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Electronic fee collection - Information exchange between service provision and toll charging (ISO 12855:2015)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 04/16

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English Version

Electronic fee collection - Information exchange between service provision and toll charging (ISO 12855:2015)

Perception du télépéage - Échange d'informations
entre la prestation de service et la perception du péage
(ISO 12855:2015)

Elektronische Gebührenerhebung -
Informationsaustausch zwischen Dienstleistern und
Gebühreneinzugsunternehmen (ISO 12855:2015)

This European Standard was approved by CEN on 7 November 2015.

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European foreword

This document (EN ISO 12855:2015) 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of an identical text or by endorsement, at the latest by June 2016, and conflicting national standards shall be withdrawn at the latest by June 2016.

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

This document supersedes EN ISO 12855:2012.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 12855:2015 has been approved by CEN as EN ISO 12855:2015 without any modification.

Electronic fee collection — Information exchange between service provision and toll charging

*Perception du télépéage — Échange d'informations entre la
prestation de service et la perception du péage*



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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).

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).

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

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 204, *Intelligent transport systems*.

This second edition cancels and replaces the first edition (ISO 12855:2012), which has been technically revised. The following changes have been made:

- adding new Application Data Units (ADUs) due to comments received from National Bodies;
- aligning the ASN.1 data definitions with the current versions of EN 14906, and ISO 17575 (all parts);
- moving the ASN.1 module from [Annex A](#) to an external text file, in a format that can be processed by ASN.1 compilers;
- clarifying the semantics of parameters in ADUs;
- aligning the structure of all major clauses in a consistent manner to improve readability.

Introduction

The widespread use of tolling requires provisions for users of vehicles that circulate through many different toll domains. Users should be offered a single contract for driving a vehicle through various toll domains. Where those vehicles require a form of on-board equipment (OBE) this should be interoperable with the toll systems in the various toll domains. In Europe, for example, this need has been officially recognized and legislation on interoperability has already been adopted (see Directive 2004/52/EC and Decision 2009/750/EC). There is both a commercial and economic justification in respect to the OBE and the toll systems for standards enabling interoperability.

The system architecture defined in ISO 17573 is the basis for all standards that relate to tolling systems in the toll domain. With respect to ISO 17573, this International Standard

- adopts its definitions of terms and concepts and basic system functionalities and structure,
- uses its terminology, and
- specifies the interfaces therein identified.

ISO 17573 uses ISO/IEC 10746-3 for the description of the architecture.

[Figure 1](#) shows the scope of the group of electronic fee collection (EFC) related standards based upon the architecture standard.

