

English Version

Intelligent transport systems - eSafety - eCall High level
application protocols (HLAP) using IP Multimedia
Subsystem (IMS) over packet switched networks

Systèmes de transport intelligents - eSafety - Exigences
de protocole d'application de haut niveau (HLAP)
relatives à l'eCall via des systèmes IMS basés sur la
commutation de paquets

Intelligente Verkehrssysteme - eSicherheit -
Allgemeines eCall Anwendungsprotokoll (HLAP) unter
Verwendung von IMS paketvermittelnden Netzwerken

This Technical Specification (CEN/TS) was approved by CEN on 30 October 2022 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
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (CEN/TS 17184:2022) has been prepared by Technical Committee CEN/TC 278 "Intelligent transport systems", the secretariat of which is held by NEN.

This document supersedes CEN/TS 17184:2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

Part of this revision of the document is aimed at making it purely packet switched and removing references to eCall over circuit switched networks, this in order to make the document future proof.

In comparison with the previous edition, the following technical modifications have been made:

- reordering and combining of some clauses to better reflect coherence and provide consistency (numbering below refers to the current numbering; where this differs from the numbering in the previous published version of this document, the original number is cited stroke through and between brackets)
- provide a mechanism to transfer the MSD via in-band modem via IMS as an option (Clause 7.8 (~~7.3.6 and 7.4.3~~))
- added expected IVS behaviour after reception of 6xx or 4xx response including positive MSD ACK (updated Clauses 7.4.1, 7.6.2 and 7.13.3 (~~7.3.6 and 7.14.4~~))
- removed section about PSAP application (~~7.8~~) which was moved to EN 16072
- updated expected IVS behaviour when the PSAP operator does not respond (updated Clauses 7.13.3.2 and 7.13.3.3 (~~7.14.3 and 7.14.4~~))
- updated definition of test eCall activation (updated Clauses 7.3.2 and 7.4.5 (~~7.2.2 and 7.3.6~~))
- updated Clauses 7.5, 7.13.1, 7.13.4.1 (~~7.4.2, 7.4.3, 7.5.2, 7.13.3, 7.13.4.2~~) and Annex B
- updated terms, definitions, symbols and abbreviations
- removed requirement to fall-back to CS eCall

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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 Point (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.

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) and EN 16062 specifies High Level Application Protocols for *eCall* using GSM/UMTS.

The operating requirements for pan-European *eCall* are made using Public Land Mobile Networks (PLMN) (such as GSM and UMTS, and latterly LTE, NR and their successors), as 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.

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.

Subsequent to the publication of the suite of *eCall* standards (EN 16072, EN 16062 and EN 16454) which support the *eCall* Regulations, new communications technologies have become available. Over the course of time, these networks (such as LTE, NR and their successors) are expected to complement and eventually replace the circuit switched GSM/UMTS networks. 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.

In circuit switched networks the *eCall* is identified as an emergency call and specifically an *eCall* in the telecircuit switching (TS) process. No number is dialled as the TS identifiers inform the MNO that the call is an emergency call/*eCall* and the MNO has procedures to direct these calls to "the most appropriate" PSAP. Having established a voice channel, the microphones and speakers are muted and a modem is used to transfer the Minimum Set of Data (MSD) to the PSAP before opening up the line to enable conversation between the PSAP operator and the occupants of the vehicle.

In a 'packet switched' network, packets of data (including voice) are sent using an internet protocol (IP) communication system. 3GPP have created the IP Multimedia Subsystem (IMS) which makes use of SIP (Session Initiation Protocol) for its call management.

This document provides High Level Application Protocols (HLAP) for *eCall* using IMS. It therefore provides the IMS packet switched equivalent of EN 16062 for circuit switched networks and should be suitable for all/any packet switched networks that support IMS and wireless access such as LTE, NR and their successors.

This document specifies the protocols to put into effect the pan-European *eCall* operating requirements, over packet switched networks (such as LTE, NR and their successors).

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.

1 Scope

In respect of pan European eCall (operating requirements defined in EN 16072), this document defines the high level application protocols, procedures and processes required to provide the *eCall service* via a packet switched wireless communications network using IMS (IP Multimedia Subsystem) and wireless access (such as LTE, NR and their successors).

This document assumes support of eCall using IMS over packet switched networks by an IVS and a PSAP and further assumes that all PLMNs available to an IVS at the time an eCall or test eCall is initiated are packet switched networks. Support of eCall where eCall using IMS over packet switched networks is not supported by an IVS or PSAP is out of the scope of this document.

At some moment in time packet switched networks will be the only Public Land Mobile Networks (PLMN) available. However as long as GSM/UMTS PLMNs are available (Teleservice 12/TS12) ETSI TS 122 003 will remain operational. Both the use of such PLMNs and the logic behind choosing the appropriate network in a hybrid situation (where both packet-switched and circuit-switched networks are available) are out of scope of this document.

NOTE 1 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.

NOTE 2 HLAP requirements for third party services supporting eCall can be found in EN 16102,. This document makes reference to those provisions but does not duplicate them.

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 16072:2022, *Intelligent transport systems - ESafety - Pan-European eCall operating requirements*

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

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

ETSI TS 122 003, *Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Circuit Teleservices supported by a Public Land Mobile Network (PLMN) (3GPP TS 22.003) [Release 14 or later]*

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 122 071, *Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Location Services (LCS); Service description; Stage 1 (3GPP TS 22.071) [Release 14 or later]*

ETSI TS 122 101, *Universal Mobile Telecommunications System (UMTS); LTE; Service aspects; Service principles (3GPP TS 22.101) [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 14 or later]*

ETSI TS 123 216, *Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Single Radio Voice Call Continuity (SRVCC); Stage 2 (3GPP TS 23.216) [Release 14 or later]*

ETSI TS 123 401, *LTE; General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access (3GPP TS 23.401) [Release 14 or later]*

ETSI TS 123 501, *5G; System architecture for the 5G System (5GS) (3GPP TS 23.501) [Release 14 or later]*

ETSI TS 124 229, *Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 (3GPP TS 24.229) [Release 14 or later]*

ETSI TS 124 301, *Universal Mobile Telecommunications System (UMTS); LTE; Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3 (3GPP TS 24.301) [Release 14 or later]*

ETSI TS 124 501, *5G; Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3 (3GPP TS 24.501) [Release 14 or later]*

ETSI TS 131 102, *Universal Mobile Telecommunications System (UMTS); LTE; Characteristics of the Universal Subscriber Identity Module (USIM) application (3GPP TS 31.102) [Release 14 or later]*

ETSI TS 133 203, *Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; 3G security; Access security for IP-based services (3GPP TS 33.203) [Release 14 or later]*

ETSI TS 136 331, *LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification (3GPP TS 36.331) [Release 14 or later]*

ETSI TS 138 331, *5G; NR; Radio Resource Control (RRC); Protocol specification (3GPP TS 38.331) [Release 15 or later]*

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