SIST

SLOVENSKI STANDARD
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Inteligentni transportni sistemi - e-Varnost - Koncept dodatnih podatkov e-Klica za omejitve opreme

Intelligent transport systems - eSafety - eCall additional data concept for equipment limitations

Intelligente Verkehrssysteme - eSicherheit - eCall OAD für Einrichtungsbegrenzungen

Systèmes de transport intelligents - eSafety - concept de données supplémentaires d'eCall pour limitations de l'équipement

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English Version

Intelligent transport systems - eSafety - eCall additional data concept for equipment limitations

Systèmes de transport intelligents - eSafety - concept de données supplémentaires d'eCall pour limitations de l'équipement

Intelligente Verkehrssysteme - eSicherheit - eCall zusätzliches Datenkonzept für Ausrüstungsbeschränkungen

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European foreword

This document (EN 17870:2023) has been prepared by 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of an identical text or by endorsement, at the latest by December 2023, and conflicting national standards shall be withdrawn at the latest by December 2023.

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EN 17870:2023 (E)

Introduction

The pan-European in-vehicle emergency call, 'eCall', is estimated to have the potential to save up to 2 500 fatalities annually in the EU when fully deployed, and furthermore to reduce the severity of injuries, to bring significant savings to the society in and to reduce human suffering.

eCall, in the context of "Intelligent Transport Systems" or "ITS", (previously known as "Road Traffic and Transport Telematics") can be described as a "user instigated or automatic system to provide notification to public safety answering points, by means of wireless communications, that a vehicle has crashed, and to provide coordinates and a defined minimum set of data, and where possible a voice link to the PSAP".

The installation of eCall is mandatory for each new type of passenger vehicle car which is approved after March 2018 and the system has already proven to be beneficial. Expansion to other vehicle categories and the possibility to retrofit equipment to existing vehicles is imminent and additional standards are devised to support this. Such standards are needed because the existing (core) standards are focussed on mandatory, in-factory installation in specific categories of vehicle (UNECE Category M1/N1). Projects like HeERO, iHeERO, sAFE and others have shown that sometimes not all requirements laid out in the core standards can be met, due to physical or other limitations related to the vehicle category or type of installation.

Although such limitations are known at the sending side, the receiving side (i.e. the PSAP) currently does not (always) have means to determine those. There is, to name one example, based on the core standards, no way a PSAP can determine whether the eCall equipment in the vehicle is installed in-factory, retrofit or even a user installed after market solution. The lack of this knowledge can interfere with the emergency process and cost valuable time.

Part of eCall is (the sending of) a "Minimum Set of Data" (MSD) which is specified in EN 15722. That standard makes a provision for additional data that can be embedded in the MSD assuming that it follows a(nother) standard. This document is such standard and it describes an additional data concept that can and is expected to be used to inform the PSAP about limitations to the equipment. Such limitations are only allowed if supported by one or more standard(s) applicable to that specific application of eCall. If and when a standard endorses a limitation, the use of the additional data concept described in this document is mandatory.

NOTE   The communications media and means of transferring the eCall MSD are not specified in this document. See list of referenced standards.

1 Scope

This document specifies an additional data concept that can be transferred as the 'optional additional data' part of an eCall MSD, see EN 15722, that can be transferred from a vehicle to a PSAP in the event of a crash or emergency via an eCall communication session.

The purpose of this document is to provide means to notify the PSAP of any limitations to the sending equipment that are endorsed by other standards, but not (immediately) apparent to the receiver. Lack of knowledge about these limitations can hamper the emergency process. This document describes an additional data concept which facilitates the inclusion of information about such limitations in a consistent and usable matter.

This document can be seen as an addendum to EN 15722; it contains as little redundancy as possible.

NOTE 1   The communications media protocols and methods for the transmission of the eCall message are not specified in this document.

