SLOVENSKI STANDARD
SIST-TS CEN/TS 17182:2019

01-januar-2019

Inteligentni transportni sistemi - e-Varnost - e-Klic prek postaje ITS

Intelligent transport systems - eSafety - eCall via an ITS-station

Intelligente Verkehrssysteme - eSicherheit - eCall über eine ITS-Station

Systèmes de transport intelligents - ESafety - eCall via une station ITS

Ta slovenski standard je istoveten z: **CEN/TS 17182:2018**

ICS:

35.240.60	Uporabniške rešitve IT v prometu	IT applications in transport

SIST-TS CEN/TS 17182:2019 **en,fr,de**

TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

CEN/TS 17182

October 2018

ICS 35.240.60

English Version

Intelligent transport systems - eSafety - eCall via an ITS-station

Systèmes de transport intelligents - ESafety - eCall via une station ITS

Intelligente Verkehrssysteme - eSicherheit - eCall über eine ITS-Station

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

Ref. No. CEN/TS 17182:2018 E

Contents

Page

European foreword 4
Introduction 5
1 Scope 6
2 Normative references 6
3 Terms and definitions 7
4 Symbols and abbreviations 9
5 Conformance 11
6 General overview of the eCall session for 112-European eCall via an ISO 21217 compliant ITS station unit 11
6.1 Pan European eCall 11
6.2 eCall via circuit switched networks 11
6.3 eCall using SIP and IMS (IMS-eCall) 12
6.4 Hybrid communications in an ITS station 13
7 General Requirements 16
8 Specific ITS-station requirements 16
8.1 eCall ITS-S application process identifiers 16
8.2 Secure installation of the eCall ITS-S application process in an ITS-SU 17
8.3 Registration of the eCall ITS-S application process in an ITS-SU 17
8.4 Activation of the eCall service in an ITS-SU 17
8.5 Call set-up 18
8.5.1 General 18
8.5.2 Flow registration 18
8.6 Procedures 21
8.6.1 Mandatory preferred operational mode 21
8.6.2 Mandatory fall-back mode 21
8.6.3 Optional fall-back mode 21
8.7 SIP protocol stack 21
8.8 Voice interface in an ITS-SU 22
Annex A (normative) EN ISO 17423 communication requirements 23
A.1 General 23
A.2 Mandatory preferred mode CSPs 23
A.3 Optional fall-back mode CSPs 25
Annex B (normative) Using localized communications 28
B.1 Preconditions 28
B.2 General information 28
B.3 V-ITS-SU architecture overview 31
B.4 Networking options 32

B.5 Requirements **34**
B.5.1 Pre-conditions **34**
B.5.2 General requirements for service advertisement **34**
B.5.3 Requirements for service advertisement specific to *eCall* **35**
Annex C (informative) **Table of timings** **36**
Annex D (informative) **Extracts from REGULATION (EU) 2015/758 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL** **39**
Bibliography **40**

European foreword

This document (CEN/TS 17182:2018) 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.

Introduction

As a result of European Regulation, from 2018, all new model Class M1/N1 vehicles (3.13) will be equipped with112-eCall (3.1). Other model class M1/N1 vehicles may be voluntarily equipped with 112-eCall (3.1), and work is underway to provide the benefit of eCall to other classes of vehicle, including commercial vehicles (3.5), busses and coaches.

In the event of an incident, in-vehicle sensors will automatically trigger a 112-eCall (3.1), or it may be manually triggered by the vehicle occupants. A voice connection is established with the European emergency number 112 and routed to the most appropriate Public Safety Answering Point (3.15) (PSAP). As soon as the connection is established, in the case of a GSM/UMTS connection, using circuit switched networks, a "Minimum set of data" (3.14) (as defined in EN 15722), providing information such as the time, location, vehicle VIN number, and driving direction, is sent as data via the voice channel. With the advent of packet switched, IP addressed, networks, a variant has been developed, that establishes an IMS connection (IMS supports IP multimedia applications (3.4) via IP multimedia sessions over a multitude of IP Connectivity Access Networks, such as E-UTRAN, UTRAN, GERAN, LAN, DOCSIS®, WiMAX™, cdma2000® and DVB-RCS2 access) in which the MSD is part of the SIP message header, so is already available to the PSAP as soon as the communication link is established.

