SLOVENSKI STANDARD
oSIST prEN 16102:2010

01-junij-2010

Inteligentni transportni sistemi - Elektronski klic v sili - Operativne zahteve za podporo tretje stranke

Intelligent transport systems - ECall - Operating requirements for third party support

Intelligente Verkehrssysteme - ECall - Betriebsanforderungen für den TPS eCall

Systèmes de transport intelligents - ECall - Exigences opérationnelles des services eCall de fournisseurs privés

Ta slovenski standard je istoveten z: **prEN 16102**

ICS:

13.200	Preprečevanje nesreč in katastrof	Accident and disaster control
35.240.60	Uporabniške rešitve IT v transportu in trgovini	IT applications in transport and trade
43.040.15	Avtomobilska informatika. Vgrajeni računalniški sistemi	Car informatics. On board computer systems

oSIST prEN 16102:2010 **en**

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Document Preview

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT

prEN 16102

April 2010

ICS 35.240.60

English Version

Intelligent transport systems - ECall - Operating requirements for third party support

Systèmes de transport intelligents - ECall - Exigences
opérationnelles des services eCall de fournisseurs privés

Intelligente Verkehrssysteme - ECall -
Betriebsanforderungen für den TPS eCall

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Ref. No. prEN 16102:2010: E

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Foreword

This document (prEN 16102:2010) has been prepared by Technical Committee CEN/TC 278 "Road transport and traffic telematics", the secretariat of which is held by NEN.

This document is currently submitted to the CEN Enquiry.

Introduction

The scale of death and injury on roads in Europe needs to be fully comprehended to understand the need for an automated method to alert about accidents. There were around 41,600 deaths and more than 1.7 million injured in 2005. An automated method of accident notification has been estimated to have the potential to save up to 2.500 fatalities annually in EU-27 when fully deployed, and furthermore to reduce the severity of injuries, to bring significant savings to the society in terms of healthcare and other costs and to reduce human suffering.

Emergency calls made from vehicles can assist with the objectives of significantly reducing road deaths and injuries, but drivers often have poor (imprecise) location-awareness, especially on interurban roads or abroad. Additionally, in many situations the car occupants may not be in a position to call using a normal mobile phone.

The situation is worse for those travelling abroad: a high (and increasing) number of vehicles travelling outside their home country is thus also contributing to the need for automated emergency call system in vehicles. In EU there are over 100 million trips to another EU country per year (EU-15) -65 % people feel less protected while abroad and most do not know which number to call in an emergency (in some countries over 60%). Language problems are pertinent and prohibit proper communication.

Yet, in the most crucial cases, the victim(s) may not be able to call because they have been injured/trapped, do not know the local number to call, and in many cases, particularly in rural situations and late at night, there may be no witnesses who happen to have a mobile phone and a sense of community.

The objective of implementing an in-vehicle emergency call system is to automate the notification of a traffic accident. One major benefit is to transmit data from the vehicle.

There are two means to provide an eCall from a vehicle:

a) One method is to use the pan European in vehicle emergency call "**eCall**", which sends the voice call and the data directly to the PSAP, using the emergency number 112.

b) Another method consists of using a "***Third Party Support for eCall"***, abbreviated as ***TPS-eCall*** inside this document. This is an eCall variant which includes the transmission of data to a third party service provider or TPSP, and the establishment of a voice call with this TPSP. In the case of a real emergency situation needing a rescue, the TPSP establishes a voice connection with the most appropriate PSAP. The TPSP also forwards all relevant information concerning the event, including the information specified by the MSD standard (EN 15722 (Intelligent transport systems - eSafety -'eCall' minimum set of data)) as a minimum, to this most appropriate PSAP. The TPSP also provides voice communication between

the PSAP and the vehicle occupants, at least by setting up a conference call, if this is required by any of the parties involved and allowed by the PSAP.

This European Standard specifies the generic operational requirements for the TPS-eCall.

