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**Electronic fee collection —  
Personalization of on-board  
equipment (OBE) —**

**Part 3:  
Using integrated circuit(s) cards**

**iTeh STANDARD PREVIEW**  
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*Perception de télépéage — Personnalisation des équipements  
embarqués —  
Partie 3: Utilisation de cartes à circuit(s) intégré(s)*

ISO/TS 21719-3:2021

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 278, *Intelligent transport systems*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

A list of all parts in the ISO/TS 21719 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

On-board equipment (OBE) is an in-vehicle device that contains one or more application instances in order to support different intelligent transportation system (ITS) implementations such as electronic fee collection (EFC).

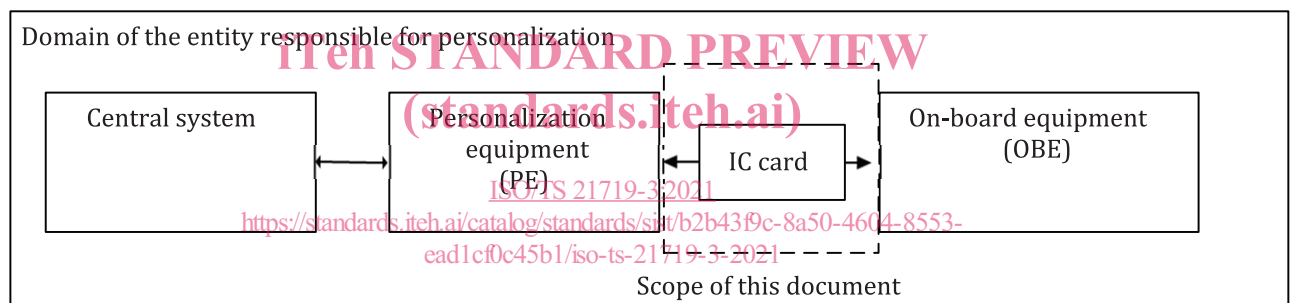
To assign the EFC application in the OBE to a certain user and/or vehicle, personalization is performed. This means that unique user and vehicle related data are transferred to and stored in the OBE.

CEN/TR 16152 assesses many aspects of the personalization process and it defines the overall personalization assets (application data, application keys and vehicle-related data).

Different communication media may be used for transferring the personalization assets to the OBE. An overall message exchange framework and needed security functionality may be applied, for all media common procedures, in order to ensure data protection and integrity.

By standardizing the personalization procedure, compatibility of personalization equipment (PE) is supported. The entity responsible for the personalization, such as a toll service provider, will further be able to outsource parts of, or a complete, personalization to a third party or to another service provider or personalization agent.

The scope of the personalization functionality is illustrated in [Figure 1](#). It is limited to the transfer of data between the PE and the OBE by using integrated circuit(s) cards (ICCs).



**Figure 1 — Scope of this document (box delimited by a dotted line)**

This document defines a complete application profile (AP), using ICCs in accordance with the ISO/IEC 7816-3, ISO/IEC 7816-4, ISO/IEC 14443-3, ISO/IEC 14443-4 and the ISO/IEC 15693 series (Table 1), in accordance with the personalization functionality described in ISO/TS 21719-1.

[Figure 2](#) shows the relationship of this document.

There are two interfaces (PE-ICC, ICC-OBE). For further details, see [Annex A](#).

This document may be supplemented by a set of specifications which define the conformity evaluation of equipment to the conformance requirements contained in this document.

