

DIN EN ISO 12813

ICS 35.240.60

Ersatz für
DIN CEN ISO/TS 12813
(DIN SPEC 91160):2011-07

**Elektronische Gebührenerhebung –
Kommunikation zur Übereinstimmungsprüfung für autonome Systeme
(ISO 12813:2015);
Englische Fassung EN ISO 12813:2015**

Electronic fee collection –

Compliance check communication for autonomous systems (ISO 12813:2015);

English version EN ISO 12813:2015

Perception du télépéage –

Communication de contrôle de conformité pour systèmes autonomes (ISO 12813:2015);

Version anglaise EN ISO 12813:2015

Gesamtumfang 54 Seiten

DIN-Normenausschuss Automobiltechnik (NAAutomobil)
DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE

Nationales Vorwort

Dieses Dokument (EN ISO 12813:2015) wurde vom Technischen Komitee ISO/TC 204 „Intelligent Transport Systems“ in Zusammenarbeit mit dem Technischen Komitee CEN/TC 278 „Intelligente Verkehrssysteme“, dessen Sekretariat vom NEN (Niederlande) gehalten wird, erarbeitet.

Das zuständige deutsche Normungsgremium ist der Gemeinschaftsarbeitsausschuss NA 052-02-71 GA „Intelligente Verkehrssysteme“ des DIN-Normenausschusses Automobiltechnik (NAAutomobil).

Das Präsidium des DIN hat mit seinem Beschluss 1/2004 festgelegt, dass von dem in den Regeln der europäischen Normungsarbeit von CEN/CENELEC verankerten Grundsatz, wonach Europäische Normen in den drei offiziellen Sprachen Deutsch, Englisch und Französisch veröffentlicht werden, in begründeten Ausnahmefällen abgewichen und auf die deutsche Sprachfassung verzichtet werden kann.

Die Genehmigung dafür hat die DIN-Geschäftsleitung entsprechend ihren in Anlage 1 zu dem DIN-Rundschreiben A 5/2004 festgelegten Kriterien für die vorliegende Norm auf Antrag des NA 052 NAAutomobil als Ergebnis einer Einzelfallentscheidung erteilt, zumal bereits dieser Norm zugrunde liegende Papiere überwiegend in englischer Sprache auch von den deutschen Marktteilnehmern angewendet werden.

Fahrzeuginterne Einrichtungen (OBE), die auf satellitengestützter Positionierung zur Datensammlung für Gebührenerhebung zur Straßennutzung dienen, werden autonom gegenüber der Straßenrandinfrastruktur betrieben. Die OBE zeichnet dabei die gefahrene Entfernung in einem mautpflichtigen Gebiet auf.

Dieser technische Standard definiert Anforderungen an die DSRC (en: dedicated short-range communication) zwischen OBE und einem Fragesteller zur Einhaltungsprüfung der Straßennutzung in einem Mautregime. Es basiert auf einer Gebührenerhebungsarchitektur nach ISO 17573.

Änderungen

Gegenüber DIN CEN ISO/TS 12813 (DIN SPEC 91160):2011-07 wurden folgende Änderungen vorgenommen:

- a) Überführung in eine Europäische Norm;
- b) Adaption der Verweisungen, Begrifflichkeiten und Abkürzungen an die Anforderungen;
- c) Neue Attribute wurde ergänzt;
- d) Ergänzungen, um Änderungen der zugrundeliegenden Normen, speziell EN ISO 14906 und EN 15509 zu berücksichtigen;
- e) Neue informative Anhänge (z. B. H) ergänzt;
- f) Editorische und formelle Korrekturen durchgeführt.

Frühere Ausgaben

DIN CEN ISO/TS 12813 (DIN SPEC 91160): 2011-07

Nationaler Anhang NA (informativ)

Begriffe

Für die Anwendung dieses Dokuments gelten die folgenden Begriffe.