This Standard is complementary to Pan European eCall EN 16072 (Intelligent transport systems — eSafety — Pan European eCall- Operating requirements) , and provides another means by which to provide the eCall service.

1 Scope

The objective of implementing a 'Third Party' emergency call is to provide emergency assistance and an automated notification of a traffic accident, using 'Third Party Supported' service packages where such services are supported between the vehicle and a 'Third Party Service Provider' in countries where such services are supported by PSAPs. It provides another means to provide the eCall service when compared to Pan European eCall as defined EN 16072 (Intelligent transport systems — eSafety — Pan European eCall- Operating requirements).

The first objective of this 'TPS-eCall' is to transfer an emergency message from a vehicle to a 'Third Party Service Provider' (TPSP) in the event of a crash or an emergency situation, and to establish a voice channel between the in-vehicle equipment and the TPSP.

The second objective of this 'TPS-eCall' is, in case of an emergency situation likely to require emergency assistance, for the TPSP to transfer an emergency message including the data of the 'Minimum Set of Data' (MSD) (as defined in EN 15722 {Intelligent transport systems - eSafety -'eCall' minimum set of data}) from the TPSP to the most appropriate PSAP and to make best efforts to establish a direct voice contact between that PSAP and the occupants of the vehicle if required by the PSAP.

This European Standard defines the general operating requirements and intrinsic procedures for an in-vehicle eCall via the services of a third party service provider.

This Standard also provides definition of the service(s) provided to the PSAP and the method and form of service delivery.

NOTE   An important part of the TPS-eCall is the "Minimum Set of Data" (MSD). The operating requirements for the MSD are determined in this European Standard, but the form and data content of the MSD is not defined herein. The common European MSD for eCall is determined in EN 15722 (Intelligent transport systems - eSafety -'eCall' minimum set of data). Additional data concepts may also be transferred, and it is recommended that any such data concepts be registered using a data registry as defined in ISO/EN 24978 (Intelligent transport systems - Emergency and safety messages - Data registry) to ensure that they can be understood by the recipient.

2 Normative references

The following referenced documents are indispensable for the application 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*

ISO 24978, *Intelligent transport systems - ITS safety and emergency messages – Data registry procedures*

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
112
single European emergency call number

3.2
data
representations of static or dynamic objects in a formalized manner suitable for communication, interpretation, or processing by humans or by machines

3.3
data concept
any of a group of data structures (i.e., object class, property, value domain, *data elements,* 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

3.4
data dictionary
organized and constructed (electronic data base) compilation of descriptions of *data concepts* that provides a consistent means for documenting, storing and retrieving the syntactical form (i.e., representational form) and the meaning and connotation of eCall *data concept*

NOTE   A data registry provides definition of the metadata concept, it does not store the values of individual instances. For example a data registry with a data concept 'registration plate identification of a vehicle' defines how the identification numbers/letters are represented. It does not contain a list of particular licence plates.

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, *association*, state, event) considered to be indivisible in a particular context

3.6
data registry
registration process to store data definitions, characterized in a consistent manner, as determined according to the provisions of an international standard, in a *data dictionary*

NOTE   neither a data registry nor a data dictionary provides a database of specific values of instances of the use of the registry/dictionary in an implementation

3.7
E164
ITU-T recommendation which defines the international public telecommunication numbering plan used in the PSTN and some other data networks

3.8
eCall
defined in EN 16072 Intelligent transport systems — eSafety — Pan European eCall - Operating requirements as "emergency call generated either automatically via activation of in-vehicle sensors or manually by the vehicle occupants; when activated, it provides notification and relevant location information to the most appropriate 'Public Safety Answering Point's, by means of *mobile wireless communications networks,* carries a defined standardised *Minimum Set of Data*, notifying that there has been an incident that requires response from the emergency services and establishes a voice channel between the occupants of the vehicle and the most appropriate *'Public Safety Answering Point'"*

