send the command SELECT to select EF$_{TV}$.

9) After step k) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = '02'.

5.3.4.2.1.2.3   Test 3

5.3.4.2.1.2.3.1   Definition and applicability

The competition of the CHV1 procedure after a successful PIM session initialization ensure the feasibility of a UPT session of the PIM in the UPT application.

5.3.4.2.1.2.3.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclauses 11.2.1, 11.2.4, 11.2.5 and 11.3.1 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclauses 11.2.1, 11.2.4, 11.2.5 and 11.3.1.

Test Group Reference (TGR): TGR_CAD_APP_PIM.

Test Procedure Reference (TPR): TPR_ CAD_APP_PIM_INI_CHV1_TST3.

5.3.4.2.1.2.3.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.2.1.2.3.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) There is a CHV1 at MF level which does not allow the disable/enable function.

3) Within the EF_{DIR} there are two file IDs in the path to the UPT application.

4) The content of EF_{TV} is "10".

5) The used CHV in the PIM simulator structure is the sequence "1234".

Test procedure

a) a PIM initialization procedure according to Alternative 3 of subclause 5.3.4.2.1.1 is performed out which the response of "select EF_{CHV1}" indicates that the disable/enable function is not allowed;

b) the CHV "1234" is entered by the tester by a MMI interaction;

c) if the command "verify chv" sent by the CAD is correct with the CHV "1234", the PIM simulator sends the status bytes "90 00";

d) the PIM simulator sends the status bytes corresponding to the received command "select MF";

e) the PIM simulator sends the status bytes corresponding to the received command "select EF_{DIR}";

f) the PIM simulator sends the data and the status bytes corresponding to the received command "get response" (length of EF_{DIR}'s content);

g) the PIM simulator sends the data (content of EF_{DIR}: one file IDin the path to the UPT application) and the status bytes corresponding to the received command "read";

h) the PIM simulator sends the status bytes corresponding to the received commands to select DF_{UPT};

i) the PIM simulator sends the status bytes corresponding to the received command "select EF_{TV}";

j) the PIM simulator sends the data ("10") and the status bytes corresponding to the received command "read".

5.3.4.2.1.2.3.5   Test requirement

1) After step b) the CAD shall send the command VERIFY CHV with P1 = '00', P2 = '01', Lc = '08' and the data = '31 32 33 34 FF FF FF FF'.

2) After step c) the CAD shall send the command SELECT to select MF.

3) After step d) the CAD shall send the command SELECT to select EF_{DIR}.

4) After step e) the CAD shall send the command GET RESPONSE.

5) After step f) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = length of EF_{DIR}'s content.

6) After step g) the CAD shall send two SELECT commands to select DF_{UPT}.

7) After step h) the CAD shall send the command SELECT to select EF_{TV}.

8) After step i) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = '02'.

5.3.4.2.2   PIM session

5.3.4.2.2.1   Definition and applicability

A PIM session can consist of the following procedures:

- Timer value substitution (O);

- CHV unblocking (O);

- one pass trong authentication (M);

- language preference update procedure (O);

- dialling number procedures (O);

- CHV1 substitution procedure (O).

These procedure are implicitly tested in later subclauses of the present document.

5.3.4.2.2.2   Conformance requirement

1) if the Timer value substitution procedure is supported by the CAD, the CAD shall send the corresponding commands in the right sequence and with right coding described in ETS 300 477 [1], clause 9;

2) if the CHV unblocking is supported by the CAD, the CAD shall send the corresponding commands in the right sequence and with right coding;

3) the CAD shall send the commands in the right sequence and with right coding for the one pass strong authentication;

4) if the language preference update procedure is supported by the CAD, the CAD shall send the corresponding commands in the right sequence and with right coding;

5) if the dialling number procedures is supported by the CAD, the CAD shall send the corresponding commands in the right sequence and with right coding;

6) if the CHV1 substitution procedure is supported by the CAD, the CAD shall send the corresponding commands in the right sequence and with right coding.

Reference: ETS 300 477 [1], clause 9 and subclause 11.2.2.

Test Group Reference (TGR): TGR_CAD_APP_PIM.

Test Procedure Reference (TPR): TPR_ CAD_APP_PIM_SES.

5.3.4.2.2.3 Test purpose

To verify that the CAD conform to the above requirements.

NOTE 1: CR1 is tested in subclause 5.3.4.2.6.

NOTE 2: CR2 is tested in subclause 5.3.4.3.3.

NOTE 3: CR3 is tested in subclause 5.3.4.4.1.

NOTE 4: CR4 is tested in subclause 5.3.4.6.2.2.

NOTE 5: CR5 is tested in subclause 5.3.4.5.

NOTE 6: CR6 is tested in subclause 5.3.4.3.2.

5.3.4.2.2.4 Method of test

Initial condition

N/A.

Test procedure

N/A.

5.3.4.2.2.5 Test requirement

N/A.

5.3.4.2.3 PIM session termination

5.3.4.2.3.1 Definition and applicability

The termination of a UPT session is done automatically by a time out of the timer in the CAD. The tester has to know the data:

- N_1, which is the time period between starting the timer during the PIM session initialization and the moment at which the user will be informed about the successful completed PIM session initialization;

- N_2, which is the time period between the MMI interaction to start the one pass strong authentication and the ending of the one pass strong authentication;

- N3, which is the time period between the MMI interaction to start the fastest PIM session procedure supported by the CAD and the ending of this procedure.

The other actions listed in ETS 300 477 [1], subclause 11.2.3, to terminate the UPT session are physical or on lower protocol level. So they will not be considered here.

5.3.4.2.3.2 Conformance requirement

1) When the timer reaches its time out value the session shall be terminated.

2) When the timer reaches its time out value before the one pass strong authentication procedure is performed, the CAD shall make a hardware reset on the PIM.

3) After executing the UPT session termination procedure all values relating to the authentication process shall be deleted from the CAD.

Reference: ETS 300 477 [1], subclause 11.2.3.

Test Group Reference (TGR): TGR_CAD_APP_PIM.

Test Procedure Reference (TPR): TPR_ CAD_APP_PIM_TER.

5.3.4.2.3.3   Test purpose

To verify that the CAD conform to the above requirements.

   NOTE: CR3 can not be tested because there is no functionality defined to read the corresponding memory of the
            CAD.

5.3.4.2.3.4   Method of test

Initial condition

   1) The CAD is connected to a PIM simulator and powered on.

Test procedure

   a) A PIM initialization procedure according to 5.3.4.2.1.1 is performed;

   b) a CHV1 procedure according to 5.3.4.2.1.2 is performed which the time-out value given by the PIM simulator is
       $N_1 + 10$ sec $+ (N_2$ x 0,5);

   c) 10 sec after the tester is informed about the successful ending of the PIM session initialization, the beginning of a
       one pass strong authentication is initiated by the tester by a MMI interaction;

   d) a PIM initialization procedure according to 5.3.4.2.1.1 is performed;

   e) a CHV1 procedure according to 5.3.4.2.1.2 is performed which the time-out value given by the PIM simulator is
       $N_1 + 10$ sec $+ (N_3$ x 0,5);

   f) 10 sec after the tester is informed about the successful ending of the PIM session initialization, the beginning of a
       PIM session procedure is initiated by the tester by a MMI interaction before the time out in the CAD appears;

   g) repeat steps d) - f) for any remaining PIM session procedure, which is supported by the CAD.

5.3.4.2.3.5   Test requirement

   1) After step c) the CAD shall terminate the UPT session and make a hardware reset on the PIM.

   2) After steps f) the CAD shall terminate the UPT session.

5.3.4.2.4   Application selection procedure

5.3.4.2.4.1   Definition and applicability

This procedure serve for selecting a particular application. This procedure is implicitly tested in other subclauses of the
present document.

5.3.4.2.4.2   Conformance requirement

   1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.2.4 considering
       the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.2.4.

Test Group Reference (TGR): TGR_CAD_APP_PIM.

Test Procedure Reference (TPR): TPR_ CAD_APP_PIM_ASP.

5.3.4.2.4.3   Test purpose

To verify that the CAD conform to the above requirements.

   NOTE: CR1 is tested in subclause 5.3.4.2.1.2. for select DF_{UPT} and in subclause 5.3.4.5 for select $DF_{TELECOM}$.

5.3.4.2.4.4   Method of test

Initial condition

N/A.

Test procedure

N/A.

5.3.4.2.4.5   Test requirement

N/A.

5.3.4.2.5   Start Timer

5.3.4.2.5.1   Definition and applicability

This procedure serve for starting the timer in the CAD with the initial value T of EF_{TV}. This procedure is implicitly tested in an other subclause of the present document.

5.3.4.2.5.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.2.5 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.2.5.

Test Group Reference (TGR): TGR_CAD_APP_PIM.

Test Procedure Reference (TPR): TPR_ CAD_APP_PIM_ST.

5.3.4.2.5.3   Test purpose

To verify that the CAD conform to the above requirements.

   NOTE: CR1 is tested in 5.3.4.2.1.2.

5.3.4.2.5.4   Method of test

Initial condition

N/A.

Test procedure

N/A.

5.3.4.2.5.5   Test requirement

N/A.

5.3.4.2.6   Timer value substitution

It is optional for the CAD to support this procedure. If the CAD support it the procedure has to been tested like described below.

Within the Timer value substitution procedure the following subjects can optionally be adjusted in the PIM simulator.

   a) Whether EF_{MTV} exists.

   b) If the new value T, presented by the tester, is greater than 0, but not greater than the maximum time out value T_{MAX}, stored in EF_{MTV} (if present).

The following alternatives will be considered.

Alternative 1 (see subclause 5.3.4.2.6.1):

a) EF_{MTV} exists;

b) the new value T, presented by the tester, is greater than 0, but not greater than the maximum time out value T_{MAX}, stored in EF_{MTV}.

Alternative 2 (see subclause 5.3.4.2.6.2):

a) EF_{MTV} exists;

b) the new value T, presented by the tester, is greater than 0 and *greater* than the maximum time out value T_{MAX}, stored in EF_{MTV}.

Alternative 3 (see subclause 5.3.4.2.6.3):

a) EF_{MTV} does *not* exist;

b) the new value T, presented by the tester, is greater than 0.

Alternative 4 (see subclause 5.3.4.2.6.4):

a) EF_{MTV} does *not* exist;

b) the new value T, presented by the tester, is *not greater* than 0.

5.3.4.2.6.1 TEST 1

5.3.4.2.6.1.1 Definition and applicability

The user can change the time value stored in the PIM.

5.3.4.2.6.1.2 Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.2.6 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.2.6.

Test Group Reference (TGR): TGR_CAD_APP_PIM.

Test Procedure Reference (TPR): TPR_ CAD_APP_PIM_TVS_TST1.

5.3.4.2.6.1.3 Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.2.6.1.4 Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) EF_{MTV} exists.

4) The number of minutes stored in EF_{MTV} is '00 03'.

Test procedure

    a) the procedure is initiated by the tester by the corresponding MMI interaction which the tester enter the new time out value T = 2;

    b) the PIM simulator sends the status bytes corresponding to the received command "select EF_{MTV}";

    c) if the CAD has send the command "get response", the PIM simulator sends the corresponding data and the status bytes;

    d) the PIM simulator sends the data ('0003') and the status bytes corresponding to the received command "read";

    e) the PIM simulator sends the status bytes corresponding to the received command "select EF_{TV}";

    f) if the CAD has send the command "get response", the PIM simulator sends the corresponding data and the status bytes;

    g) the PIM simulator sends the data and the status bytes corresponding to the received command "update".

5.3.4.2.6.1.5   Test requirement

1) After step a) the CAD shall send the command SELECT to select EF_{MTV}.

2) After step b) the CAD may send the command GET RESPONSE.

3) After step c) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00' and Le = '02'.

4) After step d) the CAD shall send the command SELECT to select EF_{TV}.

5) After step e) the CAD may send the command GET RESPONSE.

6) After step f) the CAD shall send the command UPDATE BINARY with P1 = '00', P2 = '00', Lc = '02' and data = '0002'.

5.3.4.2.6.2   TEST 2

5.3.4.2.6.2.1   Definition and applicability

The user can change the time value stored in the PIM.

5.3.4.2.6.2.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.2.6 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.2.6.

Test Group Reference (TGR): TGR_CAD_APP_PIM.

Test Procedure Reference (TPR): TPR_ CAD_APP_PIM_TVS_TST2.

