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Inteligentni transportni sistemi - e-Varnost - Preskušanje skladnosti e-klica v zvezi pošiljatelj-prejemnik za paketno preklopne sisteme IMS

Intelligent transport systems - ESafety - ECall end to end conformance testing for IMS packet switched based systems

Intelligente Verkehrssysteme - eSicherheit - eCall Ende-zu-Ende Konformitätsprüfungen für IMS-paketvermittelnde Systeme

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Systèmes de transport intelligents - eSécurité - eCall: Essais de conformité du système « eCall » de bout en bout pour les systèmes IMS basés sur la commutation de paquets

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Systèmes de transport intelligents - eSécurité - eCall: Essais de conformité du système " eCall " de bout en bout pour les systèmes IMS basés sur la commutation de paquets

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This Technical Specification (CEN/TS) was approved by CEN on 20 August 2018 for provisional application.

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European foreword

This document (CEN/TS 17240:2018) 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.

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Introduction

An *eCall* is an emergency call generated either automatically via activation of in-vehicle sensors or manually by the *vehicle occupants* *(3.36)*; 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* *(3.22)* and carries a defined standardized *minimum set of data* *(3.21)*, 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* *(3.23)*.

NOTE 1 EN 15722 specifies a standardized MSD for *eCall*, EN 16062 specifies high level application protocols 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] for more information.)

The operating requirements for pan-European *eCall* are made using Public Land Mobile Networks (PLMN) (such as GSM and 3G), as specified in a number of ETSI standards and technical specifications.

While EN 16062 provided high level application protocols (HLAP) for eCall using GSM/UMTS circuit switched networks, a new Standards Deliverable CEN/TS 17184 has been developed for the provision of eCall using IMS packet switched networks.

European Regulations require support of eCall by *vehicle manufacturers* *(3.35)*, other eCall IVS manufacturers, MNO's and PSAPs. (See Clause 2, Normative References).

This Standards Deliverable provides a complete suite for the support of IMS-eCall and may be used to test IMS-eCall aspects of *eCall service* *(3.13)* provision. Where appropriate, the tests of EN 16454 are replicated, revised or replaced. EN 16454 Conformance Tests that are required in a GSM/UMTS environment but not appropriate in an IMS environment are removed. Where new conformance tests are required for IMS, they have been added as new tests. The reference numbering of conformance tests in this environment are consistent with those in EN 16454 with the addition of the letters "IMS".

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This deliverable provides tests to enable actors in the eCall chain to be able to claim conformance to the IMS-eCall standards, even though they are unable to control the behaviour of systems of other actors in the eCall chain

NOTE 2 Conformance tests in this document allow demonstration that a system complies with the IMS-eCall Standards. Compliance to Standards is a prerequisite to providing an interoperable compliant system, but do not by themselves demonstrate that a system will function nor guarantee the quality of service.

NOTE 3 The term PSAP (Public Safety Assistance Point), 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* *(3.15)* used in the ITS Implementation Directive.

The European Committee for Standardization (CEN) draws attention to the fact that it is claimed that compliance with this European Standard may involve the use of patents concerning eCall given in EN 16062 and various ETSI standards for the *network access device* *(3.24)* and cellular mobile networks.

CEN takes no position concerning the evidence, validity and scope of these patent rights.

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1 Scope

This document defines the key actors in the eCall chain of service provision using IMS over packet switched networks (such as LTE/4G) as:

1) *In-vehicle system* *(3.20)* (IVS)/vehicle,

2) Mobile network Operator (MNO),

3) *Public safety answering point* *(3.27)* (PSAP),

and to provide conformance tests for actor groups 1) – 3).

NOTE 1 Conformance tests are not appropriate nor required for *vehicle occupants* *(3.36)*, although they are the recipient of the service.

NOTE 2 Third party eCall systems (TPS eCall) are not within the scope of this deliverable. This is because the core *TPS-eCall* *(3.32)* standard (EN 16102) does not specify the communications link between the vehicle and the TPS *service provider* *(3.29)*.

NOTE 3 These conformance tests are based on the appropriate conformance tests from EN 16454 which was published before Internet Protocol multimedia Systems (IMS) packet switched networks were available. This deliverable therefore replicates the appropriate tests from EN 16454 (and acknowledge their source); adapt and revise Conformance Test Protocols (CTP) from EN 16454 to an IMS paradigm; or provide new additional tests that are required for the IMS paradigm. Some 14 112-eCall (Pan European eCall) tests provided in EN 16454 are specific to GSM/UMTS circuit switched communications and not appropriate for the IMS paradigm and are therefore excluded from this deliverable.

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This document therefore provides a suite of ALL conformance tests for IVS equipment, MNO's, and PSAPS, required to ensure and demonstrate compliance to CEN/TS 17184.

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NOTE 4 Because in the event of non-viability or non-existence of an IMS supporting network at any particular time/location, IMS-eCall systems revert to CS networked eCall systems eCall via GSM/UMTS, IVS and PSAPs need to support, and prove compliance to both IMS and CS switched networks.

