INTERNATIONAL STANDARD

ISO/IEC 7816-4

Third edition
2013-04-15

AMENDMENT 2
2018-09

Identification cards — Integrated circuit cards —

Part 4: Organization, security and commands for interchange

AMENDMENT 2: Waiting time management

Cartes d'identification — Cartes à circuit intégré —

Partie 4: Organisation, sécurité et commandes pour les échanges

AMENDEMENT 2: Gestion du temps d'attente

Reference number
ISO/IEC 7816-4:2013/Amd.2:2018(E)

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Published in Switzerland

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This document was prepared by Technical Committee ISO/JTC1, *Information technology*, Subcommittee SC 17, *Cards and security devices for personal identification*.

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Identification cards — Integrated circuit cards —

Part 4: Organization, security and commands for interchange

AMENDMENT 2: Waiting time management

Page 102, 12.1

Add the following sentence to the end of the first paragraph:

> The waiting time management provides the information regarding application waiting time to the outside world (see 12.1.3).

Page 106

Add the following new subclause after 12.1.2:

12.1.3 Waiting time management

12.1.3.1 General

The waiting time management service provides the information regarding application waiting time depending on respective cases, e.g. each command, each operation, and each amount of data. By using this information, an application on an IFD detects an unresponsive ICC without any negotiation, as an alternative to using a single waiting time defined on a transmission protocol (See ISO/IEC 7816-3 and ISO/IEC 14443-4).

The application waiting time is the maximum delay between the leading edge of a character transmitted by an ICC and the leading edge of the previous character transmitted by an IFD.

This information is available under application waiting time management information DO‘7F75‘ in the EF.ATR/INFO and/or in the FCI of any application DF. Table Amd.2-2 indicates four formats for this information.

The rationale for handling the waiting time defined in ISO/IEC 7816-3 in correlation with the execution time information by an application on an IFD is out of the scope of this document.

Table — Amd.2-2 — Application waiting time data objects under application waiting time management information DO‘7F75‘

Tag	Length	Value
‘81‘	Var.	Application waiting time management information in compact format
‘A1‘	Var.	Application waiting time management data elements in expanded format
‘82‘	Var.	Application waiting time management information in proprietary format
‘A2‘	Var.	Application waiting time management data elements in proprietary format

12.1.3.2 Compact format

In compact format, an application waiting time management information consists of a command indicator field followed by a concatenation of 2-byte application waiting time management factors. Each bit of bits b7 to b1 indicates whether the application waiting time management factor for each command

is present, i.e. a bit as 1 means present and a bit as 0 means absent. Table Amd.2-3 shows the first byte of command indicator. Subsequent bytes of command indicator are RFU.

An application waiting time management factor consists of 1-byte base time and 1-byte unit time. The maximum application waiting time is derived from base time plus result of multiplying unit time by data length of command processing (see arithmetic expression below). A base time is the part of each command execution time independent from data length of command processing. A unit time is 1 byte data processing time for each command, e.g. reading 1 byte data, updating 1 byte data, or verifying 1 byte data.

$$AWT_{max} = T_b + (T_u \times L)$$

where

AWT_{max} is maximum application waiting time [ms];

T_b is base time [ms];

T_u is unit time [ms/B];

L is data length [B].

Table — Amd.2-3 — Coding of the first byte of command indicator

b8	b7	b6	b5	b4	b3	b2	b1	Meaning
x	—	—	—	—	—	—	—	Presence of next command indicator
0	—	—	—	—	—	—	—	Last command indicator byte
1	—	—	—	—	—		—	Next command indicator byte available
—	x	x	x	x	x	x	x	Presence of application waiting time management factor for each command
—	1	—	—	—	—	—	—	READ BINARY
—	—	1	—	—	—	—	—	UPDATE BINARY
—	—	—	1	—	—	—	—	READ RECORD (S)
—	—	—	—	1	—	—	—	UPDATE RECORD
—	—	—	—	—	x	x	x	RFU

12.1.3.3 Expanded format

In expanded format, an application waiting time management information consists of a concatenation of a command header description DO‘81‘ followed by an application waiting time management factor DO’A0‘. A value field of a command header description DO‘81‘ is composed of a mandatory command header description byte followed by an optional CLA byte, INS byte, P1 byte and P2 byte depending on the value of the command header description byte. Table Amd.2-4 shows the command header description byte (the first byte of the value field of DO‘81‘).

Table — Amd.2-4 — Coding of command header description byte

b8	b7	b6	b5	b4	b3	b2	b1	Meaning
0	0	0	0	x	x	x	x	**The command header description includes**
0	0	0	0	1	—	—	—	— (CLA), i.e. the value of CLA
0	0	0	0	—	1	—	—	— (INS), i.e. the value of INS
0	0	0	0	—	—	1	—	— (P1), i.e. the value of P1
0	0	0	0	—	—	—	1	— (P2), i.e. the value of P2
— Any other value is RFU. — The value of CLA shall encode zero as the number for logical channel with the meaning that the description is independent from logical channels.								