5.3.4.2.6.2.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.2.6.2.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) EF_{MTV} exists.

4) The number of minutes stored in EF_{MTV} is '0003'.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction which the tester enter the new time out value T = 4;

b) the PIM simulator sends the status bytes corresponding to the received command "select EF_{MTV}";

c) if the CAD has send the command "get response", the PIM simulator sends the corresponding data and the status bytes;

d) the PIM simulator sends the data ('0003') and the status bytes corresponding to the received command "read".

5.3.4.2.6.2.5   Test requirement

1) After step a) the CAD shall send the command SELECT to select EF_{MTV}.

2) After step b) the CAD may send the command GET RESPONSE.

3) After step c) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00' and Le = '02'.

4) After step d) the CAD shall stop the procedure.

5.3.4.2.6.3   TEST 3

5.3.4.2.6.3.1   Definition and applicability

The user can change the time value stored in the PIM.

5.3.4.2.6.3.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.2.6 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.2.6.

Test Group Reference (TGR): TGR_CAD_APP_PIM.

Test Procedure Reference (TPR): TPR_ CAD_APP_PIM_TVS_TST3.

5.3.4.2.6.3.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.2.6.3.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) EF_{MTV} does not exist.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction which the tester enter the new time out value T = 2;

b) the PIM simulator sends the status bytes '9404' (file-ID not found) corresponding to the received command "select EF_{MTV}";

c) the PIM simulator sends the status bytes corresponding to the received command "select EF_{TV}";

d) if the CAD has send the command "get response", the PIM simulator sends the corresponding data and the status bytes;

e) the PIM simulator sends the data and the status bytes corresponding to the received command "update".

5.3.4.2.6.3.5   Test requirement

1) After step a) the CAD shall send the command SELECT to select EF$_{MTV}$.

2) After step b) the CAD shall send the command SELECT to select EF$_{TV}$.

3) After step c) the CAD may send the command GET RESPONSE.

4) After step d) the CAD shall send the command UPDATE BINARY with P1 = '00', P2 = '00', Lc = '02' and Data = '0002'.

5.3.4.2.6.4   TEST 4

5.3.4.2.6.4.1   Definition and applicability

The user can change the time value stored in the PIM.

5.3.4.2.6.4.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.2.6 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.2.6.

Test Group Reference (TGR): TGR_CAD_APP_PIM.

Test Procedure Reference (TPR): TPR_ CAD_APP_PIM_TVS_TST4.

5.3.4.2.6.4.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.2.6.4.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) EF$_{MTV}$ does not exist.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction which the tester enter the new time out value T = 0;

b) the PIM simulator sends the status bytes '9404' (file-ID not found) corresponding to the received command "select EF$_{MTV}$".

5.3.4.2.6.4.5   Test requirement

1) After step a) the CAD shall send the command SELECT to select EF_{MTV}.

2) After step b) the CAD shall stop the procedure.

5.3.4.3   CHV related procedures

5.3.4.3.1   CHV verification

5.3.4.3.1.1   Definition and applicability

This procedure serve for to check whether the CHV sent by the CAD is identical to the one stored in EF_{CHV1}. This procedure is implicitly tested in an other subclause of the present document.

5.3.4.3.1.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.3.1 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.3.1.

Test Group Reference (TGR): TGR_CAD_APP_CHV.

Test Procedure Reference (TPR): TPR_ CAD_APP_CHV_VER.

5.3.4.3.1.3   Test purpose

To verify that the CAD conform to the above requirements.

NOTE: CR1 is tested in subclause 5.3.4.2.1.2.

5.3.4.3.1.4   Method of test

Initial condition

N/A.

Test procedure

N/A.

5.3.4.3.1.5   Test requirement

N/A.

5.3.4.3.2   CHV value substitution

5.3.4.3.2.1   Definition and applicability

It is optional for the CAD to support this procedure. If the CAD support it the procedure has to been tested like described below.

The user can choose his own CHV1 value and substitute it with the one stored in the PIM.

5.3.4.3.2.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.3.2 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.3.2.

Test Group Reference (TGR): TGR_CAD_APP_CHV.

Test Procedure Reference (TPR): TPR_ CAD_APP_CHV_SUB.

5.3.4.3.2.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.3.2.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed and DF_{UPT} is selected which the response data of the PIM simulator have indicated that the CHV status is "not blocked" and the enabled/disabled indicator is set to "enabled".

3) The used CHV in the PIM simulator structure is the sequence "1234".

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction, the old CHV1 value is "1234"; the new one should be "5678";

b) the PIM simulator sends the status bytes corresponding to the received command "change chv".

5.3.4.3.2.5   Test requirement

1) After step a) the CAD shall send the command CHANGE CHV with P1 = '00', P2 = '01', Lc = '10' and data = '31 32 33 34 FF FF FF FF 35 36 37 38 FF FF FF FF'.

5.3.4.3.3   CHV unblocking

5.3.4.3.3.1   Definition and applicability

It is optional for the CAD to support this procedure. If the CAD support it the procedure has to been tested like described below.

After a successful CHV unblocking procedure the Remaining CHV1 attempt counter is set to his Preset value N.

5.3.4.3.3.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.3.3 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.3.3.

Test Group Reference (TGR): TGR_CAD_APP_CHV.

Test Procedure Reference (TPR): TPR_ CAD_APP_CHV_UNB.

5.3.4.3.3.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.3.3.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed and DF_{UPT} is selected which the response data of the PIM simulator have indicated that the UNBLOCK status is not "blocked".

3) The Unblock CHV value in the PIM simulator structure is "4321".

4) The new CHV value to be used is "1234".

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction, the Unblock CHV value is "4321" and the new CHV value is "1234";

b) the PIM simulator sends the status bytes corresponding to the received command "unblock chv".

5.3.4.3.3.5   Test requirement

1) After step a) the CAD shall send the command UNBLOCK CHV with P1 = '00', P2 = '01', Lc = '10' and data = '34 33 32 31 FF FF FF FF 31 32 33 34 FF FF FF FF'.

5.3.4.4   UPT security related procedures

5.3.4.4.1   One pass strong authentication

5.3.4.4.1.1   Definition and applicability

This procedure is used by the PIM to authenticate itself to the network.

5.3.4.4.1.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.4.1 and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.4.1.

Test Group Reference (TGR): TGR_CAD_APP_SEC.

Test Procedure Reference (TPR): TPR_ CAD_APP_SEC_OPSA.

5.3.4.4.1.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.4.1.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) The content of EF_{CT} is '01'.

4) The content of EF_{PUI} is '01 12 FF FF FF FF FF FF FF'.

5) The content of EF_{SEQ} is '01 02 03 04 05 06 07 08'.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction;

b) the PIM simulator sends the status bytes corresponding to the received command "select EF$_{CT}$";

c) the PIM simulator sends the data ('01') and the status bytes corresponding to the received command "read";

d) the PIM simulator sends the status bytes corresponding to the received command "select EF$_{PUI}$";

e) the PIM simulator sends the data ('01 12 FF FF FF FF FF FF FF') and the status bytes corresponding to the received command "read";

f) the PIM simulator sends the status bytes corresponding to the received command "select EF$_{SEQ}$";

g) the PIM simulator sends the data ('01 02 03 04 05 06 07 08') and the status bytes corresponding to the received command "read";

h) if the CAD has sent the right command "internal authentication" (described below) the PIM simulator sends the status bytes '90 00' (if the received command was right);

i) if the CAD has sent the right command "get response" (described below) the PIM simulator sends the data '11 22 11 22 11 22 11 22' and the status bytes '90 00' (if the received command was right);

j) the PIM simulator sends the status bytes corresponding to the received command "update".

5.3.4.4.1.5   Test requirement

1) After step a) the CAD shall send the command SELECT to select EF$_{CT}$.

2) After step b) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00' and Le = '01'.

3) After step c) the CAD shall send the command SELECT to select EF$_{PUI}$.

4) After step d) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00' and Le = '09'.

5) After step e) the CAD shall send the command SELECT to select EF$_{SEQ}$.

6) After step f) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00' and Le = '08'.

7) After step g) the CAD shall send the command INTERNAL AUTHENTICATION with P1 = '00', P2 = '00', Le = '08' and data = '01 02 03 04 05 06 07 08'.

8) After step h) the CAD shall send the command GET RESPONSE.

9) After step i) the CAD shall send the command UPDATE BINARY with P1 = '00', P2 = '00', Le = '08' and data = '01 02 03 04 05 06 07 09'.

5.3.4.4.2   Reading of the service provider's telephone number

5.3.4.4.2.1   Definition and applicability

It is possible to select EF$_{ADN}$ (if present) and to read out the service provider's telephone number before running out the one pass strong authentication procedure.

5.3.4.4.2.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1] and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.4.

Test Group Reference (TGR): TGR_CAD_APP_SEC_.

Test Procedure Reference (TPR): TPR_ CAD_APP_SEC_ RSPTN.

5.3.4.4.2.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.4.2.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed (therefore the CAD has to know the length of EF_{DIR}'content).

3) Within the EF_{DIR} there is one file ID in the path to $DF_{TELECOM}$.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction;

b) the PIM simulator sends the status bytes corresponding to the received command "select EF_{MF}";

c) the PIM simulator sends the status bytes corresponding to the received command "select EF_{DIR}";

d) the PIM simulator sends the data (content of EF_{DIR}: one file ID in the path to the UPT application) and the status bytes corresponding to the received command "read";

e) the PIM simulator sends the status bytes corresponding to the received command "select $DF_{TELECOM}$";

f) the PIM simulator sends the status bytes corresponding to the received command "select EF_{ADN}";

g) the PIM simulator sends the data and the status bytes corresponding to the received command "seek";

h) if the CAD has sent the command "get response", the PIM simulator sends the corresponding data (number of the record in EF_{ADN} which contains the service provider's telephone number) and the status bytes;

i) the PIM simulator sends the data (content of record 1 of EF_{ADN}) and the status bytes corresponding to the received command "read".

5.3.4.4.2.5   Test requirement

1) After step a) the CAD shall send the command SELECT to select EF_{MF}.

2) After step b) the CAD shall send the command SELECT to select EF_{DIR}.

3) After step c) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = length of EF_{DIR}'s content.

4) After step d) the CAD shall send the command SELECT to select $DF_{TELECOM}$.

5) After step e) the CAD shall send the command SELECT to select EF_{ADN}.

6) After step f) the CAD shall send the command SEEK in type 1 or in type 2 with:

-   P1 = '00';

-   P2 = '00', '01', '02', '03', '10', '11', '12' or '13';

-   Lc = length of the following data;

    data = pattern to find the service provider's telephone number within EF_{ADN}.

7) If the CAD has sent the command SEEK in type 2 one step before (P2 = 1x, x = 0,1,2,3), the CAD shall send the command GET RESPONSE after step g).

8) After step h) the CAD shall send the command READ RECORD;

   if the CAD has sent the command SEEK in type 1 in step 6), the parameters of READ RECORD shall be:

   - P1 = '00';

   - P2 = '04'; and

   - Le = length of a record of EF_{ADN};

   if the CAD has sent the command SEEK in type 2 in step 6), the parameters of READ RECORD shall be:

   - P1 = the record number that was sent by the PIM in the last response;

   - P2 = '04'; and

   - Le = length of a record of EF_{ADN}.

5.3.4.5   General telecommunication procedures

It is optional for the CAD to support this procedures. If the CAD support them the procedures have to been tested like described below.

5.3.4.5.1   Service Table Management

5.3.4.5.1.1   Definition and applicability

The management of the service table indicates which services are allocated and activated.

5.3.4.5.1.2   Conformance requirement

1) Whether the CAD is allowed to select a service is decided by the corresponding status of this service given in EF_{PST}. If a service is not allocated or not activated in the PIM, the CAD shall not select this service.

Reference: ETS 300 477 [1], subclauses 11.5.1 and 10.3.4.

Test Group Reference (TGR): TGR_CAD_APP_GTP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GTP_MGT.

5.3.4.5.1.3   Test purpose

To verify that the CAD conform to the above requirements.

   NOTE: CR1 can not be tested because in any procedures described in ETS 300 477 [1], clause 11, there is no reading of EF_{PST} involved.

5.3.4.5.1.4   Method of test

Initial condition

N/A.

Test procedure

N/A.

5.3.4.5.1.5   Test requirement

N/A.