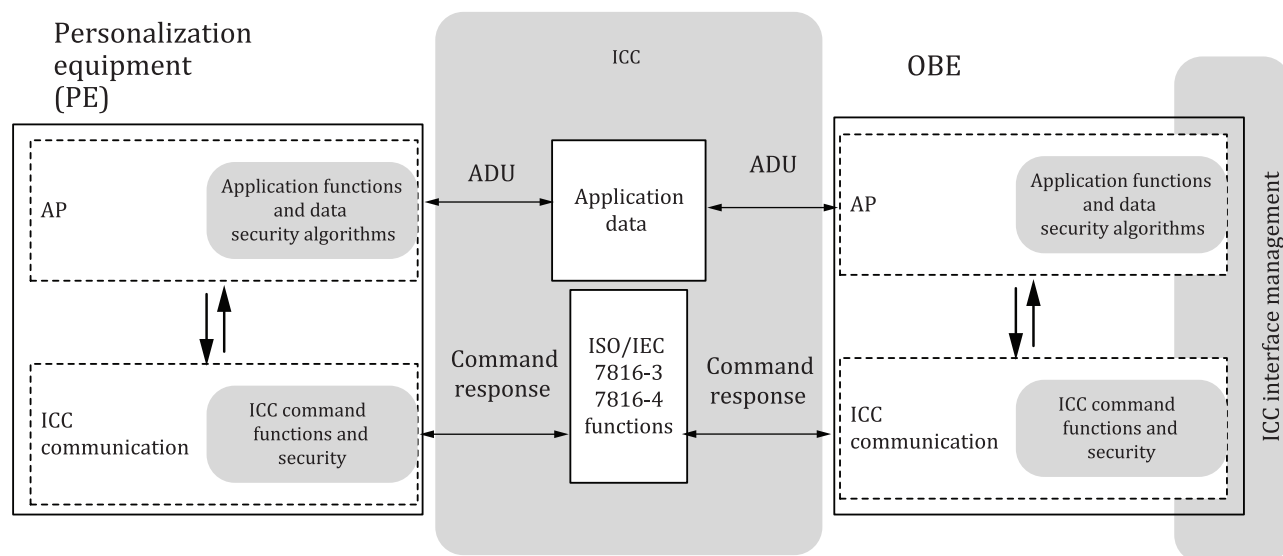


Figure 2 — Relationship between this document and ICC communication

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# Electronic fee collection — Personalization of on-board equipment (OBE) —

## Part 3: Using integrated circuit(s) cards

### 1 Scope

This document specifies:

- personalization interface;
- physical systems: on-board equipment (OBE), personalization equipment (PE) and integrated circuit(s) cards (ICCs);
- electronic fee collection (EFC) personalization functions between the PE and the OBE in accordance with ISO/TS 21719-1 when using an ICC;
- data and security elements that are transferred between the PE and the OBE using the ICC.

It is outside the scope of this document to define:

- conformance procedures and test specifications;
- setting-up of operating organizations (e.g. toll service provider, personalization agent, trusted third party, etc.);
- legal issues;
- the exact commands and security functionality within ISO/IEC 7816-4 used by the PE and the OBE, respectively, to interface an ICC.

NOTE Some of the issues that are outside the scope of this document are the subject of separate standards prepared by CEN/TC 278 and ISO/TC 204.

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 7816-3, *Identification cards — Integrated circuit cards — Part 3: Cards with contacts — Electrical interface and transmission protocols*

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

ISO/IEC 14443-3, *Cards and security devices for personal identification — Contactless proximity objects — Part 3: Initialization and anticollision*

ISO/IEC 14443-4, *Cards and security devices for personal identification — Contactless proximity objects — Part 4: Transmission protocol*

ISO/IEC 15693 (all parts), *Cards and security devices for personal identification — Contactless vicinity objects*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

#### 3.1 attribute

addressable package of data consisting of a single data element or structured sequences of data elements

[SOURCE: ISO/TS 17573-2:2020, 3.13]

#### 3.2 base standard

approved International Standard, Technical Specification or ITU-T Recommendation

Note 1 to entry: This includes but is not limited to approved standard deliverables from ISO, ITU, CEN, CENELEC, ETSI and IEEE.

