SLOVENSKI STANDARD
oSIST prEN 17905:2022

01-november-2022

Inteligentni transportni sistemi - e-Varnost - e-Klic HLAP v hibridnih omrežnih okoljih s komutiranim vezjem/paketno komutiranim omrežjem

Intelligent transport systems - eSafety - eCall HLAP in hybrid circuit switched/packet switched network environments

Intelligente Verkehrssysteme - eSicherheit - Übergeordnetes eCall-Anwendungsprotokoll (HLAP) in hybriden geschalteten Netzwerkumgebungen

Systèmes de transport intelligents - eSafety - HLAP d'eCall dans les environnements réseaux hybrides à commutation de circuits et de paquets

Ta slovenski standard je istoveten z: **prEN 17905**

ICS:

03.220.20	Cestni transport	Road transport
35.240.60	Uporabniške rešitve IT v prometu	IT applications in transport

oSIST prEN 17905:2022   **en,fr,de**

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

**DRAFT
prEN 17905**

September 2022

ICS 03.220.20; 35.240.60

English Version

Intelligent transport systems - eSafety - eCall HLAP in hybrid circuit switched/packet switched network environments

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 278.

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COMITÉ EUROPÉEN DE NORMALISATION
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Ref. No. prEN 17905:2022 E

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European foreword

This document (prEN 17905:2022) has been prepared by Technical Committee CEN/TC 278 "Intelligent transport systems", the secretariat of which is held by NEN.

This document is currently submitted to the CEN Enquiry.

This document is the result of narrowing down the scope of CEN/TS 17184 (during the review of the TS) to exclusively describe the eCall High Level Application Protocols in a packet switched networks and as such partly supersedes CEN/TS 17184.

The document complements EN 16062 and CEN/TS 17184.

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prEN 17905:2022 (E)

Introduction

An *eCall* is an emergency call generated either automatically via activation of in-vehicle sensors or manually by the vehicle occupants; when activated, to provide notification and relevant location information to the most appropriate Public Safety Answering Points (PSAP), by means of mobile wireless communications networks and carries a defined standardized 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 PSAP.

NOTE   The term PSAP, which is most widely used in the *eCall* documentation, European Commission documents, etc., is used throughout this document and equates to the term emergency call response centre used in the ITS Implementation Directive.

EN 15722 specifies a standardized MSD for *eCall*, and EN 16072 specifies pan-European *eCall* operating requirements (for third party systems, EN 16102 specifies third party services supporting *eCall* operating requirements; see EC Communication on *eCall* Implementation 2009 [COM(2009) 434 final] and Official Journal *eCall* Recommendation C_2011_6269, for more information).

The pan-European *eCall* are made using Public Land Mobile Networks (PLMN) for which operating requirements are specified in a number of ETSI standards and technical specifications. In order to provide the *eCall* service across a wireless network, high level application protocols are required as an important essential element to affect this service provision. Originally PLMN were circuit switched networks for which EN 16062 specifies High Level Application Protocols. In these networks eCall uses Teleservice No 12 (TS12) and in-band modem transfer of data.

Over time new communications technologies have become available. These technologies use so called 'packet switched' technologies using Internet protocols (IP). Particularly, 3GPP have evolved a communication management system called IMS (IP Multimedia Subsystem) which is suitable to operate over a number of bearer technologies, including LTE, NR and their successors. It is anticipated that packet switched networks (such as LTE, NR and their successors), which now co-exist with circuit switched networks (like GSM/UMTS), will, over the course of time, replace circuit switched networks.

CEN/TS 17184 provides High Level Application Protocols (HLAP) for eCall using IMS over packet switched networks. It provides the equivalent of EN 16062 for circuit switched networks and should be suitable for all/any packet switched networks and wireless access such as LTE, NR and their successors.

During at least a couple of years, packet switched networks will not be available throughout the working area of eCall. In other areas both circuit switched and packet switched networks will co-exist, but there will be areas that only have packet switched network services. This document specifies the protocols in this hybrid situation, in order to make sure that pan-European *eCall* will function as efficiently as possible.

NOTE   A (possibly) large number of vehicles support circuit switched in-band eCall only (and not eCall using IMS over packet switched networks). For these to be able to continue using the eCall service either the onboard equipment will need to be upgraded (to support eCall using IMS) or sufficient circuit switched networks need to remain operational. This falls outside the scope of this document and is not addressed herein.

The European Committee for Standardization (CEN) draws attention to the fact that, while no direct patents are known in express regard to the content of these specifications, the underlying ETSI communications Standards may involve patents and the reader is directed to the referenced ETSI standards in these respects. Similarly, as this standard relies on EN 16062 and CEN/TS 17184 the specifications below may involve the use of patents specified in these standards, and the reader is directed to these documents in respect of these aspects.

1 Scope

In respect of 112-eCall (pan-European *eCall)* (operating requirements defined in EN 16072), this document defines the additional high level application protocols, procedures and processes required to provide the *eCall service* whilst there are still both circuit switched and packet switched wireless communication networks in operation.

