



**SLOVENSKI STANDARD
SIST-TS CEN/TS 17312:2019**

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Inteligentni transportni sistemi - e-Varnost - e-Klic prek satelita

Intelligent transport systems - eSafety - eCall via satellite

Intelligente Verkehrssysteme - eSicherheit - eCall über Satellit

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Intelligent transport systems - eSafety - eCall via satellite

Systèmes de transport intelligents - E Sécurité - E Call
par satellite

Intelligente Verkehrssysteme - eSicherheit - eCall über
Satellit

This Technical Specification (CEN/TS) was approved by CEN on 6 January 2019 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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European foreword

This document (CEN/TS 17312:2019) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems”, the secretariat of which is held by NEN.

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This document was developed as part of the I_HeERO project and subsequently prepared by Technical Committee CEN/TC 278.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to announce this Technical Specification: 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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CEN/TS 17312:2019 (E)

Introduction

In accordance with a European Regulation, from March 2018, all new model Class M1/N1 vehicles will be equipped with 112-eCall. Other model class M1/N1 vehicles may be voluntarily equipped with *112-eCall* and eCall support for other classes of vehicles will be enabled in the near future.

In its study CEN/TR 17249-1, the report observed that where a *satellite telecommunications service provider* supports IMS, this means that 112-eCall over IMS can be supported, in accordance with CEN/TS 17184, via the satellite telephone network, because IMS is an IP based service which is radio agnostic. Generally, this means IMS eCall can be supported by any IP network and so will enable eCall via satellite in IMS supporting satellite networks. (However, there is no fall-back to circuit switched eCall.) Satellite communications that support internet protocol, but do not support IMS, may be able to provide the service using an agreed CeIMS.

Satellite networks are geared for handling emergency calls – in terms of prioritization and handling. In the maritime sector, the use of satellite networks is mandated and regulated for ships above a certain size. Similar emergency call services have existed for decades on satellite networks for personal safety.

Most current satellite telephone systems support access to the internet through the use of IP protocol, and therefore support IP-addressing. These systems are technically able to support IMS-112-eCall. This of course requires a satellite communications transceiver in the vehicle, but modern satellite communications systems can now usually be accessed by a standard-sized sharks-fin or flat panel antenna.

As with other existing eCall provision, this specification is based on OEM fit equipment. The provision of eCall for aftermarket vehicles will be the subject of other work.

It should also be noted that there will be no fall-back provision to circuit switched eCall in the event that there is no local PSAP equipped to handle IMS (as provided for in 3GPP release 14), but this is not required (see below).

As the ‘cell’ for a satellite system covers the entire continent, an eCall via satellite cannot identify the “most appropriate” PSAP from the location of a cell tower, and so an alternative system is bound to be specified.

Modern satellite telecommunications systems have the advantage that most (but not all) systems provide the GNSS location of the source as part of the call establishment (in order to align signals between source and satellite) and can therefore identify the location of the vehicle to a 1st level reception point PSAP. The GNSS location information is not usually available outside of the network, except for certain types of services, but can be made so for safety services.

This means that, in countries where the Administration is prepared to provide the *satellite telecommunications service provider* with a single central level 1 PSAP IP address for satellite eCalls, eCalls can be provided and supported in remote locations where there is limited or no 2G/3G/LTE/4G coverage available. As, in this paradigm, the call is always made over IMS to an IMS capable level 1 PSAP address, there is no requirement for fall-back to circuit switched eCall.

The central 1st level PSAP can then identify the GNSS location of the source of the eCall and redirect the IMS VOIP call to the “most appropriate PSAP” on the basis of the GNSS location information provided in the call establishment, or, where the GNSS location is not available in the call establishment, can read the MSD to find the location of the vehicle and similarly redirect the IMS VOIP call to the “most appropriate PSAP”. As the communication session is packet switched, call forwarding to the most appropriate PSAP is a simple exercise and the MSD will be provided in the call setup (and therefore available in any call forwarding).

Where the Administration is not prepared to offer a central 1st level PSAP address to the *satellite telecommunications service provider*, satellite eCall can be provided via a TPSP.

Note, however, that eCalls over satellite (and certainly TPSP calls via satellite) are unlikely to be provided free of carrier network charges and require satellite communication transceiver equipment in the vehicle.

Satellite-IMS-112-eCall is likely to be of particular interest to Administrations where there are users for categories of vehicle that have to cross areas of intermittent cellular coverage and across multiple countries and road networks. This may also be of interest for agricultural and forestry vehicles in locations where low population density (such as rural areas, Northern Scandinavia and mountainous regions) does not justify the provision of land based cellular telephone networks.

NOTE Support for *Satellite-IMS-112-eCall* is probably not needed in countries where there is good mobile network coverage across the length and breadth of the land.

For vehicles known to spend significant time in areas that do not have the benefit from good GSM/UMTS/LTE/4G coverage, *Satellite-IMS-112-eCall* can provide the benefit of eCall to vehicle users.

