3GPP TS 31.101 V18.1.0 (2024-06)

Technical Specification

3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; UICC-terminal interface; Physical and logical characteristics (Release 18)

3GPP

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Contents

Foreword

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

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

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

In the present document, modal verbs have the following meanings:

shall indicates a mandatory requirement to do something

shall not indicates an interdiction (prohibition) to do something

The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

should indicates a recommendation to do something

should not indicates a recommendation not to do something

may indicates permission to do something

need not indicates permission not to do something

The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

can indicates that something is possible

cannot indicates that something is impossible

The constructions "can" and "cannot" are not substitutes for "may" and "need not".

will indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

will not indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

might indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

might not indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

is (or any other verb in the indicative mood) indicates a statement of fact

is not (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

Introduction

The present document defines a generic Terminal/Integrated Circuit Card (ICC) interface for 3GPP applications. The present document is based on ETSI TS 102 221 [1], which defines a generic platform for any IC card application. The functionality provided by this platform may be operated either over the electrical interface specified in ETSI TS 102 221 [1], or by transporting APDUs over the Inter-Chip USB Terminal/ICC interface specified in ETSI TS 102 600 [7].

Requirements that are common to all 3GPP smart card based applications are also listed in this specification.

The aim of the present document is to ensure interoperability between an ICC and a terminal independently of the respective manufacturer, card issuer or operator. The present document does not define any aspects related to the administrative management phase of the ICC. Any internal technical realisation of either the ICC or the terminal is only specified where these are reflected over the interface.

Application specific details for applications residing on an ICC are specified in the respective application specific documents.

1 Scope

The present document specifies the interface between the UICC and the Terminal for 3GPP telecom network operation.

The present document specifies:

- the requirements for the physical characteristics of the UICC;
- the electrical interface between the UICC and the Terminal;
- the initial communication establishment and the transport protocols;
- the model which serves as a basis for the logical structure of the UICC;
- the communication commands and the procedures;
- the application independent files and protocols.

The administrative procedures and initial card management are not part of the present document.

For the avoidance of doubt, references to clauses of ETSI TS 102 221 [1] include all the clauses of that clause, unless specifically mentioned.

The target specification ETSI TS 102 221 [1] contains material that is outside of the scope of 3GPP requirements and the present document indicates which parts are in the scope and which are not.

A 3GPP ME may support functionality that is not required by 3GPP, but the requirements to do so are outside of the scope of 3GPP.

2 References

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

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

[1] ETSI TS 102 221 V17.4.0: "Smart Cards; UICC-Terminal interface; Physical and logical characteristics ".

[2] 3GPP TS 31.102: "Characteristics of the USIM Application".

[3] ETSI TS 101 220: "Smart cards; ETSI numbering system for telecommunication application providers".

[4] Void.

[5] ITU-T Recommendation T.50: "International Reference Alphabet (IRA) (Formerly International Alphabet No. 5 or IA5) - Information technology - 7-bit coded character set for information interchange".

[6] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3".

[7] ETSI TS 102 600 V7.6.0: "Smart cards; UICC-Terminal interface; Characteristics of the USB interface".

[8] 3GPP TS 31.111: "USIM Application Toolkit (USAT)".

[9] ETSI TS 102 671 V17.0.0: "Smart Cards; Machine to Machine UICC; Physical and logical characteristics".

3 Definitions, symbols, abbreviations and coding

All definitions, symbols, abbreviations applicable to the terminal are specified in ETSI TS 102 221 [1] and ETSI TS 102 600 [7].

The coding of Data Objects in the present document is according to ETSI TS 102 221 [1].

'XX': Single quotes indicate hexadecimal values. Valid elements for hexadecimal values are the numbers '0' to '9' and 'A' to 'F'.

Within the context of the present document, the term "terminal" used in ETSI TS 102 221 [1] refers to the Mobile Equipment (ME).

Within the context of the present document, the term "NAA" used in ETSI TS 102 221 [1] refers to the (U)SIM or the ISIM.

4 General 3GPP platform requirements

4.1 GSM/USIM application interaction and restrictions

Activation of a USIM session excludes the activation of a GSM session. In particular, this implies that once a USIM application session has been activated, commands sent to the UICC with CLAss byte set to 'A0' shall return SW1SW2 '6E 00' (class not supported) to the terminal.

Similarly, activation of a GSM session excludes the activation of a USIM session.

At most one USIM session can be active at the same time.

4.2 3GPP platform overview

The UICC/terminal interface shall support the interface specified in ETSI TS 102 221 [1]. In addition, the UICC/terminal interface may support the Inter-Chip USB interface defined in ETSI TS 102 600 [7].