3.1

Zugriffsbeglaubigung

(en: access credentials)

vertrauenswürdige Bescheinigung oder sicheres Modul, welches die geforderte Identität eines Objektes oder einer Anwendung beansprucht

[Quelle: EN 15509:2014, 3.1]

3.2

Attribut

(en: attribute)

adressierbare Datenpaket, welches aus einem einzelnen Datenelement oder strukturierten Sequenzen von Datenelementen besteht

3.3

Authentifizierung

(en: authentication)

Sicherheitsmechanismus, welcher die Überprüfung der bereitgestellten Identität ermöglicht

[Quelle: EN 301 175]

3.4

Authentifikator

(en: authenticator)

möglicherweise verschlüsselte Daten, die zur Authentifizierung verwendet werden

[Quelle: ISO/TS 19299:2015, 3.5]

3.5

Datenintegrität

(en: data integrity)

Eigenschaft, dass Daten nicht in unautorisierter Art und Weise verändert oder vernichtet wurden

[Quelle: ISO/TS 19299:2015, 3.28]

3.6

feste straßenseitige-Einrichtung

(en: fixed roadside equipment)

fest installierte straßenseitige Einrichtung

3.7

mobile straßenseitige-Einrichtung

(en: mobile roadside equipment)

Einrichtung, die in einer mobilen Einheit montiert ist oder mobile Endgeräte, die entlang der Straße verwendet werden

3.8

fahrzeuginterne Einrichtung

OBE

(en: on-board equipment)

alle erforderlichen Einrichtungen im Fahrzeug, die zur Durchführung notwendiger Kommunikationsdienste benötigt werden

3.9

Straßenrand-Einrichtung

RSE

(en: roadside equipment)

feste oder mobile Einrichtung entlang einer Straße

3.10

Mautdienstanbieter

TSP

(en: toll service provider)

Organisation, die Mautdienste in einem oder mehreren Mautgebieten anbietet

[Quelle: ISO 17573:2010]

3.11

Dienstprimitive

(en: service primitive)

Elementarer Kommunikationsdienst, der durch die Anwendungsschnitt der Applikation zur Verfügung gestellt wird

[Quelle: ISO 14906:2011, 3.18 modifiziert]

3.12

Mautkontext

(en: toll context)

logische Sicht bestehend aus Attributen und Funktionen der Basiselemente eines Mautschemas. Diese besteht aus einem Mautgrundprinzip, der geografischen Verteilung mautpflichtiger Objekte sowie dem Verhalten des zugeordneten Front-Ends

3.13

Mautregime

(en: toll regime)

Regelwerk, einschließlich Regeln zur Kontrolle, für die Erhebung von Maut in einem Mautgebiet

[Quelle: ISO 17573:2010, 3.20]

3.14

Transaktion

(en: transaction)

Gesamtheit eines Informationsaustausches zwischen zwei physisch getrennten Kommunikationseinheiten

English Version

Electronic fee collection —
Compliance check communication
for autonomous systems
(ISO 12813:2015)

Perception du télépéage —
Communication de contrôle de conformité
pour systèmes autonomes
(ISO 12813:2015)

Elektronische Gebührenerhebung —
Kommunikation zur Übereinstimmungsprüfung
für autonome Systeme
(ISO 12813:2015)

This European Standard was approved by CEN on 24 October 2015.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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 United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

European foreword

This document (EN ISO 12813:2015) has been prepared by Technical Committee ISO/TC 204 "Intelligent transport systems" in collaboration with Technical Committee CEN/TC 278 "Road transport and traffic telematics" 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 CEN ISO/TS 12813:2009.

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

Endorsement notice

The text of ISO 12813:2015 has been approved by CEN as EN ISO 12813:2015 without any modification.

Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	2
3 Terms and definitions	3
4 Abbreviated terms	4
5 Application interface architecture	5
5.1 General	5
5.2 Services provided	5
5.3 Attributes	5
5.4 Toll context	6
5.5 Use of lower layers	6
5.5.1 Supported DSRC communication stacks	6
5.5.2 Use of the CEN-DSRC stack	6
6 Functions	7
6.1 Functions in detail	7
6.1.1 General	7
6.1.2 Initialise communication	7
6.1.3 Data retrieval	7
6.1.4 Authenticated data retrieval	7
6.1.5 Driver notification	8
6.1.6 Terminate communication	8
6.1.7 Test communication	8
6.2 Security	8
6.2.1 General	8
6.2.2 Authentication/non-repudiation	8
6.2.3 Access credentials	9
7 Attributes	9
7.1 General	9
7.2 Data regarding identification	11
7.3 Data regarding status	11
7.4 Data regarding vehicle	13
8 Transaction model	15
8.1 General	15
8.2 Initialisation phase	15
8.2.1 Initialisation request	15
8.2.2 CCC application-specific contents of BST	15
8.2.3 CCC application-specific contents of VST	15
8.3 Transaction phase	15
Annex A (normative) CCC data type specifications	16
Annex B (normative) PICS proforma for the attributes	17
Annex C (informative) ETSI/ES 200 674-1 communication stack usage for CCC applications	26
Annex D (informative) Using the IR DSRC communication stack (CALM IR) for CCC applications	29
Annex E (informative) Using the ARIB DSRC communication stack for CCC applications	30
Annex F (informative) Example CCC transaction	32
Annex G (informative) Security considerations	34
Annex H (informative) Use of this International Standard for the EETS	39

Bibliography	41
---------------------------	-----------

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 first edition replaces the Technical Specification ISO/TS 12813:2009, which has been technically revised. This first edition incorporates the following main modifications compared to the Technical Specification:

- conversion from a Technical Specification to an International Standard;
- new attributes added (TrailerCharacteristics, AttributeUpdateInterval, VehicleCurrentMaxTrainWeight, VehicleWeightHistory, ExtendedOBEStatusHistory, ExtendedVehicleAxlesHistory and LocalVehicleClassId);
- amendment of terms, in order to reflect harmonization of terms across electronic fee collection (EFC) standards;
- amendments to reflect changes to the underlying base standards, in particular ISO 14906 and EN 15509;
- addition of a new informative annex (i.e. [Annex H](#)) on how to use this International Standard for the European electronic toll service;
- editorial and formal corrections as well as changes to improve readability.

Introduction

On-board equipment (OBE) that uses satellite-based positioning technology to collect data required for charging for the use of roads operates in an autonomous way (i.e. without relying on dedicated road side infrastructure). The OBE will record the amount of road usage in all toll charging systems it passes through.

This International Standard defines requirements for dedicated short-range communication (DSRC) between OBE and an interrogator for the purpose of checking compliance of road use with a local toll regime. It assumes an electronic fee collection (EFC) services architecture according to ISO 17573. See [Figure 1](#).

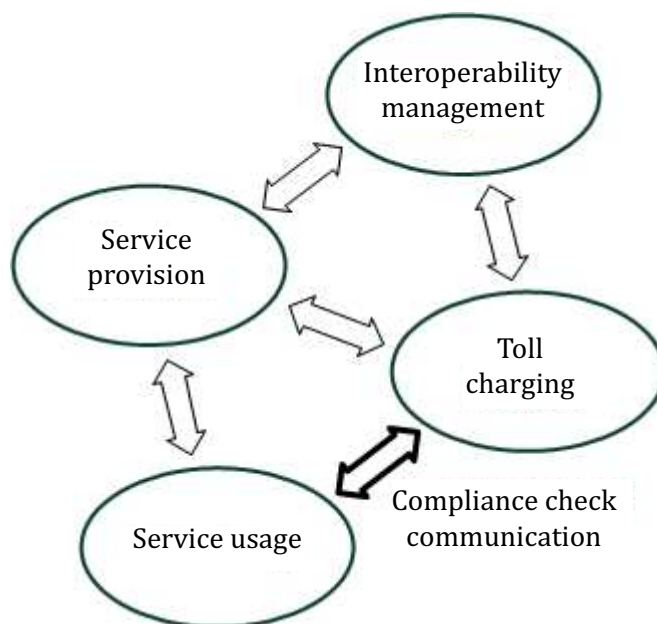


Figure 1 — Compliance check communication in EFC architecture as per ISO 17573

Toll chargers have the need to check whether the road is used in compliance with the rules in the local toll regime. One way of checking compliance is to observe a passing vehicle and to interrogate the OBE. This interrogation happens under control of an entity responsible for toll charging (see [Figure 1](#)), accomplished via short-range communication between an interrogator at road-side or in another vehicle (operated by a competent enforcement agency) and the OBE. In an interoperable environment, it is essential that this interrogation communication be standardized such that every operator of compliance checking equipment can check all passing OBE. For that purpose, this International Standard defines attributes required on all OBE for reading by an interrogator.