This document provides specifications for the provision of eCall via satellite telecommunications.

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CEN/TS 17312:2019 (E)

1 Scope

In respect of *112-eCall* (operating requirements defined in EN 16072), this document defines specifications for the provision of eCall via satellite communications networks (*Satellite-IMS-112-eCall* and *Satellite-TPS-eCall*).

As with the existing provisions for eCall for Classes M1/N1 vehicles, these are specified within the paradigm of OEM fit equipment at the point of manufacture.

This document includes only the requirements for the provision of *Satellite IMS-112-eCall* using satellite telecommunications and *Satellite-TPS-eCall*.

NOTE The *112-eCall* paradigm involves a direct call from the vehicle to the *most appropriate PSAP*. (Third party service provision by comparison, involves the support of an intermediary *third party service provider* (TPSP) before the call is forwarded to the PSAP.)

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 15722:2015, *Intelligent transport systems — ESafety — ECall minimum set of data*

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

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

EN 16102:2011, *Intelligent transport systems — eCall — Operating requirements for third party support*

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

CEN/TS 17148, *Intelligent Transport Systems — eSafety — ProForma eCall Agreement between TPSP and PARES*

CEN/TS 17184, *Intelligent transport systems — eSafety — eCall High level application Protocols (HLAP) using IMS packet switched networks*

CEN/TS 17240, *Intelligent transport systems — ESafety - eCall end to end conformance testing for IMS packet switched based systems*

CEN/TR 17249-1, *Intelligent transport systems — eSafety — Part 1: Extending eCall to other categories of vehicle*

IETF RFC 8147, *Next-Generation Pan-European eCall*

IETF RFC 5031, *A Uniform Resource Name (URN) for Emergency and Other Well-Known Services*

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 <http://www.iso.org/obp>

3.1

112

single European emergency call number supporting "Teleservice 12"

[SOURCE: ETSI/TS 122 003]

3.2

112-eCall

eCall' provided by a "Teleservice 12" mobile communication network, as defined in EN 16072 and EN 16062 or CEN/TS 17184

3.3

data

representations of static or dynamic objects in a formalized manner suitable for communication, interpretation, or processing by humans or by machines; in packet switched networks, voice is carried in packets of data

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3.4

data concept

any of a group of data structures (i.e. object class, property, value domain, data elements (3.5), 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

3.5

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

3.6

eCall

emergency call which is generated either automatically via activation of in-vehicle sensors or manually by the vehicle occupants (or person(s) riding on a vehicle that is not fitted with an enclosed compartment and/or (a) seatbelt(s)), and which, when activated, 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'

3.7

eCall service

end-to-end emergency service to connect occupants of an affected vehicle to the most appropriate PSAP via a wireless communications network together with the transfer of a minimum set of data to the PSAP

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3.8

eCall transaction

establishment of a mobile wireless communications session across a public mobile 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

3.9

IMS-112-eCall

eCall via single European emergency call number using IMS in accordance with EN 16072 and CEN/TS 17184

Note 1 to entry: Using packet switched cellular wireless networks (e.g. E-UTRAN/LTE, etc.).

3.10

in-vehicle equipment

equipment within the vehicle that provides or has access to in-vehicle data required for the minimum set of data (3.12) and any other data that is to be sent as part of or complementary to the minimum set of data to effect the eCall session 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

Note 1 to entry: 'In-vehicle equipment' refers only to 'in-vehicle equipment' for the purposes of eCall (eCall in-vehicle equipment), sometimes referred to as *eCall in-vehicle system* or *IVS*, and does not refer to any other in-vehicle equipment provided for purposes other than eCall; see *eCall in-vehicle system*. (EN 16072:2015, 3.20)

3.11

in-vehicle system (IVS)

equipment within the vehicle that 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 triggering and enacting the eCall service via a public mobile wireless communications network

3.12

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 characterizing the vehicle, and potentially sometimes also providing additional data that is deemed relevant and is essential for the performance of the eCall service

3.13

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 operating on behalf of the responsible authorities.

3.14**optional additional data (OAD)**

part of the Minimum Set of Data which is allocated for additional optional data provided in a format determined in EN 15722, and which 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 contents of the following notes are copied from EN 15722:2015, 6.1.5 and originally sourced from EN ISO 24978.

Note 3 to entry: 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 (4.45); 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 4 to entry: CEN/TC 278/WG 15 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 (3.6) should be represented using an ASN.1 representation definition that itself is made available to emergency services/PSAPs.

Note 5 to entry: 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).

3.15**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.

3.16**satellite-IMS-112-eCall**

eCall via single European emergency call number using IMS in accordance with EN 16072 and CEN/TS 17184

3.17**satellite telecommunications service provider**

entity that provides wireless telecommunications using satellites in orbit above the earth

3.18**Satellite-TPS-eCall**

eCall sent via satellite using a third party service provider