3.9
IVS dataset
minimum set of vehicle-generated data elements which are essential for the performance of the TPS-eCall. The format and content of this 'IVS dataset' is not defined by this standard, but it must be possible for the service provider to create an MSD as defined in EN 15722 (Intelligent transport systems - eSafety -'eCall' minimum set of data) based on this 'IVS Dataset'

NOTE   This may be a sub-set of the MSD data elements, as some MSD elements can be inferred/looked-up from other elements by the TPSP

3.10
MSD/minimum set of data
standardised *data concept, as specified in EN 15722 (Intelligent transport systems - eSafety -'eCall' minimum set of data),* comprising *data elements* essential for the notification of a TPS-eCall to a PSAP

3.11
network access device (NAD)
see *mobile wireless communications network device*

3.12
panEuropean eCall
eCall provided by a 'Teleservice 12' mobile communication network, as defined in EN 16072 Intelligent transport systems — eSafety — Pan European eCall - Operating requirements

3.13
'Public Safety Answering Point' (PSAP)
physical location where emergency calls are first received under the responsibility of a public authority or a private organisation recognised by the government. *See also 'most appropriate' PSAP*

NOTE   A number of different instantiations of PSAP service are supported within this European Standard.

3.14
most appropriate PSAP
PSAP defined beforehand by national authorities to cover emergency calls from a certain area or for emergency calls of a certain type (*See also PSAP)*

NOTE   A number of different instantiations of PSAP service are supported within this European Standard. A PSAP may be a 'Public Authority' or a private service provider operating under the control of a 'Public Authority'.

3.15
PSAP emergency telephone number
telephone number, generally conformant with the E164 general numbering scheme, which a TPSP can dial internationally in order to establish a voice connection to the PSAP as part of a 'TPS-eCall notification'

3.16
PSAP emergency TSD-Push address
secure URL provided by a PSAP, which allows an approved 'TPS-eCall notifier' to push a 'TPS-eCall Set of Data', including a TPS-eCall unique reference identification, to this PSAP, using methods standardised in this document

3.17
TPS-eCall Set of Data (TSD)
dataset in a format standardised within this document, which can be used by a TPSP acting as a *'TPS-eCall notifier'* to forward details of a TPS-eCall to a PSAP

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3.18
TPS-eCall generator
occupant of a vehicle or equipment within a vehicle that has cause to trigger an TPS-eCall *transaction* by automatic or manual means

3.19
TPS-eCall responder
organisation specifically trained for managing assistance or emergency situations, which receives an TPS-eCall and notifies the vehicle or caller that the call has been received

NOTE   The *'TPS-eCall responder'* and *'TPS-eCall notifier'* will often be the same organisation but, to clarify the separate stages involved in a *TPS-eCall*, distinct roles and definitions are used in this standard.

3.20
TPS-eCall notification
notification from a *'TPS-eCall notifier'* to a *most appropriate PSAP* about a *TPS-eCall* requiring assistance from the emergency services, and provision of all relevant information concerning the event (if necessary collating data from the 'IVS dataset' and data from other sources), including the information specified by the MSD standard EN 15722 (Intelligent transport systems - eSafety -'eCall' minimum set of data) as a minimum

3.21
TPS-eCall notifier
organisation specifically trained for managing emergency situations, which performs a *'TPS-eCall notification'*.as a consequence of a *'TPS-eCall responder'* receiving a *TPS-eCall* requiring assistance from the emergency services

NOTE   The 'TPS-eCall notifier' shall also make best efforts to provide voice communication between the PSAP and the vehicle occupants, at least by setting up a conference call, if this is required by any of the parties involved.

NOTE   The *'TPS-eCall responder'* and *'TPS-eCall notifier'* will often be the same organisation but, to clarify the separate stages involved, distinct roles and definitions are used in this standard for each stage of the *TPS-eCall*.