3GPP ICC based applications (e.g. USIM, USIM Application Toolkit, ISIM, SIM) are supported over both interfaces (see figure 1).

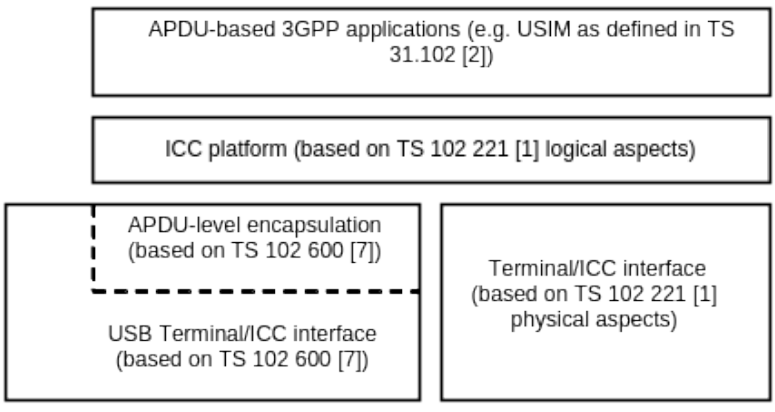

Figure 1: Terminal/UICC interface

For a UICC (ICC Platform) supporting logical secure elements as defined in ETSI TS 102 221 [1], the requirements of the 3GPP ICC based applications defined in the corresponding 3GPP specifications (e.g. TS 31.102[2] for USIM) apply to the logical UICC.

4.3 TS 102 221 UICC/terminal interface

The UICC/terminal interface shall comply with all requirements stated in ETSI TS 102 221 [1]. Where options are indicated in ETSI TS 102 221 [1], the present document specifies which options are to be used for a ETSI TS 102 221 [1] UICC/terminal interface where the UICC supports a 3GPP application.

4.4 TS 102 600 Inter-Chip USB UICC/terminal interface

If the Inter-Chip USB UICC/terminal interface is supported, it shall comply with ETSI TS 102 600 [7]. Where options are indicated in ETSI TS 102 600 [7], the present document specifies which options are to be used for an Inter-Chip USB UICC/terminal interface where the UICC supports a 3GPP application.

The protocol stack for APDU-level exchanges that are described in ETSI TS 102 600 [7] allow the transmission of APDUs. USB UICCs and USB UICC-enabled terminals shall comply with the functionality of the ETSI TS 102 221 [1] interface. Where options are indicated in ETSI TS 102 221 [1], the present document specifies which options are to be used for APDU-based applications where the UICC supports a 3GPP application.

The mapping of APDU into TPDU (see ETSI TS 102 221 [1] clause 7.3.1.1) and transmission oriented commands (see ETSI TS 102 221 [1] clause 12) do not apply in the USB context as the APDU commands and responses are transmitted over USB as encoded at the application layer (i.e. C-APDU and R-APDU are directly encapsulated).

In the context of UICC applications running over USB, the card activation and deactivation process, the cold and warm reset procedures and the request for additional processing time as described in ETSI TS 102 221 [1] shall be performed by USB commands as described in ETSI TS 102 600 [7]. Any reference to the above procedures shall be interpreted in a USB context according to ETSI TS 102 600 [7]. When an ATR is received then the corresponding provisions and error handling procedures of ETSI TS 102 221 [1] apply.

4A Physical Characteristics

The provisions of ETSI TS 102 221 [1] clause 4 apply.

In addition to the form factors described in clause 4.0 of ETSI TS 102 221 [1], the form factors defined in ETSI TS 102 671 [9] clause 6.2 are applicable.

The usage of contact C6 for contactless as defined in ETSI 102 221 [1] is not required by 3GPP. This impacts the following clauses:

ETSI TS 102 221 [1] clause 4.5.1.1

ETSI TS 102 221 [1] clause 4.5.1.2

ETSI TS 102 221 [1] clause 4.5.2.1

ETSI TS 102 221 [1] clause 4.5.2.2

ETSI TS 102 221 [1] clause 4.5.3

5 Physical and logical characteristics

5.1 Transmission speed

See clause 6A.3.2.

5.2 Voltage classes

See clause 6A.2.

5.3 File Control Parameters (FCP)

See clause 11.1.1.4.

5.3.1 Minimum application clock frequency

See clause 11.1.1.4.6.

5.4 Interface protocol

See clause 6A.3.

5A Electrical specifications of the UICC – Terminal interface

The provisions of ETSI TS 102 221 [1] clause 5 apply.

5A.1 Class A operating conditions

Class A operating conditions as specified in ETSI TS 102 221 [1] clause 5.1 is not required by 3GPP then MEs, except GSM ME, shall not support class A on the ME – UICC interface.