The cooperative ITS (C-ITS) environment is one where ITS station units (ITS-SUs) (e.g. in vehicles, at the roadside,...) securely cooperate to exchange data with other ITS-SUs using wireless communications technologies. The C-ITS approach provides for hybrid communications (3.11), i.e. simultaneous availability of multiple wireless communications technologies. There is already provision for such networks at 5,8 GHz (widely already used for road tolling and soon to be used for tachograph monitoring and weigh in motion monitoring), 5,9 GHz for road safety applications (3.4), and of course the packet switched cellular networks mentioned above. In the future, 60 GHz and other wireless networks may be employed.

The key to managing these cooperative systems is an ITS station and communications architecture which enables operation of ITS applications (3.4) in a managed, secure, and prioritized way. This is support of a functionality rather than a specification of a single black box, and may be achieved in different ways within e.g. vehicle ITS-SUs. The common functionality is defined in ISO 21217:2014 (Intelligent transport systems – Communications access for land mobiles (CALM) – Architecture) whose abstract defines *"ISO 21217:2014 describes the communications reference architecture of nodes called "ITS station units" designed for deployment in intelligent transport systems (ITS) communication networks. The ITS station reference architecture is described in an abstract way. While ISO 21217:2014 describes a number of ITS station elements, whether or not a particular element is implemented in an ITS station unit depends on the specific communication requirements of the implementation.*

ISO 21217:2014 also describes the various communication modes for peer-to-peer communications over various networks between ITS communication nodes. These nodes may be ITS station units as described in ISO 21217:2014 or any other reachable nodes.

ISO 21217:2014 also specifies the minimum set of normative requirements for a physical instantiation of the ITS station based on the principles of a bounded secured managed domain."

Within vehicles equipped to support this context, it is appropriate to consider eCall as a priority ITS application (3.4) that can use this in-vehicle functionality, rather than duplicate the in-vehicle equipment.

This Technical Specification provides the specifications enabling 112-eCall (3.1) to function via an ISO 21217 complaint "ITS-station unit". (ITS-SU).

1 Scope

In respect of 112-eCall (3.1) (operating requirements defined in EN 16072:2015), this Technical Specification defines the high level application protocols (3.10), procedures and processes required to provide the eCall service via an ISO 21217 compliant "ITS station unit"

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 'Public Land Mobile Network' (PLMN) (such as ETSI prime medium) which supports the European harmonized 112/E112 emergency number and to provide a means of manually triggering the notification of an emergency incident.

NOTE 2 Requirements for third party services supporting eCall can be found in EN 16102 [6], and have been developed in conjunction with the development of EN 16072:2015 and EN 16072:2015, and are consistent in respect of the interface to the PSAP. This technical specification applies only to 112-eCall (3.1) service provision and makes no specifications in respect of third party eCall service provision, and the reader is referred to EN 16102 [6] for any third party eCall specifications.

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.

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

CEN/TS 17240[1], *Intelligent transport systems - ESafety - ECall end to end conformance testing for IMS packet switched based systems*

EN 15722:2015, *Intelligent transport systems — ESafety — ECall minimum set of data*

EN 16062:2015, *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 16454:2015, *Intelligent transport systems — ESafety — ECall end to end conformance testing*

EN ISO 17419:2018, *Intelligent transport systems — Cooperative systems — Globally unique identification (ISO 17419)*

EN ISO 17423:2018, *Intelligent transport systems — Cooperative systems — Application requirements and objectives (ISO 17423)*

CEN ISO/TS 21176, *Intelligent transport systems — Cooperative ITS — Position, velocity and time functionality in the ITS station*

ISO/TS 16460:2016, *Intelligent transport systems — Communications access for land mobiles (CALM) — Communication protocol messages for global usage*

[1] Under preparation. Stage at the time of publication: FprCEN/TS 17240:2018.