5.3.4.5.2   Updating

5.3.4.5.2.1   Updating of ADN with less than 20 digits and without called party subaddress

5.3.4.5.2.1.1   Definition and applicability

This procedure is used to update a ADN (abbreviated dialling number) with less than 20 digits and without called party subaddress.

5.3.4.5.2.1.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.5.1.1 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.5.1.1.

Test Group Reference (TGR): TGR_CAD_APP_GTP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GTP_UPD_ADN.

5.3.4.5.2.1.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.5.2.1.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) The status of the service number 2 in the EF_{PST} is allocated and activated.

4) Within the EF_{DIR} there are two file IDs in the path to $DF_{TELECOM}$.

5) DF_{UPT} is placed directly under the MF.

6) EF_{ADN} exists in the structure of the PIM simulator.

7) A record of EF_{ADN} has a length of 18 bytes.

8) The current DF is DF_{UPT}.

9) At least one record of EF_{ADN} is free.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction:
updating the PST table with a new ADN with no need of extension 1 (phone number to be registered is less than 20 digits = +0123456789 with an alpha-identifier = 'AAAA');

b) the PIM simulator sends the status bytes corresponding to the received command "select MF";

c) the PIM simulator sends the status bytes corresponding to the received command "select EF_{DIR}";

d) the PIM simulator sends the data (content of EF_{DIR}: two file IDs in the path to $DF_{TELECOM}$, one file ID in the path to the UPT application) and the status bytes corresponding to the received command "read";

e) the PIM simulator sends the status bytes corresponding to the received commands to select $DF_{TELECOM}$;

f) the PIM simulator sends the status bytes corresponding to the received command "select EF_{ADN}";

g) the PIM simulator sends the status bytes corresponding to the received command "seek";

h) the PIM simulator sends the status bytes corresponding to the received command "update";

i) the PIM simulator sends the status bytes corresponding to the received command "select MF";

j) the PIM simulator sends the status bytes corresponding to the received command "select DF$_{UPT}$".

5.3.4.5.2.1.5 Test requirement

1) After step a) the CAD shall send the command SELECT to select MF.

2) After step b) the CAD shall send the command SELECT to select EF$_{DIR}$.

3) After step c) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = length of EF$_{DIR}$'s content.

4) After step d) the CAD shall send two SELECT commands to select DF$_{TELECOM}$.

5) After step e) the CAD shall send the command SELECT to select EF$_{ADN}$.

6) After step f) the CAD shall send the command SEEK with P1 = '00', Lc = '12' (length of a record of EF$_{ADN}$) and data = 'FF ... FF' (18 bytes) (to seek for a free record).

7) After step g) the CAD shall send the command UPDATE RECORD with:

   - P1 = '00';

   - P2 = '04' (current record);

   - Lc = '12' (length of a record of EF$_{ADN}$);

   and the data consist of:

   - Alpha-identifier = 'AA AA FF FF';

   - Length of BCD number = '06';

   - Type of Number = International coding according to EN 726-6 [11];

   - Dialling number = '01 23 45 67 89 FF FF FF FF FF';

   - Extension identifier = 'FF'.

8) After step h) the CAD shall send the command SELECT to select MF.

9) After step i) the CAD shall send the command SELECT to select DF$_{UPT}$.

5.3.4.5.2.2 Updating of LND with less than 20 digits and without called party subaddress

5.3.4.5.2.2.1 Definition and applicability

This procedure is used to update a LND (last dialling number) with less than 20 digits and without called party subaddress.

5.3.4.5.2.2.2 Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.5.1.1 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.5.1.1.

Test Group Reference (TGR): TGR_CAD_APP_GTP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GTP_UPD_LND.

5.3.4.5.2.2.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.5.2.2.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) The status of the service number 13 in the EF_{PST} is allocated and activated.

4) Within the EF_{DIR} there are three file IDs in the path to $DF_{TELECOM}$.

5) DF_{UPT} is placed directly under the MF.

6) EF_{LDN} exists in the structure of the PIM simulator.

7) A record of EF_{LND} has a length of 17 bytes.

8) The current DF is DF_{UPT}.

9) At least one record of EF_{LND} is free.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction:

   - dialling by the CAD of a phone number less than 20 digits = +0123456789);

b) the PIM simulator sends the status bytes corresponding to the received command "select MF";

c) the PIM simulator sends the status bytes corresponding to the received command "select EF_{DIR}";

d) the PIM simulator sends the data (content of EF_{DIR}: three file IDs in the path to $DF_{TELECOM}$, one file ID in the path to the UPT application) and the status bytes corresponding to the received command "read";

e) the PIM simulator sends the status bytes corresponding to the received commands to select $DF_{TELECOM}$;

f) the PIM simulator sends the status bytes corresponding to the received command "select EF_{LND}";

g) the PIM simulator sends the status bytes corresponding to the received command "update";

h) the PIM simulator sends the status bytes corresponding to the received command "select MF";

i) the PIM simulator sends the status bytes corresponding to the received command "select DF_{UPT}".

5.3.4.5.2.2.5   Test requirement

1) After step a) the CAD shall send the command SELECT to select MF.

2) After step b) the CAD shall send the command SELECT to select EF_{DIR}.

3) After step c) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = length of EF_{DIR}'s content.

4) After step d) the CAD shall send three SELECT commands to select $DF_{TELECOM}$.

5) After step e) the CAD shall send the command SELECT to select EF_{LND}.

6) After step f) the CAD shall send the command UPDATE RECORD with:

   -   P1 = '00';

   -   P2 = '03' (previous record);

   -   Lc = '0D' (length of a record of EF$_{LND}$);

and the data consist of:

   -   Alpha-identifier = 'FF FF FF';

   -   Length of BCD number = '06';

   -   Type of Number = International coding according to EN 726-6 [11];

   -   Dialling number = '01 23 45 67 89 FF FF FF FF FF';

   -   Extension identifier = 'FF'.

7) After step g) the CAD shall send the command SELECT to select MF.

8) After step h) the CAD shall send the command SELECT to select DF$_{UPT}$.

5.3.4.5.2.3   Updating of AND with more than 20 digits and with called party subaddress

5.3.4.5.2.3.1   Definition and applicability

This procedure is used to update a ADN (abbreviated dialling number) with more than 20 digits and with called party subaddress.

5.3.4.5.2.3.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.5.1.1 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.5.1.1.

Test Group Reference (TGR): TGR_CAD_APP_GTP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GTP_UPD_ADN20.

5.3.4.5.2.3.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.5.2.3.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) The status of the service numbers 2 and 10 in the EF$_{PST}$ are allocated and activated.

4) Within the EF$_{DIR}$ there is one file ID in the path to DF$_{TELECOM}$.

5) DF$_{UPT}$ is placed directly under the MF.

6) EF$_{ADN}$ and EF$_{EXT1}$ exist in the structure of the PIM simulator.

7) A record of EF$_{ADN}$ has a length of 16 bytes.

8) The current DF is DF$_{UPT}$.

9) At least one record of EF_{ADN} and three records of EF_{EXT1} are free.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction:

- updating the PST table with a new ADN with need of extension 1 (phone number to be registered is more than 20 digits = +01234567890123456789001, called party subaddress = 123, alpha-identifier 'BBBB', but without subaddress);

b) the PIM simulator sends the status bytes corresponding to the received command "select MF";

c) the PIM simulator sends the status bytes corresponding to the received command "select EF_{DIR}";

d) the PIM simulator sends the data (content of EF_{DIR}: one file ID in the path to $DF_{TELECOM}$, one file ID in the path to the UPT application) and the status bytes corresponding to the received command "read";

e) the PIM simulator sends the status bytes corresponding to the received command "select $DF_{TELECOM}$";

f) the PIM simulator sends the status bytes corresponding to the received command "select EF_{ADN}";

g) the PIM simulator sends the status bytes corresponding to the received command "seek";

h) the PIM simulator sends the status bytes corresponding to the received command "update";

i) the PIM simulator sends the status bytes corresponding to the received command "select EF_{EXT1}";

j) the PIM simulator sends the status bytes corresponding to the received command "seek";

k) the PIM simulator sends the status bytes corresponding to the received command "update";

l) the PIM simulator sends the status bytes corresponding to the received command "seek";

m) the PIM simulator sends the status bytes corresponding to the received command "update";

n) the PIM simulator sends the status bytes corresponding to the received command "seek";

o) the PIM simulator sends the status bytes corresponding to the received command "update";

p) the PIM simulator sends the status bytes corresponding to the received command "select MF";

q) the PIM simulator sends the status bytes corresponding to the received command "select DF_{UPT}".

5.3.4.5.2.3.5   Test requirement

1) After step a) the CAD shall send the command SELECT to select MF.

2) After step b) the CAD shall send the command SELECT to select EF_{DIR}.

3) After step c) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = length of EF_{DIR}'s content.

4) After step d) the CAD shall send the command SELECT to select $DF_{TELECOM}$.

5) After step e) the CAD shall send the command SELECT to select EF_{ADN}.

6) After step f) the CAD shall send the command SEEK with P1 = '00', Lc = '10' (length of a record of EF_{ADN}) and data = 'FF ... FF' (16 bytes) (to seek for a free record).

7) After step g) the CAD shall send the command UPDATE RECORD with:

- P1 = '00';

- P2 = '04' (current record);

- Lc = '10' (length of a record of EF_{ADN});

and the data consist of:

- Alpha-identifier = 'BB BB';

- Length of BCD number = '11';

- Type of Number = International coding according to EN 726-6 [11];

- Dialling number = '01 23 45 67 89 01 23 45 67 89';

- Extension identifier = number of the record in EF_{EXT1} in which the overflow will be updated.

8) After step h) the CAD shall send the command SELECT to select EF_{EXT1}.

9) After step i) the CAD shall send the command SEEK with P1 = '00', Lc = '0D' (length of a record of EF_{EXT1}) and data = 'FF ... FF' (13 bytes) (to seek for a free record).

10) After step j) the CAD shall send the command UPDATE RECORD with

-   P1 = '00';

-   P2 = '04' (current record);

-   Lc = '0D' (length of a record of EF_{EXT1});

and the data consist of:

- Record type = '02' (overflow data);

- Extension data = '02 00 01 FF FF FF FF FF FF FF FF';

- Identifier = number of the record in EF_{EXT1} in which the first part of the called party subaddress will be updated.

11) After step k) the CAD shall send the command SEEK with P1 = '00', Lc = '0D' (length of a record of EF_{EXT1}) and data = 'FF ... FF' (13 bytes) (to seek for a free record).

12) After step l) the CAD shall send the command UPDATE RECORD with:

- P1 = '00';

- P2 = '04' (current record);

- Lc = '0D' (length of a record of EF_{EXT1});

and the data consist of:

- Record type = '01' (Called party subaddress);

- Extension data = '12 3F FF FF FF FF FF FF FF FF FF';

- Identifier = number of the record in EF_{EXT1} in which the second part of the called party subaddress will be updated.

13) After step m) the CAD shall send the command SEEK with P1 = '00', Lc = '0D' (length of a record of EF_{EXT1}) and data = 'FF ... FF' (13 bytes) (to seek for a free record).

14) After step n) the CAD shall send the command UPDATE RECORD with:

- P1 = '00';

- P2 = '04' (current record);

- Lc = '0D' (length of a record of EF_{EXT1});

and the data consist of:

- Record type = '01' (Called party subaddress);

- Extension data = 'FF FF FF FF FF FF FF FF FF FF FF';

- Identifier = 'FF'.

15) After step o) the CAD shall send the command SELECT to select MF.

16) After step p) the CAD shall send the command SELECT to select DF$_{UPT}$.

5.3.4.5.2.4   Updating of LND with more than 20 digits and with called party subaddress

5.3.4.5.2.4.1   Definition and applicability

This procedure is used to update a LND (last dialling number) with more than 20 digits and with called party subaddress.

5.3.4.5.2.4.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.5.1.1 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.5.1.1.

Test Group Reference (TGR): TGR_CAD_APP_GTP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GTP_UPD_LND20.

5.3.4.5.2.4.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.5.2.4.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) The status of the service numbers 10 and 13 in the EF$_{PST}$ are allocated and activated.

4) Within the EF$_{DIR}$ there is one file ID in the path to DF$_{TELECOM}$.

5) DF$_{UPT}$ is placed directly under the MF.

6) EF$_{LND}$ and EF$_{EXT1}$ exist in the structure of the PIM simulator.

7) A record of EF$_{LND}$ has a length of 14 bytes.