5A.2 Class B operating conditions

The provisions of ETSI TS 102 221 [1] clause 5.2 apply.

5A.3 Class C operating conditions

The provisions of ETSI TS 102 221 [1] clause 5.3 apply.

5A.4 Class D operating conditions

The provisions of ETSI TS 102 221 [1] clause 5.4 apply.

6 Application protocol

See clause 7A.4.

6A Initial communication establishment procedures

6A.0 Introduction

The provisions of ETSI TS 102 221 [1] clause 6.0 apply.

6A.1 UICC activation and deactivation

The provisions of ETSI TS 102 221 [1] clause 6.1 apply.

6A.2 Supply voltage switching

The provisions of ETSI TS 102 221 [1] clause 6.2 apply.

In addition, a UICC holding a 3GPP application shall support at least two consecutive voltage classes as defined in ETSI TS 102 221 [1] clause 6.2.1, e.g. AB or BC. If the UICC supports more than two classes, they shall all be consecutive, e.g. ABC

6A.3 Answer To Reset content

The provisions of ETSI TS 102 221 [1] clause 6.3 apply.

In addition, no extra guard time, indicated in TC1 in the ATR, needs to be supported when sending characters from the terminal to the card. The terminal may reject a UICC indicating values other than 0 or 255 in TC1.

6A.3.1 Coding of historical bytes

The provisions of ETSI TS 102 221 [1] clause 6.3.1 apply.

6A.3.2 Speed enhancement

The provisions of ETSI TS 102 221 [1] clause 6.3.2 apply.

In addition, cards and terminals supporting an application based on the present specification shall support the transmission factor (F,D)=(512,32).

It is recommended that terminals and cards supporting Multimedia Message storage or any other high speed functionality (see TS 31.102 [2]) support the transmission factor (F,D)=(512,64) in addition to those specified in the present document.

6A.3.3 Global Interface bytes

The provisions of ETSI TS 102 221 [1] clause 6.3.3 apply.

6A.4 PPS procedure

The provisions of ETSI TS 102 221 [1] clause 6.4 apply.

6A.5 Reset procedures

The provisions of ETSI TS 102 221 [1] clause 6.5 apply.

6A.6 Clock stop mode

The provisions of ETSI TS 102 221 [1] clause 6.6 apply.

6A.7 Bit/character duration and sampling time

The provisions of ETSI TS 102 221 [1] clause 6.7 apply.

6A.8 Error handling

The provisions of ETSI TS 102 221 [1] clause 6.8 apply.

6A.9 Compatibility

The provisions of ETSI TS 102 221 [1] clause 6.9 are not required by 3GPP.

7 User verification and file access conditions

See clause 9.6.

7A Transmission protocols

The provisions of ETSI TS 102 221 [1] clause 7 apply.

7A.1 Physical layer

The provisions of ETSI TS 102 221 [1] clause 7.1 apply.

7A.2 Data link layer

The provisions of ETSI TS 102 221 [1] clause 7.2 apply.

7A.3 Transport layer

The provisions of ETSI TS 102 221 [1] clause 7.3 apply.

7A.4 Application layer

The provisions of ETSI TS 102 221 [1] clause 7.4 apply.

In addition, when involved in administrative management operations, a 3GPP application interfaces with appropriate equipment. These operations are outside the scope of the present document.

When involved in network operations a 3GPP application interfaces with a terminal with which messages are exchanged. A message can be a command or a response.

- A 3GPP Application command/response pair is a sequence consisting of a command and the associated response.
- A 3GPP Application procedure consists of one or more 3GPP Application command/response pairs which are used to perform all or part of an application-oriented task. A procedure shall be considered as a whole, that is to say that the corresponding task is achieved if and only if the procedure is completed. The terminal shall ensure that, when operated according to the manufacturer's manual, any unspecified interruption of the sequence of command/response pairs which realise the procedure, leads to the abortion of the procedure itself.
- A 3GPP application session is the interval of time starting at the completion of the 3GPP application initialisation procedure and ending either with the start of the 3GPP session termination procedure, or at the first instant the link between the UICC and the terminal is interrupted.

During the 3GPP network operation phase, the terminal plays the primary role and the 3GPP application plays the secondary role.

A 3GPP application specification may specify some commands defined in ETSI TS 102 221 [1] as optional or define additional commands. The 3GPP application shall execute all applicable commands in such a way as not to jeopardise, or cause suspension, of service provisioning to the user. This could occur if, for example, execution of the AUTHENTICATE is delayed in such a way which would result in the network denying or suspending service to the user.