The Scope covers conformance testing (and approval) of new engineering developments, products and systems, and does not imply testing associated with individual installations in vehicles or locations.

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

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

CEN/TS 17184:2018, *Intelligent transport systems — eSafety — eCall High level application Protocols (HLAP) using IMS packet switched networks*

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ETSI TS 102 936-1, *eCall Network Access Device (NAD) conformance specification; Part 1: Protocol test specification*

ETSI TS 102 936-2, *eCall Network Access Device (NAD) conformance specification; Part 2: Test suites*

ETSI TR 102 937, *eCall communications equipment; Conformance to EU vehicle regulations, R&TTE, EMC & LV Directives, and EU regulations for eCall implementation*

ETSI TS 122 003 (2017-03), *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 14.0.0 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 version 14.7.0 Release 14)*

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 version 14.4.0 Release 14)*

ETSI TS 124 008, *Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Mobile radio interface Layer 3 specification; Core network protocols; Stage 3 (3GPP TS 24.008 version 8.20.0 Release 8)*

ETSI TS 131 102, *Universal Mobile Telecommunications System (UMTS); LTE; Characteristics of the Universal Subscriber Identity Module (USIM) application (3GPP TS 31.102 version 14.4.0 Release 14)*

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ETSI TS 134 123-1 (2018-01), *Universal Mobile Telecommunications System (UMTS); User Equipment (UE) conformance specification; Part 1: Protocol conformance specification (3GPP TS 34.123-1 version 14.3.0 Release 14)*

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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'

Note 1 to entry: See ETSI TS 122 003.

3.2
call clear-down
act of ending a call, following call completion, which is signalled in accordance with ISUP (ISDN User Part) 'Release Cause Codes' (usually achieved by hanging up the receiver or pressing 'end call' or similar on screen)

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3.3
contracting MNO
mobile network operator which has responsibility for provisioning and managing a specific SIM

3.4
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

3.5
conformance test point
point which may be an actual instantiation of equipment performing a conformance test process 'live', using 'live' equipment or may be equipment/systems that simulate behaviour of equipment at the point being tested in order to stimulate or observe the behaviour resultant from the stimulation and note the result of that simulation

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
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concept of a group of *data* *(3.6)* structures (i.e. object class, property, value domain, *data elements* *(3.8)*, 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
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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
eCall
emergency call generated either automatically via activation of in-vehicle sensors or manually by the *vehicle occupants* *(3.36)*, 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* *(3.21)* (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*

3.10
eCall+
provision of *eCall service* *(3.13)* plus availability of wireless communication network to undertake other application services

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3.11
eCall flag
communications indicator to MNO that the call is an eCall, which means, for CS eCall, bits 6 and 7 of service category information element, and for IMS the SOS eCall URNs; alternative term for eCall identifier

3.12
eCall generator
occupant of a vehicle or equipment within a vehicle that has cause to trigger an *eCall transaction* *(3.14)* by automatic or manual means

3.13
eCall service
end-to-end emergency service to connect occupants of an affected vehicle to the *most appropriate PSAP* *(3.23)* via an audio link across a PLMN together with the transfer of a *minimum set of data* *(3.21)* to the PSAP

3.14
eCall transaction
establishment of a *mobile wireless communications session* across a *public wireless communications network* and the transmission of a *minimum set of data* *(3.21)* from a vehicle to a *public safety answering point* *(3.27)* and the establishment of an audio channel between the vehicle and the PSAP

3.15
emergency call response centre
term used in ITS Implementation Directive to mean *Public safety answering point* *(3.27)* (PSAP)

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3.16
established
created or set up

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3.17
identifier
label, symbol or token that names or identifies an entity or a collection of *data* *(3.6)* or the means of designating or referring to a specific instance of a *data concept* *(3.7)*

3.18
in progress
taking place

3.19
in-vehicle equipment
equipment within the vehicle that provides or has access to in-vehicle *data* *(3.6)* required for the *minimum set of data* *(3.21)* 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* *(3.14)* via a *public mobile wireless communications network* *(3.26)* providing a link between the vehicle and a means of enacting the *eCall service* *(3.13)* via a *public mobile wireless communications network*

3.20
in-vehicle system
in-vehicle equipment *(3.19)* together with the means to trigger, manage and effect the *eCall transaction* *(3.14)*

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3.21
minimum set of data
standardized *data concept* *(3.7)* comprising *data elements* *(3.8)* of relevant vehicle generated *data* *(3.6)* essential for the performance of the *eCall service* *(3.13)*

Note 1 to entry: See EN 15722.

3.22
mobile wireless communications network
wireless communications network (3.37) with homogeneous handover between *network access points* *(3.25)*

3.23
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 European Standard. A PSAP can be a Public Authority or a private *service provider* *(3.29)* operating on behalf of the responsible authorities.

3.24
network access device
NAD
see *mobile wireless communications network* *(3.22)* device

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3.25
network access point

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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* *(3.25)* may, but does not need to provide homogeneous or heterogeneous handover to another *network access point.*

3.26
public mobile wireless communications network
mobile wireless communications network *(3.22)* with access to a public telecommunications network

3.27
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 deliverable.