8) The current DF is DF$_{UPT}$.

9) At least one record of EF$_{LND}$ and three records of EF$_{EXT1}$ are free.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction:

- dialling by the CAD of a phone number more than 20 digits = +012345678901234567890001 and with the called party subaddress = 123;

b) the PIM simulator sends the status bytes corresponding to the received command "select MF";

c) the PIM simulator sends the status bytes corresponding to the received command "select EF$_{DIR}$";

d) the PIM simulator sends the data (content of EF$_{DIR}$: one file ID in the path to DF$_{TELECOM}$, one file ID in the path to the UPT application) and the status bytes corresponding to the received command "read";

e) the PIM simulator sends the status bytes corresponding to the received command "select DF$_{TELECOM}$";

f) the PIM simulator sends the status bytes corresponding to the received command "select EF$_{LND}$";

g) the PIM simulator sends the status bytes corresponding to the received command "update";

h) the PIM simulator sends the status bytes corresponding to the received command "select EF$_{EXT1}$";

i) the PIM simulator sends the status bytes corresponding to the received command "seek";

j) the PIM simulator sends the status bytes corresponding to the received command "update";

k) the PIM simulator sends the status bytes corresponding to the received command "seek";

l) the PIM simulator sends the status bytes corresponding to the received command "update";

m) the PIM simulator sends the status bytes corresponding to the received command "seek";

n) the PIM simulator sends the status bytes corresponding to the received command "update";

o) the PIM simulator sends the status bytes corresponding to the received command "select MF";

p) the PIM simulator sends the status bytes corresponding to the received command "select DF$_{UPT}$".

5.3.4.5.2.4.5   Test requirement

1) After step a) the CAD shall send the command SELECT to select MF.

2) After step b) the CAD shall send the command SELECT to select EF$_{DIR}$.

3) After step c) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = length of EF$_{DIR}$'s content.

4) After step d) the CAD shall send the command SELECT to select DF$_{TELECOM}$.

5) After step e) the CAD shall send the command SELECT to select EF$_{LND}$.

6) After step f) the CAD shall send the command UPDATE RECORD with:

   - P1 = '00';

   - P2 = '03' (previous record);

   - Lc = '0E' (length of a record of EF$_{LND}$);

and the data consist of:

   - alpha-identifier = empty;

   - length of BCD number = '11';

   - type of Number = International coding according to EN 726-6 [11];

   - dialling number = '01 23 45 67 89 01 23 45 67 89';

   - extension identifier = number of the record in EF$_{EXT1}$ in which the overflow will be updated.

7) After step g) the CAD shall send the command SELECT to select EF$_{EXT1}$.

8) After step h) the CAD shall send the command SEEK with P1 = '00', Lc = '0D' (length of a record of EF$_{EXT1}$) and data = 'FF ... FF' (13 bytes) (to seek for a free record).

9) After step i) the CAD shall send the command UPDATE RECORD with:

- P1 = '00';

- P2 = '04' (current record);

- Lc = '0D' (length of a record of EF_{EXT1});

and the data consist of:

- record type = '02' (overflow data);

- extension data = '02 00 01 FF FF FF FF FF FF FF FF';

- identifier = number of the record in EF_{EXT1} in which the first part of the called party subaddress will be updated.

10) After step j) the CAD shall send the command SEEK with P1 = '00', Lc = '0D' (length of a record of EF_{EXT1}) and data = 'FF ... FF' (13 bytes) (to seek for a free record).

11) After step k) the CAD shall send the command UPDATE RECORD with:

- P1 = '00';

- P2 = '04' (current record);

- Lc = '0D' (length of a record of EF_{EXT1});

and the data consist of:

- record type = '01' (Called party subaddress);

- extension data = '12 3F FF FF FF FF FF FF FF FF FF';

- identifier = number of the record in EF_{EXT1} in which the second part of the called party subaddress will be updated.

12) After step l) the CAD shall send the command SEEK with P1 = '00', Lc = '0D' (length of a record of EF_{EXT1}) and data = 'FF ... FF' (13 bytes) (to seek for a free record).

13) After step m) the CAD shall send the command UPDATE RECORD with:

- P1 = '00';

- P2 = '04' (current record);

- Lc = '0D' (length of a record of EF_{EXT1});

and the data consist of:

- record type = '01' (Called party subaddress);

- extension data = 'FF FF FF FF FF FF FF FF FF FF FF';

- identifier = 'FF'.

14) After step n) the CAD shall send the command SELECT to select MF.

15) After step o) the CAD shall send the command SELECT to select DF_{UPT}.

5.3.4.5.3   Erasure

5.3.4.5.3.1   Erasure of AND with less than 20 digits and without called party subaddress

5.3.4.5.3.1.1   Definition and applicability

This procedure is used to Erase a ADN (Abbreviated dialling number) with less than 20 digits and without called party subaddress.

5.3.4.5.3.1.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.5.1.2 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.5.1.2.

Test Group Reference (TGR): TGR_CAD_APP_GTP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GTP_ERA_ADN.

5.3.4.5.3.1.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.5.3.1.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) The status of the service number 2 in the EF_{PST} is allocated and activated.

4) Within the EF_{DIR} there is one file ID in the path to $DF_{TELECOM}$.

5) DF_{UPT} is placed directly under the MF.

6) EF_{ADN} exists in the structure of the PIM simulator.

7) A record of EF_{ADN} has a length of 16 bytes.

8) The first record in EF_{ADN} contains the alpha-identifier 'AAAA', theDialling number '01 23 45 67 89' and the Extension 1 record identifier 'FF'.

9) The second record in EF_{ADN} contains the alpha-identifier 'AAAA', theDialling number '23 45 67 89 01' and the Extension 1 record identifier 'FF'.

10) The current DF is DF_{UPT}.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction:

   - ask for Erasing by the CAD of a ADN with alpha-identifier = 'AAAA';

b) the PIM simulator sends the status bytes corresponding to the received command "select MF";

c) the PIM simulator sends the status bytes corresponding to the received command "select EF_{DIR}";

d) the PIM simulator sends the data (content of EF_{DIR}: one file ID in the path to $DF_{TELECOM}$, one file ID in the path to the UPT application) and the status bytes corresponding to the received command "read";

e) the PIM simulator sends the status bytes corresponding to the received commands to select $DF_{TELECOM}$;

f) the PIM simulator sends the status bytes corresponding to the received command "select EF_{ADN}";

g) the PIM simulator sends the status bytes corresponding to the received command "seek";

h) the PIM simulator sends the data (content of the first record of EF_{ADN} with the dialling number '01 23 45 67 89') and the status bytes corresponding to the received command "read";

i) the tester rejects the erasure by a MMI interaction;

j) the PIM simulator sends the status bytes corresponding to the received command "seek";

k) the PIM simulator sends the data (content of the second record of EF_{ADN} with the dialling number '23 45 67 89 01') and the status bytes corresponding to the received command "read";

l) the tester confirms the erasure by a MMI interaction;

m) the PIM simulator sends the status bytes corresponding to the received command "update";

n) the PIM simulator sends the status bytes corresponding to the received command "select MF";

o) the PIM simulator sends the status bytes corresponding to the received command "select DF_{UPT}".

5.3.4.5.3.1.5   Test requirement

1) After step a) the CAD shall send the command SELECT to select MF.

2) After step b) the CAD shall send the command SELECT to select EF_{DIR}.

4) After step c) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = file size of EF_{DIR}.

5) After step d) the CAD shall send the command SELECT to select $DF_{TELECOM}$.

6) After step e) the CAD shall send the command SELECT to select EF_{AND}.

7) After step f) the CAD shall send the command SEEK with:

   -   P1 = '00';

   -   P2 = '00' (from the beginning forward);

   -   Lc = '02'; and

data = 'AA AA' (to seek for a record containing 'AA AA').

8) After step g) the CAD shall send the command READ RECORD with;

   -   P1 = '00';

   -   P2 = '04' (current record); and

   -   Le = '10' (length of a record of EF_{ADN}).

9) After step i) the CAD shall send the command SEEK with:

   -   P1 = '00';

   -   P2 = '02' (from the next location forward);

   -   Lc = '02'; and

data = 'AA AA' (to seek for a record containing 'AA AA').

10) After step j) the CAD shall send the command READ RECORD with:

- P1 = '00';

- P2 = '04' (current record); and

- Le = '10' (length of a record of EF_{ADN}).

11) After step l) the CAD shall send the command UPDATE RECORD with:

- P1 = '00';

- P2 = '04' (current record);

- Lc = '10' (length of a record of EF_{ADN})

data = 'FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF'.

12) After step m) the CAD shall send the command SELECT to select MF.

13) After step n) the CAD shall send the command SELECT to select DF_{UPT}.

5.3.4.5.3.2   Erasure of LND with less than 20 digits and without called party subaddress

5.3.4.5.3.2.1   Definition and applicability

This procedure is used to Erase a LND (Last Number Dialled) with less than 20 digits and without called party subaddress.

5.3.4.5.3.2.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.5.1.2 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.5.1.2.

Test Group Reference (TGR): TGR_CAD_APP_GTP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GTP_ERA_LND.

5.3.4.5.3.2.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.5.3.2.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) The status of the service number 13 in the EF_{PST} is allocated and activated.

4) Within the EF_{DIR} there is one file ID in the path to $DF_{TELECOM}$.

5) DF_{UPT} is placed directly under the MF.

6) EF_{LND} exists in the structure of the PIM simulator.

7) A record of EF_{LND} has a length of 17 bytes.

8) The current DF is DF_{UPT}.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction:

   - ask for Erasing by the CAD of a LND;

b) the PIM simulator sends the status bytes corresponding to the received command "select MF";

c) the PIM simulator sends the status bytes corresponding to the received command "select EF$_{DIR}$";

d) the PIM simulator sends the data (content of EF$_{DIR}$: one file ID in the path to DF$_{TELECOM}$, one file ID in the path to the UPT application) and the status bytes corresponding to the received command "read";

e) the PIM simulator sends the status bytes corresponding to the received commands to select DF$_{TELECOM}$;

f) the PIM simulator sends the status bytes corresponding to the received command "select EF$_{LND}$";

g) the tester confirms the erasure by a MMI interaction;

h) the PIM simulator sends the status bytes corresponding to the received command "update";

i) the PIM simulator sends the status bytes corresponding to the received command "select MF";

j) the PIM simulator sends the status bytes corresponding to the received command "select DF$_{UPT}$".

5.3.4.5.3.2.5   Test requirement

1) After step a) the CAD shall send the command SELECT to select MF.

2) After step b) the CAD shall send the command SELECT to select EF$_{DIR}$.

3) After step c) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = file size of EF$_{DIR}$.

4) After step d) the CAD shall send the command SELECT to select DF$_{TELECOM}$.

5) After step e) the CAD shall send the command SELECT to select EF$_{LND}$.

6) After step f) the CAD shall send the command READ RECORD with:

   - P1 = '00';

   - P2 = '04' (current record); and

   - Le = '10' (length of a record of EF$_{LND}$).

7) After step g) the CAD shall send the command UPDATE RECORD with:

   - P1 = '00';

   - P2 = '04' (current record);

   - Lc = '10' (length of a record of EF$_{LND}$);

data = 'FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF'.

8) After step h) the CAD shall send the command SELECT to select MF.

9) After step i) the CAD shall send the command SELECT to select DF$_{UPT}$.

5.3.4.5.3.3   Erasure of ADN with more than 20 digits and with called party subaddress

5.3.4.5.3.3.1   Definition and applicability

This procedure is used to Erase a ADN (Abbreviated dialling number) with more than 20 digits and with called party subaddress.

5.3.4.5.3.3.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.5.1.2
considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.5.1.2.

Test Group Reference (TGR): TGR_CAD_APP_GTP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GTP_ERA_ADN20.

5.3.4.5.3.3.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.5.3.3.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) The status of the service numbers 2 and 10 in the EF_{PST} are allocated and activated.

4) Within the EF_{DIR} there is one file ID in the path to $DF_{TELECOM}$.

5) DF_{UPT} is placed directly under the MF.

6) EF_{ADN} and EF_{EXT1} exist in the structure of the PIM simulator.

7) A record of EF_{ADN} has a length of 16 bytes.

8) The first record in EF_{ADN} contains the alpha-identifier 'BBBB', the Dialling number '01 23 45 67 89 01 23 45 67
89' and the Extension 1 record identifier '01'.