7A.5 Logical secure element Interfaces

The provisions of ETSI TS 102 221 [1] clause 7.5 apply.

8 Application and file structure

8.0 General

The provisions of ETSI TS 102 221 [1] clause 8.0 apply.

This clause specifies general requirements for EFs for 3GPP applications.

EFs contain data items. A data item is a part of an EF which represents a complete logical entity. The 3GPP application specification defines the access conditions, data items and coding for each file.

EFs or data items having an unassigned value, or which are cleared by the terminal, shall have their bytes set to 'FF'. After the administrative phase all data items shall have a defined value or have their bytes set to 'FF', unless specified otherwise in other 3GPP specifications. For example, for a deleted LAI in the EF_{LOCI} file defined in TS 31.102 [2], the last byte takes the value 'FE' (refer to TS 24.008 [6]). If a data item is modified by the allocation of a value specified in another 3GPP TS, then this value shall be used and the data item is not unassigned.

EFs are mandatory (M), optional (O), or conditional (C). A conditional file is mandatory if required by a supported feature, as defined by the 3GPP application (e.g. PBR in TS 31.102 [2]). The file size of an optional EF may be zero. All implemented EFs with a file size greater than zero shall contain all mandatory data items. Optional data items may either be filled with 'F', or, if located at the end of an EF, need not exist.

When the coding is according to ITU-T Recommendation T.50 [5], bit 8 of every byte shall be set to 0.

8.1 Contents of the EFs at the MF level

See clause 13.

8.1A UICC application structure

The provisions of ETSI TS 102 221 [1] clause 8.1 apply.

8.2 File types

The provisions of ETSI TS 102 221 [1] clause 8.2 apply.

8.3 File referencing

The provisions of ETSI TS 102 221 [1] clause 8.3 apply.

8.4 Methods for selecting a file

The provisions of ETSI TS 102 221 [1] clause 8.4 apply.

8.5 Application characteristics

The provisions of ETSI TS 102 221 [1] clause 8.5 apply.

8.6 Reservation of file IDs

The provisions of ETSI TS 102 221 [1] clause 8.6 apply.

8.7 Logical channels

The provisions of ETSI TS 102 221 [1] clause 8.7 apply.

8.8 Shareable versus not-shareable files

The provisions of ETSI TS 102 221 [1] clause 8.8 apply.

8.9 Secure channels

The provisions of ETSI TS 102 221 [1] clause 8.9 apply.

8.10 Logical secure elements

The provisions of ETSI TS 102 221 [1] clause 8.10 apply.

9 Security features

The provisions of ETSI TS 102 221 [1] clause 9 apply.

9.1 Supported security features

The provisions of ETSI TS 102 221 [1] clause 9.1 apply.

9.2 Security architecture

The provisions of ETSI TS 102 221 [1] clause 9.2 apply.

9.3 Security environment

The provisions of ETSI TS 102 221 [1] clause 9.3 apply.

9.4 PIN definitions

The provisions of ETSI TS 102 221 [1] clause 9.4 apply.

9.5 PIN and key reference relation ship

The provisions of ETSI TS 102 221 [1] clause 9.5 apply.

9.6 User verification and file access conditions

A 3GPP application uses 2 PINs for user verification, PIN and PIN2. PIN2 is used only in the ADF. The PIN and PIN2 are mapped into key references as defined in ETSI TS 102 221 [1] clause 9.5.1. The Universal PIN shall be associated with a usage qualifier, and other key references may also be associated with a usage qualifier as defined in ETSI TS 102 221 [1] clause 9.5.2. The PIN status is indicated in the PS_DO, which is part of the FCP response when an ADF/DF is selected. The coding of the PS_DO is defined in ETSI TS 102 221 [1] clause 9.5.2.

PIN and PIN2 are coded on 8 bytes. Only (decimal) digits (0-9) shall be used, coded in ITU-T T.50 [5] with bit 8 set to zero. The minimum number of digits is 4. If the number of digits presented by the user is less than 8 then the ME shall pad the presented PIN with 'FF' before sending it to the 3GPP application.

The coding of the UNBLOCK PINs is identical to the coding of the PINs. However, the number of (decimal) digits is always 8.

The security architecture as defined in ETSI TS 102 221 [1] clause 9 applies to 3GPP applications with the following definitions and additions:

- A 3GPP application may reside on either a single-verification capable UICC or a multi-verification capable UICC.
- A 3GPP application residing on a multi-verification capable UICC shall support the replacement of its application PIN with the Universal PIN, key reference '11', as defined in ETSI TS 102 221 [1] clause 9.4.1. Only the Universal PIN is allowed as a replacement.
- A multi-verification capable UICC holding a 3GPP application shall support the referenced format using SEID as defined in ETSI TS 102 221 [1] clause 9.2.7.
- Every file related to a 3GPP application shall have a reference to an access rule stored in EF_{ARR}.
- Disabling of PIN2 is allowed if supported by the 3GPP application, unless indicated otherwise.