This International Standard has been prepared considering the prerequisites listed below in a) to e).

- Collected evidence must be court proof. Data must be indisputable and secured such that the operator of the compliance checking interrogator can prove the integrity and authenticity of the data in case of dispute.
- The data required for compliance checking must be read only, since the operator of the interrogator must not interfere with the working of the OBE.
- All attributes, standardised at the time of personalisation of the OBE, should be present in the OBE such that an operator of an interrogator essentially can read the same data from all OBE independent of type and make. In case an attribute does not make sense in a certain OBE implementation, a value assignment for “not applicable” or “not defined” is provided in each case. An OBE compliant to the first edition will not answer with such a response for new attributes introduced in the current edition of this International Standard.

- d) The attributes, derived from the individual toll regime, must be of general importance for all toll system types (motorway tolling, area tolling, tolls for ferries, bridges, tunnels, cordon pricing, etc.).
- e) The attributes must apply to all OBE architectures, and especially to both thin (edge-light) and fat (edge heavy) client architectures. The interrogator must be able to receive essentially the same information irrespective of OBE implementation decisions.

It is assumed that the prime objective of the operator of the compliance checking interrogator is to check whether the user has fulfilled his obligations, especially:

- whether the OBE is mounted in the correct vehicle;
- whether the classification data transmitted by the OBE are correct; and
- whether the OBE is in working condition, both in a technical and a contractual sense.

Regarding the last point of the above list, on the operational status of OBE, the following model is assumed.

As long as the OBE signals to the user correct operational status (“green”), the service provider takes full responsibility for the correct working of the OBE and for the payment by the user. Hence, as long as the OBE signals “green” and the user fulfils his other obligations (such as entering correct classification data and not tampering with the OBE), the user can expect the OBE to serve as a valid payment means. As soon as the OBE signals an invalid operational status (“red”) — either set by the central system of the service provider (e.g. because the user account is negative), by internal mechanisms of the OBE itself (e.g. because of a detected defect or an outdated data set) or a user manipulation with such result — the user knows that the OBE is no longer a valid payment means. The user then has to use alternative means of toll declaration or payment until the problem is remedied and the OBE is “green” again¹⁾.

Ultimately, the policy of when to signal “green” or “red” is defined by the service provider in accordance with the requirements defined by the toll charger(s).

In the case where the OBE status turns “red”, the user has to take action, declare road usage subject to fees or pay by some alternative means as quickly as possible. Until he does, the user is in a potentially non-compliant situation. In order to allow a judgment to be made as to whether or not a user has taken the appropriate action within an acceptable period of time, information is provided by this International Standard not only on the “green/red” operational status but also on the length of time that the OBE has been in its current status.

Different toll contexts can overlap geographically. A user could be liable in several toll contexts at once, e.g. for a nation-wide distance-dependent road tax and a local city access pricing scheme — a fact of which the user might not in all cases be aware. This International Standard builds on the concept that regarding compliance, there is no notion of toll context (see especially 5.4). It is within the responsibility of the service provider to resolve issues with overlapping toll contexts and to distil all information into a binary “red/green” message to the user.

A secondary objective of the operator of the compliance checking interrogator might be to collect data on the performance of the OBE, e.g. in order to check for the correct technical functioning. Since different OBE can work according to quite different principles, the possibilities for doing this in a standardised way are quite limited. This International Standard contains some provisions for this task (e.g. the attributes CommunicationStatus, GnssStatus, DistanceRecordingStatus), but otherwise assumes that toll chargers monitor correct recording by comparing observed traffic (e.g. with cameras) with usage data received from service providers.

This International Standard has been prepared with the intention to be “minimalist” in the sense that it covers what is required by operational systems and systems planned in the foreseeable future.

1) Here, “red” and “green” are used in the abstract, symbolic sense, and do not imply any physical implementation. The design of the user interface of the OBE is implementation-dependent, and several methods for signalling “red” or “green” are conceivable.