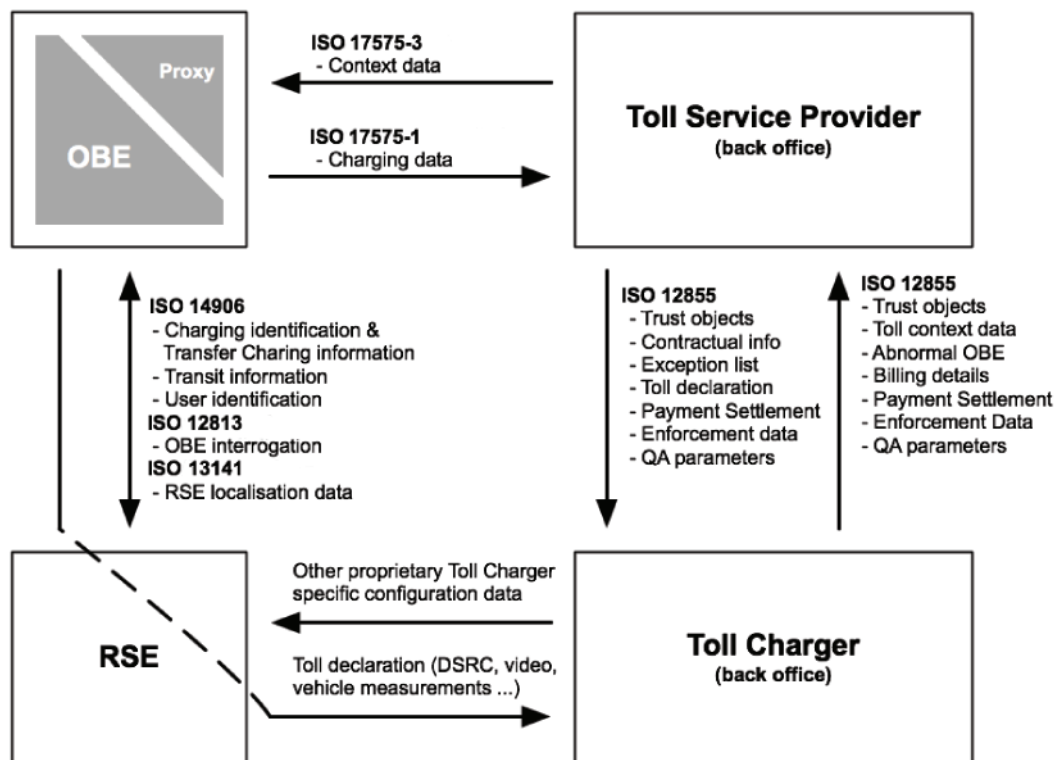


Figure 1 — Scope of EFC related standards

A given transport service for a given vehicle is fully identified by one or several toll declarations made available to the Toll Charger (TC). Toll declarations have to be made available according to the rules of the toll regime of the toll domain.

The amount due for a given transport service used by a vehicle liable to toll is finalized by the TC with the use of toll declarations (as described above) and calculation is made according to the rules of the toll regime (formula, tariff tables, specific situations rules, traffic conditions, etc.). That means that the

TC has the authority to decide on the amount due, even if it decides to assign the Toll Service Provider (TSP) the task to calculate the amount due.

The information above, associated with a given transport service, is named billing details; for a given transport service, the billing details are referring to one or several toll declarations.

Depending on the toll regime, billing details are elaborated with information collected by the TC and/or the relevant TSP; they are finalized by the TC.

The TC elaborates and makes the payment claims (or toll payment claims) available to each TSP, according to the bilateral agreements it has with each TSP, referring to billing details. These payment claims include an amount due taking into account any specific commercial conditions applicable to a vehicle, a fleet of vehicles or a given TSP.

This International Standard defines a set of interactions in support of technical interoperability between back-office systems of TCs and TSPs. The EFC-service and the EFC System model on which this International Standard is based is defined in ISO 17573.

This International Standard does not provide a full solution for interoperability, and it does not define other parts of the EFC system, other services, other technologies and non-technical elements of interoperability.

The development of a common European Electronic Toll Service (EETS) as a part of the European EFC Directive (2004/52/EC) also calls for the definition of an interoperable EFC service. This International Standard provides for effective support for the work on the definition of EETS. Details on the usage of this International Standard for the EETS are provided in [Annex F](#).

This International Standard identifies and specifies the set of Application Protocol Data Units exchanged between two actors in the roles of Toll Service Provider and Toll Charger as defined in ISO 17573. To specify these interfaces, this International Standard uses the enterprise description of the toll environment, and the interactions defined between the named classes of roles, as defined in ISO 17573. This allows for a complete specification of the data that is transferred between those identified entities. In addition, a number of computational interfaces are identified and interactions in terms of sequences of Application Protocol Data Units are defined.

Electronic fee collection — Information exchange between service provision and toll charging

1 Scope

This International Standard specifies

- the interfaces between electronic fee collection (EFC) systems for vehicle related transport services, e.g. road user charging, parking and access control; it does not cover interfaces for EFC systems for public transport; an EFC system can include any EFC system, e.g. including systems that automatically read licence plate numbers of vehicles passing a toll point,
- an exchange of information between the central equipment of the two roles of service provision and toll charging, e.g.
 - charging related data (toll declarations, billing details),
 - administrative data, and
 - confirmation data,
- transfer mechanisms and supporting functions,
- information objects, data syntax and semantics,
- examples of data interchanges (see [Annex C](#) and [Annex D](#)), and
- an example on how to use this International Standard for the European Electronic Tolling Service (EETS) (see [Annex F](#)).

This International Standard is applicable for any toll service and any technology used for charging.

It is defined as a toolbox standard of transactions and Application Protocol Data Units (APDUs), which can be used for the assigned purpose. The detailed definitions of mandatory and optional elements in a real implementation are defined elsewhere. It does not define all communication sequences, communication stacks and timings.

The scope of this International Standard is illustrated in [Figure 2](#). The data types and associated coding related to the data elements described in [Clause 6](#) are defined in [Annex A](#), using the abstract syntax notation one (ASN.1) according to ISO/IEC 8824-1.