The security architecture as defined in ETSI TS 102 221 [1] clause 9 applies to terminals supporting 3GPP applications with the following definitions and requirements:

- A terminal shall support the use of level 1 and level 2 user verification requirements as defined in ETSI TS 102 221 [1] clause 9.1.
- A terminal shall support the multi-application capabilities as defined in ETSI TS 102 221 [1] clause 9.1.
- A terminal shall support the replacement of a 3GPP application PIN with the Universal PIN, key reference '11', as defined in ETSI TS 102 221 [1] clause 9.4.1.
- A terminal shall support the security attributes defined using tag's '8C', 'AB' and '8B' as defined in ETSI TS 102 221 [1] clause 9.2.4. In addition both the referencing methods indicated by tag '8B' shall be supported as defined in ETSI TS 102 221 [1] clause 9.2.7.

The access rule is referenced in the FCP using tag '8B'. The TLV object contains the file ID (the file ID of EF_{ARR}) and record number, or file ID (the file ID of EF_{ARR}), SEID and record number, pointer to the record in EF_{ARR} where the access rule is stored. Each SEID refers to a record number in EF_{ARR}. EFs having the same access rule use the same record reference in EF_{ARR}. For an example EF_{ARR}, see ETSI TS 102 221 [1] clause 13.4.

10 Structure of commands and responses

The provisions of ETSI TS 102 221 [1] clause 10 apply.

10.1 Command APDU structure

The provisions of ETSI TS 102 221 [1] clause 10.1 apply.

10.1.1 Coding of Class Byte

The provisions of ETSI TS 102 221 [1] clause 10.1.1 apply.

10.1.2 Coding of Instruction Byte

The provisions of ETSI TS 102 221 [1] clause 10.1.2 apply except for the coding of the Instruction byte of the following commands which are not required by 3GPP:

- GET CHALLENGE

10.1.3 Coding of parameter bytes

The provisions of ETSI TS 102 221 [1] clause 10.1.3 apply.

10.1.4 Coding of Lc byte

The provisions of ETSI TS 102 221 [1] clause 10.1.4 apply.

10.1.5 Coding of data part

The provisions of ETSI TS 102 221 [1] clause 10.1.5 apply.

10.1.6 Coding of Le byte

The provisions of ETSI TS 102 221 [1] clause 10.1.6 apply.

10.2 Response APDU structure

The provisions of ETSI TS 102 221 [1] clause 10.2 apply.

10.2.1 Status conditions returned by the UICC

The provisions of ETSI TS 102 221 [1] clause 10.2.1 apply.

10.2.1.1 Normal processing

The provisions of ETSI TS 102 221 [1] clause 10.2.1.1 apply.

10.2.1.2 Postponed processing

The provisions of ETSI TS 102 221 [1] clause 10.2.1.2 apply.

10.2.1.3 Warnings

The provisions of ETSI TS 102 221 [1] clause 10.2.1.3 apply.

10.2.1.4 Execution errors

The provisions of ETSI TS 102 221 [1] clause 10.2.1.4 apply.

10.2.1.5 Checking errors

The provisions of ETSI TS 102 221 [1] clause 10.2.1.5 apply.

10.2.1.5.1 Functions in CLA not supported

The provisions of ETSI TS 102 221 [1] clause 10.2.1.5.1 apply.

10.2.1.5.2 Command not allowed

The provisions of ETSI TS 102 221 [1] clause 10.2.1.5.2 apply.

10.2.1.5.3 Wrong parameters

The provisions of ETSI TS 102 221 [1] clause 10.2.1.5.3 apply.

10.2.1.6 Application errors

The provisions of ETSI TS 102 221 [1] clause 10.2.1.6 apply.

10.2.2 Status words of the commands

The provisions of ETSI TS 102 221 [1] clause 10.2.2 apply with the following exceptions which are not required by 3GPP:

- column 'GET CHALLENGE' of table 10.16

10.3 Logical channels

The provisions of ETSI TS 102 221 [1] clause 10.3 apply.

11 Commands

11.0 Introduction

The provisions of ETSI TS 102 221 [1] clause 11.0 apply.

11.1 Generic commands

The provisions of ETSI TS 102 221 [1] clause 11.1 apply.

11.1.1 SELECT

11.1.1.1 Functional description

The provisions of ETSI TS 102 221 [1] clause 11.1.1.1 apply.