NOTE 2   Additional data concepts can also be transferred, and it is advised to register any such data concepts using a data registry as specified in EN ISO 24978 [1]. See www.esafetydata.com for an example.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 15722, *Intelligent transport systems - ESafety - ECall minimum set of data*

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

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/

- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
ASN.1
Abstract Syntax Notation One
notation that describes rules and structures for representing, encoding, transmitting and decoding data enabling representation of objects that are independent of machine-specific encoding techniques

Note 1 to entry: See various parts of ITU Recs 8824 and 8825 (ISO/IEC 8824 and ISO/IEC 8825, various parts).

3.2
eCall
emergency call generated either automatically via activation of in-vehicle sensors or manually by the vehicle occupants

Note 1 to entry: when activated it provides notification and relevant location information to the most appropriate 'Public Safety Answering Point', by means of mobile wireless communications networks, carries a defined standardised 'Minimum Set of Data' notifying that there has been an incident that requires response from the emergency services, and establishes an audio channel between the occupants of the vehicle and the most appropriate 'Public Safety Answering Point'

3.3
MSD
minimum set of data
direct, timely data content of an eCall message to the PSAP operator receiving the emergency call containing information about the location of the incident, providing detail characterising the vehicle, and potentially sometimes also providing additional data that is deemed relevant

Note 1 to entry: This data is as specified in EN 15722.

4   Symbols and abbreviations

For the purposes of this document, the following symbols and abbreviations apply.

M	mandatory
MSD	minimum set of data
O	optional
OID	object identifier
PSAP	public safety answering point
UPER	unaligned packed encoding rules (ASN.1)

5   Conformance

The conformance requirements for this document are simply that the concept conforms to EN 15722, and that the total length of the MSD, including this additional data concept, if used, remains 140 bytes.

eCall equipment that is conformant to (only) the core standards shall not use this data concept, as its functionality shall not be limited. Use of this data concept is reserved for eCall equipment that is and shall be (also) conformant to additional standards that allow for such limitation, whenever such limitation applies. Any eCall standard that endorses limitations to the core standards shall make the use of this data concept mandatory for equipment that has limited functionality.

NOTE   The mere existence of this data concept does not allow for, condone or suggest any limitation in eCall equipment.

6   Requirements

6.1 General

This document describes an addition to the standard EN 15722 for the coding of the MSD message. All requirements from EN 15722 shall be met in respect of this additional data concept.

6.2 Concepts and formats

6.2.1 MSD data concepts

The MSD as specified in EN 15722 is a direct, timely message to the PSAP operator receiving the emergency call.

The MSD has an optional additional data block that may be used to add information elements containing information about the vehicle involved.

The information elements in the additional data block of the MSD will have been selected on the basis of their relevance in an emergency rescue situation. These will in any event need to be provided, see

European Union and national privacy regulations pertaining at the time of the transfer of any such personal data and the provisions of EU 2016/679 'General Data Protection Requirements'.

6.2.2 Representation of MSD data concepts

The MSD is represented in 'Abstract Syntax Notation' (ASN.1) using the 'Unaligned Packed Encoding Rules' (UPER) as specified in ISO/IEC 8825-2 using the ASN.1 definitions specified in EN 15722. The message shall be sent in the sequence specified in that same annex.

This additional data concept is also specified following the provision made in above named annex.

6.2.3 Distribution of MSD data

The MSD shall be transmitted and formed as described in EN 15722, which also means that the maximum length of the overall MSD shall not exceed 140 bytes.

6.2.4 Equipment limitations additional data-concept 'Object Identifier'

The object identifier uniquely identifies the format and meaning of the data which follows in the additional data concept.

Both the syntax of the data structure and the semantic meaning of the content is referenced via this identifier so that it can be usefully applied.

The uniqueness of each specific relative identifier is ensured by a specific international standardization body, and maintained in a data registry operated in accordance with EN ISO 24978 [1]. These identifiers are all relative to a specific root. And the root of all *eCall* relative OID's shall be the same.

eCall has been allocated the OID 1.0.14817.106.2.1. Within this, arc '.2' has been defined to contain 'Optional Additional Data concepts' and within that subarc this additional data concept is registered as '**.7**' followed by a version number. This document specifies version 1 of this data concept, consequently the full OID data adhering to this document shall be 1.0.14817.106.2.1.2.**7.1**.