9) The first record in EF_{EXT1} contains the overflow '01 01' and the Identifier '03'.

10) The third record in EF_{EXT1} contains the first part of the called party subaddress '02 02' and the Identifier '03'.

11) The second record in EF_{EXT1} contains the second part of the called party subaddress 'FF ... FF' and the Identifier
'03'.

12) The current DF is DF_{UPT}.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction:

-   ask for Erasing by the CAD of a ADN with alpha-identifier = 'BBBB';

b) the PIM simulator sends the status bytes corresponding to the received command "select MF";

c) the PIM simulator sends the status bytes corresponding to the received command "select EF_{DIR}";

d) the PIM simulator sends the data (content of EF_{DIR}: one file ID in the path to $DF_{TELECOM}$, one file ID in the
path to the UPT application) and the status bytes corresponding to the received command "read";

e) the PIM simulator sends the status bytes corresponding to the received commands to select $DF_{TELECOM}$;

f) the PIM simulator sends the status bytes corresponding to the received command "select EF_{ADN}";

g) the PIM simulator sends the status bytes corresponding to the received command "seek";

h) the PIM simulator sends the data (content of the first record of EF_{ADN}, Extension 1 record identifier = '01') and
the status bytes corresponding to the received command "read";

i) the tester confirms the erasure by a MMI interaction;

j) the PIM simulator sends the status bytes corresponding to the received command "update";

k) the PIM simulator sends the status bytes corresponding to the received command "select EF$_{EXT1}$";

l) the PIM simulator sends the status bytes corresponding to the received command "seek";

m) the PIM simulator sends the data (content of the first record of EF$_{EXT1}$, Identifier = '03') and the status bytes corresponding to the received command "read";

n) the PIM simulator sends the status bytes corresponding to the received command "update";

o) the PIM simulator sends the data (content of the third record of EF$_{EXT1}$, Identifier = '02') and the status bytes corresponding to the received command "read";

p) the PIM simulator sends the status bytes corresponding to the received command "update";

q) the PIM simulator sends the data (content of the second record of EF$_{EXT1}$) and the status bytes corresponding to the received command "read";

r) the PIM simulator sends the status bytes corresponding to the received command "update";

s) the PIM simulator sends the status bytes corresponding to the received command "select MF";

t) the PIM simulator sends the status bytes corresponding to the received command "select DF$_{UPT}$".

5.3.4.5.3.3.5 Test requirement

1) After step a) the CAD shall send the command SELECT to select MF.

2) After step b) the CAD shall send the command SELECT to select EF$_{DIR}$.

3) After step c) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = file size of EF$_{DIR}$.

4) After step d) the CAD shall send the command SELECT to select DF$_{TELECOM}$.

5) After step e) the CAD shall send the command SELECT to select EF$_{AND}$.

6) After step f) the CAD shall send the command SEEK with:

- P1 = '00';
- P2 = '00' (from the beginning forward);
- Lc = '02'; and

data = 'BB BB' (to seek for a record containing 'BB BB').

7) After step g) the CAD shall send the command READ RECORD with:

- P1 = '00';
- P2 = '04' (current record); and
- Le = '10' (length of a record of EF$_{ADN}$).

8) After step i) the CAD shall send the command UPDATE RECORD with:

- P1 = '00';
- P2 = '04' (current record);
- Lc = '10' (length of a record of EF$_{ADN}$); and

data = 'FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF'.

9) After step j) the CAD shall send the command SELECT to select EF_{EXT1}.

10) After step k) the CAD shall send the command SEEK.

11) After step l) the CAD shall send the command READ RECORD with:

- P1 = '01' (Record number known by the previous read command);

- P2 = '04' (absolute mode); and

- Le = '0D' (length of a record of EF_{EXT1}).

12) After step m) the CAD shall send the command UPDATE RECORD with:

- P1 = '01';

- P2 = '04' (absolute mode);

- Lc = '0D' (length of a record of EF_{EXT1});

data = 'FF FF FF FF FF FF FF FF FF FF FF FF FF'.

13) After step n) the CAD shall send the command READ RECORD with:

- P1 = '03' (Record number known by the previous read command);

- P2 = '04' (absolute mode); and

- Le = '0D' (length of a record of EF_{EXT1}).

14) After step o) the CAD shall send the command UPDATE RECORD with:

- P1 = '03';

- P2 = '04' (absolute mode);

- Lc = '0D' (length of a record of EF_{EXT1});

data = 'FF FF FF FF FF FF FF FF FF FF FF FF FF'.

15) After step p) the CAD shall send the command READ RECORD with:

- P1 = '02' (Record number known by the previous read command);

- P2 = '04' (absolute mode); and

- Le = '0D' (length of a record of EF_{EXT1}).

16) After step q) the CAD shall send the command UPDATE RECORD with:

- P1 = '02';

- P2 = '04' (absolute mode);

- Lc = '0D' (length of a record of EF_{EXT1});

data = 'FF FF FF FF FF FF FF FF FF FF FF FF FF'.

17) After step r) the CAD shall send the command SELECT to select MF.

18) After step s) the CAD shall send the command SELECT to select DF_{UPT}.

5.3.4.5.3.4   Erasure of LND with more than 20 digits and with called party subaddress

5.3.4.5.3.4.1   Definition and applicability

This procedure is used to Erase a LND (Last Number Dialled) with more than 20 digits and with called party subaddress.

5.3.4.5.3.4.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.5.1.2 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.5.1.2.

Test Group Reference (TGR): TGR_CAD_APP_GTP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GTP_ERA_LND20.

5.3.4.5.3.4.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.5.3.4.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) The status of the service numbers 13 and 10 in the EF_{PST} are allocated and activated.

4) Within the EF_{DIR} there is one file ID in the path to $DF_{TELECOM}$.

5) DF_{UPT} is placed directly under the MF.

6) EF_{ADN} and EF_{EXT1} exist in the structure of the PIM simulator.

7) A record of EF_{LND} has a length of 17 bytes.

8) The record in EF_{LND} contains the Dialling number '01 23 45 67 89 01 23 45 67 89' and the Extension 1 record identifier '01'.

9) The first record in EF_{EXT1} contains the overflow '01 01' and the Identifier '03'.

10) The third record in EF_{EXT1} contains the first part of the called party subaddress '02 02' and the Identifier '03'.

11) The second record in EF_{EXT1} contains the second part of the called party subaddress 'FF ... FF' and the Identifier '03'.

12) The current DF is DF_{UPT}.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction:

-   ask for Erasing by the CAD of a LND;

b) the PIM simulator sends the status bytes corresponding to the received command "select MF";

c) the PIM simulator sends the status bytes corresponding to the received command "select EF_{DIR}";

d) the PIM simulator sends the data (content of EF_{DIR}: one file ID in the path to $DF_{TELECOM}$, one file ID in the path to the UPT application) and the status bytes corresponding to the received command "read";

e) the PIM simulator sends the status bytes corresponding to the received commands to select $DF_{TELECOM}$;

f) the PIM simulator sends the status bytes corresponding to the received command "select EF_{LND}";

g) the PIM simulator sends the data (content of the first record of EF_{LND}, Extension 1 record identifier = '01') and the status bytes corresponding to the received command "read";

h) the tester confirms the erasure by a MMI interaction;

i) the PIM simulator sends the status bytes corresponding to the received command "update";

j) the PIM simulator sends the status bytes corresponding to the received command "select EF_{EXT1}";

k) the PIM simulator sends the status bytes corresponding to the received command "seek";

l) the PIM simulator sends the data (content of the first record of EF_{EXT1}, Identifier = '03') and the status bytes corresponding to the received command "read";

m) the PIM simulator sends the status bytes corresponding to the received command "update";

n) the PIM simulator sends the data (content of the third record of EF_{EXT1}, Identifier = '02') and the status bytes corresponding to the received command "read";

o) the PIM simulator sends the status bytes corresponding to the received command "update";

p) the PIM simulator sends the data (content of the second record of EF_{EXT1}) and the status bytes corresponding to the received command "read";

q) the PIM simulator sends the status bytes corresponding to the received command "update";

r) the PIM simulator sends the status bytes corresponding to the received command "select MF";

s) the PIM simulator sends the status bytes corresponding to the received command "select DF_{UPT}".

5.3.4.5.3.4.5   Test requirement

1) After step a) the CAD shall send the command SELECT to select MF.

2) After step b) the CAD shall send the command SELECT to select EF_{DIR}.

4) After step c) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = file size of EF_{DIR}.

5) After step d) the CAD shall send the command SELECT to select $DF_{TELECOM}$.

6) After step e) the CAD shall send the command SELECT to select EF_{LND}.

7) After step f) the CAD shall send the command READ RECORD with:

   - P1 = '00';

   - P2 = '04' (current record); and

   - Le = '10' (length of a record of EF_{LND}).

8) After step h) the CAD shall send the command UPDATE RECORD with:

   - P1 = '00';

   - P2 = '04' (current record);

   - Lc = '10' (length of a record of EF_{ADN}); and

   Data = 'FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF'.

9) After step i) the CAD shall send the command SELECT to select EF_{EXT1}.

10) After step j) the CAD shall send the command SEEK.

11) After step k) the CAD shall send the command READ RECORD with:

- P1 = '01' (Record number known by the previous read command);

- P2 = '04' (absolute mode); and

- Le = '0D' (length of a record of EF_{EXT1}).

12) After step l) the CAD shall send the command UPDATE RECORD with:

- P1 = '01';

- P2 = '04' (absolute mode);

- Lc = '0D' (length of a record of EF_{EXT1});

Data = 'FF FF FF FF FF FF FF FF FF FF FF FF FF'.

13) After step m) the CAD shall send the command READ RECORD with:

- P1 = '03' (Record number known by the previous read command);

- P2 = '04' (absolute mode); and

- Le = '0D' (length of a record of EF_{EXT1}).

14) After step n) the CAD shall send the command UPDATE RECORD with:

- P1 = '03';

- P2 = '04' (absolute mode);

- Lc = '0D' (length of a record of EF_{EXT1});

Data = 'FF FF FF FF FF FF FF FF FF FF FF FF FF'.

15) After step o) the CAD shall send the command READ RECORD with:

- P1 = '02' (Record number known by the previous read command);

- P2 = '04' (absolute mode); and

- Le = '0D' (length of a record of EF_{EXT1}).

16) After step p) the CAD shall send the command UPDATE RECORD with:

- P1 = '02';

- P2 = '04' (absolute mode);

- Lc = '0D' (length of a record of EF_{EXT1});

Data = 'FF FF FF FF FF FF FF FF FF FF FF FF FF'.

17) After step q) the CAD shall send the command SELECT to select MF.

18) After step r) the CAD shall send the command SELECT to select DF_{UPT}.

5.3.4.5.4   Request

5.3.4.5.4.1   Request of AND with less than 20 digits and without called party subaddress

5.3.4.5.4.1.1   Definition and applicability

This procedure is used to present a ADN (Abbreviated dialling number) with less than 20 digits and without called party subaddress.

5.3.4.5.4.1.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.5.1.3 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.5.1.3.

Test Group Reference (TGR): TGR_CAD_APP_GTP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GTP_REQ_ADN.

5.3.4.5.4.1.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.5.4.1.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) The status of the service number 2 in the EF_{PST} is allocated and activated.

4) Within the EF_{DIR} there is one file ID in the path to $DF_{TELECOM}$.

5) DF_{UPT} is placed directly under the MF.

6) EF_{ADN} exists in the structure of the PIM simulator.

7) A record of EF_{ADN} has a length of 16 bytes.

8) A record in EF_{ADN} contains the alpha-identifier 'AAAA', the Dialling number '01 23 45 67 89' and the Extension 1 record identifier 'FF'; no other record of EF_{ADN} has the alpha-identifier 'AAAA'.

9) The current DF is DF_{UPT}.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction:

   - request by the CAD of a ADN with alpha-identifier = 'AAAA';

b) the PIM simulator sends the status bytes corresponding to the received command "select MF";

c) the PIM simulator sends the status bytes corresponding to the received command "select EF_{DIR}";

d) the PIM simulator sends the data (content of EF_{DIR}: one file ID in the path to $DF_{TELECOM}$, one file ID in the path to the UPT application) and the status bytes corresponding to the received command "read";

e) the PIM simulator sends the status bytes corresponding to the received commands to select $DF_{TELECOM}$;

f) the PIM simulator sends the status bytes corresponding to the received command "select EF_{ADN}";

g) the PIM simulator sends the status bytes corresponding to the received command "seek";

h) the PIM simulator sends the data (content of the first record of EF_{ADN} with the dialling number '01 23 45 67 89') and the status bytes corresponding to the received command "read";

i) the PIM simulator sends the status bytes corresponding to the received command "select MF";

j) the PIM simulator sends the status bytes corresponding to the received command "select DF_{UPT}".