11.1.1.2 Command parameters and data

The provisions of ETSI TS 102 221 [1] clause 11.1.1.2 apply.

11.1.1.3 Response Data

The provisions of ETSI TS 102 221 [1] clause 11.1.1.3 apply.

11.1.1.4 File control parameters

This clause defines the contents of the data objects which are part of the FCP information where there is a difference compared to the values as specified in ETSI TS 102 221 [1] clause 11.1.1.4. Where options are indicated in ETSI TS 102 221 [1] clause 11.1.1.4, this clause specifies the values to be used in the FCP related to 3GPP applications.

11.1.1.4.1 File size

The provisions of ETSI TS 102 221 [1] clause 11.1.1.4.1 apply.

11.1.1.4.2 Total file size

The provisions of ETSI TS 102 221 [1] clause 11.1.1.4.2 apply.

11.1.1.4.3 File Descriptor

The provisions of ETSI TS 102 221 [1] clause 11.1.1.4.3 apply.

11.1.1.4.4 File identifier

The provisions of ETSI TS 102 221 [1] clause 11.1.1.4.4 apply.

11.1.1.4.5 DF name

The provisions of ETSI TS 102 221 [1] clause 11.1.1.4.5 apply.

11.1.1.4.6 Proprietary information

The provisions of ETSI TS 102 221 [1] clause 11.1.1.4.6 apply, with the exception of provisions relative to 'Platform to Platform CAT Secured APDU' and clause 11.1.1.4.6.10.

The Minimum application clock frequency data object is indicated by tag '82' in the proprietary constructed data object in the FCP information, identified by tag 'A5', as defined in ETSI TS 102 221 [1] clause 11.1.1.4.6. This data object specifies the minimum clock frequency to be provided by the terminal during the 3GPP application session. The value indicated in this data object shall not exceed 3 MHz, corresponding to '1E'. The terminal shall use a clock frequency between the value specified by this data object and the maximum clock frequency for the UICC as defined in ETSI TS 102 221 [1] clause 11.1.1.4.6.3. If this data object is not present in the FCP response or the value is 'FF' then the terminal shall assume that the minimum clock frequency is 1 MHz.

11.1.1.4.7 Security attributes

The provisions of ETSI TS 102 221 [1] clause 11.1.1.4.7 apply.

11.1.1.4.8 Short file identifier

The provisions of ETSI TS 102 221 [1] clause 11.1.1.4.8 apply.

11.1.1.4.9 Life cycle status integer

The provisions of ETSI TS 102 221 [1] clause 11.1.1.4.9 apply.

11.1.1.4.10 PIN status template DO

The provisions of ETSI TS 102 221 [1] clause 11.1.1.4.10 apply.

11.1.2 STATUS

The provisions of ETSI TS 102 221 [1] clause 11.1.2 apply.

11.1.3 READ BINARY

The provisions of ETSI TS 102 221 [1] clause 11.1.3 apply.

11.1.4 UPDATE BINARY

The provisions of ETSI TS 102 221 [1] clause 11.1.4 apply.

11.1.5 READ RECORD

The provisions of ETSI TS 102 221 [1] clause 11.1.5 apply.

11.1.6 UPDATE RECORD

The provisions of ETSI TS 102 221 [1] clause 11.1.6 apply.

11.1.7 SEARCH RECORD

The provisions of ETSI TS 102 221 [1] clause 11.1.7 apply.

11.1.8 INCREASE

The provisions of ETSI TS 102 221 [1] clause 11.1.8 apply.

11.1.9 VERIFY PIN

The provisions of ETSI TS 102 221 [1] clause 11.1.9 apply.

11.1.10 CHANGE PIN

The provisions of ETSI TS 102 221 [1] clause 11.1.10 apply.

11.1.11 DISABLE PIN

The provisions of ETSI TS 102 221 [1] clause 11.1.11 apply.

11.1.12 ENABLE PIN

The provisions of ETSI TS 102 221 [1] clause 11.1.12 apply.

11.1.13 UNBLOCK PIN

The provisions of ETSI TS 102 221 [1] clause 11.1.13 apply.

11.1.14 DEACTIVATE FILE

The provisions of ETSI TS 102 221 [1] clause 11.1.14 apply.

11.1.15 ACTIVATE FILE

The provisions of ETSI TS 102 221 [1] clause 11.1.15 apply.

11.1.16 AUTHENTICATE

The provisions of ETSI TS 102 221 [1] clause 11.1.16 apply.

11.1.17 MANAGE CHANNEL

The provisions of ETSI TS 102 221 [1] clause 11.1.17 apply.

11.1.18 GET CHALLENGE

The provisions of ETSI TS 102 221 [1] clause 11.1.18 are not required by 3GPP.

