

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 16405

May 2022

ICS 03.220.20; 35.240.60

Will supersede CEN/TS 16405:2017

English Version

Intelligent transport systems - ECall - Additional data concept specification for cargo in vehicles

Intelligente Verkehrssysteme - eCall - Zusätzliches
Datenkonzeptspezifikation für Fracht in Fahrzeugen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 278.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



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

Foreword	Error! Bookmark not defined.
Introduction	Error! Bookmark not defined.
5.1 General.....	Error! Bookmark not defined.
5.2 eCall Requirements for cargo information	Error! Bookmark not defined.
5.2.1 PSAP requirements.....	Error! Bookmark not defined.
5.2.2 Information providers requirements.....	Error! Bookmark not defined.
5.3 Concepts and formats	Error! Bookmark not defined.
5.3.1 MSD data concepts	Error! Bookmark not defined.
5.3.2 Representation of MSD data concepts.....	Error! Bookmark not defined.
5.3.3 Distribution of MSD data	Error! Bookmark not defined.
5.3.4 Commercial vehicles cargo additional data concept 'Object Identifier'	Error! Bookmark not defined.
5.3.5 Commercial vehicles cargo additional data concept 'data'	Error! Bookmark not defined.
5.4 Contents of the 'Minimum Set of Data' (MSD)	Error! Bookmark not defined.
5.4.1 Basic contents of MSD	Error! Bookmark not defined.
5.4.2 Contents of the optionalAdditionalData for Schema A	Error! Bookmark not defined.
5.4.3 Contents of the optionalAdditionalData for Schema B	Error! Bookmark not defined.
Annex A (normative) ASN.1 definition of additional data concept for cargo	Error! Bookmark not defined.
A.1 General.....	Error! Bookmark not defined.
A.2 Definition of Schema A additional data concept.....	Error! Bookmark not defined.
A.2.1 ASN.1 definition	Error! Bookmark not defined.
A.2.2 Syntax check of ASN.1 definition	Error! Bookmark not defined.
A.2.3 Example	Error! Bookmark not defined.
A.3 Definition of Schema B additional data concept.....	Error! Bookmark not defined.
A.3.1 General.....	Error! Bookmark not defined.
A.3.2 ASN.1 definition	Error! Bookmark not defined.
A.3.3 Syntax check.....	Error! Bookmark not defined.
A.3.4 Example	Error! Bookmark not defined.
Annex B (informative) ASN.1 definition of complete MSD message with cargo info	Error! Bookmark not defined.
B.1 General.....	Error! Bookmark not defined.
B.2 ASN.1 definition of complete extended MSD message, cargo Schema A.....	Error! Bookmark not defined.
B.3 Example	Error! Bookmark not defined.
Annex C (informative) Schema B use case scenario.....	Error! Bookmark not defined.
Bibliography.....	Error! Bookmark not defined.

European foreword

This document (prEN 16405:2021) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems”, the secretariat of which is held by NEN.

This document is currently submitted to the CEN Enquiry.

This document supersedes CEN/TS 16405:2017.

A Technical Report on this subject, proposing these specifications, was approved in 2012 (CEN/TR 16405), for field testing. The proposed specifications have subsequently been tested in the field (by EC Project HeERO and others). This resulted in a Technical Specification (CEN/TS 16405) in 2017 of which the semantic content remained unchanged. However as the parent Standard EN 15722 (eCall Minimum Set of Data) had been revised and updated, the Technical Specification was made consistent with the layout and specifications of the revised EN 15722.

The 2017 Technical Specification has been used in several other pilot projects and part of the analysis undertaken by the 2018 special project team that delivered Technical Reports 17249-X. The input of the pilot projects and the project team resulted in revisions to the Technical Specification, allowing it to be promoted to a standard. As such this document describes the first version of EN 16405.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[oSIST prEN 16405:2022](https://standards.iteh.ai/catalog/standards/sist/82cdd743-a812-48fd-8bc8-5a0adf6410b4/osist-pren-16405-2022)

<https://standards.iteh.ai/catalog/standards/sist/82cdd743-a812-48fd-8bc8-5a0adf6410b4/osist-pren-16405-2022>

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' (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 PSAP.