5.3.4.5.4.1.5   Test requirement

1) After step a) the CAD shall send the command SELECT to select MF.

2) After step b) the CAD shall send the command SELECT to select EF_{DIR}.

3) After step c) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = file size of EF_{DIR}.

4) After step d) the CAD shall send the command SELECT to select $DF_{TELECOM}$.

5) After step e) the CAD shall send the command SELECT to select EF_{AND}.

6) After step f) the CAD shall send the command SEEK with:

   - P1 = '00';

   - Lc = '02'; and

   Data = 'AA AA' (to seek for a record containing 'AA AA').

7) After step g) the CAD shall send the command READ RECORD with:

   - P1 = '00';

   - P2 = '04' (current record); and

   - Le = '10' (length of a record of EF_{ADN}).

8) After step h) the CAD shall send the command SELECT to select MF.

9) After step i) the CAD shall send the command SELECT to select DF_{UPT}.

5.3.4.5.4.2   Request of LND with less than 20 digits and without called party subaddress

5.3.4.5.4.2.1   Definition and applicability

This procedure is used to present a LND (last number dialled) with less than 20 digits and without called party subaddress.

5.3.4.5.4.2.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.5.1.3 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.5.1.3.

Test Group Reference (TGR): TGR_CAD_APP_GTP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GTP_REQ_LND.

5.3.4.5.4.2.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.5.4.2.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) The status of the service number 13 in the EF_{PST} is allocated and activated.

4) Within the EF_{DIR} there is one file ID in the path to $DF_{TELECOM}$.

5) DF_{UPT} is placed directly under the MF.

6) EF_{LND} exists in the structure of the PIM simulator.

7) A record of EF_{LND} has a length of 16 bytes.

8) The current DF is DF_{UPT}.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction:

- request by the CAD of the LND;

b) the PIM simulator sends the status bytes corresponding to the received command "select MF";

c) the PIM simulator sends the status bytes corresponding to the received command "select EF_{DIR}";

d) the PIM simulator sends the data (content of EF_{DIR}: one file ID in the path to $DF_{TELECOM}$, one file ID in the path to the UPT application) and the status bytes corresponding to the received command "read";

e) the PIM simulator sends the status bytes corresponding to the received commands to select $DF_{TELECOM}$;

f) the PIM simulator sends the status bytes corresponding to the received command "select EF_{LND}";

g) the PIM simulator sends the data (content of the record of EF_{LND} with the dialling number '01 23 45 67 89') and the status bytes corresponding to the received command "read";

h) the PIM simulator sends the status bytes corresponding to the received command "select MF";

i) the PIM simulator sends the status bytes corresponding to the received command "select DF_{UPT}".

5.3.4.5.4.2.5   Test requirement

1) After step a) the CAD shall send the command SELECT to select MF.

2) After step b) the CAD shall send the command SELECT to select EF_{DIR}.

4) After step c) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = file size of EF_{DIR}.

5) After step d) the CAD shall send the command SELECT to select $DF_{TELECOM}$.

6) After step e) the CAD shall send the command SELECT to select EF_{LDN}.

7) After step f) the CAD shall send the command READ RECORD with:

- P1 = '00';

- P2 = '03' (previous record); and

- Le = '10' (length of a record of EF_{LND}).

8) After step g) the CAD shall send the command SELECT to select MF.

9) After step h) the CAD shall send the command SELECT to select DF_{UPT}.

5.3.4.5.4.3   Request of AND with more than 20 digits and with called party subaddress

5.3.4.5.4.3.1   Definition and applicability

This procedure is used to present a ADN (Abbreviated dialling number) with more than 20 digits and with called party subaddress.

5.3.4.5.4.3.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.5.1.3 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.5.1.3.

Test Group Reference (TGR): TGR_CAD_APP_GTP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GTP_REQ_ADN20.

5.3.4.5.4.3.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.5.4.3.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) The status of the service numbers 2 and 10 in the EF_{PST} are allocated and activated.

4) Within the EF_{DIR} there is one file ID in the path to $DF_{TELECOM}$.

5) DF_{UPT} is placed directly under the MF.

6) EF_{ADN} and EF_{EXT1} exist in the structure of the PIM simulator.

7) A record of EF_{ADN} has a length of 16 bytes.

8) A record in EF_{ADN} contains the alpha-identifier 'BBBB', the Dialling number '01 23 45 67 89 01 23 45 67 89' and the Extension 1 record identifier '01'; no other record of EF_{ADN} has the alpha-identifier 'AAAA'.

9) The first record in EF_{EXT1} contains the overflow '01 01' and the Identifier '03'.

10) The third record in EF_{EXT1} contains the first part of the called party subaddress '02 02' and the Identifier '03'.

11) The second record in EF_{EXT1} contains the second part of the called party subaddress 'FF ... FF' and the Identifier '03'.

12) The current DF is DF_{UPT}.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction:

 - request by the CAD of a ADN with alpha-identifier = 'AAAA';

b) the PIM simulator sends the status bytes corresponding to the received command "select MF";

c) the PIM simulator sends the status bytes corresponding to the received command "select EF_{DIR}";

d) the PIM simulator sends the data (content of EF_{DIR}: one file ID in the path to $DF_{TELECOM}$, one file ID in the path to the UPT application) and the status bytes corresponding to the received command "read";

e) the PIM simulator sends the status bytes corresponding to the received commands to select $DF_{TELECOM}$;

f) the PIM simulator sends the status bytes corresponding to the received command "select EF_{ADN}";

g) the PIM simulator sends the status bytes corresponding to the received command "seek";

h) the PIM simulator sends the data (content of the first record of EF$_{ADN}$ with the dialling number '01 23 45 67 89 01 23 45 67 89' and the Extension 1 record identifier number '01') and the status bytes corresponding to the received command "read";

i) the PIM simulator sends the status bytes corresponding to the received command "select EF$_{EXT1}$";

j) the PIM simulator sends the status bytes corresponding to the received command "seek";

k) the PIM simulator sends the data (content of the first record of EF$_{EXT1}$, Identifier = '03') and the status bytes corresponding to the received command "read";

l) the PIM simulator sends the data (content of the third record of EF$_{EXT1}$, Identifier = '02') and the status bytes corresponding to the received command "read";

m) the PIM simulator sends the data (content of the second record of EF$_{EXT1}$) and the status bytes corresponding to the received command "read";

n) the PIM simulator sends the status bytes corresponding to the received command "select MF";

o) the PIM simulator sends the status bytes corresponding to the received command "select DF$_{UPT}$".

5.3.4.5.4.3.5   Test requirement

1) After step a) the CAD shall send the command SELECT to select MF.

2) After step b) the CAD shall send the command SELECT to select EF$_{DIR}$.

3) After step c) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = file size of EF$_{DIR}$.

4) After step d) the CAD shall send the command SELECT to select DF$_{TELECOM}$.

5) After step e) the CAD shall send the command SELECT to select EF$_{ADN}$.

6) After step f) the CAD shall send the command SEEK with:

   - P1 = '00';

   - Lc = '02'; and

   data = 'AA AA' (to seek for a record containing 'AA AA').

7) After step g) the CAD shall send the command READ RECORD with:

- P1 = '00';

- P2 = '04' (current record); and

- Le = '10' (length of a record of EF$_{ADN}$).

8) After step h) the CAD shall send the command SELECT to select EF$_{EXT1}$.

9) After step i) the CAD shall send the command SEEK.

10) After step j) the CAD shall send the command READ RECORD with:

- P1 = '01' (Record number known by the previous read command);

- P2 = '04' (absolute mode); and

- Le = '0D' (length of a record of EF$_{EXT1}$).

11) After step k) the CAD shall send the command READ RECORD with:

- P1 = '03' (Record number known by the previous read command);

- P2 = '04' (absolute mode); and

- Le = '0D' (length of a record of EF_{EXT1}).

12) After step l) the CAD shall send the command READ RECORD with:

- P1 = '02' (Record number known by the previous read command);

- P2 = '04' (absolute mode); and

- Le = '0D' (length of a record of EF_{EXT1}).

13) After step m) the CAD shall send the command SELECT to select MF.

14) After step n) the CAD shall send the command SELECT to select DF_{UPT}.

5.3.4.5.4.4   Request of LDN with more than 20 digits and with called party subaddress

5.3.4.5.4.4.1   Definition and applicability

This procedure is used to present a LDN (last number dialled) with more than 20 digits and with called party subaddress.

5.3.4.5.4.4.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.5.1.3 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.5.1.3.

Test Group Reference (TGR): TGR_CAD_APP_GTP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GTP_REQ_LND20.

5.3.4.5.4.4.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.5.4.4.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) The status of the service numbers 10 and 13 in the EF_{PST} are allocated and activated.

4) Within the EF_{DIR} there is one file ID in the path to $DF_{TELECOM}$.

5) DF_{UPT} is placed directly under the MF.

6) EF_{LND} and EF_{EXT1} exist in the structure of the PIM simulator.

7) A record of EF_{LND} has a length of 16 bytes.

8) The record in EF_{LND} contains the alpha-identifier 'BBBB', the Dialling number '01 23 45 67 89 01 23 45 67 89' and the Extension 1 record identifier '01'.

9) The first record in EF_{EXT1} contains the overflow '01 01' and the Identifier '03'.

10) The third record in EF_{EXT1} contains the first part of the called party subaddress '02 02' and the Identifier '03'.

11) The second record in EF_{EXT1} contains the second part of the called party subaddress 'FF ... FF' and the Identifier '03'.

12) The current DF is DF_{UPT}.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction:

- request by the CAD of the LND;

b) the PIM simulator sends the status bytes corresponding to the received command "select MF";

c) the PIM simulator sends the status bytes corresponding to the received command "select EF_{DIR}";

d) the PIM simulator sends the data (content of EF_{DIR}: one file ID in the path to $DF_{TELECOM}$, one file ID in the path to the UPT application) and the status bytes corresponding to the received command "read";

e) the PIM simulator sends the status bytes corresponding to the received commands to select $DF_{TELECOM}$;

f) the PIM simulator sends the status bytes corresponding to the received command "select EF_{LND}";

g) the PIM simulator sends the data (content of the record of EF_{LND} with the dialling number '01 23 45 67 89 01 23 45 67 89' and the Extension 1 record identifier number '01') and the status bytes corresponding to the received command "read";

h) the PIM simulator sends the status bytes corresponding to the received command "select EF_{EXT1}";

i) the PIM simulator sends the status bytes corresponding to the received command "seek";

j) the PIM simulator sends the data (content of the first record of EF_{EXT1}, Identifier = '03') and the status bytes corresponding to the received command "read";

k) the PIM simulator sends the data (content of the third record of EF_{EXT1}, Identifier = '02') and the status bytes corresponding to the received command "read";

l) the PIM simulator sends the data (content of the second record of EF_{EXT1}) and the status bytes corresponding to the received command "read";

m) the PIM simulator sends the status bytes corresponding to the received command "select MF";

n) the PIM simulator sends the status bytes corresponding to the received command "select DF_{UPT}".

5.3.4.5.4.4.5 Test requirement

1) After step a) the CAD shall send the command SELECT to select MF.

2) After step b) the CAD shall send the command SELECT to select EF_{DIR}.

3) After step c) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = file size of EF_{DIR}.

4) After step d) the CAD shall send the command SELECT to select $DF_{TELECOM}$.

5) After step e) the CAD shall send the command SELECT to select EF_{LND}.

6) After step f) the CAD shall send the command READ RECORD with:

- P1 = '00';

- P2 = '03' (previous record); and

- Le = '10' (length of a record of EF_{LND}).

7) After step g) the CAD shall send the command SELECT to select EF_{EXT1}.

8) After step h) the CAD shall send the command SEEK.

9) After step i) the CAD shall send the command READ RECORD with:

   - P1 = '01' (Record number known by the previous read command);

   - P2 = '04' (absolute mode); and

   - Le = '0D' (length of a record of EF_{EXT1}).