Table Amd.2-5 lists application waiting time management factor DOs with context-specific class tag. Each application waiting time management factor is associated to the specific arithmetic expression. Two application waiting management factor DOs associated to one arithmetic expression (see 12.1.3.1) are provided.

Table — Amd.2-5 — Waiting time management factor DOs

Tag	Length	Value
'80'	Var.	Base time
'81'	Var.	Unit time

Page 113, Table 123

Replace the last row of this table with the following:

	—	—	1	—	—	—	—	Application waiting time management information
	—	x	—	—	—	—	—	0 (any other value is RFU)

Page 148, Annex H

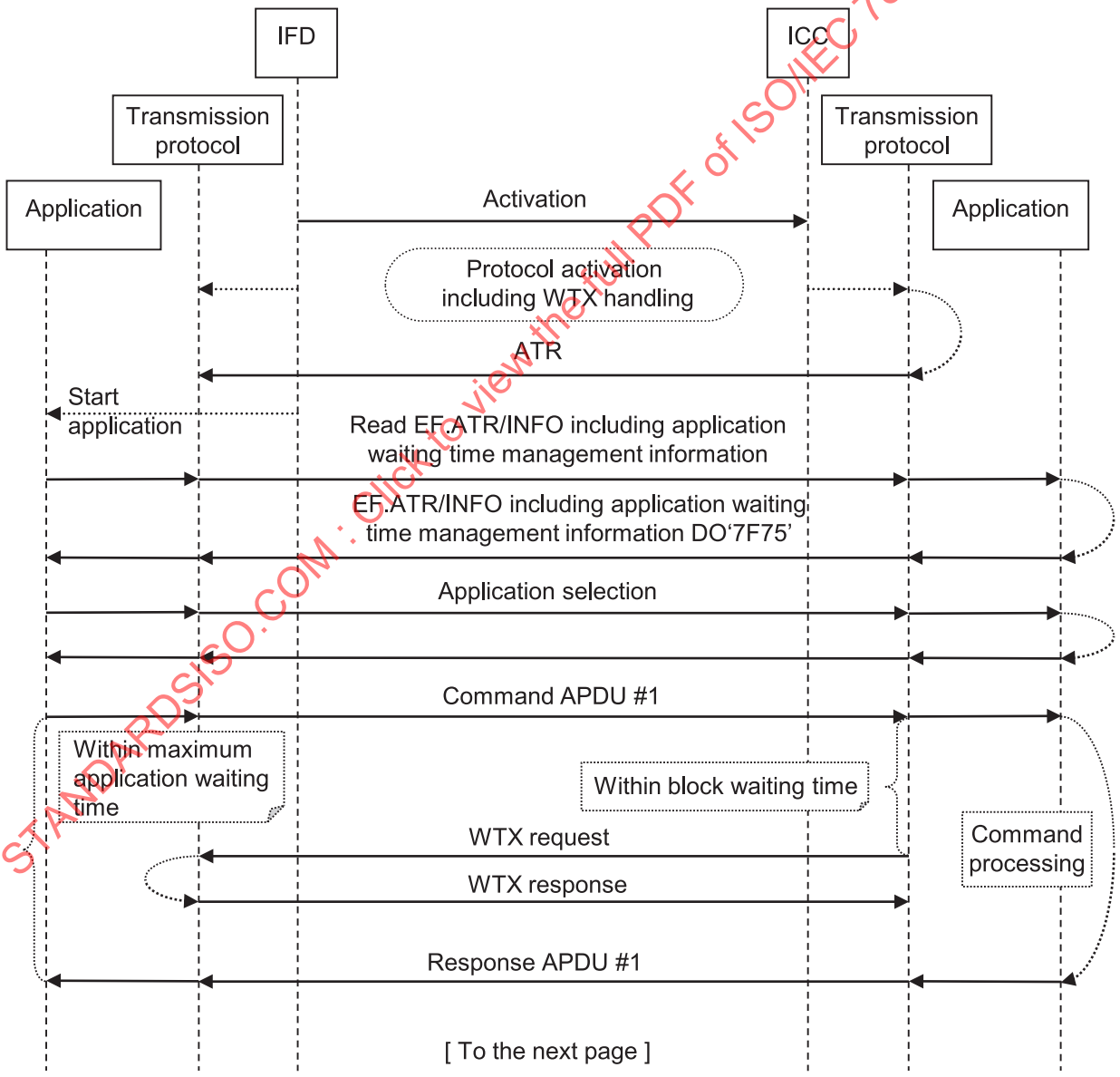
Add the following informative annex after Annex H:

Annex I
(informative)

Use case of WTX (waiting time extension) procedure and application waiting time procedure

I.1 Example in case of block waiting time shorter than maximum application waiting time

Figure I.1 illustrates an example of WTX (waiting time extension) procedure for T = 1 protocol defined in ISO/IEC 7816-3 and application waiting time procedure defined in 12.1.3. In case of this example, the block waiting time used for WTX is shorter than the maximum application waiting time used for waiting time management. The application waiting time management information is stored in EF.ATR/INFO.