11.1.19 TERMINAL CAPABILITY

The provisions of ETSI TS 102 221 [1] clause 11.1.19 apply.

11.1.20 MANAGE SECURE CHANNEL

The provisions of ETSI TS 102 221 [1] clause 11.1.20 apply.

11.1.21 TRANSACT DATA

The provisions of ETSI TS 102 221 [1] clause 11.1.21 apply.

11.1.22 SUSPEND UICC

The provisions of ETSI TS 102 221 [1] clause 11.1.22 apply.

11.1.23 GET IDENTITY

The provisions of ETSI TS 102 221 [1] clause 11.1.23 apply.

11.1.24 EXCHANGE CAPABILITIES

The provisions of ETSI TS 102 221 [1] clause 11.1.24 are not required by 3GPP.

11.1.25 MANAGE LSI

The provisions of ETSI TS 102 221 [1] clause 11.1.25 apply.

11.2 CAT commands

The provisions of ETSI TS 102 221 [1] clause 11.2 apply.

11.3 Data Oriented commands

The provisions of ETSI TS 102 221 [1] clause 11.3 apply.

12 Transmission oriented commands

The provisions of ETSI TS 102 221 [1] clause 12 apply.

13 Application independent files

The provisions of ETSI TS 102 221 [1] clause 13.0 apply.

There are five EFs at the Master File (MF) level specified in ETSI TS 102 221 [1] clause 13 (EF_{ICCID}; EF_{DIR}, EF_{PL}, EF_{ARR} and EF_{UMPC}), which are all mandatory for 3GPP.

The DF_{CD} at the Master File (MF) level specified in ETSI TS 102 221 [1] clause 13.5 is optional for 3GPP.

The EF_{DIR} file contains the Application Identifiers (AIDs) and the Application Labels of the 3GPP applications present on the card as mandatory elements. The AIDs of 3GPP applications are defined in Annex O. The 3GPP applications can only be selected by means of the AID selection. The EF_{DIR} entry shall not contain a path object for application selection. It is recommended that the application label does not contain more than 32 bytes.

14 Application independent protocol

14.1 Application independent protocol

The provisions of ETSI TS 102 221 [1] clause 14 apply with the following exceptions:

- clause 14.6.2 of ETSI TS 102 221 [1] is replaced by clause 14.2.

14.2 CAT commands

During idle mode the terminal shall send STATUS commands to the UICC at intervals no longer than:

- when the extended DRX cycle bit in the EF_{AD} is set to 1: the maximum between the interval negotiated with the UICC (see TS 31.111 [8]) and the extended idle mode DRX cycle received from the network (see TS 24.008 [6])

- in all other cases: the interval negotiated with the UICC (see TS 31.111 [8])

During a call the UICC presence detection applies. The default value for the proactive polling is the same as for the presence detection procedure.

In case of a UICC supporting LSEs, the terminal shall perform the proactive polling on every LSI where CAT was successfully initialized with the interval negotiated on each specific LSI.

15 Support of APDU-based UICC applications over USB

The provisions of ETSI TS 102 221 [1] clause 15 apply taking into account clauses 6A.3, 7A.4, 8, 9, 10, 11, 13 and 14 in the present document.

Annex A (normative): UCS2 coding of Alpha fields for files residing on the UICC

The provisions of ETSI TS 102 221 [1] annex A apply.

Annex B (informative): Main states of a UICC

The provisions of ETSI TS 102 221 [1] annex B apply.

Annex C (informative): APDU protocol transmission examples

The provisions of ETSI TS 102 221 [1] annex C apply.

Annex D (informative): ATR examples

The provisions of ETSI TS 102 221 [1] annex D apply.

Annex E (informative): Security attributes mechanisms and examples

The provisions of ETSI TS 102 221 [1] annex E apply.

Annex F (informative): Example of contents of EF_{ARR} '2F06'

The provisions of ETSI TS 102 221 [1] annex F apply.

Annex G (informative): Access Rules Referencing (ARR)

The provisions of ETSI TS 102 221 [1] annex G apply.

Annex H (normative): List of SFI Values

The provisions of ETSI TS 102 221 [1] annex H apply.

Annex I (informative): Resets and modes of operation

The provisions of ETSI TS 102 221 [1] annex I apply.

Annex J (informative): Example of the use of PINs

The provisions of ETSI TS 102 221 [1] annex J apply.

Annex K (informative): Examples of the PIN state transition on multi verification capable UICC

The provisions of ETSI TS 102 221 [1] annex K apply.

Annex L (informative): Examples of SET DATA and RETRIEVE DATA usage

The provisions of ETSI TS 102 221 [1] annex L apply.