A test suite for checking an OBE or RSE implementation for compliance with the first edition of this International Standard is defined in the corresponding edition of ISO/TS 13143-1 and ISO/TS 13143-2. This test suite is currently being updated to reflect the changes incorporated into this first edition of ISO 12813.

Electronic fee collection — Compliance check communication for autonomous systems

1 Scope

This International Standard defines requirements for short-range communication for the purposes of compliance checking in autonomous electronic fee-collecting systems. Compliance checking communication (CCC) takes place between a road vehicle's on-board equipment (OBE) and an outside interrogator (road-side mounted equipment, mobile device or hand-held unit), and serves to establish whether the data that are delivered by the OBE correctly reflect the road usage of the corresponding vehicle according to the rules of the pertinent toll regime.

The operator of the compliance checking interrogator is assumed to be part of the toll charging role as defined in ISO 17573. The CCC permits identification of the OBE, vehicle and contract, and verification of whether the driver has fulfilled his obligations and the checking status and performance of the OBE. The CCC reads, but does not write, OBE data.

This International Standard is applicable to OBE in an autonomous mode of operation; it is not applicable to compliance checking in dedicated short-range communication (DSRC)-based charging systems.

It defines data syntax and semantics, but does not define a communication sequence. All the attributes defined herein are required in any OBE claimed to be compliant with this International Standard, even if some values are set to "not defined" in cases where certain functionality is not present in an OBE. The interrogator is free to choose which attributes are read, as well as the sequence in which they are read. In order to achieve compatibility with existing systems, the communication makes use of the attributes defined in ISO 14906 wherever useful.

The CCC is suitable for a range of short-range communication media. Specific definitions are given for the CEN-DSRC as specified in EN 15509, as well as for the use of ISO CALM IR, the Italian DSRC as specified in ETSI ES 200 674-1 and ARIB DSRC as alternatives to the CEN-DSRC. The attributes and functions defined are for compliance checking by means of the DSRC communication services provided by DSRC layer 7, with the CCC attributes and functions made available to the CCC applications at the road-side equipment (RSE) and OBE. The attributes and functions are defined on the level of application data units (ADU).

The definition of the CCC includes:

- the application interface between OBE and RSE (as depicted in [Figure 2](#)),
- use of the generic DSRC application layer as specified in ISO 15628 and EN 12834,
- use of the CEN-DSRC stack as specified in EN 15509, or other equivalent DSRC stacks as described in [Annexes C, D and E](#), and
- security services for mutual authentication of the communication partners and for signing of data (see [Annex G](#)).

CCC data type specifications are given in [Annex A](#), protocol implementation conformance statement (PICS) proforma in [Annex B](#). An example CCC transaction is presented in [Annex F](#). The informative [Annex H](#) highlights how to use this International Standard for the European electronic toll service (as defined in Commission Decision 2009/750/EC).

Test specifications are not within the scope of this International Standard.

