SLOVENSKI STANDARD
SIST-TS CEN/TS 17395:2020

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Inteligentni transportni sistemi - e-Varnost - e-Klic za avtomatizirana in avtonomna vozila

Intelligent transport systems - eSafety - eCall for automated and autonomous vehicles

Intelligente Transportsysteme - eSafety - eCall für automatisierte und autonome Fahrzeuge

Systèmes de transport intelligents - eSafety - eCall pour les véhicules automatisés et autonomes

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Intelligent transport systems - eSafety - eCall for automated and autonomous vehicles

Systèmes de transport intelligents - eSécurité - eCall pour les véhicules automatisés et autonomes

Intelligente Transportsysteme - eSafety - eCall für automatisierte und autonome Fahrzeuge

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (CEN/TS 17395:2019) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems”, the secretariat of which is held by NEN.

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Introduction

eCall (an emergency call generated either automatically via activation of in-vehicle sensors or manually by the *vehicle occupants*; which, when activated provides notification and relevant location information to the most appropriate *Public Safety Answering Point*, by means of *mobile wireless communications networks*, and carrying a defined standardized *minimum set of data* (MSD) notifying that there has been an incident), as defined in EN 16072, EN 16062, EN 15722, and EN 16454, became a regulated requirement (for new model vehicles of Category M1 and N1 [cars and light vans]) under EN regulation as from April 2018.

CEN/TS 17184 further enables eCall using IMS packet switched networks, and CEN/TS 17182 enables eCall using an ITS-station in a C-ITS equipped vehicle. CEN/TS 17249 parts 2 – 6 extend eCall support to all other categories of vehicle. CEN/TS 17132 enables eCall using satellite. eCall support is now therefore possible for all categories of vehicle and via a wide range of communication media.

However, the advent of automated and autonomous vehicles presents a new challenge to the 'Public Service Answering Point' (PSAP). Traditional eCall is predicated on the paradigm of a dialogue involving the driver of the vehicle / vehicle occupants and a PSAP. In the case of an automated or autonomous vehicle there may be, at the time of the crash, no person on board the vehicle (as it moves between picking up clients in a CCAM paradigm), or there may be persons on board but the vehicle is not under their control, but may be controlled by a centralized system.

When a PSAP receives an eCall from a vehicle, the PSAP attempts to talk to the occupants of the vehicle. At the moment, if it is an automated or autonomous vehicle that is empty as it moves between picking up clients, this will result in a so-called 'silent' call, where the PSAP does not know if the occupants are unconscious, dead, or have left the vehicle, or in this case, that no-one was in the vehicle at the time of the incident. This makes it very difficult for the PSAP to determine what resources to send to the incident. Clearly, a PSAP will want to be able accord a different priority to an empty vehicle than to one carrying people.

Additionally, a PSAP, in dialogue with the driver of an affected vehicle will often ask the driver (who is the controller of the vehicle) for information about the status of the vehicle, or instruct the driver to switch the car power off, or switch hazard lights on, etc. But if a CCAM vehicle is under the control of a central operator, and not the occupants of the vehicle, the PSAP cannot expect the occupants of the vehicle to have the knowledge or control to be able to respond appropriately.

Therefore, in the case of an automated or autonomous vehicle, the MSD needs to provide additional data to identify that it is an automated/autonomous vehicle, and whether or not it is under the control of an on-board driver or a CCAM operation centre (and if the latter how to contact the operator), the number of persons on board at the time of the incident, and whether or not the vehicle has rolled over.

This document defines an 'Optional Additional Data' (OAD) concept to be sent in the event that an eCall is triggered, as part of the MSD, in the case where the vehicle is an automated vehicle or an autonomous vehicle,

1 Scope

This document defines additional data to be sent in the event that an eCall is triggered, as part of the MSD, in the case where the vehicle is an automated vehicle or an autonomous vehicle, to identify:

1) The vehicle is an automated/autonomous vehicle
2) The number of persons on board at the time of the incident
3) Whether or not the vehicle has rolled over
4) Whether the pedestrian airbag has been deployed
5) Whether it is (a) driver initiated automation or (b) centrally controlled automation
6) And if (b) telephone number or internet contact coordinates to contact the vehicle controller.

