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Electronic fee collection — Localisation augmentation communication for autonomous systems

AMENDMENT 1

Perception de télépéage — Communications d'augmentation de localisations pour systèmes autonomes

AMENDEMENT 1

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Amendment 1 to ISO 13141:2015 was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

This amendment defines the Electronic fee collection localisation augmentation communication using the WAVE communication stack as defined in IEEE.

Electronic fee collection — Localisation augmentation communication for autonomous systems

AMENDMENT 1

Page 1, fifth paragraph

Replace:

This International Standard gives specific definitions regarding the CEN DSRC stack as specified in EN 15509, and Annexes C, D and E give the use of the Italian DSRC as specified in ETSI/ES 200 674-1, ISO CALM IR, and ARIB DSRC.

with:

This document gives specific definitions regarding the CEN DSRC stack as specified in EN 15509, and Annexes C, D and E give the use of the Italian DSRC as specified in ETSI/ES 200 674-1, ISO CALM IR, ARIB DSRC and WAVE DSRC.

Page 6, 5.5.1, Table 1

Add the following row to the end 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 H

Page 7, 6.2.1

Replace:

Only the functions for CEN DSRC are defined in 6.2.2 to 6.2.4. For other supported media according to 5.5.1, equivalent functionality shall 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:

Only the functions for CEN DSRC are defined in 6.2.2 to 6.2.4. For other supported media according to 5.5.1, equivalent functionality shall 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 H for WAVE DSRC.

Page 17, Table B.8 and Page 20, Table B.18

Add the following row after item number 4 in Table B.8 and in Table B.18:

5	WAVE DSRC	Annex H	o[a]	

Insert new Annex H after Annex G.

Annex H

(informative)

Using the WAVE communication stack for LAC applications

H.1 General

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

H.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 13141:2015, 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.

H.3 LAC functions

H.3.1 General

The LAC functions are defined in IEEE 1609.11-2010, A.3.1, Table 1. Table H.1 shows the correspondences between the WAVE primitives, the DSRC layer 7 primitives and the EFC functions.

Table H.1 — LAC functions correspondence

LAC 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
n.a.	GET		WSM-WaveShortMessage.request, WSM-WaveShortMessage.indication
Write Data	SET		
n.a.		GET_STAMPED	
n.a.		GET_INSTANCE	
n.a.		SET_MMI	
n.a.		ECHO	
n.a.		GET_SECURE	
Secure write data		SET_SECURE	
Terminate communication		RELEASE	WME-ProviderService.request

The WAVE communication stack provides an LAC function called “Secure write data” as an alternative of “Write data”.

H.3.2 Secure write data

The function “Secure write data” should be implemented by the EFC function SET_SECURE as specified in ISO 14906 and with additional specification in IEEE 1609.11-2010, A.3.3. Only SSRequest choice1: SSRq-NoMacRs or Choice 3: SSRq-NoMacRs-Instances should be used.

SET_SECURE should not carry access credentials.

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

H.4 Data requirements

The addressing of the LAC system and application data implemented by the OBE and RSE should conform to the rules defined in ISO 14906:2011, 5.3. For LAC application data, EID should always be used.

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

The RSE should support any OBE that is compliant.

H.5 Security requirements

H.5.1 General

This annex provides for an authentication service that may serve to prove the identity of the data source and control the writing access to LAC attributes and to check the integrity of the data.

It provides for an encryption service that provides confidentiality of written data.

H.5.2 Authentication/non-repudiation

Authenticated writing of data is provided by the function "Secure write data". Authenticators are defined as being of ASN.1 type OCTET STRING. When using the WAVE communication stack,

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

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

H.5.3 Encryption

Encryption is mandatory for all attributes defined in this document.

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

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

H.6 Transaction requirements

H.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 H.6.2 to H.6.3.

H.6.2 Initialisation phase

H.6.2.1 LAC application-specific contents of BST

As defined in 8.2.2.

H.6.2.2 LAC application-specific contents of VST

There is only one instance of AID=21 in the ApplicationList in the VST. This instance contains the parameter ApplicationContextMark as defined in IEEE 1609.11-2010, A.5.

H.6.3 Transaction phase

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

Page 31, Bibliography

Add the following references to end of clause:

[4] 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*

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

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

[7] 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)*

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