10) After step j) the CAD shall send the command READ RECORD with:

   - P1 = '03' (Record number known by the previous read command);

   - P2 = '04' (absolute mode); and

   - Le = '0D' (length of a record of EF_{EXT1}).

11) After step k) the CAD shall send the command READ RECORD with:

   - P1 = '02' (Record number known by the previous read command);

   - P2 = '04' (absolute mode); and

   - Le = '0D' (length of a record of EF_{EXT1}).

12) After step l) the CAD shall send the command SELECT to select MF.

13) After step m) the CAD shall send the command SELECT to select DF_{UPT}.

5.3.4.5.5   Purge

5.3.4.5.5.1   Definition and applicability

This procedure is used to purge the unused extension 1 records.

5.3.4.5.5.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.5.1.4 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.5.1.4.

Test Group Reference (TGR): TGR_CAD_APP_GTP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GTP_PUR.

5.3.4.5.5.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.5.5.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) The status of the service numbers 2, 10 and 13 in the EF_{PST} are allocated and activated.

4) Within the EF_{DIR} there is one file ID in the path to $DF_{TELECOM}$.

5) DF_{UPT} is placed directly under the MF.

6) EF_{ADN}, EF_{LND} and EF_{EXT1} exist in the structure of the PIM simulator.

7) EF_{EXT1} has five records.

8) One record in EF_{ADN} has the Extension 1 record identifier '02'; all other records in EF_{ADN} has the Extension 1 record identifier 'FF'.

9) The record in EF_{LND} has the Extension 1 record identifier '05'.

10) The second record of EFEXT1 has the Identifier '01'; the first and the fifth record of EFEXT1 have the Identifier 'FF'.

11) The current DF is DF_{UPT}.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction;

b) the PIM simulator sends the status bytes corresponding to the received command "select MF";

c) the PIM simulator sends the status bytes corresponding to the received command "select EF_{DIR}";

d) the PIM simulator sends the data (content of EF_{DIR}: two file IDs in the path to $DF_{TELECOM}$, one file ID in the path to the UPT application) and the status bytes corresponding to the received command "read";

e) the PIM simulator sends the status bytes corresponding to the received commands to select $DF_{TELECOM}$;

f) the PIM simulator sends the status bytes corresponding to the received command "select EF_{ADN}";

g) the PIM simulator sends the status bytes corresponding to the received commands "seek" and the data and status bytes to the received commands "read";

h) the PIM simulator sends the status bytes corresponding to the received command "select EF_{LND}";

i) the PIM simulator sends the status bytes corresponding to the received commands "seek" and the data and status bytes to the received commands "read";

j) the PIM simulator sends the status bytes corresponding to the received command "select EF_{EXT1}";

k) the PIM simulator sends the status bytes corresponding to the received commands "seek" and the data and status bytes to the received commands "read";

l) the PIM simulator sends the status bytes corresponding to the received commands "update";

m) the PIM simulator sends the status bytes corresponding to the received command "select MF";

n) the PIM simulator sends the status bytes corresponding to the received command "select DF_{UPT}".

5.3.4.5.5.5 Test requirement

1) After step a) the CAD shall send the command SELECT to select MF.

2) After step b) the CAD shall send the command SELECT to select EF_{DIR}.

3) After step c) the CAD shall send the command READ BINARY with P1 = '00', P2 = '00', Le = length of EF_{DIR}'s content.

4) After step d) the CAD shall send the command SELECT to select $DF_{TELECOM}$.

5) After step e) the CAD shall send the command SELECT to select EF_{ADN}.

6) After step f) the CAD shall send the commands SEEK and READ RECORD to identify all the Extension 1 record identifier stored in the records of EF_{ADN} (a procedure without using READ RECORD commands is possible).

7) After step g) the CAD shall send the command SELECT to select EF_{LND}.

8) After step h) the CAD shall send the commands SEEK and READ RECORD to identify the possible Extension 1 record identifier stored in the record of EF$_{LND}$ (a procedure without using READ RECORD command is possible).

9) After step i) the CAD shall send the command SELECT to select EF$_{EXT1}$.

10) After step j) the CAD shall send the commands SEEK and READ RECORD to identify all the Identifier stored in the records of EF$_{EXT1}$ (a procedure without using READ RECORD commands is possible).

11) After step k) the CAD shall send two commands UPDATE RECORD with:

   - P1 = '03' respectively P1 = '04' (unused records of EF$_{EXT1}$);

   - P2 = '04';

   - Lc = '0D' (length of a record of EF$_{EXT1}$); and

   Data = 'FF FF FF FF FF FF FF FF FF FF FF FF FF'.

12) After step l) the CAD shall send the command SELECT to select MF.

13) After step m) the CAD shall send the command SELECT to select DF$_{UPT}$.

5.3.4.6   General information procedures

It is optional for the CAD to support this procedure. If the CAD support the time value substitution the procedure has to been tested like described below.

5.3.4.6.1   Name request procedure

5.3.4.6.1.1   Definition and applicability

This procedure serve for read the card holder name stored in EF$_{NAME}$. It is optional for the CAD to support this procedure. If the CAD support the name request procedure the procedure has to been tested described below.

This procedure is implicitly tested in an other subclause of the present document.

5.3.4.6.1.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.6.1 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.6.1.

Test Group Reference (TGR): TGR_CAD_APP_GIP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GIP_NRP.

5.3.4.6.1.3   Test purpose

To verify that the CAD conform to the above requirements.

   NOTE: CR1 is tested in subclause 5.3.4.2.1.1.

5.3.4.6.1.4   Method of test

Initial condition

N/A.

Test procedure

N/A.

5.3.4.6.1.5   Test requirement

N/A.

5.3.4.6.2   Language preference procedures

5.3.4.6.2.1   Request

5.3.4.6.2.1.1   Definition and applicability

This procedure serve for read the languages stored in EF_{LANG}. It is optional for the CAD to support this procedure. If the CAD support the language preference request the procedure has to been tested described below.

This procedure is implicitly tested in an other subclause of the present document.

5.3.4.6.2.1.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.6.2.1 considering the given conditions and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.6.2.1.

Test Group Reference (TGR): TGR_CAD_APP_GIP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GIP_ LPP_REQ.

5.3.4.6.2.1.3   Test purpose

To verify that the CAD conform to the above requirements.

NOTE: CR1 is tested in subclause 5.3.4.2.1.1.

5.3.4.6.2.1.4   Method of test

Initial condition

N/A.

Test procedure

N/A.

5.3.4.6.2.1.5   Test requirement

N/A.

5.3.4.6.2.2   Update

5.3.4.6.2.2.1   Definition and applicability

If the CAD support this procedure, the user can changed the preference language stored in EF_{LANG} (if present). It is optional for the CAD to support this procedure. If the CAD support the language preference update the procedure has to been tested described below.

5.3.4.6.2.2.2   Conformance requirement

1) The CAD shall send the commands in the sequence described in ETS 300 477 [1], subclause 11.6.2.2 and in the right format described in ETS 300 477 [1], clause 9.

Reference: ETS 300 477 [1], clause 9 and subclause 11.6.2.2.

Test Group Reference (TGR): TGR_CAD_APP_GIP.

Test Procedure Reference (TPR): TPR_ CAD_APP_GIP_ LPP_UPD.

5.3.4.6.2.2.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.6.2.2.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) EF_{LANG} exist in the file structure of the PIM simulator.

4) Within the EF_{DIR} there are two file IDs in the path to the UPT application.

Test procedure

a) the procedure is initiated by the tester by the corresponding MMI interaction, the user enter the language preferences "English" and "French" in the coding that is demanded by the MMI;

b) the PIM simulator sends the status bytes corresponding to the received command "select EF_{MF}";

c) the PIM simulator sends the status bytes corresponding to the received command "select EF_{LANG}";

d) the PIM simulator sends the data and the status bytes corresponding to the received command "update";

e) the PIM simulator sends the status bytes corresponding to the received commands to select DF_{UPT}.

5.3.4.6.2.2.5   Test requirement

1) After step a) the CAD shall send the command SELECT to select EF_{MF}.

2) After step b) the CAD shall send the command SELECT to select EF_{LANG}.

3) After step c) the CAD shall send the command UPDATE BINARY with:

- P1 = '00';

- P2 = '00';

- Lc = '08';

   bytes 1 and 2 of the data is the coding of "English" which the representation of the language is coded according to ISO 639 [10] and the characters are coded according to ISO 8859-1 [9], see ETS 300 477 [1], subclause 10.2.4, bytes 3 and 4 of the data is the coding of "French" which the representation of the language is coded according to ISO 639 [10] and the characters are coded according to ISO 8859-1 [9], see ETS 300 477 [1], subclause 10.2.4, bytes 5 - 8 of the data are padded.

4) After step d) the CAD shall send two SELECT commands to select DF_{UPT}.

5.3.4.7   Error behaviour

5.3.4.7.1   Unspecified interruption of the sequence of commands/response pairs

5.3.4.7.1.1   Definition and applicability

An unspecified interruption of the sequence of commands/response pairs shall lead to the abortion of the current procedure. The test described in this subclause is a generic one to ensure the right error behaviour of the CAD at any level of any procedure which is supported by the CAD.

5.3.4.7.1.2   Conformance requirement

1) The CAD shall ensure that, when operated according to the manufacturer's manual, any unspecified interruption of the sequence of command/response pairs which realize the procedure, leads to the abortion of the procedure itself.

Reference: ETS 300 477 [1], clause 11.

Test Group Reference (TGR): TGR_CAD_APP_ERR.

Test Procedure Reference (TPR): TPR_ CAD_APP_ ERR_ISCRP.

5.3.4.7.1.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.7.1.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

Test procedure

a) A PIM session procedure is initiated by the tester by the corresponding MMI interaction; possible PIM session procedures are:

   - timer value substitution (O);

   - CHV unblocking (O);

   - one pass strong authentication (M);

   - language preference update procedure (O);

   - dialling number procedures (O);

   - CHV1 (LPIN) substitution procedure (O);

   see subclause 5.3.4.2.2;

b) the PIM simulator caused a unspecified interruption according to the CAD manufacturer's manual during the current procedure;

   this could be:

   - no response to a received command;

   - a wrong coded response (except low level errors);

   - a response with wrong content, e.g. number out of range;

   - a response corresponding to another command which was received at last;

   - a response with undefined Status Bytes to the corresponding command, see ETS 300 477 [1], subclause 9.6.6;

c) repeat steps a), b)

   - for every remaining PIM session procedure, which is supported by the CAD;

   - for every remaining level within the procedure;

   - and for every remaining unspecified interruption according to the CAD manufacturer's manual;

d) The PIM-simulator is disconnected to the CAD;

e)   the CAD is connected to a PIM simulator and powered on;

f)   a PIM initialization procedure and a following CHW1 procedure is started described in subclause 5.3.4.2.1;

g)   the PIM simulator caused a unspecified interruption according to the CAD manufacturer's manual during the current procedure (see step b);

h)   repeat steps d), g)

   -   for every remaining Alternatives of subclause 5.3.4.2.1.1;

   -   for every remaining Case of subclause 5.3.4.2.1.2 which can be combined with the corresponding Alternative of subclause 5.3.4.2.1.1;

   -   for every remaining level within the procedures;

   -   and for every remaining unspecified interruption according to the CAD manufacturer's manual.

5.3.4.7.1.5   Test requirement

1)   After the steps b) and the steps h) CAD shall abort the current procedure and according to ETS 300 477 [1] the CAD shall inform the user or not.

5.3.4.7.2   Selecting of an optional EF

5.3.4.7.2.1   Definition and applicability

Because of many EFs within the UPT application are optional a selection of an not existing optional file can occur.

The behaviour by selecting an optional EF is implicitly tested in other subclauses of the present document.

5.3.4.7.2.2   Conformance requirement

1)   If the optional EF_{NAME} or the optional EF_{LANG} cannot be found in the PIM during the PIM session initialization procedure, it shall never cause the CAD to treat this as an error condition.

2)   If the optional EF_{MTV} cannot be found in the PIM during the Timer value substitution (if this procedure is supported by the CAD), it shall never cause the CAD to treat this as an error condition.

3)   If the optional EF_{ADN} cannot be found in the PIM during the procedure "Reading of the service provider's telephone number", it shall never cause the CAD to treat this as an error condition.

4)   If the optional EF_{LANG} cannot be found in the PIM during the language preference update procedure (if this procedure is supported by the CAD), it shall never cause the CAD to treat this as an error condition.