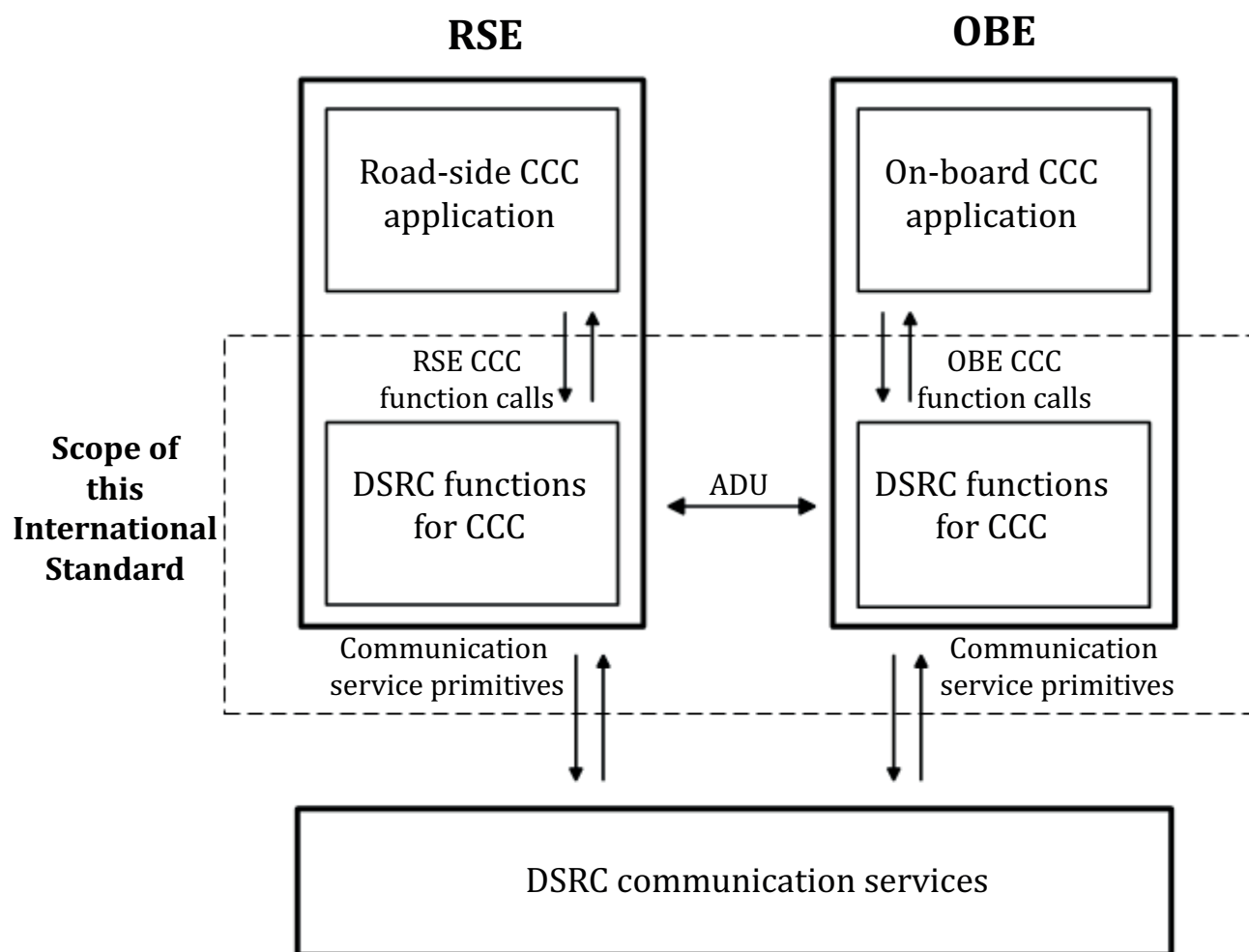


Figure 2 — CCC application interface

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 8824-1:2008, *Information technology — Abstract Syntax Notation One (ASN.1): Specification of basic notation — Part 1*

ISO/IEC 8825-2:2008, *Information technology — ASN.1 encoding rules: Specification of Packed Encoding Rules (PER) — Part 2*

ISO 14906:2011/Amd1:2005, *Electronic fee collection — Application interface definition for dedicated short-range communication*

ISO 15628:2013, *Intelligent transport systems — Dedicated short range communication (DSRC) — DSRC application layer*

EN 12834:2003, *Road transport and traffic telematics — Dedicated Short Range Communication (DSRC) — DSRC application layer*

EN 15509:2014, *Electronic fee collection — Interoperability application profile for DSRC*

NIMA Technical Report TR8350.2 version 3 — *Department of Defense World Geodetic System 1984, Its Definition and Relationships With Local Geodetic Systems*

3 Terms and definitions

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

3.1

access credentials

trusted attestation or secure module that establishes the claimed identity of an object or application

[SOURCE: EN 15509:2014, 3.1]

3.2

attribute

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

3.3

authentication

security mechanism allowing verification of the provided identity

[SOURCE: EN 301 175]

3.4

authenticator

data, possibly encrypted, that is used for authentication

[SOURCE: ISO/TS 19299:2015, 3.5]