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*

EN 16072:2015, *Intelligent transport systems - ESafety - Pan-European eCall operating requirements*

EN 16454, *Intelligent transport systems - ESafety - ECall end to end conformance testing*

EN 16062, *Intelligent transport systems - ESafety - eCall high level application requirements (HLAP) using GSM/UMTS circuit switched networks*

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

3.1
112-eCall
circuit switched eCall using the single European emergency call number supporting Teleservice 12

3.2
automated vehicle
vehicle that is 'connected' by wireless communications to other vehicles and the infrastructure combined with sensing its environment and navigating without human input

3.3
autonomous vehicle
vehicle that is sensing its environment and navigating without human input, but may not have wireless connectivity to other vehicles and the infrastructure

3.4
cooperative, connected and automated mobility
CCAM
cooperation, connectivity, and automation are complementary technologies that reinforce each other and enable services such as 'mobility as a service'(MaaS) (a shift away from personally-owned modes of transportation and towards mobility solutions that are consumed as a service) through a unified gateway that creates and manages the trip using an automated vehicle to respond to a request for a journey, drive to the pickup point, collect the passengers and take them to the destination, then move on to its next pick-up point

Note 1 to Entry: The key concept behind MaaS is to offer both the travellers and goods mobility solutions based on the travel needs.

3.6
data
representations of static or dynamic objects in a formalized manner suitable for communication, interpretation, or processing by humans or by machines

3.7
data concept
any of a group of data structures (i.e. object class, property, value domain, data elements, message, interface dialogue, association) referring to abstractions or things in the natural world that can be identified with explicit boundaries and meaning and whose properties and behaviour all follow the same rules

3.8
data element
single unit of information of interest (such as a fact, proposition, observation, etc.) about some (entity) class of interest (e.g. a person, place, process, property, concept, state, event) considered to be indivisible in a particular context

3.9
driver
operator in control of the vehicle and managing its movements on the road

3.10
eCall
emergency call generated either automatically via activation of in-vehicle sensors or manually by the vehicle occupants; 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 standardized minimum set of data (MSD) 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

3.11
eCall service
end-to-end emergency service to connect occupants of an affected vehicle to the most appropriate PSAP via an audio link across a PLMN together with the transfer of a minimum set of data to the PSAP

3.12
eCall transaction
establishment of a mobile wireless communications session across a public wireless communications network and the transmission of a minimum set of data from a vehicle to a Public Safety Answering Point and the establishment of an audio channel between the vehicle and the PSAP

3.14
identifier
any label, symbol or token that names or identifies an entity or a collection of data or the means of designating or referring to a specific instance of a data concept

3.15
in-vehicle system
IVS
equipment within the vehicle that manages the eCall session and provides or has access to in-vehicle data required for the minimum set of data and any other data that is to be sent as part of or complementary to the minimum set of data to effect the eCall transaction via a public mobile wireless communications network providing a link between the vehicle and a means of enacting the eCall service via a public mobile wireless communications network

3.16
minimum set of data
MSD
content of an eCall message to the PSAP operator receiving the emergency call in the form of a standardized data concept comprising data elements containing information about the location of the incident, providing detail characterising the vehicle, and potentially sometimes also providing additional data that is deemed relevant and is essential for the performance of the eCall service

3.17
mobile wireless communications network
wireless communications network with homogeneous handover between network access points

3.18
most appropriate PSAP
PSAP defined beforehand by responsible authorities to cover emergency calls from a certain area or for emergency calls of a certain type

Note 1 to entry: See also PSAP.

Note 2 to entry: A number of different instantiations of PSAP service are supported within this document. A PSAP can be a Public Authority or a private *service provider* *(3.27)(3.27)* operating on behalf of the responsible authorities.

3.19
network access point
beacon, antenna or similar source of signal propagation and receipt together with equipment to manage communication sessions with users operating within the operating reach of the network access point and provide connectivity for the users within the operating reach of the single access point to a wider communications network

Note 1 to entry: A network access point may but does not need to provide homogeneous or heterogeneous handover to another network access point.