ISO 21217:2014, *Intelligent transport systems — Communications access for land mobiles (CALM) — Architecture*

ISO 22418:2018, *Intelligent transport systems — Fast service announcement protocol (FSAP)*

ISO 24102-6:2018, *Intelligent transport systems — ITS station management — Part 6: Path and flow management*

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

ETSI TS 122 003, *Digital cellular communications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Circuit Teleservices supported by a Public Land Mobile Network (PLMN) (Teleservice 12/TC12) /E12)* [Release 8 or later]

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 21217:2014, ISO 22418:2018, EN ISO 17419:2018, EN ISO 17423:2018, ISO 24102-6:2018, CEN/TS 17184:2018 and the following 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-eCall

pan-European *eCall* regulated by the European Union as a required service provision for all M1/N1 class new model vehicles from 2018, and provided using circuit switched cellular wireless networks (GSM/UMTS)

3.2
112 emergency voice call
voice telephone call between a caller who dials a recognised emergency services telephone number (e.g. 112) and a PSAP emergency services responder

3.3
112 IMS-eCall
pan-European *eCall* provided using IMS over packet switched cellular wireless networks (e.g. E_UTRAN/LTE etc.)

3.4
application
instantiation of a service, typically provided by one or several software modules

3.5
commercial vehicle
classes of vehicles such as heavy goods vehicles used for the transportation of goods and subject to additional requirements and controls, especially in respect to movement (Typically UNECE classes N, O and in some cases N6)

3.6
eCall
emergency call generated either automatically via activation of in-vehicle sensors or manually by the vehicle occupants (the eCall generator)

Note 1 to entry: when activated, it provides notification and relevant location information to the most appropriate Public Safety Answering Point (PSAP) (3.15), by means of mobile wireless communications networks and carries a defined standardized Minimum set of data (3.14), 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
engine control activation
vehicle is in use (previously and commonly referred to as “ignition on”) this term embraces a similar condition for electric, hybrid, and stop/start vehicles)

3.8
first ITS relay station unit
roadside ITS station unit acting as an eCall forwarding service advertiser

Note 1 to entry: The first ITS relay station unit may also be the last ITS relay station unit (3.12)

3.9
Flow ID
(ITS-S flow identifier)
identifier, unique within an ITS station unit, that identifies an ITS-S flow

[SOURCE: ISO 24102-6]

3.10
high level application protocols
set form and sequence in which data must be presented for handling by a particular computer application (3.4), especially in the transmission of information between different computer systems, in order to accurately effect the transactions of an application

3.11
hybrid communications
approach for communications using simultaneously a variety of access technologies according to the communication needs of ITS-S application processes

3.12
last ITS relay station unit
roadside or central ITS station unit directly accessing a cellular network for connecting to a PSAP

Note 1 to entry: The last ITS relay station unit may also be the first ITS relay station unit (3.8)

3.13
M1/N1 vehicles
vehicles of the UNECE classification M1 (Power-driven vehicles having at least four wheels and used for the carriage of passengers/Vehicles used for the carriage of passengers and comprising not more than eight seats in addition to the driver's seat. (Passenger car)) and N1 (Power-driven vehicles having at least four wheels and used for the carriage of goods/ Vehicles used for the carriage of goods and having a maximum mass not exceeding 3.5 tonnes. (Pick-up Truck, Van))

3.14
minimum set of data
standardized data concept comprising data elements of relevant vehicle generated data essential for the performance of the eCall service

[SOURCE: EN 15722:2015]