The MSD (specified in EN 15722) contains static information regarding the vehicle, dynamic information regarding its location, direction of travel etc., at the time of the incident, and makes provision for additional data to be provided.

This document provides specification for an additional data concept for (commercial) vehicles to provide dynamic data about the cargo that it is carrying at the time of the incident that triggered the *eCall*, with specific emphasis on identification of dangerous goods. Two variants are provided, one (schema A) for use if information about the goods (ADR classified or not) is known in the eCall device; the second variant (schema B) is for use if information about the load has to be fetched from other sources.

The preceding Technical Specification was tested in demonstration projects (such as HeERO) and further elaborated by a technical project team delivering TS 17429-2. Results of these are incorporated in this document, now becoming a European Standard.

In order to claim conformance with this document, communication is to be established using accepted wireless communication standards, and it is to be able to demonstrate that the MSD transferred together with any standardized data elements defined herein comply with the specifications of this document, to the extent that such data are available from the vehicle.

Revisions in regards to the preceding Technical Specification (TS16405:2017) are:

- Addition of requirements clauses (5.2)
- Corrections made in paragraph 5.4.2 (Table 2) to properly reflect ASN.1 recipe ;
- Extended the allowed types of transport;
- Extended usability of the phone number supplied;
- Added a version number to the OID;
- Improvements in the precision of technical description and update of references;
- Creation of EN;

1 Scope

This document defines an additional data concept that can be transferred as an additional data concept as defined in EN 15722 eCall MSD, that can be transferred from a goods carrying vehicle to a PSAP in the event of a crash or emergency via an *eCall* communication session. Two variants are provided, one (schema A) for use where information about the goods (ADR classified or not) is known in the eCall device; the second variant (schema B) is for use where such information is fetched from elsewhere.

NOTE This document is complementary and additional to EN 15722; and contains as little redundancy as possible.

The communications media protocols and methods for the transmission of the *eCall* message are not specified in this document. Its contents are independent of the protocols and methods used.

Other additional data concepts can also be transferred, and any such data concepts are registered using a data registry, see EN ISO 24978 for additional information, and www.esafetydata.com for an example.

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*

ISO/IEC 8825-2, *Information technology — ASN.1 encoding rules — Part 2: Specification of Packed Encoding Rules (PER)*

EN ISO 24978, *Intelligent transport systems - ITS Safety and emergency messages using any available wireless media - Data registry procedures (ISO 24978)*

3 Terms and definitions

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

3.1

112

single European emergency call number supporting Teleservice 12

[SOURCE: ETSI/TS 122 003]

3.2

ADR

United Nations treaty that governs transnational transport of hazardous materials, known as *Agreement of 30 September 1957 concerning the international carriage of Dangerous goods by Road* or *Accord relatif au transport international des marchandises Dangereuses par Route*

3.3

ASN.1

Abstract Syntax Notation One

notation that describes rules and structures for representing, encoding, transmitting, and decoding data enabling representation of objects that are independent of machine-specific encoding techniques

prEN 16405:2022 (E)**3.4****commercial vehicle**

mechanically propelled road vehicle (mostly vehicle type N1, N2 or N3) that is of a construction primarily suited for the carriage of goods or burden of any kind (not including people) and travelling on a road laden

Note 1 to entry: This explicitly excludes busses or other vehicles designed and constructed for the carriage of passengers (ie. vehicle types M1, M2 or M3). It however includes vehicles designed or adapted to carry goods in other vehicle types (like: O). Any such vehicle may or may not have a maximum weight exceeding 3,500 tonnes

3.5**dangerous goods**

categories of goods carried by road characterised as articles or substances which are capable of posing a significant risk to health, safety or to property when transported

