BSI Standards Publication

Electronic fee collection – Interface definition for on-board account using integrated circuit card (ICC) (ISO 25110:2017)

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National foreword

This British Standard is the UK implementation of EN ISO 25110:2017. It is identical to ISO 25110:2017. It supersedes PD CEN ISO/TS 25110:2013, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/278, Intelligent transport systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

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EUROPEAN STANDARD

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English Version

Electronic fee collection - Interface definition for on-board account using integrated circuit card (ICC) (ISO 25110:2017)

Perception du télépéage - Définition d'interface pour compte de bord utilisant une carte à circuit intégré (ICC) (ISO 25110:2017)

Elektronische Gebührenerhebung - Schnittstellendefinition für die fahrzeugseitige bordeigene Datenverwaltung mit Chipkarte (ICC) (ISO 25110:2017)

This European Standard was approved by CEN on 22 November 2017.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

This document (EN ISO 25110:2017) has been prepared by Technical Committee ISO/TC 204 "Intelligent transport systems" in collaboration with Technical Committee CEN/TC 278 "Intelligent transport systems" the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2018, and conflicting national standards shall be withdrawn at the latest by June 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes CEN ISO/TS 25110:2013.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 25110:2017 has been approved by CEN as EN ISO 25110:2017 without any modification.

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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).

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

This first edition cancels and replaces the second edition of ISO/TS 25110:2013.

The main changes compared to the previous edition are as follows:

— the document has been converted from a Technical Specification to an International Standard;

— terms have been amended, in order to reflect harmonization of terms across electronic fee collection (EFC) standards.

Introduction

Background and motivation

There are two payment systems dealing with electronic fee collection (EFC). The first is the central account system using a one-piece on-board unit (OBU) and the second is the on-board account system using a payment media such as the integrated circuit card (ICC).

ICCs have been widely used for public transport cards such as subway and bus payment means and electronic money cards for general purpose payments, as well as for credit cards and banking cards. The ICC is expected to be used for EFC payment means along with these global trends and provides convenience and flexibility.

Currently, the descriptions in the existing EFC-related International Standards are focused on the central account system, which is rather simple and gives more feasibility for EFC interoperability than the on-board account system, which is complex and has more items to be settled.

With consideration of the widespread use for transport cards or electronic money cards, a new International Standard relating the on-board account system using those ICCs is strongly required as shown in Figure 1. Furthermore, a state-of-the-art mobile phone integrated with ICC functions, a so-called "mobile electronic purse", has been used for public transport or retail shopping as a payment means in some countries so rapidly that standardization on this theme is important and essential for considering future EFC payment methods as well.
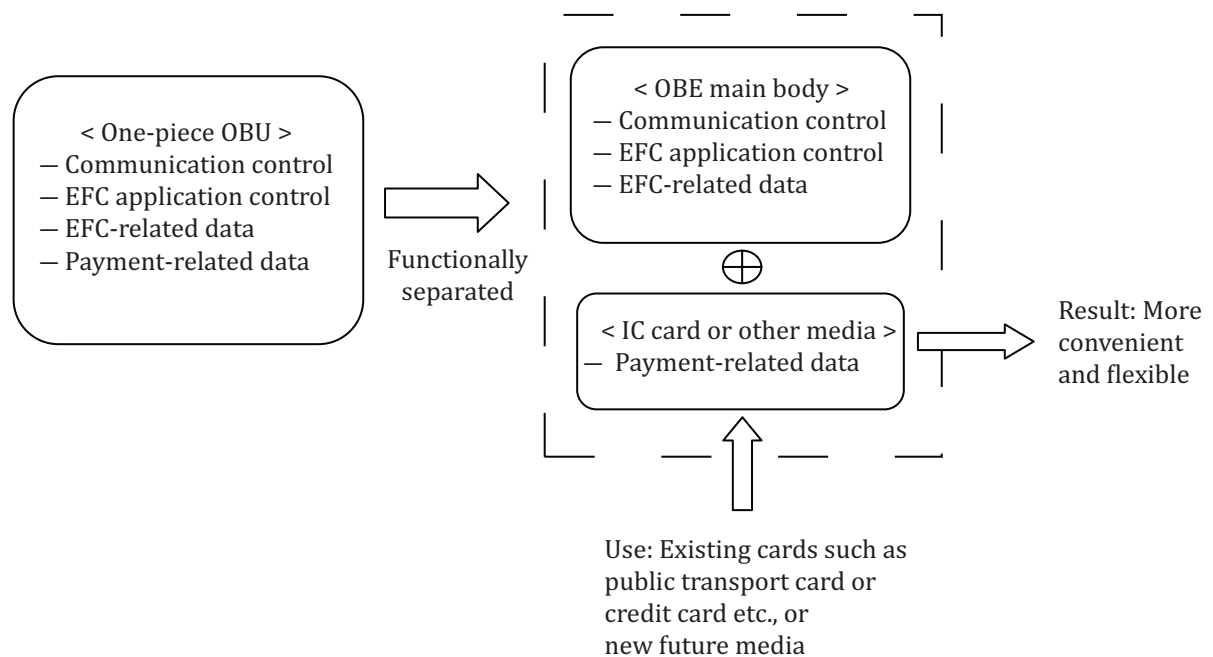