3.22
TPS-eCall service
capability of a vehicle to be a 'TPS-eCall generator', triggering of an TPS-eCall *transaction*, intent of a TPSP to be a 'TPS-eCall responder' and provision of that response including where necessary a *'TPS-eCall notification'*

3.23
TPS-eCall transaction
transmission across a mobile network of a set of data from a vehicle to a TPS eCall responder and the establishment of a voice channel between the vehicle and the 'TPS-eCall responder'

3.24
TPS-eCall
"Third Party Service supported eCall"

eCall variant as described and defined in this standard

NOTE   In summary, it includes the transmission of the 'IVS Dataset' (plus possibly additional data) from the vehicle to a TPSP, and the establishment of a voice call with this TPSP. In the event of a real emergency situation likely to require assistance from the emergency services, the TPSP shall establish a voice connection   with the most appropriate PSAP. The TPSP shall also forward all relevant information concerning the event, including the information specified by the MSD standard (CEN 15722) as a minimum, to this most appropriate PSAP. The TPSP shall also provide voice communication between the PSAP and the vehicle occupants, at least by setting up a conference call, if this is required by any of the parties involved."

3.25
TPS in-vehicle equipment

equipment within the vehicle that provides or has access to in-vehicle data required for the *IVS-Dataset* to effect the *TPS-eCall transaction* via a *public mobile wireless communications network* providing a link between the vehicle and a *'TPS-eCall responder'*

3.26
TPS in-vehicle equipment provider
provider of '*TPS in-vehicle equipment'*

NOTE   the TPS in-vehicle equipment provider may be the vehicle manufacturer or the provider of aftermarket equipment

3.27
TPS in-vehicle system (TPS-IVS)
TPS in-vehicle equipment together with the means to trigger, manage and effect the TPS-eCall transaction

3.28
TPS in-vehicle system provider
provider of a '*TPS in-vehicle system'*

NOTE   the TPS in-vehicle system provider may be the vehicle manufacturer or the provider of aftermarket equipment

3.29
TPSP
'Third Party Service Provider' organisation, recognised by the national rescue authorities as being allowed to transmit TPS-eCall to them, and compliant with the requirements of this standard

NOTE   The TPSP has two roles, 'TPS-eCall responder' and 'TPS-eCall notifier'

3.30
TPSPCallbackNumber
telephone number of a prioritised voice contact at the TPSP call centre which can be used by the PSAP in case a subsequent callback is required to request more details about the emergency or even to speak to vehicle occupants.

3.31
TPS-eCall unique reference identification (TPS-eCall-UID)
unique standardised reference identification assigned by the TPSP to a given TPS-eCall

3.32
TPS-eCall short reference identification (TPS-eCall-SID)
shortened form of the *TPS-eCall-UID*, which is restricted to current and recent incidents, designed to be appropriate for forwarding verbally to a PSAP operator, to allow less-equipped PSAPs to refer to a specific 'TPS-eCall Set of Data' for a current or recent incident

3.33
vehicle manufacturer
entity which first assembles the vehicle and may provide a *'TPS in-vehicle system'* as part of its specification and subsequently sells the vehicle directly or via an agent

3.34
vehicle occupant(s)
person(s) inside the vehicle

3.35
VehiclePhoneNumber
The telephone number of the 'In-Vehicle-System'. This number may be used to attempt a call back to the vehicle.

4 Symbols and abbreviated terms

ACD   Automatic Call Distribution

GNSS   global navigation satellite system

GSM   global system for mobile communications

HMI   human machine interface

TPS-IVS   TPS In-vehicle system

MSD   minimum set of data

MNO   mobile network operator

NAD   network access device (e.g. a GSM or UMTS module)

PSAP   public safety answering point

TPS   third party services

TPSP   third party service provider

5 Requirements

The requirements for compliance with this European Standard are defined in Clauses 6 through to and including clause 11.