3.5

data integrity

property that data has not been altered or destroyed in an unauthorized manner

[SOURCE: ISO/TS 19299:2015, 3.28]

3.6

fixed roadside equipment

roadside equipment located at a fixed position

3.7

mobile roadside equipment

equipment mounted on a mobile unit or handheld equipment to be used along the road

3.8

on-board equipment

OBE

all required equipment on-board a vehicle for performing required EFC functions and communication services

3.9

roadside equipment

RSE

equipment located along the road, either fixed or mobile

3.10

toll service provider

TSP

entity providing toll services in one or more toll domains

[SOURCE: ISO 17573:2010]

3.11

service primitive

elementary communication service provided by the application layer protocol to the application processes

[SOURCE: ISO 14906:2011, 3.18 modified]

3.12

toll context

logical view as defined by attributes and functions of the basic elements of a toll scheme consisting of a single basic tolling principle, a spatial distribution of the charge objects and a single behaviour of the related Front End

3.13

toll regime

set of rules, including enforcement rules, governing the collection of a toll in a toll domain

[SOURCE: ISO 17573:2010, 3.20]

3.14

transaction

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

4 Abbreviated terms

For the purpose of this document, the following abbreviations apply.

AC_CR	access credentials
ADU	application data unit (ISO 14906)
ASN.1	abstract syntax notation one (ISO/IEC 8824-2)
BST	beacon service table (ISO 14906)
CCC	compliance check communication
DSRC	dedicated short-range communication (ISO 14906)
EID	element identifier (ISO 15628 and EN 12834)
EFC	electronic fee collection
GNSS/CN	global navigation satellite systems/cellular network
MAC	media access control (EN 12795) or message authentication code (ISO 14906)
OBE	on-board equipment (ISO 14906)
PICS	protocol implementation conformance statement
RSE	roadside equipment (ISO 14906)
TSP	toll service provider
VST	vehicle service table (ISO 14906)
WGS84	World Geodetic System 1984

5 Application interface architecture

5.1 General

This clause gives an insight into the CCC architecture. It identifies the services provided to CCC applications and the functions that implement these services. It also defines principles regarding attributes and the use of DSRC communication primitives. A detailed description of the functions is given in [Clause 6](#), whilst the detailed list of the attributes is given in [Clause 7](#).

The CCC application interface has been designed to make use of the CEN-DSRC communication stack, via the application layer specified in ISO 15628 and EN 12834. For other identified DSRC communication media, detailed mappings to corresponding services are given in annexes.

From a general addressing viewpoint, it should be noted that only one CCC context is used, as compliance checking attributes are independent of context.

5.2 Services provided

The CCC application interface offers the following services to CCC applications:

- retrieval of compliance significant attributes, in order for RSE to assess OBE compliance,
- mutual authentication of RSE and OBE by means of exchange of credentials, and
- a command to the OBE to signal to the user the result of the compliance check

NOTE 1 The policy of whether or not the result of the compliance check or the fact that a transaction has taken place is signalled to the user is decided by the entity operating the CCC interrogator and is outside the scope of this International Standard.

The above services are realized by means of protocol exchanges performed by means of communication services and transactions as described in [Clause 8](#).

The services are provided by the following functions:

- the “initialise communication” function, which shall be used to establish the CCC communication link between RSE and OBE;
- the “data retrieval” function, which shall be used to retrieve CCC attributes;
- the “authenticated data retrieval” function, which shall be used to retrieve data with an authenticator from the OBE;
- the “driver notification” function, which shall be used to invoke a human-machine-interface (HMI) function (e.g. signal “OK” via a buzzer sound);
- the “terminate communication” function, which shall be used to terminate the CCC communication;
- the “test communication” function, which shall be used for testing and localizing the OBE.

NOTE 2 A “write” service is not provided, since the writing of data into the OBE is not foreseen.

5.3 Attributes

The attributes available on the OBE side for a CCC application at road-side for checking the compliance of a vehicle are given in detail in [Clause 7](#).

All attributes defined in this International Standard shall be available on the OBE side.

The RSE is free to decide to read any combination of attributes from the OBE. The attributes shall be identified and retrieved using the mechanisms defined in ISO 14906. More specifically, the addressing