Figure 1 — Motivation for on-board account using ICC

Figure 2 shows the scope of the EFC standards, in which the OBU is used as a communication means and the ICC carries the payment means.
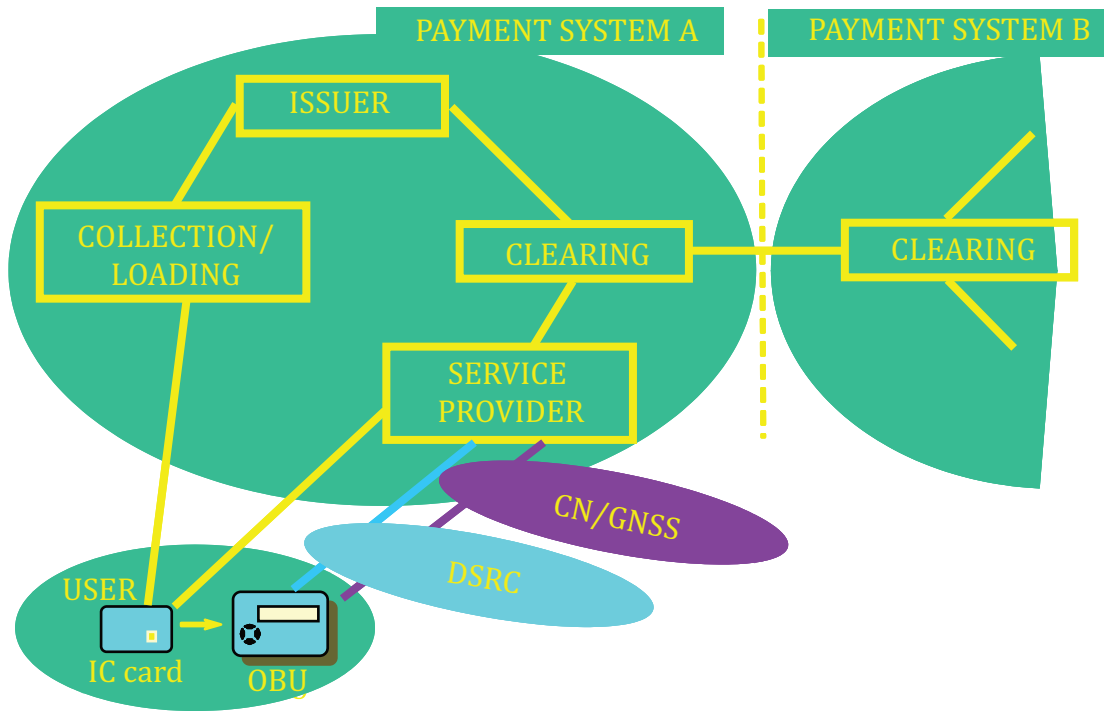

Figure 2 — Illustration of the scope of the EFC standards

Objective

The objective of this document is to classify data transfer models based on operational requirements and define a specific ICC access interface for on-board accounts using the ICC for each model. Furthermore, this document provides practical examples of transactions in Annex B, for consideration and easy adoption by toll road operators.

Use

This document provides a common technical platform for on-board accounts using ICCs to deal with various operational requirements and practical examples of on-board accounts actually used or planned in several countries.

Each toll road operator can establish their own specification by selecting an example of the models in this document (like a tool box) so as to meet their requirements.

INTERNATIONAL STANDARD

# Electronic fee collection — Interface definition for on-board account using integrated circuit card (ICC)

1 Scope

This document defines the data transfer models between roadside equipment (RSE) and integrated circuit card (ICC) and the interface descriptions between the RSE and on-board equipment (OBE) for on-board accounts using the ICC. It also provides examples of interface definitions and transactions deployed in several countries.

This document covers:

— data transfer models between the RSE and ICC which correspond to the categorized operational requirements and the data transfer mechanism for each model;

— interface definition between the RSE and OBE based on each data transfer model;

— interface definition for each model;

— functional configuration;

— RSE command definitions for ICC access;

— data format and data element definitions of RSE commands;

— a transaction example for each model in Annex B.

Figure 3 shows the configuration of an on-board account and the scope of this document. The descriptions in this document focus on the interface between the RSE and OBU to access the ICC.
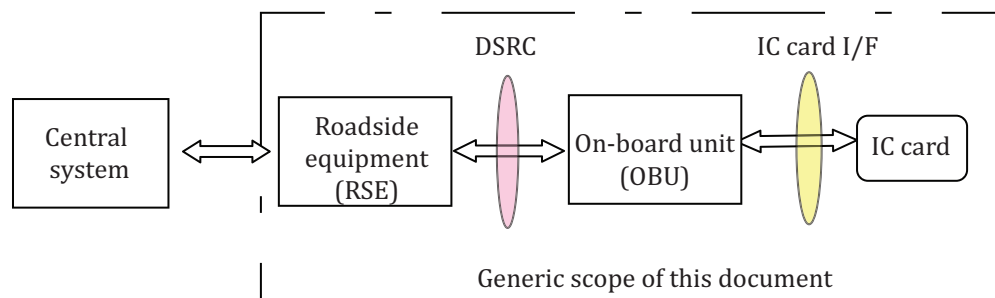
Figure 3 — Configuration of an on-board account and the scope of this document

Figure 4 shows the layer structure of the RSE, OBU and ICC where the mid-layer of application interfaces are denoted as the practical scope of this document.

NOTE   The existing standards for physical and other protocol layers both between the RSE and OBE, and between OBE and ICC, are outside the scope of this document. For example, DSRC-related items (L-1, L-2 and L-7) and ICC-related items (ICC commands, data definition, etc.) are outside the scope of this document.

There are two types of virtual bridges contained in an OBU. The first type is Bridge-1 on which an RSE command sent from the RSE is decomposed and the ICC access command contained in the application protocol data unit (APDU) part of the RSE command is transferred to ICC I/F to access the ICC. The second type is Bridge-2 in which an RSE command sent from the RSU is transformed to ICC access command and transferred to ICC I/F to access the ICC.