3.20
optional additional data
part of the Minimum Set of Data allocated for additional optional data provided in a format determined in EN 15722 and is an 'optional' additional data field contained within and transmitted as part of the MSD;

Note 1 to entry: any additional data element(s) should each consist of two parts:

a) A relative 'object identifier' (OID) and

b) the data content

Note 2 to entry: The following notes are copied from EN 15722 and originally sourced from ISO 24978

"NOTE 1: Examples: Additional data may contain a reference to an external source of relevant information (such as a phone number, a website URL/URI, etc. where further information may be found), or additional data specific to the vehicle or incident (e.g. battery temperature in the case of an electric or hybrid vehicle; number of roll-overs; URL/URI to the technical specifications to a particular vehicle model; etc.). Optional additional data should not include any data concerning or identifying a person (personal data) unless the transfer of such data has been explicitly and expressly prior instructed and authorized by the person who is identified by the data and its provision should in any event only be provided only in accordance with European Union and National privacy regulations pertaining at the time of the transfer of any such personal data.

NOTE 2: CEN TC278 WG15 or a body nominated by it should allocate an 'Object Identifier' (OID) for each 'Optional additional data concept'. Within the MSD the 'Optional Additional Data concept' used should be identified by a 'relative OID', i.e. it will only contain the arcs of the object identifier of the concept starting below the eCall MSD 'Optional Additional Data concept' object identifier. See EN 15722. Additional data should be represented using an ASN.1representation definition that itself is made available to emergency services/PSAPs.

NOTE 3: When sending an MSD containing this additional data, using GSM/UMTS (EN 16062), the addition of such data shall never cause the total (UPER encoded) MSD message length to exceed the maximum available number of bytes (total message length = 140 bytes)."

3.21
passenger
person who is travelling in a vehicle, but who is not driving it or working on it

3.22
public safety answering point
PSAP
physical location working on behalf of the national authorities where emergency calls are first received under the responsibility of a public authority or a private organization recognized by the national government

Note 1 to entry: See also most appropriate PSAP.

Note 2 to entry: A number of different instantiations of PSAP service are supported within this document.

3.23
public mobile wireless communications network
mobile wireless communications network with access to a public telecommunications network

3.24
rollover
overturning of a vehicle onto its side or upside down

3.25
service provider
physical and functional component responsible for providing telematics based services to its subscribers

3.26
'third party services supported eCall'
TPS-eCall
eCall variant providing the transmission of an eCall from a vehicle to a third party service provider (TPSP) containing an 'IVS dataset' sent to the 'TPS eCall responder' (third party service provider eCall responder) who communicates the eCall transmission of an eCall to a PSAP and where possible the establishment of a voice channel between the vehicle and the PSAP, possibly involving the 'TPS-eCall responder'

Note 1 to entry: Often as one of a bundle of services.

Note 2 to entry: as described and defined in EN 16102;

Note 3 to entry: including a 'minimum set of data' (MSD) as defined in EN 15722

Note 4 to entry: TPS-eCall responder' as specified in EN 16102

3.27
TPS eCall responder
organisation specifically trained for managing assistance or emergency situations, which receives a 'TPS-eCall' and notifies the vehicle or caller that the call has been received

3.28
vehicle
any power-driven vehicle which is moved by its own means, belonging to a vehicle category defined in UNECE Consolidated Resolution on the Construction of Vehicles (R.E.3)

3.29
wireless communications network
network operating using an air-interface capable of bi-directional transfer of data and or voice

4 Symbols and abbreviations

CCAM	**Cooperative, connected and automated mobility**
EC	European Commission
EN	European Standard
GSM	global system for mobile communications
HLAP	High Level Application Protocols
IMS	IP-Multimedia Subsystem
IVS	*in-vehicle system*
MSD	*minimum set of data* (EN 15722)
OAD	*optional additional data* (concept)
OID	object identifier
PSAP	*Public Safety Answering Point*
TPS	third party service
TR	Technical Report
TS	Technical Specification
UMTS	universal mobile telecommunication system
UNECE	United Nations Economic Commission for Europe

5 Conformance

Conformance to the requirements of this Standards Deliverable for eCall using circuit switched wireless cellular communications systems are to be found in EN 16062 and EN 16454 and in Clause 6 and 7 of this specification. In order to claim conformance to this specification a system shall be compliant to all aspects of EN 16062 and EN 16454 and to Clauses 6 and 7 of this specification, or CEN/TS 17184 and CEN/TS 17240 and to Clauses 6 and 7 of this specification.