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Electronic fee collection — Compliance check communication for autonomous systems

AMENDMENT 1

Perception du télépéage — Communication de contrôle de conformité pour systèmes autonomes

AMENDEMENT 1

Reference number
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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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Amendment 1 to ISO 12813:2015 was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

This amendment defines the electronic fee collection compliance check communication using the WAVE communication stack as defined in IEEE.

Electronic fee collection — Compliance check communication for autonomous systems

AMENDMENT 1

Page 1

Replace:

— use of the CEN-DSRC stack as specified in EN 15509, or other equivalent DSRC stacks as described in Annexes C, D and E

with:

— use of the CEN-DSRC stack as specified in EN 15509, or other equivalent DSRC stacks as described in Annexes C, D, E and I

Page 6, 5.5.1, Table 1

Add the following row before the last row of Table 1:

WAVE DSRC	IEEE 1609.11-2010 ISO 15628	IEEE 1609.3-2010 IEEE 1609.4-2016 IEEE 802.11	Implementation example in Annex I

Page 7, 6.1.1

Replace:

Subclauses 6.1.2 to 6.1.7 define the functions for CEN-DSRC only. For other supported media, according to 5.5.1, equivalent functionality should be provided, see Annex C for ETSI/ES 200 674-1 5.8 GHz microwave DSRC, Annex D for CALM Infrared DSRC and Annex E for ARIB microwave DSRC.

with:

6.1.2 to 6.1.7 define the functions for CEN-DSRC only. For other supported media, according to 5.5.1 equivalent functionality should be provided; see Annex C for ETSI/ES 200 674-1 5.8 GHz microwave DSRC, Annex D for CALM Infrared DSRC, Annex E for ARIB microwave DSRC and Annex I for WAVE 5.9 GHz microwave DSRC.

Page 9, 6.2.2

Replace:

When using one of the other communication stacks described in Annex C, D or E, algorithms and the use of lower communication layer services shall be as specified in the corresponding annex.

with:

When using one of the other communication stacks described in Annex C, D, E or I, algorithms and the use of lower communication layer services shall be as specified in the corresponding annex.

Page 21, Table B.8 and page 24, Table B.19

Add the following row after item number 4 in Table B.8 and in Table B.19:

5	WAVE DSRC	Annex I	o	

Insert new Annex I after Annex H.

Annex I

(informative)

Using the WAVE communication stack for CCC applications

I.1 General

This annex specifies the use of the WAVE system based on the standards IEEE 1609.4, IEEE 802.11-2016, IEEE 1609.0, IEEE 1609.3 and IEEE 1609.11-2010 (see full references in the Bibliography).

I.2 Communication requirements

The communication requirements are defined in IEEE 1609.11-2010, A.2.

The contents of the Beacon Service Table (BST), defined in ISO 12813:2015, 8.2.2, along with optional application-specific information, should be transmitted as the Provider Service Context (PSC) of a WAVE service advertisement (WSA) message, as defined in IEEE 1609.11-2010.

I.3 CCC functions

I.3.1 General

The CCC functions are defined in IEEE 1609.11-2010, Clause A3.1, Table 1. Table I.1 shows the correspondences between the WAVE primitives, the DSRC layer 7 primitives and the EFC functions.

Table I.1 — CCC functions correspondence

CCC function	DSRC Layer 7 primitive (ISO 15628)	EFC function (ISO 14906)	WAVE primitive(s) (IEEE 1609.3-2010)
Initialise communication	INITIALISATION		WME-ProviderService.request, WME-UserService.request
Data retrieval	GET		WSM-WaveShortMessage.request, WSM-WaveShortMessage.indication
n.a.	SET		
n.a.		GET_STAMPED	
n.a.		GET_INSTANCE	
Driver Notification		SET_MMI	
Test Communication		ECHO	
Secure data retrieval		GET_SECURE	
n.a.		SET_SECURE	
Terminate communication		RELEASE	WME-ProviderService.request

The WAVE communication stack provides a CCC function called “Secure data retrieval” as an alternative to “Authenticated data retrieval”.

I.3.2 Secure data retrieval

The function “Secure data retrieval” should be implemented by the EFC function GET_SECURE as specified in ISO 14906 and with additional specification in IEEE 1609.11-2010, A.3.2.

GET_SECURE should not carry access credentials.

NOTE GET_SECURE according to IEEE 1609.11–2010 carries encrypted application data in the form of an encrypted AttributeList and an authenticator calculated by the recipient over the requested data.

I.4 Data requirements

The addressing of the EFC system and application data implemented by the OBE and RSE should conform to the rules defined in ISO 14906:2011, 5.3. For CCC application data, EID should always be used. Multiple instances of attributes are not supported.

The OBE should implement the CCC attributes defined in Clause 7.

The RSE should support any OBE that is compliant.

I.5 Security requirements

I.5.1 General

This annex provides for an authentication service that may serve to prove the identity of the data source, the integrity of the data and/or to provide for non-repudiation. It contains a mechanism for control of access to the OBE data by means of access credentials. Access protection is also used.

It provides for an encryption service that also deals with control of access to the OBE data, both for protection of user privacy

I.5.2 Authentication/non-repudiation

Authenticated reading of data is provided by the function “Secure data retrieval”. Authenticators are defined as being of ASN.1 type OCTET STRING. When using the WAVE communication stack,

— the OBE should be able to calculate authenticators according to IEEE 1609.11-2010, A.5;

— the RSE should able to calculate authenticators according to IEEE 1609.11-2010, A.5;

— the RSE should request a message authentication code (MAC) by addressing at least the PaymentMeans attribute.

I.5.3 Encryption

Encryption of payload data should be used to manage access to attributes by the function “Secure data retrieval”. Encryption is mandatory for all attributes defined in this document.

The OBE should support encryption as defined in IEEE 1609.11-2010, A.5.

The RSE should support encryption as defined in IEEE 1609.11-2010, A.5.

I.6 Transaction requirements

I.6.1 General

The EFC transaction model complies with ISO 14906:2011, Clause 6, and IEEE 1609.11-2010 A.5, with the restrictions and amendments given in I.6.2 to I.6.3.

I.6.2 Initialisation phase

I.6.2.1 CCC application-specific contents of BST

As defined in 8.2.2.

I.6.2.2 CCC application-specific contents of VST

There is only one instance of AID=20 in the ApplicationList in the VST. This instance contains the parameter ApplicationContextMark as defined in IEEE 1609.11-2010, A.5.

I.6.3 Transaction phase

There are no requirements specific to the transaction phase. The RSE may perform a transaction by using the CCC functions in any sequence as long as the requirements of this document are met.

Page 42, Bibliography

Add the following references to the end of the Bibliography:

[23] IEEE 802.11-2016, *IEEE Standard for Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — Specific requirements — Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications*

[24] IEEE 1609.0-2013, *IEEE Guide for Wireless Access in Vehicular Environments (WAVE) — Architecture*

[25] IEEE 1609.3-2010, *IEEE Standard for Wireless Access in Vehicular Environments (WAVE) — Networking Services*

[26] IEEE 1609.11-2010, *IEEE Standard for Wireless Access in Vehicular Environments (WAVE) — Over-the-Air Electronic Payment Data Exchange Protocol for Intelligent Transportation Systems (ITS)*

[27] IEEE 1609.4-2016, *IEEE Standard for Wireless Access in Vehicular Environments (WAVE) — Multi-channel Operation*