3.6**eCall**

emergency call generated either automatically via activation of in-vehicle sensors or manually by the vehicle occupants

Note 1 to entry: When activated it 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' 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**Kemler code**

code describing the hazards of a chemical in transport, also known as Hazard Identification Number (HIN)

3.8**uniform resource identifier****URI**

string of characters used to identify a name or a resource on the Internet

3.9**uniform resource locator****URL**

URI that, in addition to identifying a resource, provides a means of locating the resource by describing its primary access mechanism

EXAMPLE Its network location

4 Symbols and abbreviations

ETSI	European Telecommunications Standards Institute
M	Mandatory
MSD	Minimum set of data
O	Optional
PER	Packed Encoding Rules (ASN.1)

PSAP Public Safety Answering Point

UPER Unaligned Packed Encoding Rules (ASN.1)

5 Requirements

5.1 General

This document describes an addendum to the standard defined in EN 15722 for the coding of the MSD message. Any requirement from EN 15722 shall be met for the exchange of information about cargo in the additional data block.

5.2 eCall Requirements for cargo information

5.2.1 PSAP requirements

Previous research has laid down some ground rules for information that is exchanged within the eCall paradigm. Basically, any information should adhere to these requirements:

- Information shall be 'machine interpretable'
- Information shall either be sent in human readable form, or automatically be translated into this
- Information shall be concise and well structured
- Information shall be accurate and up to date

Focussing on the emergency process, research has shown that PSAPs and emergency services need specific information in case of an accident with the commercial vehicle, vital in ensuring that the right resources are dispatched. Obviously, a large part of this need overlaps with what is already implemented with the basic eCall mechanism, these elements are marked with an asterisk:

1. Exact location of incident/collision/vehicle including direction of travel, prior to the collision or incident*
2. Vehicle Information:
 - VIN*
 - Make, Model, Type (Rigid, Articulated) * (via EUCARIS, local registry or VIN decoder)
 - Type of fuel (Diesel/LPG/Electric) * (via EUCARIS or local registry)
 - Registration number* (via EUCARIS or local registry)
3. Vehicle Cargo
 - For any Dangerous Goods in the cargo:
 - o UN-Number
 - o Quantity
 - o Packaging danger level code (optional)
 - o Kemmler Code (optional)

prEN 16405:2022 (E)

- For other, non dangerous, Goods:
 - o Quantity
 - o Type of good (optional)
- Regardless of cargo type:
 - o Phone number of Expert (optional)
 - o Sender details (optional)
 - o Receiver details (optional)

5.2.2 Information providers requirements

The information providers (mostly transport companies) benefit from a speedy emergency and recovery process but do have requirements as well. They obviously want to limit the resources spent to be able to share information with the PSAPs. But perhaps more important is the security and confidentiality of the data.

It is a necessity that only certified PSAPs are allowed to use the interface for eCall and that a request for data can only be made when an eCall was received. Any (exchange) protocol should ensure both requirements. The first condition can be met by several security mechanisms including the exchange of keys or based on private connections.

To ensure that a request is only made in case an eCall was received, the exchange protocol should involve one or more key elements that come from the MSD provided by an IVS in a vehicle and are not otherwise known, other than by the freight information service provider. A random number serves this purpose, whereas well-known keys like VIN or the license plate number cannot be used as a key (although the key can be the VIN encrypted with the private key of the service provider).

5.3 Concepts and formats**5.3.1 MSD data concepts**

The MSD as defined in EN 15722 is a direct, timely message to the PSAP operator receiving the emergency call.

The MSD has an optional additional data block that will be used to add information elements containing information about the load of the vehicle involved.

The information elements in the additional data block of the MSD have been selected on the basis of their relevance in an emergency rescue situation.

5.3.2 Representation of MSD data concepts

The MSD is represented in 'Abstract Syntax Notation' (ASN.1) using the 'Unaligned Packed Encoding Rules' (UPER) as defined in ISO/IEC 8825-2 using the ASN1 definitions defined in Annex A of EN 15722. The message shall be sent in the sequence defined in that same Annex.