The OID for 'Optional Additional Data concepts' (1.0.14817.106.2.1.2) is fixed and shall not be transmitted over the air as part of the additional data. The MSD data element 'oid' is specified as RELATIVE-OID and shall contain **7.1**.

For further details regarding the use of OIDs in eCall, see EN 15722.

6.2.5 Equipment limitations additional data concept 'data'

The objective of this data concept to inform about equipment limitations is to make it possible for a PSAP to know if and how the eCall equipment from which the eCall originate is (purposely) limited in functionality.

The data concept specified herein will contain information about such limitations in the most economic way possible. Limitations are derived from existing work on (pre-)standards and/or anticipated on things to come. However, it is unavoidable that, over time, other limitations will be necessary and, as such, extension of this data concept. The concept is designed such that an extension most probably can be accommodated using the ASN.1 extension features. In such case the version of the concept shall not be changed/augmented.

6.3 Contents of the 'Minimum Set of Data' (MSD)

6.3.1 Context

The following subclauses provide the definition of the minimum set of data that shall be sent from the vehicle in case of an emergency call.

6.3.2 Basic contents of MSD

Table 1 provides a summary of the semantic contents of the MSD. For a full description please refer to EN 15722.

Table 1 — Contents/format of the MSD data concept

<div align="right">
M – Mandatory data field
O – Optional data field
</div>

MSD				
msdVersion	INTEGER (1..255)	-	M	
Msd				
msdStructure				
...				
optionalAdditionalData			O	
oid	RELATIVE-OID			
data	OCTET STRING			

The following subclause describes the contents of the optionalAdditionalData block.

6.3.3 Contents of the optionalAdditionalData

Table 2 provides a summary of the semantic contents of the optionalAdditionalData part of the MSD.

The sequence of data presentation shall be as specified in Table 2, represented as described in 6.2.2 and distributed as described in 6.2.3.

For clarity the 'type' used in Table 2 is a semantic representation of the type used in the ASN.1 definition. The exact representation is found in Annex A.

The real position of the element in the data-stream is defined by the ASN.1 'unaligned packet encoding rules' (UPER), following the specification in Annex A. Elements therefore do not necessarily start or end on a byte boundary.

Although all data elements of this concept are optional, it shall only be part of an MSD if at least one of the elements is present.

Table 2 — Contents/format of additional data equipment limitations

M – Mandatory data field

O – Optional data field

optionalAdditionalData				
oid	RELATIVE OID		M	Fixed value: 7.1
data			*encoded as OCTET STRING*	
audioLimitation	ENUM		O	eCall equipment shall be able to set up a bi-directional audio connection with the 'occupants' of the vehicle, unless an additional standard allows for a limitation. In such case this element shall be present and have one of the following values: — microphoneOnly: if the equipment only has a microphone, meaning the PSAP should be able to hear but not speak to occupants; — speakerOnly: if the equipment only has a speaker, should be able to speak to but not hear the occupants — noAudio: if the equipment has neither speaker, nor microphone, meaning the PSAP cannot use the eCall to communicate with the occupants.
callbackImpossible	BOOLEAN		O	eCall equipment shall register to the network such that a PSAP can perform a callback to the device. In certain situation additional standards condone the lack of callback possibilities. In such case this element shall be present and set to TRUE
aftermarktedIVSType	ENUM		O	The sAFE project has defined 3 types of aftermarket pan-European eCall devices. The type gives additional information about the trustworthiness of the information provided. — **Type 3, Accredited installed aftermarket eCall devices**: Installed by an accredited installer after the first sale of a vehicle. These devices meet regulatory performance and conformance, although they are unlikely to have a tight integration with the vehicle. These are permanently installed IVS. — **Type 4, Aftermarket self-installed eCall devices**: These systems are designed to be installed by the vehicle owner. Intended to be a semi-permanent fit within a single vehicle with minimum integration. Susceptible to being transferred to other vehicles. — **Type 5, Aftermarket nomadic eCall devices**: In this category we find any portable device with an appropriate set of sensors and capabilities and the appropriate software to perform an eCall. These devices are either