Annex M (informative): Examples of ODD AUTHENTICATE instruction code usage

The provisions of ETSI TS 102 221 [1] annex M apply.

Annex N (informative): PCB layout for the MFF

The provisions of ETSI TS 102 671 [9] annex A apply.

Annex O (normative): Allocated 3GPP PIX numbers

The provisions of ETSI TS 101 220 [3] annex E apply.

Annex P (informative): Change history

Date	Meeting	TSG Doc.	CR	Rev	Cat	Subject/Comment	New
2002-12	TP-18	TP-020279	0027	-	D	Gather all 3GPP-specific card platform requirements in TS 31.101.	6.1.0
2003-06	TP-20	TP-030120	0028	-	F	Clarification on the support of extra guardtime	6.2.0
2004-09	TP-25	TP-040180	0029	-	B	Requirement for higher UICC/Terminal interface speed	6.3.0
		TP-040180	0030	-	B	Move "GSM/USIM application interactions and restrictions" from ETSI TS 102 221	6.3.0
2004-12	TP-26	TP-040255	0033	-	F	Correction of non specific references	6.4.0
2004-12	TP-26					Reinstation of original bullets in reference clause	6.4.1
2005-06	CT-28	CP-050136	0034	-	F	ISO/IEC 7816-Series Revision	6.5.0
2006-01						Correction of CR-number from CP-28	6.5.1
2007-06	CT-36	CP-070480	0037	7	B	Introduction of the new High Speed ME-UICC Interface	7.0.0
2007-06	-	-	-	-	-	MCC correction of implementation of CR0037R7, clause 4.3	7.0.1
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2009-12	CT-46	CP-091011	0040	2	F	References update	8.1.0
2009-12	CT-46	-	-	-	-	Upgrade of the specification to Rel-9	9.0.0
2010-06	CT-48	CP-090390	0049	2	F	Restructuration of the specification to map the clauses of ETSI TS 102 221	9.1.0
2011-01						Editorial release: formatting of clause 13 header corrected	9.1.1
2011-04	CT-51	CP-110235	0065	1	B	Introduction of Secure Channel for relay nodes	10.0.0
2011-06						Editorial release: Unnumbered reference corrected	10.0.1
2012-09	SP-57					Automatic ugrade of the specification to Rel-11	11.0.0
2014-10	SP-65					Automatic ugrade of the specification to Rel-12	12.0.0
2014-12	CT-66	CP-140986	0078	1	F	Update reference to ETSI TS 102 221 version 12.0.0 for execution time	12.1.0
2015-06	CT-68	CP-150388	0081	1	F	Update of reference to ETSI TS 102 221	12.2.0
2015-06	CT-69	CP-150563	0082	1	C	Replacement of EF LAUNCH SCWS with EF LAUNCH PAD	13.0.0
2015-12	CT-70	CP-150833	0083	5	C	Alignment of UICC polling interval with eDRX cycle	13.1.0
2016-05	CT-72	CP-160347	0087		F	Update of reference of ETSI TS 102 221	13.2.0
2016-12	CT-74	CP-160789	0088	1	B	Usage of non-removable UICC	14.0.0
2017-03	CT-75	CP-170213	0089	1	B	Introduction of SUSPEND UICC command	14.1.0
2017-12	CT-78	CP-173150	0090	-	D	Correction of clause numbering	14.2.0
2018-06	SA#80					Automatic update to Rel-15	15.0.0
2018-10	CT#81	CP-182185	0092	1	F	Remove GET IDENTITY command defined already in ETSI TS 102.221.	15.1.0
2019-09	CT#85	CP-192014	0093	1	F	Update of reference to ETSI TS 102 221	15.2.0
2020-06	CT#88e	CP-201147	0094	3	F	Update the scope of 31.101 to cover 2/4/5G aspects	15.3.0
2020-06	CT#88e	CP-201288	0095	-	F	Dedicated AID for USIM Applications with non-IMSI based SUPI Types	16.0.0
2021-03	CT#91e	CP-210083	0096	1	F	Clause 13 correction on reference to TS 31.101 Annex O	16.1.0
2021-06	CT#92e	CP-211098	0097	1	F	Removal of 3GPP USIM (non-IMSI SUPI Type) after PIX report to ETSI TS 101.220	16.2.0
2022-03	CT#95e	CP-220134	0098	1	D	Editorial update to remove offensive language	17.0.0
2022-06	CT#96	CP-221173	0099	1	B	Update the Speed enhancement of USIM	17.1.0
2024-03	-	-	-	-		Update to Rel-18 version (MCC)	18.0.0
2024-06	CT#104	CP-241221	0101	-	F	Alignment to latest ETSI SET specifications	18.1.0