[SOURCE: ISO/TS 17573-2:2020, 3.23]

#### 3.3 electronic fee collection EFC

fee collection by electronic means

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[SOURCE: ISO/TS 17573-2:2020, 3.70] [ISO/TS 21719-3:2021  
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#### 3.4 international standardized profile

internationally agreed-to, harmonized document which describes one or more *profiles* (3.9)

[SOURCE: ISO/TS 17573-2:2020, 3.102]

#### 3.5 on-board equipment OBE

all required equipment on-board a vehicle for performing required *electronic fee collection (EFC)* (3.3) functions and communication services

[SOURCE: ISO/TS 17573-2:2020, 3.126]

#### 3.6 OBE personalization

transferring *personalization assets* (3.7) to the *on-board equipment (OBE)* (3.5)

[SOURCE: ISO/TS 17573-2:2020, 3.123]

#### 3.7 personalization assets

specific data stored in the *on-board equipment (OBE)* (3.5) related to the user and the vehicle

[SOURCE: ISO/TS 17573-2:2020, 3.137]



### 3.8 personalization equipment PE

equipment for transferring *personalization assets* (3.7) to the *on-board equipment (OBE)* (3.5)

[SOURCE: ISO/TS 17573-2:2020, 3.138]

### 3.9 profile

set of requirements and selected options from *base standards* (3.2) or *international standardized profiles* (3.4) used to provide a specific functionality

[SOURCE: ISO/TS 17573-2:2020, 3.146]

### 3.10 toll service provider

entity providing toll services in one or more toll domains

Note 1 to entry: In other documents, the terms “issuer” or “contract issuer” are sometimes used.

Note 2 to entry: The toll service provider may provide the *on-board equipment (OBE)* (3.5) or may provide only a magnetic card or a smart card to be used with the OBE provided by a third party (e.g. a mobile telephone and a SIM card can be obtained from different parties).

Note 3 to entry: The toll service provider is responsible for the operation (functioning) of the OBE with respect to tolling.

[SOURCE: ISO/TS 17573-2:2020, 3.206, modified — Notes 1, 2 and 3 have been added.]

### 3.11 transaction

whole of the exchange of information between two physically separated communication facilities

[SOURCE: ISO/TS 17573-2:2020, 3.211]

## 4 Abbreviated terms

For the purposes of this document, the following abbreviated terms apply.

ADU	application data unit
AP	application profile
ATR	answer-to-reset
AVEI	automatic vehicle and equipment identification
EFC	electronic fee collection
ICC	integrated circuit(s) card
ID	identifier
ICS	implementation conformance statement
IUT	implementation under test
OBE	on-board equipment
PE	personalization equipment

PICS protocol implementation conformance statement

## 5 Conformance

### 5.1 General

This clause describes in general terms what it means to be in conformity with this document.

[Annex A](#) provides a PICS proforma that shall be filled in by the concerned equipment supplier or its representative in order to declare conformance of an implementation with this document.