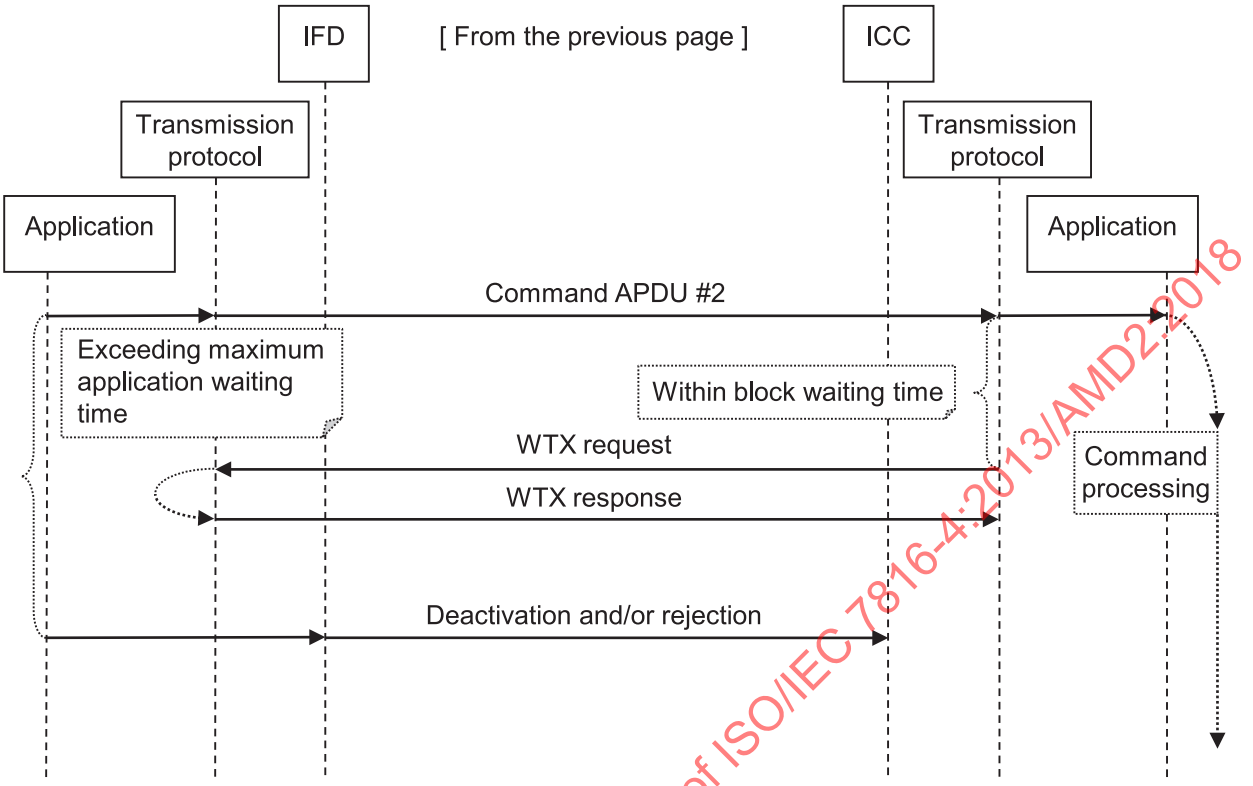


Figure I.1 — Example of WTX procedure and application waiting time procedure

In Figure I.1 command APDU #1 and #2 are sent from IFD to ICC. Command APDU #1 is processed successfully. Command APDU #2 processing is not completed within the maximum application waiting time defined in the application waiting time management information. Then the application on IFD decides to deactivate and/or to reject ICC. The following is detailed sequence in Figure I.1:

1) IFD activates ICC, then MF in ICC is selected and ICC responds ATR.
2) Both IFD and ICC activate their own protocol.
3) IFD starts the application on IFD.
4) The application on IFD reads EF.ATR/INFO including application waiting time management information.
5) The application on IFD selects the application in ICC, then ICC responds.
6) The application on IFD sends command APDU #1, then ICC starts the command processing.
7) Before exceeding the block waiting time, ICC requests WTX to IFD.
8) IFD accepts WTX, then responds.
9) ICC continues the command processing.
10) ICC sends response APDU #1 before exceeding the maximum application waiting time.
11) The application on IFD sends command APDU #2, then ICC starts the command processing.
12) Before exceeding the block waiting time, ICC requests WTX to IFD.
13) IFD accepts WTX, then responds.
14) ICC continues the command processing.