3.15
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

3.16
SIP header
component of a SIP message that conveys information about the message

4 Symbols and abbreviations

3GPP	3rd Generation Partnership Project
APDU	Application Protocol Data Unit
API	Application Program Interface
CCH	Control Channel
CDMA 2000	code-division multiple access version of IMT-2000 standard
CI	Communication Interface, (see ISO 21218)
C-ITS-SU	Central Intelligent Transport System-Station Unit
CN	Communication Network
CS	Circuit Switched
CSP	Communication Service Parameters
DOCSYS	Data Over Cable Service Interface Specification
DVB-RCS2	Digital Video Broadcasting - Return Channel via Satellite or (Return channel over system)
EN	European Norm
ETSI	European Telecommunications Standards Institut
E-UTRAN	Evolved Universal Terrestrial Radio Access Network
FA-SAP	Service access point between ITS-S facilities layer and ITS-S application entity
FNTP	Fast Networking and Transport-layer Protocol
FSAM	Fast Service Advertisement Message
FSAP	Fast Service Advertisement Protocol
FSRM	Fast Service Response Message
GERAN	GSM EDGE Radio Access Network

GNSS	Global Navigation Satellite System
GSM	Global System Mobile
HLAP	High Level Application Protocols
IETF	Internet Engineering Task Force
IMS	Internet Protocol Multimedia Subsystem
IN-SAP	Service access point between ITS-S access layer and ITS-S networking and transport layer
IP	Internet Protocol
ITS	Intelligent Transport Systems
ITS-AID	ITS Application Identifier
ITS-SAPID	ITS S application process identifer
ITS-SAPIID	ITS-S application process instance identifer
ITS-SAPSSID	ITS-S application process sink source identifier
ITS-SCU-ID	ITS station communication unit identifier
ITS-SU	Intelligent Transport Systems-Station Unit
LTE	Long Term Evolution
MF-SAP	Service access point between ITS-S management entity and ITS-S networking and transport layer
MI-SAP	Service access point between ITS-S management entity and ITS-S access layer
MNO	Mobile Network Operator
MN-SAP	Service access point between ITS-S management entity and ITS-S networking and transport layer
MSD	Minimum Set of Data
n.a.	not applicable
NF-SAP	Service access point between ITS-S networking and transport layer and ITS-S facilities layer
PARES	Public Authority responsible for Emergency Services
PLMN	Public Land Mobile Network
PS	Packet Switched
PSAP	Public Safety Answering Point
R-ITS-SU	Roadside ITS Station Unit
Rx	Receive
SAM	Service Advertisement Message
SIP	Session Initiation Protocol
SIP-BYE	SIP- BYE is a request used to terminate a specific session or attempted session
TCP	Transmission Control Protocol
TS	Technical Specification

Tx	Transmit
UMTS	Universal Mobile Telecommunications Service
UNECE	United Nations Economic Commission for Europe
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
URN	Uniform Resource Name
UTRAN	Universal Terrestrial Radio Access Network
V-ITS-SU	Vehicle-Intelligent Transport System-System Unit
VoIP	Voice over Internet Protocol
V-to-x	Vehicle-to-any compatible transceiver
WiFi	"Wireless Fidelity"; wireless networking technology that allows computers and other devices to communicate over a wireless signal
WIMAX	Worldwide Interoperability for Microwave Access

5 Conformance

This Technical Specification makes no conformance specifications or requirements in respect of TPS eCall operating requirements which can be found in EN 16102 [6]. Conformance requirements for eCall applicable for this Technical Specification are to be found in CEN/TS 17240 in respect of packet switched eCall, and in EN 16454:2015 in respect of circuit switched eCall.

6 General overview of the eCall session for 112-European eCall via an ISO 21217 compliant ITS station unit

6.1 Pan European eCall

In the introduction to EN 16072:2015, eCall is described as:

"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 response from the emergency services and establishes an audio channel between the occupants of the vehicle and the most appropriate Public Safety Answering Point (PSAP)."

A Minimum set of data (3.14) (MSD) to be provided to the PSAP in the eCall message is specified in EN 15722:2015.

6.2 eCall via circuit switched networks

In ETSI/3GPP circuit switched networks the eCall is identified as 'an emergency call with a specific service category'. The long number is not dialled as the teleservice identifiers inform the mobile network operator (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 MSD to the PSAP by sending acoustic data down the voice channel, before opening up the line to enable conversation between the PSAP operator and the occupants of the vehicle (see EN 16062:2015)