The information about the cargo of the vehicle sending the MSD shall be represented in ASN.1 UPER as well, following the provision made in above named Annex.

5.3.3 Distribution of MSD data

The MSD shall be transmitted as described in EN 15722.

5.3.4 Commercial vehicles cargo additional data concept 'Object Identifier'

The object identifier uniquely identifies the format and meaning of the data which follows in the additional data concept.

Both the syntax of the data structure and the semantic meaning of the content is referenced via this identifier so that it can be usefully applied.

The uniqueness of each specific relative identifier is ensured by a specific international standardizations body, and maintained in a data registry operated in accordance with EN ISO 24978. These identifiers are all relative to a specific root. And the root of all *eCall* relative OID's shall be the same.

eCall has been allocated the OID 1.0.14817.106.2.1. Within this, arc '.2' has been defined to contain 'eCall Additional Data concepts'. The OID for this deliverable shall be 1.0.14817.106.2.1.2.1.

This deliverable defines two schemes that each have their own unique OID:

Schema A: 1.0.14817.106.2.1.2.1.1.1

Schema B: 1.0.14817.106.2.1.2.1.2.1

The OID for 'eCall Additional Data concepts' (1.0.14817.106.2.1.2) is fixed and shall not be transmitted over the air as part of the additional data. The MSD data element 'oid' is defined as RELATIVE-OID and shall contain 1.1 if Schema A is used, or 1.2 if Scheme B is used. In order to be able to discriminate between this and future versions, an additional .1 is added.

For further detail regarding the use of OIDs in *eCall*, see EN 15722.

5.3.5 Commercial vehicles cargo additional data concept 'data'

The objective of the cargo data concept is to provide the PSAP with data concerning the load of the affected vehicle transmitting the MSD.

Two variants are provided, one (schema A) for use where information about the goods (ADR classified or not) is known in the *eCall* device; the second variant (schema B) is for use where load information should be fetched from elsewhere.

Paramount priority is given to the transmission of data relating to dangerous/dangerous goods Provision is also made to transfer data concerning other (non ADR) cargos. While these cargos may not be classified as dangerous/dangerous, in the event of an accident they may cause increased risk of accident or problems for the emergency services – for example livestock; small materials such as ball bearings, liquids, manure or other materials likely to affect the surface tension of the roadway surface or present obstacles on the roadway.

The data concept will take up slightly less than the amount of bytes available for the additional data in the MSD, using the maximum message length limit as defined in EN 15722 (140 bytes). As such there is no risk of the complete MSD to exceed the maximum number of bytes allowed by using this data concept.

5.4 Contents of the 'Minimum Set of Data' (MSD)

5.4.1 General

The following subclauses provide the definition of the minimum set of data that shall be sent from the vehicle in case of an emergency call.

5.4.2 Basic contents of MSD

Table 1 provides a summary of the semantic contents of the MSD, for a full description please refer to EN 15722.

Table 1 — Contents/format of the MSD data concept

MSD					
msdVersion	INTEGER (1..255)	-	M		
msd					
msdStructure					
optionalAdditionalData			O		
oid	RELATIVE- OID				
data	OCTET STRING				
M: Mandatory data field (ie. mandatory if this encoding scheme is used)					
O: Optional data field					

This document describes the contents of the optionalAdditionalData block.

5.4.3 Contents of the optionalAdditionalData for Schema A

Table 2 provides a summary of the semantic contents of the optionalAdditionalData part of the MSD for Schema A.

The sequence of data presentation shall be as specified in Table 2, represented as described in this clause and distributed as described in this clause.

For clarity the 'type' used in Table 2 is a semantic representation of the type used in the ASN.1 definition. The exact representation is found in Annex A.

The real position of the element in the data-stream is defined by the ASN.1 'unaligned packet encoding rules (UPER), following the definition in Annex A. Elements therefore do not necessarily start or end on a byte boundary.