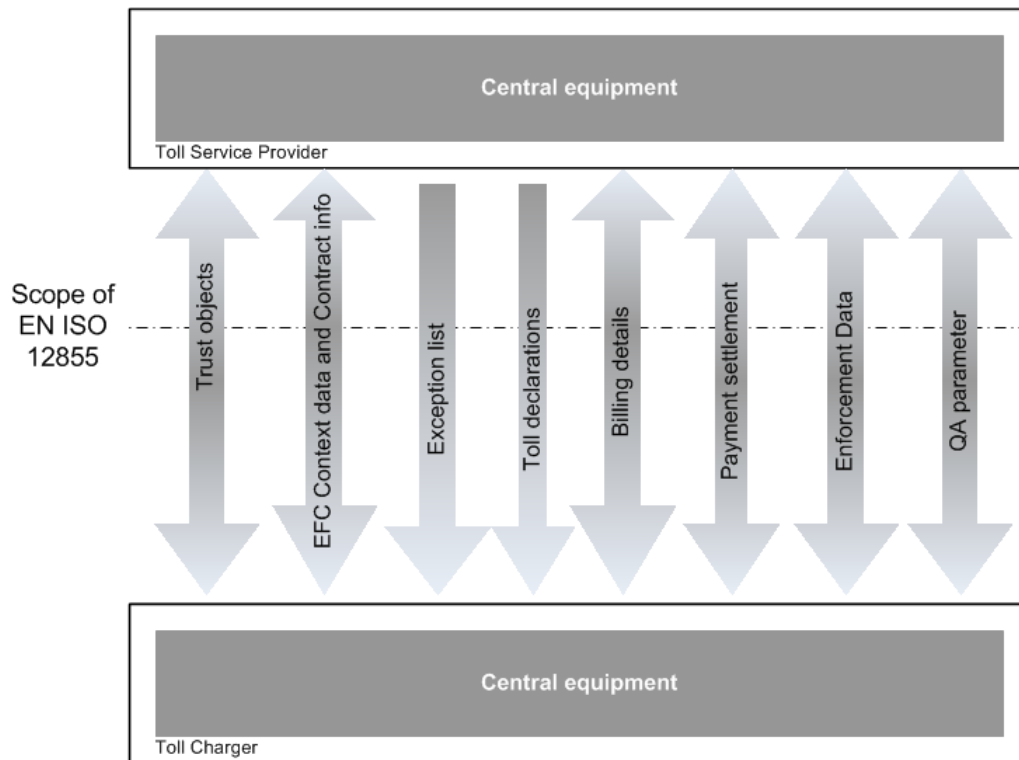


Figure 2 — Scope of this International Standard

This International Standard is not applicable to

- any communication between Toll Charger (TC) or Toll Service Provider (TSP) with any other involved party,
- any communication between elements of the TC and the TSP that is not part of the back office communication,
- processes regarding payments and exchanges of fiscal, commercial or legal accounting documents, and
- definitions of service communication channels, protocols and service primitives to transfer the APDUs.

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 639-1, *Codes for the representation of names of languages — Part 1: Alpha-2 code*

ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes*

ISO/IEC 8824-1, *Information technology — Abstract Syntax Notation One (ASN.1): Specification of basic notation*

ISO/IEC 8825-4, *Information technology — ASN.1 encoding rules: XML Encoding Rules (XER)*

ISO/IEC 9594-8:2014, *Information technology — Open Systems Interconnection — The Directory — Part 8: Public-key and attribute certificate frameworks*

ISO/IEC 9646-7, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 7: Implementation Conformance Statements*

ISO/IEC 9797-2:2011, *Information technology — Security techniques — Message Authentication Codes (MACs) — Part 2: Mechanisms using a dedicated hash-function*

ISO/IEC 10118-3, *Information technology — Security techniques — Hash-functions — Part 3: Dedicated hash-functions*

ISO/IEC 11770-3, *Information technology — Security techniques — Key management — Part 3: Mechanisms using asymmetric techniques*

ISO/IEC 14888-2:2008, *Information technology — Security techniques — Digital signatures with appendix — Part 2: Integer factorization based mechanisms*

ISO 14906:2011/Amd1:2015, *Electronic fee collection — Application interface definition for dedicated short-range communication*

ISO 17573, *Electronic fee collection — Systems architecture for vehicle-related tolling*

ISO 17575-1:—¹⁾, *Electronic fee collection — Application interface definition for autonomous systems — Part 1: Charging*

ISO 17575-3:—¹⁾, *Electronic fee collection — Application interface definition for autonomous systems — Part 3: Context data*

ISO/IEC 18033-2:2006, *Information technology — Security techniques — Encryption algorithms — Part 2: Asymmetric ciphers*

ISO/TS 19299:2015, *Electronic fee collection — Security framework*

IETF RFC 2634, *Enhanced Security Services for S/MIME*, June 1999

IETF RFC 4347, *Datagram Transport Layer Security*, April 2006

IETF RFC 5035, *Enhanced Security Services (ESS) Update: Adding CertID Algorithm Agility*, August 2007

IETF RFC 5246, *The Transport Layer Security (TLS) Protocol*, August 2008

IETF RFC 5746, *Transport Layer Security (TLS) Renegotiation Indication Extension*, February 2010

IETF RFC 6040, *Tunnelling of Explicit Congestion Notification*, February

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1) To be published.