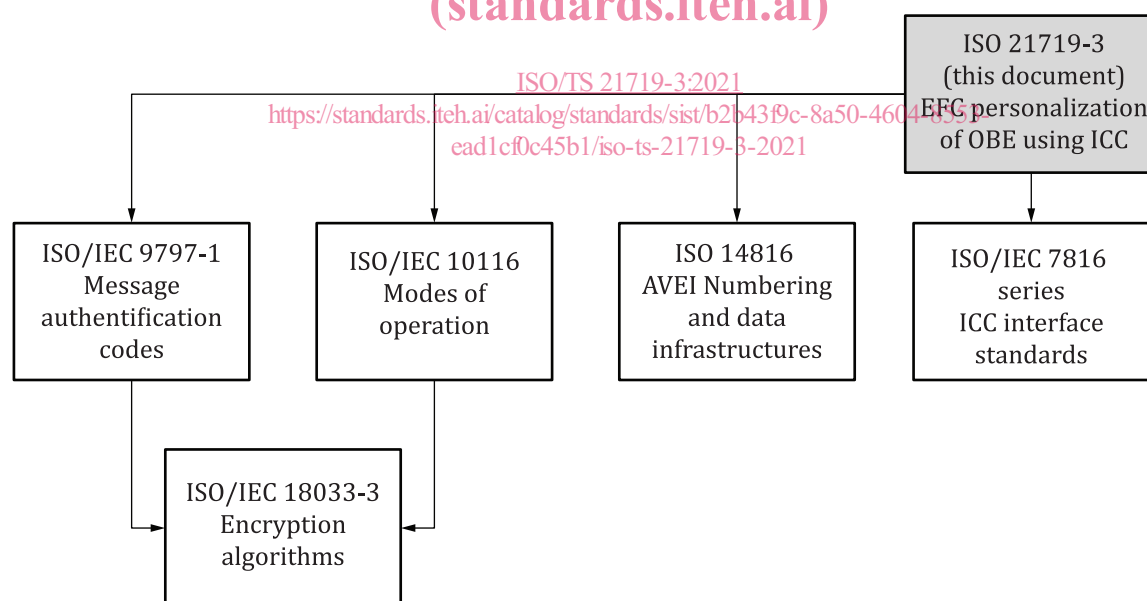
### 5.2 Base standards

This document defines one application profile (AP). The base standards that this AP is based upon are:

- standards for security functionality, e.g. ISO/IEC 9797-1;
- standards for EFC application definition, notably ISO 14906;
- standards for ICC interface definition, e.g. ISO/IEC 7816-4.

An overview of the relationship and references between base standards and this AP is illustrated in [Figure 3](#).

All requirements specified in this document are either choices made from these base standards or more specific based on the general provisions of these base standards.



**Figure 3 — Relationship and references between base standards and this document**

### 5.3 Main contents of an EFC personalization AP

The conformance requirements of an AP are divided between requirements for OBE and PE. The requirements are listed separately for OBE and PE. This applies for all parts, requirements, PICS and conformance testing.

The conformance requirements of an AP according to this document include the following parts (divided into separate requirements for OBE and PE):

- ICC interface requirements;
- EFC personalization functions;
- security requirements;
- transaction requirements.

## 6 Personalization overview

### 6.1 Process

The overall personalization process is described in ISO/TS 21719-1:2018, 5.1.

“Personalization” means that an existing EFC application structure in the OBE is populated with personalization assets such as user or vehicle-related data.

Creation of the EFC application and entering initial data, such as initial security keys, is performed before the personalization and is out of the scope of this document.

During personalization, the ICC is moved between the ICC reader interfaces of the PE and the OBE in order for the data transfer to take place according to this document. Application data and security keys are during the personalization process transferred to the OBE in an attribute list that is stored on the ICC by the PE. Writing and reading of data in the ICC is done by using standardized ICC commands and security functionality according to the ICC interface requirements defined in this document.

### 6.2 System architecture

[ISO/TS 21719-3:2021](https://standards.iteh.ai/catalog/standards/sist/b2b43f9c-8a50-4604-8553-ea11e9015b1/iso-ts-21719-3-2021)

[https://standards.iteh.ai/catalog/standards/sist/b2b43f9c-8a50-4604-8553-](https://standards.iteh.ai/catalog/standards/sist/b2b43f9c-8a50-4604-8553-ea11e9015b1/iso-ts-21719-3-2021)

The overall system architecture is described in ISO/TS 21719-1:2018, 5.3.

For personalization via the ICC interface, both the OBE and the PE shall contain an ICC reader with ICC communication functionality, and the application services as described in this specification.

Security functionality and secure key storage may either be implemented within the PE or the PE may be connected to a central system where this functionality may reside. This is out of the scope of this document.

## 7 OBE requirements

### 7.1 General

This clause contains the conformance requirements on the OBE for personalization data transfer from an ICC.

### 7.2 ICC interface requirements

#### 7.2.1 General

The OBE shall support at least one of the ICC interfaces as described in [Table 1](#).