



BSI Standards Publication

**Intelligent transport systems - eSafety - eCall
High level application Protocols (HLAP)
using IMS packet switched networks**

National foreword

This Published Document is the UK implementation of CEN/TS 17184:2018.

The UK participation in its preparation was entrusted to Technical Committee EPL/278, Intelligent transport systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2018
Published by BSI Standards Limited 2018

ISBN 978 0 580 98156 2

ICS 35.240.60

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 August 2018.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

TECHNICAL SPECIFICATION
 SPÉCIFICATION TECHNIQUE
 TECHNISCHE SPEZIFIKATION

CEN/TS 17184

August 2018

ICS 35.240.60

English Version

**Intelligent transport systems - eSafety - eCall High level
 application Protocols (HLAP) using IMS packet switched
 networks**

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

This Technical Specification (CEN/TS) was approved by CEN on 16 March 2018 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.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

CEN members are the national standards bodies of 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 United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
 COMITÉ EUROPÉEN DE NORMALISATION
 EUROPÄISCHES KOMITEE FÜR NORMUNG

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

Contents

	Page
European foreword	5
Introduction	6
1 Scope.....	8
2 Normative references.....	9
3 Terms and definitions	9
4 Symbols and abbreviations	14
5 Conformance.....	16
6 General overview of the eCall session for Pan European eCall	16
7 Requirements.....	22
7.1 Procedures following power-up of the in-vehicle system.....	22
7.1.1 General.....	22
7.1.2 Enabled IVS.....	22
7.1.3 Enabled PSAP.....	23
7.1.4 IVS configured only for 112-eCall	24
7.1.5 Self-test	24
7.1.6 Standby mode applicable to IVS configured only for 112-eCall	24
7.2 Activation.....	24
7.2.1 Activation of pan-European IMS-eCall.....	24
7.2.2 Activation of a test eCall	25
7.3 Call set-up	25
7.3.1 General.....	25
7.3.2 IVS network access device (NAD) already registered on PLMN.....	25
7.3.3 eCall in progress.....	25
7.3.4 Network selection and registration.....	26
7.3.5 Authentication of the subscriber	26
7.3.6 IMS-eCall establishment	26
7.3.7 Cell localization (by network)	27
7.3.8 Manual termination of eCall by vehicle occupants before trigger confirmation.....	27
7.4 MSD transfer in IMS-eCall	28
7.4.1 General.....	28
7.4.2 MSD transfer to a PSAP supporting IMS-eCall	28
7.4.3 MSD Transfer to a PSAP not supporting IMS-eCall.....	30
7.4.4 Security.....	31
7.5 Application layer acknowledgement (AL-ACK).....	31
7.6 Event of IMS-eCall failure.....	31
7.7 PSAP requests a new MSD	32
7.7.1 General.....	32
7.7.2 After session clear-down.....	33
7.8 PSAP application features.....	33
7.8.1 General requirements.....	33
7.8.2 MSD display to the PSAP operator	34
7.8.3 PSAP operator user interface	34
7.9 Audio link to vehicle occupants.....	34
7.10 eCall clear-down.....	34

7.11	PSAP call back	34
7.12	Rerouting to another PSAP/emergency control centre.....	35
7.13	Handling non equipped situations / error cases	35
7.13.1	MSD not transmitted correctly	35
7.13.2	Network registration fails	35
7.13.3	Call failure before the MSD is acknowledged	35
7.13.4	Mobile network not supporting eCall URN or not provided with routing tables	36
7.14	PSAP network/ICT failure	36
7.14.1	General	36
7.14.2	PSAP application failure.....	36
7.14.3	PSAP operator does not respond.....	36
7.14.4	PSAP system not available.....	37
7.14.5	MSD corrupted.....	37
7.14.6	Audio link not established.....	37
7.14.7	Audio link established but subsequently fails	37
7.14.8	Automatic repeat attempts	38
8	Third party services supported eCall (TPS-eCall)	38
9	Defences against attack (Security provisions).....	38
10	Quality of service requirements.....	38
11	Test and conformance requirements.....	38
12	Marking, labelling and packaging.....	38
13	Declaration of patents and intellectual property	38
Annex A (normative) Table of timings.....		39
Annex B (informative) SIP and IMS explained.....		41
B.1	Introduction.....	41
B.2	Session Initiation Protocol	41
B.2.1	SIP.....	41
B.2.2	SIP URI	41
B.2.3	SIP INVITE.....	41
B.2.4	Request-Line-URI.....	42
B.2.5	Via.....	42
B.2.6	From	42
B.2.7	To.....	42
B.2.8	Contact.....	42
B.2.9	Allow.....	42
B.2.10	BYE.....	43
B.2.11	CANCEL.....	43
B.2.12	INFO.....	43
B.2.13	INVITE.....	43
B.2.14	NOTIFY.....	43
B.2.15	OPTIONS.....	43
B.2.16	PRACK.....	43
B.2.17	REFER.....	44
B.2.18	REGISTER.....	44
B.2.19	SUBSCRIBE.....	44
B.2.20	UPDATE	44
B.3	IMS: Internet Protocol (IP) multimedia core network subsystem.....	44
B.3.1	IMS Overview.....	44
B.3.2	Roles of Session Control Functions	47

B.4	Emergency Communications	49
B.4.1	Overview of ETSI TS 123 167	49
B.4.2	High Level Procedures for IMS Emergency Services	49
	Bibliography	55

Currently in preview, click buy full version

European foreword

This document (CEN/TS 17184:2018) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems”, the secretariat of which is held by NEN.

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.

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.

Currently in preview, click buy full version.

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.

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 3G, and latterly LTE/4G/E-UTRAN), 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 which support the eCall Regulations, EN 16072, EN 16062 and EN 16454, new communications technologies have become available. Over the course of time, these networks (such as LTE/4G and in turn 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 (Internet protocol Multimedia System) which is suitable to operate over a number of bearer technologies, including LTE/ 4G/E-UTRAN.

In circuit switched networks the eCall is identified as an emergency call and specifically an eCall in the telecircuit switching (TS) process. The phone number is not 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, GSM/UMTS eCall then mutes microphones and speakers and uses a modem 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 through an internet protocol (IP) communication system, using SIP (Session Initiation Protocol) which is managed, most popularly using IMS.

This document provides High Level Application Protocols (HLAP) for eCall using IMS. It therefore provides the LTE/4G E-UTRAN equivalent of EN 16062 for GSM/UMTS and should be suitable for all/any packet switched networks that support IMS and LTE/ 4G/E-UTRAN wireless access.

This document specifies the protocols to put into effect the pan-European *eCall* operating requirements, and also identifies common elements that can be used in the link between third party services supporting *eCall* and PSAPs.

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, there is a default option to circuit switched eCall in the

specifications below which may involve the use of patents specified in EN 16062, and the reader is directed to EN 16062 in respect of these aspects.

Currently in preview, click buy full version

1 Scope

In respect of 112-eCall (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 (Internet protocol Multimedia System) and LTE/ 4G/E-UTRAN wireless access.

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, and have been developed in conjunction with the development of this work item, and are consistent in respect of the interface to the PSAP. 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 15722:2015, *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, *Intelligent transport systems – eCall - Operating requirements for third party support*

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

CEN/TS 17240¹, *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) [version 8.0.0, Release 8, and Release 14]*

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]*

¹ Under preparation. Stage at the time of publication: FprCEN/TS 17240.