5)   If the optional EF_{ADN}, the optional EF_{LND} or the optional EF_{EXT1} cannot be found in the PIM during a dialling number procedure (if the procedure is supported by the CAD), it shall never cause the CAD to treat this as an error condition.

Reference: ETS 300 477 [1], clause 11.

Test Group Reference (TGR): TGR_CAD_APP_ERR.

Test Procedure Reference (TPR): TPR_ CAD_APP_ ERR_SOF.

5.3.4.7.2.3   Test purpose

To verify that the CAD conform to the above requirements.

   NOTE 1: CR1 is tested in subclause 5.3.4.2.1.1.

   NOTE 2: CR2 is tested in subclause 5.3.4.2.6.

5.3.4.7.2.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

3) EF_{LANG}, EF_{ADN}, EF_{LND} and EF_{EXT1} do not exist in the file structure of the PIM simulator.

Test procedure

a) the tester initiate by the corresponding MMI interaction the procedure "Reading of the service provider's telephone number" (if this procedure is supported by the CAD), see subclause 5.3.4.4.2;

b) the PIM simulator gives the corresponding responses to the received commands;

c) the tester initiate by the corresponding MMI interaction the language preference update procedure (if this procedure is supported by the CAD), see subclause 5.3.4.6.2.2;

d) the PIM simulator gives the corresponding responses to the received commands;

e) the tester initiate by the corresponding MMI interaction a dialling number procedure (if this procedure is supported by the CAD), see subclause 5.3.4.5;

f) the PIM simulator gives the corresponding responses to the received commands;

g) repeat steps e) and f) for any dialling number procedure that is supported by the CAD.

5.3.4.7.2.5   Test requirement

1) After steps a), c) and e) the CAD shall perform the chosen procedure with selecting of the corresponding optional EFs.

2) After steps b), d) and f) the chosen procedure shall be successfully completed.

5.3.4.7.3   Procedures interrupted by MMI interaction

5.3.4.7.3.1   Definition and applicability

An interruption caused by MMI interaction lead to the completion of the current function and the abortion of the rest of the current procedure.

5.3.4.7.3.2   Conformance requirement

1) If a procedure is interrupted by MMI interaction, the function shall not be aborted before it reaches its completion, and the rest of the procedure is then aborted before the normal ending.

Reference: ETS 300 477 [1], clause 11.

Test Group Reference (TGR): TGR_CAD_APP_ERR.

Test Procedure Reference (TPR): TPR_ CAD_APP_ ERR_MMI.

5.3.4.7.3.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.7.3.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

Test procedure

a) a PIM session procedure, which is supported by the CAD, is initiated by the tester by the corresponding MMI interaction;

b) the during procedure is interrupted by the MMI interface;

c) repeat steps a), b) for every remaining PIM session procedure, which is supported by the CAD, and for every remaining level within the procedure;

d) the PIM-simulator is disconnected to the CAD;

e) the CAD is connected to a PIM simulator and powered on;

f) a PIM initialization procedure and a following CHW1 procedure is started described in subclause 5.3.4.2.1;

g) the during procedure is interrupted by the MMI interface;

h) repeat steps d) - g) for every remaining Alternatives of subclause 5.3.4.2.1.1, for every remaining Cases of subclause 5.3.4.2.1.2 and for every remaining level within the procedures.

5.3.4.7.3.5   Test requirement

1) After steps b) and steps h) the CAD shall complete the current function and abort the rest of the current procedure.

5.3.4.7.4   Error messages in the status conditions

5.3.4.7.4.1   Definition and applicability

The CAD shall abort the current procedure if it receive a error messages in the status conditions.

5.3.4.7.4.2   Conformance requirement

1) The CAD shall abort the current procedure if it receive a error message in the status conditions or a undefined status condition corresponding to the command, which was sent at last.

Reference: ETS 300 477 [1], subclause 9.6 and clause 11.

Test Group Reference (TGR): TGR_CAD_APP_ERR.

Test Procedure Reference (TPR): TPR_ CAD_APP_ ERR_SC.

5.3.4.7.4.3   Test purpose

To verify that the CAD conform to the above requirements.

5.3.4.7.4.4   Method of test

Initial condition

1) The CAD is connected to a PIM simulator and powered on.

2) A successful PIM initialization procedure and a successful CHV1 procedure is completed.

Test procedure

a) A PIM session procedure, which is supported by the CAD, is initiated by the tester by the corresponding MMI interaction; possible PIM session procedures are:

- timer value substitution (O);

- CHV unblocking (O);

- one pass strong authentication (M);

- language preference update procedure (O);

- dialling number procedures (O);

- CHV1 (LPIN) substitution procedure (O);

see subclause 5.3.4.2.2;

b) within the during procedure the PIM simulator sends an error message in the status conditions corresponding to the received command defined in ETS 300 477 [1], subclause 9.6, especially subclause 9.6.6 where the possible status conditions for each command are described;

c) repeat steps a), b) for every remaining PIM session procedure, for every remaining level within the procedure which is supported by the CAD and for every remaining error message in the status conditions corresponding to the topical command defined in ETS 300 477 [1], subclause 9.6.6;

d) the PIM-simulator is disconnected to the CAD;

e) the CAD is connected to a PIM simulator and powered on;

f) a PIM initialization procedure and a following CHW1 procedure is started described in subclause 5.3.4.2.1;

g) within the during procedure the PIM simulator sends an error message in the status conditions corresponding to the received command defined in ETS 300 477 [1], subclause 9.6.6;

h) repeat steps d) - g) for every remaining Alternatives of subclause 5.3.4.2.1.1, for every remaining Cases of subclause 5.3.4.2.1.2, for every remaining level within the procedures and for every remaining error message in the status conditions defined in ETS 300 477 [1], subclause 9.6.6.

5.3.4.7.4.5   Test requirement

1) After the steps b) and the steps h) CAD shall abort the current procedure and according to ETS 300 477 [1] the CAD shall inform the user or not.

6 List of Test Procedure Reference

This following table gives the complete list of the test procedure described above. Filling up part of or entire table, is at the charge of the test laboratory.

TEST PROCEDURE REFERENCE	APPLICABILITY	COMMENTS
TPR_PIM_PHY_FMT_ID1		
TPR_PIM_PHY_FMT_PIC		
TPR_PIM_PHY_TMP		
TPR_PIM_PHY_CNT		
TPR_PIM_ELEC_VCC_V		
TPR_PIM_ELEC_VCC_I		
TPR_PIM_ELEC_VCC_IDLE		
TPR_PIM_ELEC_RST_ST		
TPR_PIM_ELEC_RST_DY		
TPR_PIM_ELEC_CLK_FREQ		
TPR_PIM_ELEC_CLK_VI		
TPR_PIM_ELEC_CLK_DY		
TPR_PIM_ELEC_IO_VI		
TPR_PIM_ELEC_IO_DY		
TPR_PIM_ELEC_STAT		
TPR_PIM_ELEC_ATR_CON		
TPR_PIM_ELEC_ATR_PTS		
TPR_PIM_ELEC_MAJOR		
TPR_PIM_LOG_FID_FTI		
TPR_PIM_LOG_FID_FIA		
TPR_PIM_LOG_DF		
TPR_PIM_LOG_EF		
TPR_PIM_LOG_SELFILE		
TPR_PIM_LOG_RSVD		
TPR_PIM_SEC_CHV		
TPR_PIM_SEC_AUT		
TPR_PIM_SEC_FIAC		
TPR_PIM_SEC_FUAC		
TPR_PIM_FN_SEL		
TPR_PIM_FN_RDBIN		
TPR_PIM_FN_UPBIN		
TPR_PIM_FN_RDREC		
TPR_PIM_FN_UPREC		
TPR_PIM_FN_SEEK		
TPR_PIM_FN_VERCHV		
TPR_PIM_FN_CHCHV		
TPR_PIM_FN_UNCHV		
TPR_PIM_FN_ITA		
TPR_PIM_CMD_MAP		
TPR_PIM_CMD_DEF		
TPR_PIM_CMD_COD_SEL		
TPR_PIM_CMD_COD_GET		
TPR_PIM_CMD_SC_SW		
TPR_PIM_CMD_SC_CSR		
TPR_PIM_CEF_EFCHV		
TPR_PIM_CEF_MF		
TPR_PIM_CEF_UPT		
TPR_PIM_CEF_TEL		
TPR_CAD_PHY_ID1		
TPR_CAD_PHY_PLUG		
TPR_CAD_PHY_ID1E		
TPR_CAD_PHY_CNT		
TPR_CAD_PHY_PCNT		
TPR_CAD_PHY_PRES		
TPR_CAD_PHY_SHAPE		
TPR_CAD_ELEC_PTP_PIM		
TPR_CAD_ELEC_PTP_CAD		
TPR_CAD_ELEC_PTP_PP		

TEST PROCEDURE REFERENCE	APPLICABILITY	COMMENTS
TPR_CAD_ELEC_CNCT_VCC_T1		
TPR_CAD_ELEC_CNCT_VCC_T2		
TPR_CAD_ELEC_CNCT_RST		
TPR_CAD_ELEC_CNCT_CLK		
TPR_CAD_ELEC_CNCT_IO		
TPR_CAD_ELEC_SGN.		
TPR_CAD_LLP_TOPIM		
TPR_CAD_LLP_TOCAD		
TPR_CAD_LLP_ATR_RST1		
TPR_CAD_LLP_ATR_RST2		
TPR_CAD_LLP_ATR_CHA		
TPR_CAD_LLP_ATR_PTS		
TPR_CAD_LLP_ATR_RST-WRG		
TPR_CAD_LLP_PBYTES		
TPR_CAD_APP_GP_REA		
TPR_CAD_APP_GP_UPD		
TPR_CAD_APP_GP_SEE		
TPR_CAD_APP_GP_SEL		
TPR_CAD_APP_PIM_INI_PIP_TST1		
TPR_CAD_APP_PIM_INI_PIP_TST 2		
TPR_CAD_APP_PIM_INI_PIP_TST 3		
TPR_CAD_APP_PIM_INI_PIP_TST 4		
TPR_CAD_APP_PIM_INI_PIP_TST 5		
TPR_CAD_APP_PIM_INI_CHV1_TST1		
TPR_CAD_APP_PIM_INI_CHV1_TST 2		
TPR_CAD_APP_PIM_INI_CHV1_TST 3		
TPR_CAD_APP_PIM_SES		
TPR_CAD_APP_PIM_TER		
TPR_CAD_APP_PIM_ASP		
TPR_CAD_APP_PIM_ST		
TPR_CAD_APP_PIM_TVS_TST1		
TPR_CAD_APP_PIM_TVS_TST2		
TPR_CAD_APP_PIM_TVS_TST3		
TPR_CAD_APP_PIM_TVS_TST4		
TPR_CAD_APP_CHV_VER		
TPR_CAD_APP_CHV_SUB		
TPR_CAD_APP_CHV_UNB		
TPR_CAD_APP_SEC_OPSA		
TPR_CAD_APP_SEC_ RSPTN		
TPR_CAD_APP_GTP_MGT		
TPR_CAD_APP_GTP_UPD_ADN		
TPR_CAD_APP_GTP_UPD_LND		
TPR_CAD_APP_GTP_UPD_ADN_20		
TPR_CAD_APP_GTP_UPD_LND_20		
TPR_CAD_APP_GTP_ERA_ADN		
TPR_CAD_APP_GTP_ERA_LND		
TPR_CAD_APP_GTP_ERA_ADN_20		
TPR_CAD_APP_GTP_ERA_LND_20		
TPR_CAD_APP_GTP_REQ_ADN		
TPR_CAD_APP_GTP_REQ_LND		
TPR_CAD_APP_GTP_REQ_ADN_20		
TPR_CAD_APP_GTP_REQ_LND_20		
TPR_CAD_APP_GTP_PUR		
TPR_CAD_APP_GIP_NRP		
TPR_CAD_APP_GIP_ LPP_REQ		
TPR_CAD_APP_GIP_ LPP_UPD		
TPR_CAD_APP_ ERR_ISCRP		
TPR_CAD_APP_ ERR_SOF		
TPR_CAD_APP_ ERR_MMI		
TPR_CAD_APP_ ERR_SC		

History

Document history				
V1.1.1	August 1998	Public Enquiry	PE 9849:	1998-08-07 to 1998-12-04
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V1.1.2	May 1999	Publication		