6 High level functional requirements

6.1 General high level functional requirements

The high level functional requirements of the *TPS-eCall service* are as follows:

— The 'Third Party' services of a given service provider supporting TPS-eCall in countries for which the necessary organisation has been set up, shall provide an eCall service

— In the event of an accident, the TPS-IVS shall automatically determine whether or not to trigger an TPS-eCall and, when appropriate, make such a call automatically

— A TPS-eCall shall also be able to be triggered manually, for emergency situations

— The in-vehicle system shall include an integrated network access device (NAD), e.g. a GSM module (including a valid and activated SIM Card) and a GNSS system. Upon triggering a TPS-eCall, 'triggering'

as defined in section 9.2 of this standard, the TPS IVS shall attempt to send an 'IVS dataset', to the relevant 'TPS-eCall responder'.

NOTE   If some data elements can be accurately inferred by the TPSP (e.g. vehicle type based on a VIN), these elements may not necessarily be sent from the vehicle. Additional information may be provided to by the TPSP

— A 'Third Party Service Provider' shall act as a 'TPS-eCall responder' to receive and respond to a 'TPS-eCall transaction' from the vehicle, including determining whether or not assistance is required from the emergency services.

— The TPSP operator shall handle the call, determine whether rescue assistance is needed, and in case of an actual emergency situation, the TPSP shall alert the most appropriate PSAP, and provide the most appropriate PSAP with all the relevant information (as determined in this European Standard).

NOTE   additional information may be provided to the PSAP

— In case of a real emergency requiring assistance from the emergency services, a TPSP:

  — shall act as a 'TPS-eCall notifier' to request such assistance from the most appropriate PSAP; to provide the most appropriate PSAP with all relevant information (as determined in this European Standard).; and if necessary to provide voice communication between the PSAP and the vehicle occupants

  — shall make best efforts to establish a voice connection initially between the vehicle and the relevant TPSP and subsequently shall make best efforts to make a direct voice connection between the occupants of the vehicle and the PSAP if this is required by the PSAP (See also 6.3).

— The TPSP shall be able to re-establish the voice communication with the vehicle, so long as the VehiclePhoneNumber is known.

6.2 TPS-eCall generic architecture

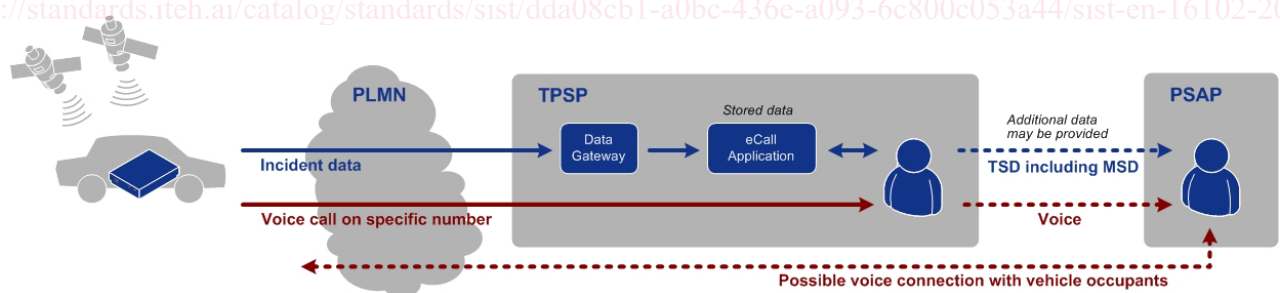A very high level generic architecture for TPS-eCall is described in Figure 1.