NOTE   The objective of implementing the pan-European in-vehicle emergency call system (eCall) is to automate the notification of a traffic accident, wherever in Europe, with the same technical standards and the same quality of services objectives by using a PLMN (such as ETSI prime medium) which supports the European harmonized 112/E112 emergency number (TS12 ETSI TS 122 003 or IMS packet switched network) and to provide a means of manually triggering the notification of an emergency incident.

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

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

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

CEN/TS 17184 :—[1], *Intelligent transport systems – eSafety - eCall High level application Protocols (HLAP) using IP Multimedia Subsystem (IMS) over packet switched networks*

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

CEN/TS YYYYY, *Intelligent transport systems – ESafety - ECall end to end conformance testing in hybrid switching environments*

ETSI TS 122 011, *Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Service accessibility (3GPP TS 22.011)* [Release 14 or later]

ETSI TS 123 122, *Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Non-Access-Stratum (NAS) functions related to Mobile Station (MS) in idle mode (3GPP TS 23.122)* [Release 14 or later]

ETSI TS 123 167, *Universal Mobile Telecommunications System (UMTS); LTE; IP Multimedia Subsystem (IMS) emergency sessions (3GPP TS 23.167)* [Release 16 or later]

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[1] To be published. Stage at the time of publication: FprCEN/TS 17184:2022.

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
112
single European emergency call number supporting Teleservice 12

Note 1 to entry: See ETSI TS 122 003.

3.2
cellular network
wireless communications network consisting of multiple adjacent access points (cells) with the capability of homogeneous transfer of a communications session instance to an adjacent cell without significant interruption to the session

3.3
CS-eCall
CS eCall
eCall over CS
emergency call generated either automatically via activation of in-vehicle sensors or manually by the *vehicle occupants* via a circuit switched mobile network

3.4
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

3.5
E112
emergency communications service using the single European emergency call number, 112, which is enhanced with location information of the calling user

Note 1 to entry: The number is not actually used directly in the communication but sets indicators in the IMS call header that identifies the call as an emergency call of type 'eCall' to the MNO.

3.6
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 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 generator
occupant of a vehicle or equipment within a vehicle that has cause to trigger an *eCall session* by automatic or manual means

3.8
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

3.9
eCall session
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

3.10
emergency call response centre
term used in ITS Implementation Directive to mean Public Safety Answering Point (PSAP)

3.11
identifier
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

3.12
in-vehicle equipment
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 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

3.13
in-vehicle system
IVS
in-vehicle equipment together with the means to trigger, manage and effect the *eCall session*

3.14
IMS-eCall
IMS eCall
eCall over IMS
manually or automatically initiated IMS emergency call, from an IVS, supplemented with a minimum set of data (MSD), via a packet switched mobile network

3.15
minimum set of data
MSD
standardized data concept comprising data elements of relevant vehicle generated data essential for the performance of the *eCall* service

Note 1 to entry: See EN 15722.

3.16
mobile wireless communications network
wireless communications network with homogeneous handover between *network access points*

3.17
mobile wireless communications network device
device providing communications to a *mobile wireless communications network* with homogeneous handover between *network access points*

3.18
most appropriate PSAP
destination for eCall 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.

3.19
Network Access Device
NAD
see *mobile wireless communications network device*

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3.20
Public Safety Answering Point (standards.iteh.ai)
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.

3.21
service provider
physical and functional component responsible for providing telematics based services to its subscribers

3.22
vehicle occupant
person inside the vehicle

3.23
wireless communications network
network operating using an air-interface capable of bi-directional transfer of *data* and or voice

Note 1 to entry: There are different types of wireless communications such as PAN, LAN, *cellular network*, etc.

4   Symbols and abbreviations

3G   3rd Generation

3GPP   Third Generation Partnership Project

CS   Circuit Switched

EC   European Commission

ECL   eCall over IMS support indicator

EMS   IMS Emergency Service support indicator

ETSI   European Telecommunications Standards Institute

GSM   Global System for Mobile communications

IMS   IP Multimedia Subsystem

IVS   In-Vehicle System

LAN   Local Area Network

LTE   Long Term Evolution

MNO   Mobile Network Operator

MSD   Minimum Set of Data

NAD   Network Access Device

NR   New Radio

PLMN   Public Land Mobile Network

PS   Packet Switched

PSAP   Public Safety Answering Point

TPS   Third Party Service

TPSP   Third Party Service Provider

TS   Technical Specification

TS12   Teleservice 12

UMTS   Universal Mobile Telecommunication System

USIM   Universal Subscriber Identity Module

VoIMS   Voice over IMS

5   Conformance

Conformance requirements are to be found in CEN/TS YYYYY and subsequently in EN 16454 (for circuit switched networks), CEN/TS 17240 (for packet switched networks).

6   General overview of the eCall session for Pan European eCall

As described in the introduction to the document, EN 16062, *eCall* is an emergency call generated either automatically via activation of in-vehicle sensors or manually by the *vehicle occupants* (the *eCall generator*); when activated, it provides notification and relevant location information to the most appropriate *Public Safety Answering Point*, by means of *mobile wireless communications networks* and carries a defined standardized *minimum set of data*, notifying that there has been an incident that requires