Figure 1 — TPS-eCall system overview

The relationship between the TPS eCall and the Pan European eCall is shown in Figure 2 below:
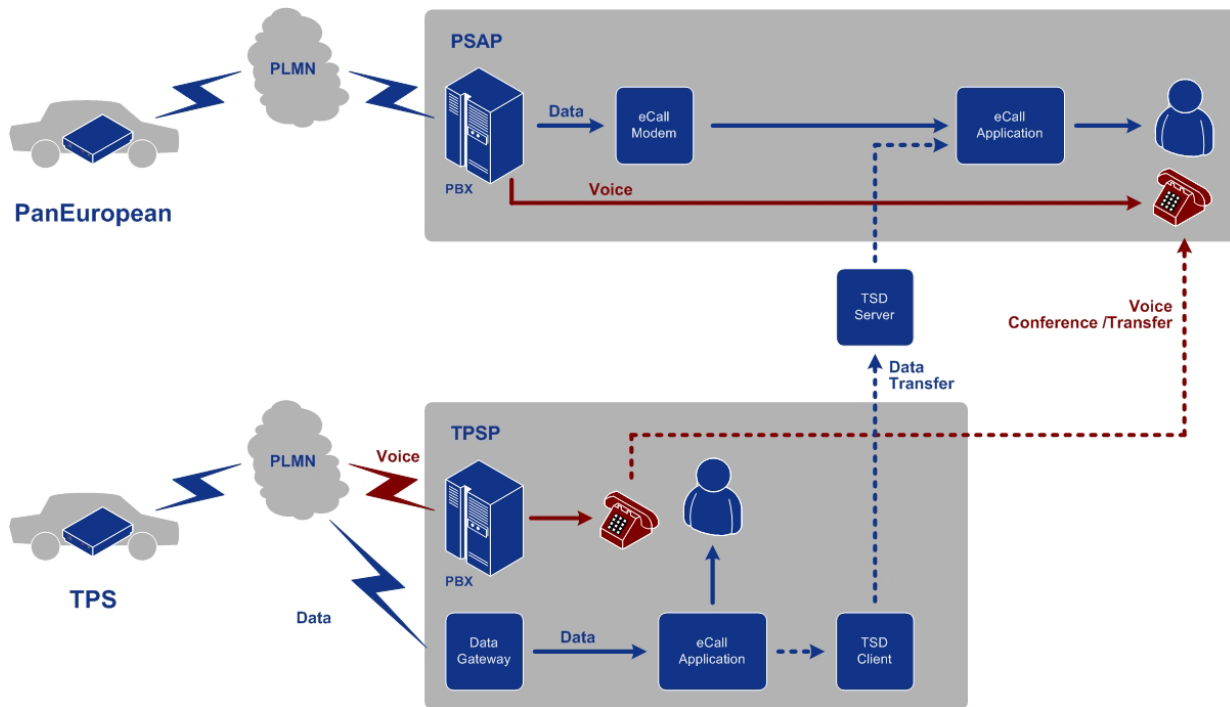
Figure 2 — End-to-end Pan-European eCall and TPS eCall systems connected to an eCall enabled PSAP

6.3 TPS-eCall operation sequence

The generic TPS-eCall functional operational sequence is as follows:

The 'TPS-eCall generator' initiates the TPS-eCall by whatever means (such as sensors/vehicle-processors) automatically triggered and/or manually triggered. The TPS-eCall (between car and TPSP) consists of two elements:

a)   the data (IVS-Dataset) provided by the TPS-IVS

b)   voice (audio) call between the TPSP and the occupants of the vehicle

The mobile network operator (MNO) shall treat the TPS-eCall as any other call, and shall include the caller line identifier (CLI).

The MNO shall establish the E164 call and transmit the data to the appropriate TPSP, according to the relevant subscriber service level agreement.

It shall be possible to verify whether the data has been properly received or not, and a mechanism shall be provided in order to retransmit the data if necessary.

The TPSP shall then send the MSD to the most appropriate PSAP (if necessary collating data from the IVS data and data from other sources) in a format compatible with CEN 15722 (eCall – Minimum set of data), and the TPSP shall make best efforts to establish a direct voice link between the PSAP and the occupants of the vehicle, if this is required by the PSAP.